



ROHM GROUP Short Form Catalog



[Viewing the catalog]

■ **New** indicates new product.

■ ☆ indicates product under development.

■ Classification by the color

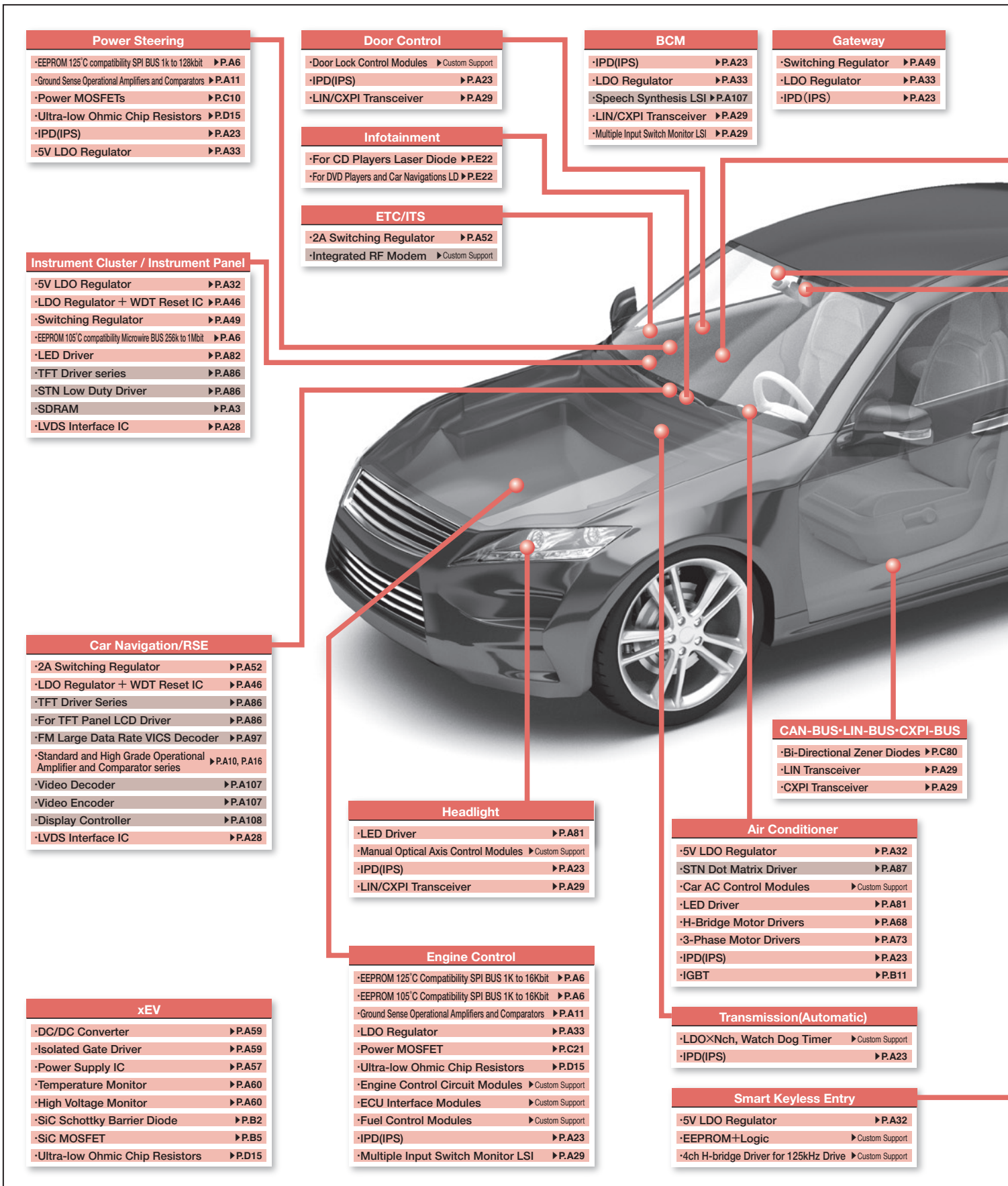
・ ROHM		Display with this color
・ LAPIS Semiconductor		The text displays LAPIS Semiconductor Product
・ Kionix		The text displays Kionix, Inc. Product

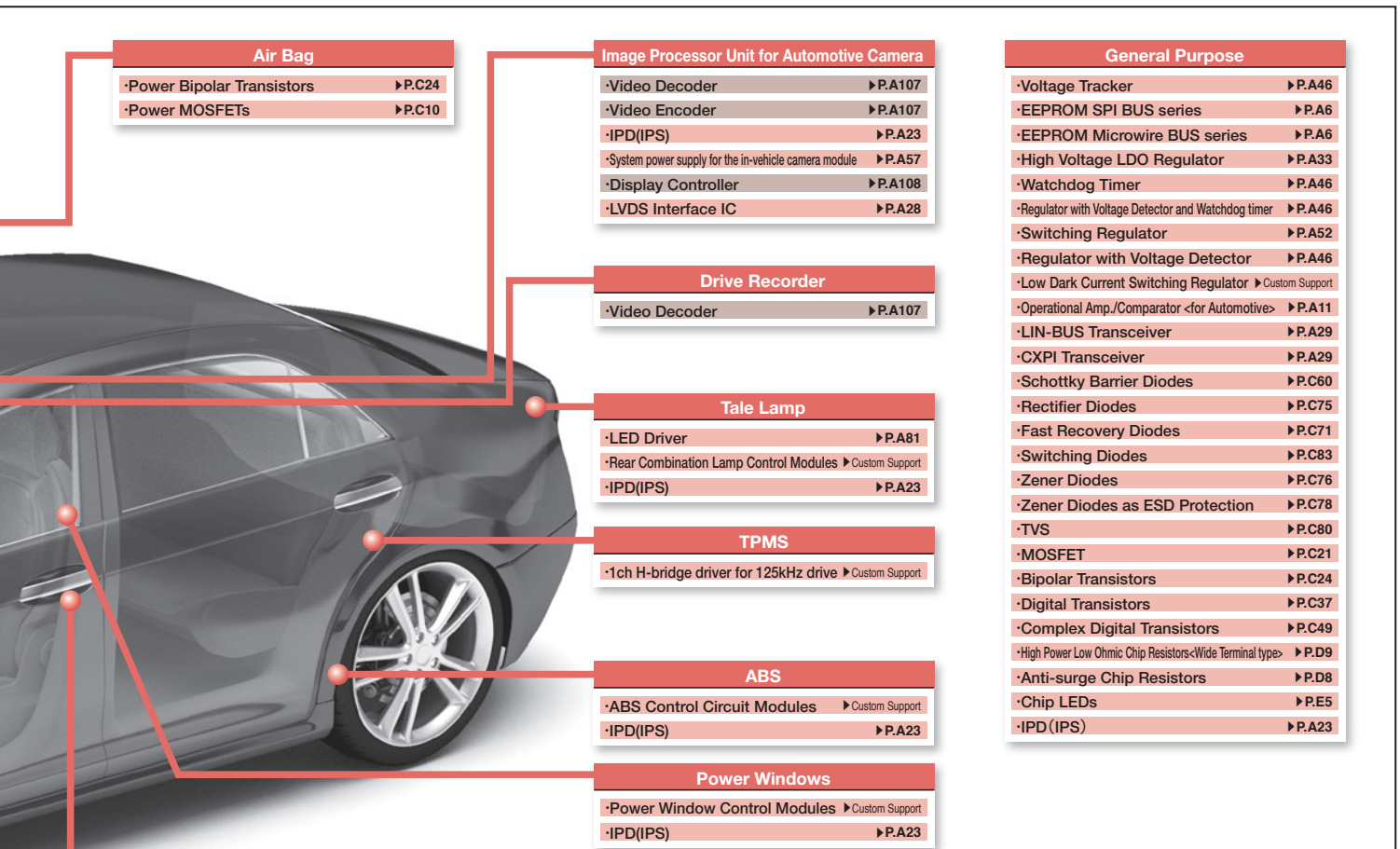
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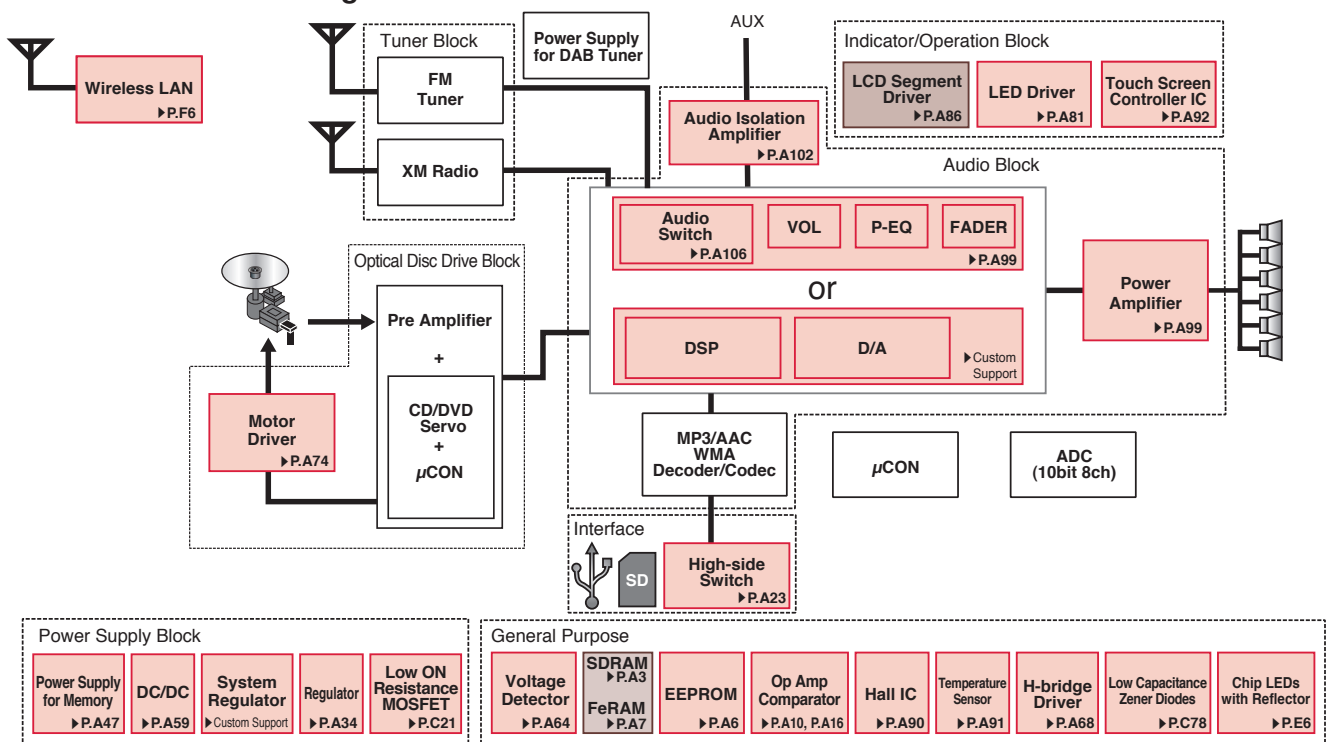


Automotive Block Diagram



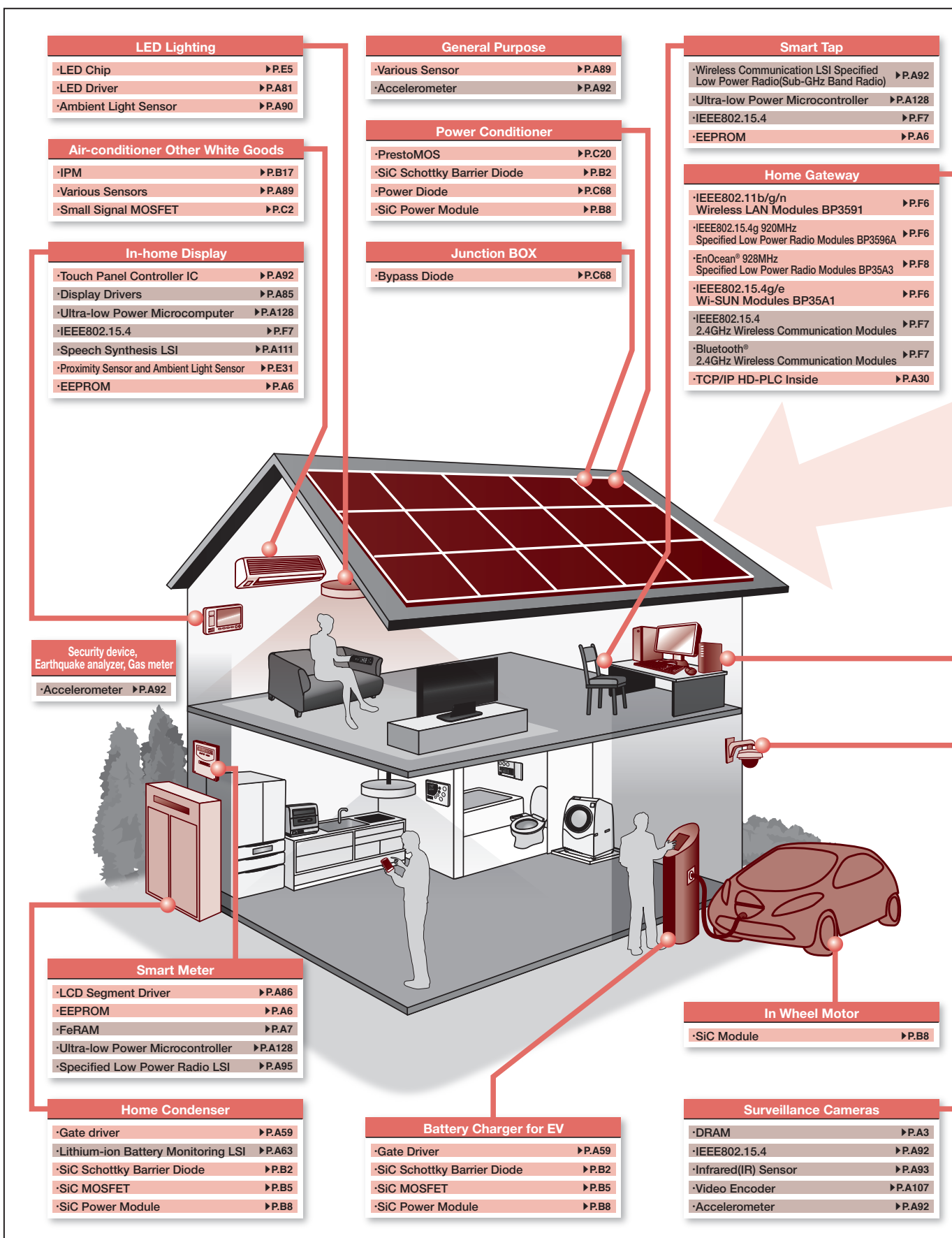


Car Audio Block Diagram

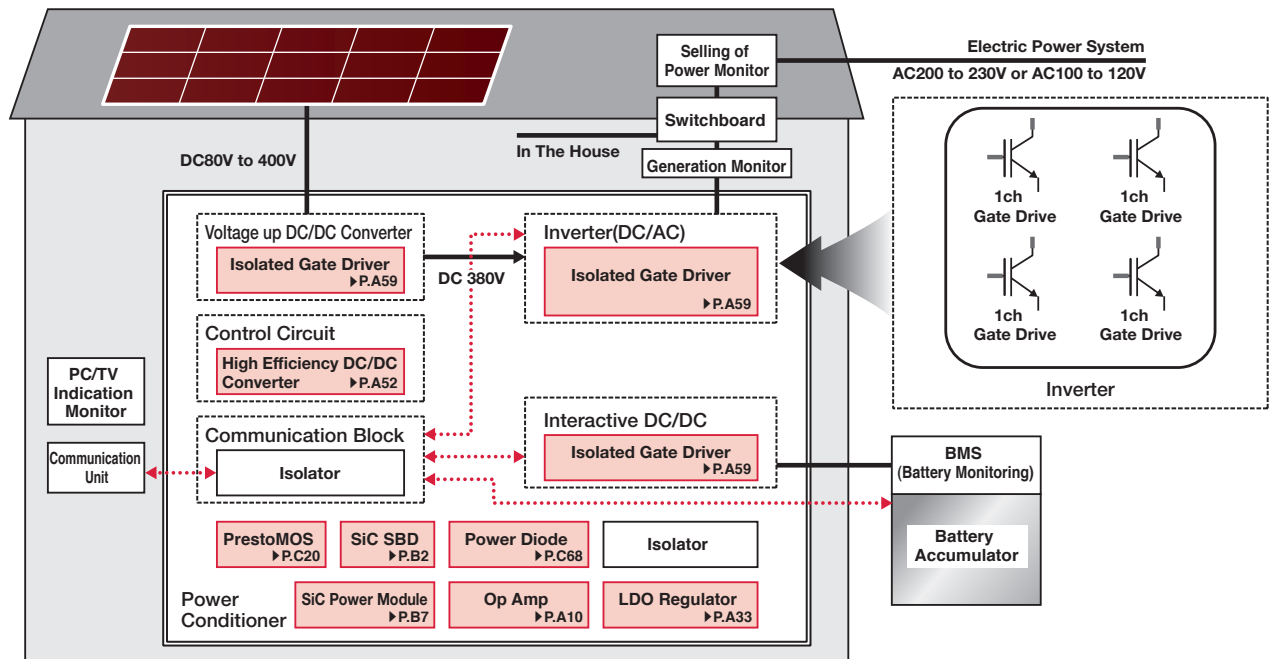




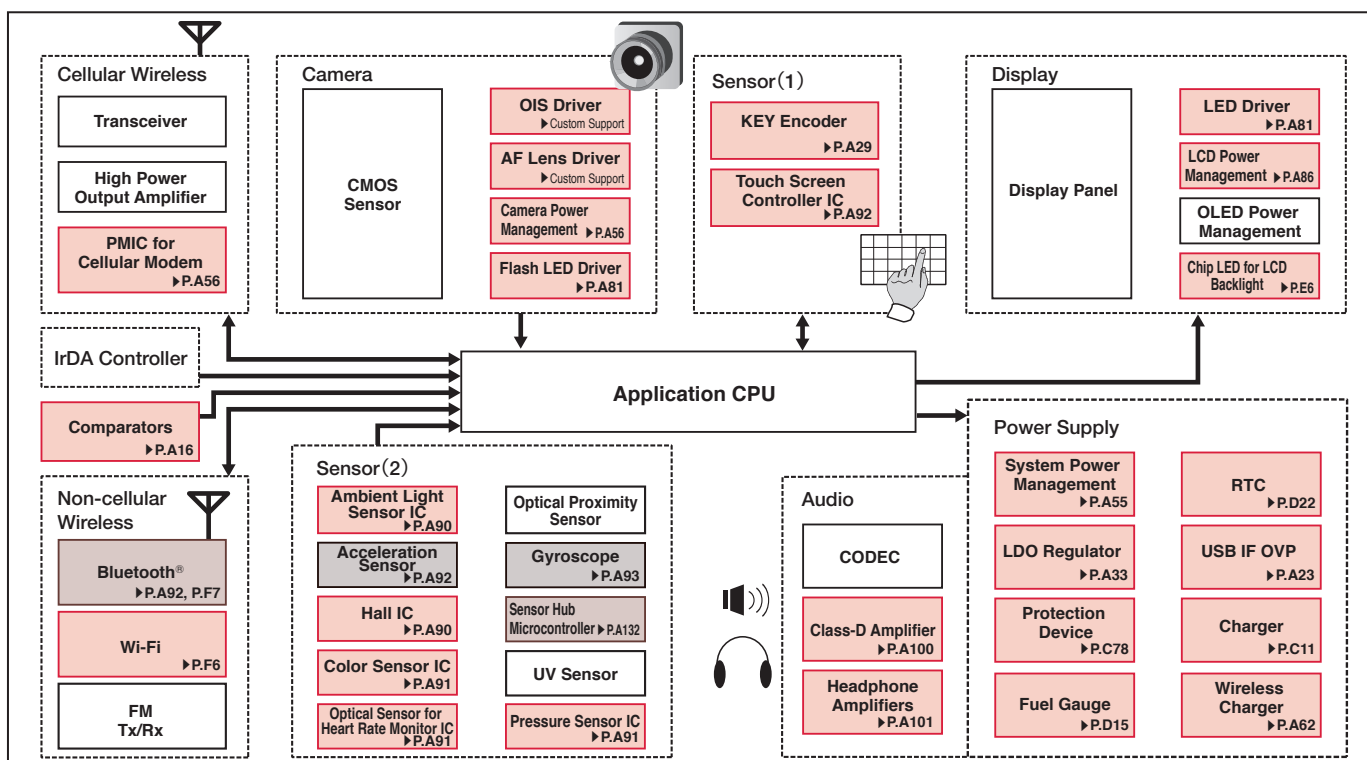
HEMS(Smart House) Block Diagram



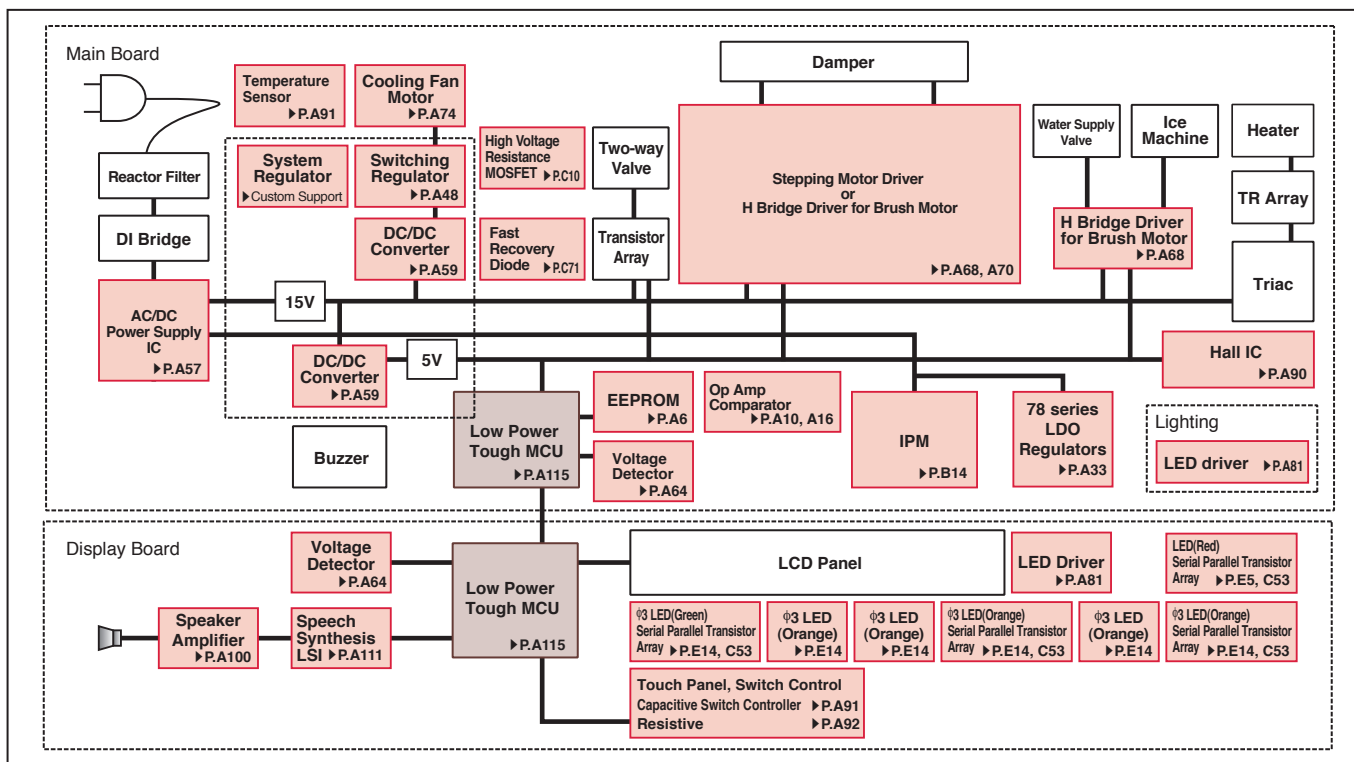
●Solar Inverter Block Diagram



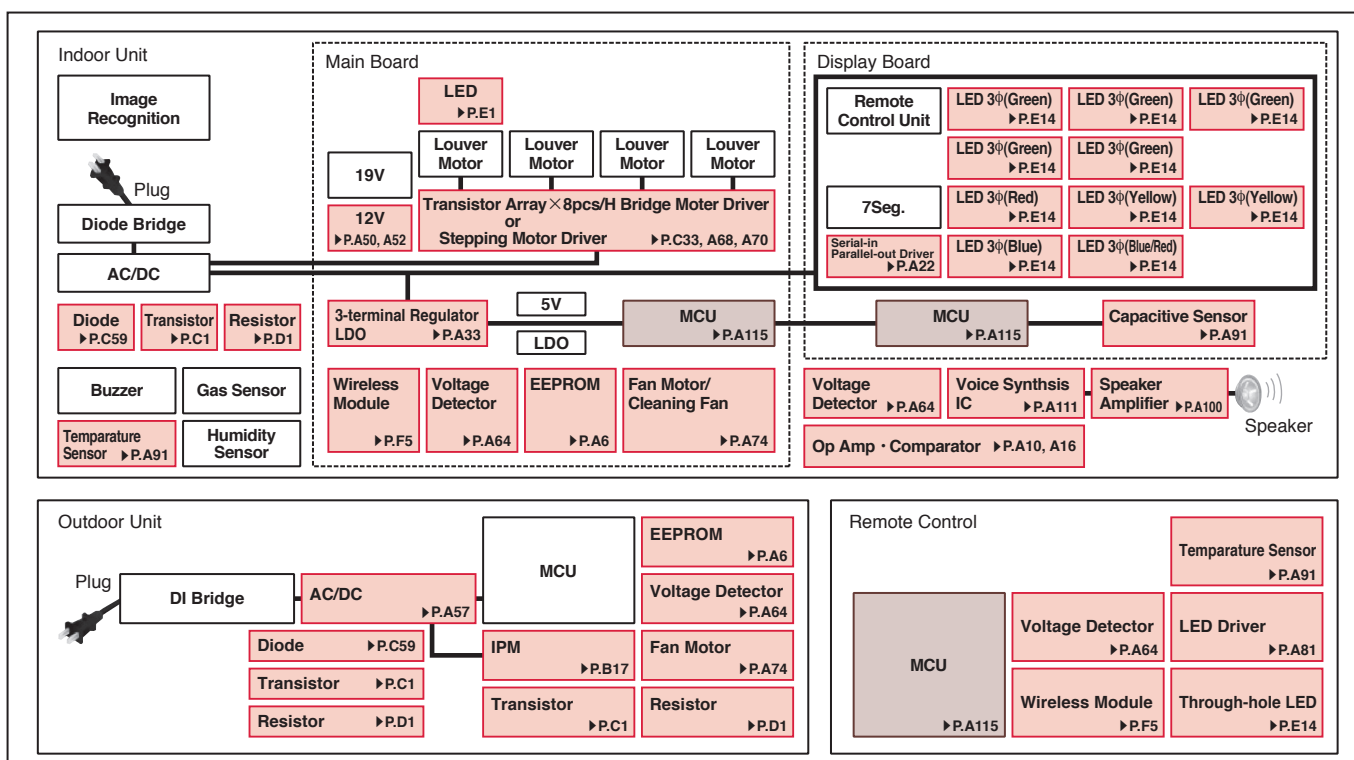
Smartphone/Tablet and Wearable Block Diagram



Refrigerator Block Diagram

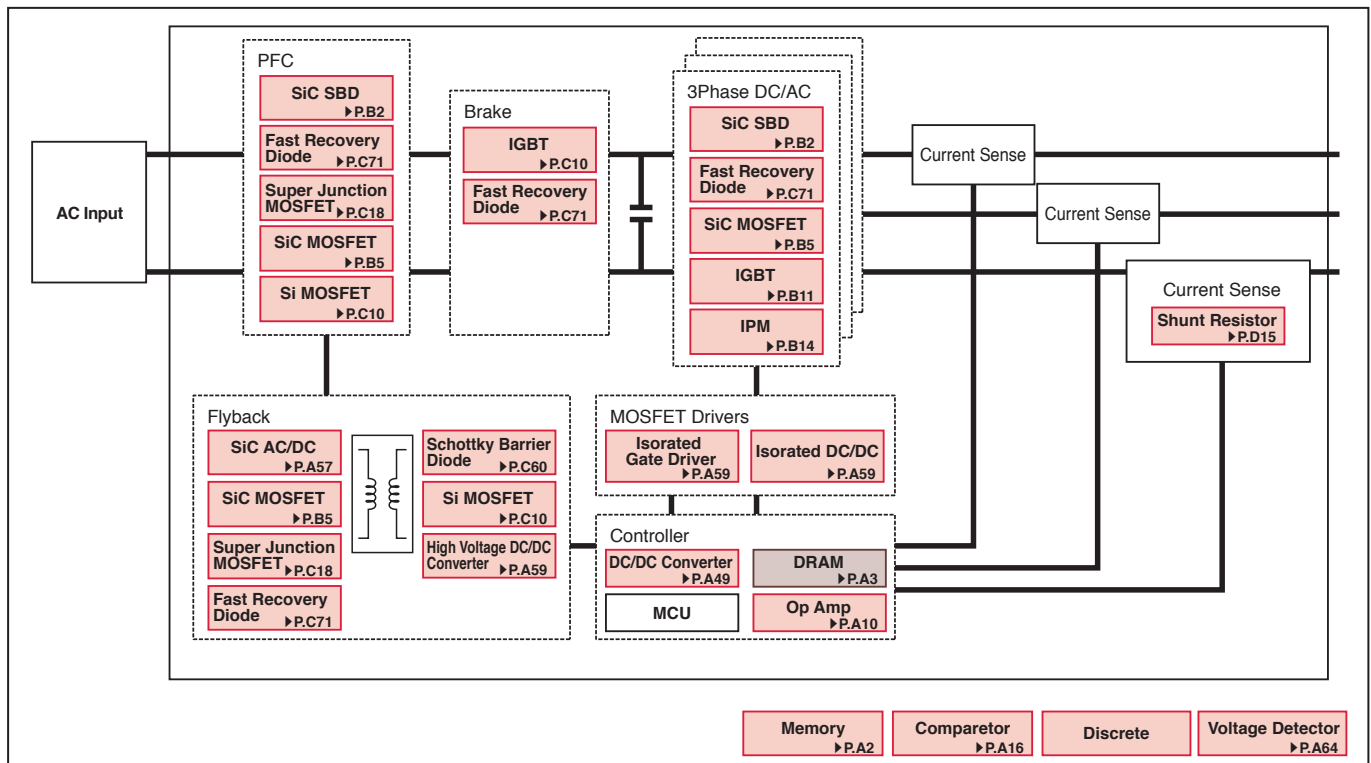


Air-conditioner Block Diagram

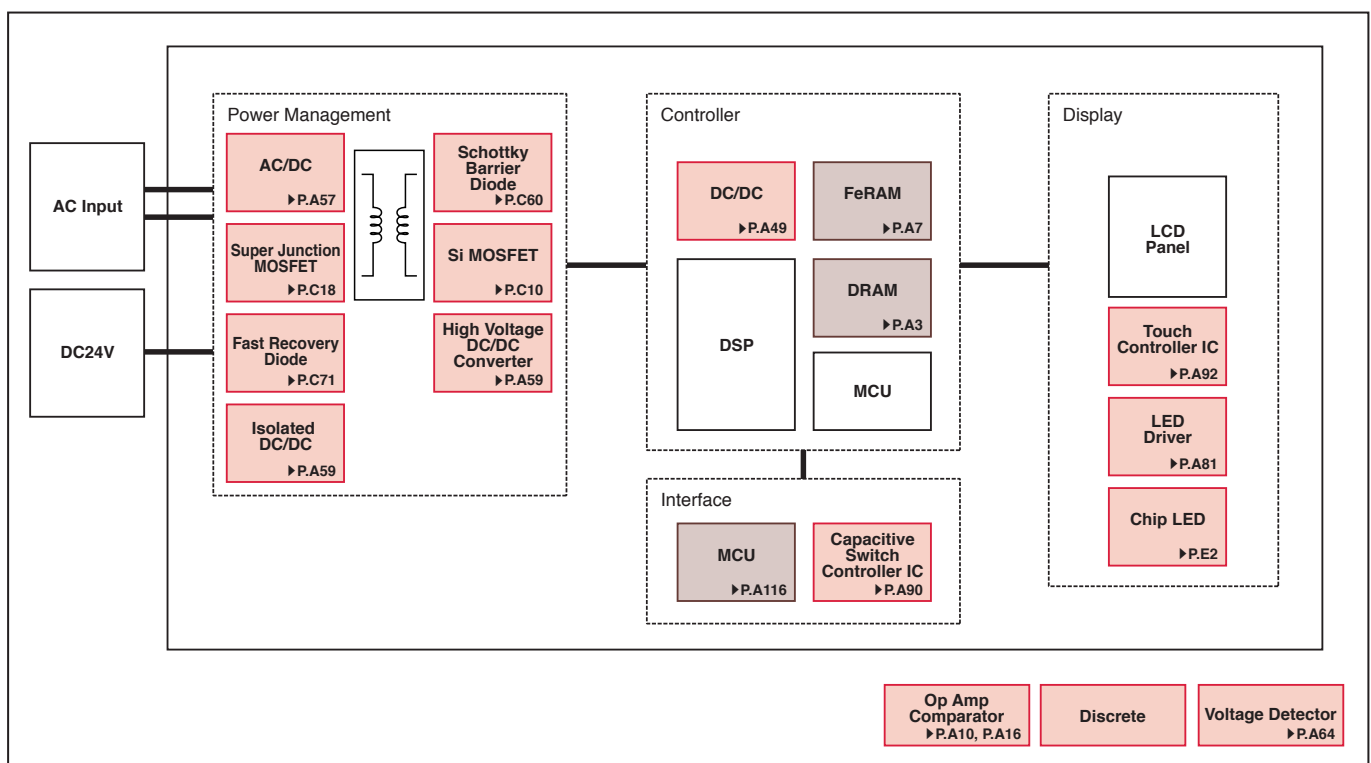


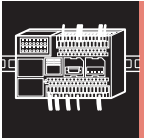


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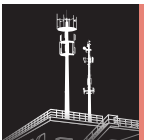
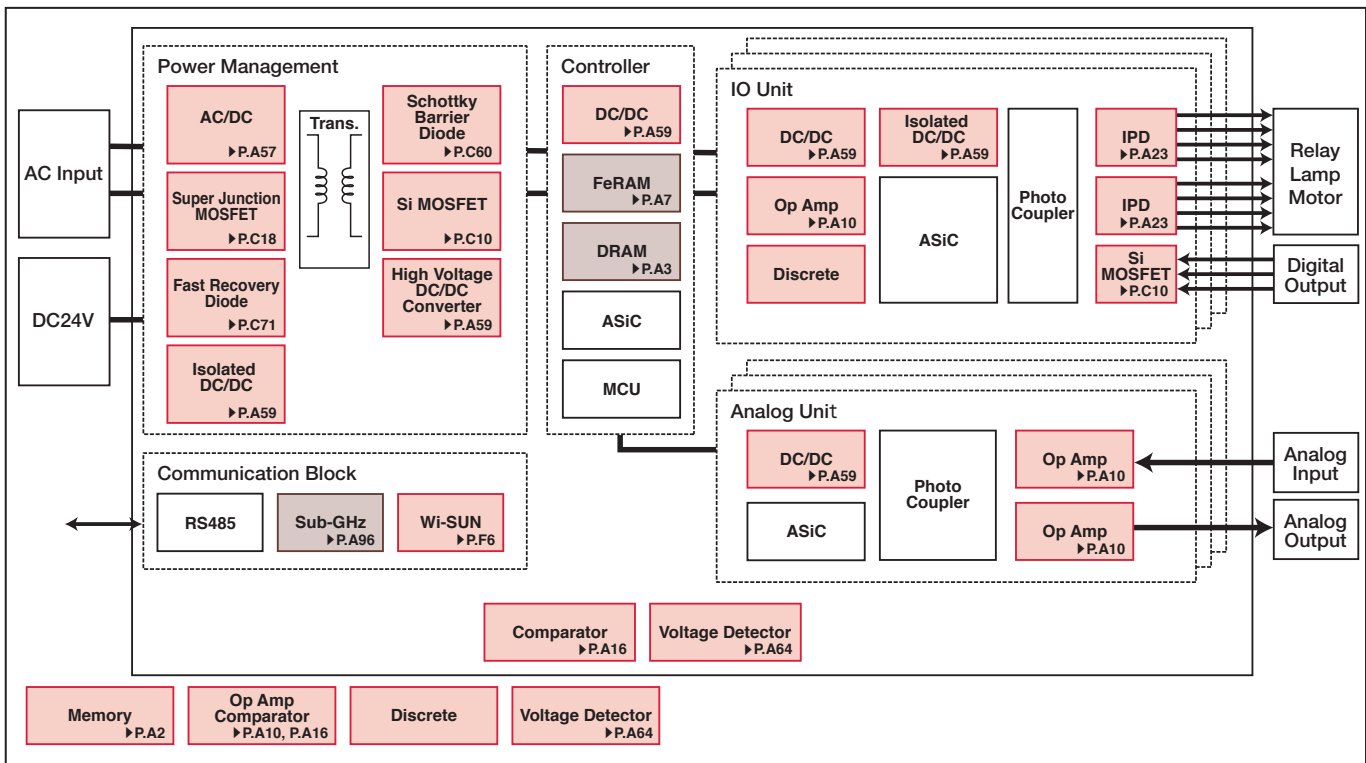


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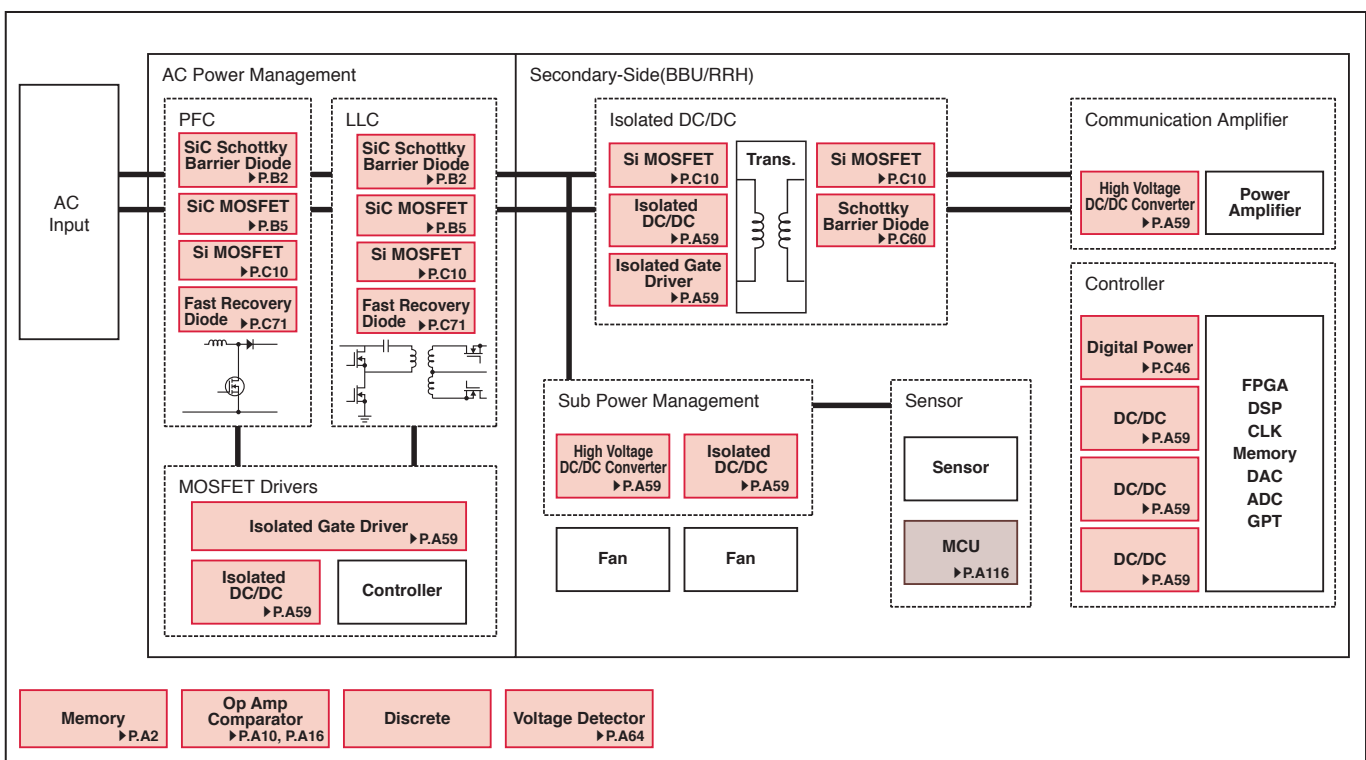


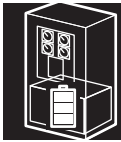


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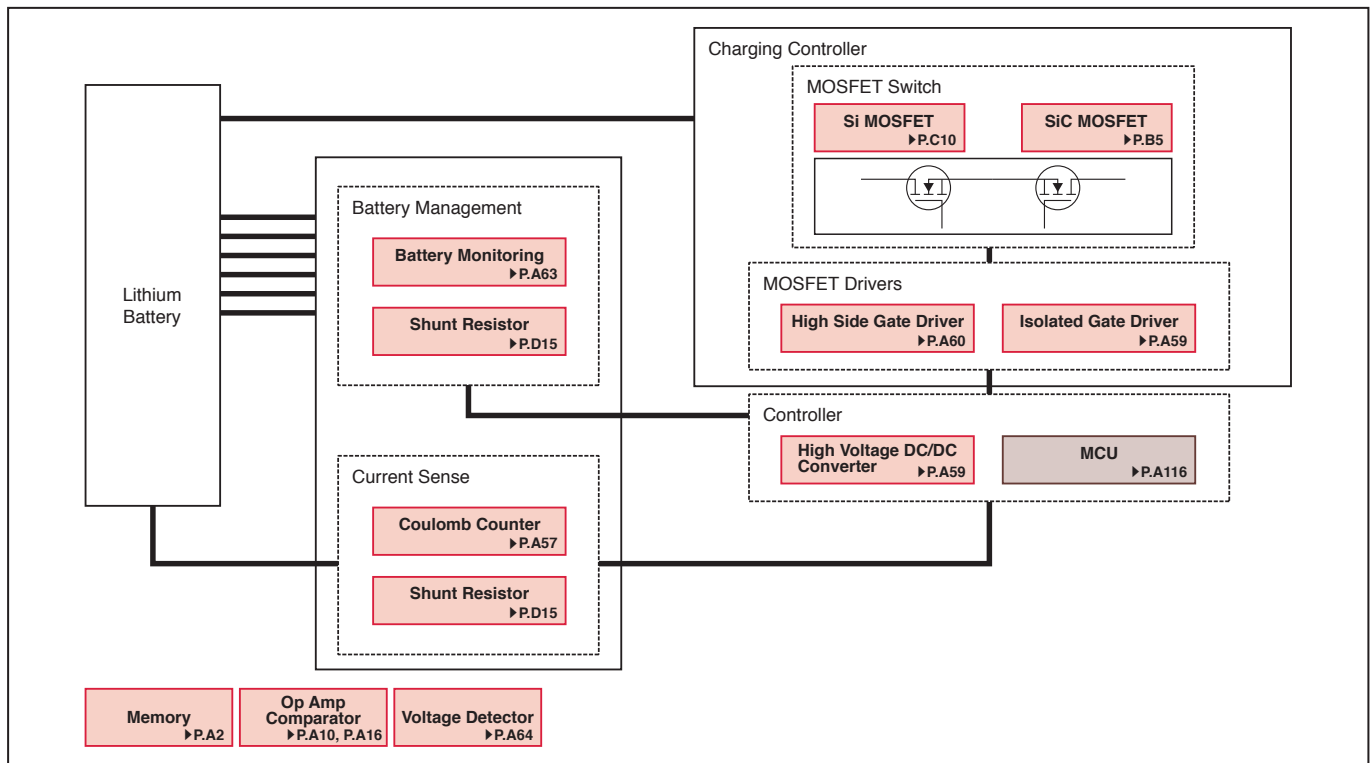


Base Station Block Diagram

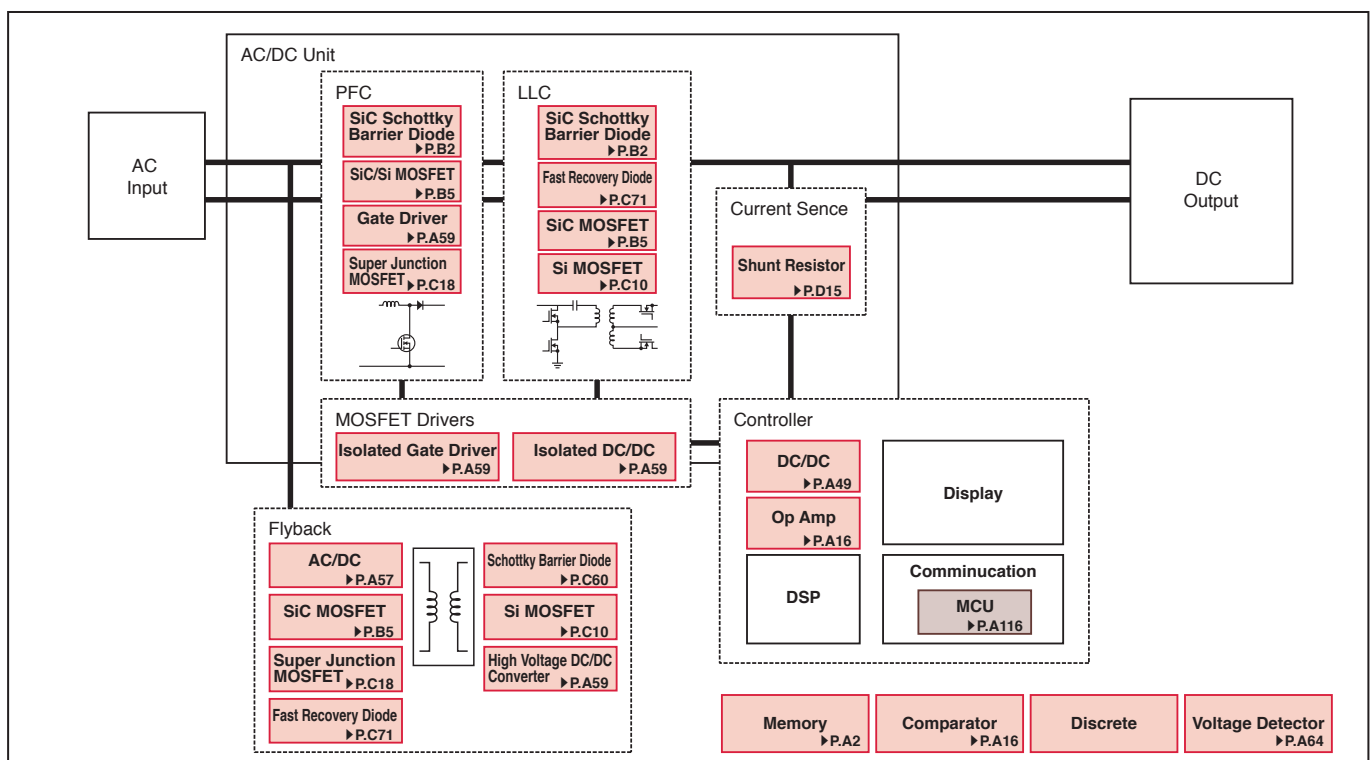




BMS(Battery Management System) Block Diagram



EV CHARGER Block Diagram



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**ICs**

Memory

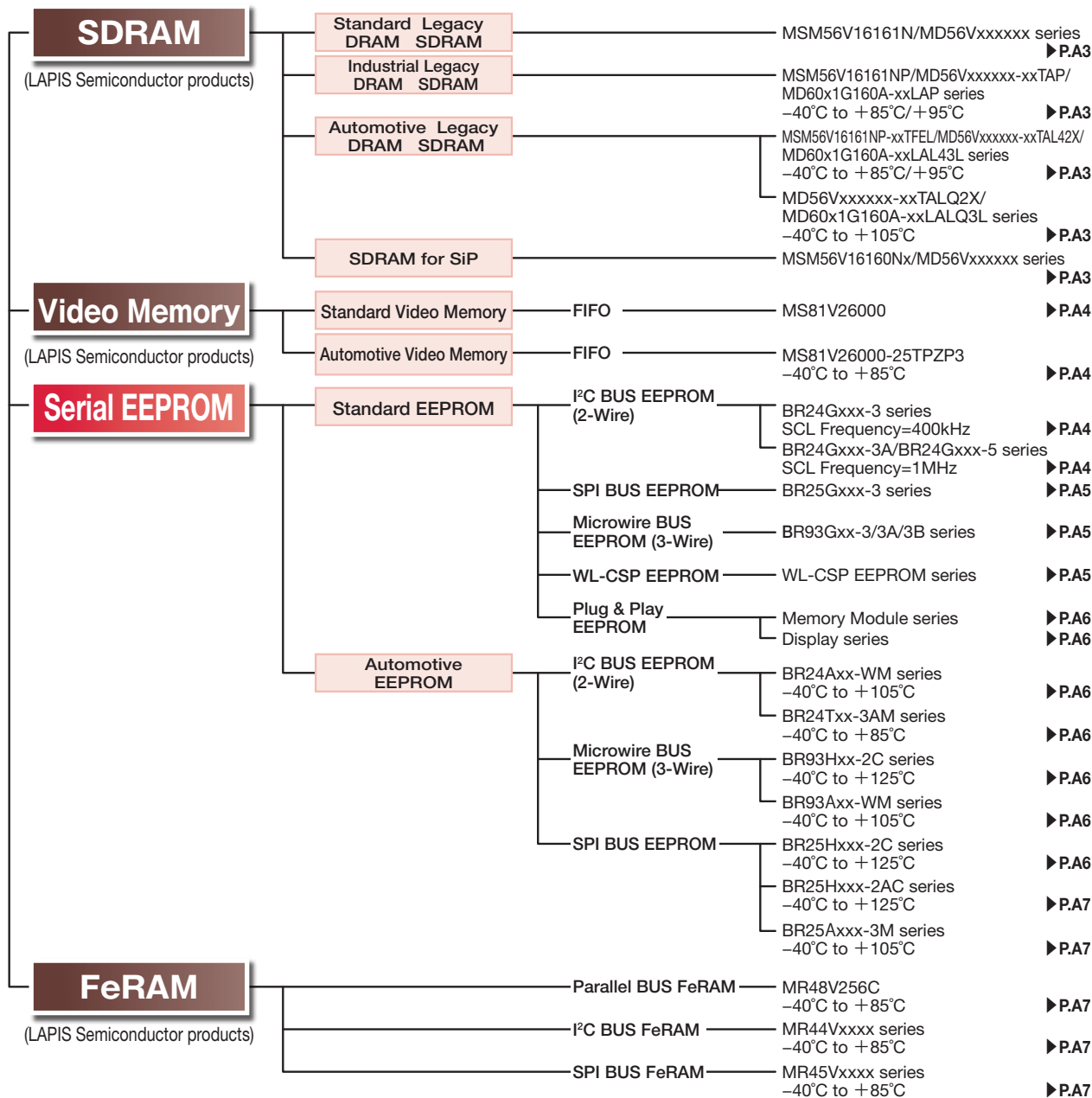
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General-purpose ICs

Memory

Memory



SDRAM

Standard Legacy DRAM SDRAM

(LAPIS Semiconductor products)

Standard												
Part No.	Data Rate type	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Features	Operating Temperature Ta(°C)	Package	Halogen Free Support*1
MSM56V16161N	SDR	3.3±0.3	16M	×16	2×512K×16	143	4096/64	7/7.5/10	Drivability Control	0 to +70	TSOP(2)50-400-0.80	✓
MD56V62161M			64M		4×1M×16	143		7/7.5/10			TSOP(2)54-400-0.80	✓
MD56V72161C			128M		4×2M×16	166		6/7/7.5/10				✓
MD56V82161A			256M		4×4M×16	166		6/7/7.5/10				✓

SDR : Single Data Rate Synchronous DRAM

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Industrial Legacy DRAM SDRAM

(LAPIS Semiconductor products)

Industrial												
Part No.	Data Rate type	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Features	Operating Temperature Ta(°C)	Package	Halogen Free Support*1
MSM56V16161NP	SDR	3.3±0.3	16M	×16	2×512K×16	143	4096/64	7/7.5/10	Drivability Control	-40 to +85	TSOP(2)50-400-0.80	✓
MD56V62161M-xxTAP			64M		4×1M×16	143		7/7.5/10			TSOP(2)54-400-0.80	✓
MD56V72161C-xxTAP			128M		4×2M×16	166		6/7/7.5/10				✓
MD56V82161A-xxTAP			256M		4×4M×16	166		6/7/7.5/10				✓
☆MD60Y1G160A-xxLAP7AL	DDR3	1.5±0.075	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8μs(Tc≤85°C), 3.9μs(Tc>85°C)	1.25/1.5	—	-40 to +95	TFBGA96-9.0x13.0-0.80	✓
☆MD60S1G160A-xxLAP7AL	DDR3L	1.35 +0.1, -0.067	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8μs(Tc≤85°C), 3.9μs(Tc>85°C)	1.25/1.5	—	-40 to +95	TFBGA96-9.0x13.0-0.80	✓

DDR3 : Double Data Rate3 Synchronous DRAM, SDR : Single Data Rate Synchronous DRAM

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

☆ : Under Development

Automotive Legacy DRAM SDRAM

(LAPIS Semiconductor products)

Automotive(85°C/95°C)													
Part No.	Data Rate type	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Features	Operating Temperature Ta(°C)	Package	Halogen Free Support*1	Automotive Grade AEC-Q100
MSM56V16161NP-xxTFEX	SDR	3.3±0.3	16M	×16	2×512K×16	143	4096/64	7/7.5/10	Drivability Control	-40 to +85	TSOP(2)50-400-0.80	✓	YES
MD56V62161M-xxTAL42X			64M		4×1M×16	143		7/7.5/10			TSOP(2)54-400-0.80	✓	YES
MD56V72161C-xxTAL42X			128M		4×2M×16	166		6/7/7.5/10				✓	YES
MD56V82161A-xxTAL42X			256M		4×4M×16	166		6/7/7.5/10				✓	YES
☆MD60Y1G160A-xxLAL43L	DDR3	1.5±0.075	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8μs(Tc≤85°C), 3.9μs(Tc>85°C)	1.25/1.5	—	-40 to +95	TFBGA96-9.0x13.0-0.80	✓	YES
☆MD60S1G160A-xxLAL43L	DDR3L	1.35 +0.1, -0.067	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8μs(Tc≤85°C), 3.9μs(Tc>85°C)	1.25/1.5	—	-40 to +95	TFBGA96-9.0x13.0-0.80	✓	YES

Automotive(105°C)													
Part No.	Data Rate type	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Features	Operating Temperature Ta(°C)	Package	Halogen Free Support*1	Automotive Grade AEC-Q100
MD56V62161M-xxTALQ2X	SDR	3.3±0.3	64M	×16	4×1M×16	143	4096/16	7/7.5/10	Drivability Control	-40 to +105	TSOP(2)54-400-0.80	✓	YES
MD56V72161C-xxTALQ2X			128M		4×2M×16	166		6/7/7.5/10					
MD56V82161A-xxTALQ2X			256M		4×4M×16	166		6/7/7.5/10					
☆MD60Y1G160A-xxLALQ3L	DDR3	1.5±0.075	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8μs(Tc≤85°C), 3.9μs(Tc>85°C)	1.25/1.5	—	-40 to +105	TFBGA96-9.0x13.0-0.80	✓	YES
☆MD60S1G160A-xxLALQ3L	DDR3L	1.35 +0.1, -0.067	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8μs(Tc≤85°C), 3.9μs(Tc>85°C)	1.25/1.5	—	-40 to +105	TFBGA96-9.0x13.0-0.80	✓	YES

DDR3 : Double Data Rate3 Synchronous DRAM, SDR : Single Data Rate Synchronous DRAM

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

☆ : Under Development

SDRAM for SiP

(LAPIS Semiconductor products)

Standard										
Part No.	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Operating Temperature Tj(°C)	Features	
MSM56V16160N-xxWBP	3.3±0.3	16M	×16	2×512K×16	143	4096/16	7/7.5/10	-40 to +125	KGD	
MD56V62160M-xxWBP		64M		4×1M×16	143		7/7.5/8/10			
MD56V72160C-xxWBP		128M		4×2M×16	166		6/7/7.5/10			

Automotive										
Part No.	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Operating Temperature Tj(°C)	Features	Automotive Grade*1
MSM56V16160NP	3.3±0.3	16M	×16	2×512K×16	143	4096/16	7/7.5/10	-40 to +125	KGD	YES
MD56V62160M		64M		4×1M×16	143		7/7.5/8/10			
MD56V72160C		128M		4×2M×16	166		6/7/7.5/10			

*1 : Please inquire to the sales for AEC-Q100.

Video Memory

Video Memory for Standard

(LAPIS Semiconductor products)

Standard													
Part No.	Supply Voltage (V)	Density (bit)	Configuration (word × bit) × port	Number of Data bits	Max. Operating Frequency (MHz)	Access Time (ns)	Cycle Time (ns)	Power Consumption (mW)		Operating Temperature Ta(°C)	Package	Notes	Halogen Free Support ^{*1}
								Operating	Standby				
MS81V26000	3.3±0.3	26M	1,114,112×24	×24	100	8/9	10/12	648/576	18	0 to +70	TQFP100-1414-0.50	Asynchronous serial read/write, Write mask function, Output data control, Cascade, The top address can be specified	✓

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Video Memory for Automotive

(LAPIS Semiconductor products)

Automotive														
Part No.	Supply Voltage (V)	Density (bit)	Configuration (word × bit) × port	Number of Data bits	Max. Operating Frequency (MHz)	Access Time (ns)	Cycle Time (ns)	Power Consumption (mW)		Operating Temperature Ta(°C)	Package	Notes	Halogen Free Support ^{*1}	Automotive Grade ^{*2}
								Operating	Standby					
MS81V26000-25TPZP3	3.3±0.3	26M	1,114,112×24	×24	40	12	25	576	18	−45 to +85	TQFP100-1414-0.50	Asynchronous serial read/write, Write mask function, Output data control, Cascade, The top address can be specified	✓	YES

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*2 : Please inquire to the sales for AEC-Q100.

Serial EEPROM

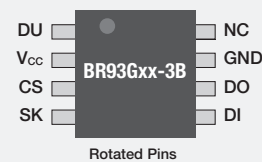
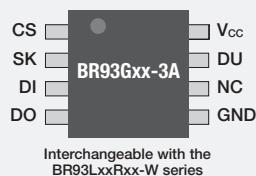
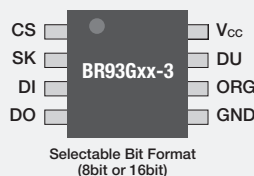
Standard EEPROM

I ² C BUS EEPROM(2-Wire) BR24Gxxx-3 series(SCL Frequency = 400kHz)																		
Part No.	Package and Suffix								Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	SCL Frequency (Hz)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)
	SOP8	SOP-J8	SSOP-B8	TSSOP-B8	MSOP8	TSSOP-B&J	VSON008X2030	VMMPO08Z1830				Operating (mA)	Standby (μA)					
BR24G01	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	1K	128 × 8	1.6 to 5.5	2	2	5	400k	-40 to +85	10 ⁶	40
BR24G02	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	2K	256 × 8	1.6 to 5.5	2	2	5	400k			
BR24G04	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	4K	512 × 8	1.6 to 5.5	2	2	5	400k			
BR24G08	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	8K	1K × 8	1.6 to 5.5	2	2	5	400k			
BR24G16	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	QUZ-3	16K	2K × 8	1.6 to 5.5	2	2	5	400k			
BR24G32	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	32K	4K × 8	1.6 to 5.5	2	2	5	400k			
BR24G64	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	64K	8K × 8	1.6 to 5.5	2	2	5	400k			
BR24G128	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	128K	16K × 8	1.6 to 5.5	2.5	2	5	400k			
BR24G256	F-3	FJ-3	FV-3	FVT-3	—	—	—	—	256K	32K × 8	1.6 to 5.5	2.5	2	5	400k			
I ² C BUS EEPROM(2-Wire) BR24Gxxx-3A series(SCL Frequency = 1MHz)																		
BR24G01	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	1K	128 × 8	1.7 to 5.5	2	2	5	1M	-40 to +85	10 ⁶	40
BR24G02	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	2K	256 × 8	1.7 to 5.5	2	2	5	1M			
BR24G04	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	4K	512 × 8	1.7 to 5.5	2	2	5	1M			
BR24G08	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	8K	1K × 8	1.7 to 5.5	2	2	5	1M			
BR24G16	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	16K	2K × 8	1.7 to 5.5	2	2	5	1M			
BR24G512	F-3A	FJ-3A	—	FVT-3A	—	—	—	—	512K	64K × 8	1.7 to 5.5	4.5	3	5	1M			
BR24G1M	F-3A	FJ-3A	—	—	—	—	—	—	1M	128K × 8	1.7 to 5.5	4.5	3	5	1M			
I ² C BUS EEPROM(2-Wire) BR24Gxxx-5 series(SCL Frequency = 1MHz)																		
BR24G32	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	32K	4K × 8	1.6 to 5.5	2	2.5	5	1M	-40 to +85	4 × 10 ⁶	200
BR24G64	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	64K	8K × 8	1.6 to 5.5	2	2.5	5	1M			
BR24G128	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	128K	16K × 8	1.6 to 5.5	2	2.5	5	1M			
BR24G256	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	256K	32K × 8	1.6 to 5.5	2	2.5	5	1M			

SPI BUS EEPROM BR25Gxxx-3 series														
Part No.	Package and Suffix					Density (bit)	Bit Format (word×bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)
	SOP8	SOP-J8	TSSOP-B8	MSOP8	VSON008X2030				Operating (mA)	Standby (μA)				
BR25G320	F-3	FJ-3	FVT-3	FVM-3	NUX-3	32K	4K×8	1.6 to 5.5	8	2	5	-40 to +85	10 ⁶	100
BR25G640	F-3	FJ-3	FVT-3	FVM-3	NUX-3	64K	8K×8	1.6 to 5.5	8	2	5			
BR25G128	F-3	FJ-3	FVT-3	FVM-3	NUX-3	128K	16K×8	1.6 to 5.5	8	2	5			
BR25G256	F-3	FJ-3	FVT-3	—	—	256K	32K×8	1.6 to 5.5	8	2	5			
BR25G512	F-3	FJ-3	FVT-3	—	—	512K	64K×8	1.8 to 5.5	4	1	5			
BR25G1M	F-3	FJ-3	—	—	—	1M	128K×8	1.8 to 5.5	4	1	5			
Microwire BUS EEPROM(3-Wire) BR93Gxx-3/3A/3B series														
BR93G46	F-3 ^{*1} / F-3A ^{*2} / F-3B ^{*3}	FJ-3 ^{*1} / FJ-3A ^{*2} / FJ-3B ^{*3}	FVT-3 ^{*1} / FVT-3A ^{*2} / FVT-3B ^{*3}	FVM-3 ^{*1} / FVM-3A ^{*2} / FVM-3B ^{*3}	NUX-3 ^{*1} / NUX-3A ^{*2} / NUX-3B ^{*3}	1K	64×16 (128×8)	1.7 to 5.5	3	2	5	-40 to +85	10 ⁶	40
BR93G56	F-3 ^{*1} / F-3A ^{*2} / F-3B ^{*3}	FJ-3 ^{*1} / FJ-3A ^{*2} / FJ-3B ^{*3}	FVT-3 ^{*1} / FVT-3A ^{*2} / FVT-3B ^{*3}	FVM-3 ^{*1} / FVM-3A ^{*2} / FVM-3B ^{*3}	NUX-3 ^{*1} / NUX-3A ^{*2} / NUX-3B ^{*3}	2K	128×16 (256×8)	1.7 to 5.5	3	2	5			
BR93G66	F-3 ^{*1} / F-3A ^{*2} / F-3B ^{*3}	FJ-3 ^{*1} / FJ-3A ^{*2} / FJ-3B ^{*3}	FVT-3 ^{*1} / FVT-3A ^{*2} / FVT-3B ^{*3}	FVM-3 ^{*1} / FVM-3A ^{*2} / FVM-3B ^{*3}	NUX-3 ^{*1} / NUX-3A ^{*2} / NUX-3B ^{*3}	4K	256×16 (512×8)	1.7 to 5.5	3	2	5			
BR93G76	F-3 ^{*1} / F-3A ^{*2} / F-3B ^{*3}	FJ-3 ^{*1} / FJ-3A ^{*2} / FJ-3B ^{*3}	FVT-3 ^{*1} / FVT-3A ^{*2} / FVT-3B ^{*3}	FVM-3 ^{*1} / FVM-3A ^{*2} / FVM-3B ^{*3}	NUX-3 ^{*1} / NUX-3A ^{*2} / NUX-3B ^{*3}	8K	512×16 (1K×8)	1.7 to 5.5	3	2	5			
BR93G86	F-3 ^{*1} / F-3A ^{*2} / F-3B ^{*3}	FJ-3 ^{*1} / FJ-3A ^{*2} / FJ-3B ^{*3}	FVT-3 ^{*1} / FVT-3A ^{*2} / FVT-3B ^{*3}	FVM-3 ^{*1} / FVM-3A ^{*2} / FVM-3B ^{*3}	NUX-3 ^{*1} / NUX-3A ^{*2} / NUX-3B ^{*3}	16K	1K×16 (2K×8)	1.7 to 5.5	3	2	5			

Microwire BUS EEPROM(3-Wire) BR93Gxx-3/3A/3B series : *1 : They are dual organization(16bit or 8bit) and it is selected the input of ORG PIN. *2 : 1PIN : CS PIN *3 : 3PIN : CS PIN

Micro Wire BUS Pin Assignment



WL-CSP EEPROM																
Part No.	I/F	Density (bit)	Package					Pull-up Resistor	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Data Retention (years)	
			Package Name	Size(mm)	Thickness (mm)(Max.)	Ball Pitch (mm)	RESIN COATING				Operating (mA)	Standby (μA)				
BU9833GUL-W	I²C	2K	VCSP50L1	x : 1.27 y : 1.50	0.55	0.5	✓	—	256 × 8	1.7 to 5.5	2	2	5	−40 to +85	40	
BU9847GUL-W	I²C	4K	VCSP50L1	x : 1.95 y : 1.06	0.55	0.5	✓	—	512 × 8	1.7 to 5.5	2	2	5	−40 to +85	40	
BU9889GUL-W	I²C	8K	VCSP50L1	x : 1.60 y : 1.00	0.55	0.5	✓	—	1K × 8	1.7 to 5.5	2	2	5	−40 to +85	40	
BRCB008GWZ-3	I²C	8K	UCSP30L1	x : 0.94 y : 0.94	0.33	0.4	—	—	1K × 8	1.7 to 3.6	2	2	5	−40 to +85	40	
BRCB016GWL-3	I²C	16K	UCSP50L1	x : 1.10 y : 1.15	0.55	0.4	✓	—	2K × 8	1.7 to 3.6	2	2	5	−40 to +85	40	
BRCD016GWZ-3	I²C	16K	UCSP35L1	x : 1.30 y : 0.77	0.40	0.4	✓	—	2K × 8	1.7 to 3.6	2	2	5	−40 to +85	40	
BRCG016GWZ-3	I²C	16K	UCSP30L1A	x : 0.82 y : 0.82	0.33	0.4	✓	—	2K × 8	1.7 to 5.5	2	2	5	−40 to +85	40	
BRCF016GWZ-3	I²C	16K	UCSP30L1	x : 0.86 y : 0.84	0.35	0.4	—	—	2K × 8	1.7 to 5.5	2	2	5	−40 to +85	40	
BRCA016GWZ-W	I²C	16K	UCSP30L1	x : 1.30 y : 0.77	0.35	0.4	—	—	2K × 8	1.7 to 3.6	2	2	5	−40 to +85	40	
BRCB032GWZ-3	I²C	32K	UCSP30L1	x : 1.45 y : 0.77	0.33	0.4	—	—	4K × 8	1.7 to 5.5	2	2	5	−40 to +85	40	
BRCH064GWZ-3	I²C	64K	UCSP35L1A	x : 1.50 y : 1.00	0.33	0.4	✓	—	8K × 8	1.6 to 5.5	2	2	5	−40 to +85	40	
BRCB064GWZ-3	I²C	64K	UCSP30L1	x : 1.50 y : 1.00	0.35	0.4	—	WP	8K × 8	1.6 to 5.5	3.9	2	5	−40 to +85	40	
BRCE064GWZ-3	I²C	64K	UCSP25L1	x : 1.50 y : 1.00	0.30	0.4	—	—	8K × 8	1.6 to 5.5	2	2	5	−40 to +85	40	
BU9897GUL-W	I²C	128K	VCSP50L2	x : 2.44 y : 1.99	0.55	0.5	✓	—	16K × 8	1.7 to 5.5	2.5	2	5	−40 to +85	40	
BU9832GUL-W	SPI	8K	VCSP50L2	x : 2.09 y : 1.85	0.55	0.5	✓	—	1K × 8	1.8 to 5.5	3	2	5	−40 to +85	40	
BU9829GUL-W	SPI	16K	VCSP50L1	x : 1.74 y : 1.65	0.55	0.5	✓	—	2K × 8	1.6 to 3.6	2	1	5	−30 to +85	10	
BR25S128GUZ-W	SPI	128K	VCSP35L2	x : 2.00 y : 2.63	0.40	0.5	✓	—	16K × 8	1.7 to 5.5	2*	2	5	−40 to +85	40	
BU9891GUL-W	MW	4K	VCSP50L1	x : 1.60 y : 1.00	0.55	0.5	✓	—	256 × 16	1.7 to 5.5	3	2	5	−40 to +85	40	

WL-CSP EEPROM : * Vcc=2.5V

Plug & Play EEPROM For Memory Modules

Part No.	Package and Suffix		Bit Format (word × bit)	Supply Voltage (V)	Clock Frequency (kHz)	Write Cycle Time (ms)	Endurance (times)	Data Retention (years)	Write Protect
	TSSOP-B8	VSON008X2030							
BR34L02	FVT-W	—	256 × 8	1.7 to 5.5	100 ^{*1} /400 ^{*2}	5	10 ⁶	40	Onetime ROM write protect
BR34E02	FVT-3	NUX-3	256 × 8	1.7 to 5.5	400	5	10 ⁶	40	Settable write protect Onetime ROM write protect

Plug & Play EEPROM For Memory Modules : *1 : V_{CC}=1.7 to 5.5V *2 : V_{CC}=2.5 to 5.5V

Plug & Play EEPROM For Display

Part No.	Package and Suffix							Function Descriptions	Bit Format (word × bit)	Supply Voltage (V)	Clock Frequency (MHz)	Write Cycle Time (ms)
	SOP8	SOP-J8	SSOP-B8	SOP14	SSOP-B14	SSOP-B16	VSON008X2030					
BR24C21	F	FJ	FV	—	—	—	—	Supports DDC1/ DDC2 for displays	128 × 8	2.5 to 5.5	100/400	10
BU9882	—	—	—	F-W	FV-W	—	—	Dual-port type compatible with DDC2 for displays	128 × 8 × 2ch	2.5 to 5.5	100 /400	10
BU9883	—	—	—	—	—	FV-W	—	2Kbit × 3ch EEPROM for HDMI ports	256 × 8 × 3ch	3.0 to 5.5	400	5
BU99022	—	—	—	—	—	—	NUX-3	2Kbit × 2ch type	256 × 8 × 2ch	1.7 to 5.5	400	5

Automotive EEPROM

105°C Operation I²C BUS EEPROM(2-Wire) BR24Axx-WM series

Part No.	Package and Suffix			Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)	Automotive Grade AEC-Q100
	SOP8	SOP-J8	MSOP8				Operating (mA)	Standby (μA)					
BR24A01A	F-WM	FJ-WM	—	1K	128 × 8	2.5 to 5.5	2	2	5	-40 to +105	10 ⁶	40	YES
BR24A02	F-WM	FJ-WM	FVM-WM	2K	256 × 8	2.5 to 5.5	2	2	5				
BR24A04	F-WM	FJ-WM	—	4K	512 × 8	2.5 to 5.5	2	2	5				
BR24A08	F-WM	FJ-WM	—	8K	1K × 8	2.5 to 5.5	2	2	5				
BR24A16	F-WM	FJ-WM	—	16K	2K × 8	2.5 to 5.5	2	2	5				
BR24A32	F-WM	—	—	32K	4K × 8	2.5 to 5.5	3	2	5				
BR24A64	F-WM	—	—	64K	8K × 8	2.5 to 5.5	3	2	5				

85°C Operation I²C BUS EEPROM(2-Wire) BR24Txx-3AM series

Part No.	Package and Suffix			Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)	Automotive Grade AEC-Q100
	SOP8	SOP-J8	TSSOP-B8				Operating (mA)	Standby (μA)					
BR24T512	F-3AM	FJ-3AM	FVT-3AM	512K	64K × 8	1.7 to 5.5	4.5	3	5	-40 to +85	10 ⁶	40	YES
BR24T1M	F-3AM	FJ-3AM	—	1M	128K × 8	1.7 to 5.5	4.5	3	5	-40 to +85	10 ⁶	40	YES

125°C Operation Microwire BUS EEPROM(3-Wire) BR93Hxx-2C series

Part No.	Package and Suffix				Density (bit)	Bit Format (word × bit)	Supply Voltage(V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)	Automotive Grade AEC-Q100
	SOP8	SOP-J8	TSSOP-B8	MSOP8				Operating (mA)	Standby (μA)					
BR93H46	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	1K	64 × 16	2.5 to 5.5	3	10	4	-40 to +125	10 ⁶	100	YES
BR93H56	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	2K	128 × 16	2.5 to 5.5	3	10	4				
BR93H66	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	4K	256 × 16	2.5 to 5.5	3	10	4				
BR93H76	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	8K	512 × 16	2.5 to 5.5	3	10	4				
BR93H86	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	16K	1K × 16	2.5 to 5.5	3	10	4				

105°C Operation Microwire BUS EEPROM(3-Wire) BR93Axx-WM series

BR93A46	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	1K	64 × 16	2.5 to 5.5	3	2	5	-40 to +105	10 ⁶	40	YES
BR93A56	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	2K	128 × 16	2.5 to 5.5	3	2	5				
BR93A66	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	4K	256 × 16	2.5 to 5.5	3	2	5				
BR93A76	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	8K	512 × 16	2.5 to 5.5	3	2	5				
BR93A86	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	16K	1K × 16	2.5 to 5.5	3	2	5				

125°C Operation SPI BUS EEPROM BR25Hxxx-2C series

BR25H010	F-2C	FJ-2C	FVT-2C	FVM-2C	1K	128 × 8	2.5 to 5.5	4	10	4	-40 to +125	10 ⁶	100	YES
BR25H020	F-2C	FJ-2C	FVT-2C	FVM-2C	2K	256 × 8	2.5 to 5.5	4	10	4				
BR25H040	F-2C	FJ-2C	FVT-2C	FVM-2C	4K	512 × 8	2.5 to 5.5	4	10	4				
BR25H080	F-2C	FJ-2C	FVT-2C	FVM-2C	8K	1K × 8	2.5 to 5.5	4	10	4				
BR25H160	F-2C	FJ-2C	FVT-2C	FVM-2C	16K	2K × 8	2.5 to 5.5	4	10	4				
BR25H320	F-2C	FJ-2C	FVT-2C	FVM-2C	32K	4K × 8	2.5 to 5.5	4	10	4				
BR25H640	F-2C	FJ-2C	FVT-2C	—	64K	8K × 8	2.5 to 5.5	5.5	10	4				
BR25H128	F-2C	FJ-2C	—	—	128K	16K × 8	2.5 to 5.5	5.5	10	4				

125°C Operation SPI BUS EEPROM with ECC Function BR25Hxxx-2AC series														
Part No.	Package and Suffix				Density (bit)	Bit Format (word×bit)	Supply Voltage(V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)	Automotive Grade AEC-Q100
	SOP8	SOP-J8	TSSOP-B8	MSOP8				Operating (mA)	Standby (μA)					
BR25H640	F-2AC	FJ-2AC	FVT-2AC	FVM-2AC	64K	8K×8	2.5 to 5.5	5.5	10	4	-40 to +125	10 ⁶	100	YES
BR25H128	F-2AC	FJ-2AC	FVT-2AC	—	128K	16K×8	2.5 to 5.5	5.5	10	4				
BR25H256	F-2AC	FJ-2AC	—	—	256K	32K×8	2.5 to 5.5	5.5	10	4				
105°C Operation SPI BUS EEPROM BR25Axxx-3M series														
BR25A256	F-3M	FJ-3M	FVT-3M	—	256K	32K×8	2.5 to 5.5	4	10	5	-40 to +105	10 ⁶	100	YES
BR25A512	F-3M	FJ-3M	FVT-3M	—	512K	64K×8	2.5 to 5.5	4	10	5				
BR25A1M	F-3M	FJ-3M	—	—	1M	128K×8	2.5 to 5.5	4	10	5				

FeRAM

Ferroelectric Memory

(LAPIS Semiconductor products)

Parallel BUS FeRAM										
Part No.	Memory Density (bit)	Configuration (word×bit)	Supply Voltage (V)	Operating Speed	Read/Write Endurance (times)	Data Retention (years)	Operating Temperature Ta(°C)	Package	Halogen Free Support*1	Automotive Grade*2
MR48V256C	256K	32K×8	2.7 to 3.6	t _{RC} =150ns	10 ¹³	10	−40 to +85	TSOP(I)28-08134-0.55	—	YES
I ² C BUS FeRAM MR44Vxxxx series										
MR44V064B	64K	8K×8	1.8 to 3.6	f _{clk} =3.4MHz	10 ¹³	10	−40 to +85	SOP8-200-1.27	✓	YES
MR44V100A	1M	128K×8	1.8 to 3.6	f _{clk} =3.4MHz					✓	
SPI BUS FeRAM MR45Vxxxx series										
MR45V032A	32K	4K×8	2.7 to 3.6	f _{clk} =15MHz	10 ¹³	10	−40 to +85	SOP8-200-1.27	✓	YES
MR45V064B	64K	8K×8	1.8 to 3.6	f _{clk} =40MHz						
MR45V256A	256K	32K×8	3.0 to 3.6	f _{clk} =15MHz						
MR45V100A	1M	128K×8	1.8 to 3.6	f _{clk} =40MHz						
MR45V200B	2M	256K×8	2.7 to 3.6	f _{clk} =34MHz						
								DIP8-300-2.54	✓	—
								DIP8-300-2.54	✓	—

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products.
For details, please inquire to the sales.

*2 : Please inquire to the sales for AEC-Q100.



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Operational Amplifiers/Comparators

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High Speed

A

Amplifiers & Linear

Input-Output Full Swing Operational Amplifiers

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package
BU7261G	—	1	1.8 to 5.5	250	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	1.1	2.0	-40 to +85	SSOP5
BU7261SG	○														-40 to +105	SSOP5
BU7262F	—	2	1.8 to 5.5	550	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	1.1	2.0	-40 to +85	SOP8
BU7262FVM	—														-40 to +85	MSOP8
BU7262NUX	—	2	1.8 to 5.5	550	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	1.1	2.0	-40 to +85	VSON008X2030
BU7262SF	○														-40 to +85	SOP8
BU7262SFVM	○	2	1.8 to 5.5	550	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	1.1	2.0	-40 to +105	MSOP8
BU7262SNUX	○														-40 to +105	VSON008X2030
BU7264F	—	4	1.8 to 5.5	1,100	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	1.1	2.0	-40 to +85	SOP14
BU7264FV	—														-40 to +85	SSOP-B14
BU7264SF	○	4	1.8 to 5.5	1,100	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	1.1	2.0	-40 to +105	SOP14
BU7264SFV	○														-40 to +105	SSOP-B14
BU7291G	—	1	2.4 to 5.5	470	1.0	0.001	8	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	105	60	80	3.0	2.8	-40 to +85	SSOP5
BU7291SG	○														-40 to +105	SSOP5
BU7294F	—	4	2.4 to 5.5	2,000	1.0	0.001	8	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	105	60	80	3.0	2.8	-40 to +85	SOP14
BU7294FV	—														-40 to +85	SSOP-B14
BU7294SF	○	4	2.4 to 5.5	2,000	1.0	0.001	8	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	105	60	80	3.0	2.8	-40 to +105	SOP14
BU7294SFV	○														-40 to +105	SSOP-B14
BU7295HFV	—	1	1.8 to 5.5	150	1.0	0.001	8	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	1.0	1.0	-40 to +85	HVSOF5
BU7295SHFV	○														-40 to +105	HVSOF5
BU7255HFV	—	1	2.4 to 5.5	540	1.0	0.001	4	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	105	60	80	3.4	4.0	-40 to +85	HVSOF5
BU7255SHFV	○														-40 to +105	HVSOF5
BD7561G	—	1	5.0 to 14.5	440	1.0	0.001	8	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.9	1.0	-40 to +85	SSOP5
BD7561SG	○														-40 to +105	SSOP5
BD7562F	—	2	5.0 to 14.5	900	1.0	0.001	8	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.9	1.0	-40 to +85	SOP8
BD7562FVM	—														-40 to +85	MSOP8
BD7562SF	○	2	5.0 to 14.5	900	1.0	0.001	8	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.9	1.0	-40 to +105	SOP8
BD7562SFVM	○														-40 to +105	MSOP8

Ground Sense Operational Amplifiers

BA3472F	—	2	3 to 36	4.0	1.0	100	30	VEE to VCC-2.0	VEE+0.3 to VCC-1.0	100	97	97	10.0	4.0	-40 to +85	SOP8
BA3472FV	—															SSOP-B8
BA3472FJ	—															SOP-J8
BA3472FVM	—															MSOP8
BA3472FVT	—															TSSOP-B8
BA3472YF-LB	○	4	3 to 36	8.0	1.0	100	30	VEE to VCC-2.0	VEE+0.3 to VCC-1.0	100	97	97	10.0	4.0	-40 to +125	SOP8
BA3472RFVM	○														-40 to +105	MSOP8
BA3474F	—														-40 to +75	SOP14
BA3474FV	—														-40 to +85	SSOP-B14
BA3474FVJ	—															TSSOP-B14J
BA3474RFV	○	-40 to +105	SSOP-B14													
BU7461G	—	1	1.7 to 5.5	0.15	1.0	0.001	8	VSS to VDD-1.2	VSS+0.1 to VDD-0.1	95	60	80	1.0	1.0	-40 to +85	SSOP5
BU7461SG	○														-40 to +105	SSOP5
BU7462F	—	2	1.7 to 5.5	0.3	1.0	0.001	8	VSS to VDD-1.2	VSS+0.1 to VDD-0.1	95	60	80	1.0	1.0	-40 to +85	SOP8
BU7462FVM	—															MSOP8
BU7462NUX	—	2	1.7 to 5.5	0.3	1.0	0.001	8	VSS to VDD-1.2	VSS+0.1 to VDD-0.1	95	60	80	1.0	1.0	-40 to +105	VSON008X2030
BU7462SF	○															SOP8
BU7462SFVM	○															MSOP8
BU7462SNUX	○	4	1.7 to 5.5	0.6	1.0	0.001	8	VSS to VDD-1.2	VSS+0.1 to VDD-0.1	95	60	80	1.0	1.0	-40 to +85	SOP14
BU7464F	—														-40 to +105	SOP14
BU7464SF	○														-40 to +85	HVSOF5
BU7465HFV	—	1	1.7 to 5.5	0.12	1.0	0.001	8	VSS to VDD-1.2	VSS+0.1 to VDD-0.1	100	60	80	1.0	1.2	-40 to +105	HVSOF5
BU7465SHFV	○														-40 to +85	SSOP5
BU7481G	—	1	1.8 to 5.5	0.42	1.0	0.001	8	VSS to VDD-1.2	VSS+0.1 to VDD-0.1	105	60	80	3.2	2.8	-40 to +105	SSOP5
BU7481SG	○														-40 to +85	SSOP5
BU7485G	—	1	3.0 to 5.5	1.5	1.0	0.001	8	VSS to VDD-1.4	VSS+0.1 to VDD-0.1	105	60	80	10.0	10.0	-40 to +85	SSOP5
BU7485SG	○														-40 to +105	SSOP5
BU7486F	—	2	3.0 to 5.5	3.0	1.0	0.001	8	VSS to VDD-1.4	VSS+0.1 to VDD-0.1	105	60	80	10.0	10.0	-40 to +85	SOP8
BU7486FV	—															SSOP-B8
BU7486FVM	—															MSOP8
BU7486SF	○														-40 to +105	SOP8
BU7486SFV	○															SSOP-B8
BU7486SFVM	○	MSOP8														
BU7487F	—	4	3.0 to 5.5	6.0	1.0	0.001	8	VSS to VDD-1.4	VSS+0.1 to VDD-0.1	105	60	80	10.0	10.0	-40 to +85	SOP14
BU7487FV	—														SSOP-B14	
BU7487SF	○														SOP14	
BU7487SFV	○														SSOP-B14	
BU7495HFV	—	1	1.8 to 5.5	0.65	1.0	0.001	7	VSS to VDD -1.2	VSS+0.1 to VDD-0.1	100	60	80	5.0	4.0	-40 to +85	HVSOF5
BU7495SHFV	○														-40 to +105	HVSOF5

High Speed

Automotive Ground Sense Operational Amplifiers

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BA3472YF-C	●	2	3 to 36	4.0	1.0	100	30	V _{EE} to V _{CC} -2.0	V _{EE} +0.3 to V _{CC} -1.0	100	97	97	10	4.0	-40 to +125	SOP8	YES
BA3472YFV-C	●															SSOP-B8	YES
BA3472YFVM-C	●															MSOP8	YES
BA3472WVF-C	●															SSOP-B8	YES
BA3474WVF-C	●	4	3 to 36	8.0	1.0	100	30	V _{EE} to V _{CC} -2.0	V _{EE} +0.3 to V _{CC} -1.0	100	97	97	10	4.0	-40 to +125	SSOP-B14	YES
BA3474YFV-C	●															SSOP-B14	YES

Product Grade : ●Automotive Grade

Low Power Consumption

Input-Output Full Swing Operational Amplifiers

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package
BU7205HFV	—	1	1.8 to 5.5	0.4	1.0	0.001	1.2	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.0025	0.0025	-40 to +85	HVSOF5
BU7205SHFV	○														-40 to +105	HVSOF5
BU7241G	—	1	1.8 to 5.5	70	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.4	0.9	-40 to +85	SSOP5
BU7241SG	○														-40 to +105	SSOP5
BU7242F	—	2	1.8 to 5.5	180	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.4	0.9	-40 to +85	SOP8
BU7242FVM	—														-40 to +85	MSOP8
BU7242NUX	—														-40 to +85	VSON008X2030
BU7242SF	○														-40 to +85	SOP8
BU7242SFVM	○	2	1.8 to 5.5	180	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.4	0.9	-40 to +105	MSOP8
BU7242SNUX	○														-40 to +105	VSON008X2030
BU7244F	—	4	1.8 to 5.5	360	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.4	0.9	-40 to +85	SOP14
BU7244FV	—														-40 to +85	SSOP-B14
BU7244SF	○														-40 to +105	SOP14
BU7244SFV	○														-40 to +105	SSOP-B14
BU7245HFV	—	1	1.8 to 5.5	5	1.0	0.001	4	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.035	0.09	-40 to +85	HVSOF5
BU7245SHFV	○														-40 to +105	HVSOF5
BU7265G	—	1	1.8 to 5.5	0.35	1.0	0.001	2.4	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.0024	0.004	-40 to +85	SSOP5
BU7265SG	○														-40 to +105	SSOP5
BU7266F	—	2	1.8 to 5.5	0.7	1.0	0.001	2.4	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.0024	0.004	-40 to +85	SOP8
BU7266FV	—														-40 to +85	SSOP-B8
BU7266FVM	—	2	1.8 to 5.5	0.7	1.0	0.001	2.4	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.0024	0.004	-40 to +85	MSOP8
BU7266SF	○														-40 to +85	SOP8
BU7266SFV	○														-40 to +105	SSOP-B8
BU7266SFVM	○														-40 to +105	MSOP8
BU7271G	—	1	1.8 to 5.5	8.6	1.0	0.001	4	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	100	60	80	0.05	0.09	-40 to +85	SSOP5
BU7271SG	○														-40 to +105	SSOP5
BU7275HFV	—	1	1.8 to 5.5	40	1.0	0.001	8	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.3	0.6	-40 to +85	HVSOF5
BU7275SHFV	○														-40 to +105	HVSOF5
BD12730G	—	1	1.8 to 5.5	320	1.0	50	5	GND to V+	0.1 to V+ -0.1	85	70	85	0.4	1.0	-40 to +85	SSOP5
BD12732F	—	2	1.8 to 5.5	580	1.0	50	5	GND to V+	0.1 to V+ -0.1	85	70	85	0.4	1.0	-40 to +85	SOP8
BD12732FJ	—														-40 to +85	SOP-J8
BD12732FV	—														-40 to +85	SSOP-B8
BD12732FVJ	—														-40 to +85	TSSOP-B8J
BD12732FVM	—														-40 to +85	MSOP8
BD12732FVT	—														-40 to +85	TSSOP-B8
BD12734F	—	4	1.8 to 5.5	1,200	1.0	50	5	GND to V+	0.1 to V+ -0.1	85	70	85	0.4	1.0	-40 to +85	SOP14
BD12734FJ	—														-40 to +85	SOP-J14
BD12734FV	—														-40 to +85	SSOP-B14
BD12734FVJ	—														-40 to +85	TSSOP-B14J
BD7541G	—	1	5.0 to 14.5	180	1.0	0.001	4	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.3	0.6	-40 to +85	SSOP5
BD7541SG	○														-40 to +105	SSOP5
BD7542F	—	2	5.0 to 14.5	400	1.0	0.001	4	V _{SS} to V _{DD}	V _{SS} +0.1 to V _{DD} -0.1	95	60	80	0.3	0.6	-40 to +85	SOP8
BD7542FVM	—														-40 to +85	MSOP8
BD7542SF	○														-40 to +105	SOP8
BD7542SFVM	○														-40 to +105	MSOP8
LMR931G	—	1	1.8 to 5.0	80	1.0	5	28	V _{SS} to V _{DD}	V _{SS} +0.04 to V _{DD} -0.05	100	94	85	0.4	1.4	-40 to +85	SSOP5
LMR932F	—	2	1.8 to 5.0	135	1.0	5	28	V _{SS} to V _{DD}	V _{SS} +0.04 to V _{DD} -0.05	100	94	85	0.4	1.4	-40 to +85	SOP8
LMR932FJ	—														-40 to +85	SOP-J8
LMR932FV	—														-40 to +85	SSOP-B8
LMR932FVJ	—														-40 to +85	TSSOP-B8J
LMR932FVM	—														-40 to +85	MSOP8
LMR932FVT	—														-40 to +85	TSSOP-B8
LMR934F	—	4	1.8 to 5.0	250	1.0	5	28	V _{SS} to V _{DD}	V _{SS} +0.04 to V _{DD} -0.05	100	94	85	0.4	1.4	-40 to +85	SOP14
LMR934FJ	—														-40 to +85	SOP-J14
LMR934FV	—														-40 to +85	SSOP-B14
LMR934FVJ	—														-40 to +85	TSSOP-B14J
LMR981G	—	1	1.8 to 5.0	80	1.0	5	28	V _{SS} to V _{DD}	V _{SS} +0.04 to V _{DD} -0.05	100	94	85	0.4	1.4	-40 to +85	SSOP6
LMR982FVM	—	2	1.8 to 5.0	135	1.0	5	28	V _{SS} to V _{DD}	V _{SS} +0.04 to V _{DD} -0.05	100	94	85	0.4	1.4	-40 to +85	MSOP8

Low Power Consumption

Ground Sense Operational Amplifiers

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package
BU7411G	—	1	1.6 to 5.5	0.35	1.0	0.001	2.4	V _{SS} to V _{DD} −1.0	V _{SS} +0.1 to V _{DD} −0.1	95	60	80	0.0024	0.004	−40 to +85	SSOP5
BU7411SG	○														−40 to +105	SSOP5
BU7421G	—	1	1.7 to 5.5	8.5	1.0	0.001	4	V _{SS} to V _{DD} −1.2	V _{SS} +0.1 to V _{DD} −0.1	100	60	80	0.05	0.09	−40 to +85	SSOP5
BU7421SG	○														−40 to +105	SSOP5
BU7441G	—	1	1.7 to 5.5	50	1.0	0.001	6	V _{SS} to V _{DD} −1.2	V _{SS} +0.1 to V _{DD} −0.1	95	60	80	0.3	0.6	−40 to +85	SSOP5
BU7441SG	○														−40 to +105	SSOP5
BU7442F	—	2	1.7 to 5.5	100	1.0	0.001	6	V _{SS} to V _{DD} −1.2	V _{SS} +0.1 to V _{DD} −0.1	95	60	80	0.3	0.6	−40 to +85	SOP8
BU7442FVM	—														−40 to +85	MSOP8
BU7442NUX	—														−40 to +85	VSON008X2030
BU7442SF	○	2	1.7 to 5.5	100	1.0	0.001	6	V _{SS} to V _{DD} −1.2	V _{SS} +0.1 to V _{DD} −0.1	95	60	80	0.3	0.6	−40 to +105	SOP8
BU7442SFVM	○														−40 to +105	MSOP8
BU7442SNUX	○														−40 to +105	VSON008X2030
BU7444F	—	4	1.7 to 5.5	200	1.0	0.001	6	V _{SS} to V _{DD} −1.2	V _{SS} +0.1 to V _{DD} −0.1	95	60	80	0.3	0.6	−40 to +85	SOP14
BU7444SF	○														−40 to +105	SOP14
BU7445HFV	—	1	1.7 to 5.5	40	1.0	0.001	8	V _{SS} to V _{DD} −1.2	V _{SS} +0.1 to V _{DD} −0.1	100	60	80	0.25	0.4	−40 to +85	HVSOF5
BU7445SHFV	○														−40 to +105	HVSOF5
BU7475HFV	—	1	1.7 to 5.5	9	1.0	0.001	7	V _{SS} to V _{DD} −1.2	V _{SS} +0.1 to V _{DD} −0.1	100	60	80	0.05	0.1	−40 to +85	HVSOF5
BU7475SHFV	○														−40 to +105	HVSOF5
BD1321G	—	1	2.7 to 5.5	130	0.1	15	70	V _{EE} to V _{CC} −0.8	V _{EE} +0.08 to V _{CC} −0.04	110	90	90	1.0	3.0	−40 to +85	SSOP5
LMR321G	—	1	2.7 to 5.5	130	0.1	15	70	V _{EE} to V _{CC} −0.8	V _{EE} +0.08 to V _{CC} −0.04	110	90	90	1.0	3.0	−40 to +85	SSOP5
LMR324F	—	4	2.7 to 5.5	410	1.0	15	70	V _{EE} to V _{CC} −0.8	V _{EE} +0.08 to V _{CC} −0.04	110	90	90	1.0	3.0	−40 to +85	SOP14
LMR324FJ	—														−40 to +85	SOP-J14
LMR324FV	—														−40 to +85	SSOP-B14
LMR324FVJ	—														−40 to +85	TSSOP-B14J
LMR341G	—	1	2.7 to 5.5	100	0.25	0.001	24	V _{SS} to V _{DD} −1.0	V _{SS} +0.06 to V _{DD} −0.06	103	80	85	1.0	2.0	−40 to +85	SSOP6
LMR342F	—	2	2.7 to 5.5	200	0.25	0.001	24	V _{SS} to V _{DD} −1.0	V _{SS} +0.06 to V _{DD} −0.06	103	80	85	1.0	2.0	−40 to +85	SOP8
LMR342FJ	—														−40 to +85	SOP-J8
LMR342FV	—														−40 to +85	SSOP-B8
LMR342FVJ	—														−40 to +85	TSSOP-B8J
LMR342FVM	—														−40 to +85	MSOP8
LMR342FVT	—														−40 to +85	TSSOP-B8
LMR344F	—	4	2.7 to 5.5	400	0.25	0.001	24	V _{SS} to V _{DD} −1.0	V _{SS} +0.06 to V _{DD} −0.06	103	80	85	1.0	2.0	−40 to +85	SOP14
LMR344FJ	—														−40 to +85	SOP-J14
LMR344FVJ	—														−40 to +85	TSSOP-B14J
LMR358F	—	2	2.7 to 5.5	210	0.1	15	70	V _{EE} to V _{CC} −0.8	V _{EE} +0.08 to V _{CC} −0.04	110	90	90	1.0	3.0	−40 to +85	SOP8
LMR358FJ	—														−40 to +85	SOP-J8
LMR358FV	—														−40 to +85	SSOP-B8
LMR358FVJ	—														−40 to +85	TSSOP-B8J
LMR358FVM	—														−40 to +85	MSOP8
LMR358FVT	—														−40 to +85	TSSOP-B8
LMR821G	—	1	2.5 to 5.5	280	1.0	30	16	V _{SS} to V _{DD} −0.9	V _{SS} +0.12 to V _{DD} −0.1	100	85	85	2.0	5.0	−40 to +85	SSOP5
LMR822F	—	2	2.5 to 5.5	560	1.0	30	16	V _{SS} to V _{DD} −0.9	V _{SS} +0.12 to V _{DD} −0.1	100	85	85	2.0	5.0	−40 to +85	SOP8
LMR822FJ	—														−40 to +85	SOP-J8
LMR822FV	—														−40 to +85	SSOP-B8
LMR822FVJ	—														−40 to +85	TSSOP-B8J
LMR822FVM	—														−40 to +85	MSOP8
LMR822FVT	—														−40 to +85	TSSOP-B8
LMR824F	—	4	2.5 to 5.5	1,120	1.0	30	16	V _{SS} to V _{DD} −0.9	V _{SS} +0.12 to V _{DD} −0.1	100	85	85	2.0	5.0	−40 to +85	SOP14
LMR824FJ	—														−40 to +85	SOP-J14
LMR824FVJ	—														−40 to +85	TSSOP-B14J
TLR341G	—	1	1.8 to 5.5	70	0.3	0.001	8	V _{SS} to V _{DD} −1.0	V _{SS} +0.055 to V _{DD} −0.05	100	90	95	1.2	2.2	−40 to +85	SSOP6
TLR342F	—	2	1.8 to 5.5	150	0.3	0.001	8	V _{SS} to V _{DD} −1.0	V _{SS} +0.055 to V _{DD} −0.05	100	85	95	1.0	1.2	−40 to +85	SOP8
TLR342FJ	—														−40 to +85	SOP-J8
TLR342FVJ	—														−40 to +85	TSSOP-B8J
TLR342FVT	—														−40 to +85	TSSOP-B8
TLR344F	—	4	1.8 to 5.5	300	0.3	0.001	8	V _{SS} to V _{DD} −1.0	V _{SS} +0.055 to V _{DD} −0.05	100	90	95	1.2	2.2	−40 to +85	SOP14
TLR344FJ	—														−40 to +85	SOP-J14
TLR344FVJ	—														−40 to +85	TSSOP-B14J

Automotive Input-Output Full Swing Operational Amplifiers

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BU7241YG-C	●	1	1.8 to 5.5	70	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.05 to V _{DD} -0.05	100	70	80	0.4	1.0	-40 to +125	SSOP5	YES
BU7242YFVM-C	●	2	1.8 to 5.5	180	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.05 to V _{DD} -0.05	100	70	80	0.4	1.0	-40 to +125	MSOP8	YES
BU7244YFV-C	●	4	1.8 to 5.5	360	1.0	0.001	10	V _{SS} to V _{DD}	V _{SS} +0.05 to V _{DD} -0.05	100	70	80	0.4	1.0	-40 to +125	SSOP-B14	YES

Low Noise

Output Full Swing Operational Amplifiers																	
Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (mA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Input Referred Noise Voltage (μVrms)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package	
BA4510F	—	2	±1 to ±3.5	5.0	1.0	80	0.7	VEE+1.5 to VCC−1.5	VEE+0.1 to VCC−0.1	90	80	80	5.0	10.0	−20 to +75	SOP8	
BA4510FV	—															SSOP-B8	
BA4510FVM	—															MSOP8	
BA4510FVT	—															TSSOP-B8	
BA2107G	—	1	±1 to ±7	1.8	1.0	150	0.9	VEE+1.5 to VCC−1.5	VEE+0.1 to VCC−0.1	80	74	80	4.0	12.0	−40 to +85	SSOP5	
BA2115F	—	2	±1 to ±7	3.5	1.0	150	0.9	VEE+1.5 to VCC−1.5	VEE+0.1 to VCC−0.1	80	74	80	4.0	12.0	−40 to +85	SOP8	
BA2115FJ	—															SOP-J8	
BA2115FVM	—															MSOP8	
Automotive Operational Amplifiers																	
Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (mA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Input Referred Noise Voltage (μVrms)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BA4558YF-M	●	2	±4 to ±15	3.0	0.5	60	1.8	VEE+1.0 to VCC−1.0	VEE+1.0 to VCC−1.0	100	90	90	1.0	2.0	−40 to +105	SOP8	YES
BA4558YFV-M	●															SSOP-B8	YES
BA4558YFVM-M	●															MSOP8	YES
BA4560YF-M	●	2	±4 to ±15	3.0	0.5	50	1.0	VEE+1.0 to VCC−1.0	VEE+1.0 to VCC−1.0	100	90	90	4.0	4.0	−40 to +105	SOP8	YES
BA4560YFV-M	●															SSOP-B8	YES
BA4560YFVM-M	●															MSOP8	YES
BA4580YF-M	●	2	±2 to ±16	6.0	0.3	100	0.8	VEE+1.5 to VCC−1.5	VEE+1.5 to VCC−1.5	110	110	110	5.0	10.0	−40 to +105	SOP8	YES
BA4580YFVM-M	●															MSOP8	YES
BA4584YFV-M	●	4	±2 to ±16	11.0	0.3	100	0.8	VEE+1.5 to VCC−1.5	VEE+1.5 to VCC−1.5	110	110	110	5.0	10.0	−40 to +105	SSOP-B14	YES
Dual Supply Voltage Operational Amplifiers																	
Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (mA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Input Referred Noise Voltage (μVrms)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package	
BA4558F	—	2	±4 to ±15	3.0	0.5	60	1.8	VEE+1.0 to VCC−1.0	VEE+1.0 to VCC−1.0	100	90	90	1.0	2.0	−40 to +85	SOP8	
BA4558FJ	—															SOP-J8	
BA4558FV	—															SSOP-B8	
BA4558FVM	—															MSOP8	
BA4558FVT	—															TSSOP-B8	
BA4558RF	○	2	±4 to ±15	3.0	0.5	60	1.8	VEE+1.0 to VCC−1.0	VEE+1.0 to VCC−1.0	100	90	90	1.0	2.0	−40 to +105	SOP8	
BA4558RFJ	○															SOP-J8	
BA4558RFV	○															SSOP-B8	
BA4558RFVM	○															MSOP8	
BA4558RFVT	○															TSSOP-B8	
BA4560F	—	2	±4 to ±15	4.0	0.5	50	1.0	VEE+1.0 to VCC−1.0	VEE+1.0 to VCC−1.0	100	90	90	4.0	10.0	−40 to +85	SOP8	
BA4560FJ	—															SOP-J8	
BA4560FV	—															SSOP-B8	
BA4560FVM	—															MSOP8	
BA4560FVT	—															TSSOP-B8	
BA4560RF	○	2	±4 to ±15	3.0	0.5	50	1.0	VEE+1.0 to VCC−1.0	VEE+1.0 to VCC−1.0	100	90	90	4.0	4.0	−40 to +105	SOP8	
BA4560RFJ	○															SOP-J8	
BA4560RFV	○															SSOP-B8	
BA4560RFVM	○															MSOP8	
BA4560RFVT	○															TSSOP-B8	
BA4564RFV	○	4	±4 to ±15	6.0	0.5	50	1.0	VEE+1.0 to VCC−1.0	VEE+1.0 to VCC−1.0	100	90	90	4.0	4.0	−40 to +105	SSOP-B14	
BA15218F	—	2	±2 to ±16	5.0	0.5	50	1.0	VEE+1.0 to VCC−1.0	VEE+2.0 to VCC−2.0	110	90	90	3.0	10.0	−40 to +85	SOP8	
BA14741F	—	4	±2 to ±18	3.0	1.0	60	2.0	VEE+1.5 to VCC−1.5	VEE+2.5 to VCC−2.5	100	100	100	1.0	2.0	−40 to +85	SOP14	
BA14741FJ	—															SOP-J14	
BA15532F	—	2	±3 to ±20	8.0	0.5	200	1.5	VEE+2.0 to VCC−2.0	VEE+2.0 to VCC−2.0	94	100	100	8.0	20.0	−20 to +75	SOP8	
BA4580RF	○	2	±2 to ±16	6.0	0.3	100	0.8	VEE+1.5 to VCC−1.5	VEE+1.5 to VCC−1.5	110	110	110	5.0	5.0	−40 to +105	SOP8	
BA4580RFJ	○															SOP-J8	
BA4580RFVM	○															MSOP8	
BA4580RFVT	○															TSSOP-B8	
BA4584FV	—	4	±2 to ±16	12.0	0.3	100	0.8	VEE+1.5 to VCC−1.5	VEE+1.5 to VCC−1.5	110	110	110	5.0	5.0	−40 to +85	SSOP-B14	
BA4584RF	○	4	±2 to ±9.5	11.0	0.3	100	0.8	VEE+1.5 to VCC−1.5	VEE+1.5 to VCC−1.5	110	110	110	5.0	5.0	−40 to +105	SOP14	
BA4584RFV	○															SSOP-B14	
LM4559F	—	2	±4 to ±18	3.3	0.5	40	0.7	VEE+2.0 to VCC−2.0	VEE+1.5 to VCC−1.5	110	100	100	3.5	4.0	−40 to +85	SOP8	
LM4559FJ	—															SOP-J8	
LM4559FV	—															SSOP-B8	
LM4559FVT	—															TSSOP-B8	
LM4559FVM	—															MSOP8	
LM4559FVJ	—															TSSOP-B8J	
LM4565F	—	2	±4 to ±18	4.5	0.5	70	0.6	VEE+1.0 to VCC−1.0	VEE+1.0 to VCC−1.0	100	100	100	5.0	10.0	−40 to +85	SOP8	
LM4565FJ	—															SOP-J8	
LM4565FV	—															SSOP-B8	
LM4565FVT	—															TSSOP-B8	
LM4565FVM	—															MSOP8	
LM4565FVJ	—															TSSOP-B8J	



Low Offset Voltage

Dual Supply Voltage Operational Amplifier

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (mA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package
BA4564WVF	○	4	±4 to ±15	6.0	0.5	50	25	VEE+1.0 to VCC-1.0	VEE+1.0 to VCC-1.0	100	90	90	4.0	4.0	-40 to +105	SSOP-B14
Input-Output Full Swing Operational Amplifier																
BD5291G	—	1	1.7 to 5.5	0.65	0.1	0.001	6	VSS to VDD	VSS+0.1 to VDD-0.1	110	90	90	2.5	3.2	-40 to +85	SSOP5

Product Grade : —Standard ○High Grade

High Performance

Ground Sense Operational Amplifier

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (mA)	Input Offset Voltage (μV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Output Voltage (V)	Voltage Gain (dB)	CMRR (dB)	PSRR (dB)	Slew Rate (V/μs)	Gain Bandwidth Product (MHz)	Operating Temperature (°C)	Package
New LMR1802G-LB	○	1	2.5 to 5.5	1.1	5	0.0005	3.5	VSS to VDD-1.0	VSS+0.05 to VDD-0.05	140	105	125	1.1	3.0	-40 to +125	SSOP5

Product Grade : ○High Grade

Comparators

Standard

Open-Collector Comparators

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (mA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Voltage Gain (dB)	Response Time (μs)	Operating Temperature (°C)	Package
BA2901F	○	4	2 to 36	0.8	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +125	SOP14
BA2901FV	○											SSOP-B14
BA2901SF	○	4	2 to 36	0.8	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +105	SOP14
BA2901SFV	○											SSOP-B14
BA2901YF-LB	○	4	2 to 36	0.8	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +125	SOP14
BA2903F	○	2	2 to 36	0.6	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +125	SOP8
BA2903FV	○											SSOP-B8
BA2903FVM	○											MSOP8
BA2903SF	○	2	2 to 36	0.6	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +105	SOP8
BA2903SFV	○											SSOP-B8
BA2903SFVM	○											MSOP8
BA2903YF-LB	○	2	2 to 36	0.6	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +125	SOP8
BA8391G	—	1	2 to 36	0.3	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +85	SSOP5
LM2901F	○	4	3 to 32	1.2	1	50	16	VEE to VCC-1.5	120	1.0	-40 to +125	SOP14
LM2901FJ	○											SOP-J14
LM2901FV	○											SSOP-B14
LM2901FVJ	○											TSSOP-B14J
LM2903F	○	2	3 to 32	0.6	1	50	16	VEE to VCC-1.5	120	1.0	-40 to +125	SOP8
LM2903FJ	○											SOP-J8
LM2903FV	○											SSOP-B8
LM2903FVJ	○											TSSOP-B8J
LM2903FVM	○											MSOP8
LM2903FVT	○											TSSOP-B8
LM339F	—											SOP14
LM339FJ	—	4	3 to 32	1.2	1	50	16	VEE to VCC-1.5	120	1.0	-40 to +85	SOP-J14
LM339FV	—											SSOP-B14
LM339FVJ	—											TSSOP-B14J
LM339FVJ	—											TSSOP-B14J
LM393F	—	2	3 to 32	0.6	1	50	16	VEE to VCC-1.5	120	1.0	-40 to +85	SOP8
LM393FJ	—											SOP-J8
LM393FV	—											SSOP-B8
LM393FVJ	—											TSSOP-B8J
LM393FVM	—											MSOP8
LM393FVT	—											TSSOP-B8
LM393FVT	—											TSSOP-B8

Automotive Open-Collector Comparators

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (mA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Voltage Gain (dB)	Response Time (μs)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BA2903YF-C	●	2	2 to 36	0.6	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +125	SOP8	YES
BA2903YFV-C	●											SSOP-B8	YES
BA2903YFVM-C	●											MSOP8	YES
BA2901YF-C	●	4	2 to 36	0.8	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +125	SOP14	YES
BA2901YFV-C	●											SSOP-B14	YES
BA2903YF-M	●	2	2 to 36	0.6	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +125	SOP8	YES
BA2903YFV-M	●											SSOP-B8	YES
BA2903YFVM-M	●											MSOP8	YES
BA2901YF-M	●	4	2 to 36	0.8	2	50	16	VEE to VCC-1.5	100	1.3	-40 to +125	SOP14	YES
BA2901YFV-M	●											SSOP-B14	YES

Product Grade : —Standard ○High Grade ●Automotive Grade

Standard

Automotive Excellent EMI Characteristics Open-Collector Comparators

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (mA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Voltage Gain (dB)	Response Time (μs)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
New BA82903YF-C	●	2	2 to 36	0.6	2	50	16	$V_{EE} - 0.3$ to $V_{CC} + 1.5$	100	1.3	-40 to +125	SOP8	YES
New BA82903YFVM-C	●											MSOP8	YES
New BA82901YF-C	●	4		0.8								SOP14	YES
New BA82901YFV-C	●											SSOP-B14	YES

Product Grade : ●---Automotive Grade

High Speed

Push-Pull Comparators

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Voltage Gain (dB)	Response Time (μs)	Operating Temperature (°C)	Package
BU7251G	—	1	1.8 to 5.5	15	1	0.001	6	V_{SS} to V_{DD}	90	0.55	-40 to +85	SSOP5
BU7251SG	○										-40 to +105	SSOP5
BU7252F	—	2	1.8 to 5.5	35	1	0.001	6	V_{SS} to V_{DD}	90	0.55	-40 to +85	SOP8
BU7252FVM	—										-40 to +85	MSOP8
BU7252SF	○	2	1.8 to 5.5	35	1	0.001	6	V_{SS} to V_{DD}	90	0.55	-40 to +105	SOP8
BU7252SFVM	○										-40 to +105	MSOP8
BU5265HFV	—	1	1.8 to 5.5	22	1	0.001	3.5	V_{SS} to V_{DD}	90	0.5	-40 to +85	HVSOF5
BU5265SHFV	○										-40 to +105	HVSOF5

Open-Drain Comparators

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Voltage Gain (dB)	Response Time (μs)	Operating Temperature (°C)	Package
BU7250G	—	1	1.8 to 5.5	15	1	0.001	6	V_{SS} to V_{DD}	90	0.75	-40 to +85	SSOP5
BU7250SG	○										-40 to +105	SSOP5
BU7253F	—	2	1.8 to 5.5	35	1	0.001	6	V_{SS} to V_{DD}	90	0.75	-40 to +85	SOP8
BU7253SF	○										-40 to +105	SOP8

Product Grade : —---Standard ○---High Grade

Low Power Consumption

Push-Pull Comparators

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Voltage Gain (dB)	Response Time (μs)	Operating Temperature (°C)	Package
BU7231G	—	1	1.8 to 5.5	5	1	0.001	6	V_{SS} to V_{DD}	90	1.7	-40 to +85	SSOP5
BU7231SG	○										-40 to +105	SSOP5
BU7232F	—	2	1.8 to 5.5	10	1	0.001	6	V_{SS} to V_{DD}	90	1.7	-40 to +85	SOP8
BU7232FVM	—										-40 to +85	MSOP8
BU7232SF	○	2	1.8 to 5.5	10	1	0.001	6	V_{SS} to V_{DD}	90	1.7	-40 to +105	SOP8
BU7232SFVM	○										-40 to +105	MSOP8
BU5255HFV	—	1	1.8 to 5.5	6.5	1	0.001	3.5	V_{SS} to V_{DD}	90	1.6	-40 to +85	HVSOF5
BU5255SHFV	○										-40 to +105	HVSOF5

Automotive Push-Pull Comparator

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Voltage Gain (dB)	Response Time (μs)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
☆BU7232YFVM-C	●	2	1.8 to 5.5	10	1	0.001	7	V_{SS} to V_{DD}	100	1.7	-40 to +125	MSOP8	YES

Open-Drain Comparators

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Voltage Gain (dB)	Response Time (μs)	Operating Temperature (°C)	Package
BU7230G	—	1	1.8 to 5.5	5	1	0.001	6	V_{SS} to V_{DD}	90	1.8	-40 to +85	SSOP5
BU7230SG	○										-40 to +105	SSOP5
BU7233F	—	2	1.8 to 5.5	10	1	0.001	6	V_{SS} to V_{DD}	90	1.8	-40 to +85	SOP8
BU7233SF	○										-40 to +105	SOP8

Automotive Open-Drain Comparator

Part No.	Product Grade	ch	Supply Voltage (V)	Circuit Current (μA)	Input Offset Voltage (mV)	Input Bias Current (nA)	Output Current (mA)	Input Voltage (V)	Voltage Gain (dB)	Response Time (μs)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BU7233YF-C	●	2	1.8 to 5.5	10	1	0.001	7	V_{SS} to V_{DD}	100	1.8	-40 to +125	SOP8	YES

Product Grade : —---Standard ○---High Grade ●---Automotive Grade

☆ : Under Development

Transistor Arrays

Darlington Transistor Arrays

Open Collectors

Part No.	Number of bit	Output Withstand Voltage (V)	Output Saturation Voltage (V)	Output Current (mA)	Input Resistance (kΩ)	Input/Output Relation	Input Active Level	Output Current Relation	Circuit Construction	Features	Package
BA12003DF-Z	7	60	1.46*	500	2.7	Inverting type	H	Sink	Darlington	Built-in surge absorbing diode	SOP-J16A
BA12004DF-Z	7	60	1.46*	500	10.5	Inverting type	H	Sink	Darlington	Built-in surge absorbing diode	SOP-J16A

* Output Current=350mA

**ICs**

Clocks & Timers

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CR Control Timer IC P. A20

CR Control Timer IC P. A20

High-performance Clock Generators ICs

Clock Generators for Digital Cameras

Part No.	Supply Voltage (V)	Reference Frequency (MHz)	Video Clock (The output which can be selected) (MHz)	CCD Clock (The output which can be selected) (MHz)	USB Clock (MHz)	Jitter 1 σ Typ. (ps)	Package
BU2394KN	3.0 to 3.6	14.318182/ 28.636363	14.318182/ 17.734450	135.000000/ 108.000000/ 98.181818/ 110.000000	48.008022	30	VQFN20
BU2396KN	3.0 to 3.6	12.000000	27.000000	24.000000/ 30.000000/ 36.000000	12.000000	50	VQFN20

DVD-Audio Reference Clock Generator

Part No.	Supply Voltage (V)	Reference Frequency (MHz)	Output Frequency(MHz)									Jitter 1 σ Typ. (ps)	C/N Typ. (ps)	Package
			DVD-Video Clock			DVD, Audio, CD Clock (The output which can be switched)				System Clock				
			Video1	Video2	Video3	768fs	512fs	384fs	256fs	768fs	384fs			
BU2363FV	3.0 to 3.6	36.864	54.0000	27.0000	—	36.8640/ 33.8688	—	18.4320/ 16.9344	—	33.8688	16.9344	50	—75 (Video)	SSOP-B16

DVD-Video Reference Clock Generators for A/V Equipments

Part No.	Supply Voltage (V)	Reference Frequency (MHz)	Output Frequency(MHz)										Jitter 1 σ Typ. (ps)	Long-term Jitter P-P Typ.(ns)	Package
			DVD-Video Clock			DVD, Audio, CD Clock (The output which can be switched)				System Clock					
			Video1	Video2	Video3	768fs	512fs	384fs	Other	768fs	384fs	Other			
BU2280FV	3.0 to 3.6	27.0000	27.0000	—	—	36.8640/ 33.8688	24.5760/ 22.5792	18.4320/ 16.9344	—	33.8688	—	—	70	8 (Audio)	SSOP-B24
BU2360FV	2.7 to 3.6	27.0000	27.0000	—	—	—	24.5760/ 22.5792	—	—	33.8688	—	—	70	2.5 (Audio)	SSOP-B16
BU2362FV	2.7 to 3.6	27.0000	27.0000	—	—	—	24.5760/ 22.5792	—	36.8640/ 16.9344	33.8688	16.9344	36.864	70	12 (Audio)	SSOP-B16

Clock Generator with Built-in VCXO for A/V Equipments

Part No.	Supply Voltage (V)	VCXO (Reference Clock)	Clock Buffer	PLL Output Frequency(MHz)								Jitter 1σ Typ. (ps)	C/N Typ. (dB)	Package
				DVD-Video Clock			DVD, Audio, CD Clock (The output which can be switched)	System Clock						
				Video1	Video2	Video3	768fs	768fs	512fs	384fs	Other			
BU3087FV	3.135 to 3.465	Tuning range 27MHz±105ppm Typ.	—	27.000000	—	74.250000 Modulation/ ± 0.25%, ± 0.50%, ± 0.75%, ± 1.00%	—	—	—	—	30	HD-Video -70	SSOP-B16	

Clock Generators for Digital Cameras : Three types of clocks generated-CCD, USB, and a Video
 DVD-Audio Reference Clock Generators : DVD/CD-Audio, DVD-Video clock generation using the DVD-Video reference clock
 DVD-Video Reference Clock Generators for A/V Equipments : DVD/CD-Audio, DVD-Video clock generation using the DVD-Video reference clock
 Clock Generator with Built-in VCXO for A/V Equipments : VCXO is Built-in with high-precision external synchronization

Real Time Clocks ICs

Real Time Clocks with High-precision Oscillation Adjustment

Part No.	I/F	Supply Voltage (V)	Time Keeping Voltage (V)	Time Keeping Current (Typ.)(μ A)	Time Keeping Current (Max.)(μ A)	Operating Frequency 1 (Max.)(kHz)	Operating Frequency 2 (Max.)(kHz)	Package
BU9873F	I ² C	1.8 to 5.5	1.45 to 5.50	0.4 (V _{DD} =3V, Ta=25°C)	1.0 (V _{DD} =3V, Ta=−40°C to +85°C)	100 (V _{DD} =1.8V to 2.5V)	400 (V _{DD} =2.5V to 5.5V)	SOP8
BU9873FJ								SOP-J8
BU9873FVT								TSSOP-B8
BU9873FVM								MSOP8
BU9873NUX								VSON008X2030

CR Control Timer IC

CR Control Timer IC

Part No.	Supply Voltage (V)	PWM Frequency (Hz)	Duty (%)	Circuit Current (mA)	Function	Operating Temperature (°C)	Package
BD9555FVM-C	4.5 to 42.0	1 to 10k	1 to 99	1	PWM/Duty 100% Switching terminal	−40 to +125	MSOP8

New

**ICs**

Switch & IPD & Multiplexer & Logic

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Standard Logic

Analog Switch/Analog Switch(Single type)

Type	Package/Part No.			Function	Supply Voltage (V)	Input Voltage(V)		ON Resistance (Max.)(Ω)	Control-Output Propagation Delay Time (Typ.)(ns)	IN-Out Propagation Delay Time (Typ.)(ns)	Max. Propagation Frequency (Typ.)(MHz)
	SOP16(14)	SSOP-B16(14)	SSOP5			H Level (Min.)	L Level (Max.)				
BU4066BC	BU4066BCF	BU4066BCFV	—	Quad Analog Switch	3 to 18	3.5	1.5	950	60	20	—
BU4S66	—	—	BU4S66G2	Single Analog Switch	3 to 16	3.5	1.5	950	80	15	—

Multiplexer

Type	Package/Part No.		Function	Supply Voltage (V)	Input Voltage(V)		ON Resistance (Max.)(Ω)	Control-Output Propagation Delay Time (Typ.)(ns)	IN-Out Propagation Delay Time (Typ.)(ns)	Max. Propagation Frequency (Typ.)(MHz)
	SOP16(14)	SSOP-B16(14)			H Level (Min.)	L Level (Max.)				
BU4051BC	BU4051BCF	BU4051BCFV	Analog Multiplexer/Demultiplexer(8↔1)	3 to 18	3.5	1.5	950	170	15	20
BU4052BC	BU4052BCF	BU4052BCFV	Dual Analog Multiplexer/Demultiplexer(4↔1)	3 to 18	3.5	1.5	950	170	15	20
BU4551B	BU4551BF	BU4551BFV	Quad Analog Multiplexer/Demultiplexer(2↔1)	3 to 16	3.5	1.5	1,100	360	35	15

Logic Gates

Type	Package/Part No.		Function	Supply Voltage (V)	Input Voltage(V)		Hysteresis Voltage (V)	Output Voltage I _{OUT} =0mA(V)		Propagation Delay Time (Typ.)(ns)
	SOP14	SSOP-B14			H Level (Min.)	L Level (Max.)		H Level (Min.)	L Level (Max.)	
BU4030B	BU4030BF	—	Quad ExclusiveOR Gate	3 to 16	3.5	1.5	—	4.95	0.05	90
BU4069UB	BU4069UBF	BU4069UBFV	Hex Unbuffer Inverter	3 to 16	4.0	1.0	—	4.95	0.05	90

Logic Gates(Single type)

Type	Package/Part No.	Function	Supply Voltage (V)	Input Voltage(V)		Hysteresis Voltage (V)	Output Voltage I _{OUT} =0mA(V)		Propagation Delay Time (Typ.)(ns)
	SSOP5			H Level (Min.)	L Level (Max.)		H Level (Min.)	L Level (Max.)	
BU4S01	BU4S01G2	Single NOR Gate	3 to 16	3.5	1.5	—	4.95	0.05	85
BU4S11	BU4S11G2	Single NAND Gate	3 to 16	3.5	1.5	—	4.95	0.05	85
BU4SU69	BU4SU69G2	Single Unbuffer Inverter	3 to 16	4.0	1.0	—	4.95	0.05	55
BU4S71	BU4S71G2	Single OR Gate	3 to 16	3.5	1.5	—	4.95	0.05	90
BU4S81	BU4S81G2	Single AND Gate	3 to 16	3.5	1.5	—	4.95	0.05	90
BU4S584	BU4S584G2	Single Schmitt Trigger	3 to 16	3.5	1.5	0.15 to 0.60	4.95	0.05	125

Function Logic

Type	Package/Part No.		Function	Supply Voltage (V)	Input Voltage(V)		Output Voltage I _{OUT} =0mA(V)		Propagation Delay Time (Typ.)(ns)	Max. Clock Frequency (Typ.)(MHz)	Set up Time (Typ.)(ns)	Hold Time (Typ.)(ns)
	SOP16	SSOP-B16			H Level (Min.)	L Level (Max.)	H Level (Min.)	L Level (Max.)				
BU4094BC	BU4094BCF	BU4094BCFV	8-Stage Shift/Store Register(3-State)	3 to 18	3.5	1.5	4.95	0.05	420	2.5	20	10

Serial-in/Parallel-out Drivers

Serial/Parallel 2-input Drivers

Part No.	Serial Number of Input	Parallel Number of Output	Supply Voltage (V)	Max. Output Current (mA)	Max. Output Voltage (V)	Output type	Package
BU2098F	2	8	2.7 to 5.5	25	15	Open drain	SOP16
BU2090F	2	12	2.7 to 5.5	25	25	Open drain	SOP16
BU2090FS	2	12	2.7 to 5.5	25	25	Open drain	SSOP-A16

Serial/Parallel 4-input Drivers

Part No.	Serial Number of Input	Parallel Number of Output	Supply Voltage (V)	Max. Output Current (mA)	Max. Output Voltage (V)	Output type	Package
BU2050F	4	8	4.5 to 5.5	25	5.5	CMOS	SOP14
BU2092F	4	12	2.7 to 5.5	25	25	Open drain	SOP18
BU2092FV	4	12	2.7 to 5.5	25	25	Open drain	SSOP-B20
BU2099FV	4	12	2.7 to 5.5	25	25	Open drain	SSOP-B20
BU2152FS	4	24	2.7 to 5.5	25	5.5	CMOS	SSOP-A32

Serial/Parallel 2-input Drivers : 2-wires Interface CLOCK, DATA
 Serial/Parallel 4-input Drivers : 4-wires Interface CLOCK, DATA, LATCH, ENABLE

USB Switch ICs

SP type(Single Pole)													
Part No.	Supply Voltage(V)			USB Switch (ch)	UART Switch (ch)	Circuit Current (μA)	USB Switch ON Resistance (Ω)	USB Switch ON Capacitance (pF)	Package				
	USB	UART											
BH6260MWX	2.9 to 3.7		1.7 to 3.6	1	1	0	5	10	USON016X3315				
DP type(Double Pole)													
BD11600NUX	2.5 to 5.5		—	1	—	18	3	6	VSON010X3020				
BD11603MWX	2.5 to 5.5		—	2	—	18	3	7	USON016X3315				
BD11601NUX	2.5 to 5.5		—	1	—	18	2.5	6	VSON008X2020				
BD11670GWL	3.8 to 28.0		—	1	—	26	5	6	UCSP50L1C				
Built-in OVP Micro USB Switch with USB2.0, MHL™ and Audio													
Part No.	Supply Voltage(V)			USB/MHL Switch (ch)	MIC Switch (ch)	HP Switch (ch)	VBUS Signal Path (ch)	ID-CBUS Path (ch)	OTG-VBUS Voltage Path (ch)	Stand by Current (μA)	USB/MHL Switch ON Resistance (Ω)	USB/MHL Switch ON Capacitance (pF)	Package
	VBUS	VBAT	VDDIO										
BD91411GW	3.8 to 28.0	2.9 to 4.6	1.7 to 3.0	2	1(mono)	1	1	1	1	6	5	6	UCSP75M3

IPD(IPS)

High Side Switch

Smart High Side Switch								
Part No.	Power Supply (V)	VDS (Max.)(V)	ch	I _{oCP} (Min.)(A)	ON Resistance (Typ.)(mΩ)	Thermal Shut Down	Package	Automotive Grade AEC-Q100
BV1HD090FJ-C	4.5 to 36.0	45.0	1	2.7	90	Self-restart	SOP-J8	YES
BD1HC500EFJ-C	4.0 to 18.0	44.5	1	0.8	500	Off-latch	HTSOP-J8	YES
BD1HC500FVM-C	4.0 to 18.0	44.5	1	0.8	500	Off-latch	MSOP-8	YES
BD1HC500HFN-C	4.0 to 18.0	44.5	1	0.8	500	Off-latch	HSOP-8	YES
BD1HD500EFJ-C	4.0 to 18.0	44.5	1	0.8	500	Self-restart	HTSOP-J8	YES
BD1HD500FVM-C	4.0 to 18.0	44.5	1	0.8	500	Self-restart	MSOP-8	YES
BD1HD500HFN-C	4.0 to 18.0	44.5	1	0.8	500	Self-restart	HSOP-8	YES

Low Side Switch

Smart Low Side Switch								
Part No.	Power Supply (V)	VDS (Max.)(V)	ch	I _{oCP} (Min.)(A)	ON Resistance (Typ.)(mΩ)	Thermal Shut Down	Package	Automotive Grade AEC-Q100
New BM2LC120FJ-C	3.0 to 5.5	42	2	3	120	Self-restart	SOP-J8	YES
New BM2LC300FJ-C	3.0 to 5.5	42	2	1.7	350	Self-restart	SOP-J8	YES
New BV1LC300FJ-C	3.0 to 5.5	42	1	1.7	350	Self-restart	SOP-J8	YES
BV1LB028FPJ-C	3.0 to 5.5	42	1	30	28	Self-restart	TO252-J3	YES
BV1LB045FPJ-C	3.0 to 5.5	42	1	18	45	Self-restart	TO252-J3	YES
BV1LB085FJ-C	3.0 to 5.5	42	1	13	85	Self-restart	SOP-J8	YES
BV1LC105FJ-C	3.0 to 5.5	42	1	3	105	Self-restart	SOP-J8	YES
BV1LB150FJ-C	3.0 to 5.5	42	1	6.5	150	Self-restart	SOP-J8	YES
BV1LB300FJ-C	3.0 to 5.5	42	1	1.7	300	Self-restart	SOP-J8	YES
BV1LB300HFS-C	3.0 to 5.5	42	1	1.7	300	Self-restart	HSOP-A8	YES
BD1LB500EFJ-C	3.5 to 5.5	42	1	0.8	350	Self-restart	HTSOP-J8	YES
BD1LB500FVM-C	3.5 to 5.5	42	1	0.8	350	Self-restart	MSOP8	YES
BM2LC105FJ-C	3.0 to 5.5	42	2	3	105	Self-restart	SOP-J8	YES
BM2LB110FJ-C	3.0 to 5.5	42	2	2.5	120	Self-restart	SOP-J8	YES
BM2LB150FJ-C	3.0 to 5.5	42	2	6.5	150	Self-restart	SOP-J8	YES
BM2LB300FJ-C	3.0 to 5.5	42	2	1.7	300	Self-restart	SOP-J8	YES
BD8LB600FS-C	3.0 to 5.5(Digital)/ 4.0 to 5.5(Analog)	45	8	1	600	Self-restart	SSOP-A24	YES
BD8LA700EFV-C	3.0 to 5.5(Digital)/ 4.0 to 5.5(Analog)	45	8	0.5	700	Off-latch	HTSSOP-B24	YES

**ICs**

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A/D Converters

10bit

10bit								
Part No.	Supply Voltage (V)	ch	Analog Input type	Sampling Frequency (SPS)	Interface	DNL (LSB)	INL (LSB)	Package
BH2715FV	2.70 to 5.25	8	Single ended	50k to 220k	SPI	±1.2	±1.5	SSOP-B16

12bit

12bit								
Part No.	Supply Voltage (V)	ch	Analog Input type	Sampling Frequency (SPS)	Interface	DNL (LSB)	INL (LSB)	Package
BU1S12S1AG-LB	2.70 to 5.25	1	Single ended	0.5M to 1.0M	SPI	−0.9Min./ +1.0Max.	−1.1Min./ +1.0Max.	SSOP6

D/A Converters

8bit

Standard 8bit Resolution The converter allows the output voltage to be set with 8-bit precision (256 steps). These popular converters offer feature-rich, highly integrated capabilities.										
Part No.	Supply Voltage (V)	ch	Current Consumption (mA)	DNL (LSB)	INL (LSB)	Load Current (mA)	Data Transfer Clock Frequency (MHz)	Input type	Data Latch Method	Package
BH2219FVM	2.7 to 5.5	2	0.4	±1.0	±1.5	±1.0	10	CMOS	LD	MSOP8
BH2220FVM	2.7 to 5.5	3	0.4	±1.0	±1.5	±1.0	10	CMOS	LD	MSOP8
BH2227FV	2.7 to 5.5	4	0.8	±1.0	±1.5	±1.0	10	CMOS	CSB	SSOP-B14
BH2228FV	2.7 to 5.5	6	0.8	±1.0	±1.5	±1.0	10	CMOS	CSB	SSOP-B14
BH2226FV	2.7 to 5.5	8	1.1	±1.0	±1.5	±1.0	10	CMOS	CSB	SSOP-B16
BH2226F	2.7 to 5.5	8	1.1	±1.0	±1.5	±1.0	10	CMOS	CSB	SOP16
BH2223FV	2.7 to 5.5	10	1.6	±1.0	±1.5	±1.0	10	CMOS	LD	SSOP-B16
BH2221FV	2.7 to 5.5	12	1.6	±1.0	±1.5	±1.0	10	CMOS	LD	SSOP-B20

10bit

10bit Resolution										
Part No.	Supply Voltage (V)	ch	Current Consumption (mA)	DNL (LSB)	INL (LSB)	Load Current (mA)	Data Transfer Clock Frequency (MHz)	Input type	Data Latch Method	Package
BU2508FV	4.5 to 5.5	4	4.5	±1.0	±3.5	±2.0	10	TTL	LD	SSOP-B14
BU2507FV	4.5 to 5.5	6	4.5	±1.0	±3.5	±2.0	10	TTL	LD	SSOP-B14
BU2506FV	4.5 to 5.5	8	4.5	±1.0	±3.5	±2.0	10	TTL	LD	SSOP-B20
BU2505FV	4.5 to 5.5	10	4.5	±1.0	±3.5	±2.0	10	TTL	LD	SSOP-B20
BU22210MUV	2.7 to 5.5	10	1.2	±0.5	±2.0	±1.0	10	TTL	CSB	VQFN016V3030



Interface

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LVDS Interface ICs

27bit LVDS Transmitter 27:4 Serializer

Part No.	Type	bits (bit)	Color Depth	Input Specification	Output Specification	Clock Frequency (MHz)	Supply Voltage (V)	Operating Temperature (°C)	Package
BU90T81	Serializer	27	8	LVC MOS	LVDS Single Link	20 to 112	1.65 to 1.95	−20 to +85	VBGA048W040

27bit LVDS Transmitter 27:8 Serializer

BU90T82	Serializer	27	8	LVC MOS	LVDS Dual Link	10 to 174	1.62 to 1.98/ 1.62 to 3.60	−40 to +85	SBGA072T070A

35bit LVDS Transmitters 35:5 Serializer

BU8254KVT	Serializer	35	10	LVC MOS	LVDS Single Link	8 to 112	3.0 to 3.6	−40 to +85	TQFP64V
BU8254GUW	Serializer	35	10	LVC MOS	LVDS Single Link	8 to 112	3.0 to 3.6	−20 to +85	VBGA099W060

56bit LVDS Transmitter 56:8 Serializer

BU7988KVT	Serializer	56	8	LVC MOS	LVDS Dual Link	8 to 112	3.0 to 3.6	−20 to +85	TQFP100V

35bit LVDS Receiver 5:35 Deserializer

BU90R104	Deserializer	35	10	LVDS Single Link	LVC MOS	8 to 112	2.3 to 3.6	−40 to +85	TQFP64V

56bit LVDS Receiver 8:56 Deserializer

BU7985KVT	Deserializer	56	8	LVDS Dual Link	LVC MOS	20 to 112	3.0 to 3.6	−20 to +85	TQFP100V

67bit LVDS Receiver 10:67 Deserializer

BU90R102	Deserializer	67	10	LVDS Dual Link	LVC MOS	8 to 160	2.3 to 3.6	−40 to +85	HQFP144VM

70bit LVDS Distributor

BU90RT102	Serializer/ Deserializer	70	10	LVDS	LVDS	20 to 135	3.0 to 3.6	−20 to +85	HTSSOP-C64

4bit LVDS Driver

BU90LV047A	Driver	4	—	LVC MOS	LVDS	250	3.0 to 3.6	−40 to +85	SSOP-B16

4bit LVDS Receiver

BU90LV048	Receiver	4	—	LVDS	LVC MOS	250	3.0 to 3.6	−40 to +85	SSOP-B16

4bit LVDS Transceiver

BU90LV049A	Transceiver	4	—	LVC MOS/LVDS	LVC MOS/LVDS	250	3.0 to 3.6	−40 to +85	SSOP-B16

Clockless Link Interface ICs

Clockless Link Serializer/Deserializer

Part No.	Type	Input Specification	Output Specification	Input ch (ch)	Output ch (ch)	Clock Frequency (MHz)	Clockless Transfer Rates (Gbps)	Parallel BUS Width (bit)	Supply Voltage (V)	Operating Temperature (°C)	Package
BU17074KV	Serializer/ Deserializer	LVC MOS/ Clockless Link	Clockless Link/ LVC MOS	—/1	1/—	20 to 75	2.7	28	2.3 to 3.6	−40 to +85	VQFP64
BU17101AKV-M	Serializer	LVC MOS	Clockless Link	—	1	30 to 51	1.63	24	2.3 to 3.6	−40 to +85	VQFP48
BU17102AKV-M	Deserializer	Clockless Link	LVC MOS	1	—	30 to 51	1.63	24	2.3 to 3.6	−40 to +85	VQFP48

Timing Controllers

Timing Controller for FHD, WUXGA

Part No.	Supply Voltage (V)	Input Specification	Output Specification	Input bits (bit)	Output bits (bit)	Clock Frequency (MHz)	Operating Temperature (°C)	Resolution	Package	Automotive Grade AEC-Q100
BU90AM4-03	1.62 to 3.63/ 1.62 to 2.20/ 1.08 to 1.32	MIPI DSI 4lane	P2P 8lane	8/6	8/6	40 to 200	−20 to +70	up to WUXGA (1920×1200)	UQFN54	—
BU8179MWV	2.25 to 3.63/ 1.62 to 2.20/ 1.08 to 1.32	eDP Ver.1.2 2lane	P2P 6lane	8/6	8/6	40 to 200	−20 to +85	up to WUXGA (1920×1200)	UQFN46	—
BU90AD2-01	1.62 to 3.63/ 1.62 to 1.98/ 1.08 to 1.32	eDP Ver.1.2 2lane	P2P 8lane	8/6	8/6	40 to 170	−40 to +85	up to WUXGA (1920×1200)	UQFN54	—
BU90AL210-M	2.3 to 3.6/ 1.35 to 1.65	LVDS Dual	mini-LVDS Dual	8/6	8/6	20 to 240	−40 to +105	up to 2880×1080	HTQFP100V	YES
BU90AL211-M	2.3 to 3.6	LVDS Dual	mini-LVDS Single	8/6	8/6	20 to 200	−40 to +105	up to 1920×1200	UQFP80	YES

Multiple Input Switch Monitor LSIs

22ch Models

Part No.	Supply Voltage (V)	Switch Input Number	Switch Input Voltage Range (V)	Wetting Current (mA)	Operating Current Intermittent Monitoring 50ms(Max.)(μA)	Control I/F	Clock Frequency (MHz)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BD3375MUV-M	8.0 to 26.0(VPUA/VPUB) 3.1 to 5.25(VDDI)	22	−14 to +40	1/3/5/10/15 (Pull up/Pull down)	100	SPI	up to 4.4	−40 to +125	VQFN48MCV070	YES
BD3375KV-C	8.0 to 26.0(VPUA/VPUB) 3.1 to 5.25(VDDI)	22	−14 to +40	1/3/5/10/15 (Pull up/Pull down)	100	SPI	up to 4.4	−40 to +125	VQFP48C	YES
New BD3378MUV-M	6.0 to 28.0(VPUA/VPUB) 3.1 to 5.25(VDDI)	22	−14 to +40	1/3/5/10/15 (Pull up/Pull down)	100	SPI	up to 4.4	−40 to +125	VQFN48MCV070	YES

33ch Models

New BD3380MUV-M	6.0 to 28.0(VPUA/VPUB) 3.1 to 5.25(VDDI)	33	−14 to +40	1/3/5/10/15 (Pull up/Pull down)	110	SPI	up to 4.4	−40 to +125	VQFN48MDV070	YES
New BD3381EKV-C	6.0 to 28.0(VPUA/VPUB) 3.1 to 5.25(VDDI)	33	−14 to +40	1/3/5/10/15 (Pull up/Pull down)	110	SPI	up to 4.4	−40 to +125	HTQFP64BV	YES

10ch Models

BD3376MUV-M	8.0 to 26.0(VPUA/VPUB) 3.1 to 5.25(VDDI)	10	−14 to +40	1/3/5/10/15 (Pull up/Pull down)	100	SPI	up to 4.4	−40 to +125	VQFN28SV5050	YES
BD3376EFV-C	8.0 to 26.0(VPUA/VPUB) 3.1 to 5.25(VDDI)	10	−14 to +40	1/3/5/10/15 (Pull up/Pull down)	100	SPI	up to 4.4	−40 to +125	HTSSOP-B30	YES

IrDA Controllers

IrDA SIR Encoder/Decoder

Part No.	Supply Voltage(V)		Data Rate (bps)	Clock Frequency (MHz)	I/F	Package
	V _{DD}	VIO				
BU92001KN	2.50 to 3.50	—	2.4k to 115.2k	24.0 to 29.5	UART	VQFN20

IrDA SIR, MIR, FIR, IrSimple Controllers/Remote Control Transmitters

BU92747GUW	1.62 to 1.98	1.62 to 3.60	2.4k to 115.2k, 0.576M, 1.152M, 4M	48	Parallel BUS(16bit)	VBGA048W040
BU92747KV	1.62 to 1.98	1.62 to 3.60	2.4k to 115.2k, 0.576M, 1.152M, 4M	48	Parallel BUS(16bit)	VQFP48C

LIN Transceivers

LIN Transceivers

Part No.	Supported Standards	Supply Voltage (V)	Operating Temperature (°C)	Absolute Maximum Rating of LIN pin (V)	Baud Rates (Max.)(kbps)	Supply Current at Sleep Mode (Typ.)(μA)	Package	Automotive Grade AEC-Q100
BD41030FJ-C	LIN2.0, LIN2.1, LIN2.2, LIN2.2A	5 to 27	−40 to +125	−27 to +40	20	3	SOP-J8	YES
BD41030HFN-C	LIN2.0, LIN2.1, LIN2.2, LIN2.2A	5 to 27	−40 to +125	−27 to +40	20	3	HSO8	YES

CAN Transceivers

CAN Transceivers

Part No.	Supported Standards	Supply Voltage (V)	Operating Temperature (°C)	Absolute Maximum Rating of CAN pin (V)	Data Rates (Max.)(Mbps)	Supply Current at Standby Mode (Typ.)(μA)	Package	Automotive Grade AEC-Q100
New BD41041FJ-C	ISO 11898-2:2016	4.75 to 5.25	−40 to +125	−27 to +40	1	10	SOP-J8	YES
New BD41044FJ-C	ISO 11898-2:2016	4.75 to 5.25	−40 to +125	−27 to +40	5	10	SOP-J8	YES

CXPI Transceivers

CXPI Transceivers

Part No.	Supported Standards	Supply Voltage (V)	Operating Temperature (°C)	Absolute Maximum Rating of BUS (V)	Baud Rates (kbps)	Supply Current at Sleep Mode (Typ.)(μA)	EMI	Package	Automotive Grade AEC-Q100
New BD41000AFJ-C	JASO_D015_3	7 to 18	−40 to +125	−27 to +40	5 to 20	3	—	SOPJ-8	YES
New BD41001FJ-C	JASO_D015_3	7 to 18	−40 to +125	−27 to +40	18.8 to 20.0	3	Improved against BD41000AFJ-C	SOPJ-8	YES

PLC(Power Line Communication)

HD-PLC Inside Compliant Baseband IC

Part No.	Supported Standards	Operating Frequency Band (MHz)	Supply Voltage (V)	Modulation Method	FEC Mode	Control I/F	Communication Speed (Mbps)	Transmission Output	Receiving Sensitivity	Operating Temperature (°C)	Package
BU82204MWV	HD-PLC inside	2 to 28	1.45 to 1.55/ 3.0 to 3.6	Wavelet OFDM	AES128	UART or SPI	up to 3	−10dBm/ 10kHz	−88dBm/ 10kHz	−40 to +85	UQFN88MV0100

Broadband Power Line Communication Baseband IC

BU82205MWV	ROHM Original PLC	2 to 28	1.45 to 1.55/ 3.0 to 3.6	Wavelet OFDM	AES128	UART or SPI	up to 3	−10dBm/ 10kHz	−88dBm/ 10kHz	−40 to +85	UQFN88MV0100

USB Type-C Power Delivery

For POWER SOURCE(Power Role : Source, DATA Role : DFP, Internal Shunt Reg., Variable OCP, Variable OVP, Internal Vconn SW)

Part No.	Supply Voltage (V)	IO Supply Voltage (V)	TYPE-C/PD Controller	Initial Supply Capable Voltage/Current (V/A)	Tolerant Voltage at CC Pins (V)	Gate Drivers for Nch FET	After OCP Behavior After OVP Behavior	DP Alternate Mode	Operating Temperature (°C)	Package
BM92A20MWV	3.1 to 20.0	1.7 to 5.5	✓/✓ (Internal Shunt Reg. for AC/DC)	5/3, 12/3, 15/3, 16/2.8, 19/2.36, 19.6/2.29, 20/2.25	6.5	For Source: 1pair	OCP : Automatic recovery OVP : Automatic recovery	—	−30 to +105	UQFN40V5050A
BM92A21MWV				5/3, 9/3, 12/3, 15/3, 20/3						UQFN40V5050A
BM92A50MWV			✓/✓	5/0.5, 12 to 20 Variable/2.25		For Source : 2pair		DP_SINK with Ext-MCU		UQFN40V5050A
BM92A56MWV				5/3, 9/3, 12/3, 15/3, 20/3				—		UQFN40V5050A
BM92A70MWV				5/0.5, 12 to 20 Variable/2.25				DP_SINK Auto		UQFN40V5050A
☆BD93W21F	4.75 to 20.00	—	✓/✓ (Internal Shunt Reg. for AC/DC)	5/3, 9/3, 12/3, 15/3, 20/2.25	25.2	For Source		—	SOP16	

For POWER SOURCE & SINK(Power Role : Source/Sink/DRP, DATA Role : DFP/UFP/DRD)

Part No.	Supply Voltage (V)	IO Supply Voltage (V)	TYPE-C/PD Controller	Connected The Required Initial Voltage(V)		Gate Drivers for Nch FET	Internal Vconn SW	DP Alternate Mode	Operating Temperature (°C)	Package
				Dead Battery	Non Dead Battery					
BM92A30MWV	3.1 to 20.0	1.7 to 5.5	✓/✓	12 to 20(Maximum voltage on the source side, NG: 5V)	5	For Sink : 1pair For Source : 1pair	✓	DP_SOURCE	−30 to +105	UQFN40V5050A
BM92A31MWV				12(NG: 5V)						UQFN40V5050A
BM92A32MWV				20(NG: 5V)						UQFN40V5050A
BM92A33MWV				15(NG: 5V)						UQFN40V5050A
BM92A34MWV				9(NG: 5V)						UQFN40V5050A
BM92A35MWV				5 to 20(Maximum voltage on the source side)						UQFN40V5050A

For POWER SINK(Power Role : Sink, DATA Role : UFP)

Part No.	Supply Voltage (V)	IO Supply Voltage (V)	TYPE-C/PD Controller	Connected The Required Initial Voltage(V) Without Ext-MCU	Start of Automatic Power Receiving Without Ext-MCU	Gate Drivers for Nch FET	Internal Vconn SW	DP Alternate Mode	Operating Temperature (°C)	Package
BM92A11MWV	3.1 to 20.0	1.7 to 5.5	✓/✓	12(NG: 5V)	✓	For Sink : 1pair For Source : 1pair	✓	—	−30 to +105	UQFN40V5050A
BM92A12MWV				20(NG: 5V)						UQFN40V5050A
BM92A13MWV				15(NG: 5V)						UQFN40V5050A
BM92A14MWV				9(NG: 5V)						UQFN40V5050A
BM92A15MWV				5 to 20(Maximum voltage on the source side)						UQFN40V5050A
☆BD91N01NUX	4.0 to 5.5		Type-C only	Type-C 5V		For Sink : 1path	—		−30 to +85	VSON010X3020

☆ : Under Development



Power Management

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Linear Regulators

Linear Regulators

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Single-Output LDO Regulators - Product Table

Max. Output Current Rating Input Voltage	0.1A	0.15A	0.2A	0.3A	0.5A	1.0A	1.5A	2.0A	3.0A	4.0A	External MOSFET
45 to 50V	BD42500G-C*2/3 BD42540FJ-C*2/3 ▶ P.A46		BD7xxL2*2 ▶ P.A33 BD4xxM2*1/2 BD4xxM2W*1/2 ▶ P.A34 BD4269FJ-C*2/3 BD42530EFJ-C*2 BD42530FP2-C*2 BD42530FPJ-C*2 ▶ P.A46	BD4269EFJ-C*2/3 ▶ P.A46	BD357xY BD7xxL5FP-C*2 BD4xxM5*1/2 BD4xxM5W*1/2 ▶ P.A33 BD4271HFP-C*2/3 BD4271FP2-C*2/3 BD3021HFP*2/3 BD3020HFP*2/3 BD42754FPJ-C*2/3 BD42754FP2-C*2/3 BD3925FP-C*2 BD3925HFP-C*2 ▶ P.A46						
30 to 36V	BDxxFA1FP3 BD50FA1MG-M*2 BD00FA1WEFJ ▶ P.A35			BD3650FP-M*2 ▶ P.A34 BA3662CP-V5 ▶ P.A36	BA78Mxx*1 ▶ P.A33	BA78xx*1 BAxxCC0*1 BDxxC0AFPS BDxxFC0FP BDxxC0A*1/2 BDxxFC0W*1 BAxxCC0W*1 BD00C0AWFP-M*2 BDxxC0AW*1 ▶ P.A33,A34,A35		BAxxDD0T BAxxDD0W*1 BDxxFD0W ▶ P.A34			
18V						BAxxBC0*1 BAxxBC0W*1 BD37210AMUV BD37215AMUV ▶ P.A36,A45	BAxxJC5T BA00JC5WT ▶ P.A36				
15V				BDxxGA3*1/2/4 ▶ P.A38,A39	BDxxGA5*2/4 ▶ P.A37,A38	BA1117FP BDxxGC0*2/4 ▶ P.A33,A37					
10V				BDxxHA3*2/4 ▶ P.A40	BDxxHA5*2/4 ▶ P.A39,A40	BDxxHC0*2/4 ▶ P.A39	BDxxHC5*2/4 ▶ P.A39				
6 to 7V	BHxxNB1WHFV BHxxRB1WGUT BHxxPB1WHFV BHxxSA3WGUT ▶ P.A45	BUxxTD2WNVX*1 BUxxTD3WG*1 BUxxTA2W*1 BUxxSD2MG-M*2 BUxxJA2MNVX-C*2 BUxxJA2VG-C*2 BUxxJA2DG-C*2 BUxxSA4WGWL ▶ P.A43,A44		BHxxM0AWHFV ▶ P.A42	BDxxIA5*2/4 BDxxKA5FP BDxxKA5W*1 BDxxIA5 BUxxSD5WG BUxxSA5WGWZ BD37201NUX ▶ P.A41,A42,A45	BDxxIC0*1/2/4 ▶ P.A40,A41	BD37215AMUV*5 ▶ P.A45				
Ultra Low Voltage (Dual Supply)					BD3550HFN BD3507HFN BD3540NUV ▶ P.A45	BD3551HFN BD3541NUV ▶ P.A45		BD3506F BD3552HFN ▶ P.A45	BD3508MUV BD3512MUV ▶ P.A45	BD3509MUV ▶ P.A45	BD3504FVM BD3521FVM ▶ P.A45

*1 : Package Lineup *2 : Automotive Grade *3 : Multi Function Regulator (Ex. Voltage Detection) *4 : Industrial Grade *5 : Negative Voltage type

Linear Regulators

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

78 series Regulators/Standard Regulator

35V Resistance 1A Output 78 series Regulators										
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Circuit Current (mA)	Thermal Shutdown Circuit	Area of Safety Operation Circuit	Over Current Protection Circuit	Package/Part No.	
									TO220CP-3	TO252-3
BA7805	7.5 to 25.0	5	±4	1.0	4.5	✓	✓	✓	BA7805CP	BA7805FP
BA7806	8.5 to 21.0	6							BA7806CP	BA7806FP
BA7807	9.5 to 22.0	7							BA7807CP	BA7807FP
BA7808	10.5 to 23.0	8							BA7808CP	BA7808FP
BA7809	11.5 to 26.0	9							BA7809CP	BA7809FP
BA7810	12.5 to 25.0	10							BA7810CP	BA7810FP
BA7812	15.0 to 27.0	12							BA7812CP	BA7812FP
BA7815	17.5 to 30.0	15							BA7815CP	BA7815FP
BA7818	21.0 to 33.0	18							BA7818CP	BA7818FP
BA7820	23.0 to 33.0	20							BA7820CP	BA7820FP
BA7824	27.0 to 33.0	24							BA7824CP	BA7824FP
35V Resistance 500mA Output 78 series Regulators										
BA78M05	7.5 to 25.0	5	±4	0.5	4.5	✓	✓	✓	BA78M05CP	BA78M05FP
BA78M06	8.5 to 21.0	6							BA78M06CP	BA78M06FP
BA78M07	9.5 to 22.0	7							BA78M07CP	BA78M07FP
BA78M08	10.5 to 23.0	8							BA78M08CP	BA78M08FP
BA78M09	11.5 to 26.0	9							BA78M09CP	BA78M09FP
BA78M10	12.5 to 25.0	10							BA78M10CP	BA78M10FP
BA78M12	15.0 to 27.0	12							BA78M12CP	BA78M12FP
BA78M15	17.5 to 30.0	15							BA78M15CP	BA78M15FP
BA78M18	21.0 to 33.0	18							BA78M18CP	BA78M18FP
BA78M20	23.0 to 33.0	20							BA78M20CP	BA78M20FP
BA78M24	27.0 to 33.0	24							BA78M24CP	BA78M24FP
15V Resistance 1A Output Standard LDO Regulator										
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Adjustment Pin Current (μA)	Reference Voltage (V)	Ripple Rejection (dB)	Load Regulation (mV)	Protection Circuit	Package
BA1117FP	10	Variable	±1	1.0	60	1.2 (I _o =1A)	75 (f=120Hz, V _i -V _o =3V, V _{ripple} =1V _{pp})	10	Over-Current/ Temperature	TO252-3

Single-Output LDO Regulators

50V Resistance 500mA Output LDO Regulators														
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Saturation Voltage : I _o =200mA(V)	Circuit Current (μA)	Operating Temperature (°C)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100			
BD3570YFP-M	4.5 to 36.0	3.3	±2 (Ta=−40 to +125°C)	0.5	—	30	−40 to +125	—	Over-Current/ Temperature	TO252-3	—			
BD3570YHFP-M										HRP5	—			
BD3571YFP-M	5.5 to 36.0	5.0			0.25					TO252-3	—			
BD3571YHFP-M										HRP5	—			
BD3572YFP-M	4.5 to 36.0	Variable 2.8 to 12.0			—					TO252-5	—			
BD3572YHFP-M										HRP5	—			
BD3573YFP-M		3.3			0.25					TO252-5	—			
BD3573YHFP-M										HRP5	—			
BD3574YFP-M	5.5 to 36.0	5.0			✓			TO252-5		—				
BD3574YHFP-M								HRP5		—				
BD3575YFP-M	4.5 to 36.0	Variable 2.8 to 12.0			TO252-5			—						
BD3575YHFP-M								HRP5		—				
50V Resistance 200mA Output Low Quiescent Current LDO Regulators														
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision(%)	Output Current (A)	Saturation Voltage: I _o =200mA(V)	Circuit Current (μA)	Operating Temperature (°C)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100			
BD733L2EFJ-C	4.37 to 45.0	3.3	±2 (Ta=−40 to +125°C)	0.2	0.6	6	−40 to +125	—	Over-Current/ Temperature	HTSOP-J8	YES			
BD750L2EFJ-C	5.8 to 45.0	5.0			0.4					HTSOP-J8	YES			
BD733L2FP-C	4.37 to 45.0	3.3			0.6					TO252-3	YES			
BD733L2FP3-C					SOT223-4					YES				
BD750L2FP-C					TO252-3					YES				
BD750L2FP3-C	5.8 to 45.0	5.0			0.4					SOT223-4	YES			
50V Resistance 500mA Output Low Quiescent Current LDO Regulators														
BD733L5FP-C	4.17 to 45.00	3.3	±2 (Ta=−40 to +125°C)	0.5	0.4	6	−40 to +125	—	Over-Current/ Temperature	TO252-3	YES			
BD750L5FP-C	5.6 to 45.0	5.0			0.25					TO252-3	YES			
45V Resistance 500mA Output Low Quiescent Current LDO Regulators														
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision(%)	Output Current (A)	I/O Voltage Difference (V)	Circuit Current (μA)	Operating Temperature (°C)	Shutdown Switch	Protection Circuit	Package/Part No.				Automotive Grade AEC-Q100
										TO252-3	TO263-3	TO263-5	TO252-J5	
BD433M5	4.0 to 42.0	3.3	±2 (Tj=−40 to +150°C)	0.5	0.25 (I _o =300mA)	38	Tj=−40 to +150	—	Over-Current/ Temperature	BD433M5FP-C	BD433M5FP2-C	—	—	YES
BD450M5	5.5 to 42.0	5.0			0.2 (I _o =300mA)					BD450M5FP-C	BD450M5FP2-C	—	—	YES
BD433M5W	4.0 to 42.0	3.3			0.25 (I _o =300mA)					—	—	BD433M5WFP2-C	BD433M5WFPJ-C	YES
BD450M5W	5.5 to 42.0	5.0			0.2 (I _o =300mA)					—	—	BD450M5WFP2-C	BD450M5WFPJ-C	YES

Single-Output LDO Regulators

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

45V Resistance 200mA Output Low Quiescent Current LDO Regulators

Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision(%)	Output Current (A)	I/O Voltage Difference (V)	Circuit Current (μA)	Operating Temperature (°C)	Shutdown Switch	Protection Circuit	Package/Part No.		Automotive Grade AEC-Q100
										HTSOP-J8	SOT223-4	
BD433M2	3.9 to 42.0	3.3	± 2 (Tj = -40 to +150°C)	0.2	0.2(Io=100mA)	40	Tj = -40 to +150	—	Over-Current/ Temperature	BD433M2EFJ-C	BD433M2FP3-C	YES
BD450M2	5.5 to 42.0	5.0			0.16(Io=100mA)					BD450M2EFJ-C	BD450M2FP3-C	YES
BD433M2W	3.9 to 42.0	3.3			0.2(Io=100mA)					BD433M2WEFJ-C	BD433M2WFP3-C	YES
BD450M2W	5.5 to 42.0	5.0			0.16(Io=100mA)					BD450M2WEFJ-C	BD450M2WFP3-C	YES

36V Resistance 300mA Output LDO Regulator

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	I/O Voltage Difference (V)	Circuit Current (mA)	Operating Temperature (°C)	Protection Circuit	Package	Automotive Grade AEC-Q100
BD3650FP-M	5.6 to 30.0	5.0	± 2 (Ta = -40 to +125°C)	0.3	0.2 (Io=200mA)	0.5	-40 to +125	Over-Current/ Temperature	TO252-3	YES

35V Resistance 2A LDO Regulators

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Protection Circuit	Package
BA15DD0T	3 to 25	1.5	± 1	2.0	0.9	0.45 (Io=2A)	55	50 (Io=0 to 2A)	Over-Voltage/ Over-Current/ Temperature	TO220FP-3
BA18DD0T		1.8								TO220FP-3
BA25DD0T		2.5								TO220FP-3
BA30DD0T		3.0								TO220FP-3
BA33DD0T		3.3								TO220FP-3
BA50DD0T		5.0								TO220FP-3
BA90DD0T		9.0								TO220FP-3
BAJ2DD0T		12.0								TO220FP-3
BAJ6DD0T		16.0								TO220FP-3

35V Resistance 2A LDO Regulators with Shutdown Switch

Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Protection Circuit	Package/Part No.			
BA00DD0W	3 to 25	Variable 1.5 to 16.0	±1	2.0	0.9	0.45 (Io=2A)	55	50 (Io=0 to 2A)	Over-Voltage/ Over-Current/ Temperature	TO220FP-5	HRP5		
BA15DD0W		1.5								BA00DD0WCP-V5 (TO220CP-V5)	BA00DD0WHFP		
BA18DD0W		1.8								BA15DD0WT	BA15DD0WHFP		
BA25DD0W		2.5								BA18DD0WT	BA18DD0WHFP		
BA30DD0W		3.0								—	BA25DD0WHFP		
BA33DD0W		3.3								BA30DD0WT	BA30DD0WHFP		
BA50DD0W		5.0								BA33DD0WT	BA33DD0WHFP		
BA90DD0W		9.0								BA50DD0WT	BA50DD0WHFP		
BAJ2DD0W		12.0								BA90DD0WT	BA90DD0WHFP		
BAJ6DD0W		16.0								BAJ2DD0WT	BAJ2DD0WHFP		
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Protection Circuit	Package/Part No.			
BD00FD0W	4 to 32	Variable 1.5 to 16.0	±1	2.0	0.5	0.4 (Io=1A)	55	Vo × 0.7% (Io=5mA to 1A)	Over-Current/ Temperature	BD00FD0WHFP	BD00FD0WFP2		
BD15FD0W		1.5	—			Vo × 2.0% (Io=5mA to 1A)		BD15FD0WHFP		BD15FD0WFP2			
BD18FD0W		1.8						BD18FD0WHFP		BD18FD0WFP2			
BD25FD0W		2.5						BD25FD0WHFP		BD25FD0WFP2			
BD30FD0W		3.0						BD30FD0WHFP		BD30FD0WFP2			
BD33FD0W	Vo + 1 to 32	3.3	±1	2.0	0.5	0.4 (Io=1A)	50	Vo × 0.7% (Io=5mA to 1A)	Over-Current/ Temperature	BD33FD0WHFP	BD33FD0WFP2		
BD50FD0W		5.0								BD50FD0WHFP	BD50FD0WFP2		
BD80FD0W		8.0								BD80FD0WHFP	BD80FD0WFP2		
BD90FD0W		9.0								BD90FD0WHFP	BD90FD0WFP2		
BDJ2FD0W		12.0								BDJ2FD0WHFP	BDJ2FD0WFP2		
BDJ5FD0W		15.0								BDJ5FD0WHFP	BDJ5FD0WFP2		
BDJ6FD0W		16.0								BDJ6FD0WHFP	BDJ6FD0WFP2		

35V Resistance 1A LDO Regulators

Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision(%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Protection Circuit	Package/Part No.				
BA03CC0	4 to 25	3.0	±2	1.0	2.5	0.30 (I _o =0.5A)	55	50 (I _o =5mA to 1A)	Over-Voltage/ Over-Current/ Temperature	BA03CC0T	BA03CC0FP			
BA033CC0		3.3								BA033CC0T	BA033CC0FP			
BA05CC0		5.0								BA05CC0T	BA05CC0FP			
BA06CC0		6.0								—	BA06CC0FP			
BA07CC0		7.0								BA07CC0T	BA07CC0FP			
BA08CC0		8.0								BA08CC0T	BA08CC0FP			
BA09CC0		9.0								BA09CC0T	BA09CC0FP			
BAJ0CC0		10.0								BAJ0CC0T	BAJ0CC0FP			
BAJ2CC0		12.0								BAJ2CC0T	BAJ2CC0FP			
BAJ5CC0		15.0								BAJ5CC0T	BAJ5CC0FP			
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision(%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (V)	Protection Circuit	Package				
BD80C0AFPS	9.0 to 26.5	8.0	±1	1.0	0.6	0.30(I _o =0.5A)	50	V _o * × 0.01 (I _o =5mA to 1A)	Over-Current/ Temperature	TO252S-3				
BD90C0AFPS	10.0 to 26.5	9.0						TO252S-3						
BD33FC0FP	4.3 to 26.5	3.3	±1	1.0	0.6	—	55	V _o * × 0.01 (I _o =5mA to 1A)	Over-Current/ Temperature	TO252-3				
BD50FC0FP	6.0 to 26.5	5.0						TO252-3						
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision(%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (V)	Protection Circuit	Package/Part No.				Automotive Grade AEC-Q100
BD33C0A	4.3 to 26.5	3.3	±3 (T _a = -40 to +125°C)	1.0	0.5	0.3 (I _o =500mA)	55	V _o * × 0.01 (I _o =5mA to 1A)	Over-Current/ Temperature	TO252-3	HRP5	TO263-3	TO252S-3	YES
BD50C0A	6.0 to 26.5	5.0								BD33C0AFP-C	BD33C0AHPF-C	BD33C0AFP2-C	—	YES
BD80C0A	9.0 to 26.5	8.0								BD50C0AFP-C	BD50C0AHPF-C	BD50C0AFP2-C	—	YES
BD90C0A	10.0 to 26.5	9.0								BD80C0AFP-C	BD80C0AHPF-C	BD80C0AFP2-C	BD80C0AFPS-C	YES
										BD90C0AFP-C	BD90C0AHPF-C	BD90C0AFP2-C	—	YES

*: V_o is Output voltage/Unit : V

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

35V Resistance 1A LDO Regulators with Shutdown Switch																
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Regulation (dB)	Load Regulation (V)	Protection Circuit	Package/Part No.						
										TO252-5	HTSOP-J8					
BD00FC0W	4.0 to 26.5	Variable	±1	1.0	0.5	0.3 (I _o =500mA)	55	V _o * × 0.01 (I _o =5mA to 1A)	Over-Current/ Temperature	BD00FC0WFP	BD00FC0WEFJ					
BD30FC0W		3.0				BD30FC0WFP				BD30FC0WEFJ						
BD33FC0W		3.3				BD33FC0WFP				BD33FC0WEFJ						
BD50FC0W	6.0 to 26.5	5.0				0.3 (I _o =500mA)	50			BD50FC0WFP	BD50FC0WEFJ					
BD60FC0W	7.0 to 26.5	6.0								BD60FC0WFP	BD60FC0WEFJ					
BD70FC0W	8.0 to 26.5	7.0								BD70FC0WFP	BD70FC0WEFJ					
BD80FC0W	9.0 to 26.5	8.0								BD80FC0WFP	BD80FC0WEFJ					
BD90FC0W	10.0 to 26.5	9.0								BD90FC0WFP	BD90FC0WEFJ					
BDJ0FC0W	11.0 to 26.5	10.0								BDJ0FC0WFP	BDJ0FC0WEFJ					
BDJ2FC0W	13.0 to 26.5	12.0								BDJ2FC0WFP	BDJ2FC0WEFJ					
BDJ5FC0W	16.0 to 26.5	15.0								BDJ5FC0WFP	BDJ5FC0WEFJ					
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Protection Circuit	Package/Part No.						
										TO220FP-5	TO252-5					
BA00CC0W	4 to 25	Variable 3.0 to 15.0	±2	1.0	2.5	0.3 (I _o =0.5A)	55	50 (I _o =5mA to 1A)	Over-Voltage/ Over-Current/ Temperature	BA00CC0WT/ BA00CC0WCP-V5 (TO220CP-V5)	BA00CC0WFP					
BA03CC0W		3.0								BA03CC0WT	—					
BA033CC0W		3.3								BA033CC0WT	BA033CC0WFP					
BA05CC0W		5.0								BA05CC0WT	BA05CC0WFP					
BA06CC0W		6.0								—	BA06CC0WFP					
BA07CC0W		7.0								BA07CC0WT	BA07CC0WFP					
BA08CC0W		8.0								BA08CC0WT	BA08CC0WFP					
BA09CC0W		9.0								BA09CC0WT	BA09CC0WFP					
BAJ0CC0W		10.0								BAJ0CC0WT	—					
BAJ2CC0W		12.0								BAJ2CC0WT	BAJ2CC0WFP					
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (V)	Protection Circuit	Package/Part No.						
										TO252-5	TO220CP-V5					
BD00C0AW	4.0 to 26.5	Variable 3.0 to 15.0	±1	1.0	0.5	0.3 (I _o =500mA)	55	V _o * × 0.01 (I _o =5mA to 1A)	Over-Current/ Temperature	BD00C0AWFP	BD00C0AWCP-V5					
BD33C0AW	4.3 to 26.5	3.3				—				BD33C0AWFP	—					
BD50C0AW	6.0 to 26.5	5.0				0.3 (I _o =500mA)				BD50C0AWFP	—					
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Saturation Voltage (V)	Circuit Current (mA)	Operating Temperature (°C)	Protection Circuit	Package	Automotive Grade AEC-Q100						
BD00C0AWFPS-M	4.0 to 26.5	Variable 3.0 to 15.0	±3 (T _a =−40 to +105°C)	1.0	0.3 (I _o =500mA)	0.5	−40 to +105	Over-Current/ Temperature	TO252S-5	YES						
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (V)	Protection Circuit	Package/Part No.			Automotive Grade AEC-Q100			
										TO252-5	HRP5	TO263-5				
BD00C0AW	4.0 to 26.5	Variable 1.0 to 15.0	±3 (T _a =−40 to +125°C)	1.0	0.5	0.3 (I _o =500mA)	55	V _o * × 0.01 (I _o =5mA to 1A)	Over-Current/ Temperature	BD00C0AWFP-C	BD00C0AWHFP-C	BD00C0AWFP2-C	YES			
BD33C0AW	4.3 to 26.5	3.3				—				BD33C0AWFP-C	BD33C0AWHFP-C	BD33C0AWFP2-C	YES			
BD50C0AW	6.0 to 26.5	5.0				0.3 (I _o =500mA)				BD50C0AWFP-C	BD50C0AWHFP-C	BD50C0AWFP2-C	YES			
BD80C0AW	9.0 to 26.5	8.0				0.3 (I _o =500mA)				BD80C0AWFP-C	BD80C0AWHFP-C	BD80C0AWFP2-C	YES			
BD90C0AW	10.0 to 26.5	9.0								BD90C0AWFP-C	BD90C0AWHFP-C	BD90C0AWFP2-C	YES			
35V Resistance 300mA LDO Regulator with Shutdown Switch																
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation	Protection Circuit	Package						
BA3662CP-V5	4 to 25	Variable 3.0 to 15.0	±2	0.3	2.5	0.3 (I _o =0.2A)	55	40mV (I _o =5to 200mA)	Over-Voltage/ Over-Current/ Temperature	TO220CP-V5						
30V Resistance 100mA LDO Regulators																
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Load Regulation (%)	Protection Circuit	Input Capacitor (μF)	Output Capacitor (μF)	Package					
BD33FA1FP3	V _o +3 to 25	3.3	±1	0.1	0.3	1 (I _o =100mA)	±1.5	Over-Current/ Temperature	1.0	1.0	SOT89-3					
BD50FA1FP3		5.0									SOT89-3					
BD54FA1FP3		5.4									SOT89-3					
BDJ2FA1FP3		12.0			0.4						SOT89-3					
30V Resistance 100mA LDO Regulators with Shutdown Switch																
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Load Regulation (%)	Protection Circuit	Input Capacitor (μF)	Output Capacitor (μF)	Package	Automotive Grade AEC-Q100				
BD50FA1MG-M	V _o +3 to 25	5	±1	0.1	0.5	2 (I _o =100mA)	±1.5	Over-Current/ Temperature	1.0	1.0	SSOP5	YES				
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Load Regulation (%)	Protection Circuit	Input Capacitor (μF)	Output Capacitor (μF)	Package					
BD00FA1WEFJ	V _o +3 to 25	Variable (3.0 to 12.0)	±1	0.1	0.3	2 (I _o =100mA)	±1.5	Over-Current/ Temperature	2.2	2.2	HTSOP-J8					

* : V_O is Output voltage/Unit : V

Single-Output LDO Regulators

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

18V Resistance 1.5A LDO Regulators

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Protection Circuit	Package
BA15JC5T	3 to 16	1.5	±1	1.5	0.5	0.3 (I _O =500mA)	55	5 (I _O =5mA to 1.5A)	0.33	22.0	Over-Current/ Temperature	TO220FP-3
BA18JC5T		1.8										TO220FP-3
BA25JC5T		2.5										TO220FP-3
BA30JC5T		3.0										TO220FP-3
BA33JC5T		3.3										TO220FP-3
BA50JC5T		5.0										TO220FP-3
BA60JC5T		6.0										TO220FP-3
BA80JC5T		8.0										TO220FP-3
BA90JC5T		9.0										TO220FP-3

18V Resistance 1.5A LDO Regulator with Shutdown Switch

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package
BA00JC5WT	3 to 16	Variable 1.5 to 12.0	±1	1.5	0.5	0.3 (I _O =500mA)	55	5 (I _O =5mA to 1.5A)	0.33	22.0	✓	Over-Current/ Temperature	TO220FP-5

18V Resistance 1A LDO Regulators

Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Protection Circuit	Package/Part No.						
												TO252-3	TO220FP-3					
BA15BC0	3 to 16	1.5	±2	1.0	0.5	0.3 (I _O =200mA)	55	35 (I _O =0 to 1A)	0.33	22.0	Over-Current/ Temperature	BA15BC0FP	BA15BC0T					
BA18BC0		1.8										BA18BC0FP	BA18BC0T					
BA25BC0		2.5										BA25BC0FP	BA25BC0T					
BA30BC0		3.0										BA30BC0FP	BA30BC0T					
BA33BC0		3.3										BA33BC0FP	BA33BC0T					
BA50BC0		5.0										BA50BC0FP	BA50BC0T					
BA60BC0		6.0		0.6								BA60BC0FP	BA60BC0T					
BA70BC0		7.0										BA70BC0FP	BA70BC0T					
BA80BC0		8.0										BA80BC0FP	BA80BC0T					
BA90BC0		9.0										BA90BC0FP	BA90BC0T					
BAJ0BC0		10.0										BAJ0BC0FP	BAJ0BC0T					

18V Resistance 1A LDO Regulators with Shutdown Switch

Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Pprecision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package/Part No.	
													TO252-5	TO220FP-5
BA00BC0W	3 to 16	Variable 1.5 to 12.0	±2	1.0	0.5 (V _O ≤6.0)	0.3 (I _O =200mA)	55	35 (I _O =0 to 1A)	0.33	22.0	✓	Over-Current/ Temperature	BA00BC0WFP/ BA00BC0WCP-V5 (TO220CP-V5)	BA00BC0WT
BA15BC0W		1.5			0.5								BA15BC0WFP	BA15BC0WT
BA18BC0W		1.8											BA18BC0WFP	BA18BC0WT
BA25BC0W		2.5											BA25BC0WFP	BA25BC0WT
BA30BC0W		3.0											BA30BC0WFP	BA30BC0WT
BA33BC0W		3.3											BA33BC0WFP	BA33BC0WT
BA50BC0W		5.0			0.6								BA50BC0WFP	BA50BC0WT
BA60BC0W		6.0											BA60BC0WFP	BA60BC0WT
BA70BC0W		7.0											BA70BC0WFP	BA70BC0WT
BA80BC0W		8.0											BA80BC0WFP	BA80BC0WT
BA90BC0W		9.0											BA90BC0WFP	BA90BC0WT
BAJ0BC0W		10.0											BAJ0BC0WFP	BAJ0BC0WT

*: V_O is Output Voltage/Unit : V

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

15V Resistance 1A LDO Regulators with Shutdown Switch														
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100
BD00GC0WEFJ/BD00GC0MEFJ-M	4.5 to 14.0	Variable 1.5 to 13.0	± 1 (Ta=+25°C)/ ± 3 (Ta=-40 to +105°C) <Automotive Grade>	1.0	0.6	0.6 (Io=1A)	60 (f=100Hz, 50mVpp, Io=0A)	25 (Io=0 to 1A)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	—/YES
BD15GC0WEFJ/BD15GC0MEFJ-M		1.5											HTSOP-J8	—/YES
BD18GC0WEFJ/BD18GC0MEFJ-M		1.8											HTSOP-J8	—/YES
BD25GC0WEFJ/BD25GC0MEFJ-M		2.5											HTSOP-J8	—/YES
BD30GC0WEFJ/BD30GC0MEFJ-M		3.0											HTSOP-J8	—/YES
BD33GC0WEFJ/BD33GC0MEFJ-M		3.3											HTSOP-J8	—/YES
BD50GC0WEFJ/BD50GC0MEFJ-M		5.0											HTSOP-J8	—/YES
BD60GC0WEFJ/BD60GC0MEFJ-M		6.0											HTSOP-J8	—/YES
BD70GC0WEFJ/BD70GC0MEFJ-M		7.0											HTSOP-J8	—/YES
BD80GC0WEFJ/BD80GC0MEFJ-M		8.0											HTSOP-J8	—/YES
BD90GC0WEFJ/BD90GC0MEFJ-M		9.0											HTSOP-J8	—/YES
BDJ0GC0WEFJ/BDJ0GC0MEFJ-M		10.0											HTSOP-J8	—/YES
BDJ2GC0WEFJ/BDJ2GC0MEFJ-M		12.0											HTSOP-J8	—/YES

15V Resistance 1A Variable/Fixed Output LDO Regulators(Industrial Equipment)														
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	
BD00GC0MEFJ-LB	4.5 to 14.0	Variable 1.5 to 13.0	$\pm 1/\pm 3$ (Ta=-40 to +105°C)	1.0	0.6	0.6 (Io=1A)	60 (f=100Hz, 50mVpp, Io=0A)	25 (Io=0 to 1A)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	
BD15GC0MEFJ-LB		1.5											HTSOP-J8	
BD18GC0MEFJ-LB		1.8											HTSOP-J8	
BD25GC0MEFJ-LB		2.5											HTSOP-J8	
BD30GC0MEFJ-LB		3.0											HTSOP-J8	
BD33GC0MEFJ-LB		3.3											HTSOP-J8	
BD50GC0MEFJ-LB		5.0											HTSOP-J8	
BD60GC0MEFJ-LB		6.0											HTSOP-J8	
BD70GC0MEFJ-LB		7.0											HTSOP-J8	
BD80GC0MEFJ-LB		8.0											HTSOP-J8	
BD90GC0MEFJ-LB		9.0											HTSOP-J8	
BDJ0GC0MEFJ-LB		10.0											HTSOP-J8	
BDJ2GC0MEFJ-LB		12.0											HTSOP-J8	

15V Voltage Resistance 500mA LDO Regulators with Shutdown Switch														
Part No.	Input Voltage (V)	Output Voltage (V)	Output voltage precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection circuit	Package	Automotive Grade AEC-Q100
BD00GA5WEFJ/BD00GA5MEFJ-M	4.5 to 14.0	Variable 1.5 to 13.0	± 1 (Ta=25°C)/ ± 3 (Ta=-40 to +105°C) <Automotive Grade>	0.5	0.6	0.6 (Io=500mA)	60 (f=100Hz, 50mVpp, Io=0A)	25 (Io=0 to 500mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	—/YES
BD15GA5WEFJ/BD15GA5MEFJ-M		1.5											HTSOP-J8	—/YES
BD18GA5WEFJ/BD18GA5MEFJ-M		1.8											HTSOP-J8	—/YES
BD25GA5WEFJ/BD25GA5MEFJ-M		2.5											HTSOP-J8	—/YES
BD30GA5WEFJ/BD30GA5MEFJ-M		3.0											HTSOP-J8	—/YES
BD33GA5WEFJ/BD33GA5MEFJ-M		3.3											HTSOP-J8	—/YES
BD50GA5WEFJ/BD50GA5MEFJ-M		5.0											HTSOP-J8	—/YES
BD60GA5WEFJ/BD60GA5MEFJ-M		6.0											HTSOP-J8	—/YES
BD70GA5WEFJ/BD70GA5MEFJ-M		7.0											HTSOP-J8	—/YES
BD80GA5WEFJ/BD80GA5MEFJ-M		8.0											HTSOP-J8	—/YES
BD90GA5WEFJ/BD90GA5MEFJ-M		9.0											HTSOP-J8	—/YES
BDJ0GA5WEFJ/BDJ0GA5MEFJ-M		10.0											HTSOP-J8	—/YES
BDJ2GA5WEFJ/BDJ2GA5MEFJ-M		12.0											HTSOP-J8	—/YES

Single-Output LDO Regulators

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

15V Resistance 500mA Variable/Fixed Output LDO Regulators(Industrial Equipment)

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package
BD00GA5MEFJ-LB	4.5 to 14.0	Variable 1.5 to 13.0	±1/±3 (Ta=-40 to +105°C)	0.5	0.6	0.6 (Io=500mA)	60 (f=100Hz, 50mV _{rpf} , Io=0A)	25 (Io=0 to 500mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8
BD15GA5MEFJ-LB		1.5											HTSOP-J8
BD18GA5MEFJ-LB		1.8											HTSOP-J8
BD25GA5MEFJ-LB		2.5											HTSOP-J8
BD30GA5MEFJ-LB		3.0											HTSOP-J8
BD33GA5MEFJ-LB		3.3											HTSOP-J8
BD50GA5MEFJ-LB		5.0											HTSOP-J8
BD60GA5MEFJ-LB		6.0											HTSOP-J8
BD70GA5MEFJ-LB		7.0											HTSOP-J8
BD80GA5MEFJ-LB		8.0											HTSOP-J8
BD90GA5MEFJ-LB		9.0											HTSOP-J8
BDJ0GA5MEFJ-LB		10.0											HTSOP-J8
BDJ2GA5MEFJ-LB		12.0											HTSOP-J8

15V Resistance 300mA LDO Regulators with Shutdown Switch

Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package/Part No.	
													HTSOP-J8	VSON008X2030
BD00GA3W	4.5 to 14.0	Variable 1.5 to 13.0	±1	0.3	0.6	0.6 (Io=300mA)	60 (f=100Hz, 50mV _{rpf} , Io=0A)	25 (Io=0 to 300mA)	1.0	1.0	✓	Over-Current/ Temperature	BD00GA3WEFJ	BD00GA3WNUX
BD15GA3W		1.5											BD15GA3WEFJ	☆BD15GA3WNUX
BD18GA3W		1.8											BD18GA3WEFJ	☆BD18GA3WNUX
BD25GA3W		2.5											BD25GA3WEFJ	☆BD25GA3WNUX
BD30GA3W		3.0											BD30GA3WEFJ	☆BD30GA3WNUX
BD33GA3W		3.3											BD33GA3WEFJ	☆BD33GA3WNUX
BD50GA3W		5.0											BD50GA3WEFJ	BD50GA3WNUX
BD60GA3W		6.0											BD60GA3WEFJ	BD60GA3WNUX
BD70GA3W		7.0											BD70GA3WEFJ	☆BD70GA3WNUX
BD80GA3W		8.0											BD80GA3WEFJ	☆BD80GA3WNUX
BD90GA3W		9.0											BD90GA3WEFJ	☆BD90GA3WNUX
BDJ0GA3W		10.0											BDJ0GA3WEFJ	☆BDJ0GA3WNUX
BDJ2GA3W		12.0											BDJ2GA3WEFJ	☆BDJ2GA3WNUX

15V Resistance 300mA LDO Regulators with Shutdown Switch

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100
BD00GA3MEFJ-M	4.5 to 14.0	Variable 1.5 to 13.0	±3 (Ta=-40 to +105°C) <Automotive Grade>	0.3	0.6	0.6 (Io=300mA)	60 (f=100Hz, 50mV _{rpf} , Io=0A)	25 (Io=0 to 300mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	YES
BD15GA3MEFJ-M		1.5											HTSOP-J8	YES
BD18GA3MEFJ-M		1.8											HTSOP-J8	YES
BD25GA3MEFJ-M		2.5											HTSOP-J8	YES
BD30GA3MEFJ-M		3.0											HTSOP-J8	YES
BD33GA3MEFJ-M		3.3											HTSOP-J8	YES
BD50GA3MEFJ-M		5.0											HTSOP-J8	YES
BD60GA3MEFJ-M		6.0											HTSOP-J8	YES
BD70GA3MEFJ-M		7.0											HTSOP-J8	YES
BD80GA3MEFJ-M		8.0											HTSOP-J8	YES
BD90GA3MEFJ-M		9.0											HTSOP-J8	YES
BDJ0GA3MEFJ-M		10.0											HTSOP-J8	YES
BDJ2GA3MEFJ-M		12.0											HTSOP-J8	YES

15V Resistance 300mA Variable/Fixed Output LDO Regulators(Industrial Equipment)

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package
BD00GA3MEFJ-LB	4.5 to 14.0	Variable 1.5 to 13.0	±3 (Ta=-40 to +105°C)	0.3	0.6	0.6 (Io=300mA)	60 (f=100Hz, 50mV _{rpf} , Io=0A)	25 (Io=0 to 300mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8
BD15GA3MEFJ-LB		1.5											HTSOP-J8
BD18GA3MEFJ-LB		1.8											HTSOP-J8
BD25GA3MEFJ-LB		2.5											HTSOP-J8
BD30GA3MEFJ-LB		3.0											HTSOP-J8
BD33GA3MEFJ-LB		3.3											HTSOP-J8
BD50GA3MEFJ-LB		5.0											HTSOP-J8
BD60GA3MEFJ-LB		6.0											HTSOP-J8
BD70GA3MEFJ-LB		7.0											HTSOP-J8
BD80GA3MEFJ-LB		8.0											HTSOP-J8
BD90GA3MEFJ-LB		9.0											HTSOP-J8
BDJ0GA3MEFJ-LB		10.0											HTSOP-J8
BDJ2GA3MEFJ-LB		12.0											HTSOP-J8

☆ : Under Development

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

A

Power Management

10V Resistance 1.5A LDO Regulators with Shutdown Switch															
Part No.		Input Voltage (V)	Output Voltage (V)	Output Voltage precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100
Consumer/Automotive Grade															
BD00HC5WEFJ/BD00HC5MEFJ-M		4.5 to 8.0	Variable 1.5 to 7.0	±1 (Ta=25°C)/ ±3 (Ta=-40 to +105°C) <Automotive Grade>	1.5	0.6	0.6 (Io=1.5A)	60 (f=100Hz, 50mV _{rps} , Io=0A)	25 (Io=0 to 1.5A)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	—/YES
BD15HC5WEFJ/BD15HC5MEFJ-M			1.5											HTSOP-J8	—/YES
BD18HC5WEFJ/BD18HC5MEFJ-M			1.8											HTSOP-J8	—/YES
BD25HC5WEFJ/BD25HC5MEFJ-M			2.5											HTSOP-J8	—/YES
BD30HC5WEFJ/BD30HC5MEFJ-M			3.0											HTSOP-J8	—/YES
BD33HC5WEFJ/BD33HC5MEFJ-M			3.3											HTSOP-J8	—/YES
BD50HC5WEFJ/BD50HC5MEFJ-M			5.0											HTSOP-J8	—/YES
BD60HC5WEFJ/BD60HC5MEFJ-M			6.0											HTSOP-J8	—/YES
BD70HC5WEFJ/BD70HC5MEFJ-M			7.0											HTSOP-J8	—/YES
10V Resistance 1.5A Variable/Fixed Output LDO Regulators(Industrial Equipment)															
Part No.		Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	
BD00HC5MEFJ-LB		4.5 to 8.0	Variable 1.5 to 7.0	±1/±3 (Ta=-40 to +105°C)	1.5	0.6	0.6 (Io=1.5A)	60 (f=100Hz, 50mV _{rps} , Io=0A)	25 (Io=0 to 1.5A)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	
BD15HC5MEFJ-LB			1.5											HTSOP-J8	
BD18HC5MEFJ-LB			1.8											HTSOP-J8	
BD25HC5MEFJ-LB			2.5											HTSOP-J8	
BD30HC5MEFJ-LB			3.0											HTSOP-J8	
BD33HC5MEFJ-LB			3.3											HTSOP-J8	
BD50HC5MEFJ-LB			5.0											HTSOP-J8	
BD60HC5MEFJ-LB			6.0											HTSOP-J8	
BD70HC5MEFJ-LB			7.0											HTSOP-J8	
10V Resistance 1A LDO Regulators with Shutdown Switch															
Part No.		Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100
Consumer/Automotive Grade															
BD00HC0WEFJ/BD00HC0MEFJ-M		4.5 to 8.0	Variable 0.8 to 7.0 (Automotive Grade Variable 1.5 to 7.0)	±1 (Ta=+25°C)/ ±3 (Ta=-40 to +105°C) <Automotive Grade>	1.0	0.6	0.6 (Io=1A)	60 (f=100Hz, 50mV _{rps} , Io=0A)	25 (Io=0 to 1A)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	—/YES
BD15HC0WEFJ/BD15HC0MEFJ-M			1.5											HTSOP-J8	—/YES
BD18HC0WEFJ/BD18HC0MEFJ-M			1.8											HTSOP-J8	—/YES
BD25HC0WEFJ/BD25HC0MEFJ-M			2.5											HTSOP-J8	—/YES
BD30HC0WEFJ/BD30HC0MEFJ-M			3.0											HTSOP-J8	—/YES
BD33HC0WEFJ/BD33HC0MEFJ-M			3.3											HTSOP-J8	—/YES
BD50HC0WEFJ/BD50HC0MEFJ-M			5.0											HTSOP-J8	—/YES
BD60HC0WEFJ/BD60HC0MEFJ-M			6.0											HTSOP-J8	—/YES
BD70HC0WEFJ/BD70HC0MEFJ-M			7.0											HTSOP-J8	—/YES
10V Resistance 1A Variable/Fixed Output LDO Regulators(Industrial Equipment)															
Part No.		Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	
BD00HC0MEFJ-LB		4.5 to 8.0	Variable 0.8 to 7.0 (Variable 1.5 to 7.0)	±1/±3 (Ta=-40 to +105°C)	1.0	0.6	0.6 (Io=1A)	60 (f=100Hz, 50mV _{rps} , Io=0A)	25 (Io=0 to 1A)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	
BD15HC0MEFJ-LB			1.5											HTSOP-J8	
BD18HC0MEFJ-LB			1.8											HTSOP-J8	
BD25HC0MEFJ-LB			2.5											HTSOP-J8	
BD30HC0MEFJ-LB			3.0											HTSOP-J8	
BD33HC0MEFJ-LB			3.3											HTSOP-J8	
BD50HC0MEFJ-LB			5.0											HTSOP-J8	
BD60HC0MEFJ-LB			6.0											HTSOP-J8	
BD70HC0MEFJ-LB			7.0											HTSOP-J8	
10V Resistance 500mA LDO Regulators with Shutdown Switch															
Part No.		Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100
Consumer/Automotive Grade															
BD00HA5WEFJ/BD00HA5MEFJ-M		4.5 to 8.0	Variable 1.5 to 7.0	±1 (Ta=+25°C)/ ±3 (Ta=-40 to +105°C) <Automotive Grade>	0.5	0.6	0.6 (Io=500mA)	60 (f=100Hz, 50mV _{rps} , Io=0A)	25 (Io=0 to 500mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	—/YES
BD15HA5WEFJ/BD15HA5MEFJ-M			1.5											HTSOP-J8	—/YES
BD18HA5WEFJ/BD18HA5MEFJ-M			1.8											HTSOP-J8	—/YES
BD25HA5WEFJ/BD25HA5MEFJ-M			2.5											HTSOP-J8	—/YES
BD30HA5WEFJ/BD30HA5MEFJ-M			3.0											HTSOP-J8	—/YES
BD33HA5WEFJ/BD33HA5MEFJ-M			3.3											HTSOP-J8	—/YES
BD50HA5WEFJ/BD50HA5MEFJ-M			5.0											HTSOP-J8	—/YES
BD60HA5WEFJ/BD60HA5MEFJ-M			6.0											HTSOP-J8	—/YES
BD70HA5WEFJ/BD70HA5MEFJ-M			7.0											HTSOP-J8	—/YES

Single-Output LDO Regulators

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

10V Resistance 500mA Variable/Fixed Output LDO Regulators(Industrial Equipment)

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package
BD00HA5MEFJ-LB	4.5 to 8.0	Variable 1.5 to 7.0	±1/±3 (Ta=-40 to +105°C)	0.5	0.6	0.6 (Io=500mA)	60 (f=100Hz, 50mVpp, Io=0A)	25 (Io=0 to 500mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8
BD15HA5MEFJ-LB		1.5											HTSOP-J8
BD18HA5MEFJ-LB		1.8											HTSOP-J8
BD25HA5MEFJ-LB		2.5											HTSOP-J8
BD30HA5MEFJ-LB		3.0											HTSOP-J8
BD33HA5MEFJ-LB		3.3											HTSOP-J8
BD50HA5MEFJ-LB		5.0											HTSOP-J8
BD60HA5MEFJ-LB		6.0											HTSOP-J8
BD70HA5MEFJ-LB		7.0											HTSOP-J8

10V Resistance 300mA LDO Regulators with Shutdown Switch

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection circuit	Package	Automotive Grade AEC-Q100
Consumer/Automotive Grade														
BD00HA3WEFJ/BD00HA3MEFJ-M	4.5 to 8.0	Variable 1.5 to 7.0	±1(Ta=-25°C)/±3 (Ta=-40 to +105°C) <Automotive Grade>	0.3	0.6	0.6 (Io=300mA)	60 (f=100Hz, 50mVpp, Io=0A)	25 (Io=0 to 300mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	—/YES
BD15HA3WEFJ/BD15HA3MEFJ-M		1.5											HTSOP-J8	—/YES
BD18HA3WEFJ/BD18HA3MEFJ-M		1.8											HTSOP-J8	—/YES
BD25HA3WEFJ/BD25HA3MEFJ-M		2.5											HTSOP-J8	—/YES
BD30HA3WEFJ/BD30HA3MEFJ-M		3.0											HTSOP-J8	—/YES
BD33HA3WEFJ/BD33HA3MEFJ-M		3.3											HTSOP-J8	—/YES
BD50HA3WEFJ/BD50HA3MEFJ-M		5.0											HTSOP-J8	—/YES
BD60HA3WEFJ/BD60HA3MEFJ-M		6.0											HTSOP-J8	—/YES
BD70HA3WEFJ/BD70HA3MEFJ-M		7.0											HTSOP-J8	—/YES

10V Resistance 300mA Variable/Fixed Output Industrial LDO Regulators

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection circuit	Package
BD00HA3MEFJ-LB	4.5 to 8.0	Variable 1.5 to 7.0	±1/±3 (Ta=-40 to +105°C)	0.3	0.6	0.6 (Io=300mA)	60 (f=100Hz, 50mVpp, Io=0A)	25 (Io=0 to 300mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8
BD15HA3MEFJ-LB		1.5											HTSOP-J8
BD18HA3MEFJ-LB		1.8											HTSOP-J8
BD25HA3MEFJ-LB		2.5											HTSOP-J8
BD30HA3MEFJ-LB		3.0											HTSOP-J8
BD33HA3MEFJ-LB		3.3											HTSOP-J8
BD50HA3MEFJ-LB		5.0											HTSOP-J8
BD60HA3MEFJ-LB		6.0											HTSOP-J8
BD70HA3MEFJ-LB		7.0											HTSOP-J8

7V Resistance 1A LDO Regulators with Shutdown Switch

Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package/Part No.	
													HTSOP-J8	HVSOF6
BD00IC0W	2.4 to 5.5	Variable 0.8 to 4.5	±1	1.0	0.3	0.4 (Io=1A)	60 (f=100Hz, 50mVpp, Io=0A)	25 (Io=0 to 1A)	1.0	1.0	✓	Over-Current/ Temperature	BD00IC0WEFJ	BD00IC0WHFV
BD10IC0W		1.0											BD10IC0WEFJ	BD10IC0WHFV
BD12IC0W		1.2											BD12IC0WEFJ	BD12IC0WHFV
BD1CIC0W		1.25											—	BD1CIC0WHFV
BD15IC0W		1.5											BD15IC0WEFJ	BD15IC0WHFV
BD18IC0W		1.8											BD18IC0WEFJ	BD18IC0WHFV
BD25IC0W		2.5											BD25IC0WEFJ	BD25IC0WHFV
BD26IC0W		2.6											—	BD26IC0WHFV
BD30IC0W		3.0											BD30IC0WEFJ	BD30IC0WHFV
BD33IC0W		3.3											BD33IC0WEFJ	BD33IC0WHFV

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100
BD00IC0MEFJ-M	2.4 to 5.5	Variable 0.8 to 4.5	±3 (Ta=-40 to +105°C)	1.0	0.3	0.4 (Io=1A)	60 (f=100Hz, 50mVpp, Io=0A)	25 (Io=0 to 1A)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	YES
BD10IC0MEFJ-M		1.0											HTSOP-J8	YES
BD12IC0MEFJ-M		1.2											HTSOP-J8	YES
BD15IC0MEFJ-M		1.5											HTSOP-J8	YES
BD18IC0MEFJ-M		1.8											HTSOP-J8	YES
BD25IC0MEFJ-M		2.5											HTSOP-J8	YES
BD30IC0MEFJ-M		3.0											HTSOP-J8	YES
BD33IC0MEFJ-M		3.3											HTSOP-J8	YES

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

7V Resistance 1A Variable/Fixed Output LDO Regulators(Industrial Equipment)																
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection circuit	Package			
BD00IC0MEFJ-LB	2.3 to 5.5	Variable 0.8 to 4.5	±3 (Ta=−40 to +105°C)	1.0	0.3	0.4 (Io=1A)	60 (f=100Hz, 50mV _{rpp} , Io=0A)	25 (Io=0 to 1A)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8			
BD10IC0MEFJ-LB	2.4 to 5.5	1.0											HTSOP-J8			
BD12IC0MEFJ-LB		1.2											HTSOP-J8			
BD15IC0MEFJ-LB		1.5											HTSOP-J8			
BD18IC0MEFJ-LB		1.8											HTSOP-J8			
BD25IC0MEFJ-LB		2.5											HTSOP-J8			
BD30IC0MEFJ-LB		3.0											HTSOP-J8			
BD33IC0MEFJ-LB		3.3											HTSOP-J8			
7V Resistance 500mA LDO Regulators																
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Protection Circuit	Package				
BD10KA5FP	2.3 to 5.5	1.0	±1	0.5	0.35	0.12 (Io=200mA)	50	25 (Io=0 to 500mA)	1.0	1.0	Over-Current/ Temperature	TO252-3				
BD12KA5FP		1.2										TO252-3				
BD15KA5FP		1.5										TO252-3				
BD18KA5FP		1.8										TO252-3				
BD25KA5FP		2.5										TO252-3				
BD30KA5FP		3.0										TO252-3				
BD33KA5FP		3.3										TO252-3				
7V Resistance 500mA LDO Regulators with Shutdown Switch																
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package/Part No.			
													TO252-5	SOP8		
BD00KA5W	2.3 to 5.5	Variable 1.0 to 4.0	±1	0.5	0.35	0.12 (Io=200mA)	50	25 (0 to 500mA)	1.0	1.0	✓	Over-Current/ Temperature	BD00KA5WFP	BD00KA5WF		
BD10KA5W		1.0											BD10KA5WFP	BD10KA5WF		
BD12KA5W		1.2											BD12KA5WFP	BD12KA5WF		
BD15KA5W		1.5											BD15KA5WFP	BD15KA5WF		
BD18KA5W		1.8											BD18KA5WFP	BD18KA5WF		
BD25KA5W		2.5											BD25KA5WFP	BD25KA5WF		
BD30KA5W		3.0											BD30KA5WFP	BD30KA5WF		
BD33KA5W		3.3											BD33KA5WFP	BD33KA5WF		
Part No.			Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100
Consumer/Automotive Grade																
BD00IA5WEFJ/BD00IA5MEFJ-M			2.4 to 5.5	Variable 0.8 to 4.5	±1 (Ta=+25°C)/ ±3 (Ta=−40 to +105°C) <Automotive Grade>	0.5	0.25	0.4 (Io=500mA)	60 (f=100Hz, 50mV _{rpp} , Io=0A)	25 (Io=0 to 500mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8	—/YES
BD10IA5WEFJ/BD10IA5MEFJ-M				1.0											HTSOP-J8	—/YES
BD12IA5WEFJ/BD12IA5MEFJ-M				1.2											HTSOP-J8	—/YES
BD15IA5WEFJ/BD15IA5MEFJ-M				1.5											HTSOP-J8	—/YES
BD18IA5WEFJ/BD18IA5MEFJ-M				1.8											HTSOP-J8	—/YES
BD25IA5WEFJ/BD25IA5MEFJ-M				2.5											HTSOP-J8	—/YES
BD30IA5WEFJ/BD30IA5MEFJ-M				3.0											HTSOP-J8	—/YES
BD33IA5WEFJ/BD33IA5MEFJ-M				3.3											HTSOP-J8	—/YES
Part No.			Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package	Automotive Grade AEC-Q100
BD00IA5MHFV-M			2.4 to 5.5	Variable 0.8 to 4.5	±1(Ta=+25°C)/ ±3(Ta=−40 to +105°C) <Automotive Grade>	0.5	0.25	0.4 (Io=500mA)	60 (f=100Hz, 50mV _{rpp} , Io=0A)	25 (Io=0 to 500mA)	1.0	1.0	✓	Over-Current/ Temperature	HVSOF6	YES

Single-Output LDO Regulators

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

7V Resistance 500mA Variable/Fixed Output LDO Regulators(Industrial Equipment)

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shutdown Switch	Protection Circuit	Package
BD00IA5MEFJ-LB	2.4 to 5.5	Variable 0.8 to 4.5	$\pm 1/\pm 3$ (Ta=−40 to +105°C)	0.5	0.25	0.4 (Io=500mA)	60 (f=100Hz, 50mVpp, Io=0A)	25 (Io=0 to 500mA)	1.0	1.0	✓	Over-Current/ Temperature	HTSOP-J8
BD10IA5MEFJ-LB		1.0											HTSOP-J8
BD12IA5MEFJ-LB		1.2											HTSOP-J8
BD15IA5MEFJ-LB		1.5											HTSOP-J8
BD18IA5MEFJ-LB		1.8											HTSOP-J8
BD25IA5MEFJ-LB		2.5											HTSOP-J8
BD30IA5MEFJ-LB		3.0											HTSOP-J8
BD33IA5MEFJ-LB		3.3											HTSOP-J8

6.5V Resistance 500mA Full CMOS LDO Regulators

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (μA)	I/O Voltage Difference (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Protection Circuit	Package
BU18SD5WG	1.7 to 6.0	1.8	± 1	0.5	33.0	150 (Io=100mA)	68	0.5	Over Current/ Temperature	SSOP5
BU33SD5WG		3.3				85 (Io=100mA)				SSOP5

6.5V Resistance 500mA Full CMOS LDO Regulators with Shutdown Switch WL-CSP type

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Protection Circuit	Package
BU30SA5GWZ	1.8 to 5.0	3	± 1	0.5	0.033	0.08 (Io=100mA)	70dB (f=1kHz)	6 (Io=0.01mA to 300mA)	Over Current/ Temperature	UCSP30L1
BU33SA5GWZ		3.3								UCSP30L1

6.5V Resistance 300mA CMOS LDO Regulators with Shutdown Switch

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	Soft Start Function	Package											
BH15M0AWHFV	2.5 to 5.5	1.5	±25mV	0.3	—	60	6 (I _o =1 to 100mA)	65	100	1.0	1.0	✓	✓	✓	—	—	HVSOF6											
BH18M0AWHFV		1.8															HVSOF6											
BH20M0AWHFV		2.0															HVSOF6											
BH21M0AWHFV		2.1															HVSOF6											
BH25M0AWHFV		2.5	±1		60 (I _o =100mA)												60	6 (I _o =1 to 100mA)	65	100	1.0	1.0	✓	✓	✓	—	—	HVSOF6
BH26M0AWHFV		2.6																										HVSOF6
BH27M0AWHFV		2.7																										HVSOF6
BH28M0AWHFV		2.8																										HVSOF6
BH29M0AWHFV		2.9																										HVSOF6
BH30M0AWHFV		3.0																										HVSOF6
BH31M0AWHFV		3.1																										HVSOF6
BH32M0AWHFV		3.2																										HVSOF6
BH33M0AWHFV		3.3																										HVSOF6
BH34M0AWHFV		3.4																										HVSOF6

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

6.5V Resistance 200mA CMOS LDO Regulators with Shutdown Switch																		
Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	Package/Part No.		
																SSON004X1010	SSOP5	
BUxxTD2WNVX series / BUxxTD3WG series	1.7 to 5.5	1.0	±25mV	0.2	—	70	10 (I _o =1 to 100mA)	35	70	0.47	0.47	✓	✓	✓	✓	BU10TD2WNVX	BU10TD3WG	
		1.05														BU1ATD2WNVX	—	
		1.1														BU11TD2WNVX	BU11TD3WG	
		1.15														BU1BTD2WNVX	—	
		1.2														BU12TD2WNVX	BU12TD3WG	
		1.25														BU1CTD2WNVX	BU1CTD3WG	
		1.3														—	BU13TD3WG	
		1.5														BU15TD2WNVX	BU15TD3WG	
		1.8														BU18TD2WNVX	BU18TD3WG	
		1.85														BU1JTD2WNVX	BU1JTD3WG	
		1.9														BU19TD2WNVX	BU19TD3WG	
		2.0														BU20TD2WNVX	BU20TD3WG	
		2.05														BU2ATD2WNVX	—	
		2.1	±1	0.2	280 (I _o =200mA)	70	10 (I _o =1 to 100mA)	35	70	0.47	0.47	✓	✓	✓	✓	BU21TD2WNVX	BU21TD3WG	
		2.3														BU23TD2WNVX	—	
		2.5														BU25TD2WNVX	BU25TD3WG	
		2.6														BU26TD2WNVX	BU26TD3WG	
		2.7														BU27TD2WNVX	BU27TD3WG	
		2.75														BU2HTD2WNVX	—	
		2.8														BU28TD2WNVX	BU28TD3WG	
		2.85														BU2JTD2WNVX	BU2JTD3WG	
		2.9														BU29TD2WNVX	BU29TD3WG	
		3.0														BU30TD2WNVX	BU30TD3WG	
		3.1														BU31TD2WNVX	BU31TD3WG	
		3.2														BU32TD2WNVX	BU32TD3WG	
		3.3														BU33TD2WNVX	BU33TD3WG	
		3.4														BU34TD2WNVX	BU34TD3WG	

Type	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	Package/Part No.				
																SSON004X1216	HVSOF5			
BU15TA2W	2.5 to 5.5	1.5	±25mV	0.2	—	70	10 (I _o =0.01 to 100mA)	40	70	1.0	1.0	✓	✓	✓	✓	BU15TA2WNVX	BU15TA2WHFV			
BU18TA2W		1.8			BU18TA2WNVX											BU18TA2WHFV				
BU25TA2W		2.5	±1		400 (I _o =200mA)	65										360 (I _o =200mA)	330 (I _o =200mA)	300 (I _o =200mA)	BU25TA2WNVX	BU25TA2WHFV
BU26TA2W		2.6																	BU26TA2WNVX	BU26TA2WHFV
BU27TA2W		2.7																	BU27TA2WNVX	BU27TA2WHFV
BU28TA2W		2.8																	BU28TA2WNVX	BU28TA2WHFV
BU2JTA2W		2.85																	BU2JTA2WNVX	BU2JTA2WHFV
BU29TA2W		2.9																	BU29TA2WNVX	BU29TA2WHFV
BU30TA2W		3.0																	BU30TA2WNVX	BU30TA2WHFV
BU31TA2W		3.1																	BU31TA2WNVX	BU31TA2WHFV
BU32TA2W		3.2																	BU32TA2WNVX	BU32TA2WHFV
BU33TA2W		3.3																	BU33TA2WNVX	BU33TA2WHFV
BU34TA2W		3.4																	BU34TA2WNVX	BU34TA2WHFV

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	Package	Automotive Grade AEC-Q100
BU12SD2MG-M	1.7 to 6.0	1.2	±2 (T _a =−40 to +105°C)	0.2	400 (I _o =100mA)	68	1 (I _o =1 to 200mA)	33	100	1.0	1.0	✓	✓	✓	—	SSOP5	YES
BU15SD2MG-M		1.5			280 (I _o =100mA)											SSOP5	YES
BU18SD2MG-M		1.8			150 (I _o =100mA)											SSOP5	YES
BU25SD2MG-M		2.5			100 (I _o =100mA)											SSOP5	YES
BU28SD2MG-M		2.8			85 (I _o =100mA)											SSOP5	YES
BU30SD2MG-M		3.0														SSOP5	YES
BU33SD2MG-M		3.3														SSOP5	YES

A

Power Management

Single-Output LDO Regulators

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

6.5V Resistance 200mA CMOS LDO Regulators with Shutdown Switch

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	Package	Automotive Grade AEC-Q100			
BU10JA2MNVX-C	1.7 to 6.0	1.0	±36mV	0.2	800	70	10	35	70	0.47	0.47	✓	✓	✓	✓	SSON004R1010	YES			
BU11JA2MNVX-C		1.1			SSON004R1010											YES				
BU12JA2MNVX-C		1.2			SSON004R1010											YES				
BU1CJA2MNVX-C		1.25			SSON004R1010											YES				
BU15JA2MNVX-C		1.5			SSON004R1010											YES				
BU18JA2MNVX-C		1.8	±2	0.2	380											SSON004R1010	YES			
BU25JA2MNVX-C		2.5			280											SSON004R1010	YES			
BU28JA2MNVX-C		2.8			260											SSON004R1010	YES			
BU2JJA2MNVX-C		2.85			260											SSON004R1010	YES			
BU29JA2MNVX-C		2.9			240											SSON004R1010	YES			
BU30JA2MNVX-C		3.0			220											SSON004R1010	YES			
BU33JA2MNVX-C		3.3			220											SSON004R1010	YES			
BU10JA2VG-C		1.0			—	68	0.5	33	100	1.0	1.0	✓	✓	✓	✓	SSOP5	YES			
BU12JA2VG-C		1.2	SSOP5	YES																
BU1CJA2VG-C		1.25	SSOP5	YES																
BU15JA2VG-C		1.5	SSOP5	YES																
BU18JA2VG-C		1.8	160	SSOP5												YES				
BU25JA2VG-C		2.5	100	SSOP5												YES				
BU28JA2VG-C		2.8	SSOP5	YES																
BU2JJA2VG-C		2.85	85	SSOP5												YES				
BU30JA2VG-C		3.0	SSOP5	YES																
BU33JA2VG-C		3.3	SSOP5	YES																
BU10JA2DG-C	1.0	—	85	85												SSOP5	YES			
BU12JA2DG-C	1.2																	SSOP5	YES	
BU1CJA2DG-C	1.25																	SSOP5	YES	
BU15JA2DG-C	1.5																	SSOP5	YES	
BU18JA2DG-C	1.8																	160	SSOP5	YES
BU25JA2DG-C	2.5																	100	SSOP5	YES
BU28JA2DG-C	2.8																	SSOP5	YES	
BU2JJA2DG-C	2.85				SSOP5	YES														
BU30JA2DG-C	3.0				SSOP5	YES														
BU33JA2DG-C	3.3				SSOP5	YES														

6.5V Resistance 200mA CMOS LDO Regulators with Shutdown Switch WL-CSP type

Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	Package (mm)
BU18SA4WGWL	1.7 to 5.5	1.8	±2	0.2	100 (Io=150mA)	70	2 (Io=1 to 100mA)	40	100	0.47	0.47	✓	✓	✓	—	UCSP50L1 0.8×0.8, H=Max. 0.55mm
BU25SA4WGWL		2.5			100 (Io=150mA)											UCSP50L1 0.8×0.8, H=Max. 0.55mm
BU2FSA4WGWL		2.55			80 (Io=150mA)											UCSP50L1 0.8×0.8, H=Max. 0.55mm
BU28SA4WGWL		2.8			80 (Io=150mA)											UCSP50L1 0.8×0.8, H=Max. 0.55mm
BU30SA4WGWL		3.0			80 (Io=150mA)											UCSP50L1 0.8×0.8, H=Max. 0.55mm
BU33SA4WGWL		3.3			80 (Io=150mA)											UCSP50L1 0.8×0.8, H=Max. 0.55mm

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

6.5V Resistance 150mA CMOS LDO Regulators with Shutdown Switch																		
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Package			
BH25NB1WHFV	2.5 to 5.5	2.5	±1	0.15	250 (I _o =100mA)	80	6 (I _o =1 to 100mA)	60	50	0.1	2.2	✓	✓	✓	HVSOF5			
BH28NB1WHFV		2.8													HVSOF5			
BH2JNB1WHFV		2.85													HVSOF5			
BH29NB1WHFV		2.9													HVSOF5			
BH30NB1WHFV		3.0													HVSOF5			
BH31NB1WHFV		3.1													HVSOF5			
BH33NB1WHFV		3.3													HVSOF5			
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Package (mm)			
BH15RB1WGUT	2.5 to 5.5	1.5	±25mV	0.15	—	63	2 (I _o =1 to 100mA)	34	40	1.0	1.0	✓	✓	✓	VCSP60N1 1.04×1.0, H=Max. 0.675			
BH18RB1WGUT		1.8													VCSP60N1 1.04×1.0, H=Max. 0.675			
BH25RB1WGUT		2.5	±1		100 (I _o =100mA)										VCSP60N1 1.04×1.0, H=Max. 0.675			
BH28RB1WGUT		2.8													VCSP60N1 1.04×1.0, H=Max. 0.675			
BH29RB1WGUT		2.9													VCSP60N1 1.04×1.0, H=Max. 0.675			
BH30RB1WGUT		3.0													VCSP60N1 1.04×1.0, H=Max. 0.675			
BH31RB1WGUT		3.1													VCSP60N1 1.04×1.0, H=Max. 0.675			
BH33RB1WGUT		3.3													VCSP60N1 1.04×1.0, H=Max. 0.675			
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%) High Speed Mode Low I _{CC} Mode	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA) High Speed Mode Low I _{CC} Mode	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	Package		
BH12PB1WHFV	1.7 to 5.5	1.2	±25mV	0.15	—	60 (High speed mode)	10 (I _o =10 to 100mA)	20	2	50	0.47	0.47	✓	✓	✓	✓	HVSOF5	
BH15PB1WHFV		1.5															HVSOF5	
BH18PB1WHFV		1.8															HVSOF5	
BH25PB1WHFV		2.5	±1		−3.0 to +3.8												210 (I _o =100mA)	HVSOF5
BH28PB1WHFV		2.8																HVSOF5
BH29PB1WHFV		2.9																HVSOF5
BH30PB1WHFV		3.0																HVSOF5
BH31PB1WHFV		3.1																HVSOF5
BH33PB1WHFV		3.3																HVSOF5
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Vsat (mV)	Ripple Rejection (dB)	Load Regulation (mV)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	Package		
BH18SA3WGUT	2.2 to 5.5	1.8	±25mV	0.15	—	63	2 (I _o =1 to 100mA)	40	50	1.0	1.0	✓	✓	✓	—	VCSP60N1		
BH28SA3WGUT		2.8	±1		100 (I _o =100mA)										VCSP60N1			
BH30SA3WGUT		3.0	VCSP60N1															
Ultra LDO type, Fast Transient Response																		
Part No.	Output Current (A)	Input Voltage(V)		Output Voltage (V)	Voltage Accuracy (%)	Power Good	Adjustable Soft Start	UVLO	OCP	TSD	Package							
		V _{CC}	V _{IN}															
BD3550HFN	0.5	4.3 to 5.5	0.95 to (V _{CC} −1)	0.65 to 2.70	±1	—	✓	✓	Recovery	Recovery	HSO8							
BD3507HFV	0.55	4.5 to 5.5	1.2 to (V _{CC} −1)															
BD3551HFN	1.0	4.3 to 5.5	0.95 to (V _{CC} −1)	0.65 to 2.50														
BD3506F	2.5		1.2 to (V _{CC} −1)	0.65 to 2.70														
BD3552HFN	2.0		0.95 to (V _{CC} −1)	0.65 to 2.70														
BD3508MUV	3.0		0.75 to (V _{CC} −1)	0.65 to 2.70														
BD3540NUV	0.5	3.0 to 5.5	0.95 to (V _{CC} −1)	0.65 to 2.70	±1	✓	✓	✓	Recovery	Recovery	VSON010V3030							
BD3541NUV	1.0		0.95 to (V _{CC} −1)								VSON010V3030							
BD3512MUV	3.0	4.3 to 5.5	0.7 to (V _{CC} −1)	0.65 to 2.50						Latch	VQFN020V4040							
BD3509MUV	4.0									Recovery	VQFN020V4040							
BD3504FVM	External FET	4.5 to 5.5	V _O + (I _O × R _{on}) to (V _{CC} −1)	0.65 to 2.50	±1	—	✓	✓	Latch	Latch	MSOP8							
BD3521FVM	External FET			1.5							MSOP8							
Power Supply ICs for High Fidelity Audio																		
Part No.	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Reference Voltage Accuracy (%)	Dropout Voltage (mV)	Noise Level (μVrms)	PSRR (dB)	Over Current Protection	Thermal Protection	Package								
BD37201NUX	0.5	2.7 to 5.5	Variable 1.0 to 4.5	±1	200	4.72	90(f=1kHz) 55(f=1MHz)	✓	✓	VSON008X2030								
☆BD37210AMUV	1.0	3.0 to 16.0	Variable 1.0 to 15.0	±1	300	4.6	78(f=1kHz) 53(f=1MHz)	✓	✓	VQFN020V4040								
☆BD37215AMUV	1.0	−16.0 to −3.0	Variable −15.0 to −1.0	±1	300	5.1	90(f=1kHz) 55(f=1MHz)	✓	✓	VQFN020V4040								

UVLO : Under Voltage Lock Out, OCP : Over Current Protection, TSD : Thermal Shut Down

☆ : Under Development

Please ensure that minimum input voltage always exceeds the sum of output voltage and drop out voltage for the device.

LDO Regulators with Voltage Detector and Watchdog Timer

550mA Output LDO Regulators with Voltage Detector and Watchdog Timer												
Part No.	Input Voltage (V)	LDO				Voltage Detector			Circuit Current (μA)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
		Output Voltage(V)	Output Voltage Precision(%)	Output Current(A)	I/O Voltage Difference(V)	Detection Voltage(V)	Voltage Detection Precision(%)	Function				
BD4271HFP-C	5.5 to 45.0	5	±2 (Tj=−40 to +150°C)	0.55	0.2 (Io=300mA)	4.65	±2.6	4.65V Voltage Detector+WDT	75	Tj=−40 to +150	HRP7	YES
BD4271FP2-C											TO263-7	YES
500mA Output LDO Regulators with Voltage Detector and Watchdog Timer												
BD3021HFP	5.6 to 36.0	5	±2 (Ta=−40 to +125°C)	0.5	0.3 (Io=200mA)	4.5	±2	4.5V Voltage Detector+WDT (Active switch)	80	Ta=−40 to +125	HRP7	Preparing
BD3020HFP						Variable (at Vs open:4.1V)		Adjustable Voltage Detector+WDT			HRP7	Preparing

LDO Regulators with Voltage Detector

500mA Output LDO Regulators with Voltage Detector													
Part No.	Input Voltage (V)	LDO				Voltage Detector		Shutdown Switch	Circuit Current (μA)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100	
		Output Voltage(V)	Output Voltage Precision(%)	Output Current(A)	I/O Voltage Difference(V)	Detection Voltage(V)	Voltage Detection Precision(%)						
BD42754FPJ-C	5.5 to 45.0	5	±2 (Tj=-40 to +150°C, V _{OC} =6.0 to 28V, I _o =5 to 400mA)	0.5	0.25 (I _o =300mA)	4.62	±2.8	—	75	Tj=-40 to +150	TO252-J5	YES	
BD42754FP2-C											TO263-5	YES	
200mA/300mA Output LDO Regulators with Voltage Detector													
BD4269FJ-C	5.5 to 45.0	5	±2 (Tj=-40 to +150°C, V _{OC} =6.0 to 16V, I _o =1 to 100mA)	0.2	0.25 (I _o =100mA)	Variable (with RADJ not used : 4.62V)	±2.6	—	70	Tj=-40 to +150	SOP-J8	YES	
BD4269EFJ-C				0.3							HTSOP-J8	YES	

Voltage Tracker

500mA Voltage Tracker								
Part No.	Input Voltage (V)	Output Current (A)	Offset Voltage (mV)	Circuit Current (μA)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100	
BD3925FP-C	4.5 to 36.0	0.5	±10(Ta=−40 to +125°C, Vcc=6 to 36V, Io=5 to 200mA)	45	Ta=−40 to +125	TO252-5	—	
BD3925HFP-C						HRP5	—	
50mA/70mA Voltage Tracker								
BD42500G-C	5.3* to 42.0	0.05	±15(Tj=−40 to +150°C, Vcc=6 to 40V, Io=1 to 50mA)	40	Tj=−40 to +150	SSOP5	YES	
BD42540FJ-C	5.4* to 42.0	0.07	±10(Tj=−40 to +150°C, Vcc=5.5 to 26V, Io=0.1 to 60mA)	40	Tj=−40 to +150	SOP-J8	YES	
250mA Voltage Tracker								
BD42530EFJ-C	5.6* to 42.0	0.25	±10(Tj=−40 to +150°C, Vcc=6 to 32V, Io=0.1 to 250mA)	40	Tj=−40 to +150	HTSOP-J8	YES	
BD42530FP2-C	5.6* to 42.0	0.25	±10(Tj=−40 to +150°C, Vcc=6 to 32V, Io=0.1 to 250mA)	40	Tj=−40 to +150	TO263-5	YES	
BD42530FPJ-C	5.6* to 42.0	0.25	±10(Tj=−40 to +150°C, Vcc=6 to 32V, Io=0.1 to 250mA)	40	Tj=−40 to +150	TO252-J5	YES	

* : 5V setting

Multi-Output LDO Regulators

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

2ch LDO Regulators														
Part No.	Input Voltage (V)	Output Voltage1 (V)	Output Voltage2 (V)	Output voltage Precision (%)	Output Current (A)	Bias Current (mA)	I/O Voltage Difference (V)	Ripple Rejection (dB)	Load Regulation (mV)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Protection Circuit	Package
BA30E00WHFP	4.1 to 16.0	3.3	Variable 0.8 to 3.3	±2	0.6/0.6	0.7	0.3 (I _o =300mA)	68 (3.3V output)	30 (I _o =0 to 0.6A)	1.0	47	✓	Over-Current/ Temperature	HRP7
BA3259HFP	4.75 to 14.00				1.0/1.0	3.0	1.1 (I _o =1A)	52	5 (I _o =5mA to 1A)	3.3	1.0	—		HRP5
BA33D15HFP	4.1 to 16.0		1.5		0.5/0.5	0.7	0.25 (I _o =250mA)	58 (1.5V output)	30 (I _o =0 to 500mA)	1.0				HRP5
BA33D18HFP			1.8											HRP5

2ch High Efficiency CMOS Regulator												
Part No.	Output Voltage (V)	Output Voltage Precision (%)	Output Current (A)	Ripple Rejection (dB)	Load Regulation (%)	Output Short Current (mA)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	
BD70511GWL	LDO1	1.2	1.5	0.15	60	10	30	✓	✓	✓	✓	
	LDO2			0.3			65					

2ch Variable Step CMOS LDO Regulators																								
Part No.	Input Voltage (V)	V _{OUT}		Selectable Output Voltage (V)								Output Voltage Precision (%)	Output Current (A)	V _{sat} (mV) (I _o =100mA)	Ripple Rejection (dB)	Load Regulation (%)	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Low Voltage Protection
BD7003NUX	2.5 to 5.5	1ch	1.5	1.8	1.8	1.8	1.8	2.6	2.8	2.9	2.8	1.8	0.3	90	66	0.2 (I _o =1 to 300mA)	55	150	1.0	1.0	✓	✓	✓	✓
2ch		2.8	2.6	2.7	2.8	2.9	2.8	2.8	2.9	3.3														
BD7004NUX		1ch	1.2	1.2	1.8	1.8	1.8	1.8	2.8	3.0	3.3													
		2ch	1.5	1.8	1.5	1.8	3.0	3.3	3.0	3.0	3.3													
BD7602GUL	2.7 to 5.5	1ch	3.0								2	0.1	—	45	0.7	10	—	4.7						
		2ch	2.8	2.9	2.95	3.0	3.05	3.1	3.2	3.3		—											0.15	

3ch CMOS LDO Regulators																	
Part No.	Input Voltage (V)	Output Voltage (V)	Output Voltage Precision	Output Current (A)	Vsat (mV) (I _o =200mA)	Ripple Rejection (dB)	Load Regulation (%)	ch	Circuit Current (μA)	Output Short Current (mA)	Input Capacitor (μF)	Output Capacitor (μF)	Shut Down Switch	Over Current Protection	Temperature Protection	Discharge Function	Package
BU6650NUX	2.5 to 5.5	2.8	±1%	0.2	360	65	10 (I _o =1 to 100mA)	1	120	70	2.2	1.0	✓	✓	✓	✓	VSON008X2030
		2.8	±1%		360	65		2									
		1.8	±25mV		—	70		3									
BU6651NUX		2.8	±1%		360	65		1									VSON008X2030
		1.8	±25mV		—	70		2									
		1.5	±25mV		—	70		3									
BU6652NUX		2.8	±1%		360	65		1									VSON008X2030
		2.8	±1%		360	65		2									
		1.5	±25mV		—	70		3									
BU6653NUX		2.8	±1%		360	65		1									VSON008X2030
		1.8	±25mV		—	70		2									
		1.8	±25mV		—	70		3									
BU6654NUX		3.3	±1%		300	65		1									VSON008X2030
		1.8	±25mV		—	70		2									
		1.5	±25mV		—	70		3									
BU6655NUX		3.3	±1%		300	65		1									VSON008X2030
		2.8	±1%		360	65		2									
		1.8	±25mV		—	70		3									

Linear Regulators for DDR SDRAM

Termination Regulators for DDR SDRAM																						
Part No.	V _{CC} Input Voltage (V)	V _{TT,IN} Termination Input Voltage (V)	V _{DDQ} Reference Input Voltage (V)	V _{TT} Output Voltage (V)	V _{TT} Voltage Precision (mV)	V _{TT} Output Current (A)	V _{REF} Output Current (mA)	Features												Package		
								Enable	Soft Start	Power Good	UVLO	Output Ceramic Capacitors	Thermal Protection	DDR(VDDQ)								
														DDR1 (2.5V/2.6V)	DDR2 (1.8V)	DDR2L (1.5V)	LPDDR2 (1.2V)	DDR3 (1.5V)	DDR3L (1.35V)		DDR3U (1.25V)	LPDDR3 (1.2V)
BD3533F	2.7 to 5.5	1.0 to 5.5	1.00 to 2.75	0.75 to 1.25	±30	±1.0	±20	✓	✓	—	✓	—	Recovery	✓	✓	—	—	—	—	—	SOP8	
BD3533FVM								✓	✓	—	—	—	—	—	MSOP8							
BD3533HFN								✓	✓	—	—	—	—	—	HSON8							
BD3539FVM	2.7 to 5.5	1.0 to 5.5	1.00 to 2.75	0.75 to 1.25	±15	±1.0	±25	✓	✓	—	✓	✓	Recovery	✓	✓	✓	—	✓	—	—	MSOP8	
BD3539NUX								✓	✓	—	—	—	—	—	VSON008X2030							
BD35390FJ								✓	✓	✓	✓	✓	Recovery	✓	✓	✓	—	✓	—	—	—	—
Part No.	V _{CC} Input Voltage (V)	V _{TT,IN} Termination Input Voltage (V)	V _{DDQ} Reference Input Voltage (V)	V _{TT} Output Voltage (V)	V _{TT} Voltage Precision (mV)	V _{TT} Output Current (A)	V _{REF} Output Current (mA)	Features												Package	Automotive Grade AEC-Q100	
								Enable	Soft Start	Power Good	UVLO	Output Ceramic Capacitors	Thermal Protection	DDR(VDDQ)								
DDR1 (2.5V/2.6V)	DDR2 (1.8V)	DDR2L (1.5V)	LPDDR2 (1.2V)	DDR3 (1.5V)	DDR3L (1.35V)	DDR3U (1.25V)	LPDDR3 (1.2V)							DDR4 (1.2V)								
BD35395FJ-M	2.7 to 5.5	1.0 to 5.5	1.00 to 2.75	0.500 to 1.375	±13.5	±1.0	—	✓	✓	✓	✓	✓	Recovery	✓	✓	✓	—	✓	✓	—	SOP-J8	YES

General-purpose ICs

Switching Regulators

Switching Regulators

Integrated MOSFET Switching Regulators

Single Output Buck Converters $V_{IN} \leq 6V$ ▶ P.A49

Single Output Buck Converters $V_{IN} \leq 20V$ ▶ P.A50

Single Output Buck Converters $V_{IN} \geq 20V$ ▶ P.A50

Dual Output Buck Converters ▶ P.A51

Boost and Buck-Boost Converters ▶ P.A51

External Switch Switching Regulators

Buck Controllers ▶ P.A51

Boost and Buck-Boost Converters ▶ P.A51

For Automotive Switching Regulators

Primary Integrated Switch Buck Converter ▶ P.A52

Secondary Integrated Switch Buck Converter ▶ P.A52

Primary Integrated Switch Buck/Boost Converter (Quick Buck Booster®) ▶ P.A52

Primary External Switch Buck Controller ▶ P.A52

Primary External Switch Buck/Boost Controller ▶ P.A52

Switching Regulators

Integrated MOSFET Switching Regulators

Single Output Buck Converters $V_{IN} \leq 6V$

Part No.	Input Voltage Maximum Rating (V)	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Switching Frequency (MHz)	Control Mode	Features						Package (mm)
							Power Good	Adjustable Soft Start	Synchronous Rectifier	Light-Load Efficiency	Over-Current Protection	Thermal Protection	
BD9122GUL	7	0.3	2.5 to 5.5	1 to 2	1	Current	—	—	✓	✓	Latch	Latch	VCSP50L2 2.5×1.1, H=0.55
Nano BD70522GUL	6	0.5	2.5 to 5.5	1.2 to 3.3*	1	On-time	✓	—	✓	✓	Recovery	Recovery	VCSP50L1C 1.76×1.56, H=0.57
BD9161FVM	7	0.6	2.5 to 4.5	1.0 to 3.3	1	Current	—	—	✓	✓	Latch	Latch	MSOP8
BD9161FVM-LB	7	0.6	2.5 to 4.5	1.0 to 3.3	1	Current	—	—	✓	✓	Latch	Latch	MSOP8
BU9006GUZ	7	0.75	2.5 to 4.5	1.0 to V_{IN}	2	Current	—	—	✓	—	Recovery	Recovery	VCSP35L1 1.6×1.6, H=0.4
BD9109FVM	7	0.8	4.5 to 5.5	3.3	1	Current	—	—	✓	✓	Latch	Latch	MSOP8
BD9109FVM-LB	7	0.8	4.5 to 5.5	3.3	1	Current	—	—	✓	✓	Latch	Latch	MSOP8
BD9102FVM	7	0.8	4.0 to 5.5	1.24	1	Current	—	—	✓	✓	Latch	Latch	MSOP8
BD8966FVM	7	0.8	4.0 to 5.5	1.0 to 2.5	1	Current	—	—	✓	—	Latch	Latch	MSOP8
BD9106FVM	7	0.8	4.0 to 5.5	1.0 to 2.5	1	Current	—	—	✓	✓	Latch	Latch	MSOP8
BD9106FVM-LB	7	0.8	4.0 to 5.5	1.0 to 2.5	1	Current	—	—	✓	✓	Latch	Latch	MSOP8
BD9120HFN	7	0.8	2.7 to 4.5	1.0 to 1.5	1	Current	—	—	✓	✓	Latch	Latch	HSO8
BD8967FVM	7	0.8	4.5 to 5.5	3.3	1	Current	—	—	✓	—	Latch	Latch	MSOP8
BD9104FVM	7	0.8	4.5 to 5.5	3.3	1	Current	—	—	✓	✓	Latch	Latch	MSOP8
BU90008GWZ	7	1	2.3 to 5.5	1	3.6	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BU90003GWZ	7	1	2.3 to 5.5	1.2	4	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BU90007GWZ	7	1	2.3 to 5.5	1.25	4	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BU90009GWZ	7	1	2.3 to 5.5	1.3	4.2	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BU90004GWZ	7	1	2.3 to 5.5	1.8	5.4	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BU90104GWZ	7	1	2.3 to 5.5	1.8	5.4	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BU90090GWZ	7	1	2.3 to 5.5	1.83	5.4	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BU90005GWZ	7	1	2.3 to 5.5	2.5	6	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BU90006GWZ	7	1	2.3 to 5.5	3	6	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BU90002GWZ	7	1	4.0 to 5.5	3.3	6	On-time	—	—	✓	✓	Recovery	Recovery	UCSP35L1 1.3×0.9, H=0.4
BD9A100MUV	7	1	2.7 to 5.5	0.8 to ($V_{IN} \times 0.7$)	1	Current	✓	✓	✓	✓	Recovery	Recovery	VQFN016V3030
BD9A101MUV-LB	7	1	2.7 to 5.5	0.8 to ($V_{IN} \times 0.7$)	1	Current	✓	✓	✓	✓	Recovery	Recovery	VQFN016V3030
BD9B100MUV	7	1	2.7 to 5.5	0.8 to ($V_{IN} \times 0.8$)	2/1	On-time	✓	✓	✓	Deep	Recovery	Recovery	VQFN016V3030
BD8964FVM	7	1.2	4.0 to 5.5	1.0 to 1.8	1	Current	—	—	✓	—	Latch	Latch	MSOP8
BD9107FVM	7	1.2	4.0 to 5.5	1.0 to 1.8	1	Current	—	—	✓	✓	Latch	Latch	MSOP8
BD9123MUV	7	1.2	2.7 to 5.5	0.85 to 1.2	1	Current	✓	—	✓	✓	Latch	Latch	VQFN016V3030
BU90023NUX	7	1.5	2.3 to 5.5	1.23	1	On-time	—	—	✓	✓	Recovery	Recovery	VSON008X2030
BU90028NUX	7	1.5	2.3 to 5.5	1.18	1	On-time	—	—	✓	✓	Recovery	Recovery	VSON008X2030
BD8961NV	7	2	4.5 to 5.5	3.3	1	Current	—	—	✓	—	Latch	Latch	SON008V5060
BD9111NV	7	2	4.5 to 5.5	3.3	1	Current	—	—	✓	✓	Latch	Latch	SON008V5060
BD9110NV	7	2	4.5 to 5.5	1.0 to 2.5	1	Current	—	—	✓	✓	Latch	Latch	SON008V5060
BD89630EFJ	7	2	2.7 to 5.5	1.0 to 2.5*	1	Current	—	—	✓	—	Latch	Latch	HTSOP-J8
BD8960NV	7	2	2.7 to 5.5	1.0 to 2.5*	1	Current	—	—	✓	—	Latch	Latch	SON008V5060
BD9130NV	7	2	2.7 to 5.5	1.0 to 2.5*	1	Current	—	—	✓	✓	Latch	Latch	SON008V5060
BD9B200MUV	7	2	2.7 to 5.5	0.8 to ($V_{IN} \times 0.8$)	2/1	On-time	✓	✓	✓	Deep	Recovery	Recovery	VQFN016V3030
BD8962MUV	7	3	2.7 to 5.5	0.8 to 2.5*	1	Current	—	—	✓	—	Latch	Latch	VQFN020V4040
BD8963EFJ	7	3	2.7 to 5.5	1.0 to 2.5*	1	Current	—	—	✓	—	Latch	Latch	HTSOP-J8
BD9139MUV	7	3	2.7 to 5.5	0.8 to 3.3*	1	Current	—	—	✓	✓	Latch	Latch	VQFN016V3030
BD9A300MUV	7	3	2.7 to 5.5	0.8 to ($V_{IN} \times 0.7$)	1	Current	✓	✓	✓	✓	Recovery	Recovery	VQFN016V3030
BD9A301MUV-LB	7	3	2.7 to 5.5	0.8 to ($V_{IN} \times 0.7$)	1	Current	✓	✓	✓	✓	Recovery	Recovery	VQFN016V3030
BD9B300MUV	7	3	2.7 to 5.5	0.8 to ($V_{IN} \times 0.8$)	2/1	On-time	✓	✓	✓	Deep	Recovery	Recovery	VQFN016V3030
BD9B301MUV-LB	7	3	2.7 to 5.5	0.8 to ($V_{IN} \times 0.8$)	2/1	On-time	✓	✓	✓	Deep	Recovery	Recovery	VQFN016V3030
BD9A302QWZ	7	3	2.7 to 5.5	0.8 to ($V_{IN} \times 0.7$)	1	Current	—	—	✓	✓	Recovery	Recovery	UMMP008AZ020 2.0×2.0, H=0.4
BD9B304QWZ	7	3	2.7 to 5.5	0.8 to ($V_{IN} \times 0.8$)	2/1	On-time	—	—	✓	Deep	Recovery	Recovery	UMMP008AZ020 2.0×2.0, H=0.4
BD9B333GWZ	7	3	2.7 to 5.5	0.6 to ($V_{IN} \times 0.8$)	1.3	On-time	✓	✓	✓	Deep	Recovery	Recovery	UCSP35L1 1.98×1.8, H=0.4
BD9137MUV	7	4	2.7 to 5.5	0.8 to 3.3*	1	Current	—	—	✓	✓	Recovery	Recovery	VQFN020V4040
BD91361MUV	7	4	2.7 to 5.5	0.8 to 3.3*	1	Current	—	—	✓	✓	Latch	Latch	VQFN020V4040
BD9A400MUV	7	4	2.7 to 5.5	0.8 to ($V_{IN} \times 0.7$)	1	Current	✓	✓	✓	✓	Recovery	Recovery	VQFN016V3030
BD9B400MUV	7	4	2.7 to 5.5	0.8 to ($V_{IN} \times 0.8$)	2/1	On-time	✓	✓	✓	Deep	Recovery	Recovery	VQFN016V3030
BD91364BMUU	7	5	2.9 to 5.5	0.8 to ($V_{IN} \times 0.8$)	1.7	On-time	✓	✓	✓	✓	Latch	Recovery	VQFN20U4040M
BD9B500MUV	7	5	2.7 to 5.5	0.8 to ($V_{IN} \times 0.8$)	2/1	On-time	✓	✓	✓	Deep	Recovery	Recovery	VQFN016V3030
BD9A600MUV	7	6	2.7 to 5.5	0.8 to ($V_{IN} \times 0.7$)	1	Current	✓	✓	✓	✓	Recovery	Recovery	VQFN016V3030
BD9B600MUV	7	6	2.7 to 5.5	0.8 to ($V_{IN} \times 0.8$)	2/1	On-time	✓	✓	✓	Deep	Recovery	Recovery	VQFN016V3030

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*: Restrictions depend on input/output voltage conditions.

A

Power Management

Integrated MOSFET Switching Regulators

Single Output Buck Converters $V_{IN} \leq 20V$

Part No.	Input Voltage Maximum Rating (V)	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Switching Frequency (MHz)	Control Mode	Features							Package (mm)
							Power Good	Adjustable Soft Start	Synchronous Rectifier	Light-Load Efficiency	Over-Current Protection	Thermal Protection	Over-Voltage Protection	
BD8312HFN	15	0.8	3.5 to 14.0	1.2 to 12.0*	1.5	Current	—	—	✓	—	—	Recovery	—	HS0N8
BD9227F	22	1	6 to 20	$(V_{IN} \times 0.252)$ to V_{IN} $(V_{IN} \times 0.252) \geq 1.0$	1	Current	—	—	—	—	Recovery	Recovery	—	SOP8
BD8313HFN	15	1	3.5 to 14.0	1.2 to 12.0*	1	Current	—	—	✓	—	—	Recovery	—	HS0N8
BD9141MUV	15	2	4.5 to 13.2	2.5 to 6.0*	0.5	Current	—	—	✓	✓	Latch	Latch	—	VQFN020V4040
BD95821MUV	15.2	2	7.5 to 15.0	0.8 to $(V_{IN} \times 0.5)$ $(V_{IN} \times 0.5) \leq 5.5$	0.5 to 0.8	H ³ Reg	✓	—	✓	—	Latch	Recovery	✓	VQFN016V3030
BD9325FJ	20	2	4.75 to 18.0	0.9 to $(V_{IN} \times 0.9)$	0.38	Current	—	✓	—	—	Recovery	Recovery	—	SOP-J8
BD9325FJ-LB	20	2	4.75 to 18.0	0.9 to $(V_{IN} \times 0.9)$	0.38	Current	—	✓	—	—	Recovery	Recovery	—	SOP-J8
BD9C301FJ	20	3	4.5 to 18.0	$(V_{IN} \times 0.125)$ to $(V_{IN} \times 0.7)$	0.5	Current	—	—	✓	—	Latch	Recovery	—	SOP-J8
BD9C301FJ-LB	20	3	4.5 to 18.0	$(V_{IN} \times 0.125)$ to $(V_{IN} \times 0.7)$	0.5	Current	—	—	✓	—	Latch	Recovery	—	SOP-J8
BD95831MUV	15.2	3	7.5 to 15.0	0.8 to $(V_{IN} \times 0.5)$ $(V_{IN} \times 0.5) \leq 5.5$	0.5 to 0.8	H ³ Reg	✓	—	✓	—	Latch	Recovery	✓	VQFN016V3030
BD9D320EFJ	20	3	4.5 to 18.0	0.765 to 7.0 $(V_{IN} \times 0.07)$ to $(V_{IN} \times 0.65)$	0.7	On-time	—	✓	✓	—	Recovery	Recovery	—	HTSOP-J8
BD9D321EFJ	20	3	4.5 to 18.0	0.765 to 7.0 $(V_{IN} \times 0.07)$ to $(V_{IN} \times 0.65)$	0.7	On-time	—	✓	✓	✓	Recovery	Recovery	—	HTSOP-J8
BD9D322QWZ	20	3	4.5 to 18.0	0.765 to 7.0 $(V_{IN} \times 0.07)$ to $(V_{IN} \times 0.65)$	0.7	On-time	—	✓	✓	✓	Recovery	Recovery	—	UMMP008Z2020 2.0×2.0, H=0.4
BD9D323QWZ	20	3	4.5 to 18.0	0.765 to 7.0 $(V_{IN} \times 0.07)$ to $(V_{IN} \times 0.65)$	0.7	On-time	—	✓	✓	—	Recovery	Recovery	—	UMMP008Z2020 2.0×2.0, H=0.4
BD9859EFJ	15	3	5 to 14	1.0 to $(V_{IN} \times 0.7)$	0.75	Current	—	—	—	—	Recovery	Recovery	—	HTSOP-J8
BD9326EFJ	20	3	4.75 to 18.0	0.9 to $(V_{IN} \times 0.9)$	0.38	Current	—	✓	—	—	Recovery	Recovery	—	HTSOP-J8
BD9326EFJ-LB	20	3	4.75 to 18.0	0.9 to $(V_{IN} \times 0.9)$	0.38	Current	—	✓	—	—	Recovery	Recovery	—	HTSOP-J8
BD9C401EFJ	20	4	4.5 to 18.0	$(V_{IN} \times 0.125)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.125) \geq 0.8$	0.5	Current	—	—	✓	—	Latch	Recovery	—	HTSOP-J8
BD95841MUV	15.2	4	7.5 to 15.0	0.8 to $(V_{IN} \times 0.5)$ $(V_{IN} \times 0.5) \leq 5.5$	0.5 to 0.8	H ³ Reg	✓	—	✓	—	Latch	Recovery	✓	VQFN016V3030
BD9327EFJ	20	4	4.75 to 18.0	0.9 to $(V_{IN} \times 0.9)$	0.38	Current	—	✓	—	—	Recovery	Recovery	—	HTSOP-J8
BD9327EFJ-LB	20	4	4.75 to 18.0	0.9 to $(V_{IN} \times 0.9)$	0.38	Current	—	✓	—	—	Recovery	Recovery	—	HTSOP-J8
BD9C501EFJ	20	5	4.5 to 18.0	$(V_{IN} \times 0.075)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.075) \geq 0.8$	0.5	Current	—	—	✓	—	Latch	Recovery	—	HTSOP-J8
BD95861MUV	20	6	7.5 to 18.0	0.8 to $(V_{IN} \times 0.5)$ $(V_{IN} \times 0.5) \leq 5.5$	0.35 to 0.80	H ³ Reg	✓	—	✓	—	Latch	Recovery	✓	VQFN024V4040
BD9C601EFJ	20	6	4.5 to 18.0	$(V_{IN} \times 0.075)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.075) \geq 0.8$	0.5	Current	—	—	✓	—	Latch	Recovery	—	HTSOP-J8
BD95500MUV	24	6	3 to 20	0.7 to 5.0	0.2 to 1.0	H ³ Reg	✓	✓	✓	✓	Latch	Recovery	✓	VQFN040V6060

Single Output Buck Converters $V_{IN} \geq 20V$

New	BD9G201EFJ-LB	45	1.5	4.5 to 42.0	0.8 to V_{IN} *	0.3	Current	—	—	—	—	Recovery	Recovery	—	HTSOP-J8ES
New	BD9G102G-LB	45	0.5	6 to 42	$(V_{IN} \times 0.08)$ to $(V_{IN} \times 0.8)$ $(V_{IN} \times 0.08) \geq 0.75$	1	Current	—	—	—	—	Recovery	Recovery	✓	SSOP6
New	BD9E104FJ	30	1	7 to 26	$(V_{IN} \times 0.143)$ to $(V_{IN} \times 0.5)$ $(V_{IN} \times 0.143) \geq 1.0$	0.57	Current	—	—	✓	✓	Recovery	Recovery	✓	SOP-J8
New	BD9E103FJ	30	1.5	7 to 28	5	0.33	Current	—	—	✓	✓	Recovery	Recovery	✓	SOP-J8
	BD9G101G	45	0.5	6 to 42	$(V_{IN} \times 0.15)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.15) \geq 1.0$	1.5	Current	—	—	—	—	Recovery	Recovery	—	SSOP6
	BD9E100FJ-LB	40	1	7 to 36	$(V_{IN} \times 0.15)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.15) \geq 1.0$	1	Current	—	—	✓	—	Recovery	Recovery	✓	SOP-J8
	BD9E101FJ-LB	40	1	7 to 36	$(V_{IN} \times 0.0855)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.0855) \geq 1.0$	0.57	Current	—	—	✓	—	Recovery	Recovery	✓	SOP-J8
	BD9E102FJ	30	1	7 to 26	$(V_{IN} \times 0.143)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.143) \geq 1.0$	0.57	Current	—	—	✓	✓	Recovery	Recovery	✓	SOP-J8
	BD9E151NUX	30	1.2	6 to 28	$(V_{IN} \times 0.06)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.06) \geq 1.0$ *	0.6	Current	—	✓	—	—	Recovery	Recovery	✓	VSON008X2030
	BD9701CP-V5	36	1.5	8 to 35	1.0 to $(V_{IN} - 3.0)$	0.1	Voltage	—	—	—	—	Recovery	Recovery	—	TO220CP-V5
	BD9701FP	36	1.5	8 to 35	1.0 to $(V_{IN} - 3.0)$	0.1	Voltage	—	—	—	—	Recovery	Recovery	—	TO252-5
	BD9703CP-V5	36	1.5	8 to 35	1.0 to $(V_{IN} - 3.0)$	0.3	Voltage	—	—	—	—	Recovery	Recovery	—	TO220CP-V5
	BD9703FP	36	1.5	8 to 35	1.0 to $(V_{IN} - 3.0)$	0.3	Voltage	—	—	—	—	Recovery	Recovery	—	TO252-5
	BD9870FPS	36	1.5	8 to 35	1.0 to $(0.8 \times (V_{IN} - I_{LO} \times R_{ON}))$	0.9	Voltage	—	—	—	—	Recovery	Recovery	—	TO252S-5
	BD9873CP-V5	36	1.5	8 to 35	1.0 to $(0.8 \times (V_{IN} - I_{LO} \times R_{ON}))$	0.11	Voltage	—	—	—	—	Recovery	Recovery	—	TO220CP-V5
	BD9778HFP	36	2	7 to 35	$(V_{IN} \times 0.06)$ to V_{IN} $(V_{IN} \times 0.06) \geq 1.0$	0.05 to 0.50	Voltage	—	—	—	—	Recovery	Recovery	—	HRP7
	BD9E300EFJ-LB	40	2.5	7 to 36	$(V_{IN} \times 0.15)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.15) \geq 1.0$	1	Current	—	—	✓	—	Recovery	Recovery	✓	HTSOP-J8
	BD9E301EFJ-LB	40	2.5	7 to 36	$(V_{IN} \times 0.0855)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.0855) \geq 1.0$	0.57	Current	—	—	✓	—	Recovery	Recovery	✓	HTSOP-J8
	BD9E303EFJ-LB	40	3	7 to 36	$(V_{IN} \times 0.06)$ to $(V_{IN} \times 0.8)$ $(V_{IN} \times 0.06) \geq 1.0$	0.3	Current	—	—	✓	—	Recovery	Recovery	✓	HTSOP-J8
	BD9702CP-V5	36	3	8 to 35	1.0 to $(V_{IN} - 3.0)$	0.11	Voltage	—	—	—	—	Recovery	Recovery	—	TO220CP-V5
	BD9874CP-V5	36	3	8 to 35	1.0 to $(0.8 \times (V_{IN} - I_{LO} \times R_{ON}))$	0.11	Voltage	—	—	—	—	Recovery	Recovery	—	TO220CP-V5
	BD9E302EFJ	30	3	7 to 28	$(V_{IN} \times 0.11)$ to $(V_{IN} \times 0.7)$ $(V_{IN} \times 0.11) \geq 1.0$	0.55	Current	—	—	✓	✓	Recovery	Recovery	✓	HTSOP-J8
	BD95513MUV	30	3	4.5 to 28.0	0.7 to 5.0	0.2 to 1.0	H ³ Reg	✓	✓	✓	✓	Latch	Recovery	✓	VQFN032V5050
	BD9G341AEFJ	80	3	12 to 76	1.0 to $(V_{IN} \times 0.7)$ *	0.05 to 0.75	Current	—	—	—	—	Recovery	Recovery	✓	HTSOP-J8
	BD9G341AEFJ-LB	80	3	12 to 76	1.0 to $(V_{IN} \times 0.7)$ *	0.05 to 0.75	Current	—	—	—	—	Recovery	Recovery	✓	HTSOP-J8
	BD95514MUV	30	4	4.5 to 28.0	0.7 to 5.0	0.2 to 1.0	H ³ Reg	✓	✓	✓	✓	Latch	Recovery	✓	VQFN032V5050
New	BD9V101MUF-LB	70	1	16 to 60	0.8 to 5.5	1.9 to 2.3	Current	✓	—	✓	—	Recovery	Recovery	✓	VQFN24FV4040
New	BD9F800MUX	30	8	4.5 to 28.0	0.765 to 13.5*	0.3, 0.6	On-time	✓	—	✓	—	Recovery	Recovery	—	VQFN11X3535A

*: Restrictions depend on input/output voltage conditions.

Dual Output Buck Converters

Part No.	Number of Channels	Input Voltage Maximum Rating (V)	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Switching Frequency (MHz)	Control Mode	Features					Description	Package
								Synchronous Rectifier	Light-Load Efficiency	Over-Current Protection	Thermal Protection	Over-Voltage Protection		
BD91501MUV	2	7	Io1 : 0.4 Io2 : 0.3	2.55 to 5.50	Vo1 : 2.55 Vo2 : 1.80	1.65	Current	✓	✓	Latch	Recovery	—	100% Duty	VQFN016V3030
BD9151MUV	2	7	Io1 : 0.4 Io2 : 0.8	2.8 to 5.5	Vo1 : 1.8 Vo2 : 1.2	1	Current	✓	✓	Latch	Latch	—	Voltage Detector, High-side gate controller	VQFN020V4040
BD9152MUV	2	7	Io1 : 1.5 Io2 : 1.5	4.5 to 5.5	Vo1 : 3.3 Vo2 : 0.8 to 2.5	1	Current	✓	✓	Latch	Latch	—	—	VQFN020V4040
BD93291EFJ	2	30	Io1 : 2.5 Io2 : 1.5	8 to 26	Vo1 : 5.0 Vo2 : 0.8 to 4.0	1.5 to 2.5	H ³ Reg	✓	✓	Recovery	Recovery	—	—	HTSOP-J8
BD95830MUV	2	15.1	Io1 : 3.0 Io2 : 3.0	7.5 to 15	Vo1 : 0.8 to 5.5 Vo2 : 0.8 to 5.5	0.4 to 0.8	H ³ Reg	✓	—	Latch	Recovery	Latch	—	VQFN032V5050

Boost and Buck-Boost Converters

	Part No.	Number of Channels	Switch Current Limit (mA)	Input Voltage (V)	Output Voltage (V)	Switching Frequency (kHz)	Control Mode	Features												Package
								Boost	Buck-Boost	SEPIC	Inverting	Synchronous Rectifier	Light-Load Efficiency	Soft Start	Input Pass Through	UVLO	Over-Current Protection			
	BU33DV5G	1	10	1.75 to 4.50	3.3	100	Current	✓	—	—	—	✓	—	—	—	✓	Recovery	✓	SSOP5	
	BU33DV7NUX	1	300	1.8 to 5.5	3.3	600	Current	✓	—	—	—	✓	✓	✓	✓	✓	Recovery	✓	VSON010V3030	
	BU34DV7NUX	1	300	1.8 to 5.5	3.4	600	Current	✓	—	—	—	✓	✓	✓	✓	✓	Recovery	✓	VSON010V3030	
	BU33UV7NUX	1	500	0.6 to 4.5	3.3	800	Current	✓	—	—	—	✓	✓	✓	✓	✓	Recovery	✓	VSON010X3020	
	BD8316GWL	2	1,000	2.5 to 5.5	Vo1 : -9.0 to -1.0 Vo2 : V _{IN} to 18	1,600	Current	✓	—	—	✓	—	—	✓	—	✓	Latch	✓	UCSP50L1	
	BD8317GWL	2	1,000	2.5 to 5.5	Vo1 : -9.0 to -1.0 Vo2 : V _{IN} to 18	800	Current	✓	—	—	✓	—	—	✓	—	✓	Latch	✓	UCSP50L1	
New	BD83854GWL	2	600	2.5 to 4.5	±5.4	1000/500	Current	✓	—	—	✓	✓	—	—	—	✓	Latch	✓	UCSP50L1C	
New	BD83854MUV	2	600	2.5 to 4.5	±5.4	1000/500	Current	✓	—	—	✓	✓	—	—	—	✓	Latch	✓	VQFN20PV3535	
	BD8152FVM	1	1,400	2.5 to 5.5	V _{IN} to 14	600/1,200	Current	✓	✓	✓	—	—	—	Adj.	—	✓	Recovery	✓	MSOP8	
	BD8158FVM	1	1,400	2.1 to 4.0	V _{IN} to 14	600/1,200	Current	✓	✓	✓	—	—	—	Adj.	—	✓	Recovery	✓	MSOP8	
	BD8306MUV	1	2,000	1.8 to 5.5	1.8 to 5.2	300 to 2,000	Voltage	✓	✓	—	—	✓	—	✓	—	✓	Latch	✓	VQFN016V3030	
	BD8311NUV	1	2,500	3.5 to 11.0	4 to 11	1,200	Voltage	✓	—	—	—	—	—	✓	—	✓	Latch	✓	VSON010V3030	
	BD8314NUV	1	2,500	3 to 12	4 to 12	1,200	Voltage	✓	—	—	—	—	—	✓	—	✓	Latch	✓	VSON010V3030	
New	BD83070GWL	1	2,000	2.0 to 5.5	2.5 or 3.3	1,500	Current	—	✓	—	—	✓	✓	✓	—	✓	Recovery	✓	UCSP50L1C	

External Switch Switching Regulators

Buck Controllers

Part No.	Number of Channels	Input Voltage Maximum Rating (V)	Input Voltage (V)	Supply Voltage (V)	Output Voltage (V)	Switching Frequency (MHz)	Control Mode	Features								Package
								Power Good	Enable	Externally Synchronizable	Adjustable Soft Start	Synchronous Rectifier	Light-Load Efficiency	Over-Current Protection	Thermal Protection	
BD9305AFVM	1	20	4.2 to 18.0	—	1.25 to V_{IN}^*	0.1 to 0.8	Voltage	—	✓	—	—	—	—	SCP Latch	Recovery	MSOP8
BD95601MUV-LB	1	28	4.5 to 25.0	—	0.75 to 2.0	0.2 to 0.5	H ³ Reg	✓	✓	—	✓	✓	✓	Latch	Recovery	VQFN020V4040
BD63536FJ	1	32	3 to 30	—	1.25 to V_{IN}^*	0.01 to 0.3	Voltage	—	—	—	—	—	—	Recovery	Recovery	SOP-J8
BD9845FV	1	36	3.6 to 35.0	—	1.0 to V_{IN}^*	0.1 to 1.5	Voltage	—	✓	—	✓	—	—	Recovery	Recovery	SSOP-B14
BD9611MUV	1	60	10 to 56	—	$(V_{IN} \times 0.02)$ to $(V_{IN} \times 0.97)$ $(V_{IN} \times 0.02) \geq 0.8^*$	0.05 to 0.50	Voltage	—	✓	✓	✓	✓	—	Recovery	Recovery	VQFN020V4040
BD9536FV	2	16	7.5 to 15.0	—	0.7 to 5.5	0.2 to 0.6	H ³ Reg	—	✓	—	✓	✓	—	Latch	Recovery	SSOP-B28
BD9535MUV	2	30	3 to 28	4.5 to 5.5	0.7 to 2.0	0.2 to 0.6	H ³ Reg	✓	✓	—	✓	✓	✓	Latch	Recovery	VQFN032V5050
BD95602MUV-LB	2	30	5.5 to 28.0	—	1.0 to 5.5	0.15 to 0.50	H ³ Reg	✓	✓	—	✓	✓	✓	Latch	Recovery	VQFN032V5050
BD9848FV	2	36	3.6 to 35.0	—	1.0 to V_{IN}^*	0.1 to 1.5	Voltage	—	✓	—	✓	—	—	Recovery	Recovery	SSOP-B20

Boost and Buck-Boost Converters

Part No.	Number of Channels	Input Voltage Maximum Rating (V)	Input Voltage (V)	Output Voltage (V)	Switching Frequency (kHz)	Control Mode	Features										Package
							Boost	Buck-Boost	Inverting	Buck	Enable	Externally Synchronizable	Adjustable Soft Start	Synchronous Rectifier	Over-Current Protection	Thermal Protection	
BD8303MUV	1	15	2.7 to 14.0	1 to 12	200 to 1,000	Voltage	—	✓	—	—	✓	—	—	✓	Latch	Recovery	VQFN016V3030
BD9306AFVM	1	20	4.2 to 18.0	V _{IN} to (V _{IN} /0.3)	100 to 800	Voltage	✓	—	—	—	✓	—	—	—	Latch	Recovery	MSOP8
BD9851EFV	2	20	4 to 18	1.0 or more	10 to 300	Voltage	✓	—	✓	✓	—	—	✓	—	Latch	Recovery	HTSSOP-B20
BA9743AFV	2	36	3.6 to 35.0	2.505 or more	10 to 800	Voltage	✓	—	✓	✓	—	—	✓	—	Latch	Recovery	SSOP-B16
BA9744FV	2	36	2.5 to 35.0	1.222 or more	10 to 800	Voltage	✓	—	✓	✓	—	—	✓	—	Latch	Recovery	SSOP-B16
BA9741F	2	36	3.6 to 35.0	2.5 or more	10 to 800	Voltage	✓	—	✓	✓	—	—	✓	—	Latch	Recovery	SOP16
BA9741FS	2	36	3.6 to 35.0	2.5 or more	10 to 800	Voltage	✓	—	✓	✓	—	—	✓	—	Latch	Recovery	SSOP-A16
New BD9615MUV-LB	1	62	3.5 to 60.0	V _{IN} to (V _{IN} /0.2)	100 to 2,500	Voltage	✓	—	—	—	✓	✓	✓	—	Recovery	Recovery	VQFN16KV3030

* : Restrictions depend on input/output voltage conditions.

For Automotive Switching Regulators

Primary Integrated Switch Buck Converter

Part No.	Number of Outputs	Output FET		Input Voltage Maximum Rating (V)	Output Current (A) Max.	Input Voltage (V)		Output Voltage (V) Typ.	Output Voltage Accuracy (%)	Quiescent Current (μA) Typ.	Switching Frequency		Control Mode	Features							Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
		Upper (Typ.)	Bottom (Typ.)			Min.	Max.				Range (kHz)	Accuracy (%)		Power Good	Sync	Adjustable Soft Start	Synchronous Rectification	Light-Load Efficiency	Over-Voltage Protection	Spread Spectrum			
New Nano BD8P250MUF-C	1	Nch (110mΩ)	Nch (110mΩ)	42	2.0	3.5	36	5.0	±2.0	8	2,200	±10	Current	✓	—	—	✓	✓	✓	✓	—40 to +125	VQFN24FV4040	YES
New Nano BD9P233MUF-C	1	Pch (190mΩ)	Nch (120mΩ)	42	2.0	3.0	36	3.3	±2.0	26	200 to 2,400	±9	Current	✓	✓	✓	✓	✓	✓	✓	—40 to +125	VQFN32FAV050	YES
BD99010EFV-M	1	Pch (170mΩ)	Nch (130mΩ)	42	2.0	3.6	35	3.3	±2.0	22	200 to 500	±20	Current	—	—	—	✓	✓	✓	—	—40 to +105	HTSSOP-B24	YES
BD99011EFV-M	1	Pch (170mΩ)	Nch (130mΩ)	42	2.0	3.6	35	5.0	±2.0	22	200 to 500	±20	Current	—	—	—	✓	✓	✓	—	—40 to +105	HTSSOP-B24	YES
BD90610EFJ-C	1	Pch (160mΩ)	—	42	1.25	3.5	36	Adj. (0.8 to V _{IN})	±2.0	2200	50 to 600	±10	Current	—	✓	—	—	—	—	—	—40 to +125	HTSOP-J8	YES
BD90620EFJ-C	1	Pch (160mΩ)	—	42	2.5	3.5	36	Adj. (0.8 to V _{IN})	±2.0	2200	50 to 600	±10	Current	—	✓	—	—	—	—	—	—40 to +125	HTSOP-J8	YES
BD90620HFP-C	1	Pch (160mΩ)	—	42	2.5	3.5	36	Adj. (0.8 to V _{IN})	±2.0	2200	50 to 600	±10	Current	—	✓	—	—	—	—	—	—40 to +125	HRP7	YES
BD90640EFJ-C	1	Pch (160mΩ)	—	42	4.0	3.5	36	Adj. (0.8 to V _{IN})	±2.0	2200	50 to 600	±10	Current	—	✓	—	—	—	—	—	—40 to +125	HTSOP-J8	YES
BD90640HFP-C	1	Pch (160mΩ)	—	42	4.0	3.5	36	Adj. (0.8 to V _{IN})	±2.0	2200	50 to 600	±10	Current	—	✓	—	—	—	—	—	—40 to +125	HRP7	YES
BD9060F-C	1	Pch (300mΩ)	—	42	2.0	5.0	35	Adj. (0.8 to V _{IN})	±2.0	4500	50 to 500	±5	Voltage	—	✓	—	—	—	—	—	—40 to +125	SOP8	YES
BD9060HFP-C	1	Pch (300mΩ)	—	42	2.0	5.0	35	Adj. (0.8 to V _{IN})	±2.0	4500	50 to 500	±5	Voltage	—	✓	—	—	—	—	—	—40 to +125	HRP7	YES
Nano BD9V100MUF-C	1	Nch (600mΩ)	Nch (400mΩ)	70	1.0	16	60	Adj. (0.8 to 5.5)	±2.0	2500	1,900 to 2,300	±10	Current	✓	—	—	✓	—	✓	—	—40 to +125	VQFN24FV4040	YES

Secondary Integrated Switch Buck Converter

Part No.	Number of Outputs	Output FET		Input Voltage Maximum Rating (V)	Output Current (A) Max.	Input Voltage (V)		Output Voltage (V) Typ.	Output Voltage Accuracy (%)	Quiescent Current (μA) Typ.	Switching Frequency		Control Mode	Features							Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
		Upper (Typ.)	Bottom (Typ.)			Min.	Max.				Range (kHz)	Accuracy (%)		Power Good	SLIM	Sync	Adjustable Soft Start	Synchronous Rectification	Over-Voltage Protection	Output Discharge			
New BD9S000NUX-C	1	Pch (270mΩ)	Nch (180mΩ)	7	0.6	2.7	5.5	Adj. (0.8 to V _{IN})	±1.5	350	2,200	±10	Current	✓	—	—	✓	✓	✓	✓	—40 to +125	VSON008X2020	YES
New BD9S012NUX-C	1	Pch (270mΩ)	Nch (180mΩ)	7	0.6	2.7	5.5	1.1	±1.5	350	2,200	±10	Current	✓	—	—	✓	✓	✓	✓	—40 to +125	VSON008X2020	YES
New BD9S100NUX-C	1	Pch (270mΩ)	Nch (180mΩ)	7	1.0	2.7	5.5	Adj. (0.8 to V _{IN})	±1.5	350	2,200	±10	Current	✓	—	—	✓	✓	✓	✓	—40 to +125	VSON008X2020	YES
New BD9S110NUX-C	1	Pch (270mΩ)	Nch (180mΩ)	7	1.0	2.7	5.5	1.2	±1.5	350	2,200	±10	Current	✓	—	—	✓	✓	✓	✓	—40 to +125	VSON008X2020	YES
New BD9S111NUX-C	1	Pch (270mΩ)	Nch (180mΩ)	7	1.0	2.7	5.5	1.8	±1.5	350	2,200	±10	Current	✓	—	—	✓	✓	✓	✓	—40 to +125	VSON008X2020	YES
BD9S200MUF-C	1	Nch (35mΩ)	Nch (35mΩ)	7	2.0	2.7	5.5	Adj. (0.8 to V _{IN} × 0.8)	±1.5	650	2,200	±10	Current	✓	✓	✓	✓	✓	✓	—	—40 to +125	VQFN16FV3030	YES
BD9S300MUF-C	1	Nch (35mΩ)	Nch (35mΩ)	7	3.0	2.7	5.5	Adj. (0.8 to V _{IN} × 0.8)	±1.5	650	2,200	±10	Current	✓	✓	✓	✓	✓	✓	—	—40 to +125	VQFN16FV3030	YES
BD9S400MUF-C	1	Nch (35mΩ)	Nch (35mΩ)	7	4.0	2.7	5.5	Adj. (0.8 to V _{IN} × 0.8)	±1.5	650	2,200	±10	Current	✓	✓	✓	✓	✓	✓	—	—40 to +125	VQFN16FV3030	YES

Primary Integrated Switch Buck/Boost Converter(Quick Buck Booster®)

Part No.	Number of Outputs	Output FET		Input Voltage Maximum Rating (V)	Output Current (A) Max.	Input Voltage (V)		Output Voltage (V) Typ.	Output Voltage Accuracy (%)	Quiescent Current (μA) Typ.	Switching Frequency		Control Mode	Features							Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
		Upper (Typ.)	Bottom (Typ.)			Min.	Max.				Range (kHz)	Accuracy (%)		Power Good	Sync	Adjustable Soft Start	Synchronous Rectification	Light-Load Efficiency	Over-Voltage Protection	Spread Spectrum			
New BD8P250MUF-C + BD90302NUF-C	1	Nch (110mΩ)	Nch (110mΩ)	42	0.8	2.7	36	5.0	±2.0	8	2,200	±10	Current	✓	—	—	✓	✓	✓	✓	—40 to +125	VQFN24FV4040	YES
	1	Pch (55mΩ)	Nch (65mΩ)	7						65												VSON10FV3030	YES

Primary External Switch Buck Controller

BD9015KV-M	2	Ext. Nch	Ext. Nch	35	—	3.9	30	Adj. (0.8 to 10)	±1.5	4,000	250 to 550	±10	Current	✓	✓	✓	✓	—	✓*1	—	—40 to +105	VQFP48C	YES
BD9016KV-M	2	Ext. Nch	Ext. Nch	35	—	3.9	30	Adj. (0.8 to 10)	±1.5	4,000	250 to 550	±10	Current	✓	✓	✓	✓	—	✓*2	—	—40 to +105	VQFP48C	YES

Primary External Switch Buck/Boost Controller

BD9035AEFV-C	1	Ext. Pch	Ext. Nch	40	—	3.8	30	Adj.	±1.5	7,000	100 to 600	±7	Voltage	✓	✓	✓	—	—	✓	—	—40 to +125	HTSSOP-B24	YES

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 Nano Energy® is registered trademark of ROHM. Nano Pulse Control™ is trademark of ROHM.

*1 : When over voltage is detected, Bottom FET is OFF

*2 : When over voltage is detected, Bottom FET is ON

Digital Controllers(Powervation) series

Digital Controllers for Servers/Base Stations(Powervation)

Single-Phase Controllers																						
Part No.		Phase Count	Supply Voltage (V)	Interfaces			Features										Fault Response				Package (mm)	
				SMBus	VR12/ 12.5 SVID	VR13 SVID	3-Bit Parallel VID	Auto-Tuning	Programmable fsw	Phase Add/ Drop	DSS*	Sensors & Precision Telemetry	Programmable Load-Line	Single Pin CONFIG™	ADDR	VSET/ VTRAC K/System Good	TSENSE Supported	OVP/ OCP	SCP/ OTP	LOS	Phase Loss	
New	PV2105	1	0.6 to 21.0	PMBUS™ Compliant	—	—	—	Auto-Control®: Real-Time Adaptive Auto-Tuning	375kHz to 1.25MHz	—	—	Vout, Iout, Vin, Eout, Temperature, Duty Cycle, fsw	—	8 Tables	✓	—	Internal Die Sense & External	Restart/ Latching	Restart/ Latching	Retry	Restart	QFN28 4 × 4
	PV3114		0.6 to 5.5		—	—	✓		375kHz to 1MHz	—	—		—		✓	—		Restart/ Latching	Restart/ Latching	Retry or Disable	—	QFN28 4 × 4
	PV3101		0.6 to 5.5		—	—	—		375kHz to 1MHz	—	✓		—		✓	✓		Restart/ Latching	Retry	Retry	—	QFN32 5 × 5
	PV3102		0.6 to 5.5		—	—	—		375kHz to 1MHz	—	✓		—		✓	✓		Restart/ Latching	Retry	Retry	—	QFN28 4 × 4
	PV3104		0.60 to 1.52		✓	—	—		375kHz to 1MHz	—	—		—		—	—		Latch	Latch	—	—	QFN32 5 × 5
	PV3103		0.60 to 1.52		✓	—	—		375kHz to 1MHz	—	—		—		—	—		Latch	Latch	—	—	QFN28 4 × 4
	PV3105		0.6 to 5.5		—	—	—		375kHz to 1.25MHz	—	✓		—		✓	✓		Restart/ Latching	Restart/ Latching	—	—	QFN28 4 × 4
Dual-Phase Controllers																						
New	PV2205	2	0.6 to 16.0	PMBUS™ Compliant	—	—	—	Auto-Control®: Real-Time Adaptive Auto-Tuning	375kHz to 1.25MHz	Automatic	—	Vout, Iout, Vin, Eout, Temperature, Duty Cycle, fsw	—	8 Tables	✓	✓	Internal Die Sense & External	Restart/ Latching	Restart/ Latching	Retry	Restart	QFN32 5 × 5
	PV3204		0.6 to 5.5		—	—	✓		375kHz to 1MHz	Automatic	—		—		✓	—		Restart/ Latching	Restart/ Latching	Retry or Disable	Restart	QFN32 5 × 5
	PV3012		0.6 to 5.5		—	—	—		375kHz to 1MHz	Automatic	✓		—		✓	✓		Restart/ Latching	Retry	Retry	—	QFN32 5 × 5
	PV3201		0.60 to 1.52		✓	—	—		375kHz to 1MHz	SVID	—		—		—	—		Latch	Latch	—	—	QFN32 5 × 5
	PV3203		0.6 to 5.5		—	—	—		375kHz to 1.25MHz	Automatic	✓		—		✓	✓		Restart/ Latching	Restart/ Latching	Retry	Restart	QFN32 5 × 5
	PV3205		0.6 to 5.5		—	—	—		375kHz to 1.25MHz	Automatic	✓		—		✓	✓		Restart/ Latching	Restart/ Latching	Retry	Restart	QFN32 5 × 5
	PV3202		0.60 to 1.52		✓	—	—		375kHz to 1MHz	Automatic/ SVID	—		—		—	—		Latch	Latch	—	—	QFN32 5 × 5
	PV3207		0.6 to 5.5		—	—	—		375kHz to 1MHz	Automatic	✓		—		✓	✓		Restart/ Latching	Latch	Retry	—	QFN32 5 × 5
	PV4210		0.25 to 3.04		✓	✓	—		375kHz to 1MHz	Automatic	—		✓	23 Tables	—	—		Restart/ Latching	Restart/ Latching	—	—	QFN32 5 × 5
New	PV4220		0.6 to 5.5		—	—	—		375kHz to 1MHz	Automatic	✓		—	23 Tables	✓	✓		Restart/ Latching	Restart/ Latching	Retry	Restart	QFN32 5 × 5

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A

Power Management

General-purpose ICs

Switching Regulators (System Power Supplies)

Switching Regulators(System Power Supplies)

**System Power Supply ICs
for Car Audio**

**System Power Supply ICs for
Car Audio Systems** ▶ P.A55

**System Power Supply ICs
for LCD Panels**

**Single-Channel Source Voltage Output Power
Supply IC with Gamma Buffer Amplifier** ▶ P.A55

**Multi-Channel System Power Supply ICs
for Small- to Midium-Sized Panels** ▶ P.A55

**Multi-Channel System Power Supply ICs
for Large Panels** ▶ P.A55

**Automotive Panel Power
Management ICs** ▶ P.A55

**Programmable
Gamma-Voltage Generator/
Gamma Buffer Amplifiers**

**High-precision Gamma Correction ICs
with Built-in DAC** ▶ P.A55

**High-precision Gamma Correction IC
with Built-in DAC for Automotive Panels** ▶ P.A55

**System Power Supply ICs
for Mobile Phones**

**Multifunction
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**System Power Supply ICs
for DSC/DVCs**

**System Switching Regulator ICs
with Built-in FET(5V)** ▶ P.A56

**System Switching Regulator ICs
for Digital Video Cameras/for DSLRs** ▶ P.A56

Strobe Charge Control ICs ▶ P.A56

Backup Battery Switching ICs ▶ P.A56

**System Power Supply ICs
for Automotive**

**3ch System Power Supply ICs
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**2ch System Power Supply ICs
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**System Power Supply ICs
for Industrial/
Consumer Applications**

**Power Management IC(PMIC) for Intel®
Atom™ E3800 series Platform** ▶ P.A57

**Power Management IC for NXP i.MX
series Applications Processors** ▶ P.A57

Switching Regulators(System Power Supplies)

System Power Supply ICs for Car Audio

System Power Supply ICs for Car Audio Systems										
Part No.	Supply Voltage (V)	Function						Input I/F	Package	Automotive Grade AEC-Q100
		Reference Voltage (V)	Output Current (A)	Protection Circuit						
Over Current	Temperature									
BD49101AEFS-M*1/ BD49101ARFS-M*2	5.5 to 25.0	Buck DC/DC1	Controller	0.8	—	Current Limit with Short Current Protection Circuit	✓	I ² C	HTSSOP-A44 (EXP-PAD down HTSSOP-A44 package) HTSSOP-A44R (EXP-PAD up HTSSOP-A44R package)	YES
		Buck DC/DC2	Low Power Standby REG	0.8	1.0					
		REG1	Secondly	0.6	0.5	Foldback				
		REG2	—	0.8	0.1					
		REG3	Secondly	0.8	0.3					
		REG4	Secondly, Voltage Calibration	0.8	1.5 (Variable)					
		REG5	—	0.8	0.1					
		High Side Switch	—	—	0.5					
		+ B Detection Circuit	Over/Under Current Detection	—	—	—				

*1 : BD49101AEFS-M : EXP-PAD down HTSSOP-A44 package
 *2 : BD49101ARFS-M : EXP-PAD up HTSSOP-A44R package

System Power Supply ICs for LCD Panels

Single-Channel Source Voltage Output Power Supply IC with Gamma Buffer Amplifier											
Part No.	Supply Voltage (V)	Operating Temperature (°C)	Operating Frequency (MHz)	Output for Source Voltage (V)	V COM (ch)	Buffer for Gamma (ch)	Package				
BD8157EFV	2.1 to 4.0	−40 to +125	0.6/1.2	up to 14	1	4	HTSSOP – B20				
Multi-Channel System Power Supply ICs for Small- to Midium-Sized Panels											
Part No.	Supply Voltage (V)	Operating Temperature (°C)	Operating Frequency (MHz)	Output for Source Voltage (V)	Output for Logic Voltage (V)	Output for Gate Voltage (V)	Start up Sequence Circuit	V COM (ch)	Package		
BD8153EFV	2.1 to 6.0	−40 to +125	1.1	up to 18.0	3.3	Variable	✓	—	HTSSOP-B24		
BD8163EFV	2.1 to 6.0	−40 to +125	1.1	up to 18.0	2.5	Variable	✓	—	HTSSOP-B24		
BD8179MUV	2.6 to 5.5	−40 to +85	1.2	up to 19.0	—	Variable	✓	1(Buffer 4ch)	VQFN032V5050		
BD9862MUV	1.8 to 5.5	−40 to +85	0.7 to 1.4	up to 15.0	—	Variable	✓	—	VQFN024V4040		
BM81028AMWV	2.5 to 5.5	−40 to +85	0.6/1.2	8.0 to 14.5 0.1V step	1.1 to 1.3 50mV step 1.7 to 1.9/2.4 to 2.6 50mV step	13 to 26 0.2V step/ −4.0 to −9.3 0.1V step	✓	1	UQFN28V4040P		
Multi-Channel System Power Supply ICs for Large Panels											
Part No.	Supply Voltage (V)	Operating Temperature (°C)	Operating Frequency (MHz)	Output for Source Voltage (V)	Output for Logic Voltage 1	Output for Logic Voltage 2	Output for Gate Voltage	Start up Sequence Circuit	V COM (ch)	Package	
BD8166EFV	6.0 to 18.0	−40 to +85	0.5	up to 18.0	Variable	—	Variable	✓	1	HTSSOP-B40	
BD8160AEFV	8.0 to 18.0	−40 to +85	0.5/0.75	up to 18.0	Variable	—	Variable	✓	—	HTSSOP-B28	
BD8165MUV	4.2 to 14.0	−40 to +105	0.65	up to 18.0	Variable	Variable	Variable	✓	1	VQFN048V7070	
BD8162AEKV	4.2 to 14.0	−40 to +105	0.2 to 0.8	up to 18.0	Variable	Variable	Variable	✓	1 (Buffer 4ch)	HTQFP64V	
BM81100MUW	7.6 to 14.0	−40 to +85	0.75	up to 19.8	Variable	—	Variable	✓	1	VQFN40W6060A	
BM81110MUW	8.6 to 14.7	−40 to +85	0.75/1.0	up to 19.8	Variable	Variable	Variable	✓	—	VQFN40W6060A	
BM81004MUV	8.6 to 14.0	−40 to +105	0.75/1.0	up to 18.0	Variable	Variable	Variable	✓	1	VQFN48V7070A	
Automotive Panel Power Management ICs											
Part No.	Supply Voltage (V)	Operating Temperature (°C)	Operating Frequency (MHz)	Output for Source Voltage1 (V)	Output for Source Voltage2 (V)	Output for Logic Voltage (V)	Output for Gate Voltage (V)	Start up Sequence Circuit	V COM (ch)	Package	Automotive Grade AEC-Q100
BD81842MUV-M	2.0 to 5.5	−40 to +105	2.1	up to 18.0	—	—	Variable	✓	1	VQFN24SV4040	YES
BM81810MUV-M	2.6 to 5.5	−40 to +105	0.525/1.05/2.1	5.0 to 17.0 0.1V step	—	0.9 to 3.4 50mV step	8.0 to 35.0 0.2V step/ −14.0 to −4.0 0.1V step	✓	1	VQFN32SV5050	YES
BD81870EFV-M	2.5 to 5.5	−40 to +105	2.1	up to 18.0	V _{DD} − 13.0 to −1.0	—	—	✓	—	HTSSOP-B20	YES

Programmable Gamma-Voltage Generator/Gamma Buffer Amplifiers

High-precision Gamma Correction ICs with Built-in DAC											
Part No.	Supply Voltage(V)		Operating Temperature (°C)	Clock Frequency (MHz)	DAC (bit)	Serial I/F	Auto Data Read	V COM (ch)	Buffer for Gamma (ch)	Package	
	Gamma Collection Input	Logic									
BD8132FV	6 to 18	2.3 to 4.0	−30 to +85	5.0	10	3Wire	Built-in	1	18	SSOP-B40	
BD8139AEFV	6 to 18	2.3 to 4.0	−30 to +85	0.4	10	I²C BUS	Built-in	1	10	HTSSOP-B40	
BD8143MUV	8 to 18	2.3 to 5.5	−40 to +105	2.0	10	3Wire	—	—	12	VQFN032V5050	
BD81010MUV	8 to 18	2.1 to 3.6	−40 to +85	0.4	10	I²C BUS	—	1	14	VQFN032V5050	
BD8149MUV	10 to 18	2.1 to 3.6	−25 to +85	0.4	10	I²C BUS	Built-in	—	12	VQFN032V5050	
BD81026MUV	8 to 18	2.1 to 3.6	−25 to +85	0.4	10	I²C BUS	—	—	12	VQFN024V4040	
High-precision Gamma Correction IC with Built-in DAC for Automotive Panels											
Part No.	Supply Voltage(V)		Operating Temperature (°C)	Clock Frequency (MHz)	DAC (bit)	Serial I/F	Auto Data Read	V COM (ch)	Buffer for Gamma (ch)	Package	Automotive Grade AEC-Q100
	Gamma Collection Input	Logic									
BD81849MUV-C	10 to 18	2.1 to 3.6	−40 to +105	0.4	10	I²C BUS	Built-in	—	12	VQFN32SV5050	YES

System Power Supply ICs for Mobile Phones

Multifunction System Power Supply ICs

Part No.	Supply Voltage (V)	Item	DC/DC		LDO						Input I/F	Protection Circuit			Package (mm)											
			DC/DC1	DC/DC2	LDO1	LDO2	LDO3	LDO4	LDO5	LDO6		Over Current	Temperature	Low Voltage												
BH6173GUL	2.2 to 5.2	Output Voltage(V)	0.8 to 2.4	—	1.0 to 3.3	1.0 to 3.3	1.2 to 3.3	—	—	—	I ² C	LDO1 to 3 is fold back DC/DC is dropping type	✓	✓	VCSP50L2 2.05×2.05, H=Max.0.55											
		Output Current(mA)	500	—	300	300	300	—	—	—																
		Ripple Rejection(dB)(at 120Hz)	—	—	60	60	60	—	—	—																
BH6172GU	2.2 to 5.5	Output Voltage(V)	0.8 to 2.4	—	1.0 to 3.3	1.0 to 3.3	1.2 to 3.3	1.2 to 3.3	1.2 to 3.3	—	I ² C/Parallel	LDO1 to 5 is fold back DC/DC is dropping type	✓	✓	VCSP85H2 2.6×2.6, H=Max.1.0											
		Output Current(mA)	500	—	150	150	300	300	150	—																
		Ripple Rejection(dB)(at 120Hz)	—	—	60	60	60	60	60	—																
BH6174GUL	2.6 to 5.5	Output Voltage(V)	0.8 to 2.4	0.8 to 2.4	1.0 to 3.3	1.0 to 3.3	1.2 to 3.3	1.2 to 3.3	1.2 to 3.3	—	I ² C/Parallel	LDO1 to 5 is fold back DC/DC is dropping type	✓	✓	VCSP50L2 2.8×2.8, H=Max.0.55											
		Output Current(mA)	600	600	300	300	300	300	300	—																
		Ripple Rejection(dB)(at 120Hz)	—	—	60	60	60	60	60	—																
BH6178GUL	2.7 to 4.5	Output Voltage(V)	1.8	1.235	1.8	1.8	1.215	1.2	2.7	—	Parallel	LDO1 to 5 is fold back DC/DC is dropping type	✓	✓	VCSP50L2 2.8×2.8, H=Max.0.55											
		Output Current(mA)	400	650	50	50	50	50	50	—																
		Ripple Rejection(dB)(at 120Hz)	—	—	60	60	60	60	60	—																
BH6176GU	2.2 to 5.5	Output Voltage(V)	0.80 to 2.35	—	1.0 to 3.3	1.0 to 3.3	1.2 to 3.3	1.2 to 3.3	1.2 to 3.3	1.2 to 3.3	I ² C/Parallel	LDO1 to 6 is fold back DC/DC is dropping type	✓	✓	VCSP85H2 2.6×2.6, H=Max.1.0											
		Output Current(mA)	500	—	150	150	300	300	150	300																
		Ripple Rejection(dB)(at 120Hz)	—	—	60	60	60	60	60	60																
BH6179GU	2.2 to 5.5	Output Voltage(V)	0.80 to 2.35	—	1.0 to 3.3	1.0 to 3.3	1.2 to 3.3	1.2 to 3.3	1.2 to 3.3	1.2 to 3.3	I ² C/Parallel	LDO1 to 6 is fold back DC/DC is dropping type	✓	✓	VCSP85H2 2.6×2.6, H=Max.1.0											
		Output Current(mA)	600	—	150	150	300	300	150	300																
		Ripple Rejection(dB)(at 120Hz)	—	—	50	50	50	50	50	50																
Part No.	Supply Voltage (V)	Item	DC/DC Output			LDO Output										Buffer for TCXO	Lithium Ion Charging Control	USB Transceiver	Protection Cinctuise	Protection Circuit			Package			
			DC/DC1	DC/DC2	DC/DC6	LDO1	LDO1, 2	LDO2	LDO3	LDO4, 5	LDO6, 7	LDO8	LDO9	LDO10					Over Current	Temperature	Low Voltage					
BH6062GW	2.9 to 4.6	Output Voltage(V)	1.175	1.825	1.920	2.8	—	1.175	1.835	—	—	—	—	—	✓	—	—	✓	LDO is fold back DC/DC is dropping type	✓	✓	UCSP75M3				
		Output Current(mA)	900	800	400	40	—	50	30	—	—	—	—	—												
Part No.	Supply Voltage (V)	Item	DC/DC Output					LDO Output										Buffer for TCXO	SIM I/F	Protection Cinctuise	Protection Circuit			Package		
			SWREG1	SWREG2	SWREG3	SWREG4	SWREG5	LDO1	LDO2	LDO3	LDO4	LDO5	LDO6	LDO7	LDO8	LDO9	LDO10	LDO11	LDO12							
BD71801AGWL	2.6 to 5.5	Output Voltage(V)	1.1	1.8	1.2	1.4	3.2	2.6/1.8	3.3	1.8	2.8	1.2	2.8	2.8	2.5	2.8	2.8	1.2	1.2	✓	✓	✓	LDO is fold back DC/DC is dropping type	✓	✓	UCSP50L3C
		Output Current(mA)	1,000	500	1,000	500	1,400	300	50	50	300	150	150	50	150	150	150	150	150							

LDOs, detectors and charge control in a single chip

System Power Supply ICs for DSC/DVCs

System Switching Regulator ICs with Built-in FET(5V)

Part No.	ch	Operating Frequency (MHz)	Supply Voltage (V)	Reference Voltage (V)	Reference Voltage Precision (%)	Topology					Built-in FET (ch)	Synchronous Rectifier (ch)	Load Switch (ch)	Package (mm)
						Step up (ch)	Step Down (ch)	Step up/down (ch)	Inverting (ch)	Buck-Boost (ch)				
BD9639MWV	6	0.5 to 2.0	2.5 to 5.5	0.4	±2.5	2	2	—	—	2	6	5	1	UQFN056V7070
BD9355MWV	7	2.0/1.0	1.5 to 5.5	0.8	±1.25	3	2	—	1	1	7	3	1	UQFN036V5050
				1.0	±1.0									
BD9757MWV	8	1.2	1.5 to 5.5	1.0	±1.0	3	4	—	1	—	7	5	2	UQFN044V6060
				0.8	±1.25									
BD9634GU	7	0.5 to 1.5	2.5 to 5.5	0.8	±2.5	3	1	1	1	1	5	3	1	VCSP85H4 4.26×4.26, H=Max.1.0

System Switching Regulator ICs for Digital Video Cameras/for DSLRs

Part No.	ch	Operating Frequency (MHz)	Supply Voltage (V)	Reference Voltage (V)	Reference Voltage Precision (%)	Step up (ch)	Step Down (ch)	Buck-Boost (ch)	Inverting/Stepdown (ch)	Built-in FET (ch)	Synchronous Rectifier (ch)	Load Switch (ch)	Package (mm)
BD9865MWV	4	0.6 to 1.5	4 to 14	1.0	±1.0	—	2	1	1	4	3	—	UQFN040V5050
				0.8	±1.25								
BD9866GUL	4	0.6 to 1.5	4 to 14	0.6	±1.66	—	3	1	—	4	4	—	VCSP50L3 3.75×3.75, H=Max.0.55
				0.8	±1.25								
BD8355MWV	7	0.5 to 1.8	4 to 10	0.8	±1.25	1	6	—	—	7	6	—	UQFN056V7070
				1.0	±1.0								

Strobe Charge Control ICs

Part No.	Supply Voltage (Vcc)(V)	Peak Current (A)	Full Charge Detection Voltage (V)	100nsec. pulse AC Full Charge Detection Voltage (V)	Full Terminal Output	Power Transistor Saturation Voltage I _{sw} =1A (V)	IGBTOUTN (mA)	IGBTOUTP (mA)	Package
BD4233NUX	2.5 to 5.5	0.5 to 2.0	1±1.1%	1.0—1.1% to ±1.6%	Nch Open drain	0.4	60	140	VSON010X3020
BD4234NUX	2.5 to 5.5	0.5 to 2.0	1±1.1%	1.0—1.1% to ±1.6%	Nch Open drain	0.4	30	140	VSON010X3020

Backup Battery Switching ICs

Part No.	Input Voltage(V)		Output Voltage(V)		Input Detection Voltage(V)		Output Detection Voltage(V)		Switching Voltage(V)	Unreg Reset Voltage(V)		Package
	V _{IN}		V _{RO}	V _{OUT}	—VDET1	+VDET1	—VDET2	+VDET2		—VDET3(VDETSEL=L)	—VDET4(VDETSEL=H)	
BD7212MUV	3.50 to 6.00		3.2	3.2	3.5	3.6	2.10	2.23	3.06	1.5	2.5	VQFN016V3030
BD7213MUV	3.50 to 8.00		3.2	3.2	3.3	3.4	2.05	2.14	2.89	1.5	2.5	VQFN016V3030
BD7214MUV	3.50 to 8.00		3.2	3.2	3.3	3.4	2.05	2.14	2.89	—	—	VQFN016V3030

System Power Supply ICs for Automotive

3ch System Power Supply ICs for Automotive														
Part No.	Supply Voltage (V)	Operating Frequency (kHz)	Operating Temperature (°C)	Sequence	Initial Accuracy	Output		Function				Package	Automotive Grade AEC-Q100	
						ch	V _{OUT} /Max. I _{OUT}	Over Current Protection	TSD	Under/Over Voltage Detection	Reset			WDT
BD39000EKV-C	4 to 30 (Rating 40V)	200 to 550	−40 to +125	✓	±2	1ch (DC/DC)	Buck-Boost DC/DC Controller (V _{OUT} /I _{OUT} variable)	✓	✓	✓	—	WINDOW WDT	HTQFP48V	YES
						2ch (DC/DC)	Synchronous Buck DC/DC Converter (1.23V, 0.9A)				✓			
						3ch (LDO)	LDO(5V, 0.6A)							
BD39001EKV-C	4 to 30 (Rating 40V)	200 to 550	−40 to +125	✓	±2	1ch (DC/DC)	Buck-Boost DC/DC Controller (V _{OUT} /I _{OUT} variable)	✓	✓	✓	—	WINDOW WDT	HTQFP48V	YES
						2ch (DC/DC)	Synchronous Buck DC/DC Converter (3.3V, 0.9A)				✓			
						3ch (LDO)	LDO(5V, 0.6A)							
2ch System Power Supply IC for Automotive														
BD39012EFV-C	4 to 36 (Rating 45V)	200 to 600	−40 to +125	External Control EN1:DC/DC EN2:LDO	±2	1ch (DC/DC)	Synchronous Buck DC/DC Converter (V _{OUT} variable, 1A)	✓	✓	✓	—	WINDOW WDT	HTSSOP-B24	YES
						2ch (LDO)	LDO(5V, 0.4A)				✓			

System Power Supply ICs for Industrial/Consumer Applications

Power Management IC(PMIC) for Intel® Atom™ E3800 series Platform																											
Part No.	Supply Voltage (V)	Item	DC/DC Output							SW	LDO output								I/F	Protection Circuit	Package (mm)						
			DC/DC1 V1P0A	DC/DC2 V1P0S	DC/DC3 V1P8A	DC/DC4 VDDQ	DC/DC5 V1P0S5	DC/DC6 VCC	DC/DC7 VNN		V1P8S	LDO1 VRTC	LDO2 V3P3A	LDO3 V3P3S	LDO4 V1P24A	LDO5 VSDIO	LDO6 V1P24S	LDO7 VTT				LDO8 VSFR					
BD9596BMWV	3.5 to 5.5	Output Voltage(V)	1.0	1.0	1.8	1.2 to 1.6	1.05	0.5 to 1.2	0.5 to 1.2	1.8	3.3	3.3	3.3	1.24	1.8 or 3.3	1.24	VDDQ/2	1.35	IMVP7	UVLO, TSD, SCP, OVP	UQFN88MV0100 10×10×1.0						
		Output Current(mA)	700	2,600	1,800	4,500	1,300	13,000	13,000	800	120	100	500	50	20	50	530	500									
Power Management ICs for NXP i.MX series Applications Processors																											
Part No.	Correspondance	Item	DC/DC Output								LDO Output								White LED Driver	Lithium Charging Control	Coulomb Counter	RTC	GPO (ch)	I²C I/F	Package		
			BUCK1	BUCK2	BUCK3	BUCK4	BUCK5	BUCK6	BUCK7	BUCK8	LDO1	LDO2	LDO3	LDO4	LDO5	LDO6	LDO7	LDO8								VS	VS
BD71815AGW	i.MX 7Solo i.MX 7Dual	Output Voltage(V)	0.8 to 2.0	0.8 to 2.0	1.2 to 2.7	1.10 to 1.85	1.8 to 3.3	—	—	—	0.8 to 3.3	0.8 to 3.3	0.8 to 3.3	0.8 to 3.3	0.8 to 3.3	—	—	3	1.8	0.5× DVREFIN	✓	✓	✓	✓	1	✓	UCSP55M4C
		Output Current(mA)	800	1,000	500	1,000	1,000	—	—	—	100	100	50	400	250	—	—	25	100								
BD71837MWV	i.MX 8M Quad/ QuadLite/ Dual	Output Voltage(V)	0.7 to 1.3	0.7 to 1.3	0.7 to 1.3	0.7 to 1.3	0.7 to 1.35	3.0 to 3.3	1.605 to 1.995	0.8 to 1.4	3.0 to 3.3, 1.6 to 1.9	0.9, 0.8	1.8 to 3.3	0.9 to 1.8	1.8 to 3.3	0.9 to 1.8	1.8 to 3.3	—	—	—	—	—	—	—	✓	UQFN68CV8080	
		Output Current(mA)	3,600	4,000	2,100	1,000	2,500	3,000	1,500	3,000	10	10	300	250	300	300	150	—	—								

Isolated/Non-isolated Power Supply

AC/DC Converter ICs

Non-isolated AC/DC Converter ICs(PWM Driver Built-in MOSFET and Sense Resistor)									
Part No.	Output Voltage (V)	MOSFET V _{OS} (Max.)(V)	Control Method	Switching Frequency (kHz)	ON Resistance (Ω)	OCP Current (A)	Frequency Reduction	Max. Duty (%)	Package
New BM2P109TF	10.0	650	PWM	100	9.0	0.45	—	75	SOP8
New BM2P129TF	12.0	650	PWM	100	9.0	0.45	—	75	SOP8
New BM2P135TF	13.0	650	PWM	100	4.5	0.45	—	75	SOP8
New BM2P137TKF	13.0	800	PWM	100	7.5	0.45	—	75	SOP8
New BM2P139TF	13.0	650	PWM	100	9.0	0.45	—	75	SOP8
New BM2P159PF	14.2	650	PWM	100	9.0	0.30	—	75	SOP8
New BM2P159T1F	15.0	650	PWM	100	9.0	0.45	—	75	SOP8
New BM2P161W	16.8	650	PWM	65	1.9	1.46	✓	40	DIP7K
New BM2P163W	16.8	650	PWM	65	3.0	1.46	✓	40	DIP7K
New BM2P249Q	24.8	650	PWM	65	9.0	0.80	✓	40	DIP7K
New BM2P249TF	24.8	650	PWM	100	9.0	0.45	—	75	SOP8
New BM2P201X	20.0	650	PWM	65	1.5	2.00	✓	40	DIP7K
New BM2P161X	16.8	650	PWM	65	1.5	2.00	✓	40	DIP7K
New BM2P151X	15.0	650	PWM	65	1.5	2.00	✓	40	DIP7K
New BM2P141X	14.0	650	PWM	65	1.5	2.00	✓	40	DIP7K
New BM2P121X	12.0	650	PWM	65	1.5	2.00	✓	40	DIP7K
New BM2P101X	10.0	650	PWM	65	1.5	2.00	✓	40	DIP7K

AC/DC Converter ICs(PWM Driver Built-in MOSFET)

	Part No.	Supply Voltage (V)	MOSFET V_{DS} (Max.)(V)	Control Method	Switching Frequency(kHz)	ON Resistance (Ω)	Peak Current (A)	Brown Out	V_{CC} OVP	Package
New	BM2P0391	8.9 to 26.0	650	PWM	100	4.0	5.2	✓(adjustable)	Self-restart	DIP7K
New	BM2P095F	8.9 to 26.0	650	PWM	65	8.5	1.3	—	Latch	SOP8
New	BM2PA96F	8.9 to 26.0	650	PWM	65	8.5	1.3	—	Self-restart	SOP8
New	BM2P015	8.9 to 26.0	650	PWM	65	1.4	10.4	—	Latch	DIP7K
New	BM2P016	8.9 to 26.0	650	PWM	65	1.4	10.4	—	Self-restart	DIP7K
New	BM2P016T	8.9 to 26.0	650	PWM	65	1.4	10.4	—	Self-restart	TO220
	BM2P011	8.9 to 26.0	650	PWM	65	1.4	10.4	✓(adjustable)	Latch	DIP7K
	BM2P012	8.9 to 26.0	650	PWM	65	1.4	10.4	✓(adjustable)	Self-restart	DIP7K
	BM2P013	8.9 to 26.0	650	PWM	65	1.4	10.4	—	Latch	DIP7K
	BM2P014	8.9 to 26.0	650	PWM	65	1.4	10.4	—	Self-restart	DIP7K
	BM2P031	8.9 to 26.0	650	PWM	65	2.4	5.2	✓(adjustable)	Latch	DIP7K
	BM2P032	8.9 to 26.0	650	PWM	65	2.4	5.2	✓(adjustable)	Self-restart	DIP7K
	BM2P033	8.9 to 26.0	650	PWM	65	2.4	5.2	—	Latch	DIP7K
	BM2P034	8.9 to 26.0	650	PWM	65	2.4	5.2	—	Self-restart	DIP7K
	BM2P051	8.9 to 26.0	650	PWM	65	4.0	2.6	✓(adjustable)	Latch	DIP7K
	BM2P051F	8.9 to 26.0	650	PWM	65	4.0	2.6	✓(adjustable)	Latch	SOP8
	BM2P052	8.9 to 26.0	650	PWM	65	4.0	2.6	✓(adjustable)	Self-restart	DIP7K
	BM2P052F	8.9 to 26.0	650	PWM	65	4.0	2.6	✓(adjustable)	Self-restart	SOP8
	BM2P053	8.9 to 26.0	650	PWM	65	4.0	2.6	—	Latch	DIP7K
	BM2P053F	8.9 to 26.0	650	PWM	65	4.0	2.6	—	Latch	SOP8
	BM2P054	8.9 to 26.0	650	PWM	65	4.0	2.6	—	Self-restart	DIP7K
	BM2P054F	8.9 to 26.0	650	PWM	65	4.0	2.6	—	Self-restart	SOP8
	BM2P091	8.9 to 26.0	650	PWM	65	8.5	1.3	✓(adjustable)	Latch	DIP7K
	BM2P091F	8.9 to 26.0	650	PWM	65	8.5	1.3	✓(adjustable)	Latch	SOP8
	BM2P092	8.9 to 26.0	650	PWM	65	8.5	1.3	✓(adjustable)	Self-restart	DIP7K
	BM2P092F	8.9 to 26.0	650	PWM	65	8.5	1.3	✓(adjustable)	Self-restart	SOP8
	BM2P093	8.9 to 26.0	650	PWM	65	8.5	1.3	—	Latch	DIP7K
	BM2P093F	8.9 to 26.0	650	PWM	65	8.5	1.3	—	Latch	SOP8
	BM2P094	8.9 to 26.0	650	PWM	65	8.5	1.3	—	Self-restart	DIP7K
	BM2P094F	8.9 to 26.0	650	PWM	65	8.5	1.3	—	Self-restart	SOP8
	BM2P074KF	10.2 to 26.0	800	PWM	65	6.7	2.0	—	Self-restart	SOP8
New	BM2P061EK-LB	10.9 to 30.0	800	PWM	65	1.6	5.0	✓(adjustable)	Self-restart	DIP7AK
New	BM2P101EK-LB	10.9 to 30.0	800	PWM	100	1.6	5.0	✓(adjustable)	Self-restart	DIP7AK
	BM2P0161	8.9 to 26.0	650	PWM	65	1.0	12.0	—	Self-restart	DIP7K
	BM2P0361	8.9 to 26.0	650	PWM	65	3.0	4.0	—	Self-restart	DIP7K

AC/DC Converter ICs(PWM Driver Built-in MOSFET and Sense Resistor)

	Part No.	Supply Voltage (V)	MOSFET V_{DS} (Max.)(V)	Control Method	Switching Frequency(kHz)	ON Resistance (Ω)	OCF Current (A)	Brown Out (V)	V_{CC} OVP	Package
New	BM2P01A	11.9 to 26.0	650	PWM	100	2.0	0.43	100	Latch	DIP8
New	BM2P01B	11.9 to 26.0	650	PWM	100	2.0	0.54	100	Latch	DIP8

AC/DC Converter ICs(PWM Controller)

	Part No.	Supply Voltage (V)	Control Method	START-UP Circuit	Switching Frequency(kHz)	AC Line Voltage Correction	V_{CC} Recharge	Brown Out	V_{CC} OVP	Package
	BM1P061FJ	8.9 to 26.0	PWM	✓	65	✓	✓	✓(adjustable)	Self-restart	SOP-J8
	BM1P062FJ	8.9 to 26.0	PWM	✓	65	✓	✓	✓(adjustable)	Latch	SOP-J8
	BM1P065FJ	8.9 to 26.0	PWM	✓	65	✓	—	✓(adjustable)	Self-restart	SOP-J8
	BM1P066FJ	8.9 to 26.0	PWM	✓	65	✓	—	✓(adjustable)	Latch	SOP-J8
	BM1P067FJ	8.9 to 26.0	PWM	✓	65	✓	—	—	Self-restart	SOP-J8
	BM1P068FJ	8.9 to 26.0	PWM	✓	65	✓	—	—	Latch	SOP-J8
	BM1P101FJ	8.9 to 26.0	PWM	✓	100	✓	✓	✓(adjustable)	Self-restart	SOP-J8
	BM1P102FJ	8.9 to 26.0	PWM	✓	100	✓	✓	✓(adjustable)	Latch	SOP-J8
	BM1P105FJ	8.9 to 26.0	PWM	✓	100	✓	—	✓(adjustable)	Self-restart	SOP-J8
	BM1P107FJ	8.9 to 26.0	PWM	✓	100	✓	—	—	Self-restart	SOP-J8
	BD7672BG	8.5 to 25.0	PWM	—	65	—	—	—	Latch	SSOP6
	BD7673AG	8.5 to 25.0	PWM	—	65	—	—	—	Latch	SSOP6
	BD7679G	8.5 to 25.0	PWM	—	65	—	—	—	Self-restart	SSOP6
	BD7678FJ	8.5 to 25.5	PWM	—	65	✓	—	✓(adjustable)	Latch	SOP-J8

AC/DC Converter ICs(Quasi-Resonant Controller)

	Part No.	Supply Voltage (V)	Control Method	START-UP Circuit	Switching Frequency(kHz)	AC line Voltage Correction	FBOLP	V_{CC} OVP	ZT OVP	Package
	BM1Q002FJ	8.9 to 26.0	QR	✓	120	✓	Self-restart	Latch	Latch	SOP-J8
	BM1Q021FJ	8.9 to 26.0	QR	✓	120	✓	Self-restart	Self-restart	Self-restart	SOP-J8
	BM1Q041FJ	8.9 to 26.0	QR	✓	120	✓	Self-restart	Self-restart	none	SOP-J8
New	BM1Q011FJ	8.9 to 26.0	QR	✓	120	✓	Self-restart	Self-restart	none	SOP-J7
New	BM1Q104FJ	14.0 to 30.0	QR	✓	111	—	Self-restart	—	Latch	SOP-J8

AC/DC Converter ICs(PFC, PFC+Quasi-Resonant Controller)

	Part No.	Supply Voltage (V)	Control Method	START-UP Circuit	X-cap Discharge	QR Maximum Frequency(kHz)	PFC Maximum Frequency(kHz)	PFC Output Voltage Conversion	V_{CC} OVP/ZT OVP	Package
	BD7690FJ	10.0 to 26.0	PFC	—	—	—	220	—	—	SOP-J8
	BD7691FJ	10.0 to 26.0	PFC	—	—	—	220	—	—	SOP-J8
	BM1050AF	8.9 to 26.0	PFC+QR	✓	—	120	65	—	Selectable Externally	SOP24
	BM1051F	8.9 to 26.0	PFC+QR	✓	—	120	65	—	Selectable Externally	SOP24
	BM1C101F	8.9 to 26.0	PFC+QR	✓	✓	120	400	✓	✓	SOP18
	BM1C102F	8.9 to 26.0	PFC+QR	✓	✓	120	400	—	✓	SOP18

AC/DC Converter ICs(For SiC MOSFET Driving)

Part No.	Supply Voltage (V)	Control Method	MOSFET	MOSFET Performance	Maximum Frequency(kHz)	FBOLP	Brown Out	V _{CC} OVP	Package
BD7682FJ-LB	15.0 to 27.5	QR	External	—	120	Self-restart	✓ (adjustable)	Latch	SOP-J8
BD7683FJ-LB	15.0 to 27.5	QR	External	—	120	Latch	✓ (adjustable)	Latch	SOP-J8
BD7684FJ-LB	15.0 to 27.5	QR	External	—	120	Self-restart	✓ (adjustable)	Self-restart	SOP-J8
BD7685FJ-LB	15.0 to 27.5	QR	External	—	120	Latch	✓ (adjustable)	Self-restart	SOP-J8

AC/DC Converter ICs(Secondary Side Synchronous Rectification with Shunt Regulator)

Part No.	Supply Voltage (V)	Control Method	Shunt Regulator Accuracy(%)	Drain Terminal Maximum Voltage(V)	Compulsion OFF Time(μs)	V _{CC} OVP	Auto Sleep Function	CCM Mode	Package
BM1R00146F	2.7 to 32.0	SR	± 0.5	120	1.3	Self-restart	✓	✓	SOP8
BM1R00147F	2.7 to 32.0	SR	± 0.5	120	2.0	Self-restart	✓	✓	SOP8
BM1R00148F	2.7 to 32.0	SR	± 0.5	120	3.0	Self-restart	✓	✓	SOP8
BM1R00149F	2.7 to 32.0	SR	± 0.5	120	3.6	Self-restart	✓	✓	SOP8
BM1R00150F	2.7 to 32.0	SR	± 0.5	120	4.6	Self-restart	✓	✓	SOP8
New BM1R00178F	2.7 to 32.0	SR	± 0.5	120	3.0	Self-restart	—	✓	SOP8

Isolated DC/DC Converter ICs

Isolated DC/DC Converter ICs

Part No.	Output Power (W)	Input Voltage Maximum Rating(V)	Switch Current Limit (A)	Input Voltage (V)	Switching Frequency (kHz)	Control Mode	Features						Package
							Enable	Soft Start	Light-Load Efficiency	UVLO	Over-Current Protection	Thermal Protection	
BD7F100EFJ-LB	1W at V _{IN} 5.0V	45	1.25	3.0 to 40.0	400	Adaptive on-time	✓	✓	✓	✓	Recovery	Recovery	HTSOP-J8
BD7F100HFN-LB	5W at V _{IN} 24V						✓	✓	✓	✓	Recovery	Recovery	HSOP8
BD7F200EFJ-LB	5W at V _{IN} 12V	45	2.75	8.0 to 40.0	400	Adaptive on-time	✓	✓	✓	✓	Recovery	Recovery	HTSOP-J8
BD7F200HFN-LB	10W at V _{IN} 24V						✓	✓	✓	✓	Recovery	Recovery	HSOP8
☆ BD7J200EFJ-LA	10W at V _{IN} 48V	80	2.13	8.0 to 80.0	400	Adaptive on-time	✓	✓	✓	✓	Recovery	Recovery	HTSOP-J8
☆ BD7J200HFN-LA							✓	✓	✓	✓	Recovery	Recovery	HSOP8

☆ : Under Development

Isolated DC/DC Controller

Isolated DC/DC Controller

Part No.	Topology	Primary/Secondary	Supply Voltage (V)	Switching Frequency(kHz)	Frequency Synchronization	I/F	Package	Automotive Grade AEC-Q100
BD8325FVT-M	Active Clamp Forward	Primary IC	9 to 18	50 to 500	✓	—	TSSOP-B30	YES

Gate Drivers

Isolated Gate Drivers

Isolated Gate Drivers

Part No.	Input-side Supply Voltage (V)	Output-side Positive Supply Voltage(V)	Output-side Negative Supply Voltage(V)	Isolation Voltage (Vrms)	I/O Delay Time (ns)	Minimum Input Pulse Width(ns)	Maximum Output Current (A)	Operating Temperature (°C)	Function	Package	Automotive Grade AEC-Q100
BM6101FV-C	4.5 to 5.5	14 to 24	—12 to 0	2,500	350	180	3	—40 to +125	Miller clamp/Fail output/Built-in under voltage lock out circuit/Thermal protection/Short current protection/DESAT/Soft turn-off function for short current protection	SSOP-B20W	YES
BM6102FV-C	4.5 to 5.5	14 to 20	—	2,500	200	100	3	—40 to +125	Miller clamp/Fail output/Built-in under voltage lock out circuit/Thermal protection/Short current protection/DESAT/Soft turn-off function for short current protection	SSOP-B20W	YES
BM6104FV-C	4.5 to 5.5	10 to 24	—12 to 0	2,500	150	90	3	—40 to +125	Miller clamp/Fail output/Built-in under voltage lock out circuit/Short current protection/DESAT/Soft turn-off function for short current protection	SSOP-B20W	YES
BM60014FV-C	4.5 to 5.5	10 to 24	—	2,500	120	70	3	—40 to +125	Miller clamp/Fail output/Built-in under voltage lock out circuit	SSOP-B20W	YES
New BM61S40RFV-C	4.5 to 5.5	16 to 20	—	3,750	65	60	4	—40 to +125	Miller clamp/Built-in under voltage lock out circuit/Over voltage protection	SSOP-B10W	YES

Isolated Gate Drivers(For Industrial Equipment)

Part No.	Input-side Supply Voltage(V)	Output-side Positive Supply Voltage(V)	Output-side Negative Supply Voltage(V)	Isolation Voltage(Vrms)	I/O Delay Time(ns)	Minimum Input Pulse Width(ns)	Maximum Output Current(A)	Operating Temperature(°C)	Function	Package
BM6108FV-LB	4.5 to 5.5	10 to 24	—12 to 0	2,500	150	90	3	—40 to +105	Miller clamp/Fail output/Built-in under voltage lock out circuit/Short current protection/DESAT/Soft turn-off function for short current protection	SSOP-B20W
New BM6105AFW-LBZ	4.5 to 5.5	13.3 to 20.0	—12 to 0	2,500	120	60	3	—40 to +105	Miller clamp/Fail output/Ready output/Built-in under voltage lock out circuit/DESAT	SOP16WM

Isolated Gate Drivers with Flyback Controller

Part No.	Input-side Supply Voltage(V)	Output-side Positive Supply Voltage(V)	Output-side Negative Supply Voltage(V)	Isolation Voltage (Vrms)	I/O Delay Time(ns)	Minimum Input Pulse Width(ns)	Maximum Output Current(A)	Operating Temperature(°C)	Function	Package	Automotive Grade AEC-Q100
BM60051FV-C	4.5 to 24.0/4.5 to 5.5	9 to 24	—	2,500	260	180	5	—40 to +125	Miller clamp/Fail output/Built-in under voltage lock out circuit/Temperature monitor/Short current protection/Soft turn-off function for short current protection	SSOP-B28W	YES
BM60055FV-C	4.5 to 30.0	9 to 24	—	2,500	250	170	5	—40 to +125	Miller clamp/Fail output/Built-in under voltage lock out circuit/Thermal protection/Short current protection/Soft turn-off function for short current protection/Over current protection/2 level turn off	SSOP-B28W	YES
New BM60052AFV-C	4 to 32	10 to 20	—12 to 0	2,500	120	90	3	—40 to +125	Miller clamp/Fail output/Ready output/Built-in under voltage lock out circuit/Thermal protection/DESAT/Soft turn-off function for DESAT	SSOP-B28W	YES
New BM60054AFV-C	4 to 32	10 to 20	—12 to 0	2,500	120	90	3	—40 to +125	Miller clamp/Fail output/Ready output/Built-in under voltage lock out circuit/Thermal protection/Short current protection/Soft turn-off function for short current protection	SSOP-B28W	YES
New BM60056FV-C	6 to 30	14 to 24	—	2,500	3,000	3,000	1.5	—40 to +125	Miller clamp/Fail output/Built-in under voltage lock out circuit/Temperature Monitor/Short current protection/Soft turn-off function for short current protection	SSOP-B28W	YES

Others

IGBT/MOSFET High-side Low-side Gate Drivers

Part No	Input-side Supply Voltage(V)	High-side Floating Supply Voltage(V)	I/O Delay Time (ns)	minimum Output Current(A)	Dead Time (ns)	ch	Operating Temperature(°C)	Package	Automotive Grade AEC-Q100
BS2101F	10 to 18	600	220	0.06/−0.13	—	2	−40 to +125	SOP8	—
BS2103F	10 to 18	600	220	0.06/−0.13	160	2	−40 to +125	SOP8	—
BS2114F	10 to 20	600	250	0.5/−0.5	160	2	−40 to +125	SOP8	—
New BM60212FV-C	10 to 24	1,200	75	3/−3	—	2	−40 to +125	SSOP-B20W	YES

IGBT/MOSFET High-side Low-side 3 Phase Bridge Drivers

Part No	Input-side Supply Voltage(V)	High-side Floating Supply Voltage(V)	I/O Delay Time (ns)	Output Current (A)	Dead Time (ns)	ch	Built-in Boot Diode	Operating Temperature(°C)	Package
BS2130F-G	11.5 to 20.0	600	630/580	0.2/−0.35	300	6	—	−40 to +125	SOP28
New BS2132F	11.5 to 20.0	600	630/580	0.2/−0.35	300	6	✓	−40 to +125	SOP28

(LAPIS Semiconductor products)

Non-insulated Gate Driver for Battery Management System (BMS)

Part No.	Supply Voltage (V)	Gate Driving Voltage (V) Min.	Turn on Time (μs) Max.	Turn off Time (μs) Max.	Operating temperature (°C)	Package	Halogen Free Support
☆ ML5810	6.5 to 64	10	350	70	−40 to +105	P-TSSOP20-0225-0.65	✓

☆ : Under Development

Temperature Monitor

Isolated Temperature Monitor

Part No.	Supply Voltage 1 (V)	Supply Voltage 2 (V)	Isolation Voltage (Vrms)	Circuit Current 1 (mA)	Circuit Current 2 (mA)	Input Voltage (V)	Output Current Accuracy (%)	Output Duty Accuracy (%)	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BM66002FV-C	9 to 24	3.0 to 5.5	2,500	3.75	0.2	1.4 to 4.0	±2.0	±2.0	−40 to +125	SSOP-B20W	YES

Power Management

1 Channel Compact High Side Switch ICs

Part No.	Input Voltage (V)	ON Resistance (mΩ)	Control Input Logic	Output Current(A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	OCP	Thermal Shut Down	Flag Output Delay/ at Over Current (ms)	Discharge Resistance(Ω)	Package
BD6538G	2.7 to 5.5	150	H Active	0.5	0.5/−/1.0	1.0	Latch	Recovery	15	—	SSOP5
BD2220G	2.7 to 5.5	160	H Active	0.5	0.5/−/1.0	1.0	Latch	Recovery	15	—	SSOP5
BD2221G	2.7 to 5.5	160	L Active	0.5	0.5/−/1.0	1.0	Latch	Recovery	15	—	SSOP5
BD2224G	2.7 to 5.5	150	H Active	0.5	0.55/0.78/1.0	1.0	Recovery	Recovery	15	—	SSOP5
BD2225G	2.7 to 5.5	150	L Active	0.5	0.55/0.78/1.0	1.0	Recovery	Recovery	15	—	SSOP5
BD2226G	2.7 to 5.5	150	H Active	0.65	0.75/1.0/1.35	1.0	Recovery	Recovery	15	—	SSOP5
BD2227G	2.7 to 5.5	150	L Active	0.65	0.75/1.0/1.35	1.0	Recovery	Recovery	15	—	SSOP5
BD2232G	2.7 to 5.5	100	H Active	1.0	1.15/1.275/1.4	1.0	Recovery	Recovery	15	60	SSOP5
BD2233G	2.7 to 5.5	100	L Active	1.0	1.15/1.275/1.4	1.0	Recovery	Recovery	15	60	SSOP5
BD2240G	2.7 to 5.5	110	H Active	0.75	0.82/0.97/1.12	1.0	Recovery	Recovery	15	60	SSOP5
BD2241G	2.7 to 5.5	110	L Active	0.75	0.82/0.97/1.12	1.0	Recovery	Recovery	15	60	SSOP5
BD2246G	2.7 to 5.5	110	H Active	0.5	0.63/0.765/0.9	1.0	Recovery	Recovery	15	60	SSOP5
BD2247G	2.7 to 5.5	110	L Active	0.5	0.63/0.765/0.9	1.0	Recovery	Recovery	15	60	SSOP5
BD2248G	2.7 to 5.5	110	H Active	0.2	0.2/0.3/0.4	1.0	Recovery	Recovery	15	60	SSOP5
BD2222G*	2.8 to 5.5	90	H Active	1.5	0.2 to 1.7(adjustable)	0.6	Recovery	Recovery	7	—	SSOP6
BD2242G*	2.8 to 5.5	90	H Active	1.5	0.2 to 1.7(adjustable)	0.6	Recovery	Recovery	7	60	SSOP6
BD2243G*	2.8 to 5.5	90	L Active	1.5	0.2 to 1.7(adjustable)	0.6	Recovery	Recovery	7	60	SSOP6

Part No.	Input Voltage (V)	ON Resistance (mΩ)	Control Input Logic	Output Current (A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	OCP	Thermal Shut Down	Flag Output Delay/ at Over Current (ms)	Discharge Resistance (Ω)	Package	Automotive Grade AEC-Q100
BD22621G-M	2.7 to 5.5	120	H Active	0.15	0.18/0.30/0.42	1.0	Recovery	Recovery	15	60	SSOP5	YES
BD2262G-M	2.7 to 5.5	120	H Active	0.2	0.2/0.3/0.4	1.0	Recovery	Recovery	15	60	SSOP5	YES
BD22641G-M	2.7 to 5.5	120	H Active	0.5	0.57/0.76/0.96	1.0	Recovery	Recovery	15	60	SSOP5	YES
BD2264G-M	2.7 to 5.5	120	H Active	0.5	0.63/0.765/0.9	1.0	Recovery	Recovery	15	60	SSOP5	YES
BD2265G-M	2.7 to 5.5	120	L Active	0.5	0.63/0.765/0.9	1.0	Recovery	Recovery	15	60	SSOP5	YES
BD2266G-M	2.7 to 5.5	120	H Active	0.75	0.82/0.97/1.12	1.0	Recovery	Recovery	15	60	SSOP5	YES
BD2267G-M	2.7 to 5.5	120	L Active	0.75	0.82/0.97/1.12	1.0	Recovery	Recovery	15	60	SSOP5	YES
BD2268G-M	2.7 to 5.5	110	H Active	1.0	1.15/1.275/1.4	1.0	Recovery	Recovery	15	60	SSOP5	YES
BD2269G-M	2.7 to 5.5	110	L Active	1.0	1.15/1.275/1.4	1.0	Recovery	Recovery	15	60	SSOP5	YES
BD2244G-M*	2.8 to 5.5	100	H Active	1.5	0.2 to 1.7(adjustable)	0.6	Recovery	Recovery	7	60	SSOP6	YES
BD2245G-M*	2.8 to 5.5	100	L Active	1.5	0.2 to 1.7(adjustable)	0.6	Recovery	Recovery	7	60	SSOP6	YES

1 Channel Compact High Side Switch ICs(Industrial Equipment)

Part No.	Input Voltage (V)	ON Resistance (mΩ)	Control Input Logic	Output Current (A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	OCP	Thermal Shut Down	Flag Output Delay/ at Over Current (ms)	Discharge Resistance(Ω)	Package
BD6538G-LB	2.7 to 5.5	150	H Active	0.5	0.5/−/1.0	1.0	Latch	Recovery	15	—	SSOP5
BD2220G-LB	2.7 to 5.5	160	H Active	0.5	0.5/−/1.0	1.0	Latch	Recovery	15	—	SSOP5
BD2221G-LB	2.7 to 5.5	160	L Active	0.5	0.5/−/1.0	1.0	Latch	Recovery	15	—	SSOP5
BD2224G-LB	2.7 to 5.5	150	H Active	0.5	0.55/0.78/1.0	1.0	Recovery	Recovery	15	—	SSOP5
BD2225G-LB	2.7 to 5.5	150	L Active	0.5	0.55/0.78/1.0	1.0	Recovery	Recovery	15	—	SSOP5
BD2226G-LB	2.7 to 5.5	150	H Active	0.65	0.75/1.0/1.35	1.0	Recovery	Recovery	15	—	SSOP5
BD2227G-LB	2.7 to 5.5	150	L Active	0.65	0.75/1.0/1.35	1.0	Recovery	Recovery	15	—	SSOP5

*UL approved File No. E243261

1 Channel High Side Switch ICs												
Part No.	Input Voltage (V)	ON Resistance (mΩ)	Control Input Logic	Output Current (A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	OCF	Thermal Shut Down	Flag Output Delay/ at Over Current (ms)	Discharge Resistance (Ω)	Package	
BD2055AFJ	2.7 to 5.5	80	H Active	0.25	0.3/0.5/0.8	1.2	Recovery	Recovery	1.3	—	SOP-J8	
BD2045AFJ	2.7 to 5.5	80	L Active	0.25	0.3/0.5/0.8	1.2	Recovery	Recovery	1.3	—	SOP-J8	
BD6519FJ	3 to 5.5	100	L Active	0.5	0.7/1.1/1.6	1.0	Recovery	Recovery	2.5	—	SOP-J8	
BD2051AFJ	2.7 to 5.5	80	H Active	0.5	0.7/1.0/1.6	1.2	Recovery	Recovery	1.3	—	SOP-J8	
BD2041AFJ	2.7 to 5.5	80	L Active	0.5	0.7/1.0/1.6	1.2	Recovery	Recovery	1.3	—	SOP-J8	
BD82001FVJ	2.7 to 5.5	70	H Active	0.9	1.0/1.5/2.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	
BD82000FVJ	2.7 to 5.5	70	L Active	0.9	1.0/1.5/2.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	
BD2065AFJ	2.7 to 5.5	80	H Active	1.0	1.1/1.5/2.3	1.2	Recovery	Recovery	2.5	—	SOP-J8	
BD2061AFJ	2.7 to 5.5	80	L Active	1.0	1.1/1.5/2.3	1.2	Recovery	Recovery	2.5	—	SOP-J8	
BD82065FVJ	2.7 to 5.5	70	H Active	1.1	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	
BD82061FVJ	2.7 to 5.5	70	L Active	1.1	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	
BD82020FVJ*	2.8 to 5.5	90	H Active	1.1	1.1/1.5/2.0	0.4	Recovery	Recovery	12	75	TSSOP-B8J	
BD82021FVJ*	2.8 to 5.5	90	L Active	1.1	1.1/1.5/2.0	0.4	Recovery	Recovery	12	75	TSSOP-B8J	
BD82022FVJ*	2.8 to 5.5	90	H Active	1.5	1.5/2.0/2.6	0.4	Recovery	Recovery	12	75	TSSOP-B8J	
BD82023FVJ*	2.8 to 5.5	90	L Active	1.5	1.5/2.0/2.6	0.4	Recovery	Recovery	12	75	TSSOP-B8J	
BD82024FVJ*	2.8 to 5.5	90	H Active	2.1	2.1/2.5/3.3	0.4	Recovery	Recovery	12	75	TSSOP-B8J	
BD82025FVJ*	2.8 to 5.5	90	L Active	2.1	2.1/2.5/3.3	0.4	Recovery	Recovery	12	75	TSSOP-B8J	
BD82028FVJ*	4.5 to 5.5	72	H Active	0.5	0.6/1.0/1.2	0.3	Recovery	Recovery	13	75	TSSOP-B8J	
BD82029FVJ*	4.5 to 5.5	72	L Active	0.5	0.6/1.0/1.2	0.3	Recovery	Recovery	13	55	TSSOP-B8J	
BD82030FVJ*	4.5 to 5.5	72	H Active	1.0	1.05/1.5/1.8	0.3	Recovery	Recovery	13	55	TSSOP-B8J	
BD82031FVJ*	4.5 to 5.5	72	L Active	1.0	1.05/1.5/1.8	0.3	Recovery	Recovery	13	55	TSSOP-B8J	
BD82032FVJ*	4.5 to 5.5	72	H Active	1.5	1.55/2.0/2.3	0.3	Recovery	Recovery	13	55	TSSOP-B8J	
BD82033FVJ*	4.5 to 5.5	72	L Active	1.5	1.55/2.0/2.3	0.3	Recovery	Recovery	13	55	TSSOP-B8J	
BD82034FVJ*	4.5 to 5.5	72	H Active	2.0	2.05/2.5/2.8	0.3	Recovery	Recovery	13	55	TSSOP-B8J	
BD82035FVJ*	4.5 to 5.5	72	L Active	2.0	2.05/2.5/2.8	0.3	Recovery	Recovery	13	55	TSSOP-B8J	
BD82038FVJ*	2.7 to 5.5	72	H Active	0.5	0.60/1.00/1.20	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82039FVJ*	2.7 to 5.5	72	L Active	0.5	0.60/1.00/1.20	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82040FVJ*	2.7 to 5.5	72	H Active	1.0	1.05/1.50/1.80	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82041FVJ*	2.7 to 5.5	72	L Active	1.0	1.05/1.50/1.80	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82042FVJ*	2.7 to 5.5	72	H Active	1.5	1.55/2.00/2.30	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82043FVJ*	2.7 to 5.5	72	L Active	1.5	1.55/2.00/2.30	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82044FVJ*	2.7 to 5.5	72	H Active	2.0	2.05/2.50/2.80	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82045FVJ*	2.7 to 5.5	72	L Active	2.0	2.05/2.50/2.80	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82046FVJ*	2.7 to 5.5	72	H Active	2.5	2.70/3.20/3.80	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82047FVJ*	2.7 to 5.5	72	L Active	2.5	2.70/3.20/3.80	0.5	Recovery	Recovery	7	55	TSSOP-B8J	
BD82048QVZ	2.7 to 5.5	63	H Active	0.5	0.86/1.15/1.44	0.6	Recovery	Recovery	7	55	SMMP006Z2020	
BD82049QVZ	2.7 to 5.5	63	L Active	0.5	0.86/1.15/1.44	0.6	Recovery	Recovery	7	55	SMMP006Z2020	
BD82050QVZ	2.7 to 5.5	63	H Active	1.0	1.24/1.65/2.08	0.6	Recovery	Recovery	7	55	SMMP006Z2020	
BD82051QVZ	2.7 to 5.5	63	L Active	1.0	1.24/1.65/2.08	0.6	Recovery	Recovery	7	55	SMMP006Z2020	
BD82052QVZ	2.7 to 5.5	63	H Active	1.5	1.65/2.20/2.75	0.6	Recovery	Recovery	7	55	SMMP006Z2020	
BD82053QVZ	2.7 to 5.5	63	L Active	1.5	1.65/2.20/2.75	0.6	Recovery	Recovery	7	55	SMMP006Z2020	
BD82054QVZ	2.7 to 5.5	63	H Active	2.0	2.10/2.80/3.50	0.6	Recovery	Recovery	7	55	SMMP006Z2020	
BD82055QVZ	2.7 to 5.5	63	L Active	2.0	2.10/2.80/3.50	0.6	Recovery	Recovery	7	55	SMMP006Z2020	
Part No.	Input Voltage(V)	ON Resistance (mΩ)	Control Input Logic	Output Current (A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	OCF	Thermal Shut Down	Flag Output Delay/ at Over Current (ms)	Discharge Resistance (Ω)	Package	Automotive Grade AEC-Q100
BD82004FVJ-M	2.7 to 5.5	70	H Active	0.9	1.0/1.5/2.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	YES
BD82005FVJ-M	2.7 to 5.5	70	L Active	0.9	1.0/1.5/2.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	YES
BD82006FVJ-M	2.7 to 5.5	70	H Active	1.1	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	YES
BD82007FVJ-M	2.7 to 5.5	70	L Active	1.1	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	YES
1 Channel High Side Switch ICs(Industrial Equipment)												
Part No.	Input Voltage (V)	ON Resistance (mΩ)	Control Input Logic	Output Current (A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	OCF	Thermal Shut Down	Flag Output Delay/ at Over Current (ms)	Discharge Resistance (Ω)	Package	
BD82001FVJ-LB	2.7 to 5.5	70	H Active	0.9	1.0/1.5/2.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	
BD82000FVJ-LB	2.7 to 5.5	70	L Active	0.9	1.0/1.5/2.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	
BD82065FVJ-LB	2.7 to 5.5	70	H Active	1.1	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	
BD82061FVJ-LB	2.7 to 5.5	70	L Active	1.1	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	TSSOP-B8J	
2 Channel High Side Switch ICs												
Part No.	Input Voltage (V)	ON Resistance (mΩ)	Control Input Logic	Output Current (A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	OCF	Thermal Shut Down	Flag Output Delay/ at Over Current (ms)	Discharge Resistance (Ω)	Package	
BD2056AFJ	2.7 to 5.5	100	H Active	0.3	0.3/0.5/0.9	1.8	Recovery	Recovery	1.3	—	SOP-J8	
BD2046AFJ	2.7 to 5.5	100	L Active	0.3	0.3/0.5/0.9	1.8	Recovery	Recovery	1.3	—	SOP-J8	
BD6516F*	3.0 to 5.5	110	H Active	1.1	1.2/1.65/2.5	1.3	Recovery	Recovery	1	—	SOP8	
BD6517F*	3.0 to 5.5	110	L Active	1.1	1.2/1.65/2.5	1.3	Recovery	Recovery	1	—	SOP8	
BD2052AFJ	2.7 to 5.5	100	H Active	0.6	0.7/1.0/1.8	1.8	Recovery	Recovery	1.3	—	SOP-J8	
BD2042AFJ	2.7 to 5.5	100	L Active	0.6	0.7/1.0/1.8	1.8	Recovery	Recovery	1.3	—	SOP-J8	
BD2066FJ*	2.7 to 5.5	80	H Active	1.0	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	SOP-J8	
BD2062FJ*	2.7 to 5.5	80	L Active	1.0	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	SOP-J8	
Part No.	Input Voltage (V)	ON Resistance (mΩ)	Control Input Logic	Output Current (A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	OCF	Thermal Shut Down	Flag Output Delay/ at Over Current (ms)	Discharge Resistance (Ω)	Package	Automotive Grade AEC-Q100
BD2068FJ-M	2.7 to 5.5	80	H Active	1.0	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	SOP-J8	YES
BD2069FJ-M	2.7 to 5.5	80	L Active	1.0	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	SOP-J8	YES
2 Channel High Side Switch ICs(Industrial Equipment)												
Part No.	Input Voltage (V)	ON Resistance (mΩ)	Control Input Logic	Output Current(A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	OCF	Thermal Shut Down	Flag Output Delay/ at Over Current (ms)	Discharge Resistance (Ω)	Package	
BD2066FJ-LB*	2.7 to 5.5	80	H Active	1.0	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	SOP-J8	
BD2062FJ-LB*	2.7 to 5.5	80	L Active	1.0	1.5/2.4/3.0	0.8	Recovery	Recovery	15	—	SOP-J8	

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Load Switch ICs

Part No.	Input Voltage (V)	Current Consumption (μA)	ON Resistance (mΩ)	Number of Output channel(ch)	Control Input Logic	Output Current (A)	Over Current Detection(A) Min./Typ./Max.	Output Turn on Time (ms)	Thermal Shut Down	Discharge Resistance (Ω)	Package(mm)
BD6524HFV	3.0 to 5.5	50	200	1	H Active	0.5	—	0.4	—	200	HVSOF6
BD6528HFV	V _{DD} =2.7 to 4.5/ V _{RS} =0 to 2.7	20	110	1	H Active	0.5	—	0.5	—	70	HVSOF6
BD6529GUL	V _{DD} =2.7 to 4.5/ V _{RS} =0 to 2.7	20	100	1	H Active	0.5	—	0.5	—	70	VCSP50L1 1.0×1.5, H=0.55
BD2200GUL	2.7 to 5.5	20	100	1	H Active	0.5	—	1.0	—	70	VCSP50L1 1.0×1.5, H=0.55
BD2201GUL	2.7 to 5.5	20	100	1	H Active	1.0	—	1.0	—	70	VCSP50L1 1.0×1.5, H=0.55
BD2204GUL	V _{IN} =2.7 to 4.5/ V _{IN} =1.2 to 2.4	30	120	1	H Active	0.5	—	0.06	Recovery	80	VCSP50L1 1.0×1.5, H=0.55
BD2202G	2.7 to 3.6	70	150	1	H Active	0.2	0.25/—/1.0	1.2	Recovery	—	SSOP5
BD2206G	2.7 to 3.6	70	150	1	H Active	0.5	0.8/—/1.6	1.2	Recovery	—	SSOP5
BD6520F	3.0 to 5.5	110	50	1	H Active	2.0	—	2.0	Latch	350	SOP8
BD6522F	3.0 to 5.5	110	50	1	H Active	2.0	—	1.0	Latch	350	SOP8

Load Switch ICs(Industrial Equipment)

BD2202G-LB	2.7 to 3.6	70	150	1	H Active	0.2	0.25/—/1.0	1.2	Recovery	—	SSOP5
BD2206G-LB	2.7 to 3.6	70	150	1	H Active	0.5	0.8/—/1.6	1.2	Recovery	—	SSOP5

1 Channel Compact High Side Load Switch ICs

BUS1DJC0GWZ	1.1 to 5.0	0.35	63	1	H Active	2.0	—	0.012	—	80	UCSP30L1 0.8×0.8, H=0.35
BUS1DJC3GWZ	1.1 to 5.0	0.35	63	1	H Active	2.0	—	0.19	—	80	UCSP30L1 0.8×0.8, H=0.35

2 Channel Compact High Side Load Switch IC

BDS2EJAAGUL	3.0 to 3.6	0.2	45	2	H Active	1.0	1.0	— (Soft Start)	Recovery	30	VCSP50L1 1.95×1.0, H=0.55

Controller IC for High Side NMOSFET

Part No.	Input Voltage (V)	Current Consumption (μA)	Output Voltage(V)		Number of Output channel(ch)	Control Input Logic	Output Turn on Time (ms)	Discharge Resistance (Ω)	Package
			V _{CC} =3.3V	V _{CC} =5.0V					
BD2270HFV	2.7 to 5.5	50	9.5	13.5	1	H Active	0.13	200	HVSOF5

Controller IC for High Side NMOSFET(Industrial Equipment)

BD2270HFV-LB	2.7 to 5.5	50	9.5	13.5	1	H Active	0.13	200	HVSOF5

Wireless Power

Receiver ICs

Part No.	Wireless Power Standard	Output Power (W)	Output Voltage (V)	Input Voltage (V)	Output Current (A)	Operating Frequency(kHz)	Operating Temperature(°C)	Package (mm)
BD57011AGWL	WPC(Qi) v1.2	5	4.3 to 5.3	20	1.1	210	−20 to +85	UCSP50L3C 3.36×2.62, H=Max.0.57
BD57015GWL	WPC(Qi) v1.2 and PMA SR1	15	5.0 to 12.0	20	1.5	480	−30 to +85	UCSP50L4C 4.10×3.20, H=Max.0.57

Transmitter ICs

Part No.	Wireless Power Standard	Output Power (W)	Operating Temperature (°C)	Recommendation MCU	Package (mm)
BD57021MWV	WPC(Qi) v1.2	5	−20 to +85	ML610Q772	UQFN040V5050 5.0×5.0, H=Max.1.0
BD57020MWV	WPC(Qi) v1.2	15	−20 to +85	ML62Q1300/ML62Q1500	UQFN040V5050 5.0×5.0, H=Max.1.0

(LAPIS Semiconductor products)

Power Receiver LSI(13.56MHz Wireless Charge)

Part No.	Function Overview	Supply Voltage	Frequency Band (MHz)	Data Flash	Function	I/F	ADC (method)	Clock Source	Operating Temperature (°C)	Package	Halogen Free Support*1
ML7630	Power Receiving	Generated from magnetic field	0.2 to 6.78	1K	200mW Output Output Voltage setting	NFC Forum Type3 Tag i°C slave×1ch	10bit (SA type) ×3ch	—	−40 to +85	S-UFLGA34-2.59x2.59-0.4-W(WCSP34)	✓

Power Transmitter LSI(13.56MHz Wireless Charge)

Part No.	Function Overview	Supply Voltage	Frequency Band (MHz)	Data Flash	Function	I/F	ADC (method)	Clock Source	Operating Temperature (°C)	Package	Halogen Free Support*1
ML7631	Power Transmission	5	6.78	1K	Transmission Power Adjust Control	i°C slave×1ch	10bit (SA type) ×3ch	27.12MHz (Crystal)	−40 to +85	P-WQFN32-0505-0.50	✓

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Battery Management

Battery Charger ICs

Part No.	Supply Voltage (V)	ON Resistance (mΩ)	Charge Voltage (V)	Charge Current Accuracy(%)	Switching Frequency (kHz)	Operating Temperature(°C)	Package
BD8664GW	4.1 to 5.5	70	8.3±0.5%	± 2	1,000	−30 to +85	UCSP75M2
BD8665GW	4.1 to 5.5	70	8.4±0.5%	± 3	1,000	−30 to +85	UCSP75M2
BD8668GW	4.1 to 5.5	70	8.4±0.5%	± 3	1,000	−30 to +85	UCSP75M2
BD99950MUV	6.0 to 24.0	—	8.4/12.6±0.5%	± 3	600 to 1,200	−10 to +85	VQFN020PV3535
New BD99954GW	3.8 to 25.0	—	4.192/8.4/ 12.592/16.8±0.5%	± 2 to ± 40	600 to 1,200	−30 to +85	UCSP55M3C
New BD99954MWV	3.8 to 25.0	—	4.192/8.4/ 12.592/16.8±0.5%	± 2 to ± 40	600 to 1,200	−30 to +85	UQFN040V5050

Solar Charge Management IC

Part No.	Supply Voltage (V)	Charge Current (mA)	Switching Frequency (kHz)	Over Current Detection Level(A)	MPPT	Package (mm)
BU1840AMUV	0.625 to 1.980	400	160, 320	Min.3.0	✓	VQFN024V4040 4.1×4.1, H=Max.1.0

Charge Protection ICs

Standard Protection type

Part No.	Absolute Maximum Ratings(V)	Over Voltage Detection Level(V)	Under Voltage Detection Level(V)	Over Current Detection Level(A)	Ron (mΩ)	OK/FLGB PIN Logic			Package(mm)
						<UVLO	Normal	>OVLO	
BD6040GUL	+30	6.4 ± 0.2	2.65 ± 0.12	Min.1.2	125(Typ.)	H	L	H	VCSP50L1 1.6×1.6, H=Max.0.55
BD6041GUL	+30	5.85 ± 0.15	2.65 ± 0.12	Min.1.2	125(Typ.)	H	L	H	VCSP50L1 1.6×1.6, H=Max.0.55
BD6042GUL	+30	6.2 ± 0.2	2.65 ± 0.12	Min.1.2	125(Typ.)	H	L	H	VCSP50L1 1.6×1.6, H=Max.0.55
BD6044GUL	+36	6.4 ± 0.2	2.65 ± 0.12	Min.1.2	125(Typ.)	H	H	L	VCSP50L1 1.6×1.6, H=Max.0.55
BD6049GUL	+30	6.8 ± 0.17	2.65 ± 0.12	Min.1.2	125(Typ.)	H	H	L	VCSP50L1 1.6×1.6, H=Max.0.55
BD91409GW	+30	6.25 ± 0.15	3.125 ± 0.1	Min.2.0	75(Typ.)	—	—	—	UCSP75M2 2.8×2.8, H=Max.0.85

Negative Voltage Protection type

BD6046GUL	± 30	6.7 ± 0.2	3.6 ± 0.18	Min.1.2	250(Typ.)	H	H	L	VCSP50L2 2.5×2.5, H=Max.0.55
BD6047AGUL	± 30	5.85 ± 0.15	3.6 ± 0.18	Min.1.7	125(Typ.)	H	H	L	VCSP50L1 1.95×1.95, H=Max.0.55

Standard Protection type : Charger protection IC provides over voltage protection for charger IC. Built-in circuits include overvoltage lockout, overcurrent limit, undervoltage protection, internal start up delay, and status flag.

Negative Voltage Protection type : Addition to the conventional standard charge protection IC, it prevents the negative voltage happened by the USB reverse insertion without any additional components.

Cell Balance IC of Power Storage Element Cells

EDLC Cell Balance IC(4 to 6 series)

Part No.	Absolute Maximum Ratings(V)	Cell Voltage Detection Range VCB (V)	Over-voltage Detection Voltage 1(V)	Over-voltage Detection Voltage 2(V)	Shunt SW Ron (Ω)	Function			Package (mm)
						EN	OVLO	Stack IC	
BD14000EFV-C	+28	2.4 to 3.1V ± (1%) (0.1V/step usable)	VCB+0.15 or 0.25 (OVLOSEL = L or H)	VCB+0.3 or 0.5 (OVLOSEL = L or H)	1(Typ.)	✓	✓	✓	HTSOP-B30 10.0×7.6, H=Max.1.0

Li-ion Battery Monitoring LSI

(LAPIS Semiconductor products)

Stand-alone type

Part No.	Description	Supply Voltage (V)	Overvoltage Detection Error (Typ.)(mV)	FET Driver for Charge-Discharge Control	Cell Balancing Switch	Current Consumption (Typ.)(μA)		Overvoltage/Undervoltage Detection	Charge and Discharge Over-Current Detection	Temperature Detection	Short Circuit Detection	Open Wire Detection	Parameter Change	Operation Temperature (°C)	Package	Halogen Free Support ^{*1}
						Operating	Power-down									
ML5203	7-cells, cell voltage/current protection, cell voltage/current monitoring	+5 to +42	±25	NMOS	Internal (MCU Control)	30	0.1	✓	✓	—	—	—	Mask option	−40 to +85	P-SSOP30-56-0.65	—
ML5232	14-cells, 2nd protection	+7 to +80	±20	—	—	2.5	—	Overvoltage detection	—	—	—	—	Mask option	−40 to +105	P-TSSOP20-0225-0.65	✓
ML5233	10-cells, cell voltage/current/temperature protection, cascade connection	+5 to +60	±15	NMOS	—	25	0.1	✓	✓	✓	✓	—	Mask option	−40 to +85	P-LQFP32-0707-0.80	✓
ML5235	13-cells, cell voltage/current protection, cell voltage monitoring	+7 to +80	±25	NMOS	—	25	0.1	✓	✓	—	—	—	Mask option	−40 to +85	P-SSOP30-56-0.65	—
New ML5241	5-cells, 2nd protection	+5 to +25	±25	—	—	1	0.1	Overvoltage detection	—	—	—	✓	Mask option	−40 to +85	P-WSON10-0303-0.50	✓
New ML5243	5-cells, cell voltage/current/temperature protection	+5 to +25	±25	NMOS	—	6.5	0.1	✓	✓	✓	✓	✓	Mask option	−40 to +85	P-TSSOP20-0225-0.65	✓
New ML5245	13-cells, cell voltage/current/temperature protection, cell voltage monitoring	+7 to +80	±15	NMOS	—	25	0.1	✓	✓	✓	✓	—	Mask option	−40 to +85	P-SSOP30-56-0.65	—

MCU Control type

Part No.	Description	Supply Voltage (V)	Cell Voltage Measurement Error (Typ.)(mV)	Monitoring Output	FET Driver for Charge-Discharge Control	Cell Balancing Switch	Current Consumption(Typ.)		Overvoltage/Undervoltage Detection	Charge and Discharge Over-Current Detection	Short Circuit Detection	Parameter Change	Operation Temperature (°C)	Package	Halogen Free Support ^{*1}
							Operating	Power-down							
New ML5204	5-cells, analog monitoring output	+3.3 to +42	±25	cell voltage / current	—	internal	14μA	—	✓	✓	✓	Mask option	−40 to +85	P-TSSOP20-0225-0.65	✓
ML5238	16-cells, analog monitoring output	+7 to +80	±20	cell voltage/ current	NMOS	internal	50μA	0.1μA	—	—	✓	MCU control	−40 to +85	P-QFP44-910-0.80	—
ML5236	14-cells, ADC built-in, digital monitoring output	+8 to +64	±15	cell voltage/ current/temperature	High-side NMOS	internal	330μA	0.1μA	Overvoltage detection	—	✓	MCU control	−40 to +85	P-TQFP44-1010-0.80	✓
ML5239	16-cells, ADC built-in, cascade connection, digital monitoring output	+10 to +72	±10	cell voltage/ temperature	—	external	1.2mA	0.1μA	—	—	—	MCU control	−40 to +85	P-TQFP64-1010-0.50	✓
New ML5248	7-cells, analog monitoring output	+5 to +31.5	±20	cell voltage/ current	High-side NMOS	internal	32μA	0.1μA	✓	—	✓	MCU control	−40 to +85	P-SSOP30-56-0.65	—

Dedicated Controller

Part No.	Description	Supply Voltage(V)		AD Converter	Current Consumption (Typ.)(μA)			Package	Halogen Free Support ^{*1}
		V _{DD}	AV _{DD}		Operating	Suspended(HALT)	Shutdown		
ML610Q486P	nX-U8/100, 32KB Flash, 1KB RAM, master clock 500kHz	1.6 to 3.6	2.2 to 3.6	12bit, 4ch	400	15	0.2	TQFP48	✓
ML610Q488P	nX-U8/100, 48KB Flash with ECC, 2KB RAM, master clock 1MHz	1.8 to 3.6	2.2 to 3.6	10bit, 3ch	175	1.4	0.2	TQFP48	✓

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

General-purpose ICs

Voltage Detectors(Reset ICs)

Voltage Detectors(Reset ICs)

Voltage Detectors
(Reset ICs) ▶P.A64

Over Voltage Detectors
(Reset ICs) ▶P.A65

Voltage Detectors
with Adjustable Delay Time ▶P.A65

Voltage Detectors
with Built-in Delay Time ▶P.A65

Voltage Detectors
for Automotive ▶P.A66

Voltage Detectors
with Watchdog Timer ▶P.A66

Composite type Voltage Detectors
(2ch+Comparator) ▶P.A66

Voltage Detectors How to find part number

B D 4 8 K 2 5 5 F V E — M

Series

Series
Option

Voltage
Detection
Value

Reset Delay
Time

Package

Product Grade

48: Without Delay Time, Open-Drain Output type
49: Without Delay Time, CMOS Output type
45: Fixed Delay Time, Open-Drain Output type
46: Fixed Delay Time, CMOS Output type
52: Adjustable Delay Time, Open-Drain Output type
53: Adjustable Delay Time, CMOS Output type
47: Without Delay Time, Open-Collector Output type
(Bipolar)
71: Without Delay Time, Open-Drain Output type

E / None: SSOP5(SOT23-5)/
HVSOF5 / SOP4(SC82)
K: SSOP3(SOT23-3) 1pin:GND
L: SSOP3(SOT23-3) 3pin:GND

None: Without/
Adjustable Delay Time
5: 50ms
1: 100ms
2: 200ms
4: 400ms

G: SSOP5(SOT23-5)
SSOP3(SOT23-3)
FVE: VSOF5
F: SOP4(SC82)
HFV: HVSOF5

None: For Consumer
M: For Car Infotainment
C: For Car

Voltage Detectors(Reset ICs)

Voltage Detectors(Reset ICs)

Standard CMOS Voltage Detector ICs

Part No.	Types	Voltage Detection Precision (%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage (V)	*L*Output Current(mA)		Package					
							ON	OFF		V _{DD} =1.2V	V _{DD} =2.4V						
BD48ExxG series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.0	0.1	Open Drain	0.60 (V _s =4.8V)	0.85 (V _s =4.8V)	V _s ×0.05	1	4	SSOP5					
BD48xxFVE series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.0	0.1							VSOFF5					
BD48KxxG series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.0	0.1							SSOP3(GND 1pin)					
BD48LxxG series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.0	0.1							SSOP3(GND 3pin)					
BD49ExxG series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.0	0.1	CMOS						0.60 (V _s =4.8V)	0.85 (V _s =4.8V)	V _s ×0.05	1	4	SSOP5
BD49xxFVE series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.0	0.1												VSOFF5
BD49KxxG series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.0	0.1												SSOP3(GND 1pin)
BD49LxxG series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.0	0.1												SSOP3(GND 3pin)

Detection voltage(from 2.3V to 6.0V as 0.1V step) is applied in the xx of part No. Ex : In case of 2.3V detection voltage in BD48ExxG series, part No. is BD48E23G.

Voltage Detector ICs(Low Voltage Detection type)

Part No.	Types	Voltage detection Precision at Ta=+25°C (%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage (V)	*L"Output Current(mA)		Package
							ON	OFF		V _{DD} =1.2V	V _{DD} =2.4V	
BU48xxG series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1	Open Drain	0.40 (V _{DET} =4.8V)	0.55 (V _{DET} =4.8V)	V _{DET} × 0.05	3.3	6.5	SSOP5
BU48xxFVE series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1							VSO5
BU48xxF series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1							SOP4
BU49xxG series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1	CMOS	0.40 (V _{DET} =4.8V)	0.55 (V _{DET} =4.8V)	V _{DET} × 0.05	3.3	6.5	SSOP5
BU49xxFVE series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1							VSO5
BU49xxF series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1							SOP4

Bipolar Voltage Detector IC

Part No.	Types	Voltage detection Precision at Ta=+25°C (%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage (mV)	*L"Output Current (mA)	Package
							I _{CLL}	I _{CH}			
BD47xxG series	0.1V step 28 type	±1	1.9 to 4.6	0.85 to 10.00	0.1	Open Collector	1.5	1.6	50	15	SSOP5

Voltage Detector ICs (Low Voltage Detection Type): *Detection voltage (from 0.9V to 4.8V as 0.1V step) is applied in the xx of part No.. Ex : In case of 2.3V detection voltage in BU48xxG series, part No. is BU4823G.
Bipolar Voltage Detector ICs : *Detection voltage(from 1.9V to 4.6V as 0.1V step) is applied in the xx of part No. Ex : In case of 2.3V detection voltage in BD47xxG series, part No. is BD4723G.

Over Voltage Detectors(Reset ICs)

Over Voltage Detector ICs

Part No.	Types	Voltage Detection Precision at Ta=+25°C(%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage (mV)	*L"Output Current (mA)	Package
							I _{CLL}	I _{CH}			
BD71L4LG-1	±0.8	4.05	1.2 to 7.0	—	Open Drain	0.6	0.7	30	4 (V _{DD} =4.25V)	4 (V _{DD} =4.25V)	SSOP5
BD71L4LHFV-1	±0.8	4.05	1.2 to 7.0	—							HVSOF5
New BD71L3SHFV	±1.0	3.83	1.2 to 7.0	—							HVSOF5

Over Voltage Detector ICs(125°C Automotive Grade AEC-Q100 Corresponding)

Part No.	Types	Voltage Detection Precision Within The All Temperature (%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage (V)	*L"Output Current(mA) V _{DD} =1.2V	Package	Automotive Grade AEC-Q100
							ON	OFF				
 BD70HxxG-2C series	0.1V step 4 type	±1.4	3.46 to 3.76	0.8 to 6.0	0.1	Open Drain	0.27	0.3	—	1.0mA or more	SSOP5	YES
 BD73HxxG-2C series	0.1V step 4 type		3.46 to 3.76	0.8 to 6.0	0.1	CMOS					SSOP5	YES

* : Detection voltage is applied in the xx of part No. Please see the Data sheet specifications.

Voltage Detectors with Adjustable Delay Time

Voltage Detectors with Adjustable Delay Time

Part No.	Types	Voltage detection Precision at Ta=+25°C (%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage(V)	*L"Output Current (mA)		RESET Active Timeout Period (ms)	Delay Circuit Resistance (MΩ)	Package
							ON	OFF		V _{DD} =1.2V	V _{DD} =2.4V			
BD52ExxG series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.00	0.1	Open Drain	0.90 (V _{DET} =4.8V)	0.85 (V _{DET} =4.8V)	V _{DET} × 0.05	1.2	5.0	Variable	9	SSOP5
BD52xxFVE series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.00	0.1		0.90 (V _{DET} =4.8V)	0.85 (V _{DET} =4.8V)	V _{DET} × 0.05	1.2	5.0	Variable	9	VSO5
BD53ExxG series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.00	0.1	CMOS	0.90 (V _{DET} =4.8V)	0.85 (V _{DET} =4.8V)	V _{DET} × 0.05	1.2	5.0	Variable	9	SSOP5
BD53xxFVE series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.00	0.1		0.90 (V _{DET} =4.8V)	0.85 (V _{DET} =4.8V)	V _{DET} × 0.05	1.2	5.0	Variable	9	VSO5

Voltage Detectors with Adjustable Delay Time(Low Voltage Detection type)

Part No.	Types	Voltage detection Precision at Ta=+25°C (%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage(V)	*L"Output Current (mA)		RESET Active Timeout Period (ms)	Delay Circuit Resistance (MΩ)	Package
							ON	OFF		V _{DD} =1.2V	V _{DD} =2.4V			
BU42xxG series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1	Open Drain	0.40 (V _{DET} =4.8V)	0.55 (V _{DET} =4.8V)	V _{DET} × 0.05	3.3	6.5	Variable	10	SSOP5
BU42xxFVE series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1							Variable	10	VSO5
BU42xxF series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1							Variable	10	SOP4
BU43xxG series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1	CMOS	0.40 (V _{DET} =4.8V)	0.55 (V _{DET} =4.8V)	V _{DET} × 0.05	3.3	6.5	Variable	10	SSOP5
BU43xxFVE series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1							Variable	10	VSO5
BU43xxF series	0.1V step 40 type	±1	0.9 to 4.8	0.7 to 7.0	0.1							Variable	10	SOP4

Voltage Detector with Adjustable Delay Time(SENSE type)

Part No.	Voltage Detection Precision at Ta=+25°C(%)	Voltage Detection (V)	Power Supply Voltage (V)	Output type	Circuit Current (μA)	Hysteresis Voltage(V)	Output ON Resistance (Ω)	RESET Active Timeout Period (ms)	Package
BD4142HFV	±1.8	0.5	3.0 to 5.5	Open Drain	7.5	0.01	100	Variable	HVSOF5

Voltage Detectors with Adjustable Delay Time : Detection voltage(from 2.3V to 6.0V as 0.1V step) is applied in the xx of part No. Ex : In case of 2.3V detection voltage in BD52ExxG series, part No. is BD5223G.

Voltage Detectors with Adjustable Delay Time(Low Voltage Detection type) : Detection voltage(from 0.9V to 4.8V as 0.1V step) is applied in the xx of part No. Ex : In case of 2.3V detection voltage in BU42xxG series, part No. is BU4223G.

Voltage Detectors with Built-in Delay Time

Voltage Detectors with Built-in Delay Time(Open Drain Output type)

Part No.	Types	Voltage Detection Precision (%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage (V)	*L"Output current(mA)		RESET Active Timeout Period (ms)	Manual Reset PIN	Package
							ON	OFF		V _{DD} =1.2V	V _{DD} =2.4V			
BD45xx5G series	0.1V step 26 type	±1	2.3 to 4.8	0.95 to 10.00	0.1	Open Drain	0.80 (V _{DET} =4.8V)	0.85 (V _{DET} =4.8V)	V _{DET} × 0.05	1.2	5.0	50	YES	SSOP5
BD45xx1G series	0.1V step 26 type	±1	2.3 to 4.8	0.95 to 10.00	0.1							100	YES	SSOP5
BD45xx2G series	0.1V step 26 type	±1	2.3 to 4.8	0.95 to 10.00	0.1							200	YES	SSOP5
BU45Kxx2G series	0.1V step 26 type	±1	2.3 to 4.8	0.6 to 10.0	0.1		2.3 (V _{DET} =4.8V)	2.8 (V _{DET} =4.8V)				200	NO	SSOP3(GND 1pin)
BU45Lxx2G series	0.1V step 26 type	±1	2.3 to 4.8	0.6 to 10.0	0.1							200	NO	SSOP3(GND 3pin)
BU45Kxx4G series	0.1V step 26 type	±1	2.3 to 4.8	0.6 to 10.0	0.1							400	NO	SSOP3(GND 1pin)
BU45Lxx4G series	0.1V step 26 type	±1	2.3 to 4.8	0.6 to 10.0	0.1							400	NO	SSOP3(GND 3pin)

Detection voltage(from 2.3V to 4.8V as 0.1V step) is applied in the xx of part No.. Ex : In case of 2.3V detection voltage in BD45xx5G series, part No. is BD45235G.

Voltage Detectors with Built-in Delay Time(CMOS Output type)

Part No.	Types	Voltage Detection Precision (%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage (V)	*L*Output current(mA)		RESET Active Timeout Period (ms)	Manual Reset PIN	Package
							ON	OFF		V _{DD} =1.2V	V _{DD} =2.4V			
BD46xx5G series	0.1V step 26 type	±1	2.3 to 4.8	0.95 to 10.00	0.1	CMOS	0.80 (V _{DET} =4.8V)	0.85 (V _{DET} =4.8V)	V _{DET} ×0.05	1.2	5.0	50	YES	SSOP5
BD46xx1G series	0.1V step 26 type	±1	2.3 to 4.8	0.95 to 10.00	0.1							100	YES	SSOP5
BD46xx2G series	0.1V step 26 type	±1	2.3 to 4.8	0.95 to 10.00	0.1							200	YES	SSOP5
BU46Kxx2G series	0.1V step 26 type	±1	2.3 to 4.8	0.6 to 10.0	0.1		2.3 (V _{DET} =4.8V)	2.8 (V _{DET} =4.8V)				200	NO	SSOP3(GND 1pin)
BU46Lxx2G series	0.1V step 26 type	±1	2.3 to 4.8	0.6 to 10.0	0.1							200	NO	SSOP3(GND 3pin)
BU46Kxx4G series	0.1V step 26 type	±1	2.3 to 4.8	0.6 to 10.0	0.1							400	NO	SSOP3(GND 1pin)
BU46Lxx4G series	0.1V step 26 type	±1	2.3 to 4.8	0.6 to 10.0	0.1							400	NO	SSOP3(GND 3pin)

Detection voltage(from 2.3V to 4.8V as 0.1V step) is applied in the xx of part No.. Ex : In case of 2.3V detection voltage in BD46xx5G series, part No. is BD46235G.

Voltage Detectors for Automotive

105°C Corresponding

Part No.	Types	Voltage Detection Precision at T _a =25°C (%)	Voltage Detection (V)	RESET Active Voltage (V)	Detection Step (V)	Output type	Circuit Current(μA)		Hysteresis Voltage (V)	*L*Output Current (mA)		RESET Active Timeout Period (ms)	Delay Circuit Resistance (MΩ)	Manual Reset PIN	Package	Automotive Grade AEC-Q100
							ON	OFF		V _{DD} =1.2V	V _{DD} =2.4V					
BD48ExxG-M series	0.1V step 38 type	±1	2.3 to 6.0	0.95 to 10.00	0.1	CMOS	0.60 (V _S =4.8V)	0.85 (V _S =4.8V)	V _S × 0.05	1.0	4	—	—	NO	SSOP5	YES
BD49ExxG-M series	0.1V step 38 type		2.3 to 6.0	0.95 to 10.00	0.1							—	—	NO	SSOP5	YES
BD45Exx5G-M series	0.1V step 26 type		2.3 to 4.8	0.95 to 10.00	0.1							50	—	YES	SSOP5	YES
BD45Exx1G-M series	0.1V step 26 type		2.3 to 4.8	0.95 to 10.00	0.1							100	—	YES	SSOP5	YES
BD45Exx2G-M series	0.1V step 26 type		2.3 to 4.8	0.95 to 10.00	0.1							200	—	YES	SSOP5	YES
BD46Exx5G-M series	0.1V step 26 type		2.3 to 4.8	0.95 to 10.00	0.1							50	—	YES	SSOP5	YES
BD46Exx1G-M series	0.1V step 26 type		2.3 to 4.8	0.95 to 10.00	0.1							100	—	YES	SSOP5	YES
BD46Exx2G-M series	0.1V step 26 type		2.3 to 4.8	0.95 to 10.00	0.1							200	—	YES	SSOP5	YES
BD52xxG-2M series	0.1V step 42 type	±2.5 (All Temperature)	0.9 to 5.0	0.8 to 6.0	0.1	Open Drain	0.23	0.27	V _{DET} × 0.05	1.0mA or more	2.0mA or more	Variable	± 30% (All Temperature)	NO	SSOP5	YES
BD53xxG-2M series	0.1V step 42 type		0.9 to 5.0	0.8 to 6.0	0.1	CMOS						Variable		NO	SSOP5	YES

125°C Corresponding

Part No.	Types	Voltage Detection Precision Within The All Temperature (%)	Voltage Detection (V)	RESET Active Voltage Range (V)	Detection step(V)	Output type	Circuit current(μA)		Hysteresis Voltage (V)	*L*Output current (mA)		RESET Active Timeout Period(ms)	Delay Time Precision (%)	Manual Reset PIN	Package	Automotive Grade AEC-Q100
							ON	OFF		V _{DD} =1.2V	V _{DD} =2.4V					
BD52xxG-2C series	0.1V step 42 type	±3	0.9 to 5.0	0.8 to 6.0	0.1	Open Drain	0.23	0.27	V _{DET} × 0.05	1.0mA or more	2.0mA or more	Variable	±50 (All Temperature)	NO	SSOP5	YES
BD53xxG-2C series	0.1V step 42 type		0.9 to 5.0	0.8 to 6.0	0.1	CMOS						Variable		NO	SSOP5	YES
New BD52xxNVX-2C series	0.1V step 6 type	±2.5	2.6 to 3.1	0.8 to 6.0	0.1	Open Drain						Variable		NO	SSON004R1010	YES
New BD70HxxG-2C series	0.1V step 4 type	±1.4	3.46 to 3.76	0.8 to 6.0	0.1	Open Drain	0.27	0.3	—			—	—	NO	SSOP5	YES
New BD73HxxG-2C series	0.1V step 4 type		3.46 to 3.76	0.8 to 6.0	0.1	CMOS						—		NO	SSOP5	YES

Detection voltage is applied in the "xx" of part No. Ex. : In case of 2.3V detection voltage in BD48ExxG-M series, Part No. is BD48E23G-M.

Others

Voltage Detectors with Watchdog Timer

Part No.	Voltage Detection Precision (%)	Voltage Detection (V)	RESET Active Voltage (V)	Output type	Circuit Current(μA)	Hysteresis Voltage (V)	*L*Output Current(mA)		RESET Active Timeout Period	Delay Circuit Resistance (MΩ)	WDT Active Voltage (V)	INH Mode (Active)	Package
					ON		V _{DD} =1.2V	V _{DD} =0.5V					
BD37A19FVM	±1.5	1.9	1.0 to 10.0	Open Drain	5	V _{DET} × 0.13	0.7	Variable	10	2.5 to 10.0		H	MSOP8
BD37A41FVM	±1.5	4.1	1.0 to 10.0			V _{DET} × 0.035						H	MSOP8
BD87A28FVM	±1.5	2.8	1.0 to 10.0			V _{DET} × 0.045						L	MSOP8
BD87A29FVM	±1.5	2.9	1.0 to 10.0			V _{DET} × 0.05						L	MSOP8
BD87A34FVM	±1.5	3.4	1.0 to 10.0									L	MSOP8
BD87A41FVM	±1.5	4.1	1.0 to 10.0			V _{DET} × 0.035						L	MSOP8
BD99A41F	±1.5	4.1	1.0 to 10.0									H	SOP8

Composite type Voltage Detector(2ch+Comparator)

Part No.	Voltage Detection Precision (%)	Voltage Detection (V)	Output type	Circuit Current(μA) V _{SS} =5V	Hysteresis Voltage (mV)	RESET Active Timeout Period	Input Voltage (V)	Package
BD3775AF	±1.5	1.23	Open Collector + Constant Current Pull Up	350	28	Variable	3.5 to 18.0	SOP8



Motor / Actuator Drivers

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DC Brush Motor Drivers

7V Max. H-Bridge Drivers

Part No.	ch	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage(V)		Output ON Resistance (Ω Typ.)	Output Modes	Package
				H Level	L Level			
BD6210F	1	3.0 to 5.5	0.5	2.0 or more	0.8 or less	1.0	Forward/Reverse/Standby(Ide)/Brake	SOP8
BD6210HFP								HRP7
BD6211F			1.0			1.0		SOP8
BD6211HFP								HRP7
BD6212FP			2.0			0.5		HSOP25
BD6212HFP								HRP7

18V Max. H-Bridge Drivers

BD6220F	1	6.0 to 15.0	0.5	2.0 or more	0.8 or less	1.5	Forward/Reverse/Standby(Ide)/Brake	SOP8
BD6221F			1.0			1.5		SOP8
BD6222FP			2.0			1.0		HSOP25
BD6222HFP								HRP7
BD6225FP	2		0.5			1.5		HSOP25
BD6226FP			1.0			1.5		HSOP25

36V Max. H-Bridge Drivers

BD6230F	1	6.0 to 32.0	0.5	2.0 or more	0.8 or less	1.5	Forward/Reverse/Standby(Ide)/Brake	SOP8
BD6231F			1.0			1.5		SOP8
BD6231HFP								HRP7
BD6232FP			2.0			1.0		HSOP25
BD6232HFP								HRP7
BD6236FP	2		1.0			1.5		HSOP25
BD6236FM								HSOP-M28
BD6237FM			2.0			1.0		HSOP-M28
New BD62105AFVM	1	8.0 to 28.0	0.5			1.8		MSOP8
New BD62110AEFJ			1.0					HTSOP-J8
New BD62120AEFJ			2.0			0.65		HTSOP-J8

Part No.	Supply Voltage (V)	Output Current (A)	Output Current Peak (A)	Circuit Current (mA)	Input Threshold Voltage(V)		Output ON Resistance (Ω)	Package
					H Level	L Level		
BD62210AEFV	8.0 to 28.0	1.0	1.5	2.5	2.0	0.8	1.9	HTSSOP-B28
BD62220AEFV	8.0 to 28.0	2.0	2.8	2.5	2.0	0.8	0.65	HTSSOP-B28

40V Max. H-Bridge Drivers

Part No.	Maximum Voltage (V)	Supply Voltage (V)	Output Current (A)	ch	Output ON Resistance (Upper + Lower) (Ω Typ.)	Output Modes	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BD16950EFV-C	40	5.5 to 40.0	—	1	—	Available to select High, Low or Hi-Z Output by each Output terminal.	−40 to +125	HTSSOP-B24	YES
BD16938EFV-C	40	6.3 to 32.0	1.0	4 (Half 8ch)	1.4	Available to select High, Low or Hi-Z Output by each Output terminal.	−40 to +125	HTSSOP-B28	YES
BD16939EFV-C	40	6.3 to 32.0	1.0	3 (Half 6ch)	1.35	Available to select High, Low or Hi-Z Output by each Output terminal.	−40 to +125	HTSSOP-B28	YES
New BD16912EFV-C	40	6.0 to 18.0	3.0	1	0.36	Forward/Reverse/Standby/Brake	−40 to +125	HTSSOP-B20	YES

50V Max. H-Bridge Drivers

Part No.	ch	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage(V)		Output ON Resistance (Ω Typ.)	Output Modes	Package
				H Level	L Level			
New BD63130AFM	1	8.0 to 46.2	3.0	2.0 or more	0.8 or less	0.55	Forward/Reverse/Standby(Ide)/Brake	HSOP-M36
New BD63150AFM			5.0			0.3		HSOP-M36

60V Max. H-Bridge Drivers

Part No.	Maximum Voltage (V)	Supply Voltage (V)	Output Current (A)	ch	Output ON Resistance (Upper + Lower) (Ω Typ.)	Output Modes	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BD16933EFV-C	60	7.0 to 36.0	1.0	1.5 (Half 3ch)	1.81	Available to select High, Low or Hi-Z Output by each Output terminal.	−40 to +125	HTSSOP-B20	YES
BD16922EFV-M	60	8.0 to 36.0	1.0	2	2.25	Forward/Reverse/Standby/Brake	−40 to +110	HTSSOP-B24	YES

H-Bridge Driver High-Current

Part No.	ch	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage(V)		Output ON Resistance (Ω Typ.)	Output Modes	Package
				H Level	L Level			
BD62321HFP	1	6.0 to 32.0	3.0	2.0 or more	0.8 or less	1.0	Forward/Reverse/Standby(Ide)/Brake	HRP7

H-Bridge Drivers High-Speed series								
Part No.	ch	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage(V)		Output ON Resistance (Ω Typ.)	Output Modes	Package
				H Level	L Level			
BD65491FV	1	1.8 to 16.0	1.2 Peak 4	1.45 or more	0.5 or less	0.35	Forward/Reverse/ Standby(Idle)/ Brake	SSOP-B16
BD65492MUV	2	1.8 to 16.0	1.0	1.45 or more	0.5 or less	0.9		VQFN024V4040
BD65494MUV	1	2.0 to 9.0	1.0 peak 2.5	2.0 or more	0.7 or less	0.55		VQFN016V3030
BD65496MUV	1	1.8 to 16.0	1.2 peak 5	1.45 or more	0.5 or less	0.35		VQFN024V4040
BD6376GUL	1	2.0 to 9.0	1.0	2.0 or more	0.7 or less	0.45		VCSP50L1
BD6736FV	1	2.0 to 9.0	1.0 peak 3.2	2.0 or more	0.7 or less	0.35		SSOP-B20
BD6735FV	2	2.0 to 8.0	1.0	2.0 or more	0.7 or less	1.0		SSOP-B20
BD63565EFV	2	1.8 to 16.0	1.0	1.45 or more	0.5 or less	0.9		HTSSOP-B20
BD63573NUV	1	2.0 to 16.0	1.2 peak 3.2	1.45 or more	0.5 or less	0.38		VSON010V3030
1.0A Reversible Motor Drivers(Single Motor)								
Part No.	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage(V)		Output Saturation Voltage (V Typ.)	Output Operation Modes	Package	
			H Level	L Level				
BA6287F	4.5 to 15.0	1.0	2.0 or more	0.8 or less	1 (I _o =0.2A)	Forward/Reverse/ Idle/Brake	SOP8	
BA6285FS	4.5 to 15.0	1.0	2.0 or more	0.8 or less	1 (I _o =0.2A)		SSOP-A16	
BA6285AFP-Y	4.5 to 24.0	1.0	2.0 or more	0.8 or less	1 (I _o =0.2A)		HSOP25	
BA6920FP-Y	6.5 to 34.0	1.0	3.0 or more	0.8 or less	2.2 (I _o =0.02A)		HSOP25	
2.0A or More Reversible Motor Driver(Single Motor)								
Part No.	Supply Voltage (V)	Output Current (A)	Input Threshold Voltage(V)		Output Saturation Voltage (V Typ.)	Output Modes	Package	
			H Level	L Level				
BA6219BFP-Y	8 to 18	2.2	3.0 or more	1.0 or less	2.4 (I _o =0.4A)	Forward/Reverse/ Idle/Brake	HSOP25	
1.0A or More Reversible Motor Driver(2 Motors)								
BA6247FP-Y	8 to 18	1.0	3.5 or more	1.0 or less	2.4 (I _o =0.5A)	Forward/Reverse/ Brake	HSOP25	

Stepper Motor Drivers

High Performance, High Reliability 36V Stepper Motor Drivers For PCs, MFPs, Industrial equipments etc.

BD63730EFV	CLK IN	PARA IN	1.0A	3.0A	1/2STEP	1/4STEP	1/8STEP	1/16STEP	1/32STEP	1/64STEP	1/128STEP	1/256STEP	1/512STEP	1/1024STEP	1/2048STEP	1/4096STEP	1/8192STEP	1/16384STEP	1/32768STEP	1/65536STEP	1/131072STEP	1/262144STEP	1/524288STEP	1/1048576STEP	1/2097152STEP	1/4194304STEP	1/8388608STEP	1/16777216STEP	1/33554432STEP	1/67108864STEP	1/134217728STEP	1/268435456STEP	1/536870912STEP	1/1073741824STEP	1/2147483648STEP	1/4294967296STEP	1/8589934592STEP	1/17179869184STEP	1/34359738368STEP	1/68719476736STEP	1/137438953472STEP	1/274877906944STEP	1/549755813888STEP	1/1099511627776STEP	1/2199023255552STEP	1/4398046511104STEP	1/8796093022208STEP	1/17592186044416STEP	1/35184372088832STEP	1/70368744177664STEP	1/140737488355328STEP	1/281474976710656STEP	1/562949953421312STEP	1/1125899906842624STEP	1/2251799813685248STEP	1/4503599627370496STEP	1/9007199254740992STEP	1/18014398509481984STEP	1/36028797018963968STEP	1/72057594037927936STEP	1/144115188075855872STEP	1/288230376151711744STEP	1/576460752303423488STEP	1/1152921504606846976STEP	1/2305843009213693952STEP	1/4611686018427387904STEP	1/9223372036854775808STEP	1/18446744073709551616STEP	1/36893488147419103232STEP	1/73786976294838206464STEP	1/147573952589676412928STEP	1/295147905179352825856STEP	1/590295810358705651712STEP	1/1180591620717411303424STEP	1/2361183241434822606848STEP	1/4722366482869645213696STEP	1/9444732965739290427392STEP	1/18889465931478580854784STEP	1/37778931862957161709568STEP	1/75557863725914323419136STEP	1/151115727451828646838272STEP	1/302231454903657293676544STEP	1/604462909807314587353088STEP	1/1208925819614629174706176STEP	1/2417851639229258349412352STEP	1/4835703278458516698824704STEP	1/9671406556917033397649408STEP	1/19342813113834066795298816STEP	1/38685626227668133590597632STEP	1/77371252455336267181195264STEP	1/154742504910672534362390528STEP	1/309485009821345068724781056STEP	1/618970019642690137449562112STEP	1/1237940039285380274899124224STEP	1/2475880078570760549798248448STEP	1/4951760157141521099596496896STEP	1/9903520314283042199192993792STEP	1/19807040628566084398385987584STEP	1/39614081257132168796771975168STEP	1/79228162514264337593543950336STEP	1/158456325028528675187087900672STEP	1/316912650057057350374175801344STEP	1/633825300114114700748351602688STEP	1/1267650600228229401496703205376STEP	1/2535301200456458802993406410752STEP	1/5070602400912917605986812821504STEP	1/10141204801825835211973625643008STEP	1/20282409603651670423947251286016STEP	1/40564819207303340847894502572032STEP	1/81129638414606681695789005144064STEP	1/162259276829213363391578010288128STEP	1/324518553658426726783156020576256STEP	1/649037107316853453566312041152512STEP	1/1298074214633706907132624082305024STEP	1/2596148429267413814265248164610048STEP	1/5192296858534827628530496329220096STEP	1/10384593717069655257060992658440192STEP	1/20769187434139310514121985316880384STEP	1/41538374868278621028243970633760768STEP	1/83076749736557242056487941267521536STEP	1/166153499473114484112975882535043072STEP	1/332306998946228968225951765070086144STEP	1/664613997892457936451903530140172288STEP	1/1329227995784915872903807060280344576STEP	1/2658455991569831745807614120560689152STEP	1/5316911983139663491615228241121378304STEP	1/10633823966279326983230456482242756608STEP	1/21267647932558653966460912964485513216STEP	1/42535295865117307932921825928971026432STEP	1/85070591730234615865843651857942052864STEP	1/170141183460469231731687303715884105728STEP	1/340282366920938463463374607431768211456STEP	1/680564733841876926926749214863536422912STEP	1/1361129467683753853853498429727072845824STEP	1/2722258935367507707706996859454145691648STEP	1/5444517870735015415413993718908291383296STEP	1/10889035741470030830827987437816582766592STEP	1/21778071482940061661655974875633165533184STEP	1/43556142965880123323311949751266331066368STEP	1/87112285931760246646623899502532662132736STEP	1/174224571863520493293247799005065324265472STEP	1/348449143727040986586495598010130648530944STEP	1/696898287454081973172991196020261297061888STEP	1/1393796574908163946345982392040522594123776STEP	1/2787593149816327892691964784081045188247552STEP	1/5575186299632655785383929568162090376495104STEP	1/11150372599265311570767859136324180752990208STEP	1/22300745198530623141535718272648361505980416STEP	1/44601490397061246283071436545296723011960832STEP	1/89202980794122492566142873090593446023921664STEP	1/178405961588244985132285746181186892047843328STEP	1/356811923176489970264571492362373784095686656STEP	1/713623846352979940529142984724747568191373312STEP	1/1427247692705959881058285969449495136382746624STEP	1/2854495385411919762116571938898990272765493248STEP	1/5708990770823839524233143877797980545530986496STEP	1/11417981541647679048466287755595961091061972992STEP	1/22835963083295358096932575511191922182123945984STEP	1/45671926166590716193865151022383844364247891968STEP	1/91343852333181432387730302044767688728495783936STEP	1/182687704666362864775460604089535377456991567872STEP	1/365375409332725729550921208179070754913983135744STEP	1/730750818665451459101842416358141509827966271488STEP	1/1461501637330902918203684832716283019655932542976STEP	1/2923003274661805836407369665432566039311865085952STEP	1/5846006549323611672814739330865132078623730171904STEP	1/11692013098647223345629478661730264157247460343808STEP	1/23384026197294446691258957323460528314494920687616STEP	1/46768052394588893382517914646921056628989841375232STEP	1/93536104789177786765035829293842113257979682750464STEP	1/187072209578355573530071658587684226515959365500928STEP	1/374144419156711147060143317175368453031918731001856STEP	1/748288838313422294120286634350736906063837462003712STEP	1/1496577676626844588240573268701473812127674924007424STEP	1/2993155353253689176481146537402947624255349848014848STEP	1/5986310706507378352962293074805895248510699696029696STEP	1/11972621413014756705924586149611790497021399392059392STEP	1/23945242826029513411849172299223580994042798784118784STEP	1/47890485652059026823698344598447161988085597568237568STEP	1/95780971304118053647396689196894323976171195136475136STEP	1/191561942608236107294793378393788647952342390272950272STEP	1/383123885216472214589586756787577295904684780545900544STEP	1/766247770432944429179173513575154591809369561091801088STEP	1/1532495540865888858358347027150309183618739122183602176STEP	1/3064991081731777716716694054300618367237478244367204352STEP	1/6129982163463555433433388108601236734474956488734408704STEP	1/12259964326927110866866776217202473468949912977468817408STEP	1/24519928653854221733733552434404946937899825954937634816STEP	1/49039857307708443467467104868809893875799651909875269632STEP	1/98079714615416886934934209737619787751599303819750539264STEP	1/196159429230833773869868419475239575503198607639501078528STEP	1/392318858461667547739736838950479151006397215279002157152STEP	1/784637716923335095479473677900958302012794430558004314304STEP	1/1569275433846670190958947355801916604025588861116008628608STEP	1/3138550867693340381917894711603833208051177722232017257216STEP	1/6277101735386680763835789423207666416102355444464034514432STEP	1/12554203470773361527671578846415332832204710888928069028864STEP	1/25108406941546723055343157692830665664409421777856138057728STEP	1/50216813883093446110686315385661331328818843555712276115456STEP	1/100433627766186892221372630771322662657637687111424552230912STEP	1/200867255532373784442745261542645325315275374222849104618224STEP	1/401734511064747568885490523085290650630550748445698209236448STEP	1/803469022129495137770981046170581301261101496891396418472896STEP	1/1606938044258990275541962092341162602522202993782792836945792STEP	1/3213876088517980551083924184682325205044405987565585673891584STEP	1/6427752177035961102167848369364650410088811975131171347783168STEP	1/12855504354071922204335696738729300820177623950262342695566336STEP	1/25711008708143844408671393477458601640355247900524685391132672STEP	1/51422017416287688817342786954917203280710495801049370782265344STEP	1/102844034832575377634685573909834406561420991602098741564530688STEP	1/205688069665150755269371147819668813122841983204197483129061376STEP	1/411376139330301510538742295639337626245683966408394966258122752STEP	1/822752278660603021077484591278675252491367932816789932516245504STEP	1/1645504557321206042154969182557350504982735865633579865032491008STEP	1/3291009114642412084309938365114701009965471731267159730064982016STEP	1/6582018229284824168619876730229402019930943462534319460129964032STEP	1/13164036458569648337239753460458804039861886925068638920259928064STEP	1/26328072917139296674479506920917608079723773850137277840519856128STEP	1/52656145834278593348959013841835216159447547700274555681039712256STEP	1/105312291668557186697918027683670432318895095400549111362079424512STEP	1/210624583337114373395836055367340864637790190801098222724158849024STEP	1/421249166674228746791672110734681729275580381602196445448317698048STEP	1/842498333348457493583344221469363458551160763204392890896635396096STEP	1/1684996666696914987166688442938726917102321526408785781793270792192STEP	1/3369993333393829974333376885877453834204643052817571563586541584384STEP	1/6739986666787659948666753771754907668409286105635143127173083168768STEP	1/13479973333575319897333507543509815336818572211270286254346166337536STEP	1/26959946667150639794667015087019630673637144422540572508692332675072STEP	1/53919893334301279589334030174039261347274288845081145017384665350144STEP	1/107839786668602559178668060348078522694548577690162290034769330700288STEP	1/215679573337205118357336120696157045389097155380324580069538614000576STEP	1/431359146674410236714672241392314090778194310760649160139077228001152STEP	1/862718293348820473429344482784628181556388621521298320278154456002304STEP	1/1725436586697640946858688965569256363112777243042596640556308912004608STEP	1/3450873173395281893717377931138512726225554486085193281112617824009216STEP	1/6901746346790563787434755862277025452451108972170386562225235648018432STEP	1/13803492693581127574869511724554050904902217944340773124450471296036864STEP	1/27606985387162255149739023449108101809804435888681546248900942592073728STEP	1/55213970774324510299478046898216203619608871777363092497801885184147456STEP	1/110427941548649020598956093796432407239217743554726184995603770368294912STEP	1/220855883097298041197912187592864814478435487109452369991207540736589824STEP	1/441711766194596082395824375185729628956870974218904739982415081473179648STEP	1/883423532389192164791648750371459257913741948437809479964830162946359296STEP	1/1766847064778384329583297500742918515827483896875618959929660325892718592STEP	1/3533694129556768659166595001485837031654967793751237919859320651785437184STEP	1/7067388259113537318333190002971674063309935587502475839718641303570874368STEP	1/14134776518227074636666380005943348126619871175004951679437282607141748736STEP	1/28269553036454149273332760011886696253239742350009903358874565214283497472STEP	1/56539106072908298546665520023773392506479484700019806717749130428566994944STEP	1/113078212145816597093331040047546785012958969400039613435498260857133989888STEP	1/226156424291633194186662080095093570025917938800079226870996521714267979776STEP	1/452312848583266388373324160190187140051835877600158453741993043428535959552STEP	1/904625697166532776746648320380374280103671755200316907483986086857071919104STEP	1/1809251394333065553493296640760748560207343510400633814967972173714143838208STEP	1/3618502788666131106986593281521497120414687020801267629935944347428287676416STEP	1/7237005577332262213973186563042994240829374041602535259871888694856575352832STEP	1/14474011154664524427946373126085988481658748083205070519743777389713150705664STEP	1/28948022309329048855892746252171976963317496166410141039487554779426301411328STEP	1/57896044618658097711785492504343953926634992332820282078975109558852602822656STEP	1/11579208923731619542357098500868790785326998

Standard 36V Stepping Motor Drivers

BD6395FP	PARAMIN	I _{OMAX} 1.5A	UNSTEP	Current Control PWM	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	4kV	FUNCTION Control	SPINE Control	SP1	SP2
BD6393FP	PARAMIN	I _{OMAX} 1.2A	UNSTEP	Current Control PWM	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	4kV	FUNCTION Control	SPINE Control	SP1	SP2
BD68620EFV	PARAMIN	I _{OMAX} 2.0A	UNSTEP	Current Control PWM	Thin PKG	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	FUNCTION Control	SPINE Control	SP1	SP2
BD68610EFV	PARAMIN	I _{OMAX} 1.0A	UNSTEP	Current Control PWM	Thin PKG	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	FUNCTION Control	SPINE Control	SP1	SP2
BD6290EFV	PARAMIN	I _{OMAX} 0.8A	UNSTEP	Current Control PWM	Thin PKG	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	FUNCTION Control	SPINE Control	SP1	SP2
BD63960EFV	PARAMIN	I _{OMAX} 1.5A	UNSTEP	Current Control PWM	Thin PKG	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	FUNCTION Control	SPINE Control	SP1	SP2
BD63940EFV	PARAMIN	I _{OMAX} 1.2A	UNSTEP	Current Control PWM	Thin PKG	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	FUNCTION Control	SPINE Control	SP1	SP2
BD63620AEFV	CLK MIN	I _{OMAX} 2.0A	UNSTEP	Current Control PWM	Thin PKG	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	FUNCTION Control	SPINE Control	SP1	SP2
BD63610AEFV	CLK MIN	I _{OMAX} 1.0A	UNSTEP	Current Control PWM	Thin PKG	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	FUNCTION Control	SPINE Control	SP1	SP2
BD63801EFV	CLK MIN	I _{OMAX} 0.8A	UNSTEP	Current Control PWM	Thin PKG	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO	FUNCTION Control	SPINE Control	SP1	SP2
BD60223FP	CLK MIN	I _{OMAX} 1.5A	UNSTEP	Current Control PWM	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO		FUNCTION Control	SPINE Control	SP1	SP2
BD63888AEKV	CLK MIN	I _{OMAX} 1.5A	UNSTEP	Current Control PWM	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO		FUNCTION Control	SPINE Control	SP1	SP2
BD68888AEKV	PARAMIN	I _{OMAX} 1.5A	UNSTEP	Current Control PWM	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO		FUNCTION Control	SPINE Control	SP1	SP2
BD63888MUV	CLK MIN	I _{OMAX} 1.2A	UNSTEP	Current Control PWM	Small Signal Power	ON POWER	T.S.D.	A O.C.P.	UV	OVLO		FUNCTION Control	SPINE Control	SP1	SP2

* 1 : The BD6395FP, BD6393FP, and BD6290EFV are all function-compatible.

* 2 : The BD6395FP and BD6393FP are all pin-compatible.

* 3 : The BD63620AEFV, BD63610AEFV, and BD63801EFV are all function-compatible.

* 4 : The BD63960EFV and BD63940EFV are all pin-compatible.

Part No.	Supply Voltage(V)	Output Current (A)	Circuit Current (mA)	Input Threshold Voltage(V)		Output ON Resistance (Ω)	Package
	V _{CC}			High Level	Low Level		
BD6395FP	16 to 28	1.5	3.0	2.0	0.8	1.2	HTSSOP-B54
BD6393FP	16 to 28	1.2	3.0	2.0	0.8	1.5	HTSSOP-B40
BD68620EFV	19 to 28	2.0	1.3	2.0	0.8	0.95	HTSSOP-B40
BD68610EFV	19 to 28	1.0	1.3	2.0	0.8	1.8	HTSSOP-B40
BD6290EFV	19 to 28	0.8	3.0	2.0	0.8	2.8	HSOP-M36
BD63960EFV	19 to 28	1.5	2.7	2.0	0.8	1.1	HTSSOP-B28
BD63940EFV	19 to 28	1.2	2.7	2.0	0.8	1.4	HTSSOP-B28
BD63620AEFV	19 to 28	2.0	1.3	2.0	0.8	0.95	HTSSOP-B28
BD63610AEFV	19 to 28	1.8	1.3	2.0	0.8	1.8	HTSSOP-B28
BD63801EFV	19 to 28	0.8	2.7	2.0	0.8	2.8	HTSSOP-B28
New BD60223FP	8 to 28	1.5	2.5	2.0	0.8	0.55	HSOP25
New BD63888AEKV	8 to 28	1.5	5.0	2.0	0.8	1.0	HTQFP48V
New BD68888AEKV	8 to 28	1.5	5.0	2.0	0.8	1.0	HTQFP48V
New BD63888MUV	8 to 28	1.2	5.0	2.0	0.8	1.0	VQFN036V6060

μ-step 36V Stepper Motor Drivers

BD63860EFV														
BD63847EFV														
BD63843EFV														
BD63510AEFV														
BD63511EFV														
BD63520AEFV														
BD63521EFV														
BD63524AEFV														
BD63525AEFV														

* 1 : The BD63847EFV and BD63843EFV are all function-compatible.
* 2 : The BD63510AEFV, BD63520AEFV and BD63525AEFV are all function-compatible.
* 3 : The BD63511AEFV and BD63521AEFV are all function-compatible.

Part No.	Supply Voltage(V)		Output Current (A)	Circuit Current (mA)	Input Threshold Voltage(V)		Output ON Resistance (Ω)	Package
	V _{CC}				High Level	Low Level		
BD63860EFV	16 to 28		2.5	4.0	2.0	0.8	0.8	HTSSOP-B28
BD63847EFV	19 to 28		2.0	2.5	2.0	0.8	0.85	HTSSOP-B28
BD63843EFV	19 to 28		1.0	2.5	2.0	0.8	1.9	HTSSOP-B28
BD63510AEFV	8 to 28		1.0	2.5	2.0	0.8	1.75	HTSSOP-B28
BD63511EFV	8 to 28		1.0	2.5	2.0	0.8	1.75	HTSSOP-B28
BD63520AEFV	8 to 28		2.0	2.5	2.0	0.8	0.65	HTSSOP-B28
BD63521EFV	8 to 28		2.0	2.5	2.0	0.8	0.65	HTSSOP-B28
BD63524AEFV	8 to 28		2.5	2.5	2.0	0.8	0.35	HTSSOP-B28
BD63525AEFV	8 to 28		2.5	2.5	2.0	0.8	0.35	HTSSOP-B28

Low Voltage Stepper Motor Drivers For Mini and Handheld Printers

BD6382EFV															
BD6381EFV															
BD6380EFV															

Part No.	Supply Voltage(V)		Output Current (A)	Circuit Current (mA)	Input Threshold Voltage(V)		Output ON Resistance (Ω)	Package
	V _{CC}	V _M			High Level	Low Level		
BD6382EFV	3.0 to 5.5	5.5 to 13.5	0.8	1.6	2.0	0.8	1.2	HTSSOP-B24
BD6381EFV	2.5 to 5.5	6.0 to 13.5	1.2	1.6	2.0	0.8	1.0	HTSSOP-B24
BD6380EFV	2.5 to 5.5	4.0 to 13.5	0.8	1.6	2.0	0.8	1.2	HTSSOP-B24

45V Stepper Motor Drivers

BD6425EFV													
BD6423EFV													
BD6422EFV													

Part No.	Supply Voltage(V)		Output Current (A)	Circuit Current (mA)	Input Threshold Voltage(V)		Output ON Resistance (Ω)	Package
	V _{CC}				High Level	Low Level		
BD6425EFV	19 to 42		1.5	2.0	2.0	0.8	1.1	HTSSOP-B28
BD6423EFV	19 to 42		1.0	2.0	2.0	0.8	2.0	HTSSOP-B24
BD6422EFV	19 to 42		1.0	2.0	2.0	0.8	2.0	HTSSOP-B24

Symbol Key	CLK IN Control signal input CLK-IN type	SERVO Built-in servo circuit	PARA IN Control signal input PARALLEL-IN type	Iomax 0.8A	Iomax 1.0A	Iomax 1.2A	Iomax 1.5A	Iomax 2.0A	Iomax 2.5A	Maximum output current	36V MAX	60V MAX	Rated Voltage	120° SPM	120° PWM	180° PWM	Output power system		
1/2STEP	1/4STEP	1/8STEP	1/16STEP	Number of step	Constant Current PWM	Thin PKG	Thin package	FW/RW	Switch able between forward and reverse	Small size Power Pkg	DECAY SW	SLOW/FAST/MIX	DECAY switching function	EPINE	Easy replacement pin compatible with competitor's	ONE POWER	1 power supply system due to built-in regulator	T.S.D.	Built-in thermal shut-down circuit
External FET	External output FET H-side:Nch/L-side:Nch	External FET	External output FET H-side:Pch/L-side:Nch	DMOS	DMOS output	FG AMP	Built-in FG Amplifier	HYS AMP	Built-in hysteresis Amplifier	ONE POWER	1 power supply system due to built-in regulator	T.S.D.	Built-in thermal shut-down circuit						

3-Phase Brushless Motor Drivers

3-Phase Brushless Motor Pre-Drivers with Speed Control

BD6762FV



BD63030EKV-C



Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage(V)		External FET Drive Voltage		PWM Frequency (kHz)	Package	
					H Level	L Level	Upper(V)	Lower(V)			
BD6762FV	36	16 to 28	−25 to +75	17	2.2	0.8	V _{CC} +6.8	10.8	16	HTSSOP-B24	
Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage(V)		External FET Drive Voltage V _{CC} =6.5V		PWM Frequency (kHz)	Package	Automotive Grade AEC-Q100
					H Level	L Level	Upper(V)	Lower(V)			
BD63030EKV-C	50	6.5 to 18.0	−40 to +125	18	3.8	1.9	2×V _{CC} −1.0	5.5	20	HTQFP64AV	YES

3-Phase Brushless Motor Driver with Speed Control

BD67929EFV



Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage(V)		External FET Drive Voltage(V)		PWM Frequency (kHz)	Package
					H Level	L Level	Upper	Lower		
BD67929EFV	36	19 to 28	−25 to +85	4.0	3.0	1.5	—	—	200	HTSSOP-B28

3-Phase Brushless Motor Pre-Drivers

BD6761FS



BD63001AMUV



BD63002AMUV



BD16805FV-M



Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage(V)		External FET Drive Voltage(V)		PWM Frequency (kHz)	Package	
					H Level	L Level	Upper	Lower			
BD6761FS	36	16 to 28	−35 to +75	15.0	2.2	0.8	V _{CC} +6	10.5	15	SSOP-A32	
BD63001AMUV	33	4.5 to 5.5/6 to 28	−40 to +85	2.5	2.0	0.8	V _{CC} −0.2	9.5	20	VQFN024V4040	
BD63002AMUV	33	8.0 to 26.4	−40 to +85	2.5	2.0	0.8	V _{CC} +7	5.0	External IN	VQFN028V5050	
Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage(V)		External FET Drive Voltage(V)		PWM Frequency (kHz)	Package	Automotive Grade AEC-Q100
					H Level	L Level	Upper	Lower			
BD16805FV-M	60	8 to 18	−40 to +110	15.2	3.0	1.0	2×V _{CC} −0.5	8.0	25	SSOP-B40	YES

3-Phase Brushless Motor Drivers

BD63005AMUV



BD63006MUV



BD63007MUV



BD63015EFV



BD63035EFV-M



Part No.	Max. Voltage (V)	Supply Voltage (V)	Output Current (A)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage(V)		Output ON Resistance (Ω)	Package
						H Level	L Level		
BD63005AMUV	33	10 to 28	2.0	−25 to +85	4.4	2.0	0.8	0.17	VQFN040V6060
BD63006MUV	33	8 to 28	1.5	−40 to +85	4.4	—	—	0.8	VQFN024V4040
BD63007MUV	33	8 to 28	3.0	−25 to +85	4.4	2.0	0.8	0.17	VQFN040V6060
BD63015EFV	36	8 to 28	1.5	−40 to +105	8.0	2.0	0.8	0.6	HTSSOP-B20

Part No.	Max. Voltage (V)	Supply Voltage (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage(V)		Output ON Resistance (Ω)	PWM Frequency (kHz)	Package	Automotive Grade AEC-Q100
					H Level	L Level				
BD63035EFV-M	36	8 to 28	−40 to +105	8.0	2.0	0.8	0.6	22.7	HTSSOP-B20	YES

Fan Motor Drivers

5V Single-Phase Full-wave Fan Motor Drivers

BH6766FVM						
BD6965NUX						
BD6966NUX						
BU6909AGFT						
BU69090NUX						

Part No.	Supply Voltage (V)	I _o Max. (mA)	Power Transistor	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Lock Time Ratio	Package
BH6766FVM	2.0 to 6.0	630	CMOS	Upper and Lower 0.6(I _o =250mA)	—	1.3	—	MSOP8
BD6965NUX	2.0 to 5.5	800	CMOS	Upper and Lower 0.4(I _o =250mA)	Direct PWM	—	1:10	VSON008X2030
BD6966NUX	1.8 to 5.5	1,000	CMOS	Upper and Lower 0.4(I _o =300mA)	Direct PWM	1.0	1:10	VSON010X3030
BU6909AGFT	1.8 to 5.5	800	CMOS	Upper and Lower 0.16(I _o =200mA)	Direct PWM	Include Hall sensor	1:10	TSSOF6
BU69090NUX	1.8 to 5.5	800	CMOS	Upper and Lower 0.16(I _o =200mA)	Direct PWM	Include Hall sensor	1:10	VSON008X2030

Standard Single-Phase Full-wave Fan Motor Drivers

BD6981FVM							
BD6982FVM							
BD6967FVM							
BD6968FVM							
BD6962FVM							
BD6964FVM							
BD6961F							
BD6964F							
BD69830FV							

Part No.	Supply Voltage (V)	I _o Max. (mA)	Power Transistor	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Lock Time Ratio	Package
BD6981FVM	2.8 to 16.0	800	DMOS	Upper and Lower 0.45(I _o =200mA)	—	1.2	1:6	MSOP8
BD6982FVM	2.8 to 16.0	800	DMOS	Upper and Lower 0.45(I _o =200mA)	—	1.2	1:6	MSOP8
BD6967FVM	3.3 to 14.0	800	DMOS	Upper and Lower 0.45(I _o =200mA)	DC/Direct PWM	1.2	1:10	MSOP10
BD6968FVM	3.3 to 14.0	800	DMOS	Upper and Lower 0.45(I _o =200mA)	DC/Direct PWM	1.2	1:10	MSOP10
BD6962FVM	3.3 to 14.0	800	DMOS	Upper and Lower 0.4(I _o =300mA)	Direct PWM	—	1:10	MSOP8
BD6964FVM	3.3 to 14.0	800	DMOS	Upper and Lower 0.4(I _o =300mA)	Direct PWM	—	1:10	MSOP8
BD6961F	3.3 to 14.0	1,000	DMOS	Upper and Lower 0.4(I _o =300mA)	Direct PWM	—	1:10	SOP8
BD6964F	3.3 to 14.0	1,000	DMOS	Upper and Lower 0.4(I _o =300mA)	Direct PWM	—	1:10	SOP8
BD69830FV	6.0 to 28.0	900	DMOS	Upper and Lower 0.6(I _o =200mA)	Direct PWM	1.2	1:30	SSOP-B14

Multifunction Single-Phase Full-wave Fan Motor Drivers

BD6971FV	12V MIN	350 CLASS	FG FAULT	SOFT S/W	HALL	LOCK	MIN rpm	T.S.D.	IO LIMIT
BD6994FV	12V MIN	350 CLASS	FG FAULT	SOFT S/W	HALL	LOCK	MIN rpm	T.S.D.	
BD6995FV	12V MIN	400 CLASS	FG FAULT	SOFT S/W	HALL	LOCK	MIN rpm	T.S.D.	IO LIMIT
BD61243FV	12V MIN	450 CLASS	FG FAULT	SOFT S/W		LOCK	MIN rpm	T.S.D.	IO LIMIT
BD69730FV	12V MIN	PRE DRIVER	FG FAULT	SOFT S/W	HALL	LOCK	MIN rpm	T.S.D.	IO LIMIT
BD69740FV	12V MIN	PRE DRIVER		SOFT S/W	HALL	LOCK	MIN rpm	T.S.D.	IO LIMIT
BD61245EFV	12V MIN	800 CLASS	FG FAULT	SOFT S/W		LOCK	MIN rpm	T.S.D.	IO LIMIT
BD61250MUV	24V MIN	PRE DRIVER	FG FAULT	SOFT S/W		LOCK	MIN rpm	T.S.D.	IO LIMIT
BD61246EFV	12V MIN	800 CLASS		SOFT S/W		LOCK	MIN rpm	T.S.D.	IO LIMIT
BD61247NUX	12V MIN	400 CLASS	FG FAULT	SOFT S/W		LOCK		T.S.D.	
BD61251FV	12V MIN	PRE DRIVER	FG FAULT	SOFT S/W		LOCK		T.S.D.	IO LIMIT

Part No.	Supply Voltage (V)	Io Max. (mA)	Power Transistor	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Lock Time Ratio	Package
BD6971FV	3.5 to 17.0	1,000	DMOS	Upper and Lower 0.6(Io=200mA)	DC/Direct PWM	1.3	1:10	SSOP-B14
BD6994FV	4.5 to 17.0	1,200	DMOS	Upper and Lower 0.6(Io=400mA)	DC/Direct PWM	1.25	1:10	SSOP-B16
BD6995FV	4.3 to 17.0	1,200	DMOS	Upper and Lower 0.6(Io=400mA)	DC	1.25	1:10	SSOP-B16
BD61243FV	5.5 to 16.0	1,200	DMOS	Upper and Lower 0.4(Io=400mA)	DC/Direct PWM	1.25	1:10	SSOP-B14
BD69730FV	4.3 to 17.0	10	Pre-Driver	—	DC/Direct PWM	1.26	1:20	SSOP-B16
BD69740FV	4.3 to 17.0	10	Pre-Driver	—	DC/Direct PWM	1.26	1:20	SSOP-B16
BD61245EFV	4.0 to 16.0	1,800	DMOS	Upper and Lower 0.2(Io=400mA)	DC/Direct PWM	—	1:10	HTSSOP-B16
BD61250MUV	4.5 to 36.0	10	Pre-Driver	—	DC/Direct PWM	—	1:20	VQFN024V4040
New BD61246EFV	4.0 to 16.0	1,800	DMOS	Upper and Lower 0.2(Io=400mA)	DC/Direct PWM	—	1:10	HTSSOP-B16
New BD61247NUX	4.5 to 16.0	1,200	DMOS	Upper and Lower 0.2(Io=200mA)	Direct PWM	—	1:10	VSON010X3030
New BD61251FV	4.5 to 16.0	10	Pre-Driver	—	Direct PWM	—	1:20	SSOP-B16

2-Phase Half-wave Fan Motor Drivers

BD6701F	24V MIN	400 CLASS	FG FAULT	LOCK	ALARM	T.S.D.	IO LIMIT
BA6406F	24V MIN	PRE DRIVER		LOCK	ALARM		
BA6506F	24V MIN	PRE DRIVER	FG FAULT	LOCK			

Part No.	Supply Voltage (V)	Io Max. (mA)	Power Transistor	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Zenner Diode Clamp Voltage (V)	Output Clamp Voltage (V)	Lock Time Ratio	Package
BD6701F	6.0 to 28.0	800	DMOS	0.3 (Io=200mA)	—	—	—	54	1:10	SOP8
BA6406F	4.0 to 28.0	70	Pre-Driver	—	—	—	—	—	1:4.5	SOP8
BA6506F	4.0 to 28.0	70	Pre-Driver	—	—	—	—	—	1:4.5	SOP8

3-Phase Full-wave Fan Motor Drivers

BD67173NUX	5V MIN	400 CLASS	SENSOR LESS DRIVE	PWM 150°	FG FAULT	T.S.D.	LOCK	MIN rpm
BD6326NUX	5V MIN	400 CLASS	SENSOR LESS DRIVE	PWM 180°	FG FAULT	T.S.D.	LOCK	MIN rpm
BD63441AFU	12V MIN	PRE DRIVER	SENSOR LESS DRIVE	PWM 150°	FG FAULT	T.S.D.	LOCK	MIN rpm
BD63251MUV	12V MIN	PRE DRIVER	SENSOR LESS DRIVE	PWM 180°	FG FAULT	T.S.D.	LOCK	MIN rpm

Part No.	Supply Voltage (V)	Io Max. (mA)	Power Transistor	Output Saturation Voltage (V)	Speed Control	Hall Bias Voltage (V)	Lock Time Ratio	Package
BD67173NUX	2.2 to 5.5	700	CMOS	Upper and Lower 0.25(Io=250mA)	Direct PWM	—	1:5	VSON010X3030
BD6326NUX	2.2 to 5.5	700	CMOS	Upper and Lower 0.25(Io=250mA)	Direct PWM	—	1:5	VSON010X3030
BD63441AFU	5.5 to 16.0	10	Pre-Drive	—	DC/Direct PWM	—	1:10	SSOP-C20
BD63251MUV	5.5 to 15.0	10	Pre-Drive	—	DC/Direct PWM	1.5	1:10	VQFN024V4040

3-Phase Brushless Fan Motor Drivers For Household Appliances

BM6241FS	 	  
BM6242FS	 	  
BM6243FS	 	  
BM6244FS	 	     
BM6245FS	 	     
BM6246FS	 	     
BM6247FS	 	     
BM6248FS	 	     
BM6249FS	 	     

A

Motor / Actuator Drivers

Part No.	Control	Output Device	Rated Voltage (V)	Output Current (A)	Output ON Resistance(Ω)	Diode Forward Voltage(V)	Package
New BM6241FS	6 inputs	MOSFET	250	2.0	0.9	0.9	SSOP-A54_23
New BM6242FS	6 inputs	MOSFET	600	1.5	2.7	1.1	SSOP-A54_23
New BM6243FS	6 inputs	MOSFET	600	2.5	1.7	1.1	SSOP-A54_23
New BM6244FS	120°	MOSFET	250	2.0	0.9	0.9	SSOP-A54_36
New BM6245FS	120°	MOSFET	600	1.5	2.7	1.1	SSOP-A54_36
New BM6246FS	120°	MOSFET	600	2.5	1.7	1.1	SSOP-A54_36
New BM6247FS	180°(Sinusoidal)	MOSFET	250	2.0	0.9	0.9	SSOP-A54_36
New BM6248FS	180°(Sinusoidal)	MOSFET	600	1.5	2.7	1.1	SSOP-A54_36
New BM6249FS	180°(Sinusoidal)	MOSFET	600	2.5	1.7	1.1	SSOP-A54_36

3-Phase Brushless Fan Motor Controllers For Household Appliances

Part No.	Supply Voltage (V)	Commutation Logic	Control Voltage Input (V)	Phase Control (deg.)	FG Conversion Ratio	Package
New BD62017AFS	10.0 to 18.0	180°(Sinusoidal)	2.1 to 5.4	0 to + 40	15:12	SSOP-A24
New BD62018AFS	10.0 to 18.0	180°(Sinusoidal)	2.1 to 5.4	0 to + 40	12:12	SSOP-A24

Fractional Pulse Rate Converters

Part No.	Supply Voltage (V)	Circuit Current (mA)	Input Frequency (kHz)	Conversion Ratio	Package
New BU6821G	4.5 to 5.5	0.5	0.005 to 5	15:12	SSOP5
New BU6823G	4.5 to 5.5	0.5	0.005 to 5	21:12	SSOP5

Driver for ODD

1ch System Motor Driver ICs Wide Application

Part No.	Power Supply (V)	Dynamic Range of Driver Output (V)	I/F Amplifier	Mute of Driver Output	Regulator for DSP (V)	Protect Circuit for Low Power Supply	Protect for Abnormal Input	Temp. Protection	Standby Circuit	Package
BD7931F	4.5 to 14.0	7.5(V _{CC} =8V, R _L =500mA)	—	—	—	—	—	✓	✓	SOP8
BH6578FVM	4.5 to 5.5	4.5(V _{CC} =5V, R _L =500mA)	—	—	—	—	—	✓	—	MSOP8

4ch System Motor Driver ICs Basic type for CD player

Part No.	Power Supply (V)	I/F	FOCUS TILT (ch)	TRACKING (ch)	SLED	LOADING	SPINDLE	Short Circuit Protection for Loading	Protect for Pickup	Regulator	Reset	Package	Automotive Grade AEC-Q100
BD8226EFV	5.5 to 14.0	Analog & PWM	1	1	DC Select input	DC	—	—	—	Variable voltage × 1	—	HTSSOP-B24	—
BD8229EFV	4.5 to 14.0	Analog & PWM	1	1	DC Select input	DC	—	—	—	—	1 input 1 output	HTSSOP-B24	—
BD8266EFV-M	4.5 to 10.0	Analog & PWM	1	1	DC Select input	DC	—	Self off	—	—	—	HTSSOP-B24	YES
BD8263EFV-M	4.5 to 10.0	Analog & PWM	1	1	DC Select input	DC	✓	—	—	—	—	HTSSOP-B28	YES

5ch System Motor Driver ICs Loading Channel Added

Part No.	Power Supply (V)	I/F	FOCUS TILT (ch)	TRACKING (ch)	SLED	LOADING	SPINDLE	Short Circuit Protection for Loading	Protect for Pickup	Regulator	Package	Automotive Grade AEC-Q100
BD8205EFV-M	6.0 to 10.0	Analog & PWM	1	1	DC	DC	DC	—	—	—	HTSSOP-B24	YES
BD8203EFV	4.5 to 14.0	Analog & PWM	1	1	DC	DC	DC	—	—	Variable voltage × 1/ 5V Fixed × 1	HTSSOP-B40	—

6ch to 9ch System Motor Driver ICs Basic type for DVD Player, Blu-ray

Part No.	Power Supply (V)	I/F	FOCUS TILT (ch)	TRACKING (ch)	SLED	LOADING	SPINDLE	LVDS for SA	Short Circuit Protection for Loading	Protect for Pickup	Package	Automotive Grade AEC-Q100
BD8255MUV-M	4.5 to 5.5	SPI	1	1	2ch STTEPING	DC	3-Phase Brushless	—	✓	—	VQFN48SV7070	YES
BD8256EFV-M	4.5 to 10.5	SPI	2	1	2ch STTEPING	DC	3-Phase Brushless	2ch	✓	Self off	HTSSOP-B54	YES

			Rated Voltage				Maximum output current		Built-in thermal shut-down circuit		Built-in under voltage lock out circuit		Built-in over current protection circuit		Output current limit can be set
			External capacitor for detecting motor lock not necessary				RPM pulse signal output								

System Motor Driver IC for Half Height Drives(Sensorless) Space Saving Type										
Part No.	Supply Voltage (V)	ch	Output System	Output (Ω)	Output Gain	Under Voltage Protection	Overvoltage Protection	Input Abnormality Protection	Temperature Protection	Package
BD7763EFV	4.3 to 5.5	1 to 3	PWM	1.5	17.5dB	✓	—	✓	✓	HTSSOP-B54
		4, 5	PWM	1.3	17.5dB					
		6, 7	PWM	2.2	1.15A/V					
	10.8 to 13.2	8	PWM	1.0	1.15A/V		✓			
		9	PWM	1.5	—		—			

System Motor Driver ICs for Slim Drives(3 Sensors) Basic Type										
BH5510KV	4.0 to 5.5	1 to 3	PWM	1.3	14dB	✓	✓	✓	✓	VQFP48C
		4, 5	PWM	1.5	14dB					
		6	PWM	0.6	1A/V or 0.2A/V					
BH5510KVT	4.0 to 5.5	1 to 3	PWM	1.3	14dB	✓	✓	✓	✓	TQFP48V
		4, 5	PWM	1.5	14dB					
		6	PWM	0.6	1A/V or 0.2A/V					
BH5511KV	4.0 to 5.5	1 to 3	PWM	1.3	17.5dB/8.0dB	✓	✓	✓	✓	VQFP48C
		4, 5	PWM	1.5	17.5dB					
		6	PWM	0.6	0.5A/V or 0.33A/V or 0.17A/V					

Drivers for Printer

3-Phase Brushless Motor Driver for Polygonal Mirrors For LBP, PPC										
Part No.	Power Supply (V)	Output Current (A)	Circuit Current (mA)	Input Threshold Voltage(V)		Current Limit Detect Voltage (V)	Output ON Resistance (Ω)	Circuit Current When Motor Stop (mA)	PWM Frequency (kHz)	Package
BD67929EFV	19.0 to 28.0	2.5	4.0	H Level	L Level	0.5	1.35 (I _o =1.0A)	1.0	200	HTSSOP-B28

Motor Drivers with Brush for Printers								
Part No.	Supply Voltage (V)	Output Current (A)	Output Current Peak (A)	Circuit Current (mA)	Input Threshold Voltage(V)		Output ON Resistance (Ω)	Package
					H Level	L Level		
BD62210AEFV	8.0 to 28.0	1.0	1.5	2.5	2.0	0.8	1.9	HTSSOP-B28
BD62220AEFV	8.0 to 28.0	2.0	2.8	2.5	2.0	0.8	0.65	HTSSOP-B28
BD63130AFM	8.0 to 46.2	3.0	5.0	2.5	2.0	0.8	0.55	HSOP-M36
BD63150AFM	8.0 to 46.2	5.0	6.0	2.5	2.0	0.8	0.3	HSOP-M36

Bipolar Stepper Motor Drivers for Paper Feed/Carriage For LBP, PPC, Scanner, Photo, Printer, FAX, IJP Please Refer to Page A70 to A72 General Purpose ICs for The Other Stepper Motor Driver Lineup							
Part No.	Power Supply(V)	Output Current (A)	Circuit Current (mA)	Input Threshold Voltage(V)		Output ON Resistance (Ω)	Package
	V _{cc}			High Level	Low Level		
BD63801EFV	19.0 to 28.0	0.8	2.7	2.0	0.8	2.8	HTSSOP-B24
BD68715EFV	19.0 to 28.0	1.5	2.0	2.0	0.8	0.95	HTSSOP-B28
BD63715AEFV	19.0 to 28.0	1.5	2.0	2.0	0.8	0.95	HTSSOP-B28

3-Phase Brushless Motor Pre-Drivers for Paper Feed For LBP, PPC										
Part No.	Max. Voltage (V)	Power Supply (V)	Operating Temperature (°C)	Circuit Current (mA)	Input Threshold Voltage(V)		External Threshold Voltage(V)		PWM Frequency (kHz)	Package
BD6761FS	36	16.0 to 28.0	−35 to +75	15.0	H Level	L Level	Upper	Lower	15	SSOP-A32
BD6762FV	36	16.0 to 28.0	−25 to +75	17.0	2.2	0.8	V _{cc} +6	10.5	16	SSOP-B40

3-Phase Brushless Motor Driver for Polygonal Mirrors For LBP, PPC : Current limit value is calculated by dividing current limit voltage by RNF resistance which is to detect the output current.
 Motor Drivers with Brush for Printers : The BD62210AEFV and BD62220AEFV are all pin-compatible.

Driver for Camera

5ch System Lens Driver for Cameras											
Part No.	Supply Voltage (V)	Driver Output Max. Current (A)	Drive Method Examples of Actuator(Drived Motor, Driving System, and Output ON Resistance(Ω))					Input I/F	Reference Voltage Output for Output Setting Current(V)	Package (mm)	
				AF	Zoom	Iris	Shutter				
BD6758KN	2.5 to 5.5	0.8	ex.	STM(1, 2ch) FULL ON 1.2	DCM(3ch) FULL ON 1.2	DCM or VCM(4ch) FULL ON 1.2	VCM(5ch) Constant current 1.0	Parallel	1.2 (±3%)	VQFN36 6.2×6.2, H=Max.0.95	
6ch System Lens Drivers for Cameras											
Part No.	Supply Voltage (V)	Driver Output Max. Current (A)	Drive Method Examples of Actuator(Drived Motor, Driving System, and Output ON Resistance(Ω))					Input I/F	Reference Voltage Output For Output Setting Current(V)	Package (mm)	
				AF	Zoom	Iris	Shutter				Barrier
BD6373GW	2.5 to 5.5	0.8	ex.	STM(1, 2ch) FULL ON 1.2	STM(3, 4ch) FULL ON 1.2	DCM or VCM(5ch) FULL ON 1.2	VCM(6ch) FULL ON 1.2	—	Parallel	—	UCSP75M2 2.6×2.6, H=Max.0.85
BD6753KV	4.5 to 10.5 (1, 2ch) 2.0 to 10.5 (3 to 6ch)	0.8	ex.			DCM or VCM(5ch) PWM(±3%) 1.2	VCM(6ch) PWM(±3%) 1.2	—	Parallel + Serial	0.9 (±10%)	VQFP48C 9.0×9.0, H=Max.1.60

Single and Dual-Channel Lens Drivers for SLRs(Single Lens Reflex)

Part No.	ch	Supply Voltage (V)	Driver Output Max. Current (A)	Drive Method Examples of Actuator(Driven Motor, Driving System, and Output ON Resistance(Ω))						Turn on Time	Turn off Time (ns)	Control Frequency (kHz)(Max.)	Package (mm)
				Cleaner	AF	Zoom	Iris	Shutter					
BD65492MUV	2	1.8 to 16.0	1.0	ex.	—	STM(2ch) FULL ON 0.9	—	—	—	200ns (Including 80ns to Prevent from overlap current.)	80	500	VQFN024V4040 4.0×4.0, H=Max.1.0
BD6735FV	2	2.0 to 8.0	1.0	ex.	—	—	—	STM(2ch) FULL ON 1.0	—	300ns (Including 90ns to Prevent from overlap current.)	100	100	SSOP-B20 6.5×6.4, H=Max.1.25
BD6376GUL	1	2.0 to 9.0	1.0	ex.	—	—	DCM(1ch) FULL ON 0.45	—	—	200ns (Including 80ns to Prevent from overlap current.)	60	200	VCSP50L1 1.6×1.6, H=Max.0.55
BD65491FV	1	1.8 to 16.0	1.2 Peak 4.0	ex.	—	—	—	—	Plunger(1ch) FULL ON 0.35	150ns (Including 80ns to Prevent from overlap current.)	50	500	SSOP-B16 6.5×5.0, H=Max.1.25
BD6736FV	1	2.0 to 9.0	1.0 Peak 3.2	ex.	—	—	—	—	Plunger(1ch) FULL ON 0.35	1000ns (Including 800ns to Prevent from overlap current.)	100	100	SSOP-B20 6.5×6.4, H=Max.1.25
BD65499MUV	1	4.0 to 27.0	0.5 Peak 2.0	ex.	Piezo(1ch) FULL ON 0.6	—	—	—	—	150ns (Including 80ns to Prevent from overlap current.)	50	300	VQFN028V5050 5.0×5.0, H=Max.1.0
BD65494MUV	1	2.0 to 9.0	1.0 Peak 2.5	ex.	—	—	—	—	Plunger(1ch) FULL ON 0.55	200ns (Including 80ns to Prevent from overlap current.)	60	200	VQFN016V3030 3.0×3.0, H=Max.1.0
BD65496MUV	1	1.8 to 16.0	1.2 Peak 5.0	ex.	—	—	—	—	Plunger(1ch) FULL ON 0.35	150ns (Including 80ns to Prevent from overlap current.)	50	500	VQFN024V4040 4.0×4.0, H=Max.1.0

STM : Stepping motor, DCM : DC motor, VCM : Voice coil motor("Drive method examples of actuator" are recommendation. Another types may be evaluated.)

μ-step System Lens Drivers for Cameras

Part No.	Supply Voltage (V)	Driver Output Max. Current (A)	Drive Method Examples of Actuator(Driven Motor, Driving System, and Output ON Resistance(Ω))					Input I/F	μ-step Resolution	Package (mm)		
				AF	Zoom	Iris	Shutter				Others	
BU24020GU	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5	ex. 1	STM(1, 2ch) μ-step(class-D) 1.5	STM(3, 4ch) μ-step(class-D) 1.5	—	—	3-wire serial	1024	VCSP85H2 2.6×2.6, H=Max.1.0		
			ex. 2		DCM(3ch) FULL ON(PWM) 1.5	VCM(4ch) FULL ON(PWM) 1.5	—				—	
BU24033GW	1.62 to 3.6 (Io) 2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5/0.6	ex. 1	STM(1, 2ch) μ-step(class-D) 1.5	STM(3, 4ch) μ-step(class-D) 1.5	VCM(5ch) FULL ON(PWM) 1.0	VCM(6ch) constant current 1.0	—	3-wire serial	1024	UCSP75M3 3.0×3.0, H=Max.0.85	
			ex. 2		DCM(5ch) FULL ON (PWM+Speed control) 1.0	VCM(3ch) FULL ON(PWM) 1.5		DCM(4ch) FULL ON(PWM) 1.5				
BU24035GW	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5/0.6	ex. 1	STM(1, 2ch) μ-step(class-D) 1.5	DCM(5ch) FULL ON (PWM+Speed control) 1.0	STM(3, 4ch) μ-step(class-D) 1.5	VCM(6ch) constant current 1.0	—	3-wire serial	1024	UCSP75M3 3.1×3.1, H=Max.0.85	
			ex. 2		DCM(3ch) FULL ON (PWM+Speed control) 1.5	VCM(5ch) FULL ON(PWM)/ constant current 1.0		VCM(4ch) FULL ON(PWM) 1.5				
BU24036MWV	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5/0.6	ex. 1	STM(1, 2ch) μ-step(class-D) 2.0	DCM(5ch) FULL ON (PWM+Speed control) 1.0	STM(3, 4ch) μ-step(class-D) 1.5	VCM(6ch) constant current 1.0	—	3-wire serial	1024	UQFN040V5050 5.0×5.0, H=Max.1.0	
			ex. 2		DCM(3ch) FULL ON (PWM+Speed control) 1.5	VCM(5ch) FULL ON(PWM)/ constant current 1.0		VCM(4ch) FULL ON(PWM) 1.5				
BU24038GW	2.7 to 3.6 (Logic) 2.7 to 5.5 (Driver)	0.5	ex. 1	STM(1, 2ch) μ-step(class-D) 1.5	STM(3, 4ch) μ-step(class-D) 1.5	STM(5, 6ch) μ-step(class-D) 1.5	VCM(8ch) FULL ON(PWM) 1.5	VCM(9ch) constant current 1.0	DCM(7ch) FULL ON(PWM) 1.5	3-wire serial	1024	UCSP75M3 3.8×3.8, H=Max.0.85
			ex. 2		STM(5, 6ch) μ-step(class-D) 1.5	VCM(3ch) FULL ON (PWM) 1.5	VCM(4ch) FULL ON (PWM) 1.5					

STM : Stepping motor, DCM : DC motor, VCM : Voice Coil Motor("Drive method examples of actuator" are recommendation. Another types may be evaluated.)

Mobile Phone Module Drivers

Parallel Interface Lens Driver for Voice Coil Motors														
Part No.	Supply Voltage (V)	Applications	ch	Drive System	Driver Output Max. Current (A)	Driver Output ON Resistance (Ω)	Input I/F	Input Mode Selection Terminal	Current Sense Resistor	Temperature Protection	Power Save Function	Back side coating	Package (mm)	
BD6369GUL	2.5 to 5.5	Drive AF using voice coil motor	1	Constant voltage (±5%)	400	0.8 (V _M =5V, I _o =0.4A)	Parallel	✓	—	✓	✓	with	VCSP50L2 2.1×2.1, H=Max.0.55	
2-wire Serial(I ² C-compatible) Interface Lens Drivers for Uni-directional Voice Coil Motors														
Part No.	Supply Voltage (V)	Applications	ch	Drive System	Driver Output Max. Current (mA)	Driver Output Low Voltage (V)	Input I/F		Ringing Compensation	Temperature Protection		Back side coating	Package (mm)	
BU64241GWZ	2.3 to 4.8	Drive AF using voice coil motor	0.25	Constant current (±10%)	130	0.15 (V _{CC} =3V, I _o =100mA)	I ² C Fm compatible		ISRC	✓		without	UCSP30L1 1.3×0.77, H=Max.0.33	
BU64243GWZ	2.3 to 4.8	Drive AF using voice coil motor	0.25	Constant current (±10%)	130	0.15 (V _{CC} =3V, I _o =100mA)	I ² C Fm compatible		ISRC	✓		with	UCSP35L1 0.77×1.3, H=Max.0.40	
BU64244GWZ	2.3 to 4.8	Drive AF using voice coil motor	0.25	Constant current (±10%)	130	0.15 (V _{CC} =3V, I _o =100mA)	I ² C Fm compatible		ISRC	✓		with	UCSP35L1 0.77×1.3, H=Max.0.36	
BU64249GWX	2.3 to 4.8	Drive AF using voice coil motor	0.25	Constant current (±10%)	130	0.15 (V _{CC} =3V, I _o =100mA)	I ² C Fm compatible		ISRC	✓		without	UCSP16X1 1.3×0.77, H=Max.0.2	
BU64291GWZ	2.3 to 4.8	Drive AF using voice coil motor	0.5	Constant current (±5%)	100	0.25 (V _{CC} =3V, I _o =100mA)	I ² C Fm compatible		ISRC	✓		without	UCSP30L1 0.77×1.37, H=Max.0.33	
BU64980AGWZ	2.3 to 4.8	Drive AF using voice coil motor	0.25	Constant current (±5%)	100	0.25 (V _{CC} =3V, I _o =100mA)	I ² C Fm+ compatible		ISRC	✓		without	UCSP25L1 0.72×1.13, H=Max.0.30	
BU64981AGWZ	2.3 to 4.8	Drive AF using voice coil motor	0.25	Constant current (±5%)	100	0.25 (V _{CC} =3V, I _o =100mA)	I ² C Fm+ compatible		ISRC	✓		with	UCSP30L1A 0.72×1.13, H=Max.0.33	
2-wire Serial(I ² C-compatible) Interface Lens Drivers for Bi-directional Voice Coil Motors														
Part No.	Supply Voltage (V)	Applications	ch	Drive System	Driver Output Max. Current (A)	Driver Output ON Resistance (Ω)	Input I/F		Ringing Compensation	Temperature Protection		Back side coating	Package (mm)	
BU64295GWZ	2.3 to 4.8	Drive AF using voice coil motor	1	Constant current (±5%)	±100	2.0 (V _{DD} =3V)	I ² C Fm compatible		ISRC	✓		without	UCSP30L1 0.77×1.2, H=Max.0.33	
BU64296GWX	2.3 to 4.8	Drive AF using voice coil motor	1	Constant current (±5%)	±100	2.0 (V _{DD} =3V)	I ² C Fm compatible		ISRC	✓		without	UCSP16X1 0.77×1.2, H=Max.0.20	
BU64297GWZ	2.3 to 4.8	Drive AF using voice coil motor	1	Constant current (±5%)	±100	2.0 (V _{DD} =3V)	I ² C Fm compatible		ISRC	✓		with	UCSP35L1 0.77×1.2, H=Max.0.36	
BU64253GWZ	2.5 to 4.5	Drive AF using voice coil motor	1	Constant current (±5%)	±100	3.2 (V _{DD} =3V)	I ² C Fm compatible		ISRC	✓		with	UCSP30L1A 0.72×1.13, H=Max.0.33	
BU64985GWZ	1.6 to 1.98	Drive AF using voice coil motor	1	Constant current (±5%)	±60	1.3 (V _{DD} =1.8V)	I ² C Fm+ compatible		ISRC	✓		with	UCSP35L1 0.77×1.2, H=Max.0.36	
BU64987GWZ	1.6 to 1.98	Drive AF using voice coil motor	1	Constant current (±5%)	±100	1.3 (V _{DD} =1.8V)	I ² C Fm+ compatible		ISRC	✓		with	UCSP35L1 0.77×1.2, H=Max.0.36	
2-wire Serial(I ² C-compatible) Interface Lens Driver for Piezo Actuators														
Part No.	Supply Voltage (V)	Applications		ch	Drive System	Driver Output Max. Current (mA)	Driver Output ON Resistance (Ω)	Input I/F	Base Clock	Temperature Protection	Power Save Function	Back side coating	Package (mm)	
	V _{CC}													
BU64562GWZ	2.3 to 4.8	ex.1	Drive AF using piezo actuator	1	FULL ON	500	1.4 (V _{CC} =3V)	I ² C Fm compatible	Built-in 15MHz	✓	✓	without	UCSP30L1 1.90×2.1, H=Max.0.33	
		ex.2	Drive Zoom using piezo actuator											
Parallel Interface Lens Driver for Stepping Motors														
Part No.	Supply Voltage (V)	Applications		ch	Drive System	Driver Output Max. Current (mA)	Driver Output ON Resistance (Ω)	Input I/F	Input Mode Selection Terminal	Built-In Wave Sloping Comparator	Temperature Protection	Power Save Function	Back side coating	Package (mm)
BD6360GUL	2.3 to 5.5	ex.1	Drive AF using piezo actuator	2	FULL ON	500	1.0 (V _{CC} =3V, I _o =0.4A)	Parallel	✓	✓	✓	✓	with	VCSP50L2 2.1×2.1, H=Max.0.55
		ex.2	Drive Zoom using piezo actuator											



ICs

LED Drivers

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LED Drivers

Boost Converter LED Drivers

White LED Drivers with External FET

Part No.	Supply Voltage (V)	No. of LEDs	Output Voltage (V)	Switching Frequency (MHz)	Primary Brightness Control Method	Control Interface	Package (mm)
BD6583MUV-A	2.7 to 22.0	Max.72 12series×6strings in parallel (V _F restrictions exist)	Max.43.0	1	PWM signal from the PWMPOW/PWM DRV terminal Resistance switching at the ISET terminal	Pin logic setting	VQFN024V4040
BD9486F	9 to 18	Max.About 120 120series×1string in parallel	Max.About 400	0.05 to 0.80	PWM signal Analog signal	Pin logic setting	SOP16
BD9411F	9 to 35	Max.About 120 120series×1string in parallel	Max.About 400	0.05 to 1.00	PWM signal Analog signal	Pin logic setting	SOP18
BD9413F	9 to 35	Max.About 120 120series×1string in parallel	Max.About 400	0.05 to 1.00	PWM signal Analog signal	Pin logic setting	SOP18
BD9483F	11 to 35	Max.About 240 120series×2strings in parallel	Max.About 400	0.05 to 0.80	PWM signal Analog signal	Pin logic setting	SOP24
BD9483FV	11 to 35	Max.About 240 120series×2strings in parallel	Max.About 400	0.05 to 0.80	PWM signal Analog signal	Pin logic setting	SSOP-B24
BD9416F	9 to 35	Max.About 240 120series×2strings in parallel	Max.About 400	0.05 to 1.00	PWM signal Analog signal	Pin logic setting	SOP24
BD9416FS	9 to 35	Max.About 240 120series×2strings in parallel	Max.About 400	0.05 to 1.00	PWM signal Analog signal	Pin logic setting	SSOP-A24
BD9479FV	9 to 35	Max.About 96 12series×8strings in parallel	Max.About 40	0.1 to 0.8	PWM signal Analog signal	Pin logic setting	SSOP-B40
BD9408FV	9 to 35	Max.About 120 120series×1string in parallel	Max.About 400	0.05 to 2.00	PWM signal Analog signal	Pin logic setting	SSOP-B14
BD9409F	11.5 to 35.0	Max.About 120 120series×1string in parallel	Max.About 400	0.05 to 1.00	PWM signal Analog signal	Pin logic setting	SOP16
BD9420F	9 to 35	Max.72 12series×6strings in parallel (V _F restrictions exist)	Max.About 40	0.1 to 0.8	PWM signal Analog signal	Pin logic setting	SOP28
BD9421F	9 to 35	Max.72 12series×6strings in parallel (V _F restrictions exist)	Max.About 40	0.1 to 0.8	PWM signal Analog signal	Pin logic setting	SOP24

White LED Drivers with Integrated FET

BD60A00NUX	2.7 to 5.5	Max.10 10series×1string in parallel	Max.40.0	0.6	PWM signal Resistance switching at the ISET terminal	Pin logic setting	VSON008X2030
BD60A60NUX	2.7 to 5.5	Max.6 6series×1string in parallel	Max.26.0	0.6	PWM signal Resistance switching at the ISET terminal	Pin logic setting	VSON008X2030
BD65B60GWL	2.7 to 5.5	Max.16 8series×2strings in parallel	Max.28.5	1.1/0.6	I ² C BUS PWM signal Resistance switching at the ISET terminal	I ² C BUS + PWM	UCSP50L1 1.4 × 1.8, H=Max.0.55
BD6586MUV	2.7 to 5.5	Max.24 6series×4strings in parallel	Max.24.0	1	PWM signal Resistance switching at the ISET terminal	Pin logic setting	VQFN024V4040
BD65D00MUV	6 to 27	Max.40 10series×4strings in parallel	Internal FET Max.40.0 External FET Max.80.0	0.6 to 1.6	PWM signal Resistance switching at the ISET terminal Analog voltage control	Pin logic setting	VQFN028V5050
BD6142AMUV	4.2 to 27	Max.80 10series×8strings in parallel	Max.41.0	0.6 to 1.6	PWM signal Resistance switching at the ISET terminal Analog voltage control	Pin logic setting	VQFN024V4040
BD9394EFV	9 to 35	Max.72 18series×4strings in parallel	Max.60.0	0.1 to 0.8	PWM signal Analog signal	Pin logic setting	HTSSOP-B24
BD9394FP	9 to 35	Max.72 18series×4strings in parallel	Max.60.0	0.1 to 0.8	PWM signal Analog signal	Pin logic setting	HSOP20
BD93941EFV	9 to 35	Max.72 18series×4strings in parallel	Max.60.0	0.1 to 0.8	PWM signal Analog signal	Pin logic setting	HTSSOP-B20
BD93941FP	9 to 35	Max.72 18series×4strings in parallel	Max.60.0	0.1 to 0.8	PWM signal Analog signal	Pin logic setting	HSOP20
BD93942F	9 to 35	Max.72 18series×4strings in parallel	Max.60.0	0.1 to 0.8	PWM signal Analog signal	Pin logic setting	SOP16
BD9470AEFV	9 to 35	Max.72 18series×4strings in parallel	Max.40.0	0.1 to 0.5	PWM signal	Pin logic setting	HTSSOP-B28
BD9470AFM	9 to 35	Max.72 18series×4strings in parallel	Max.40.0	0.1 to 0.5	PWM signal	Pin logic setting	HSOP-M28
BD9397EFV	9 to 35	Max.84 14series×6strings in parallel	Max.50.0	0.10 to 1.25	PWM signal Analog signal	Pin logic setting	HTSSOP-B40
BD9422EFV	9 to 35	Max.84 14series×6strings in parallel	Max.60.0	0.10 to 1.25	PWM signal Analog signal	Pin logic setting I ² C	HTSSOP-B40
BD9423EFV	9 to 35	Max.84 14series×6strings in parallel	Max.60.0	0.05 to 1.25	PWM signal Analog signal	Pin logic setting I ² C	HTSSOP-B40

Synchronous White LED Drivers with Integrated FET

BD6071HFN	2.7 to 5.5	Max.3 3series×1string in parallel	Max.14.0	1	PWM signal from EN terminal	—	HSO8
BD6072HFN	2.7 to 5.5	Max.4 4series×1string in parallel	Max.18.0	1	PWM signal from EN terminal	—	HSO8

LED Camera Flash Drivers

Part No.	Supply Voltage (V)	Number of LED	Output Voltage (V)	Output Current	Switching Frequency (MHz)	Control Interface	Package (mm)
BD6164GUT	2.7 to 4.5	1 (Large current LED)	Max.4.7	52, 72mA(Torch mode) 260, 280, 300, 320mA(Flash mode)	4	I ² C BUS	VCSP60N1 1.5 × 1.1, H=Max.0.675
BD7710GWL	2.7 to 5.5	Max.6 1 to 2series×3strings in parallel (V _F restrictions exist) (large current LED)	Max.5.5	ch1=0 to 400mA ch2=0 to 800mA ch3=0 to 400mA ch1, 2, 3 short=0 to 1.6A	2	I ² C BUS	UCSP50L2
BD7757MWX	2.7 to 5.0	Max.2 1 to 2series×1string in parallel (V _F restrictions exist) (large current LED)	Max.5.1	0 to 1.5A	2	UPIC*	USON014X3020

White LED Driver for Head Light

Part No.	Supply Voltage (V)	Application	ch	Maximum Input Voltage (V)	Output Current	Dimmer Mode	DC/DC	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BD18351EFV-M	4.5 to 65.0	Head Lamp/DRL	1	65	Depend on Extra parts	PWM/DC	Boost	−40 to +125	HTSSOP-B24	YES

*:UPIC : Uni-Port Interface Control

Buck Converter LED Drivers

Buck Converter LED Lighting Drivers for DC/DC Converter type

Part No.	Supply Voltage (V)	Switching Terminal Voltage (V)	Ron (Ω)	Operating Frequency (kHz)	Over Current Protection	Package
BM531Q11	9.0 to 35.0	250	0.93(Typ.)	Max.440	✓	DIP7AK
New BD94062F	10.5 to 35.0	—	—	Max.800	✓	SOP16

White LED Drivers for PFC Direct Connection Current Resonance type

Part No.	Supply Voltage (V)	Drive Method	Oscillation Frequency Variable (kHz)	Primary Brightness Control Method	Control Interface	Package
BD92111F	8.0 to 18.0	Half Bridge	30 to 200	PWM signal	Pin logic setting	SOP18
BD94121F	9.0 to 18.0	Half Bridge	30 to 300	PWM signal/Analog signal	Pin logic setting	SOP18
New BD94122F	9.0 to 18.0	Half Bridge	30 to 300	PWM signal/Analog signal	Pin logic setting	SOP18

Buck-Boost LED Drivers

White LED Drivers

Part No.	Power Supply (V)	Boost FET	ch	Output Voltage (V)	Output Current (mA)	Switching Frequency (MHz)	PWM Dimming Ratio	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BD81A24EFV-M	4.5 to 35.0	Internal	4	Max.35	Max.120/ch	0.2 to 2.2	10,000 : 1@100Hz	-40 to +125	HTSSOP-B28	YES
BD81A24MUV-M	4.5 to 35.0	Internal	4	Max.35	Max.120/ch	0.2 to 2.2	10,000 : 1@100Hz	-40 to +125	VQFN28SV5050	YES
BD81A24MUF-M	4.5 to 35.0	Internal	4	Max.35	Max.120/ch	0.2 to 2.2	10,000 : 1@100Hz	-40 to +125	VQFN28FV5050	YES
BD81A44EFV-M	4.5 to 35.0	External	4	Max.35	Max.120/ch	0.2 to 2.2	10,000 : 1@100Hz	-40 to +125	HTSSOP-B28	YES
BD81A44MUV-M	4.5 to 35.0	External	4	Max.35	Max.120/ch	0.2 to 2.2	10,000 : 1@100Hz	-40 to +125	VQFN28SV5050	YES
BD81A44MUF-M	4.5 to 35.0	External	4	Max.35	Max.120/ch	0.2 to 2.2	10,000 : 1@100Hz	-40 to +125	VQFN28FV5050	YES
New BD81A74EFV-M	4.5 to 35.0	External	4	Max.35	Max.120/ch	0.2 to 2.2	10,000 : 1@100Hz	-40 to +125	HTSSOP-B28	YES
New BD81A74MUV-M	4.5 to 35.0	External	4	Max.35	Max.120/ch	0.2 to 2.2	10,000 : 1@100Hz	-40 to +125	VQFN28SV5050	YES

White LED Driver for Head Light

Part No.	Power Supply (V)	Application	ch	Rated Voltage (V)	Output Current	Dimmer Mode	DC/DC	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BD8381AEFV-M	5 to 30	Head Lamp/DRL	1	50	Depend on extraparts	PWM/DC	Buck-Boost, Boost, Buck	-40 to +125	HTSSOP-B28	YES

LED Drivers for Lighting

AC/DC Controller ICs for LED Lighting Included 650V MOSFET

Part No.	Supply Voltage (V)	Input AC Voltage (Vac)	Built-in PFC Function	Built-in MOSFET	LED Average Current (mA)	Switching Frequency (kHz)	Package
BM520Q15F	8.9 to 26.0	80 to 275	—	✓	up to 200	20 to 200	SOP8
BM521Q25F	8.9 to 25.0	80 to 275	✓	✓	up to 200	20 to 300	SOP8
BD521GOFJ	8.9 to 25.0	80 to 275	✓	—	—	20 to 300	SOP-J8

Inductorless(Charge Pump)LED Drivers

White LED Drivers

Part No.	Supply Voltage (V)	No. of LEDs	Charge Pump Step-up Circuit			Primary Brightness Control Method	Control Interface	Package
			Output Voltage (V)	Output Current (mA)	Pump Frequency			
BD1604MUV	2.7 to 5.5	1 to 4	Max.4.5	120	1MHz	PWM control via EN terminal Resistance switching at ISET terminal	Pin logic setting	VQFN016V3030
BD2606MVV	2.7 to 5.5	1 to 6	Max.4.7	120	250kHz/1kHz	Built-in 64-step current DAC(0.5 to 32.0mA)	I ² C BUS	SQFN016V4040

Constant Current/Serial-in Parallel-out LED Drivers

Parallel-out LED Drivers

Part No.	Supply Voltage (V)	No. of LEDs	Constant Current Driver							Control Interface	Package	
			Max. Current Setting Method	Max. Current		Channel-to-Channel Matching	Brightness Control					
BD1754HFN	2.7 to 5.5	1 to 4 (Parallel Connection)	Resistance change at ISET terminal		32mA (at an ISET resistance of 120kΩ)		Max.3% (at 1V LED pin voltage)		Built-in 64-step current DAC		UPIC*	HS0N8
BD2802GU	2.7 to 5.5	6 (RGB 2ch)	Resistance change at ISET terminal		30.48mA (at an ISET resistance of 120kΩ)		Max.10% (at 1V LED pin voltage)		Built-in 128-step current DAC		I ² C BUS	VCSP85H2
BD2812GU	2.7 to 5.5	6 (RGB 2ch)	Resistance change at ISET terminal		30.48mA (at an ISET resistance of 120kΩ)		Max.10% (at 1V LED pin voltage)		Built-in 128-step current DAC/ Inductorless (Charge Pump)		I ² C BUS	VCSP85H3
Part No.	Supply Voltage (V)	Output Voltage (V)	No. of Output (ch)	Output Method	Max. LED Current	Each Output Format	Other	Control Method	Max. Clock Frequency (MHz)	Package	Automotive Grade AEC-Q100	
BD8378FV-M	3.0 to 5.5	35	8	Open Drain	50mA/ch	ON/OFF	—	SPI	1.25	SSOP-B16	YES	
BD8379FV-M	3.0 to 5.5	35	12	Open Drain	50mA/ch	ON/OFF	—	SPI	1.25	SSOP-B20	YES	
BD8379EFV-M	3.0 to 5.5	35	12	Open Drain	50mA/ch	ON/OFF	—	SPI	1.25	HTSSOP-B20	YES	
BD2808MUV-M	3.0 to 5.5	20	RGB×8 (24ch)	Constant Current	50mA/ch	Built-in 64-step current DAC for RGB	Built-in 256-step PWM control for all channels	2-Wire Serial	1.0	VQFN48MCMV070	YES	
BD8389FV-M	3.0 to 5.5	40	12ch	Open Drain	50mA/ch	ON/OFF	—	SPI	1.25	SSOP-B20	YES	

Dot Matrix LED Drivers

Part No.	Supply Voltage (V)	LED Matrix	Max. LED Current	Built-in Pattern		Matrix Data RAM	Mobile Light	PWM Dimming (step)	Current Setting (step)	Interface	Max. Clock Frequency	Package (mm)
				Scroll	Slope							
☆BU26507GUL	2.7 to 5.5	5 $\times$ 6 30dots	42.5mA/Line	✓	✓	2pages	—	64	16	I ² C BUS/SPI (2 address/—)	400kHz/13MHz	VCSP50L2 2.5 $\times$ 2.5, H=Max.0.55
BD26503GUL	2.7 to 5.5	7 $\times$ 17 119dots	30mA/Line	✓	✓	2pages	—	64	16	I ² C BUS/SPI (2 address/—)	400kHz/13MHz	VCSP50L3 3.6 $\times$ 3.6, H=Max.0.55
BD26503KS2	2.7 to 5.5	7 $\times$ 17 119dots	30mA/Line	✓	✓	2pages	—	64	16	I ² C BUS/SPI (2 address/—)	400kHz/13MHz	SQFP-T52
BU16501KS2	2.7 to 5.5	8 $\times$ 16 128dots	42.5mA/Line	—	—	1page	—	64	16	I ² C BUS/SPI (2 address/—)	400kHz/13MHz	SQFP-T52

LED Source Drivers (For Automotive)

Part No.	Supply Voltage (V)	Application	ch	Driver	Maximum Input Voltage(V)	Maximum Output Current (mA)	Dimmer Mode	Accuracy of Current	Operating Temperature (°C)	Package	Automotive Grade AEC-Q100
BD18340FV-M	4.5 to 19.0	DRL/Position/FOG/Turn/Rear	1 to 10	Controller (External PNP)	70	Total 1,000	PWM/DC	± 3 (Ta=25 to 125°C)	-40 to +125	SSOP-B16	YES
BD18341FV-M	4.5 to 19.0	DRL/Position/FOG/Turn/Rear	1 to 10	Controller (External PNP)	70	Total 1,000	PWM/DC	± 3 (Ta=25 to 125°C)	-40 to +125	SSOP-B16	YES
BD8372EFJ-M	5.5 to 40.0	DRL/Position/FOG/Turn/Rear	1	Internal	50	200	High Current/Low Current	± 3 (Ta=25°C)	-40 to +125	HTSOP-J8	YES
BD8372HFP-M	5.5 to 40.0	DRL/Position/FOG/Turn/Rear	1	Internal	50	200	High Current/Low Current	± 3 (Ta=25°C)	-40 to +125	HRP7	YES
BD8374EFJ-M	4.5 to 42.0	DRL/Position/FOG/Turn/Rear	1	Internal	50	500	PWM	± 3 (Ta=25°C)	-40 to +125	HTSOP-J8	YES
BD8374HFP-M	4.5 to 42.0	DRL/Position/FOG/Turn/Rear	1	Internal	50	500	PWM	± 3 (Ta=25°C)	-40 to +125	HRP7	YES
BD83732HFP-M	4.5 to 42.0	DRL/Position/FOG/Turn/Rear	1	Internal	50	500	PWM/DC	± 3 (Ta=25°C)	-40 to +125	HRP7	YES
BD83733HFP-M	4.5 to 42.0	DRL/Position/FOG/Turn/Rear	1	Internal	50	500	PWM/DC	± 3 (Ta=25°C)	-40 to +125	HRP7	YES
BD83740HFP-M	4.5 to 42.0	DRL/Position/FOG/Turn/Rear	1	Internal	50	500	PWM	± 3 (Ta=25°C)	-40 to +125	HRP7	YES
New BD83740EFJ-M	4.5 to 42.0	DRL/Position/FOG/Turn/Rear	1	Internal	50	500	PWM	± 3 (Ta=25°C)	-40 to +125	HTSOP-J8	YES

*UPIC : Uni-Port Interface Control

☆ : Under Development



Display Drivers

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TFT Driver series

Driver for Large LCD Panels

6bit RSDS™ Source Driver							
Part No.	Function	Gray Scale (bit)	Number of Outputs	Driver Output Voltage (V)Max.	Max.Clock Frequency (MHz)Max.	Logic Power Supply Voltage (V)	Package
BU95306	RSDS™ I/F R-DAC Type	6	600/618/630/642	13.5	85	2.7 to 3.6	COF

*RSDS™ is the trademark of signal interface technology proposal by National Semiconductor Corporation of the U.S.A

Drivers for Small to Medium LCD Panels

(LAPIS Semiconductor products)

TFT-LCD Drivers									
Part No.	Type	Logic Supply Voltage (V)	LCD Voltage (V)	Number of Driver Outputs	I/F	Operating Temperature (°C)	Package	Halogen Free Support*1	Automotive Grade*2
ML9860B	Source	2.1 to 3.6	10.0 to 14.6	480	RSDS	−40 to +95	Au bump chip	✓	YES
ML9863A	Source	2.4 to 3.6	8.0 to 14.6	960/804/792/768	CMOS/RSDS	−40 to +95	Au bump chip	✓	YES
ML9881	Source	2.7 to 3.6	8.0 to 14.6	1440/1284/1278/1260/1200/1080/1026/1020	RSDS/mini-LVDS	−40 to +95	Au bump chip	✓	YES
ML9882	Source	2.7 to 3.6	8.0 to 14.6	1440/1284/1278/1260/1200/1080/1026/1020	RSDS/mini-LVDS	−40 to +95	Au bump chip	✓	YES
ML9883	Source	2.7 to 3.6	8.0 to 14.6	1440/1284/1278/1200/1080/1062/1026/1020	RSDS/mini-LVDS	−40 to +95	Au bump chip	✓	YES
ML9872	Gate	2.4 to 3.6	to 40	540/480/400/384/360/300/240	CMOS	−40 to +105	Au bump chip	✓	YES
ML9873	Gate	2.4 to 3.6	to 40	960/800/768/720/684/682/640/600/540/512	CMOS	−40 to +105	Au bump chip	✓	YES
ML9874	Gate	1.6 to 3.6	to 40	810/800/770/768/720/683/648/640/600/540/525/512/480/450/420/410	CMOS	−40 to +95	Au bump chip	✓	YES

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*2 : Please inquire to the sales for AEC-Q100.

TN/STN LCD Driver series

LCD Segment Drivers

Low Duty LCD Segment Drivers																
Part No.	Display (dots)	Outputs		Operating Voltage(V)		Operating Temperature (°C)	Duty	Bias	I/F	EVR	GPO	Independent Blink	LED Driver (port)	PWM Gen.	Keyscan	Package
		seg.	com.	I/F Power Supply (V _{cc})	LCD Power Supply (VLCD)											
BU9796AMUV	48	12	4	2.5 to 5.5		−40 to +85	1/4	1/3,1/2	2wire	—	—	—	—	—	—	VQFN024V4040
BU9796AFS	80	20	4	2.5 to 5.5		−40 to +85	1/4	1/3,1/2	2wire	—	—	—	—	—	—	SSOP-A32
BU97941FV	104	26	4	1.8 to 3.6	2.7 to 5.5	−40 to +85	1/4,1/3, Static	1/3	3wire	—	—	—	4	—	—	SSOP-B40
BU9795AFV	108	27	4	2.5 to 5.5		−40 to +85	1/4	1/3,1/2	3wire	—	—	—	—	—	—	SSOP-B40
BU97930MUV	108	27	4	1.8 to 3.6	2.7 to 5.5	−40 to +85	1/4,1/3, Static	1/3	3wire	—	4port	✓	1	1ch 8bit	—	VQFN040V6060
BU97931FV	112	28	4	1.8 to 3.6	2.7 to 5.5	−40 to +85	1/4,1/3, Static	1/3	3wire	—	5port	✓	1	1ch 8bit	—	SSOP-B40
BU97960MUV	120	15	8	2.5 to 6.0	2.5 to 6.0	−40 to +85	1/8,1/4	1/4,1/3	2wire	✓	—	—	—	—	—	VQFN028V5050
BU9795BGUW	124	31	4	2.5 to 5.5		−40 to +85	1/4	1/3,1/2	3wire	—	—	—	—	—	—	VBGA049W040A
BU9795BKV	140	35	4	2.5 to 5.5		−40 to +85	1/4	1/3,1/2	3wire	—	—	—	—	—	—	VQFP48C
BU9795ZKS2	140	35	4	2.5 to 5.5		−40 to +85	1/4	1/3,1/2	3wire	—	—	—	—	—	—	SQFP-T52
BU9797AFUV	144	36	4	2.5 to 5.5		−40 to +85	1/4	1/3	2wire	—	—	—	—	—	—	TSSOP-C48V
BU97981MUV	168	42	4	1.8 to 3.6	3.3 to 5.5	−30 to +75	1/4,1/3, Static	1/3	3wire	—	27port	✓	3	2ch 12bit	—	VQFN56AV8080
BU97981KV	196	49	4	1.8 to 3.6	3.3 to 5.5	−30 to +75	1/4,1/3, Static	1/3	3wire	—	31port	✓	3	2ch 12bit	—	VQFP64
BU97981GU	196	49	4	1.8 to 3.6	3.3 to 5.5	−30 to +75	1/4,1/3, Static	1/3	3wire	—	31port	✓	3	2ch 12bit	—	VBGA064T050A
BU9794AKV	200	50	4	2.5 to 5.5	2.5 to 5.5	−40 to +85	1/4	1/3,1/2	3wire	—	—	—	—	—	—	VQFP64
BU9799KV	200	50	4	2.5 to 5.5	2.5 to 5.5	−40 to +85	1/4	1/3,1/2	2wire	✓	—	—	—	—	—	VQFP64
BU97501KV	204	51	4	2.7 to 6.0	4.5 to 6.0	−40 to +85	1/4,1/3	1/3,1/2	3wire+KEYOUT	—	4port	—	—	—	5×6 Max. 30Key	VQFP64
BU97950AFUV	280	35	8	2.5 to 6.0	2.5 to 6.0	−40 to +85	1/8,1/4	1/4,1/3	2wire	✓	—	—	—	—	—	TSSOP-C48V
BU97530KVT	445	89	5	2.7 to 6.0		−40 to +85	1/5,1/4,1/3, Static	1/3,1/2	3wire+KEYOUT	✓	9port (9ch PWM)	—	—	9ch 8bit	5×6 Max. 30Key	TQFP100V
BU97550CH	528	66	8	2.7 to 6.0		−40 to +85	1/8,1/7,1/5 1/4,1/3,Static	1/4,1/3, 1/2	3wire+KEYOUT	✓	9port (9ch PWM)	—	—	9ch 9bit	5×6 Max. 30Key	CHIP

Low Duty LCD Segment Drivers for Automotive Application

Part No.	Display (dots)	Outputs		Operating Voltage(V)		Operating Temperature (°C)	Duty	Bias	I/F	EVR	GPO	Independent Blink	LED Driver	PWM Gen.	Keyscan	Package	Automotive Grade AEC-Q100
		seg.	com.	I/F Power Supply (V _{cc})	LCD Power Supply (V _{LCD})												
BU97601FV-M	116	29	4	2.7 to 6.0		-40 to +85	1/4,1/3,1/2, Static	1/3,1/2	3wire + KEYOUT	✓	16port (16ch PWM)	—	—	6ch 9bit	4×5 Max. 20Key	SSOP-B40	YES
BU9797FUV-M	144	36	4	2.5 to 5.5		-40 to +85	1/4	1/3,1/2	2wire	—	—	—	—	—	—	TSSOP-C48V	YES
BU97510CKV-M	216	54	4	2.7 to 6.0		-40 to +85	1/4,1/3	1/3,1/2	3wire	—	6port (6ch PWM)	—	—	6ch 6bit	—	VQFP64	YES
BU97520AKV-M	276	69	4	2.7 to 6.0		-40 to +85	1/4,1/3	1/3,1/2	3wire + KEYOUT	—	6port (6ch PWM)	—	—	6ch 8bit	5×6 Max. 30Key	VQFP80	YES
BU97540KV-M	335	67	5	2.7 to 6.0		-40 to +85	1/5,1/4,1/3, Static	1/3,1/2	3wire + KEYOUT	✓	9port (9ch PWM)	—	—	9ch 9bit	5×6 Max. 30Key	VQFP80	YES
BU97530KVT-M	445	89	5	2.7 to 6.0		-40 to +85	1/5,1/4,1/3, Static	1/3,1/2	3wire + KEYOUT	✓	9port (9ch PWM)	—	—	9ch 8bit	5×6 Max. 30Key	TQFP100V	YES
BU97550KV-M	528	66	8	2.7 to 6.0		-40 to +85	1/8,1/7,1/5,1/4, 1/3,Static	1/4,1/3,1/2	3wire + KEYOUT	✓	9port (9ch PWM)	—	—	9ch 9bit	5×6 Max. 30Key	VQFP80	YES
BU91795MUF-M	48	12	4	2.5 to 6.0		-40 to +105	1/4	1/3	2wire	—	—	—	—	—	—	VQFN24FV4040	YES
BU91796FS-M	80	20	4	2.5 to 6.0		-40 to +105	1/4	1/3	2wire	—	—	—	—	—	—	SSOP-A32	YES
BU91600FV-M	116	29	4	2.7 to 6.0		-40 to +105	1/4,1/3,1/2, Static	1/3,1/2	3wire + KEYOUT	✓	16port (16ch PWM)	—	—	6ch 9bit	4×5 Max. 20Key	SSOP-B40	YES
BU91797MUF-M	144	36	4	2.5 to 6.0		-40 to +105	1/4	1/3	2wire	—	—	—	—	—	—	VQFN48FV7070	YES
BU91797FUV-M	144	36	4	2.5 to 6.0		-40 to +105	1/4	1/3	2wire	—	—	—	—	—	—	TSSOP-C48V	YES
BU91600FUV-M	148	37	4	2.7 to 6.0		-40 to +105	1/4,1/3,1/2, Static	1/3,1/2	3wire + KEYOUT	✓	16port (16ch PWM)	—	—	6ch 9bit	4×5 Max. 20Key	TSSOP-C48V	YES
BU91799KV-M	200	50	4	2.5 to 6.0	2.5 to 6.0	-40 to +105	1/4	1/3	2wire	✓	—	—	—	—	—	VQFP64	YES
BU91501KV-M	204	51	4	2.7 to 6.0	4.5 to 6.0	-40 to +105	1/4,1/3	1/3,1/2	3wire + KEYOUT	—	4port	—	—	—	5×6 Max. 30Key	VQFP64	YES
BU91510KV-M	216	54	4	2.7 to 6.0		-40 to +105	1/4,1/3	1/3,1/2	3wire	—	6port (6ch PWM)	—	—	6ch 6bit	—	VQFP64	YES
BU91520KV-M	276	69	4	2.7 to 6.0		-40 to +105	1/4,1/3	1/3,1/2	3wire + KEYOUT	—	6port (6ch PWM)	—	—	6ch 8bit	5×6 Max. 30Key	VQFP80	YES
BU91530KVT-M	445	89	5	2.7 to 6.0		-40 to +105	1/5,1/4,1/3, Static	1/3,1/2	3wire + KEYOUT	✓	9port (9ch PWM)	—	—	9ch 8bit	5×6 Max. 30Key	TQFP100V	YES
BU91R63CH-M	176	44	4	2.7 to 6.0	2.7 to 6.0	-40 to +105	1/4,1/3,1/2, Static	1/3,1/2	2wire	✓	—	—	—	—	—	Au Bump Chip	YES
New BU91R64CH-M	320	80	4	2.7 to 6.0	2.7 to 6.0	-40 to +105	1/4,1/3,1/2, Static	1/3,1/2	2wire/3wire	✓	—	✓	—	—	—	Au Bump Chip	YES
New BU91R65CH-M	640	160	4	2.7 to 6.0	2.7 to 6.0	-40 to +105	1/4,1/3,1/2, Static	1/3,1/2	2wire/3wire	✓	—	✓	—	—	—	Au Bump Chip	YES

Low Duty LCD Segment Drivers for Industrial Application

Part No.	Display (dots)	Outputs		Operating Voltage(V)		Operating Temperature (°C)	Duty	Bias	Interface	EVR	GPO	Independent Blink	LED Driver (port)	PWM Gen.	Keyscan	Package
		seg.	com.	I/F Power Supply (V _{cc})	LCD Power Supply (V _{LCD})											
BU97941FV-LB	104	26	4	1.8 to 3.6	2.7 to 5.5	-40 to +85	1/4,1/3,Static	1/3	3wire	—	—	—	4	—	—	SSOP-B40
BU9795AFV-LB	108	27	4	2.5 to 5.5		-40 to +85	1/4	1/3,1/2	3wire	—	—	—	—	—	—	SSOP-B40
BU97931FV-LB	112	28	4	1.8 to 3.6	2.7 to 5.5	-40 to +85	1/4,1/3,Static	1/3	3wire	—	5port	✓	1	1ch 8bit	—	SSOP-B40

Common/Segment Drivers for Dot Matrix LCD

(LAPIS Semiconductor products)

LCD Drivers

Part No.	No. of Driver Output	Max. Driving Display Size	Logic Supply Voltage(V)	Driver Supply Voltage (V)	Operating Temperature (°C)	Feature	Package	Halogen Free Support*1
ML9460	240	320×240 (QVGA)	2.5 to 5.5	up to 43	-30 to +75	Output change 240/200/160/120	Au bump chip	✓
ML9461B	320		2.5 to 5.5	2.6 to 5.5	-30 to +75	Output change 320/240/200	Au bump chip	✓

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Controller Drivers for Graphic LCD

(LAPIS Semiconductor products)

LCD Controller Drivers

Part No.	Max. No. of Segment Outputs	Max. Driving Display Size	Logic Supply Voltage (V)	Driver Supply Voltage (V)	Operating Temperature (°C)	Feature	Package	Halogen Free Support*1	Automotive Grade*2
ML9058E	132	132×65 dots	3.7 to 5.5	6 to 18	-40 to +85	Integrated RAM/ Boost circuit	Au bump chip	✓	YES
ML9059E	132	132×49 dots	3.7 to 5.5	6 to 18	-40 to +85	Integrated RAM/ Boost circuit	Au bump chip	✓	YES
ML9445	180	180×65 dots	2.7 to 5.5	6 to 18.5	-40 to +105	Integrated RAM/ Boost circuit	Au bump chip	✓	YES
ML9092-01	56	56×10 dots	4.5 to 5.5	4.5 to 16.5	-40 to +85	Integrated RAM/ Boost circuit/PWM	TQFP100-1414-0.50	✓	YES
ML9092-02	60	60×10 dots	4.5 to 5.5	4.5 to 16.5	-40 to +85	Integrated RAM/ Boost circuit	TQFP100-1414-0.50	✓	YES
ML9092-03						Integrated RAM			
ML9092-04						Integrated RAM/PWM			

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*2 : Please inquire to the sales for AEC-Q100.

Controller Drivers for Character LCD

(LAPIS Semiconductor products)

LCD Controller Drivers

Part No.	Max. No. of Segment Outputs	Digits/Lines	Logic Supply Voltage (V)	Driver Supply Voltage (V)	Operating Temperature (°C)	Feature	Package	Halogen Free Support*1
ML9042-0x	100	5×8 dots, 20 characters×2 lines	2.7 to 5.5	2.7 to 5.5	-40 to +85	Built-in bias register 2kΩ/ Supports custom fonts	Au bump chip	✓
ML9042-1x	100	5×8 dots, 20 characters×2 lines	2.7 to 5.5	2.7 to 5.5	-40 to +85	Built-in bias register 4kΩ/ Supports custom fonts	Au bump chip	✓
ML9042-2x	100	5×8 dots, 20 characters×2 lines	2.7 to 5.5	2.7 to 5.5	-40 to +85	Built-in bias register 10kΩ/ Supports custom fonts	Au bump chip	✓

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.



ICs

Display Drivers

- ▶ TN/STN LCD Driver series ▶▶ Controller Drivers for Low Duty LCD
- ▶ VFD Driver series ▶▶ Anode/Grid Drivers for VFD
- ▶▶▶ Controller Drivers for Character VFD
- ▶▶▶ Controller Drivers for Low Duty VFD
- ▶ Car Clock Drivers

Controller Drivers for Low Duty LCD

(LAPIS Semiconductor products)

LCD Controller Drivers(Package Product)														
Part No.	Max. No. of Segment Outputs	Max. No. of Driving Segments					Internal Oscillation Frame Frequency (Hz)	Logic Supply Voltage (V)	Driver Supply Voltage (V)	Operating Temperature (°C)	Feature	Package	Halogen Free Support ^{*1}	Automotive Grade ^{*2}
ML9470-12	80	80	160	—	—	—	—	3.0 to 5.5 (single)		−40 to +105	Supports external clock input	QFP100-1420-0.65	✓	YES
ML9471	80	—	—	240	320	400	—	3.0 to 5.5 (single)		−40 to +105	Supports external clock input	TQFP100-1414-0.50	✓	YES
ML9472	60	60	120	—	—	—	—	3.0 to 5.5 (single)		−40 to +105	Supports external clock input	TQFP80-1212-0.50	✓	YES
ML9473	60	—	—	180	240	300	—	3.0 to 5.5 (single)		−40 to +105	Supports external clock input	TQFP80-1212-0.50	✓	YES
ML9475	40	—	—	120	160	—	—	3V ± 10%/5V ± 10%	3.5 to 5.5	−40 to +105	Supports external clock input/ Bias generator built in/ EMS countermeasure built in	QFP56-910-0.65	✓	YES
ML9476	16	—	—	48	64	—	—	3V ± 10%/5V ± 10%	3.5 to 5.5	−40 to +105	Supports external clock input/ Bias generator built in/ EMS countermeasure built in	TQFP48-0707-0.50	✓	YES
ML9477	32	—	—	96	128	—	—	3V ± 10%/5V ± 10%	3.5 to 5.5	−40 to +105	Supports external clock input/ Bias generator built in/ EMS countermeasure built in	TQFP48-0707-0.50	✓	YES
ML9484	50	50	100	150	200	—	—	2.7 to 5.5	4.5 to 5.5	−40 to +105	Supports external clock input/ Bias generator built in	TQFP64-1010-0.50	✓	YES
LCD Controller Drivers(Gold Bump Product)														
ML9480	40	40	80	120	160	—	65/75/85/95/130/150/170/190 command switching	2.7 to 5.5	4.5 to 5.5	−40 to +105	Supports external clock input/ Bias generator built in/ EMS countermeasure built in/ No external parts	Au bump chip	✓	YES
ML9478C	80	80	160	240	320	—	65/75/85/95 command switching	2.7 to 5.5	4.5 to 5.5	−40 to +105	Supports external clock input/ Bias generator built in/ EMS countermeasure built in/ No external parts	Au bump chip	✓	YES
ML9479E	160	160	320	480	640	—	65/75/85/95 command switching	2.7 to 5.5	4.5 to 5.5	−40 to +105	Supports external clock input/ Bias generator built in/ EMS countermeasure built in/ No external parts	Au bump chip	✓	YES
ML9488	80	80	160	240	320	—	130/150/170/190 command switching	2.7 to 5.5	4.5 to 5.5	−40 to +105	Supports external clock input/ Bias generator built in	Au bump chip	✓	YES
ML9489	160	160	320	480	640	—	130/150/170/190 command switching	2.7 to 5.5	4.5 to 5.5	−40 to +105	Supports external clock input/ Bias generator built in	Au bump chip	✓	YES

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*2 : Please inquire to the sales for AEC-Q100.

VFD Driver series

Anode/ Grid Drivers for VFD

(LAPIS Semiconductor products)

VFD Drivers									
Part No.	No. of Driver Output	Driving Target	VFD Driving Voltage (V)	Power Supply Type	Operating Temperature (°C)	Feature	Package	Halogen Free Support ^{*1}	Automotive Grade ^{*2}
ML9271	48	Anode/Grid	18	Positive supply	—40 to +105	Cascade connection	QFP64-1414-0.80	—	YES
ML9272	40	Anode/Grid	65	Positive supply	—40 to +105	Cascade connection	SSOP60-700-0.65	✓	YES

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*2 : Please inquire to the sales for AEC-Q100.

Controller Drivers for Character VFD

(LAPIS Semiconductor products)

VFD Controller Drivers								
Part No.	Display Pixels	VFD Driving Voltage (V)	Power Supply Type	Operating Temperature (°C)	Feature	Package	Halogen Free Support ^{*1}	Automotive Grade ^{*2}
ML9208-xxGA	5 × 7 dots	VDD-42	Negative supply	—40 to +85	3-bit gradation	QFP64-1414-0.80	✓	—
ML9208-xxMB	5 × 7 dots	VDD-42	Negative supply	—40 to +85	3-bit gradation	SSOP64-525-0.80	—	—
ML9208A-xxGA	5 × 7 dots	VDD-42	Negative supply	—40 to +85	4-bit gradation	QFP64-1414-0.80	✓	—
ML9208A-xxTB	5 × 7 dots	VDD-42	Negative supply	—40 to +85	4-bit gradation	TQFP64-1010-0.50	✓	—
ML9209-xxGA	16 segs	VDD-42	Negative supply	—40 to +85	4-bit gradation	QFP44-910-0.80	—	—
ML9289-xxGA	16 segs	42	Positive supply	—40 to +85	4-bit gradation	QFP44-910-0.80	✓	—
ML9289-xxTB	16 segs	42	Positive supply	—40 to +85	4-bit gradation	TQFP48-0707-0.50	—	—
ML9286-xxGA	5 × 7 dots	80	Positive supply	—40 to +105	Multigrad function/ 8-bit gradation/ Cascade connection	QFP80-1414-0.65	✓	YES
ML9286-xxTB	5 × 7 dots	80	Positive supply	—40 to +105	Multigrad function/ 8-bit gradation/ Cascade connection	TQFP80-1212-0.50	✓	YES

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*2 : Please inquire to the sales for AEC-Q100.

Controller Drivers for Low Duty VFD

(LAPIS Semiconductor products)

VFD Controller Drivers								
Part No.	Max. No. of Driving Segments	VFD Driving Voltage (V)	Power Supply Type	Operating Temperature (°C)	Feature	Package	Halogen Free Support ^{*1}	Automotive Grade ^{*2}
ML9212GA	64 (1/2Duty) 96 (1/3Duty)	18	Positive supply	—40 to +85	10-bit gradation/ Cascade connection	QFP56-910-0.65	✓	YES
ML9213GP	112 (1/2Duty) 168 (1/3Duty)	18	Positive supply	—40 to +85	10-bit gradation/ Cascade connection	QFP80-1414-0.65	✓	YES

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*2 : Please inquire to the sales for AEC-Q100.

Car Clock Drivers

(LAPIS Semiconductor products)

Car Clock									
Part No.	Display Duty	VFD Driving Voltage (V)	Logic Supply Voltage (V)	Operating Temperature (°C)	Supply Current (Max.)	No. of Digit	Package	Halogen Free Support ^{*1}	Automotive Grade ^{*2}
ML9298	1/2	4.0 to 18	No need	−40 to +85	0.6mA	4digits×1line and col.	SSOP32-430-1.00	✓	YES
ML9098B	Static, 1/2	3.0 to 5.5	3.0 to 5.5	−40 to +105	0.6mA	4digits×1line and col., AM, PM	TQFP48-0707-0.50	—	YES

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*2 : Please inquire to the sales for AEC-Q100.



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Hall ICs

Omnipolar Detection Hall ICs Detects S- or N-pole Magnetic Fields and Turns the Output ON(active Low)									
Part No.	Supply Voltage (V)	Operate Point(mT)		Pulse Drive Period (ms)	Power supply noise resitsance	Supply Current (Avg.)(μA)	Output	Operating Temperature (C)	Package (mm)
		S-pole	N-pole						
BU52492NUZ	1.65 to 3.60	+2.4	−2.4	50	Normal	4.2	CMOS	−40 to +85	VSON0421114A 1.1 × 1.4, H=Max.0.4
BU52092GWZ	1.65 to 3.60	+2.4	−2.4	50	Normal	4.4	CMOS	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52493NUZ	1.65 to 3.60	+4.1	−4.1	50	Normal	4.2	CMOS	−40 to +85	VSON0421114A 1.1 × 1.4, H=Max.0.4
BU52055GWZ	1.65 to 3.60	+4.1	−4.1	50	Normal	5.0	CMOS	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52494NUZ	1.65 to 3.60	+6.3	−6.3	50	Normal	4.2	CMOS	−40 to +85	VSON0421114A 1.1 × 1.4, H=Max.0.4
BU52054GWZ	1.65 to 3.60	+6.3	−6.3	50	Normal	5.0	CMOS	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52095GWZ	1.65 to 3.60	+9.5	−9.5	50	Normal	4.4	CMOS	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52097GWZ	1.65 to 3.60	+15.0	−15.0	50	Normal	4.4	CMOS	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52098GWZ	1.65 to 3.60	+24.0	−24.0	50	Normal	4.4	CMOS	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52792GWZ	2.7 to 5.5	+2.4	−2.4	50	Normal	3.2	CMOS	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BD7411G	4.5 to 5.5	+3.4	−3.4	—	Normal	2.0(mA)	CMOS	−40 to +85	SSOP5
Omnipolar Detection Hall ICs with Polarity Discrimination(Polarity Detection for Both S and N Features Dual Outputs) Features 2 Outputs to Discriminate Between N- and S-pole Detection									
BU52472NUZ	1.65 to 3.60	+2.4	−2.4	50	High	4.4	CMOS (2 Outputs : S, N pole)	−40 to +85	VSON0421114A 1.1 × 1.4, H=Max.0.4
BU52272NUZ	1.65 to 3.60	+2.4	−2.4	50	Normal	4.4	CMOS (2 Outputs : S, N pole)	−40 to +85	VSON0421114A 1.1 × 1.4, H=Max.0.4
BU52072GWZ	1.65 to 3.60	+2.4	−2.4	50	Normal	4.4	CMOS (2 Outputs : S, N pole)	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52273NUZ	1.65 to 3.60	+4.1	−4.1	50	Normal	4.4	CMOS (2 Outputs : S, N pole)	−40 to +85	VSON0421114A 1.1 × 1.4, H=Max.0.4
BU52073GWZ	1.65 to 3.60	+4.1	−4.1	50	Normal	4.4	CMOS (2 Outputs : S, N pole)	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52274NUZ	1.65 to 3.60	+6.3	−6.3	50	Normal	4.4	CMOS (2 Outputs : S, N pole)	−40 to +85	VSON0421114A 1.1 × 1.4, H=Max.0.4
BU52074GWZ	1.65 to 3.60	+6.3	−6.3	50	Normal	4.4	CMOS (2 Outputs : S, N pole)	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52075GWZ	1.65 to 3.60	+9.5	−9.5	50	Normal	5.0	CMOS (2 Outputs : S, N pole)	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52077GWZ	1.65 to 3.60	+15.0	−15.0	50	Normal	5.0	CMOS (2 Outputs : S, N pole)	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
BU52177GXZ	1.65 to 3.60	+15.0	−15.0	50	Normal	5.0	CMOS (2 Outputs : S, N pole)	−40 to +85	XCSP30L1 0.65 × 0.65, H=Max.0.33
BU52078GWZ	1.65 to 3.60	+24.0	−24.0	50	Normal	5.0	CMOS (2 Outputs : S, N pole)	−40 to +85	UCSP35L1 0.8 × 0.8, H=Max.0.4
Bipolar Latch Hall IC Detects Turn of Pole(S→N or N→S)(N-pole→S-pole : Out put High→Low S-pole→N-pole : Out put Low→High)									
Part No.	Supply Voltage (V)	Operate Point(mT)		Pulse Drive Period (ms)	Supply Current (Avg.)(μA)	Output	Operating Temperature (C)	Package (mm)	
		S-pole	N-pole						
BU52040HFV	1.65 to 3.30	+3.0	−3.0	0.5	200	CMOS	−40 to +85	HVSOF5	

Geomagnetic Sensor IC

3-Axis Digital Magnetometer IC								
Part No.	Supply Voltage (V)	Magnetic Measurement (μ T)	Magnetic Sensitivity (μ T/LSB)	Current Consumption (μ A)	I/F	Operating Temperature (°C)	Package (mm)	
New BM1422AGMV	1.7 to 3.6	±1,200	0.042	150	I²C	−40 to +85	MLGA010V020A 2.0 × 2.0, H=Max.1.0	

Current Sensor IC

Contactless Current Sensor IC								
Part No.	Supply Voltage (V)	Magnetic Measurement (μT)	Magnetic Sensitivity (μ T/LSB)	Current Consumption (μ A)	I/F	Operating Temperature (°C)	Package (mm)	
New BM14270MUV-LB	2.7 to 5.5	±280	0.045	70	I²C	−40 to +125	VQFN20QV3535 3.5 × 3.5, H=Max.1.0	

Ambient Light Sensor ICs

Analog Current Output type Ambient Light Sensor ICs								
Part No.	Supply Voltage (V)	Sensitivity Variations (%)	Illuminance Measurement (lx)	High Sensitivity	IR Cut	I/F	Operating Temperature (°C)	Package
BH1603FVC	2.4 to 5.5	±15	0 to 100,000	—	—	Linear Current Output (Source)	−40 to +85	WSOF6
BH1620FVC	2.4 to 5.5	±15	0 to 100,000	—	—	Linear Current Output (Source)	−40 to +85	WSOF5
BH1680FVC	2.4 to 5.5	±15	0 to 50,000	✓	✓	Linear Current Output (Source)	−40 to +85	WSOF5
BH1682FVC	2.3 to 5.5	±3μA	1 to 55,000	—	✓	Logarithmic Current Output (Source)	−40 to +80	WSOF5
Digital 16bit Serial Output type Ambient Light Sensor ICs								
BH1721FVC	2.4 to 3.6	±15	0 to 65,000	—	—	I²C	−40 to +85	WSOF5
BH1730FVC	2.4 to 3.6	±15	0 to 65,000(1/128 lx step)	✓	—	I²C	−40 to +85	WSOF6
BH1726NUC	2.3 to 3.6	±15	0 to 30,000(1/512 lx step)	✓	✓	I²C	−40 to +85	WSN008X2120

Color Sensor IC

Digital 16bit Serial Output type Color Sensor IC

Part No.	Supply Voltage (V)	λ_r (nm)				Illuminance Measurement (lx)	High Sensitivity	IR Cut	I/F	Operating Temperature (°C)	Package
		Red	Green	Blue	IR						
New BH1749NUC	2.3 to 3.6	630	540	460	825	0 to 80,000	✓	✓	I ² C	−40 to +85	WS0N008X2120

Optical Sensor for Heart Rate Monitor ICs

Optical Sensor for Heart Rate Monitor ICs

Part No.	Analog Supply Voltage (V)	IO Supply Voltage (V)	Sampling Frequency (Hz)	Red Light, IR Cut	I/F	Operating Temperature (°C)	Package (mm)
BH1790GLC	2.5 to 3.6	1.7 to 3.6	32/64	✓	I ² C	−20 to +85	WLGA010V28 2.8 × 2.8, H=Max.1.0
BH1792GLC	2.5 to 3.6	1.7 to 3.6	32/64/128/256/1,024	✓	I ² C	−20 to +85	WLGA010V28 2.8 × 2.8, H=Max.1.0

Pressure Sensor ICs

Digital Pressure Sensor ICs with Built-in Temperature Compensation Function

Part No.	Supply Voltage (V)	Pressure Range (hPa)	Relative Pressure Accuracy (hPa)	Absolute Pressure Accuracy (hPa)	Average Current Consumption (μA)	I/F	Operating Temperature (°C)	Package (mm)
BM1383AGLV	1.7 to 3.6	300 to 1,100	±0.12	±1	3.0	I ² C	−40 to +85	CLGA12V025M 2.5 × 2.5, H=Max.1.0
BM1386GLV	1.7 to 3.6	300 to 1,300	±0.12	±1	3.0	I ² C	−40 to +85	CLGA10V020A 2.0 × 2.0, H=Max.1.0

Temperature Sensor ICs

Analog Output Temperature Sensor IC

Part No.	Supply Voltage (V)	Temperature Accuracy(°C)		Temperature Sensitivity (mV/°C)	Output Voltage(V) (Ta=+30°C, V _{DD} =3V)	Supply Current (μA)	Operating Temperature (°C)	Package
		Ta=+30°C	Ta=−30, +100°C					
BD1020HFV	2.4 to 5.5	±1.5	±2.5	−8.2	1.3	4.0	−30 to +100	HVSOF5

Digital Output Temperature Sensor IC

Part No.	Supply Voltage (V)	Temperature Accuracy(°C) Ta=−20 to +85°C	Current Consumption (μA)	I/F	Operating Temperature (°C)	Package
BH1900NUX	2.7 to 3.6	±3	75	I ² C	−30 to +95	VSON008X2030

Low Power Thermostat Output Temperature Sensor ICs

Part No.	Supply Voltage (V)	Detection Temperature (°C)	Detection Temperature Accuracy (°C)	Current Consumption (Operation/Power down) (μA)	Output type		Operating Temperature (°C)	Package
					Type	Active		
New BDJ0600AHFV	2.4 to 5.5	60	±2.5	7.5/0.3	Open Drain	L	−30 to +100	HVSOF5
New BDJ0700AHFV	2.4 to 5.5	70	±2.5	7.5/0.3	Open Drain	L	−30 to +100	HVSOF5
New BDJ0800AHFV	2.4 to 5.5	80	±2.5	7.5/0.3	Open Drain	L	−30 to +100	HVSOF5

Amplifier for Human Body Detector IC

Pyroelectric Infrared Sensor Amplifier

Part No.	Supply Voltage (V)	DRAIN Voltage (V)	Amp.1/Amp.2 Gain (dB)	Output type	Package
BD9251FV	2.97 to 6.00	2.3	Max. 46	Analog/CMOS	SSOP-B14

Capacitive Switch Controller ICs

Capacitive Switch Controller ICs

Part No.	Supply Voltage (V)	Cap. Switch (ch)	LED_Driver (ch)	LED_PWM Control	Matrix Control	I/F	MCU (bit)	Program Memory	Intermittent Motion	Package
BU21170MUV	3.0 to 5.5	5	5	✓	—	I ² C	32	ROM	—	VQFN020V4040
BU21079F	3.0 to 5.5	8	—	—	4×4	I ² C	32	ROM	✓	SOP16
BU21077MUV	2.7 to 5.5	8	—	—	4×4	I ² C	32	RAM	✓	VQFN020V4040
BU21072MUV	3.0 to 5.5	10	6	✓	4×4	I ² C	32	ROM	—	VQFN024V4040
BU21078MUV	3.0 to 5.5	12	8	✓	6×6	I ² C	32	ROM	—	VQFN028V5050
BU21078FV	3.0 to 5.5	12	8	✓	6×6	I ² C	32	ROM	—	SSOP-B28
☆BU21181FS	3.0 to 5.5	18	—	—	—	I ² C	32	ROM	✓	SSOP-A32
BU21180FS	3.0 to 5.5	20	—	—	—	I ² C	32	ROM	—	SSOP-A32

☆ : Under Development

Touch Screen Controller ICs

Resistive type											
Part No.	Supply Voltage (V)	MCU (bit)	Resolution	Touch Detection	Standby Current (μA)	Active Current (mA)	Host I/F	Operating Temperature (°C)	Package (mm)	Automotive Grade AEC-Q100	
BU21029MUV	1.65 to 3.6	—	4096×4096	2 points/Single	100	0.8	I ² C	−20 to +85	VQFN020V4040	—	
BU21029GUL	1.65 to 3.6	—	4096×4096	2 points/Single	100	0.8	I ² C	−20 to +85	VCSP50L2 2.0×2.0, t=0.55	—	
BU21028FV-M	2.7 to 3.6	—	4096×4096	2 points/Single	100	0.8	I ² C	−40 to +85	SSOP-B20	YES	
BU21023MUV	2.7 to 3.6	8	1024×1024	2 points/Single	60	4.0	I ² C/SPI	−20 to +85	VQFN028V5050	—	
BU21023GUL	2.7 to 3.6	8	1024×1024	2 points/Single	60	4.0	I ² C/SPI	−20 to +85	VCSP50L2 2.6×2.6, t=0.55	—	
BU21024FV-M	2.7 to 3.6	8	1024×1024	2 points/Single	60	4.0	I ² C/SPI	−40 to +85	SSOP-B28	YES	
BU21027MUV	2.7 to 3.6	32	4096×4096	2 points/Single	70	8.0	I ² C	−20 to +85	VQFN020V4040	—	
BU21025GUL	1.65 to 3.6	—	4096×4096	Single	0.8	0.12	I ² C	−30 to +85	VCSP50L2 2.0×1.5, t=0.55	—	
BU21026MUV	1.65 to 3.6	—	4096×4096	Single	0.8	0.12	I ² C	−30 to +85	VQFN020V4040	—	
Touch Screen I/F LSIs Supporting SPI/I ² C (LAPIS Semiconductor products)											
Part No.	Supply Voltage (V)	MCU	Resolution	Touch Detection	Stand-by Current (μA)	Active Current (mA)	Host I/F	Operating Temperature (°C)	Package	Halogen free Support*1	Automotive Grade
ML26700CGD	2.7 to 3.6	—	4096×4096	Single	30	0.42	I ² C	−40 to +85	WQFN12-0303-0.50	✓	—
ML26700SGD	2.7 to 3.6	—	4096×4096	Single	30	0.42	SPI	−40 to +85	WQFN12-0303-0.50	✓	—

*1: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Accelerometers

(Kionix products)

3-Axis Accelerometers							
Part No.	Axis	Full-Scale Range	I/F Output	Current Consumption (μA)	Size, No. of Pins, Package	Features	Automotive Grade AEC-Q100
KX122-1037	3	User-selectable 2g, 4g, 8g	Digital SPI/I ² C	10 to 145	2 × 2 × 0.9mm, 12pin, LGA	2KB FIFO/FILO, Wide range of ODRs from 0.781Hz to 25.6kHz, Directional Tap/Double-Tap™, Free fall, Orientation Detection	—
KX124-1051	3	User-selectable 2g, 4g, 8g	Digital SPI/I ² C	10 to 145	3 × 3 × 0.9mm, 16pin, LGA	2KB FIFO/FILO, Wide range of ODRs from 0.781Hz to 25.6kHz, Directional Tap/Double-Tap™, Free fall, Orientation Detection	—
New KX126-1063	3	User-selectable 2g, 4g, 8g	Digital SPI/I ² C	0.9 to 145	2 × 2 × 0.9mm, 12pin, LGA	Pedometer function, 2KB FIFO/FILO, Wide range of ODRs from 0.781Hz to 25.6kHz, Directional Tap/Double-Tap™, Free fall, Orientation Detection, V _{DD} =7pin	—
New KX127-1068	3	User-selectable 2g, 4g, 8g	Digital SPI/I ² C	0.9 to 145	2 × 2 × 0.9mm, 12pin, LGA	Pedometer function, 2KB FIFO/FILO, Wide range of ODRs from 0.781Hz to 25.6kHz, Directional Tap/Double-Tap™, Free fall, Orientation Detection, V _{DD} =9pin	—
KXCJB-1041	3	User-selectable 2g, 4g, 8g	Digital I ² C	10 to 135	3 × 3 × 0.45mm, 10pin, LGA	Low Current Consumption, User-configurable wakeup function, Ultra thin type	—
KX112-1042	3	User-selectable 2g, 4g, 8g	Digital SPI/I ² C	10 to 135	2 × 2 × 0.6mm, 12pin, LGA	2KB FIFO/FILO, Wide range of ODRs from 0.781Hz to 25.6kHz, Directional Tap/Double-Tap™, Free fall, User-configurable wakeup function, Thin type	—
New KXTJ3-1057	3	User-selectable 2g, 4g, 8g, 16g	Digital I ² C	10 to 135	2 × 2 × 0.9mm, 12pin, LGA	User-configurable wakeup function, V _{DD} =7pin	—
New KX003-1077	3	User-selectable 2g, 4g, 8g, 16g	Digital I ² C	10 to 135	2 × 2 × 0.9mm, 12pin, LGA	User-configurable wakeup function, V _{DD} =9pin	—
New KX224-1053	3	User-selectable 8g, 16g, 32g	Digital SPI/I ² C	10 to 145	3 × 3 × 0.9mm, 16pin, LGA	2KB FIFO/FILO, Wide range of ODRs from 0.781Hz to 25.6kHz, Mechanical resonance frequency(−3dB) 6kHz(xy), 3.6kHz(z)	—
New KX222-1054	3	User-selectable 8g, 16g, 32g	Digital SPI/I ² C	0.9 to 145	2 × 2 × 0.9mm, 12pin, LGA	2KB FIFO/FILO, Wide range of ODRs from 0.781Hz to 25.6kHz, Mechanical resonance frequency(−3dB) 6kHz(xy), 3.6kHz(z)	—
KXTC9 series	3	1.5g to 6.0g	Analog	170 to 310	3 × 3 × 0.9mm, 10pin, LGA	Factory Programmable Internal Low Pass Filter	—
New KX220 series	3	up to 40g	Analog	170 to 310	3 × 3 × 0.9mm, 10pin, LGA	Factory Programmable Internal Low Pass Filter	—
New KX123-6000	3	User-selectable 2g, 4g, 8g	Digital SPI/I ² C	10 to 145	3 × 3 × 0.9mm, 16pin, LGA	AEC-Q100 qualified, Operating Temperature −40 to 85° C, 2KB FIFO/FILO, Wide range of ODRs from 0.781Hz to 25.6kHz, Directional Tap/Double-Tap™, Free fall, Orientation Detection	YES*

*For Automotive Non-Safety
Directional Tap/Double-Tap™ is a trademark of Kionix.

6-Axis Combo Sensor

(Kionix products)

3-Axis Accelerometer+3-Axis Gyroscope										
Part No.	Axis	Gyroscope Full-Scale Range	Accelerometer Full-Scale Range	Accelerometer Sensitivity	Resolution	Size, No. of Pins, Package	I/F Output	Wakeup	Operating Temperature (°C)	V _{CC} (V)
☆KXG07	6	±2048, ±1024, ±512, ±256, ±128, ±64 °/Sec.	2g, 4g, 8g, 16g	16384(±2g), 8192(±4g), 4096(±8g), 2048(±16g), Counts/g	16	3×3×0.9mm, 16pin, LGA	Digital I ² C/SPI	YES	−40 to +85	1.8 to 3.6
☆KXG08	6	±2048, ±1024, ±512, ±256, ±128, ±64 °/Sec.	2g, 4g, 8g, 16g	16384(±2g), 8192(±4g), 4096(±8g), 2048(±16g), Counts/g	16	2.5×3×0.95mm, 14pin, LGA	Digital I ² C/SPI	YES	−40 to +85	1.8 to 3.6
3-Axis Accelerometer+3-Axis Magnetometer										
Part No.	Axis	Accelerometer Full-Scale Range	I/F Output	Current (μA)	Magnetometer Range (μT)	Operating Temperature (°C)	Size, No. of Pins, Package	Features		
New KMX62-1031	6	User-selectable 2g, 4g, 8g, 16g	Digital I ² C	10 to 395	±1,200	−40 to +85	3×3×0.9mm, 16pin, LGA	E-compass Solution, Magnetic field change, Free fall		

☆ : Under Development

Infrared Image Sensor

(LAPIS Semiconductor products)

Infrared (IR) Sensor										
Part No.	Feature	Pixel	Measurement Range (°C)	Temperature Resolution (without lens) (°C)	Output type	Read Speed	Supply Voltage (V)	Operating Temperature Range (°C)	Package	Halogen free Support*
ML8540	2000 pixels thermopile type Thermal image sensor	47row × 48column 2256 pixels	−30 to +300(Variable)	0.5	Analog	6FPS	4.5 to 5.5	−30 to +85	C-QFN24-8585-1.00	✓

*A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

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Sensors & MEMS



ICs

Communication LSI

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Communication LSI

Wireless Communication LSIs

Bluetooth®

(LAPIS Semiconductor products)

Bluetooth® Low Energy LSIs

Part No.	Support Standard	Frequency Band	Supply Voltage (V)	Modulation Method	Function	Control I/F	Transmission Rate (Mbps)	Transmission Output (dBm)	Reception Sensitivity (dBm)	Operating Temperature (°C)	Package	Halogen Free Support ^{*4}
ML7125-001	Bluetooth® Core Spec v4.1 (Single mode)	2.4GHz ISM band	1.6 to 3.6	GFSK	Role:Master/Slave Connectable device(s):2 devices	(BACI ^{*1}) SPI (HCI ^{*2}) UART	1	+4/0/-6/-12/-18	-85 ^{*3}	-20 to +75	S-VFLGA67-4.69X3.12-0.40-W (WCSP67)	✓
ML7125-002	Bluetooth® Core Spec v4.1 (Single mode)	2.4GHz ISM band	1.6 to 3.6	GFSK	Role:Slave Connectable device:1 device	UART	1	+4/0/-6/-12/-18	-85 ^{*3}	-20 to +75	S-VFLGA67-4.69X3.12-0.40-W (WCSP67)	✓

Bluetooth® is a registered trademark of Bluetooth® SIG.

*1 : BACI(Bluetooth Application Control Interface);LAPIS Semiconductor proprietary host interface *2 : HCI(Host Control Interface);Bluetooth standard interface *3 : BER(Bit Error Rate)<0.1% equivalent

*4 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Specified Low Power Radio(Sub-GHz Band Radio)

(LAPIS Semiconductor products)

UHF Transmitter LSIs

Part No.	Support Standard	Frequency Band	Supply Voltage (V)	Modulation Method	FEC Mode	Control I/F	Transmission Rate	Transmission Output (dBm)	Reception Sensitivity	Operating Temperature (°C)	Package	Halogen Free Support ^{*4}
ML7386	ARIB STD-T67 RCR STD-30	426MHz band	1.8 to 3.6	2-FSK MSK	—	Synchronous serial (Control) DIO(DATA)	2.4kbps 4.8kbps 7.2kbps	10mW	—	-25 to +85	P-WQFN28-0404-0.40	✓
ML7386B								1mW/10mW				✓

UHF Transceiver LSIs

ML7066[J]	ARIB STD-T67 RCR STD-30	426MHz band 429MHz band	2.1 to 3.6	2-FSK	—	Synchronous serial(Control) DIO(DATA)	1.2kbps, 2.4kbps 4.8kbps[NRZ] (3-step setting function)	1mW/ 10mW	−116dBm [BER<1%] ^{*1}	−25 to +65	P-VQFN48-0707-0.50	✓
ML7396D	ARIB STD-T108 EN300-220	750 to 960MHz	1.8 to 3.6	2- (G)FSK (G)MSK	IEEE 802.15.4g compliant	Synchronous serial (Control・DATA) DIO(DATA)	to 50kbps 100kbps 150kbps 200kbps 400kbps	1mW/ 10mW/ 20mW	−107dBm [100kbps BER=0.1%] ^{*1}	−40 to +85	P-WQFN40-0606-0.50	✓
ML7396A	FCC part1 5.247/249								−106dBm [100kbps BER=0.1%] ^{*1}			✓
ML7344J	ARIB STD-T67 RCR STD-30	160 to 510MHz	1.8 to 3.6	2- (G)FSK (G)MSK	—	Synchronous serial (Control) DIO(DATA)	to 15kbps	1mW/ 10mW/ 20mW	−117dBm [4.8kbps BER=0.1%] ^{*1}	−40 to +85	P-WQFN40-0606-0.50	✓
ML7344C	Q/GDW374.3		3.3 to 3.6 (100mW)					20mW/ 100mW	✓			
ML7406	EN300-220 EN1357-4:2011	750 to 960MHz	1.8 to 3.6	2- (G)FSK (G)MSK	—	Synchronous serial (Control) DIO(DATA)	to 500kbps	1mW/ 10mW/ 20mW	−106dBm [100kbps BER=0.1%] ^{*1}	−40 to +85	P-WQFN32-0505-0.50	✓
ML7345	ARIB STD-T67 ARIB STD-T108 RCR STD-30 EN300-220 EN13757-4:2013	160 to 960MHz	1.8 to 3.6	2- (G)FSK (G)MSK 4- (G)FSK	—	Synchronous serial (Control) DIO(DATA)	to 100kbps	1mW/ 10mW/ 20mW	−123dBm [2.4kbps BER=1%] ^{*1}	−40 to +85	P-WQFN32-0505-0.50	✓
ML7345D	ARIB STD-T67 ARIB STD-T108 RCR STD-30 EN300-220 EN13757-4:2013	315 to 960MHz	1.8 to 3.6	2- (G)FSK (G)MSK 4- (G)FSK	—	Synchronous serial (Control) DIO(DATA)	to 100kbps	1mW/ 10mW/ 20mW	−119.5dBm [2.4kbps BER=1%] ^{*1}	−40 to +85	P-WQFN32-0505-0.50	✓
ML7345C	Q/GDW374.3	470 to 510MHz	3.3 to 3.6 (100mW)	2- (G)FSK (G)MSK 4- (G)FSK	—	Synchronous serial (Control) DIO(DATA)	to 100kbps	20mW/ 100mW	−123dBm [2.4kbps BER=1%] ^{*1}	−40 to +85	P-WQFN32-0505-0.50	✓
ML7414	ARIB STD-T67 ARIB STD-T108 Sigfox®(Rev 2.E) RCR STD-30 EN300-220 EN13757-4:2013	315 to 960MHz	1.8 to 3.6	2- (G)FSK (G)MSK 4- (G)FSK BPSK (TX only)	IEEE 802.15.4g compliant	Synchronous serial (Control) DIO(DATA)	to 100kbps	1mW/ 10mW/ 20mW	−106dBm [100kbps BER=1%] ^{*1}	−40 to +85	P-WQFN32-0505-0.50	✓

*1 : BER means Bit Error Rate.

*2 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Sigfox® is a registered trademark of SIGFOX A.B.

LPWA

(LAPIS Semiconductor products)

UHF Transceiver LSI

Part No.	Supported Standard	Frequency Band	Supply Voltage (V)	Modulation Method	FEC Mode	Control Interface	Transmission Rate	Transmission Output (dBm)	Reception Sensitivity	Operating Temperature (°C)	Package	Halogen Free Support ^{*3}
ML7404	ARIB STD-T67 ARIB STD-T108 RCR STD-30 EN300-220 EN13757-4:2013 Sigfox® (Rev 2.E) IEEE802.15.4k	315 to 960MHz	1.8 to 3.6	2-(G)FSK (G)MSK 4-(G)FSK BPSK DSSS	IEEE 802.15.4k compliant	Synchronous serial (Control) DIO(DATA)	to 100kbps (xFSK) 80k to 200kcpss (DSSS)	1mW/10mW/20mW	-119.5dBm [2.4kbps BER=1%] ^{*1} (xFSK) -121dBm [200kpcps, SF=64, PER=1%] ^{*2} (DSSS)	-40 to +85	P-WQFN32-0505-0.50	✓

Sigfox® is a registered trademark of SIGFOX A.B.

*1 : BER means Bit Error Rate. *2 : PER means Packet Error Rate.

*3 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Multipule Band Radio(Sub-GHz Band & 2.4GHz Band Radio)

(LAPIS Semiconductor products)

UHF Transceiver LSI												
Part No.	Supported Standard	Frequency Band	Supply Voltage (V)	Modulation Method	FEC Mode	Control Interface	Transmission Rate	Transmission Output (dBm)	Reception Sensitivity	Operating Temperature (°C)	Package	Halogen Free Support ^{*2}
New ML7411	ARIB STD-T66 ARIB STD-T67 ARIB STD-T108 RCR STD-30 EN300-220 EN13757-4:2013 FCC part15	169MHz Band 433MHz Band 860MHz Band 915MHz Band 920MHz Band 2.4GHz Band	1.8 to 3.6	2-(G)FSK (G)MSK 4-(G)FSK	IEEE 802.15.4g compliant	Synchronous serial (Control) DIO(DATA)	1.2k to 300kbps	1mW/ 10mW/ 20mW	-108dBm [100kbps BER=1%] ^{*1} (860/920MHz Band) -95dBm [100kbps, BER=1%] ^{*1} (2.4GHz Band)	-40 to +85	P-WQFN36-0606-0.50	✓

*1 : BER means Bit Error Rate. *2 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

MCU Included Specified Low Power Radio(Sub-GHz Band Radio) System LSI

(LAPIS Semiconductor products)

UHF Transceiver LSI												
Part No.	Support Standard	Frequency Band	Supply Voltage (V)	Modulation Method	CPU core	Memory resources	Transmission Rate	Transmission Output (dBm)	Reception Sensitivity	Operating Temperature (°C)	Package	Halogen Free Support ^{*2}
ML7416N	ARIB STD-T108	750 to 960MHz	1.8 to 3.6	2-(G)FSK (G)MSK	CorTex®-M0+	FLASH512KB, RAM64KB	to 50kbps 100kbps 150kbps 200kbps 400kbps	1mW/ 10mW/ 20mW	-106dBm [100kbps BER=0.1%] ^{*1}	-40 to +85	P-LFBGA81-1010-1.00	✓

Cortex® is a registered trade mark of SIGFOX S.A.

*1 : BER means Bit Error Rate. *2 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Car Communication LSIs

FM Data Broadcast Reception LSIs

(LAPIS Semiconductor products)

FM Data Reception Tuner							
Part No.	Feature	Supply Voltage (V)	Supply Current (Max.)(mA)	Operating Temperature (°C)	Package	Halogen Free Support ^{*1}	Automotive Grade ^{*2}
ML7174[J]	FM VICS [®] tuner, FM multiplexing demodulate LSI for VICS [®] , Built-in BPF, frame memory, and VICS [®] descrambler, Frames A,B,C, SPI slave	3.0 to 3.6	85	−40 to +85	P-WQFN64-0909-0.50-63	✓	YES
ML7183[J]	FM VICS [®] tuner & Filter LSI, BPF, I ² C slave	3.0 to 3.6	75	−40 to +85	P-WQFN64-0909-0.50-63	✓	YES
FM Multiplexing Demodulate for VICS [®]							
ML7154[J]	VICS [®] compliant FM multiplexing demodulate LSI for VICS [®] , Built-in BPF, frame memory, and VICS [®] descrambler, Frames A,B,C, SPI slave	3.0 to 3.6	28	−40 to +85	P-WQFN64-0909-0.50-63	✓	YES

[J] : This LSI is limited to the market in Japan.

VICS® is a registered trademark of Vehicle Information and Communication System Center.

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*2 : Please inquire to the sales for AEC-Q100.

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Communication LSI



Audio & Video

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Audio Amplifiers

Speaker Amplifiers

Portable Amplifier 1.9W+1.9W Stereo Speaker Amplifier

Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Standby Current (μA)	Voltage Gain (dB)	Output Power (W)	Distortion (%)	Output Noise Voltage (μVrms)	Package
BD7836EFV	4.5 to 5.5	1.0	5	0.1	6/10/15.6/21.6	1.9 (V _{DD} =5V, 4Ω, THD+N=1%)	0.1	16	HTSSOP-B20

Portable Amplifier 1.1W to 1.5W Monaural Speaker Amplifier

Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Standby Current (μA)	Voltage Gain (dB)	Output Power(R _L =8Ω, THD=10%)		Distortion (%)	Output Noise Voltage (dBr)	Package
						V _{CC} =3.6V	V _{CC} =5.0V			
BD7830NUV	2.4 to 5.5	0.53	3.2	0	0 to 20	0.77W	1.5W	0.1	-100	VSON008V2030

Portable Amplifiers Analog Input Monaural Class-D Speaker Amplifiers

Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Voltage Gain (dB)	Output Power (W)		Distortion (%)	Output Noise Voltage (μVrms)	ALC Circuit	Package (mm)
BD5460GUL	2.5 to 5.5	0.69	2.0 (V _{DD} =3.6V)	6	2.5 (V _{DD} =5V, R _L =4Ω, THD+N=10%)	0.85 (V _{DD} =3.6V, R _L =8Ω, THD+N=10%)	0.3 (V _{DD} =3.6V)	30	—	VCSP50L1 1.6 × 1.6
BD5461GUL	2.5 to 5.5	0.69	2.0 (V _{DD} =3.6V)	12	2.5 (V _{DD} =5V, R _L =4Ω, THD+N=10%)	0.85 (V _{DD} =3.6V, R _L =8Ω, THD+N=10%)	0.3 (V _{DD} =3.6V)	40	—	VCSP50L1 1.6 × 1.6
BD27400GUL	2.5 to 5.5	0.69	2.9 (V _{DD} =3.6V)	External Variable	2.5 (V _{DD} =5V, R _L =4Ω, THD+N=10%)	0.85 (V _{DD} =3.6V, R _L =8Ω, THD+N=10%)	0.3 (V _{DD} =3.6V)	40	—	VCSP50L1 1.5 × 1.5
BD5632NUX	2.5 to 5.5	0.52	2.7 (V _{DD} =3.6V)	6	2.5 (V _{DD} =5V, R _L =4Ω, THD+N=10%)	0.85 (V _{DD} =3.6V, R _L =8Ω, THD+N=10%)	0.3 (V _{DD} =3.6V)	40	—	VSON008X2030
BD5634NUX	2.5 to 5.5	0.52	2.7 (V _{DD} =3.6V)	12	2.5 (V _{DD} =5V, R _L =4Ω, THD+N=10%)	0.85 (V _{DD} =3.6V, R _L =8Ω, THD+N=10%)	0.3 (V _{DD} =3.6V)	40	—	VSON008X2030
BD5638NUX	2.5 to 5.5	0.52	2.7 (V _{DD} =3.6V)	18	2.5 (V _{DD} =5V, R _L =4Ω, THD+N=10%)	0.85 (V _{DD} =3.6V, R _L =8Ω, THD+N=10%)	0.3 (V _{DD} =3.6V)	40	—	VSON008X2030
BD5465GUL	2.5 to 5.5	0.69	3.3 (V _{DD} =3.6V)	12	0.6 (V _{DD} =3.6 to 5.5V)		0.3 (V _{DD} =3.6V)	40	✓	VCSP50L1 1.8 × 1.8
BD5466GUL	2.5 to 5.5	0.69	3.0 (V _{DD} =3.6V)	18	1.5 (V _{DD} =5V, R _L =4Ω, THD+N=1%)	0.5 (V _{DD} =3.6V, R _L =8Ω, THD+N=1%)	0.3 (V _{DD} =3.6V)	40	✓	VCSP50L1 1.7 × 1.7
BD5467GUL	2.5 to 5.5	0.69	3.0 (V _{DD} =3.6V)	13	1.5 (V _{DD} =5V, R _L =4Ω, THD+N=1%)	0.5 (V _{DD} =3.6V, R _L =8Ω, THD+N=1%)	0.3 (V _{DD} =3.6V)	40	✓	VCSP50L1 1.7 × 1.7
BD5468GUL	2.5 to 5.5	0.69	3.0 (V _{DD} =3.6V)	13	1.5 (V _{DD} =5V, R _L =4Ω, THD+N=1%)	0.5 (V _{DD} =3.6V, R _L =8Ω, THD+N=1%)	0.3 (V _{DD} =3.6V)	40	✓	VCSP50L1 1.7 × 1.7
BD5469GUL	2.5 to 5.5	0.69	3.0 (V _{DD} =3.6V)	13	0.88 (V _{DD} =4.2V, R _L =8Ω, THD+N=1%)	0.64 (V _{DD} =3.6V, R _L =8Ω, THD+N=1%)	0.3 (V _{DD} =3.6V)	40	✓	VCSP50L1 1.7 × 1.7

Portable Amplifier Analog Input Stereo Class-D Speaker Amplifier

Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Voltage Gain (dB)	Output Power (W)		Distortion (%)	Output Noise Voltage (μVrms)	Max. LDO Current (mA)	Package
BD28412MUV	4.5 to 13.0	3.20	16 (V _{CC} =11V)	20/26/ 32/36	18 (V _{CC} =12V, R _L =4Ω, THD+N=10%, PBT)	9 (V _{CC} =12V, R _L =8Ω, THD+N=10%)	0.03 (V _{CC} =11V)	100	—	VQFN032V5050

Mid./High-Power Amplifier Class-D Speaker Amplifiers for Digital Input with Built-in DSP

Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Output Power (W)		Distortion (%)	Output Noise Voltage (μVrms)	DSP					Package
								Volume	DC Cut HPF	Hard Clipper	Parametric EQ	DRC	
BM28723AMUV	10 to 24	4.56 (4-Layer Board)	45 (V _{CC} =18V)	10 (V _{CC} =13V, R _L =8Ω)	17 (V _{CC} =18V, R _L =8Ω)	0.08	150	✓	✓	✓	✓ (12 Band)	✓ (3 Band)	VQFN032V5050

Mid./High-Power Amplifier Class-D Speaker Amplifier for Digital Input

Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Output Power (W)		Distortion (%)	Output Noise Voltage (μVrms)	Power Limiter Function	Package
BD28623MUV	8.5 to 24.0	3.56 (4-Layer Board) 2.21 (2-Layer Board)	40 (V _{CC} =18V)	—	15 (V _{CC} =16V, R _L =8Ω)	0.08	150	✓ (GAIN)	VQFN024V4040

Mid./High-Power Amplifiers Analog Input/BTL Output Class-D Speaker Amplifiers

Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Voltage Gain (dB)	Output Power (W)		Distortion (%)	Output Noise Voltage (μVrms)	Power Limiter Function	Package
BD5424EFS	10.0 to 18.0	4.5 (4-Layer Board) 2.0 (2-Layer Board)	30 (V _{CC} =12V)	28	10 (V _{CC} =12V, R _L =8Ω)	20 (V _{CC} =17V, R _L =8Ω)	0.1	80	✓ (Power Limiter)	HTSSOP-A44
BD5423AEFS	10.0 to 16.5	4.5 (4-Layer Board) 2.0 (2-Layer Board)	25 (V _{CC} =12V)	28	10 (V _{CC} =12V, R _L =8Ω)	17 (V _{CC} =12V, R _L =4Ω)	0.1	80	✓ (Power Limiter)	HTSSOP-A44
BD5426EFS	10.0 to 16.5	4.5 (4-Layer Board) 2.0 (2-Layer Board)	25 (V _{CC} =12V)	28	9 (V _{CC} =12V, R _L =8Ω)	10 (V _{CC} =13V, R _L =8Ω)	0.1	80	✓ (Power Limiter)	HTSSOP-A44
BD5413EFV	6.0 to 10.5	2.8 (4-Layer Board) 1.1 (2-Layer Board)	12 (V _{CC} =9V)	30	4 (V _{CC} =9V, R _L =8Ω)	5 (V _{CC} =9V, R _L =6Ω)	0.2	90	—	HTSSOP-B24

Headphone Amplifiers

Ultra-Compact Coupling Capacitorless Headphone Amplifiers

Part No.	Supply Voltage (V)	Quiescent Current (mA)	Gain (V/V)	Maximum Output Power (mW)	Distortion (%)	Output Noise Voltage (μVrms)	Ripple Rejection (dB)	Note	Package (mm)
BD88200GUL	2.4 to 5.5	2	Variable Gain with external resistor	80 (V _{DD} =3.3V, R _L =16Ω)	0.006 (V _{DD} =3.3V, R _L =16Ω)	10	−80 (f=217Hz)	Virtual ground based	VCSP50L2 2.1 × 2.1
BD88210GUL	2.4 to 5.5	2	−1.0	80 (V _{DD} =3.3V, R _L =16Ω)	0.006 (V _{DD} =3.3V, R _L =16Ω)	10	−80 (f=217Hz)	Virtual ground based	VCSP50L2 2.1 × 2.1
BD88215GUL	2.4 to 5.5	2	−1.5	80 (V _{DD} =3.3V, R _L =16Ω)	0.006 (V _{DD} =3.3V, R _L =16Ω)	10	−80 (f=217Hz)	Virtual ground based	VCSP50L2 2.1 × 2.1
BD88220GUL	2.4 to 5.5	2	−2.0	80 (V _{DD} =3.3V, R _L =16Ω)	0.006 (V _{DD} =3.3V, R _L =16Ω)	10	−80 (f=217Hz)	Virtual ground based	VCSP50L2 2.1 × 2.1
BD88400GUL	2.4 to 5.5	2	Variable Gain with external resistor	80 (V _{DD} =3.3V, R _L =16Ω)	0.006 (V _{DD} =3.3V, R _L =16Ω)	10	−80 (f=217Hz)	Ground based	VCSP50L2 2.1 × 2.1
BD88400FJ	2.4 to 5.5	2	Variable Gain with external resistor	80 (V _{DD} =3.3V, R _L =16Ω)	0.006 (V _{DD} =3.3V, R _L =16Ω)	10	−80 (f=217Hz)	Ground based	SOP-J14
BD88410GUL	2.4 to 5.5	2	−1.0	80 (V _{DD} =3.3V, R _L =16Ω)	0.006 (V _{DD} =3.3V, R _L =16Ω)	10	−80 (f=217Hz)	Ground based	VCSP50L2 2.1 × 2.1
BD88415GUL	2.4 to 5.5	2	−1.5	80 (V _{DD} =3.3V, R _L =16Ω)	0.006 (V _{DD} =3.3V, R _L =16Ω)	10	−80 (f=217Hz)	Ground based	VCSP50L2 2.1 × 2.1
BD88420GUL	2.4 to 5.5	2	−2.0	80 (V _{DD} =3.3V, R _L =16Ω)	0.006 (V _{DD} =3.3V, R _L =16Ω)	10	−80 (f=217Hz)	Ground based	VCSP50L2 2.1 × 2.1

Headphone Amplifier Designed for 0.93V Low Voltage Operation

Part No.	Supply Voltage (V)	Quiescent Current (mA)	Maximum Output Power (mW)		Distortion (%)		Output Noise Voltage (μVrms)	Package
			Single-ended(16Ω)	BTL(8Ω)	Single-ended(16Ω)	BTL(8Ω)		
BU7150NUV	0.93 to 3.50 (Ta=0°C or more)	1	14 (V _{DD} =1.5V)	85 (V _{DD} =1.5V)	0.1(P _O =5mW)	0.2(P _O =25mW)	10	VSON010V3030

Standard Headphone Amplifiers

Part No.	Supply Voltage (V)	Quiescent Current (mA)	Voltage Gain (dB)	Maximum Output Power (mW)R _L =16Ω	Distortion (%)	Ripple Rejection (dB)	Package
BH3544F	2.8 to 6.5	7.0	6	62	0.02	57	SOP8
BH3547F	4.5 to 6.5	3.7	6	77	0.05	57	SOP8
BH3548F	4.0 to 5.5	6.5	6	62 (120@R _L =8Ω)	0.02	57	SOP8

Others

Audio Subsystems															
Part No.	Supply Voltage (V)	Power Dissipation (mW)	Quiescent Current (mA)	Standby Current (μA)	SP Amplifier					HP Amplifier			Package		
					Voltage Gain (dB)	Distortion (%)	Output Power(W) V _{CC} =5V	Voltage Gain (dB)	Distortion (%)	HP AMP/Maximum Output Voltage(dBV) V _{CC} =3.3V					
BH7881EFV	3.3 to 5.5	1,100	18	0	11(SE)/17(BTL)	0.04	2	5.5	0.02	1.4	HTSSOP-B24				
BH7884EFV	3.0 to 5.5	1,100	9	0.2	12(SE)/18.2(BTL)	0.1	1	5.6	0.03	1.0	HTSSOP-B24				
Line Amplifier(OP Amp)															
Part No.	Supply Voltage (V)	Circuit Current (mA)	Open Loop Gain (dB)	Input	CMRR (dB)	Supply Voltage Rejection Ratio (dB)	Common-mode Input Voltage Range (V)V _{CC} =8V	Offset Voltage (mV)	Offset Current (nA)	Input Bias Current (nA)	Distortion (%)	ch Separation (dB)	Gain Bandwidth Product (MHz)	Slew Rate (V/μs)	Package
BA3131FS	6.0 to 16.0	4.9	110	3	72	90	6	0.5	5	50	0.0025	115	2.6	1.2	SSOP-A20
Line Amplifiers(Output Coupling Capacitor-less Line Amplifiers)															
Part No.	Supply Voltage (V)	Circuit Current (mA)	ch	Voltage Gain (dB)	Maximum Output Voltage (Vrms)	Distortion (%)	Output Noise Voltage (μVrms)	Channel Separation (dB)	Ripple Rejection (dB)	Charge Pump	Package				
BD8876FV	3.0 to 5.5	3.2	2	6 or 9	3.5	0.003	8	80	65	✓	SSOP-B14				
BD8878FV	3.0 to 5.5	3.2	2	6.7	3.0	0.003	10	65	65	✓	SSOP-B14				
Line Amplifiers(Preamps with Built-in ALC)															
Part No.	Supply Voltage (V)	Circuit Current (mA)	Open Loop Gain (dB)	Distortion (%)	Input Resistance (Ω)	Maximum Output Voltage (Vrms)	Equivalent Input Noise Voltage (μVrms)	ALC Range (dB)	Channel Separation (dB)	Channel Separation (dB)	Package				
BA3308F	4.5 to 14.0	3.5	80	0.1	25	1.2	1.0	45	0	75	SOP14				
BA3308FV	4.5 to 14.0	3.5	80	0.1	25	1.2	1.0	45	0	75	SSOP-B14				
Isolation Amplifiers															
Part No.	Supply Voltage (V)	Operating Temperature (°C)	Circuit	Circuit Current (mA)	Voltage Gain (dB)	CMRR (dB)	Common-mode Input Voltage Range (V)V _{CC} =8V	THD (%)	Output Noise Voltage (μVrms)	Channel Separation (dB)	Slew Rate (V/μs)	Input Resistance (kΩ)	Package		
BA3121F	4.0 to 18.0	−30 to +85	2	9.0	−0.04	57	3.75	0.002	3.5	82	2.0	55	SOP8		
BA3123F	4.0 to 18.0	−40 to +85	2	9.0	−0.04	57	3.75	0.002	3.5	82	2.0	55	SOP8		

Power Supply ICs for Audio

Power Supply ICs for High Fidelity Audio

* The following products are belonging to ICs. (Refer PA45)

Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

Power Supply ICs for High Fidelity Audio										
Part No.	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Reference Voltage Accuracy (%)	Dropout Voltage (mV)	Noise Level (μVrms)	PSRR (dB)	Over Current Protection	Thermal Protection	Package
BD37201NUX	0.5	2.7 to 5.5	Variable 1.0 to 4.5	±1	200	4.72	90(f=1 kHz) 55(f=1 MHz)	✓	✓	VSON008X2030
☆BD37210AMUV	1.0	3.0 to 16.0	Variable 1.0 to 15.0	±1	300	4.6	78(f=1 kHz) 53(f=1 MHz)	✓	✓	VQFN020V4040
☆BD37215AMUV	1.0	−16.0 to −3.0	Variable −15.0 to −1.0	±1	300	5.1	90(f=1 kHz) 55(f=1 MHz)	✓	✓	VQFN020V4040

☆ : Under Development

Audio Processors

Analog Audio Processors

6ch/8ch Sound Processors with Built-in Micro-step Volume												
Part No.	Supply Voltage (V)	Circuit Current (mA)	Output Noise Voltage (μVrms)	Distortion (%)	Selector	Main Volume (dB)		Zone Volume (dB)		Tone Control	Serial Control	Package
							ch		ch			
BD34704KS2	±6.5 to ±7.5	±32	1.2	0.0004	18	+32 to −95 0.5/Step	8	+7.5 to −91.5 0.5/Step	2	—	2Wire	SQFP-T80C
BD34705KS2	±6.5 to ±7.5	±32	1.2	0.0004	12	+32 to −95 0.5/Step	8	+6 to −16 1/Step, −16 to −56 2/Step	2	—	2Wire	SQFP-T64
BD34701KS2	±6.5 to ±7.5	±22	1.5	0.0004	8	+32 to −95 0.5/Step	8	—	—	—	2Wire	SQFP-T52
BD3471KS2	±6.5 to ±7.5	±30	1.5	0.0004	12	+24 to −95 0.5/Step	8	—	—	—	2Wire	SQFP-T80C
BD3473KS2	±6.5 to ±7.5	±30	1.5	0.0004	12	+24 to −95 0.5/Step	8	—	—	Bass, Treble	2Wire	SQFP-T80C
BD3474KS2	±6.5 to ±7.5	±30	1.5	0.0004	12	+32 to −95 0.5/Step	8	—	—	Bass, Treble	2Wire	SQFP-T80C
2ch/4ch/6ch Sound Processors												
BD34700FV	±6.5 to ±7.5	±22	1.5	0.0004	—	+32 to −95 0.5/Step	4	—	—	—	2Wire	SSOP-B40
☆BD34710FV	±6.5 to ±7.5	±22	1.5	0.0004	3	+32 to −95 0.5/Step	6	—	—	—	2Wire	SSOP-B40
BD3812F	±5.0 to ±7.3	±2	1.2	0.0050	—	0.6 to 18 2/Step, 0 to −103 1/Step	2	—	—	—	2Wire	SOP14
BD3814FV	±5.0 to ±7.3	±7	1.0	0.001	—	0 to −95 1/Step	6	—	—	Bass, Treble	2Wire	SSOP-B40

☆ : Under Development

6ch Sound Processors																
Part No.	Supply Voltage (V)	Circuit Current (mA)	Output Noise Voltage (μVrms)	Distortion (%)	Selector	Input Gain (dB)	Output Gain (dB)	Volume (dB)	Volume	Tone Control	Bass Boost	Serial Control	Package			
BD3811K1	±5.0 to ±7.3	±15	2.0	0.005	8	0, 6	0, 6 to 18, 2/Step	0 to −103, 1/Step	6	Bass, Treble	23mm	2Wire	QFP80			
BD3818KS	±5.0 to ±7.4	±28	1.0	0.002	5	0, 3, 6, 9	—	0 to −95, 1/Step	6	Bass, Treble	(Dynamic)	2Wire	SQFP80			
7ch Sound Processors																
Part No.	Supply Voltage (V)	Current Consumption (mA)	Output Noise Voltage (μVrms)	Distortion (%)	Selector	Input Gain (dB)	Output Gain (dB)	Volume (dB)	Volume	Tone Control	Serial Control	Package				
BD3816K1	±5.0 to ±7.3	±24	1.2	0.001	7	0 to 7, 1/Step	0 to 17, 1/Step	0 to −95, 1/Step	7	Bass, Treble	2Wire	QFP80				
BD3817KS	±5.0 to ±7.3	±24	1.2	0.001	10	0 to 7, 1/Step	0 to 17, 1/Step	0 to −95, 1/Step	7	Bass, Treble	2Wire	SQFP100				
6ch/9ch Stereo Input Selector ICs Maximum Input Voltage : 4.2V																
Part No.	Supply Voltage (V)	Current Consumption (mA)	Output Noise Voltage (μVrms)	Distortion (%)	Selector	Serial Control	Package									
BD3843FS	±4.0 to ±7.3	±3	1.0	0.004	6	2Wire	SSOP-A24									
BD3841FS	±5.0 to ±7.3	±3	1.0	0.004	9	2Wire	SSOP-A32									
Sound Processors with Built-in 2-band Equalizer																
Part No.	Supply Voltage (V)	Current Consumption (mA)	Selector		Input Gain (dB)	Volume (dB)	Fader		Parametric EQ	Loudness	LPF for Sub Woofer	Option	Serial Control	Output Noise Voltage (μVrms)	Distortion (%)	Package
			Single	Diff.			(dB)	Output								
BD37503FV	7.0 to 9.5	20	3	1	0 to +20	0 to −36, −∞	0 to −63, −∞	4	—	✓*	—	Anti-aliasing Filter*	I ² C BUS	5.8	0.001	SSOP-B20
BD37511FS	7.0 to 9.5	15	3	0	0 to +20	0 to −40	0 to −62, −∞	4	—	—	—	—	I ² C BUS	6.0	0.005	SSOP-A20
BD37512FS	7.0 to 9.5	15	3	1	0 to +20	0 to −40	0 to −62, −∞	4	—	—	—	—	I ² C BUS	6.0	0.005	SSOP-A20
BD37513FS	7.0 to 9.5	38	3	1	0 to +20	+15 to −79, −∞	0 to −79, −∞	4	—	✓	—	—	I ² C BUS	3.8	0.001	SSOP-A20
BD37514FS	7.0 to 9.5	38	3	1	0 to +20	+15 to −79, −∞	0 to −79, −∞	5	✓	✓	—	—	I ² C BUS	3.8	0.001	SSOP-A20
BD37515FS	7.0 to 9.5	38	3	1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	5	✓	✓	✓	—	I ² C BUS	3.8	0.001	SSOP-A20
BD37521FS	7.0 to 9.5	38	3	1	0 to +20	+15 to −79, −∞	0 to −79, −∞	4	—	EXT	—	—	I ² C BUS	3.8	0.001	SSOP-A24
BD37522FS	7.0 to 9.5	38	4	1	0 to +20	+15 to −79, −∞	0 to −79, −∞	4	✓	✓	—	—	I ² C BUS	3.8	0.001	SSOP-A24
BD37523FS	7.0 to 9.5	38	4	1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	5	✓	✓	✓	—	I ² C BUS	3.8	0.001	SSOP-A24
BD3870FS	4.5 to 9.5	8	3	—	0/6/12/18	0 to −87, −∞	—	2	EXT	—	—	Surround	2Wire	4.5	0.01	SSOP-A24
BD3871FS	4.5 to 9.5	8	3	—	24/26/28	0 to −87, −∞	—	2	EXT	—	—	Surround	2Wire	40 (G _V =24dB)	0.01	SSOP-A24
BD3872FS	4.5 to 9.5	8	5	—	0/5/10/19/23/26/28	0 to −87, −∞	—	2	EXT	—	—	Surround	2Wire	4.5	0.01	SSOP-A32
BD3873FS	4.5 to 9.5	8	3	—	18/21/24/27	0 to −87, −∞	—	2	EXT	—	—	Surround	2Wire	40 (G _V =24dB)	0.01	SSOP-A24
BD3490FV	4.75 to 9.50	7	4	—	0/2/4/6/8/12/16/20	0 to −87 (2ch Independent control), −∞	—	2	EXT	—	—	Bass Boost, Surround	I ² C BUS	5.0	0.002	SSOP-B28
BD3491FS	4.75 to 9.50	7	6	—	0/2/4/6/8/12/16/20	0 to −87 (2ch Independent control), −∞	—	2	EXT	—	—	Bass Boost, Surround	I ² C BUS	5.0	0.002	SSOP-A32

Sound Processors with Built-in 2-band Equalizer : Built-in Bass and Treble control *Loudness and Anti-aliasing Filter can be used exclusively. EXT : Set by external components
BD37511FS and BD37512FS are all function-compatible. BD37513FS, BD37514FS and BD37515FS are all function-compatible. BD37522FS and BD37523FS are all function-compatible.

Analog Audio Processors

Sound Processors with Built-in 3-band Equalizer

Part No.	Supply Voltage (V)	Current Consumption (mA)	Selector		Input Gain (dB)	Volume (dB)	Fader		Parametric EQ	Loudness	LPF/HPF for Sub Woofer	Mixing		Level Meter	Option	Serial Control	Output Noise Voltage (μVrms)	Distortion (%)	Package
			Single	Diff.			(dB)	Outputs					ATT						
BD37524FS	7.0 to 9.5	38	4	1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	6	✓	✓	LPF	—	—	✓	—	I²C BUS	3.8	0.001	SSOP-A24
BD37531FV	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	6	✓	✓	—	—	—	—	—	I²C BUS	3.8	0.001	SSOP-B28
BD37532FV	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	6	✓	✓	LPF	—	—	—	—	I²C BUS	3.8	0.001	SSOP-B28
BD37533FV	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	6	✓	✓	LPF	✓	✓	—	—	I²C BUS	3.8	0.001	SSOP-B28
BD37534FV	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	6	✓	✓	LPF	✓	✓	✓	—	I²C BUS	3.8	0.001	SSOP-B28
BD37541FS	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to −79, −∞	0 to −79, −∞	6	✓	EXT	—	✓	—	—	—	I²C BUS	3.8	0.001	SSOP-B28
BD37542FS	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	6	✓	EXT	LPF	✓	✓	—	—	I²C BUS	3.8	0.001	SSOP-A32
BD37543FS	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	6	✓	EXT	LPF + HPF	✓	✓	✓	—	I²C BUS	3.8	0.001	SSOP-A32
BD37544FS	7.0 to 9.5	38	1/3/4	3/2/1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	6	✓	—	LPF + HPF	✓	✓	—	Super Bass	I²C BUS	3.8	0.001	SSOP-A32
BD37545FS	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to −79, −∞	+15 to −79, −∞	6	✓	—	LPF + HPF	✓	✓	✓	External I/O	I²C BUS	3.8	0.001	SSOP-A32
BD37033FV-M	7.0 to 9.5	31	3/5	2/1	0 to +16	+15 to −79, −∞	+15 to −79, −∞	6	✓	✓	LPF	✓	✓	✓	—	I²C BUS	5.5	0.002	SSOP-B28
BD37034FV-M	7.0 to 9.5 VccL to 13	36	3/5	2/1	0 to +16	+15 to −79, −∞	+15 to −79, −∞	6	✓	✓	LPF + HPF	✓	✓	✓	High Voltage Output	I²C BUS	6.0	0.002	SSOP-B28
BD3883FS	6.5 to 9.5	8	5	—	0/6/12/16/20/23/26/29	0 to −87, −∞	0/−10	2	EXT	—	—	—	—	—	Surround	2Wire	4.0	0.01	SSOP-A32
BD3403FV	6.5 to 9.5	16	5	—	0 to +26 (2/Step)	0 to −30 (2/Step)	0 to −59, −∞	2	EXT	—	—	—	—	—	Surround	2Wire	8.0	0.02	SSOP-B40

General-Purpose Electronic Volume with Built-in Advanced Switch

Part No.	Supply Voltage (V)	Current Consumption (mA)	Selector		Input Gain (dB)	Fader Volume (dB)	Outputs	Mixing		Post Filter	High-Voltage Output (dB)	Serial Control	Output Noise Voltage (μ Vrms)	Distortion (%)	Package
			Single	Diff.				ch	ATT (dB)						
BD3464FV	7.0 to 9.5	25	—	—	—	+23 to -79, - ∞ (1/Step)	4	—	—	—	—	I ² C BUS	1.9	0.0004	SSOP-B20
BD3465FV	7.0 to 9.5	25	—	—	—	+23 to -79, - ∞ (1/Step)	4	3	+0 to -64, - ∞ (8/Step)	—	—	I ² C BUS	1.9	0.0004	SSOP-B20
BD3460FS	7.0 to 9.5	25	—	—	—	+23 to -79, - ∞ (1/Step)	6	—	—	—	—	I ² C BUS	1.9	0.0004	SSOP-A24
BD3461FS	7.0 to 9.5	25	—	—	—	+23 to -79, - ∞ (1/Step)	6	3	+0 to -64, - ∞ (8/Step)	—	—	I ² C BUS	1.9	0.0004	SSOP-A24
BD34602FS-M	7.0 to 9.5	35	—	—	—	+23 to -79, - ∞ (1/Step)	6	3	+0 to -79, - ∞ (1/Step)	—	—	I ² C BUS	1.3	0.0004	SSOP-A24
BD37067FV-M	7.0 to 9.5	37	2/3/4/5	4/3/2/1	+23 to -15 (1/Step)	+23 to -79, - ∞ (1/Step)	6	1	—	✓	—	I ² C BUS	8	0.003	SSOP-B40
BD37068FV-M	7.0 to 9.5 V _{CC} L to 17.8	30/7	1/2/3/4/5	5/4/3/2/1	+23 to -15 (1/Step)	+23 to -79, - ∞ (1/Step)	6	1	—	✓	0/8.3	I ² C BUS (High-Voltage Mode)	23 (High-Voltage Mode)	0.003	SSOP-B40
BD37069FV-M	7.0 to 9.5 V _{CC} L to 17.8	30/7	2/3/4/5	4/3/2/1	+23 to -15 (1/Step)	+23 to -79, - ∞ (1/Step)	6	1	—	✓	2/4.6/8.3	I ² C BUS (High-Voltage Mode)	23 (High-Voltage Mode)	0.003	SSOP-B40

6ch Electronic Volume for 5.1ch Car Theater System

Part No.	Supply Voltage (V)	Current Consumption (mA)	Input Selector		Input Gain (dB)	5.1chVolume (dB)	Monaural Volume (dB)	Output Gain (dB)	Mix Car Navi. Cell Phones	Output for Spectrum Analyzer	Serial Control	Output Noise Voltage (μVrms)	Distortion (%)	Package
			Single Input	Monaural Differential Amplifier Input										
BD3433K	±7.0 to ±9.5	12	5.1ch × 2	1	0.6,12 (Each F, R)	+23 to -79, -∞(1/Step)	+15 to -63, -∞(1/step)	0, +2.5(A)/0, -4.5(B)	✓	✓	3Wire	3	0.001	QFP44

Single Power Supply Sound Processors with Built-in Pre Amplifier for Tape Recording and Playback

Part No.	Supply Voltage (V)	Current Consumption (mA)	Selector	Input Gain (dB)	Volume (dB)	Tone Control	Dynamic Bass	Surround	REC/PB Amplifier	Vocal Cut	Output for Spectrum Analyzer	Serial Control	Output Noise Voltage (μ Vrms)	Max. Output (Vrms)	Distortion (%)	Package
BD3401KS2	8.0 to 9.5	35	5	-5/0/3.5	0 to -76/- ∞ (2/4/Step)	Bass, Middle, Treble	✓	✓	✓	✓	✓	2Wire	3.0	2.5	0.005	SQFP-T64
BD3402KS2	8.0 to 9.5	28	5	-5/0/3.5	0 to -76/- ∞ (2/4/Step)	Bass, Treble	—	—	✓	—	—	2Wire	2.5	2.5	0.005	SQFP-T64

Bandpass Filter ICs for Spectrum Analyzer Display

Part No.	Supply Voltage (V)	Current Consumption (mA)	Band	Input Mix Amplifier	REC Level Display	Standard Output (V)	Maximum Output (V)	BPF Center Frequency (Hz)		Package
BA3835F	4.5 to 6.5	8.5	5	✓	—	1.35	4.8	105, 340, 1k, 3.4k, 10.5k		SOP18
BA3834F	4.5 to 6.5	10.0	7	✓	—	1.35	4.8	68, 170, 420, 1k, 2.4k, 5.9k, 14.4k		SOP18

Sound Processors with Built-in 3-band Equalize : EXT : Set by external components

BD37531FV, BD37532FV, BD37533FV and BD37534FV are pin-compatible.

BD37541FS, BD37542FS and BD37543FS are pin-compatible. BD37033FV-M and BD37034FV-M are pin-compatible.

General-Purpose Electronic Volume with Built-in Advanced Switch : BD3464FS and BD3465FS are pin-compatible. BD3461FS and BD34602FS-M are pin-compatible. BD37067FV-M and BD37068FV-M are pin-compatible.

AUDIO SoC

Audio 1Chip System ICs													
Part No.	Supply Voltage (V)	USB I/F	SD I/F	CD DSP	SDRAM	Quad SPI I/F (ch)	SPI I/F	I ² C I/F	UART I/F	Digital Audio I/F	GPIO (Dedicated pins)	Operating Temperature (°C)	Package
BM94715EKU	HVcc 3.0 to 3.6 LVcc 1.45 to 1.65	USB2.0 Dual Role Full Speed (Host/Device)(1ch)	SDIO	3Beam Method	16Mbit Stack	1	Master 1ch Slave 1ch	Master Slave 2ch	HS UART 2ch	I ² S IN 2ch 2series, I ² S OUT 2ch 1series	77 (16)	−40 to +85	HTQFP128UA
BM94803AEKU	HVcc 3.0 to 3.6 LVcc 1.45 to 1.65	USB2.0 Dual Role High Speed (Host/Device)(1ch)	SDIO	3Beam Method	16Mbit Stack	1	Master 1ch Slave 1ch	Master Slave 2ch	HS UART 2ch	I ² S IN 2ch 2series, I ² S OUT 2ch 1series	77 (13)	−40 to +85	HTQFP128UA

Media Decoders

AAC/WMA/MP3/WAV+SD Memory Card+CD-ROM																
Part No.	Supply Voltage (V)	USB	SD	iPod	Serial I/F	Display Information	MP3	WMA	AAC	CD-ROM Mode	CD-ROM File System	MP3 Recording Format	File Search	Audio Output		Package
														Analog	Digital	
BU94605AKV	3.0 to 3.6	USB2.0 Full Speed	MMC SD, miniSD, microSD, SDHC	—	I ² C BUS	Folder number, File number, Play time, Folder name, File name, TAG(Artist, Album, Title)	MPEG1,2,2.5 LAYER1,2,3	WMA9 Standard	MPEG4 AAC-LC	Mode1, Mode2, form1/2, Romeo, Joliet	ISO 9660 Level1,2	—	Search during the playback	Line	I ² S SPDIF	VQFP80
AAC/WMA/MP3/WAV+SD Memory Card+iPod+CD-ROM																
BU94607AKV	3.0 to 3.6	USB2.0 Full Speed	MMC SD, miniSD, microSD, SDHC	iPod touch, iPhone, iPad	I ² C BUS	Folder number, File number, Play time, Folder name, File name, TAG(Artist, Album, Title)	MPEG1,2,2.5 LAYER1,2,3	WMA9 Standard	MPEG4 AAC-LC	Mode1, Mode2, form1/2, Romeo, Joliet	ISO 9660 Level1,2	—	Search during the playback	Line	I ² S SPDIF	VQFP80
AAC/WMA/MP3/WAV+SD Memory Card+CD-ROM+MP3 Record																
BU94702AKV	3.0 to 3.6	USB2.0 Full Speed	MMC SD, miniSD, microSD, SDHC	—	I ² C BUS	Folder number, File number, Play time, Folder name, File name, TAG(Artist, Album, Title)	MPEG1,2,2.5 LAYER1,2,3	WMA9 Standard	MPEG4 AAC-LC	Mode1, Mode2, form1/2, Romeo, Joliet	ISO 9660 Level1,2	MPEG1 Layer3 Sample Rate : 32,44,1,48kHz Bit Rate : 32,64,128, 192,256,320kHz	Search during the playback	Line	I ² S SPDIF	VQFP80
AAC/WMA/MP3/WAV+SD Memory Card+iPod+CD-ROM+MP3 Record																
BU94705AKV	3.0 to 3.6	USB2.0 Full Speed	MMC SD, miniSD, microSD, SDHC	iPod touch, iPhone, iPad	I ² C BUS	Folder number, File number, Play time, Folder name, File name, TAG(Artist, Album, Title)	MPEG1,2,2.5 LAYER1,2,3	WMA9 Standard	MPEG4 AAC-LC	Mode1, Mode2, form1/2, Romeo, Joliet	ISO 9660 Level1,2	MPEG1 Layer3 Sample Rate : 32,44,1,48kHz Bit Rate : 32,64,128, 192,256,320kHz	Search during the playback	Line	I ² S SPDIF	VQFP80

Media Decoders : iPod, iPad and iPhone are registered trademarks of Apple Inc. in the U.S. and other countries.
It is necessary to get 'Made for iPod/iPhone/iPad license' for introducing BU94607AKV, BU94705AKV.

Audio Converters

Audio Codec

Audio Codec											
Part No.	Supply Voltage (V)	ADC	DAC	Microphone Input	Speaker Output		Headphone Output	Filter		ALC	Package
		ch/bit	ch/bit		Type	Monaural/ Stereo		EQ	Notch		
BU26154MUV	HV _{DD} 2.7 to 5.5 LV _{DD} 2.7 to 3.6	1ch/24bit	2ch/24bit	1	AB/D	Monaural	Stereo	✓	✓	✓	VQFN040V6060
BU26156RFS	HV _{DD} 2.7 to 5.5 LV _{DD} 2.7 to 3.6	2ch/24bit	2ch/24bit	2	AB/D	Stereo	Stereo	✓	✓	✓	HTSSOP-A44R

Video Amplifiers

Composite Video Amplifiers

Ultra-compact(WL-CSP) Output Capacitor-less 1ch Video Drivers

Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara.1 (dB)	Freq. Chara.2 (dB)	Input type	LPF	Mute (Standby) (μA)	Output Capa-less	Max. Output Level (Vp-p)	Video Out→In Change Mode	Package (mm)
BH76906GU	2.5 to 3.45	15	6	−0.2 (4.5MHz)	−26 (18MHz)	Bias(150kΩ)	8th order 4.5MHz	0	✓	5.2	—	VCSP85H 1.6 × 1.6, H=1.0Max.
BH76909GU	2.5 to 3.45	15	9	−0.2 (4.5MHz)	−26 (18MHz)	Bias(150kΩ)	8th order 4.5MHz	0	✓	5.2	—	VCSP85H 1.6 × 1.6, H=1.0Max.
BH76912GU	2.5 to 3.45	15	12	−0.2 (4.5MHz)	−26 (18MHz)	Bias(150kΩ)	8th order 4.5MHz	0	✓	5.2	—	VCSP85H 1.6 × 1.6, H=1.0Max.
BH76916GU	2.5 to 3.45	15	16.5	−0.2 (4.5MHz)	−26 (18MHz)	Bias(150kΩ)	8th order 4.5MHz	0	✓	5.2	—	VCSP85H 1.6 × 1.6, H=1.0Max.
BH76706GU	2.5 to 3.45	15	6	−0.2 (4.5MHz)	−28 (18MHz)	Bias(150kΩ)	8th order 4.5MHz	0	✓	5.2	✓	VCSP85H 1.6 × 1.6, H=1.0Max.

Output Capacitor-less 1ch Video Drivers

Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara.1 (dB)	Freq. Chara.2 (dB)	Input type	LPF	Mute (Standby) (μA)	Output Capa-less	Max. Output Level (Vp-p)	Package
BH76806FVM	2.5 to 3.45	16	6	−0.45 (4.5MHz)	−51 (23.5MHz)	Bias(150kΩ)	8th order 4.5MHz	0	✓	5.2	MSOP8
BH76809FVM	2.5 to 3.45	16	9	−0.45 (4.5MHz)	−51 (23.5MHz)	Bias(150kΩ)	8th order 4.5MHz	0	✓	5.2	MSOP8
BH76812FVM	2.5 to 3.45	15	12	−0.45 (4.5MHz)	−51 (23.5MHz)	Bias(150kΩ)	8th order 4.5MHz	0	✓	5.2	MSOP8
BH76816FVM	2.5 to 3.45	15	16.5	−0.45 (4.5MHz)	−51 (23.5MHz)	Bias(150kΩ)	8th order 4.5MHz	0	✓	5.2	MSOP8

Compact Low Current 1ch Video Drivers

Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara.1 (dB)	Freq. Chara.2 (dB)	Input type	LPF	Mute (Standby) (μA)	Output Capa-less	Max. Output Level (Vp-p)	Video Out→In Change Mode	Package
BH76106HFV	2.6 to 5.5	7	6	0.1 (4.5MHz)	−45 (19MHz)	Clamp	8th order 4.5MHz	0	✓	2.6	—	HVSOF6
BH76109HFV	2.6 to 5.5	7	9	0.1 (4.5MHz)	−45 (19MHz)	Clamp	8th order 4.5MHz	0	✓	2.6	—	HVSOF6
BH76112HFV	2.6 to 5.5	7	12	0.1 (4.5MHz)	−45 (19MHz)	Clamp	8th order 4.5MHz	0	✓	2.6	—	HVSOF6
BH76206HFV	2.6 to 5.5	8	6	−0.3 (6MHz)	−40 (27MHz)	Clamp	8th order 6MHz	0	✓	2.6	—	HVSOF6

1ch Video Drivers Built-in Video Switch

Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara. (dB)	Switchers	Input type	Video Driver	Mute	Output Capa-less	Max. Output Level(Vp-p)		Package
										Vcc=3V	Vcc=5V	
BH76330FVM	2.8 to 5.5	10	6	0 (10MHz)	3 input-1 output	Clamp	✓	✓ (Standby)	✓	2.7	4.6	MSOP8
BH76331FVM	2.8 to 5.5	10	6	0 (10MHz)	3 input-1 output	Bias	✓	✓ (Standby)	—	2.8	4.6	MSOP8
BH76360FV	2.8 to 5.5	12	6	0 (10MHz)	6 input-1 output	Clamp	✓	✓ (Standby)	✓	2.7	4.6	SSOP-B16
BH76361FV	2.8 to 5.5	12	6	0 (10MHz)	6 input-1 output	Bias	✓	✓ (Standby)	—	2.8	4.6	SSOP-B16

Video Switches

1ch Video Switch(Wide Band-width)

Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara. (dB)	Switchers	Input type	Video Driver	Mute	Crosstalk (dB)	Max. Output Level(Vp-p)		Package
										Vcc=3V	Vcc=5V	
BH76332FVM	2.8 to 5.5	9	0	0 (30MHz)	3 input-1 output	Clamp	—	✓ (Standby)	−65 (4.43MHz)	1.8	3.8	MSOP8
BH76333FVM	2.8 to 5.5	8	0	0 (30MHz)	3 input-1 output	Bias	—	✓ (Standby)	−65 (4.43MHz)	1.9	3.4	MSOP8
BH76362FV	2.8 to 5.5	11	0	0 (30MHz)	6 input-1 output	Clamp	—	✓ (Standby)	−65 (4.43MHz)	1.8	3.8	SSOP-B16
BH76363FV	2.8 to 5.5	11	0	0 (30MHz)	6 input-1 output	Bias	—	✓ (Standby)	−65 (4.43MHz)	1.9	3.4	SSOP-B16

Video and Audio Signal Switcher

Part No.	Supply Voltage (V)	Video Circuit Current (mA)	Audio Circuit Current (mA)	Video Freq. Chara.1 (dB)	Video Freq. Chara.2 (dB)	Video Amplifier Gain (dB)	Audio Freq. Chara.1 (dB)	Audio Freq. Chara.2 (dB)	Audio Amplifier Gain (dB)	Residual Noise (μVrms)	Package
BH7649KS2	7.5 to 9.5	34	23	0 (6.75MHz)	−30 (27MHz)	−3/−6/0/+3/+6	−0.5 (24kHz)	−26 (96kHz)	−6/0	20	SQFP-T52

Others

Isolation Amplifier

Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara. (dB)	ch	Input type	Video Driver	Input Impedance (kΩ)	CMRR (dB)	Max. Output Level (Vp-p)	Package
BH7673G	4.5 to 5.5	4.8	0	0 (10MHz)	1	Bias	—	150	60	3.8	SSOP5

Image Correction

Image Correction IC for Panel											
Part No.	Supply Voltage(V)			Image Data Size	Control I/F	Input/Output Digital I/F	Image Adjustment	PWM Output	LVDS Transmitter	Package	Automotive Grade AEC-Q100
	V _{DD} Core	V _{DD} I/O	V _{DD} LVDS								
BU1523KV	1.65 to 1.95	3.0 to 3.6	3.0 to 3.6	Supports up to WVGA+ (864×480)	I ² C BUS	24bitRGB Interface 8bit YUV=4:2:2 ITU-R BT.656	✓	—	✓	VQFP100	Preparing
Video Encoders Built-in Image Correction											
Part No.	Supply Voltage(V)			Image Data Size	Control I/F	Input/Output Digital I/F	Fog Reduction	Video Encoder	Package	Automotive Grade AEC-Q100	
	V _{DD} Core	V _{DD} I/O	AV _{DD}								
BU6521KV	1.4 to 1.6	2.7 to 3.6	2.7 to 3.6	ITU-R BT.656	I ² C BUS Serial EEPROM Interface	8bit YUV=4:2:2 ITU-R BT.656	✓	✓	VQFP48C	YES	

Video LSIs

Video Decoder

(LAPIS Semiconductor products)

CVBS/S-video											
Part No.	Supply Voltage (V)	Input(Analog)		Output(Digital)	Pixel Frequency	Crystal Oscillator supported	Feature	Operating Temperature (°C)	Package	Halogen Free Support ^{*1}	Automotive Grade ^{*2}
		Terminal	Type								
ML86101A	3.3/1.5	CVBS×4 or CVBS×2+S-video×1 or S-video×2	NTSC PAL SECAM	ITU-R BT.656 YUV 8bit	12.2727MHz, 13.5MHz, 14.3181MHz, 14.75MHz	✓	Simple, small	−40 to +85	P-TQFP48-0707-0.50	✓	YES
ML86V7668A	3.3/2.5	CVBS×4 or CVBS×1+S-video×3	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16bit RGB 18bit	12.2727MHz, 13.5MHz	—	RGB output	−40 to +85	P-TQFP100-1414-0.50	✓	YES
CVBS/S-video/Component/RGB											
ML86V7675	3.3/1.5	CVBS×4 +(Comp or S-video)×1 +Comp×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8bit	7.9930MHz to 33.333MHz	✓	WVGA, EGA analog RGB supported	−40 to +85	P-TQFP64-1010-0.50	✓	YES

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.
*2 : Please inquire to the sales for AEC-Q100.

Video Encoder

(LAPIS Semiconductor products)

CVBS											
Part No.	Supply Voltage (V)	Input(Digital)	Output(Analog)		Pixel Frequency	Crystal Oscillator supported	Feature	Operating Temperature (°C)	Package	Halogen Free Support ^{*1}	Automotive Grade ^{*2}
			Terminal	Type							
ML86V76580	3.3/1.8	ITU-R BT.656 YUV 8bit	CVBS	NTSC PAL	12.2727MHz, 13.5MHz, 14.3181MHz, 14.75MHz	—	75Ω drive	−40 to +85	P-TQFP48-0707-0.50	✓	YES
ML86640	3.3	TU-R BT.656 YUV 8/16/24bit RGB 24bit	CVBS	NTSC PAL	13.5MHz, 27MHz	—	75Ω drive P/I conversion	−40 to +105	P-TQFP48-0707-0.50	✓	YES
CVBS/S-video/Component/RGB											
ML86V7655	3.3/2.5	ITU-R BT.656 YUV 8/16/24bit RGB 24bit	CVBS S-video Component	NTSC PAL	12.2727MHz, 13.5MHz, 14.3181MHz, 14.75MHz, 18MHz	—	I/P, P/I conversion	−40 to +85	P-TQFP100-1414-0.50	✓	YES

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.
*2 : Please inquire to the sales for AEC-Q100.

Video Interface

(LAPIS Semiconductor products)

LVTTTL/LVDS/MIPI Video Interface								
Part No.	Supply Voltage (V)	Input	Output	Feature	Operating Temperature (°C)	Package	Halogen Free Support ^{†1}	Automotive Grade ^{†2}
 ML86795	3.3(1.8)/1.5	ITU-R BT.656 YUV 8bit Single/Dual LVDS (RGB 18/24bit) MIPI-CSI2 2ch (RGB565/888, YUV422-8bit) 1Gbps/Lane Max.	ITU-R BT.656 YUV 16bit Single/Dual LVDS (RGB 18/24bit) MIPI-CSI2 (RGB565/888, YUV422-8bit) Two Virtual Channel Supported 1Gbps/Lane Max.	LVTTTL/LVDS/MIPI-CSI2 I/F, LVTTTL/LVDS/MIPI to LVTTTL/LVDS/MIPI translate, MIPI Virtual Channel	−40 to +105	P-WQFN64-0909-0.50	✓	YES

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.
*2 : Please inquire to the sales for AEC-Q100.

Display Controller Series for Small to Medium-Sized TFT LCD

(LAPIS Semiconductor products)

T-CON, Video Decoder, Scaler Included													
Part No.	Supply Voltage (V)	Input(Analog)		Input(Digital)	Output	Resolution	OSD	MCU	Feature	Operating Temperature (°C)	Package	Halogen Free Support ⁽¹⁾	Automotive Grade ⁽²⁾
		Terminal	Type										
ML86V8201	3.3/1.5	CVBS×2 or S-video×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit	ITU-R BT.656 YUV 8bit RGB 18/24bit	QVGA to WVGA	Line	—	Rear camera function Image quality adjustment	−40 to +85	P-TQFP100-1414-0.50	✓	YES
ML86203	3.3/1.5	CVBS×1	NTSC PAL	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit	ITU-R BT.656 YUV 8bit Single LVDS (RGB 18/24bit)	VGA to WXGA	—	—	Rear camera function WXGA panel support Image quality adjustment	−40 to +85	P-TQFP80-1010-0.40	✓	YES
ML86207	3.3/1.5	CVBS×2	NTSC PAL	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit + Single LVDS (RGB 18/24bit)	ITU-R BT.656 YUV 8bit RGB 18/24bit Single LVDS (RGB 18/24bit)	VGA to WXGA	Text Line	—	LVTTTL/LVDS I/F Digital video input ×2 WXGA panel support Rear camera function Image quality adjustment OSD function	−40 to +85	P-TQFP100-1414-0.50	✓	YES
ML86287	3.3/1.5	CVBS×2	NTSC PAL	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit + Single LVDS (RGB 18/24bit)	ITU-R BT.656 YUV 8bit RGB 18/24bit Single LVDS (RGB 18/24bit)	VGA to WXGA	Text Line	—	LVTTTL/LVDS I/F Digital video input ×2 WXGA panel support Rear camera function Picture in Picture Image quality adjustment OSD, ROM-OSD function	−40 to +85	P-TQFP128-1414-0.40	✓	YES
☆ML86209	3.3/1.5	CVBS single×2 or differential×1	NTSC PAL	ITU-R BT.656 ITU-R BT.1120 like YUV 8/16bit Single/Dual LVDS (RGB 18/24bit) MIPI-CS12 (RGB565/888, YUV422-8bit) 1Gbps/Lane Max	ITU-R BT.656 or MIPI-CS12 (RGB565/888, YUV422-8bit) 1Gbps/Lane Max + Single/Dual LVDS (RGB 18/24bit)	VGA to Full HD	Text Line	—	LVTTTL/LVDS/MIPI-CS12 I/F Digital video input ×4 Full HD panel support Rear camera function Image quality adjustment OSD, ROM-OSD function	−40 to +85	P-TQFP128-1414-0.40	✓	YES
☆ML86289	3.3/1.5	CVBS single×2 or differential×1	NTSC PAL	ITU-R BT.656 ITU-R BT.1120 like YUV 8/16bit Single/Dual LVDS (RGB 18/24bit) MIPI-CS12 (RGB565/888, YUV422-8bit) 1Gbps/Lane Max	ITU-R BT.656 or MIPI-CS12 (RGB565/888, YUV422-8bit) 1Gbps/Lane Max + Single/Dual LVDS (RGB 18/24bit)	VGA to Full HD	Text Line	—	LVTTTL/LVDS/MIPI-CS12 I/F Digital video input ×4 Full HD panel support Rear camera function Picture in Picture Image quality adjustment OSD, ROM-OSD function	−40 to +85	P-TQFP128-1414-0.40	✓	YES
ML86V8202C	3.3/1.8	CVBS×2 or S-video×1 + Comp×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit	ITU-R BT.656 style YUV 8/16/24bit RGB 18/24bit	QVGA to WVGA	—	—	Component video support Image quality adjustment	−40 to +85	P-TQFP100-1414-0.50	✓	YES
ML86240	3.3/1.5	CVBS×4 or CVBS×2 + (Comp or S-video)×1 + Comp×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit 2ch	ITU-R BT.656 YUV 8bit RGB 18/24bit	QVGA to WVGA	Text Line	—	Component video support Digital video input ×2 Rear camera function Image quality adjustment OSD function	−40 to +85	P-TFBGA144-1111-0.80	—	YES
ML86241	3.3(1.8)/1.5	CVBS×4 or CVBS×2 + (Comp or S-video)×1 + Comp×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit + Single LVDS (RGB 18/24bit)	ITU-R BT.656 YUV 8/16bit RGB 18/24bit YUV 16bit Single LVDS (RGB 18/24bit)	QVGA to WXGA	Text Line	—	Component video support LVTTTL/LVDS I/F Digital video input ×2 WXGA panel support Rear camera function Image quality adjustment OSD, ROM-OSD function	−40 to +85	P-TFBGA144-1111-0.80	—	YES
☆ML86243	3.3/1.5	CVBS single×2 or differential×1	NTSC PAL	^{*3} ITU-R BT.656 YUV 8/16bit ITU-R BT.1120 like YUV 8/16bit Single/Dual LVDS (YUV 8/16bit RGB 18/24bit)	^{*3} ITU-R BT.656 (YUV 8/16bit RGB 24bit) Single/Dual LVDS (RGB 18/24bit) MIPI-CS12 (RGB565/888, YUV422-16bit)	QVGA to WXGA	Text Line	—	Multi Input/Output support LVTTTL/LVDS/MIPI-CS12/CVBS I/F Rear camera function Picture in Picture Image quality adjustment OSD, ROM-OSD function State monitor function	−40 to +85	P-TQFP128-1414-0.40	—	YES
☆ML86245	3.3/1.5	—	—	^{*3} ITU-R BT.656 YUV 8/16bit ITU-R BT.1120 like YUV 8/16bit Single/Dual LVDS (YUV 8/16bit RGB 18/24bit)	^{*3} ITU-R BT.656 (YUV 8/16bit RGB 24bit) Single/Dual LVDS (RGB 18/24bit) MIPI-CS12 (RGB565/888, YUV422-16bit)	QVGA to WXGA	Text Line	—	Multi Input/Output support LVTTTL/LVDS/MIPI-CS12 I/F Rear camera function Picture in Picture Image quality adjustment OSD, ROM-OSD function State monitor function	−40 to +85	P-TQFP128-1414-0.40	—	YES
☆ML86321	3.3/1.5	CVBS single×2 or differential×1	NTSC PAL	ITU-R BT.656 ITU-R BT.1120 like YUV 8/16bit MIPI-CS12 (RGB565/888, YUV422-8bit) 1Gbps/Lane Max	Single LVDS (RGB 18/24bit) YUV 8/16bit	QVGA to WXGA	Text Line	—	Electronic rear-view mirror support 3-screen synthesis Image correction function (Angle/Aspherical/Keystone/Lens distortion correction) OSD, ROM-OSD function (15windows, 1layer) State monitor function	−40 to +85	P-TQFP128-1414-0.40	—	YES

^{*1}: A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

^{*2}: Please inquire to the sales for AEC-Q100.

^{*3}: Please inquire to the sales for input/output specification.

☆ : Under Development

T-CON, Image Adjustment Functions Included													
Part No.	Supply Voltage (V)	Input(Analog)		Input(Digital)	Output	Resolution	OSD	MCU	Feature	Operating Temperature (°C)	Package	Halogen Free Support ^①	Automotive Grade ^②
		Terminal	Type										
ML86V8101	3.3	—	—	RGB 18bit	RGB 18bit	QVGA to QHD	—	—	Image quality adjustment function	−40 to +85	P-TQFP64-1010-0.50	✓	YES
ML86V8102	3.3	—	—	RGB 18/24bit	RGB 18/24bit	QVGA to QHD	—	—	RGB 24 bits supported image quality adjustment function	−40 to +85	P-TQFP80-1010-0.40	✓	YES
☆ML86173	3.3/1.5	—	—	ITU-R BT.656 YCbCr 8/10bit RGB 18/24bit Single/Dual LVDS (RGB 18/24bit)	Single/Dual LVDS (RGB 18/24bit)	WVGA to H 2880(Max.) V 1080(Max.) (Pixel rate 160MHz Max.)	Text	—	Image quality adjustment OSD, ROM OSD function (30windows, 2layers) Frequency conversion function State monitor function	−40 to +85	P-TQFP100-1414-0.50	✓	YES
☆ML86175	3.3/1.5	—	—	ITU-R BT.656 YUV 8/16bit RGB 18/24bit Single/Dual LVDS 4ch (RGB 18/24bit)	Single/Dual LVDS (RGB 18/24bit)	H 2048(Max.) V 2048(Max.) (Pixel rate 160MHz Max.)	Text	—	Image quality adjustment 90 degree rotation function OSD, ROM OSD function (15windows, 1layer) Frequency conversion function State monitor function	−40 to +85	TQFP128-1414-0.40	✓	YES
Video decoder, 8051MCU Included													
ML86V8401	3.3/1.8	CVBS×3 or CVBS×2 +S-video×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit	ITU-R BT.656 RGB 18/24bit	QVGA to WVGA	Text	8051 (8bit)	System control MCU installed	−40 to +85	P-TQFP100-1414-0.50	—	Yes

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

☆ : Under Development

*2 : Please inquire to the sales for AEC-Q100.



ICs

Speech Synthesis LSI

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Speech Synthesis LSI

Speech Synthesis LSI with Built-in Large-capacity P2ROM™ (LAPIS Semiconductor products)

I ² C Interface 2ch Simultaneous Playback Speaker Amplifier Installed														
Part No.	Operating Voltage (V)	Operating Frequency (MHz)	Operating Temperature (°C)	ROM Capacity (bit)	Number of Phrases	Maximum Playback Time(sec.) ^{*1}	CPU I/F	SP Amplifier Output(W) /Class	Number of Mixing (Internal)(ch)	DAC (bit)	Others	Package	Halogen Free Support ^{*5}	Automotive Grade
ML22863	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 4M	4096 ^{*2}	258	I ² C	0.7/ AB-class	2	16	—	P-SSOP30-56-0.65	✓	—
ML22864	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 8M	4096 ^{*2}	520	I ² C	0.7/ AB-class	2	16	—	P-SSOP30-56-0.65	✓	—
ML22865	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 16M	4096 ^{*2}	1044	I ² C	0.7/ AB-class	2	16	—	P-SSOP30-56-0.65	✓	—
I ² C Interface Speech-speed and Pitch Conversion Function Installed Speaker Amplifier Installed														
ML22763	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 4M	4096 ^{*2}	258	I ² C	0.7/ AB-class	1	16	Speech-speed and pitch conversion	P-SSOP30-56-0.65	✓	—
ML22764	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 8M	4096 ^{*2}	520	I ² C	0.7/ AB-class	1	16	Speech-speed and pitch conversion	P-SSOP30-56-0.65	✓	—
ML22765	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 16M	4096 ^{*2}	1044	I ² C	0.7/ AB-class	1	16	Speech-speed and pitch conversion	P-SSOP30-56-0.65	✓	—
Clock Synchronous Serial Interface 2ch Simultaneous Playback Speaker Amplifier Installed														
ML22823	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 4M	4096 ^{*2}	258	Clock synchronous serial	0.7/ AB-class	2	16	—	P-SSOP30-56-0.65	✓	—
ML22824	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 8M	4096 ^{*2}	520	Clock synchronous serial	0.7/ AB-class	2	16	—	P-SSOP30-56-0.65	✓	—
ML22825	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 16M	4096 ^{*2}	1044	Clock synchronous serial	0.7/ AB-class	2	16	—	P-SSOP30-56-0.65	✓	—
Clock Synchronous Serial Interface Speech-speed and Pitch Conversion Function Installed Speaker Amplifier Installed														
ML22723	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 4M	4096 ^{*2}	258	Clock synchronous serial	0.7/ AB-class	1	16	Speech-speed and pitch conversion	P-SSOP30-56-0.65	✓	—
ML22724	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 8M	4096 ^{*2}	520	Clock synchronous serial	0.7/ AB-class	1	16	Speech-speed and pitch conversion	P-SSOP30-56-0.65	✓	—
ML22725	2.7 to 3.6 or 4.5 to 5.5	4.096	−40 to +85	P2ROM™ 16M	4096 ^{*2}	1044	Clock synchronous serial	0.7/ AB-class	1	16	Speech-speed and pitch conversion	P-SSOP30-56-0.65	✓	—
Clock Synchronous Interface														
ML22802	2.7 to 3.6	4.096	−20 to +85	P2ROM™ 2M	512 ^{*3}	131	Clock synchronous serial	—	1	12	—	P-SSOP30-56-0.65	✓	—
ML22804	2.7 to 3.6	4.096	−20 to +85	P2ROM™ 4M	1024 ^{*4}	262	Clock synchronous serial	—	1	12	—	P-SSOP30-56-0.65	✓	—
ML22808	2.7 to 3.6	4.096	−20 to +85	P2ROM™ 8M	1024 ^{*4}	524	Clock synchronous serial	—	1	12	—	P-SSOP30-56-0.65	✓	—

*1 : Maximum playback time when the sampling frequency is 4kHz in ADPCM2. *2 : 1024 phrases (1 bank) × 4 banks. *3 : 256 phrases (1 bank) × 2 banks. *4 : 256 phrases (1 bank) × 4 banks.
 *5 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Speech Synthesis LSI with Built-in Medium/Small-capacity Flash/Mask ROM (LAPIS Semiconductor products)

Clock Synchronous Serial Interface 4ch Simultaneous Playback Speaker Amplifier Installed(Industrial Grade)															
Part No.	Operating Voltage (V)	Operating Frequency	Operating Temperature (°C)	ROM Capacity (bit)	Number of Phrases	Maximum Playback Time(sec.)	CPU I/F	SP Amplifier Output(W) /Class	Number of Mixing (Internal)(ch)	DAC	Others	Package	Halogen Free Support ^{*3}	Automotive Grade ^{*4}	Industrial Grade
ML22562	2.7 to 5.5	4.096	−40 to +85	Mask 2M	1024	98 ^{*1}	Clock synchronization Serial	1.0/AB-class	4	16	Fail safe	P-SSOP30-56-0.65	✓	—	✓
ML22563	2.7 to 5.5	4.096	−40 to +85	Mask 4M	1024	201 ^{*1}	Clock synchronization Serial	1.0/AB-class	4	16	Fail safe	P-SSOP30-56-0.65	✓	—	✓
ML22Q563	2.7 to 5.5	4.096	−40 to +85	Flash 4M	1024	201 ^{*1}	Clock synchronization Serial	1.0/AB-class	4	16	Fail safe	P-SSOP30-56-0.65	✓	—	✓
Clock Synchronous Serial Interface 4ch Simultaneous Playback Speaker Amplifier Installed Support for 105°C (Automotive Grade)															
ML22572	2.7 to 5.5	4.096	−40 to +85	Mask 2M	1024	98 ^{*1}	Clock synchronization Serial	1.0/AB-class	4	16	Fail safe	P-SSOP30-56-0.65	✓	YES	—
ML22573	2.7 to 5.5	4.096	−40 to +85	Mask 4M	1024	201 ^{*1}	Clock synchronization Serial	1.0/AB-class	4	16	Fail safe	P-SSOP30-56-0.65	✓	YES	—
ML22Q573	2.7 to 5.5	4.096	−40 to +85	Flash 4M	1024	201 ^{*1}	Clock synchronization Serial	1.0/AB-class	4	16	Fail safe	P-SSOP30-56-0.65	✓	YES	—
ML22Q553	4.5 to 5.5	4.096	−40 to +85	Flash 4M	1024	201 ^{*1}	Clock synchronization Serial	1.0/AB-class	4	16	Speaker terminal short circuit detection function	P-SSOP30-56-0.65	✓	YES	—
Clock Synchronous Serial Interface Speaker Amplifier Installed(Automotive Grade)															
ML22321	2.3 to 5.5	4.096	−40 to +85	Mask 920K	62	43 ^{*1}	Clock synchronization Serial	1.0/AB-class	1	—	Disconnection detection/ Temperature protection circuit/ Analog volume control	P-SSOP30-56-0.65	—	YES	—
ML22Q321	2.3 to 5.5	4.096	−40 to +85	Flash 920K	62	43 ^{*1}	Clock synchronization Serial	1.0/AB-class	1	—	Disconnection detection/ Temperature protection circuit/ Analog volume control	P-SSOP30-56-0.65	—	YES	—

*1 : Maximum playback time when the sampling frequency is 6.4kHz in HQ-ADPCM.

*3 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*4 : Please inquire to the sales for AEC-Q100.

Clock Synchronous Serial Interface D-class Speaker Amplifier Installed(Automotive Grade)															
Part No.	Operating Voltage (V)	Operating Frequency	Operating Temperature (°C)	ROM Capacity (bit)	Number of Phrases	Maximum Playback Time(sec.)	CPU I/F	SP Amplifier Output(W) /Class	Number of Mixing (Internal) (ch)	DAC	Others	Package	Halogen Free Support ^{*3}	Automotive Grade ^{*4}	Industrial Grade
ML22Q374	2.0 to 5.5	4.096 (Built-in)	−40 to +85	Flash 692K	30	27 *2	Clock synchronization Serial	1.0/ AB-class	1	—	Disconnection/Short circuit detection Built-in oscillator	P-SSOP16-0225-0.65	—	YES	—
I ² C Interface D-class Speaker Amplifier Installed(Automotive Grade)															
ML22Q394	2.0 to 5.5	4.096 (Built-in)	−40 to +85	Flash 692K	30	27 *2	I ² C	1.0/ AB-class	1	—	Disconnection/Short circuit detection Built-in oscillator	P-SSOP16-0225-0.65	—	YES	—

*2 : Maximum playback time when the sampling frequency is 6.4kHz in ADPCM2.

*3 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*4 : Please inquire to the sales for AEC-Q100.

Speech Synthesis LSI with External Memory (LAPIS Semiconductor products)

4ch Simultaneous Playback Serial External Memory Speaker Amplifier installed															
Part No.	Operating Voltage (V)	Operating Frequency (MHz)	Operating Temperature (°C)	ROM Capacity (bit)	Number of Phrase	Maximum Playback Time	CPU I/F	SP Amplifier Output(W) /Class	Number of Mixing (Internal) (ch)	DAC (bit)	Others	Package	Halogen Free Support ^{*6}	Automotive Grade ^{*7}	Industrial Grade
ML22460	2.7 to 5.5	4.096	−40 to +85	External maximum 128M	1024	139min ^{*1}	I ² C	0.7/ AB-class	4	16	—	P-SSOP30-56-0.65	✓	—	—
ML22420	2.7 to 5.5	4.096	−40 to +85	External maximum 128M	1024	139min ^{*1}	Clock synchronization Serial	0.7/ AB-class	4	16	—	P-SSOP30-56-0.65	✓	—	—
4ch Simultaneous Playback Built-in Mask ROM+Serial External Memory Speaker Amplifier Installed Support for 105°C(Automotive Grade)															
ML22594	4.5 to 5.5	4.096	−40 to +105	Mask 6M ^{*4} External maximum 128M	1024 ^{*5} (Built-in 512/ External 512)	Built-in 303sec. ^{*2} External 109min ^{*3}	Clock synchronization Serial	1.0/ AB-class	4	16	Speaker terminal short circuit detection function	P-SSOP30-56-0.65	✓	YES	—

*1 : Maximum playback time when the sampling frequency is 4kHz in ADPCM2. *2 : Maximum playback time when the sampling frequency is 6.4kHz in HQ-ADPCM.

*3 : With an external memory module (Max. 128Mbit). Maximum playback time when the sampling frequency is 6.4kHz in HQ-ADPCM.

*4 : Mask's built-in ROM is 6Mbit and an external memory module (Max. 128Mbit) can be connected.

*5 : Total of mask's internal 512 phrases and external memory's 512 phrases.

*6 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

*7 : Please inquire to the sales for AEC-Q100.



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Microcontroller

General-purpose 16bit MCU

ML62Q1000 series

Standard type 1300 Group 16bit MCU(Industrial Grade)

Part No.	Operating Conditions						ROM/RAM				Functions/Features			
	Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Port			
		Low Speed	High Speed								Input	Output	Input/Output	
☆ML62Q1323	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	16K	2K	2K	—	—	12	
☆ML62Q1324	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	24K	2K	2K	—	—	12	
☆ML62Q1325	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	32K	2K	2K	—	—	12	
☆ML62Q1333	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	16K	2K	2K	—	—	16	
☆ML62Q1334	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	24K	2K	2K	—	—	16	
☆ML62Q1335	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	32K	2K	2K	—	—	16	
☆ML62Q1345	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	32K	2K	4K	—	—	20	
☆ML62Q1346	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	48K	2K	4K	—	—	20	
☆ML62Q1347	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	64K	2K	4K	—	—	20	
☆ML62Q1365	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	2.8µA (Internal RC oscillation)	-40 to +105	Flash	32K	2K	4K	—	—	28	
☆ML62Q1366	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	2.8µA (Internal RC oscillation)	-40 to +105	Flash	48K	2K	4K	—	—	28	
☆ML62Q1367	1.6 to 5.5	32.768kHz (Internal RC oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	2.8µA (Internal RC oscillation)	-40 to +105	Flash	64K	2K	4K	—	—	28	

Standard type 1500 Group 16bit MCU(Industrial Grade)

	Part No.	Operating Conditions					ROM/RAM				Functions/Features				
		Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Port			
			Low Speed	High Speed								Input	Output		Input/Output
W	ML62Q1530	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	32K	4K	8K	—	—	42	
W	ML62Q1531	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	48K	4K	8K	—	—	42	
W	ML62Q1532	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	64K	4K	8K	—	—	42	
W	ML62Q1533	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	8K	—	—	42	
W	ML62Q1534	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	8K	—	—	42	
W	ML62Q1540	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	32K	4K	8K	—	—	46	
W	ML62Q1541	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	48K	4K	8K	—	—	46	
W	ML62Q1542	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	64K	4K	8K	—	—	46	
W	ML62Q1543	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	8K	—	—	46	
W	ML62Q1544	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	8K	—	—	46	
W	ML62Q1550	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	32K	4K	16K	—	—	58	
W	ML62Q1551	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	48K	4K	16K	—	—	58	
W	ML62Q1552	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	64K	4K	16K	—	—	58	
W	ML62Q1553	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	16K	—	—	58	
W	ML62Q1554	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	16K	—	—	58	
W	ML62Q1555	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	160K	4K	16K	—	—	58	
W	ML62Q1556	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	192K	4K	16K	—	—	58	
W	ML62Q1557	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	256K	4K	16K	—	—	58	
☆	ML62Q1558	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	384K	4K	16K	—	—	58	
☆	ML62Q1559	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	512K	4K	16K	—	—	58	
W	ML62Q1563	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	16K	—	—	72	
W	ML62Q1564	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	16K	—	—	72	
W	ML62Q1565	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	160K	4K	16K	—	—	72	
W	ML62Q1566	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	192K	4K	16K	—	—	72	
W	ML62Q1567	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	256K	4K	16K	—	—	72	
☆	ML62Q1568	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	384K	8K	32K	—	—	72	
☆	ML62Q1569	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	512K	8K	32K	—	—	72	
W	ML62Q1573	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	16K	—	—	92	
W	ML62Q1574	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	16K	—	—	92	
W	ML62Q1575	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	160K	4K	16K	—	—	92	
W	ML62Q1576	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	192K	4K	16K	—	—	92	
W	ML62Q1577	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	256K	4K	16K	—	—	92	
☆	ML62Q1578	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	384K	8K	32K	—	—	92	
☆	ML62Q1579	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41 ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	512K	8K	32K	—	—	92	

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Functions/Features																	Notes	Package	Chip Support	Halogen Free Support ¹⁾	Industrial Grade
16bit Timer	16bit Multi Functions Timer	WDT	ADC (method)	DAC	Serial Port			Supply Voltage Detection	LCD Driver	External Interrupt Sources	Others										
					I ² C	SSIO	UART														
4 (8bit×8)	4 (TMR, PWM, IGBT, Capture)	1	10bit×6(SA type)	—	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓						
4 (8bit×8)	4 (TMR, PWM, IGBT, Capture)	1	10bit×6(SA type)	—	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓						
4 (8bit×8)	4 (TMR, PWM, IGBT, Capture)	1	10bit×6(SA type)	—	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓						
4 (8bit×8)	4 (TMR, PWM, IGBT, Capture)	1	10bit×8(SA type)	—	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-TSSOP20-0225-0.65	—	✓	✓						
4 (8bit×8)	4 (TMR, PWM, IGBT, Capture)	1	10bit×8(SA type)	—	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-TSSOP20-0225-0.65	—	✓	✓						
4 (8bit×8)	4 (TMR, PWM, IGBT, Capture)	1	10bit×8(SA type)	—	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-TSSOP20-0225-0.65	—	✓	✓						
6 (8bit×12)	4 (TMR, PWM, IGBT, Capture)	1	10bit×8(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-WQFN24-0404-0.50	—	✓	✓						
6 (8bit×12)	4 (TMR, PWM, IGBT, Capture)	1	10bit×8(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-WQFN24-0404-0.50	—	✓	✓						
6 (8bit×12)	4 (TMR, PWM, IGBT, Capture)	1	10bit×8(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-WQFN24-0404-0.50	—	✓	✓						
6 (8bit×12)	4 (TMR, PWM, IGBT, Capture)	1	10bit×8(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-TQFP32-0707-0.80 P-WQFN32-0505-0.50	—	✓	✓						
6 (8bit×12)	4 (TMR, PWM, IGBT, Capture)	1	10bit×8(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-TQFP32-0707-0.80 P-WQFN32-0505-0.50	—	✓	✓						
6 (8bit×12)	4 (TMR, PWM, IGBT, Capture)	1	10bit×8(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	8	Comparator×1, Thermal sensor, DMA, MPY	—	P-TQFP32-0707-0.80 P-WQFN32-0505-0.50	—	✓	✓						
Functions/Features																	Notes	Package	Chip Support	Halogen Free Support ¹⁾	Industrial Grade
16bit Timer	16bit Multi Functions Timer	WDT	ADC (method)	DAC	Serial Port			Supply Voltage Detection	LCD Driver	External Interrupt Sources	Others										
					I ² C	SSIO	UART														
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP48-0707-0.50	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP48-0707-0.50	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP48-0707-0.50	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP48-0707-0.50	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP48-0707-0.50	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA type)	8bit×1	Master Slave ¹⁾ Master ¹⁾	UART Full Duplex/SSIO×2 (UART Half Duplex×2)	VLS×1	—	10	Comparator×2, DMA, MPY	—	P-TQFP52-1010-0.65	—	✓	✓						
6 (8bit×12)	6 (TMR, PWM, IGBT, Capture)	1	10bit×12(SA																		

☆ : Under Development

Built-in LCD Driver Segments type 1700 Group 16bit MCU(Industrial Grade)

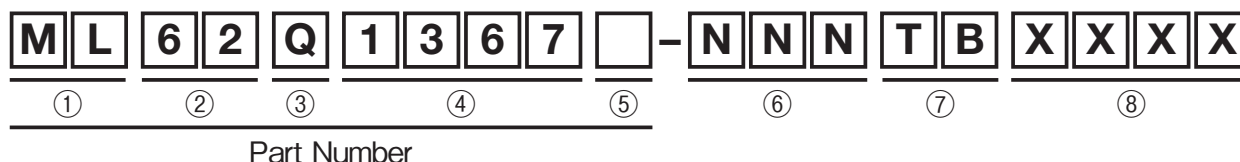
	Part No.	Operating Voltage (V)	Operating Conditions				ROM/RAM				Functions/Features			
			Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Port		
			Low Speed	High Speed								Input	Output	
New	ML62Q1700	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	32K	4K	8K	—	—	37
New	ML62Q1701	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	48K	4K	8K	—	—	37
New	ML62Q1702	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	64K	4K	8K	—	—	37
New	ML62Q1703	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	8K	—	—	37
New	ML62Q1704	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	8K	—	—	37
New	ML62Q1710	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	32K	4K	8K	—	—	41
New	ML62Q1711	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	48K	4K	8K	—	—	41
New	ML62Q1712	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	64K	4K	8K	—	—	41
New	ML62Q1713	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	8K	—	—	41
New	ML62Q1714	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	8K	—	—	41
New	ML62Q1720	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	32K	4K	8K	—	—	53
New	ML62Q1721	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	48K	4K	8K	—	—	53
New	ML62Q1722	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	64K	4K	8K	—	—	53
New	ML62Q1723	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	8K	—	—	53
New	ML62Q1724	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	8K	—	—	53
New	ML62Q1725	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	160K	4K	16K	—	—	53
New	ML62Q1726	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	192K	4K	16K	—	—	53
New	ML62Q1727	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	256K	4K	16K	—	—	53
	☆ML62Q1728	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	384K	4K	16K	—	—	53
	☆ML62Q1729	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	512K	4K	16K	—	—	53
New	ML62Q1733	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	16K	—	—	67
New	ML62Q1734	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	16K	—	—	67
New	ML62Q1735	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	160K	4K	16K	—	—	67
New	ML62Q1736	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	192K	4K	16K	—	—	67
New	ML62Q1737	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	256K	4K	16K	—	—	67
	☆ML62Q1738	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	384K	8K	32K	—	—	67
	☆ML62Q1739	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	512K	8K	32K	—	—	67
New	ML62Q1743	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	96K	4K	16K	—	—	87
New	ML62Q1744	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	128K	4K	16K	—	—	87
New	ML62Q1745	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	160K	4K	16K	—	—	87
New	ML62Q1746	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	192K	4K	16K	—	—	87
New	ML62Q1747	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	256K	4K	16K	—	—	87
	☆ML62Q1748	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	384K	8K	32K	—	—	87
	☆ML62Q1749	1.6 to 5.5	32.768kHz (Internal RC oscillation/Crystal oscillation)	24MHz (PLL oscillation)	41ns 30.5µs	(TBD) (Internal RC oscillation)	-40 to +105	Flash	512K	8K	32K	—	—	87

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Microcontroller

A119

ML62Q1000 series Part Number Explanation



① Device type

ML : Bipolar Logic

② CPU Core type

62 : 16bit CPU nX-U16/100

③ ROM type

Q : Flash ROM

④ Part Code

12xx : 1200 Group

13xx : 1300 Group

2x : 16pin

3x : 20pin

4x : 24pin

6x : 32pin

14xx : 1400 Group

15xx : 1500 Group

3x : 48pin

4x : 52pin

5x : 64pin

6x : 80pin

7x : 100pin

16xx : 1600 Group(Built-in LCD Driver)

17xx : 1700 Group(Built-in LCD Driver)

0x : 48pin

1x : 52pin

2x : 64pin

3x : 80pin

4x : 100pin

⑤ Option Code

None to x : Set for product

⑥ ROM Code

NNN : Blank

001 to xxx : Custom Code Number

x3 : ROM 16KB

x4 : ROM 24KB

x5 : ROM 32KB

x6 : ROM 48KB

x7 : ROM 64KB

x0 : ROM 32KB

x1 : ROM 48KB

x2 : ROM 64KB

x3 : ROM 96KB

x4 : ROM 128KB

x5 : ROM 160KB

x6 : ROM 192KB

x7 : ROM 256KB

x8 : ROM 384KB

x9 : ROM 512KB

x0 : ROM 32KB

x1 : ROM 48KB

x2 : ROM 64KB

x3 : ROM 96KB

x4 : ROM 128KB

x5 : ROM 160KB

x6 : ROM 192KB

x7 : ROM 256KB

x8 : ROM 384KB

x9 : ROM 512KB

⑦ Package Code

GD : WQFN

MB : SSOP

TD : TSSOP

TB : TQFP

GA : QFP

⑧ Company's Code in LAPIS

High Temperature Operation(85°C or 105°C) 8bit/16bit MCU

ML610Q100

Standard type 8bit MCU(Industrial Grade)

Part No.	Operating Conditions						ROM/RAM				Functions/Features			
	Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Port			
		Low Speed	High Speed								Input	Output	Input/Output	
ML610Q101	2.7 to 5.5	32.768kHz (Internal RC oscillation)	8.192MHz	0.122µs/ 30.5µs	—	−40 to +85	Flash	4K	—	256	—	—	11	
ML610Q102	2.7 to 5.5	32.768kHz (Internal RC oscillation)	8.192MHz	0.122µs/ 30.5µs	—	−40 to +85	Flash	6K	—	256	—	—	11	
ML610Q111	2.7 to 5.5	32.768kHz (Internal RC oscillation)	8.192MHz	0.122µs/ 30.5µs	—	−40 to +105	Flash	24K	4K	2K	—	—	15	
ML610Q112	2.7 to 5.5	32.768kHz (Internal RC oscillation)	8.192MHz	0.122µs/ 30.5µs	—	−40 to +105	Flash	32K	4K	4K	—	—	25	

Built-in LCD Driver Segments type 8bit MCU

ML610Q172	2.2 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122μs/30.5μs	2.0μA (Internal RC oscillation)	—40 to +85	Flash	128K	2K	4K	6	2	37
ML610Q173	2.2 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122μs/30.5μs	2.0μA (Internal RC oscillation)	—40 to +85	Flash	128K	2K	4K	6	2	37
ML610Q174	2.2 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122μs/30.5μs	2.0μA (Internal RC oscillation)	—40 to +85	Flash	128K	2K	4K	6	6	49
ML610Q178	2.2 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122μs/30.5μs	2.0μA (Internal RC oscillation)	—40 to +85	Flash	128K	—	4K	7	8	59

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

(LAPIS Semiconductor products)

Functions/Features																		Notes	Package	Chip Support	Halogen Free Support ⁽¹⁾	Industrial Grade
8bit Timer	16bit Timer	PWM	WDT	ADC (method)	Serial Port			Supply Voltage Detection	LCD Driver	External Interrupt Sources	Others											
					I ² C	SSIO	UART															
	6 (16bit×3)	—	16bit×1 (with dead time)	1	10bit×6 (SA type)	—	—	Half Duplex×1	VLS×2	—	5	Analog comparator×2	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓					
	6 (16bit×3)	—	16bit×1 (with dead time)	1	10bit×6 (SA type)	—	—	Half Duplex×1	VLS×2	—	5	Analog comparator×2	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓					
	6 (16bit×3)	—	16bit×4 (Complementary type)	1	10bit×6 (SA type)	Master/Slave x1	1	Half Duplex×2	VLS×2	—	7	Analog comparator×2	—	P-TSSOP20-0225-0.65	—	✓	✓					
	6 (16bit×3)	—	16bit×4 (Complementary type)	1	10bit×8 (SA type)	Master/Slave x1	1	Half Duplex×2	VLS×2	—	7	Analog comparator×2	—	P-LQFP32-0707-0.80	—	✓	✓					
	6 (16bit×3)	—	16bit×3 (Supports IGBT control)	1	10bit×12 (SA type)	Master×1	2	Half Duplex×2	BLD×1	Max.96dot 24seg.×4com.	4	Low speed frequency correction	—	QFP64-P-1414-0.80	—	✓	—					
	6 (16bit×3)	—	16bit×3 (Supports IGBT control)	1	10bit×8 (SA type)	Master×1	2	Half Duplex×2	BLD×1	Max.96dot 24seg.×4com.	4	Low speed frequency correction/ Analog comparator	—	QFP64-P-1414-0.80	—	✓	—					
	6 (16bit×3)	—	16bit×3 (Supports IGBT control)	1	10bit×12 (SA type)	Master×1	2	Half Duplex×2	BLD×1	Max.128dot 32seg.×4com.	4	Low speed frequency correction/ Analog comparator	—	QFP80-P-1420-0.80	—	✓	—					
	6 (16bit×3)	—	16bit×2 (Supports IGBT control)	1	10bit×16 (SA type)	Master×1	2	Half Duplex×2	BLD×1	Max.160dot 40seg.×4com.	5	Low speed frequency correction/ Analog comparator	—	P-QFP100-1420-0.65	—	✓	—					

ML620Q100

Standard type 16bit MCU(Industrial Grade)

Part No.	Operating Conditions						ROM/RAM				Functions/Features			
	Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Port			
		Low Speed	High Speed								Input	Output	Input/Output	
ML620Q131*1	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	8K	2K	2K	1	—	10	
ML620Q132*1	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	16K	2K	2K	1	—	10	
ML620Q133*1	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	24K	2K	2K	1	—	10	
ML620Q134*1	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	16K	2K	2K	1	—	14	
ML620Q135*1	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	20K	2K	2K	1	—	14	
ML620Q136*1	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	24K	2K	2K	1	—	14	
ML620Q131B	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	8K	2K	2K	1	—	10	
ML620Q132B	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	16K	2K	2K	1	—	10	
ML620Q133B	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	24K	2K	2K	1	—	10	
ML620Q134B	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	8K	2K	2K	1	—	14	
ML620Q135B	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	16K	2K	2K	1	—	14	
ML620Q136B	1.6 to 5.5	32.768kHz (Internal RC oscillation)	16MHz	62.5ns 30.5µs	3.5µA (Internal RC oscillation)	-40 to +105	Flash	24K	2K	2K	1	—	14	
ML620Q151A*1	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	32K	2K	2K	5 (Use crystal oscillation) 6 (Not use crystal oscillation)	4	30 (Use crystal oscillation) 31 (Not use crystal oscillation)	
ML620Q152A*1	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	48K	2K	2K	5 (Use crystal oscillation) 6 (Not use crystal oscillation)	4	30 (Use crystal oscillation) 31 (Not use crystal oscillation)	
ML620Q153A*1	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	64K	2K	2K	5 (Use crystal oscillation) 6 (Not use crystal oscillation)	4	30 (Use crystal oscillation) 31 (Not use crystal oscillation)	
ML620Q154A*1	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	32K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	33 (Use crystal oscillation) 34 (Not use crystal oscillation)	
ML620Q155A*1	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	48K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	33 (Use crystal oscillation) 34 (Not use crystal oscillation)	
ML620Q156A*1	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	64K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	33 (Use crystal oscillation) 34 (Not use crystal oscillation)	
ML620Q157A*1	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	32K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	45 (Use crystal oscillation) 46 (Not use crystal oscillation)	
ML620Q158A*1	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	48K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	45 (Use crystal oscillation) 46 (Not use crystal oscillation)	
ML620Q159A*1	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	64K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	45 (Use crystal oscillation) 46 (Not use crystal oscillation)	
ML620Q151B	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	32K	2K	2K	5 (Use crystal oscillation) 6 (Not use crystal oscillation)	4	30 (Use crystal oscillation) 31 (Not use crystal oscillation)	
ML620Q152B	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	48K	2K	2K	5 (Use crystal oscillation) 6 (Not use crystal oscillation)	4	30 (Use crystal oscillation) 31 (Not use crystal oscillation)	
ML620Q153B	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	64K	2K	2K	5 (Use crystal oscillation) 6 (Not use crystal oscillation)	4	30 (Use crystal oscillation) 31 (Not use crystal oscillation)	
ML620Q154B	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	32K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	33 (Use crystal oscillation) 34 (Not use crystal oscillation)	
ML620Q155B	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	48K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	33 (Use crystal oscillation) 34 (Not use crystal oscillation)	
ML620Q156B	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	64K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	33 (Use crystal oscillation) 34 (Not use crystal oscillation)	
ML620Q157B	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	32K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	45 (Use crystal oscillation) 46 (Not use crystal oscillation)	
ML620Q158B	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	48K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	45 (Use crystal oscillation) 46 (Not use crystal oscillation)	
ML620Q159B	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122µs/ 30.5µs	2.5µA (Crystal oscillation) 3.5µA (Internal RC oscillation)	-40 to +105	Flash	64K	2K	2K	6 (Use crystal oscillation) 7 (Not use crystal oscillation)	4	45 (Use crystal oscillation) 46 (Not use crystal oscillation)	

*1 : Recommended "B" version for New Design.

*2 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Functions/Features																	Notes	Package	Chip Support	Halogen Free Support ¹⁾	Industrial Grade
8bit Timer	16bit Timer	PWM	WDT	ADC (method)	Serial Port			Supply Voltage Detection	LCD Driver	External Interrupt Sources	Others										
					IC	SSIO	UART														
10 (16bit×5)	—	16bit×1 (with dead time)	1	10bit×6 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓					
10 (16bit×5)	—	16bit×2 (with dead time)	1	10bit×6 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓					
10 (16bit×5)	—	16bit×3 (with dead time)	1	10bit×6 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓					
10 (16bit×5)	—	16bit×4 (with dead time)	1	10bit×8 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-TSSOP20-0225-0.65	—	✓	✓					
10 (16bit×5)	—	16bit×5 (with dead time)	1	10bit×8 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-TSSOP20-0225-0.65	—	✓	✓					
10 (16bit×5)	—	16bit×6 (with dead time)	1	10bit×8 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-TSSOP20-0225-0.65	—	✓	✓					
10 (16bit×5)	—	16bit×1 (with dead time)	1	10bit×6 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓					
10 (16bit×5)	—	16bit×1 (with dead time)	1	10bit×6 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-SSOP16-0225-0.65 P-WQFN16-0404-0.50	—	✓	✓					
10 (16bit×5)	—	16bit×1 (with dead time)	1	10bit×8 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-TSSOP20-0225-0.65	—	✓	✓					
10 (16bit×5)	—	16bit×1 (with dead time)	1	10bit×8 (SA type)	Master×1 Slave×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1 VLS×1	—	5	Analog comparator×2	—	P-TSSOP20-0225-0.65	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	7	Analog comparator×1	—	P-TQFP48-0707-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	7	Analog comparator×1	—	P-TQFP48-0707-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	7	Analog comparator×1	—	P-TQFP48-0707-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-TQFP52-1010-0.65	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-TQFP52-1010-0.65	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-TQFP52-1010-0.65	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-QFP64-1414-0.80 P-TQFP64-1010-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-QFP64-1414-0.80 P-TQFP64-1010-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-QFP64-1414-0.80 P-TQFP64-1010-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	7	Analog comparator×1	—	P-TQFP48-0707-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	7	Analog comparator×1	—	P-TQFP48-0707-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	7	Analog comparator×1	—	P-TQFP48-0707-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-TQFP52-1010-0.65	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-TQFP52-1010-0.65	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-QFP64-1414-0.80 P-TQFP64-1010-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-QFP64-1414-0.80 P-TQFP64-1010-0.50	—	✓	✓					
2 (16bit×1)	4	16bit×4 (Complementary type)	1	10bit×12 (SA type)	Master×1	1	Half Duplex×2, (Full Duplex×1)	LLD×1	—	8	Analog comparator×1	—	P-QFP64-1414-0.80 P-TQFP64-1010-0.50	—	✓	✓					

Low Power 16bit MCU

ML620Q500/ML620Q400

Standard type 16bit MCU(Industrial Grade)

Part No.	Operating Conditions						ROM/RAM				Functions/Features					
	Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Co-processor for Multiplication and Division	Port			8bit Timer	16bit Timer
		Low Speed	High Speed									Input	Output	Input/Output		
ML620Q503H	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation/ External input)	16MHz (Internal RC oscillation/ Crystal oscillation/ External input)	62.5ns 30.5µs	0.45µA (Crystal oscillation)	-40 to +85	Flash	32K	2K	2K	✓	2	—	36	8 (16bit×4)	4
ML620Q504H	1.8 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation/ External input)	16MHz (Internal RC oscillation/ Crystal oscillation/ External input)	62.5ns 30.5µs	0.45µA (Crystal oscillation)	-40 to +85	Flash	64K	2K	6K	✓	2	—	36	8 (16bit×4)	4

Built-in LCD Driver Dot Matrix type 16bit MCU

ML620Q416A	1.8 to 3.6	32.768kHz (Internal RC oscillation/ Crystal oscillation)	16MHz (Internal RC oscillation/ PLL)	62.5ns 30.5µs	0.38µA (Crystal oscillation)	-40 to +85	Flash	128K	4K	16K	✓	—	—	52	8 (16bit×4)	4
ML620Q418A	1.8 to 3.6	32.768kHz (Internal RC oscillation/ Crystal oscillation)	16MHz (Internal RC oscillation/PLL)	62.5ns 30.5µs	0.38µA (Crystal oscillation)	-40 to +85	Flash	256K	4K	16K	✓	—	—	52	8 (16bit×4)	4

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

USB Interface & Security Function 32bit MCU

ML630Q400(Cortex-M0+)

Built-in LCD Driver Dot Matrix type 32bit MCU(Industrial Grade)

Part No.	Operating Conditions						ROM/RAM				Functions/Features					
	Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Co-processor for Multiplication and Division	Port			8bit Timer	16bit Timer
		Low Speed	High Speed									Input	Output	Input/Output		
ML630Q464	1.8 to 3.6	32.768kHz (Internal RC oscillation/ Crystal oscillation)	16MHz (Internal RC oscillation) 24MHz(PLL)	41.7ns 30.5µs	0.8µA (Crystal oscillation)	-40 to +85	Flash	64K	2K	8K	32bit multiplier	—	—	38	8 (16bit×4)	4
ML620Q466	1.8 to 3.6	32.768kHz (Internal RC oscillation/ Crystal oscillation)	16MHz (Internal RC oscillation) 24MHz(PLL)	41.7ns 30.5µs	0.8µA (Crystal oscillation)	-40 to +85	Flash	128K	2K	16K	32bit multiplier	—	—	38	8 (16bit×4)	4

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

(LAPIS Semiconductor products)

Functions/Features																		Notes	Package	Chip Support	Halogen Free Support ¹⁾	Industrial Grade
PWM	Capture	WDT	ADC (method)	Serial Port				Supply Voltage Detection	LCD Driver	External Interrupt Sources	Others											
					IC	SSIO (SPI)	UART	USB														
16bit×4 (use 16bit Timer)	16bit×4 (use 16bit Timer)	1	24bit×2(RC type) 12bit×12(SA type)	Master ×2	2	Full Duplex ×2	—	VLS×1 LLD×1	—	8	Low speed frequency correction/ Analog comparator×2/Melody : Buzzer	—	P-TQFP48-0707-0.50	✓	✓	✓						
16bit×4 (use 16bit Timer)	16bit×4 (use 16bit Timer)	1	24bit×2(RC type) 12bit×12(SA type)	Master ×2	2	Full Duplex ×2	—	VLS×1 LLD×1	—	8	Low speed frequency correction/ Analog comparator×2/Melody : Buzzer	—	P-TQFP48-0707-0.50	✓	✓	✓						
16bit×4 (use 16bit Timer)	16bit×4 (use 16bit Timer)	1	24bit×2(RC type) 12bit×12(SA type)	Master/ Slave ×3	2	Full Duplex ×3	—	VLS×1 LLD×1	Max.2048dot 64seg.×32com.	8	Low speed frequency correction/ Analog comparator×2/Melody : Buzzer/1kHz Timer	—	—	✓	✓	—						
16bit×4 (use 16bit Timer)	16bit×4 (use 16bit Timer)	1	24bit×2(RC type) 12bit×12(SA type)	Master/ Slave ×3	2	Full Duplex ×3	—	VLS×1 LLD×1	Max.2048dot 64seg.×32com.	8	Low speed frequency correction/ Analog comparator×2/Melody : Buzzer/1kHz Timer	—	—	✓	✓	—						

(LAPIS Semiconductor products)

Functions/Features																	
	PWM	Capture	WDT	ADC (method)	Serial Port				Supply Voltage Detection	LCD Driver	External Interrupt Sources	Others	Notes	Package	Chip Support	Halogen Free Support ¹⁾	Industrial Grade
					PC	SSIO (SPI)	UART	USB									
	16bit×4 (use 16bit Timer)	16bit×4 (use 16bit Timer)	1	24bit×2(RC type) 12bit×12(SA type)	Master/ Slave ×2	2	Full Duplex ×2	1	VLS×1 LLD×1	Max.400dot 50seg.×8com.	8	AES/Random generator/DMA/RTC/ Analog comparator×2/1kHz Timer	—	P-TQFP100-1414-0.50	—	✓	✓
	16bit×4 (use 16bit Timer)	16bit×4 (use 16bit Timer)	1	24bit×2(RC type) 12bit×12(SA type)	Master/ Slave ×2	2	Full Duplex ×2	1	VLS×1 LLD×1	Max.400dot 50seg.×8com.	8	AES/Random generator/DMA/RTC/ Analog comparator×2/1kHz Timer	—	P-TQFP100-1414-0.50	—	✓	✓

Low Voltage Operation 8bit MCU

ML610400/ML610Q400

Standard type 8bit MCU

Part No.	Operating Conditions						ROM/RAM				Functions/Features							
	Operating Voltage (V)	Operating Frequency (Max.)		Minimum Instruction Execution Time	Current Consumption (Typ. @HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Port			8bit Timer	1kHz Timer	PWM	Capture	WDT
		Low Speed	High Speed								Input	Output	Input/Output					
ML610482	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Mask	64K	—	4K	6	4	22	⁴ (16bit×2)	—	16bit×1	—	1
ML610Q482	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	64K	—	4K	6	4	22	⁴ (16bit×2)	—	16bit×1	—	1

Standard type 8bit MCU(Industrial Grade)

ML610482P	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-40 to +85	Mask	64K	—	4K	6	4	22	⁴ (16bit×2)	—	16bit×1	—	1
ML610Q482P	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-40 to +85	Flash	64K	—	4K	6	4	22	⁴ (16bit×2)	—	16bit×1	—	1

Built-in LCD Driver Dot Matrix type 8bit MCU

ML610421	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Mask	32K	—	2K	6	3	22	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q421	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	32K	—	2K	6	3	22	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q422	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	32K	—	2K	6	3	14	⁴ (16bit×2)	1	16bit×1	2	1
ML610426	1.1 to 3.6	32.768kHz (Crystal oscillation)	1MHz	1µs/30.5µs	0.5µA	-20 to +70	Mask	40K	—	2K	5	—	7	⁴ (16bit×2)	1	16bit×1	—	1
ML610Q426	1.1 to 3.6	32.768kHz (Crystal oscillation)	1MHz	1µs/30.5µs	0.5µA	-20 to +70	Flash	40K	—	2K	5	—	7	⁴ (16bit×2)	1	16bit×1	—	1
ML610Q426C	1.1 to 3.6	32.768kHz (Crystal oscillation)	1MHz	1µs/30.5µs	0.5µA	-20 to +70	Flash	40K	—	2K	7	—	13	⁴ (16bit×2)	1	16bit×1	—	1
ML610Q428	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 2MHz	0.244µs/0.5µs/30.5µs	0.5µA	-20 to +70	Flash	48K	—	4K	6	3	14	² (16bit×1)	1	16bit×3	—	1
ML610429	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 2MHz	0.244µs/0.5µs/30.5µs	0.5µA	-20 to +70	Mask	48K	—	4K	10	3	20	² (16bit×1)	1	16bit×3	—	1
ML610Q429	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 2MHz	0.244µs/0.5µs/30.5µs	0.5µA	-20 to +70	Flash	48K	—	4K	10	3	20	² (16bit×1)	1	16bit×3	—	1
ML610Q431	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	64K	—	3K	6	3	22	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q431A	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	64K	—	3K	6	3	22	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q432	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	64K	—	3K	6	3	14	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q432A	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	64K	—	3K	6	3	14	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q435	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	96K	—	3K	6	3	22	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q435A	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	96K	—	3K	6	3	22	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q436	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	96K	—	3K	6	3	14	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q436A	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-20 to +70	Flash	96K	—	3K	6	3	14	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q438	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 2MHz	0.244µs/0.5µs/30.5µs	0.5µA	-20 to +70	Flash	128K	—	7K	10	3	20	⁴ (16bit×2)	1	16bit×3	2	1
ML610Q439	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 2MHz	0.244µs/0.5µs/30.5µs	0.5µA	-20 to +70	Flash	128K	—	7K	10	3	20	⁴ (16bit×2)	1	16bit×3	2	1

Built-in LCD Driver Dot Matrix type 8bit MCU(Industrial Grade)

ML610Q421P	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-40 to +85	Flash	32K	—	2K	6	3	22	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q422P	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244µs/2µs/30.5µs	0.5µA	-40 to +85	Flash	32K	—	2K	6	3	14	⁴ (16bit×2)	1	16bit×1	2	1
ML610Q439P	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 2MHz	0.244µs/0.5µs/30.5µs	0.5µA	-40 to +85	Flash	128K	—	7K	10	3	20	⁴ (16bit×2)	1	16bit×3	2	1

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

(LAPIS Semiconductor products)

Functions/Features														Notes	Package	Chip Support	Halogen Free Support ¹⁾	Industrial Grade
ADC (method)	Serial Port			Supply Voltage Detection	LCD Driver	External Interrupt Sources	Others											
	I ² C	SSIO	UART															
24bit×2(RC type)	Master x1	1	Half Duplex x1	BLD×1	—	5	Low speed frequency correction/ Buzzer	—	—	✓	✓	—						
24bit×2(RC type)	Master x1	1	Half Duplex x1	BLD×1	—	5	Low speed frequency correction/ Buzzer	—	P-TQFP48-0707-0.50	✓	✓	—						
24bit×2(RC type)	Master x1	1	Half Duplex x1	BLD×1	—	5	Low speed frequency correction/ Buzzer	—	—	✓	✓	✓						
24bit×2(RC type)	Master x1	1	Half Duplex x1	BLD×1	—	5	Low speed frequency correction/ Buzzer	—	P-TQFP48-0707-0.50	✓	✓	✓						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.400dot 50seg.×8com.	5	Low speed frequency correction/ Melody : Buzzer	—	—	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.400dot 50seg.×8com.	5	Low speed frequency correction/ Melody : Buzzer	—	P-TQFP120-1414-0.40	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.800dot 50seg.×16com.	5	Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : enable	P-TQFP120-1414-0.40	✓	✓	—						
16bit×1(RC type)	Master x1	1	Half Duplex x1	BLD×1	Max.800dot 50seg.×16com.	5	Low speed frequency correction/Melody : Buzzer/ EL Driver/External input voltage detection	—	—	✓	✓	—						
16bit×1(RC type)	Master x1	1	Half Duplex x1	BLD×1	Max.800dot 50seg.×16com.	5	Low speed frequency correction/Melody : Buzzer/ EL Driver/External input voltage detection	—	—	✓	✓	—						
16bit×1(RC type)	Master x1	1	Half Duplex x1	BLD×1	Max.672dot 42seg.×16com.	8	Low speed frequency correction/Melody : Buzzer/ EL Driver/External input voltage detection	—	—	✓	✓	—						
24bit×2(RC type)	Master x1	1	Half Duplex x1	BLD×1	Max.1392dot 58seg.×24com.	5	Low speed frequency correction/ Melody : Buzzer	Selectable oscillation stop detection reset : function enable/disable according to mask option	TQFP128-P-1414-0.40	✓	✓	—						
24bit×2(RC type)	Master x1	1	Half Duplex x1	BLD×1	Max.512dot 64seg.×8com.	9	Low speed frequency correction/ Melody : Buzzer	Selectable oscillation stop detection reset : function enable/disable according to mask option	—	✓	✓	—						
24bit×2(RC type)	Master x1	1	Half Duplex x1	BLD×1	Max.512dot 64seg.×8com.	9	Low speed frequency correction/ Melody : Buzzer	Selectable oscillation stop detection reset : function enable/disable according to mask option	TQFP128-P-1414-0.40	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1024dot 64seg.×16com.	5	RTC/Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : enable	P-LQFP144-2020-0.50	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1024dot 64seg.×16com.	5	RTC/Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : disable	—	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1536dot 64seg.×24com.	5	RTC/Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : enable	P-LQFP144-2020-0.50	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1536dot 64seg.×24com.	5	RTC/Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : disable	P-LQFP144-2020-0.50	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1024dot 64seg.×16com.	5	RTC/Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : enable	—	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1024dot 64seg.×16com.	5	RTC/Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : disable	P-LQFP144-2020-0.50	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1536dot 64seg.×24com.	5	RTC/Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : enable	—	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1536dot 64seg.×24com.	5	RTC/Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : disable	P-LQFP144-2020-0.50	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1344dot 56seg.×24com.	9	Low speed frequency correction/ Melody : Buzzer	Selectable oscillation stop detection reset : function enable/disable according to software	P-LQFP144-2020-0.50	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1024dot 64seg.×16com.	9	Low speed frequency correction/ Melody : Buzzer	Selectable oscillation stop detection reset : function enable/disable according to software	—	✓	✓	—						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.400dot 50seg.×8com.	5	Low speed frequency correction/ Melody : Buzzer	—	P-TQFP120-1414-0.40	✓	✓	✓						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.800dot 50seg.×16com.	5	Low speed frequency correction/ Melody : Buzzer	Low-speed scillation stop detect reset : enable	P-TQFP120-1414-0.40	✓	✓	✓						
24bit×2(RC type) 12bit×2(SA type)	Master x1	1	Half Duplex x1	BLD×1	Max.1024dot 64seg.×16com.	9	Low speed frequency correction/ Melody : Buzzer	Selectable oscillation stop detection reset : function enable/disable according to software	P-LQFP144-2020-0.50	—	✓	✓						

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Microcontroller

Built-in LCD Driver Segments type 8bit MCU

Part No.	Operating Conditions						ROM/RAM				Functions/Features								
	Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Port			8bit Timer	1kHz Timer	PWM	Capture		WDT
		Low Speed	High Speed								Input	Output	Input/Output						
ML610401	1.25 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/ 30.5μs	0.9μA	-20 to +70	Mask	6K	—	192	4	12	18	2 (16bit×1)	—	—	2	1	
ML610402	1.25 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/ 30.5μs	0.9μA	-20 to +70	Mask	6K	—	192	4	8	18	2 (16bit×1)	—	—	2	1	
ML610403	1.25 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/ 30.5μs	0.9μA	-20 to +70	Mask	6K	—	192	4	4	18	2 (16bit×1)	—	—	2	1	
ML610404	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Mask	8K	—	256	5	12	22	4 (16bit×2)	—	16bit×1	2	1	
ML610405	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Mask	8K	—	256	5	8	22	4 (16bit×2)	—	16bit×1	2	1	
ML610406	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Mask	8K	—	256	5	4	22	4 (16bit×2)	—	16bit×1	2	1	
ML610407	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Mask	16K	—	1K	5	12	22	4 (16bit×2)	—	16bit×1	2	1	
ML610Q407	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Flash	16K	—	1K	5	12	22	4 (16bit×2)	—	16bit×1	2	1	
ML610Q407A	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Flash	16K	—	1K	5	12	22	4 (16bit×2)	—	16bit×1	2	1	
ML610Q407D	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Flash	16K	—	1K	5	12	22	4 (16bit×2)	—	16bit×1	2	1	
ML610408	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Mask	16K	—	1K	5	8	22	4 (16bit×2)	—	16bit×1	2	1	
ML610Q408	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Flash	16K	—	1K	5	8	22	4 (16bit×2)	—	16bit×1	2	1	
ML610409	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Mask	16K	—	1K	5	4	22	4 (16bit×2)	—	16bit×1	2	1	
ML610Q409	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Flash	16K	—	1K	5	4	22	4 (16bit×2)	—	16bit×1	2	1	
ML610Q409A	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/ 30.5μs	0.9μA	-20 to +70	Flash	16K	—	1K	5	4	22	4 (16bit×2)	—	16bit×1	2	1	
ML610Q411	1.1 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/ 30.5μs	0.5μA	-20 to +70	Flash	16K	—	1K	6	3	22	4 (16bit×2)	1	16bit×1	2	1	
ML610Q412	1.1 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/ 30.5μs	0.5μA	-20 to +70	Flash	16K	—	1K	6	3	14	4 (16bit×2)	1	16bit×1	2	1	
ML610Q418	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244μs/2μs/ 30.5μs	1.1μA	-20 to +70	Flash	128K	4K	4K	6	3	18	4 (16bit×2)	—	16bit×1	2	1	
ML610Q418C	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244μs/2μs/ 30.5μs	1.1μA	-20 to +70	Flash	128K	4K	4K	6	3	26	4 (16bit×2)	—	16bit×1	2	1	
ML610Q419	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244μs/2μs/ 30.5μs	0.9μA	-20 to +70	Flash	64K	4K	2K	6	3	18	4 (16bit×2)	—	16bit×1	2	1	
ML610Q419C	1.1 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz 500kHz	0.244μs/2μs/ 30.5μs	0.9μA	-20 to +70	Flash	64K	4K	2K	6	3	26	4 (16bit×2)	—	16bit×1	2	1	
ML610Q461	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz 500kHz	0.5μs/2μs/ 30.5μs	0.9μA	-20 to +70	Flash	16K	—	1K	5	10	14	4 (16bit×2)	—	16bit×1	2	1	
ML610Q462	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz 500kHz	0.5μs/2μs/ 30.5μs	0.9μA	-20 to +70	Flash	16K	—	1K	5	6	14	4 (16bit×2)	—	16bit×1	2	1	
ML610Q463	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz 500kHz	0.5μs/2μs/ 30.5μs	0.9μA	-20 to +70	Flash	16K	—	1K	5	2	14	4 (16bit×2)	—	16bit×1	2	1	
ML610Q477	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz 500kHz	0.5μs/2μs/ 30.5μs	0.8μA	-20 to +70	Flash	24K	—	2K	4	10	15	6 (16bitx 3)	—	—	2	1	
ML610Q478	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz 500kHz	0.5μs/2μs/ 30.5μs	0.8μA	-20 to +70	Flash	24K	—	2K	4	6	15	6 (16bitx 3)	—	—	2	1	
ML610Q479	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz 500kHz	0.5μs/2μs/ 30.5μs	0.8μA	-20 to +70	Flash	24K	—	2K	4	2	15	6 (16bitx 3)	—	—	2	1	

Built-in LCD Driver Segments type 8bit MCU(Industrial Grade)

ML610401P	1.25 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/30.5μs	0.9μA	-40 to +85	Mask	6K	—	192	4	12	18	2 (16bit×1)	—	—	2	1
ML610402P	1.25 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/30.5μs	0.9μA	-40 to +85	Mask	6K	—	192	4	8	18	2 (16bit×1)	—	—	2	1
ML610403P	1.25 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/30.5μs	0.9μA	-40 to +85	Mask	6K	—	192	4	4	18	2 (16bit×1)	—	—	2	1
ML610404P	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Mask	8K	—	256	5	12	22	4 (16bit×2)	—	16bit×1	2	1
ML610405P	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Mask	8K	—	256	5	8	22	4 (16bit×2)	—	16bit×1	2	1
ML610406P	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Mask	8K	—	256	5	4	22	4 (16bit×2)	—	16bit×1	2	1
ML610407P	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Mask	16K	—	1K	5	12	22	4 (16bit×2)	—	16bit×1	2	1
ML610Q407P	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Flash	16K	—	1K	5	12	22	4 (16bit×2)	—	16bit×1	2	1
ML610Q407PA	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Flash	16K	—	1K	5	12	22	4 (16bit×2)	—	16bit×1	2	1
ML610408P	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Mask	16K	—	1K	5	8	22	4 (16bit×2)	—	16bit×1	2	1
ML610Q408P	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Flash	16K	—	1K	5	8	22	4 (16bit×2)	—	16bit×1	2	1
ML610409P	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Mask	16K	—	1K	5	4	22	4 (16bit×2)	—	16bit×1	2	1
ML610Q409P	1.25 to 3.6	32.768kHz (Crystal oscillation)	2MHz	0.5μs/30.5μs	0.9μA	-40 to +85	Flash	16K	—	1K	5	4	22	4 (16bit×2)	—	16bit×1	2	1
ML610Q411P	1.1 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/30.5μs	0.5μA	-40 to +85	Flash	16K	—	1K	6	3	22	4 (16bit×2)	1	16bit×1	2	1
ML610Q411PA	1.1 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/30.5μs	0.5μA	-40 to +85	Flash	16K	—	1K	6	3	22	4 (16bit×2)	1	16bit×1	2	1
ML610Q412P	1.1 to 3.6	32.768kHz (Crystal oscillation)	500kHz	2μs/30.5μs	0.5μA	-40 to +85	Flash	16K	—	1K	6	3	14	4 (16bit×2)	1	16bit×1	2	1

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Microcontroller

Speech Play Back 8bit MCU

ML610Q300

Standard type 8bit MCU(Industrial Grade)															
Part No.	Operating Conditions						ROM/RAM					Functions/Features			
	Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	Memory for Sound	RAM Capacity (Byte)	Port			
		Low Speed	High Speed									Input	Output	Input/Output	
ML610Q304	2.0 to 5.5	32.768kHz (Internal RC oscillation)	8.192MHz	0.122μs/30.5μs	2.7μA	−40 to +85	Flash	96K	2K	Flash ROM	1K	1	3	11	
ML610Q359	2.2 to 3.6	32.768kHz (Crystal oscillation)	8.192MHz	0.122μs/30.5μs	1.7μA	−40 to +85	Flash	160K	3K	Flash ROM	2K	8	3	29	
ML610Q360	2.2 to 3.6	32.768kHz (Crystal oscillation)	8.192MHz	0.122μs/30.5μs	1.7μA	−40 to +85	Flash P2ROM	160K	3K	P2ROM: 16Mbit	2K	8	3	29	
Built-in LCD Driver Segments type 8bit MCU															
ML610Q380	2.2 to 5.5	32.768kHz (Internal RC oscillation/ Crystal oscillation)	8.192MHz	0.122μs/30.5μs	2.0μA	−40 to +70	Flash	128K	—	Flash ROM	2K	7	4	34	

*1 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Sensor Hub 8bit MCU

ML610Q790

U8 Core Based Standard type 8bit MCU													
Part No.	Operating Conditions					ROM/RAM				Functions/Features			
	Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@HALT)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	Port		
		Low Speed	High Speed								Input	Output	Input/Output
ML610Q793*1	V _{DD} :1.7 to 1.9 A _{VDD} :2.5 to 3.6	32.768kHz (External clock)	4.096MHz	0.25μs/30.5μs	0.6μA	−30 to +85	Flash	64K	—	4K	—	—	21
ML610Q794G*1	2.5 to 3.6	32.768kHz (Crystal oscillation)	4.096MHz	0.25μs/30.5μs	1.1μA	−30 to +85	Flash	64K	—	4K	—	—	21

*1 : Not Recommended for New Dsign

*2 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Sensor Hub 32bit MCU

ML630Q790

ARM Cortex-M0+ Based Standard type 32bit MCU													
Part No.	Operating Conditions					ROM/RAM				Functions/Features			
	Operating Voltage (V)	Operating Frequency(Max.)		Minimum Instruction Execution Time	Current Consumption (Typ.@SLEEPDEEP)	Operating Temperature (°C)	ROM type	ROM Capacity (Byte)	Data Flash Capacity (Byte)	RAM Capacity (Byte)	port		
		Low Speed	High Speed								Input	Output	Input/Output
ML630Q791*1	V _{DD} :1.7 to 1.9	32.768kHz (External clock)	32MHz	—	2.5μA	−40 to +85	Flash	128K	—	16K	—	—	7

*1 : Not Recommended for New Dsign

*2 : A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

ML610/ML610Q/ML620Q/ML630Q Part Number Explanation

M	L	6	2	0	Q	1	5	1	B	—	N	N	N	T	B	x	x	x	x
①	②	③	④	⑤		⑥	⑦	⑧											

Part Name

① Device type

ML : Bipolar Logic

② CPU Core type

610 : 8bit CPU nX-U8/100

620 : 16bit CPU nX-U16/100

630 : 32bit CPU ARM CortexM0+

④ Part Code

1xx : High Temperature Operation

3xx : Speech Play Back

4xx : Low Power or Low Voltage Operation

5xx : Low Power

79x : Sensor HUB

⑤ Option Code

None to x : Set for product

⑥ ROM Code

NNN : Blank

001 to xxx : Custom Code Number

⑦ Package Code

GD : VQFN, WQFN

MB : SSOP

TD : TSSOP

TB : TQFP

GA : QFP

WA : Chip

⑧ Company's Code in LAPIS

(LAPIS Semiconductor products)

	Functions/Features											Notes	Package	Chip Support	Halogen Free Support ¹⁾	Industrial Grade	
	8bit Timer	PWM	WDT	ADC (method)	Serial Port			Supply Voltage Detection	LCD Driver	External Interrupt Sources	SP Amp Output(W)/ Class						Others
					I ² C	SSIO	UART										
	4 (16bit×2)	—	1	10bit×3 (SA type)	Master/ Slave x1	2	Half Duplex x1	—	—	9	1.0(@5V)/ D class	Speech function/ ADPCM decoder/ Built-in speaker Amplifier.	—	P-VQFN28-0505-0.50 P-WQFN32-0505-0.50	—	✓	✓
	8 (16bit×4)	—	1	12bit×4 (SA type)	—	2	Half Duplex x2 (Full Duplexx1+ Half Duplexx1)	VLS×1	—	7	0.5(@3V)/ AB class	Speech function/ ADPCM decoder/ Built-in speaker Amplifier.	—	P-TQFP64-1010-0.50	—	✓	✓
	8 (16bit×4)	—	1	12bit×4 (SA type)	—	2	Half Duplex x2 (Full Duplexx1+ Half Duplexx1)	VLS×1	—	7	0.5(@3V)/ AB class	Speech function/ ADPCM decoder/ Built-in speaker Amplifier.	—	P-TQFP64-1010-0.50	—	—	✓
	6 (16bit×3)	16bit×2	1	10bit×8 (SA type)	Master x1	2	Half Duplex x2	BLD×1	Max. 96dot 24seg. ×4com.	5	0.6(@5V)/ AB class	Speech function/ ADPCM decoder/ Built-in speaker Amplifier.	—	P-QFP80-1414-0.65	—	—	—

(LAPIS Semiconductor products)

Functions/Features														Notes	Package	Chip Support	Halogen Free Support ²⁾	Industrial Grade	
8bit Timer	PWM	WDT	ADC(method)	Serial port				External interrupt sources	Others										
					I ² C	SSIO	UART	I ² C/SPI(for Host Communication)											
6 (16bit×3)	—	1	12bit×3 (SA type)	Master ×1	1		Full Duplex ×2	1	16	16bit Square Root, Multiply, Divider, Host I/F(SPI/I ² C/Logging RAM:8KB)					—	S-UFLGA48-3.06x2.96-0.40 (WCSP48)	—	✓	—
6 (16bit×3)	—	1	12bit×2 (SA type)	Master ×1	1		Full Duplex ×2	1	16	16bit Square Root, Multiply, Divider, Host I/F(SPI/I ² C/Logging RAM:8KB)					—	P-TQFP-48-0707-0.50	—	✓	—

(LAPIS Semiconductor products)

Functions/Features															Notes	Package	Chip Support	Halogen Free Support ²⁾	Industrial Grade
8bit Timer	PWM	WDT	ADC (method)	Serial Port			External Interrupt Sources	Others											
				I ² C	SSIO	UART	I ² C/SPI(for Host Communication)												
8 (16bit×4)	1	1	—	Master ×2	—	Full Duplex ×1	1	7	Square Root, Division operations, Host I/F (Built-in 512 byte communication register)					—	S-UFLGA20-1.84x2.14-0.40 (WCSP20)	—	✓	—	

**ICs**

IC Packages

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ROHM Packages

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WL-CSP Packages	P. A149

LAPIS Semiconductor Packages

Package List	P. A150
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DIP Package	P. A155
QFN Packages	P. A155
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WL-CSP Package	P. A157

*Please check the dimensions of each products in detail.

LAPIS Semiconductor products and ROHM Semiconductor dimensions products have different although they have a same package name.

Please refer packages from page, A150 for LAPIS Semiconductor products.

Part No. Explanation

- When ordering, specify the part number.
- Check each code against the tables shown below.
- Fill in from the left, leaving any extra boxes empty on the right.

B **A** **4** **5** **5** **8** **F** **—** **D** **X** **E** **2**

Part No.

Custom Specification code

Packaging and forming specification

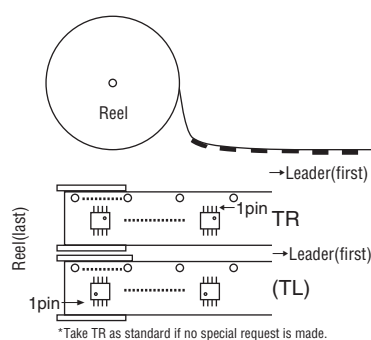
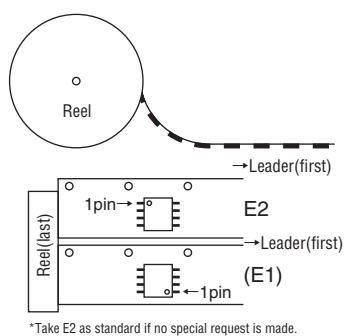
Alphabetical symbols specify custom product. Standard product has no symbols.

E2	Embossed tape and reel	Pin 1 fed last
(E1)	Embossed tape and reel	Pin 1 fed first
TR	Embossed tape and reel	Pin 1 fed first
(TL)	Embossed tape and reel	Pin 1 fed last

Ordering information

1. A packaging specification is not required for packaging other than taping.
(Ex.) BA4558F or BA4558F-DX
2. A packaging specification is required for tape packaging.
(Ex.) Example of E2-oriented embossed taping: BA4558F-E2 or BA4558F-DXE2

For example



Please refer packages from page, A150 for LAPIS Semiconductor products.

Package Ordering Units

● Embossed tape packaging <Package specification name : E2(E1)>

Package ordering unit quantity	Non-Lead Gull Wing Packages	SOP Packages	Power Packages	QFP Packages	BGA/QFN
5,000	SSON004X1216*, SSON004X1010	—	—	—	—
4,000	WSON008X2120, VSON008X2020, VSON008X2030, VSON010X3020, VSON010X3030, VMMP008Z1830*	—	—	—	—
3,000	VSOF5*, HVSOF5/6*, HSON8*, WSOF5/6*, VSON008V2030*, VSON010V3030, VQFN016V3030, WL-CSP (2.8mm□ and under)	TSSOP-B8, SOP4*, SSOP3/5/6*, MSOP8/10*	—	—	—
2,500	VQFN020V4040, VQFN024V4040, VQFN028V5050, VQFN032V5050, UQFN036V5050, UQFN040V5050, WL-CSP (over 2.81mm□)	SOP8/14/16, SSOP-A16, TSSOP-B14J, SSOP-B8/14/16/20, SOP-J8/J14, HTSSOP-16/20/28, HTSOP-J8, TSSOP-B8J	—	—	4×4mm
2,000	VQFN040V6060, UQFN044V6060	SOP18/20/24, SSOP-A20/24/32, SSOP-B24/28/40, HTSSOP-B24/30/40, HSOP25	HRP5/7*, TO252-3/5, SOT223-4, TO263-7, TO252-J3/J5	—	6×6mm
1,500	VQFN048V7070, UQFN056V7070	SSOP-A44, HTSSOP-A44/A44R/B54, HSOP28/-M28/-M36	—	QFP32, TQFP48V, VQFP48C, HTQFP48V, UQFP64, TQFP64U	—
1,000	—	—	—	SQFP-T52, QFP44, VQFP64, VQFP80, UQFP80, TQFP64V, HTQFP64AV, HTQFP64BV	—
500	—	—	TO263-3/5	VQFP100, TQFP100V	—

1) *:Package specification : TR(TL)

2) Specification differ by package size of WL-CSP

3) WL-CSP Package Specification : E2 (standard)

● Tray packaging

Pin pitch: 0.8 mm	Pin pitch: 0.65 mm	Pin pitch: 0.5 mm	Pin pitch: 0.4 mm	Dimensions dxe(mm)	Individual package quantity	Tray quantity	Package ordering unit quantity	Tomson Case dimensions AxBxC(mm)
QFP32	—	VQFP48C	—	175×166	100	10	1,000	60×200×200
QFP44	SQFP-T52/64	VQFP64/80, TQFP48V/64V	UQFP80	216×116	50	20	1,000	70×130×510
QFP-A64, QFP80/T80	—	VQFP100, TQFP100V, HTQFP100V	TQFP128U	256×166	50	10	500	75×200×290
QFP120	—	—	—	322.6×135.9	24	10	240	75×140×338

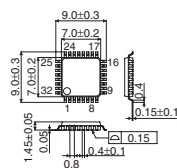
Please refer packages from page, A150 for LAPIS Semiconductor products.

QFP Packages

(Unit: mm)

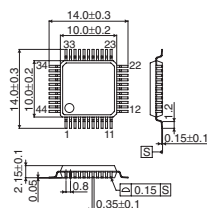
QFP<Pin Pitch:0.8mm>

QFP32



Tray:1,000pcs
Embossed carrier tape:1,500pcs

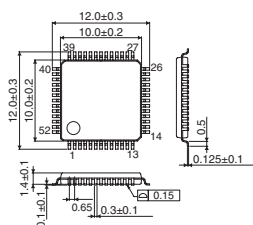
QFP44



Tray:1,000pcs
Embossed carrier tape:1,000pcs

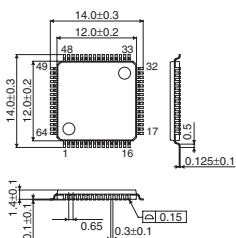
SQFP<Pin Pitch:0.65mm>

SQFP-T52



Tray:1,000pcs
Embossed carrier tape:1,000pcs

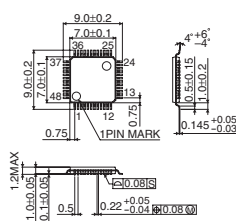
SQFP-T64



Tray:1,000pcs

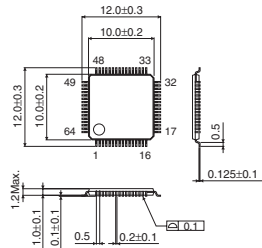
TQFPV<Pin Pitch:0.5mm>

TQFP48V



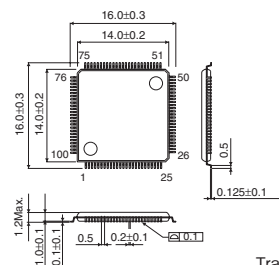
Tray:1,000pcs
Embossed carrier tape:1,500pcs

TQFP64V



Tray:1,000pcs
Embossed carrier tape:1,000pcs

TQFP100V



Tray:500pcs
Embossed carrier tape:500pcs

- ▶ **QFP Packages**
 - ▶ **VQFP**<Pin Pitch:0.5mm>
 - ▶ **UQFP**<Pin Pitch:0.4mm>
 - ▶ **TQFP**<Pin Pitch:0.4mm>
 - ▶ **HTQFPV**<Pin Pitch:0.5mm>
 - ▶ **VMMP Package**
 - ▶ **VMMP**<Pin Pitch:0.5mm>

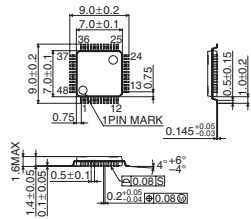
Please refer packages from page, A150 for LAPIS Semiconductor products.

QFP Packages

(Unit: mm)

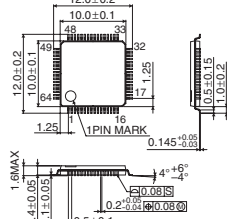
VQFP<Pin Pitch:0.5mm>

VQFP48C



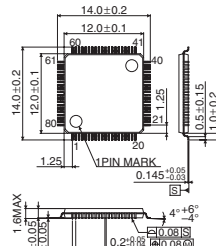
Tray:1,000pcs
Embossed carrier tape:1,500pcs

VQFP64



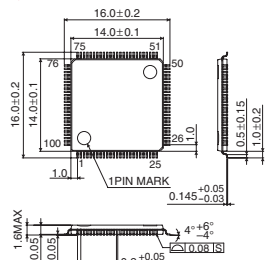
Tray:1,000pcs
Embossed carrier tape:1,000pcs

VQFP80



Tray:1,000pcs
Embossed carrier tape:1,000pcs

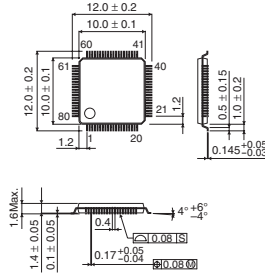
VQFP100



Tray:500pcs
Embossed carrier tape:500pcs

UQFP<Pin Pitch:0.4mm>

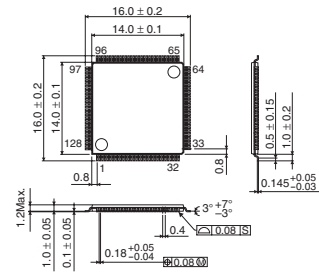
UQFP80



Tray:1,000pcs
Embossed carrier tape:1,000pcs

TQFPU<Pin Pitch:0.4mm>

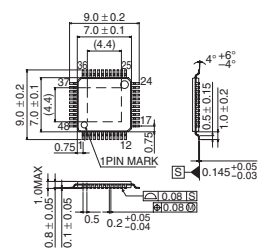
TQFP128U



Tray:500pcs

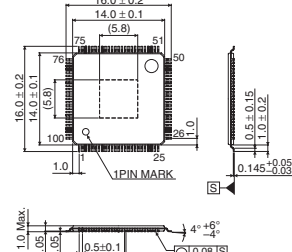
HTQFPV<Pin Pitch:0.5mm>

HTQFP48V



Tray:1,000pcs
Embossed carrier tape:1,500pcs

HTQFP100V



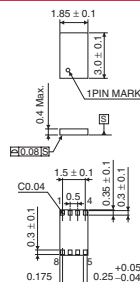
Tray:500pcs

VMMP Package

(Unit: mm)

VMMP<Pin Pitch:0.5mm>

VMMP008Z1830



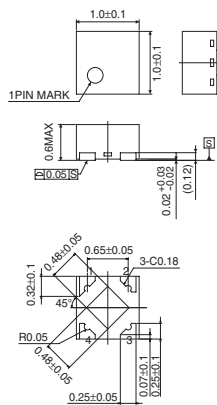
Embossed carrier tape:4,000pcs

Please refer packages from page, A150 for LAPIS Semiconductor products.

SON Packages

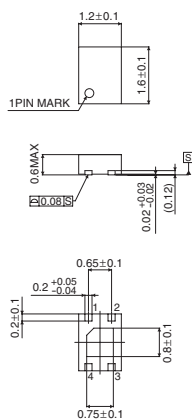
SSON-X<Pin Pitch:0.65mm>

SSON004X1010



Embossed carrier tape:5,000pcs

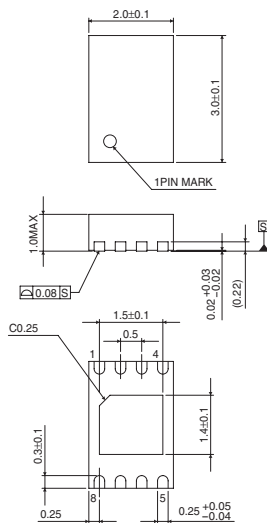
SSON004X1216



Embossed carrier tape:5,000pcs

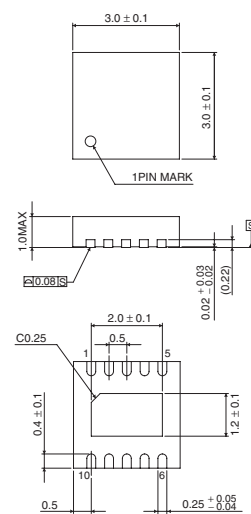
VSON-V<Pin Pitch:0.5mm>

VSON008V2030



Embossed carrier tape:3,000pcs

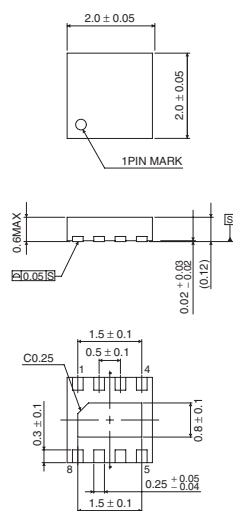
VSON010V3030



Embossed carrier tape:3,000pcs

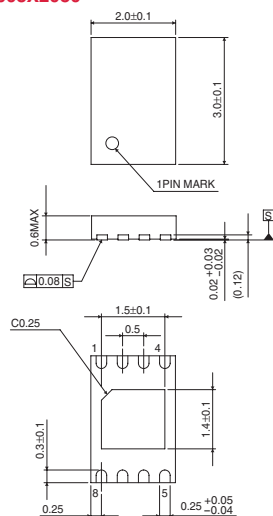
VSON-X<Pin Pitch:0.5mm>

VSON008X2020



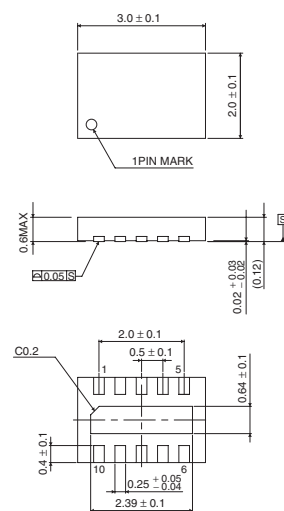
Embossed carrier tape:4,000pcs

VSON008X2030



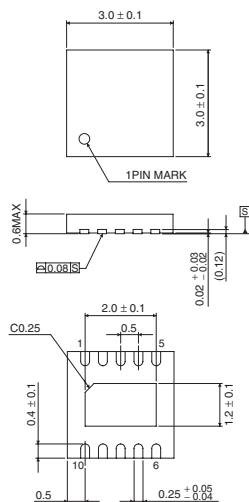
Embossed carrier tape:4,000pcs

VSON010X3020



Embossed carrier tape:4,000pcs

VSON010X3030

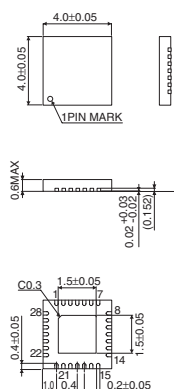


Embossed carrier tape:4.000pcs

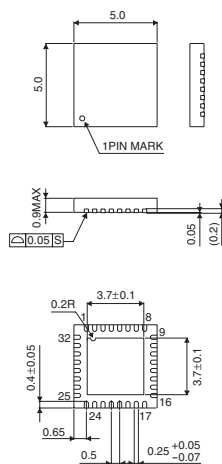
QFN Packages

QFN032<Pin Pitch:0.5mm>

QFN032(Powervation series)



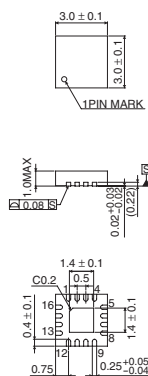
Tape:250, 500, 1,000, 5,000pcs



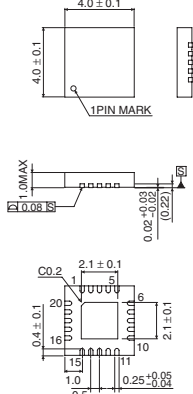
Tape:250, 500, 1,000, 5,000pcs

VQFN-V<Pin Pitch:0.5mm>

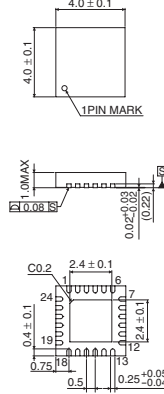
VQFN028V5050



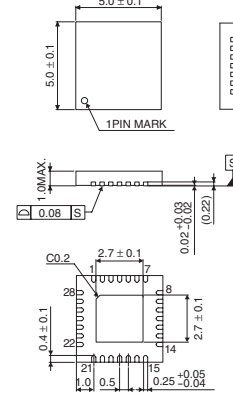
Embossed carrier tape:3,000pcs



Embossed carrier tape:2,500pcs

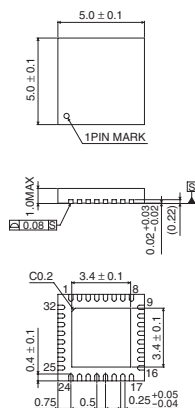


Embossed carrier tape:2,500pcs

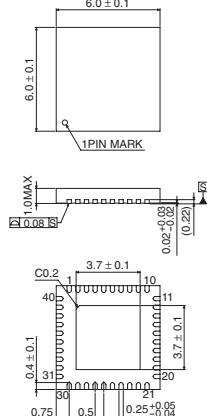


Embossed carrier tape:2,500pcs

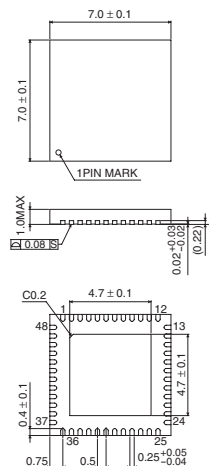
VQFN048V7070



Embossed carrier tape:2,500pcs



Embossed carrier tape:2,000pcs



Embossed carrier tape:1,500pcs

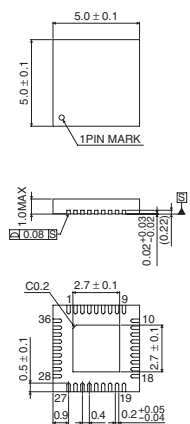
Please refer packages from page, A150 for LAPIS Semiconductor products.

QFN Packages

(Unit: mm)

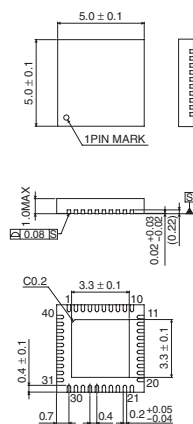
UQFN-V<Pin Pitch:0.4mm>

UQFN036V5050



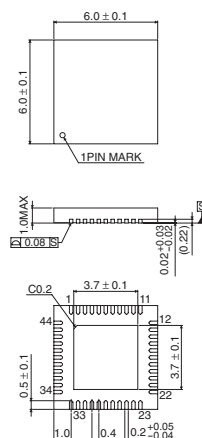
Embossed carrier tape: 2,500 pcs

UQFN040V5050



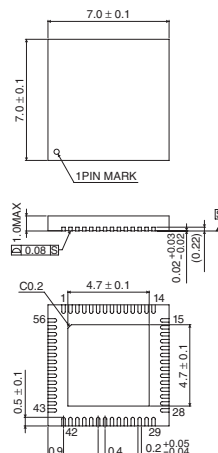
Embossed carrier tape: 2,500 pcs

UQFN044V6060



Embossed carrier tape: 2,000 pcs

UQFN056V7070



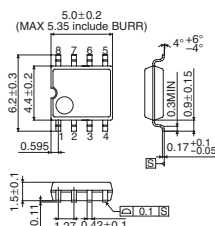
Embossed carrier tape: 1,500 pcs

SOP Packages

(Unit: mm)

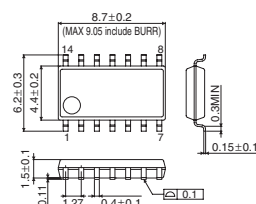
SOP<Pin Pitch:1.27mm>

SOP8



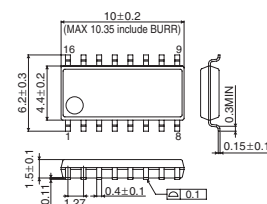
Embossed carrier tape: 2,500 pcs

SOP14



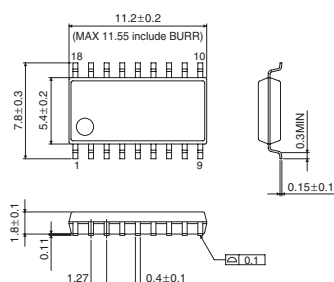
Embossed carrier tape: 2,500 pcs

SOP16



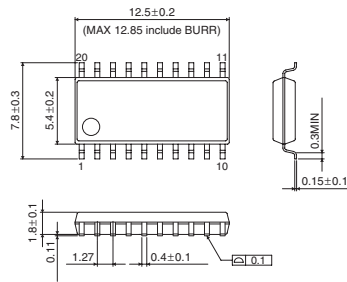
Embossed carrier tape: 2,500 pcs

SOP18



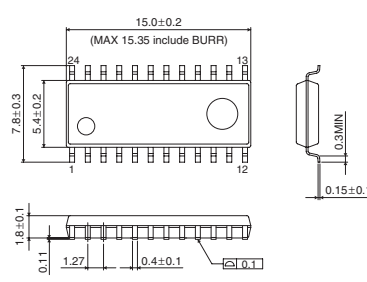
Embossed carrier tape: 2,000 pcs

SOP20



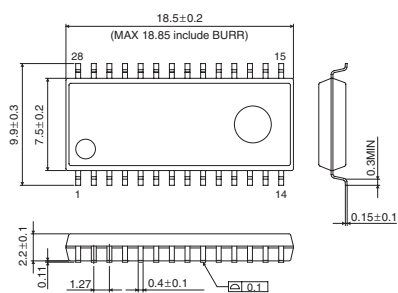
Embossed carrier tape: 2,000 pcs

SOP24



Embossed carrier tape: 2,000 pcs

SOP28



Embossed carrier tape: 1,500 pcs

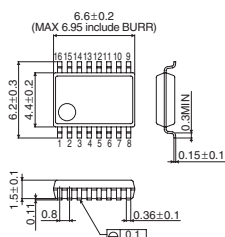
Please refer packages from page, A150 for LAPIS Semiconductor products.

SOP Packages

(Unit: mm)

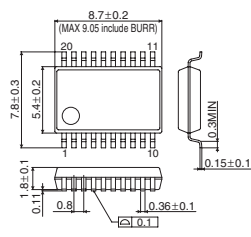
SSOP-A<Pin Pitch:0.8mm>

SSOP-A16



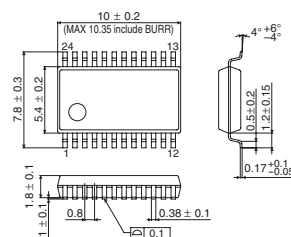
Embossed carrier tape:2,500pcs

SSOP-A20



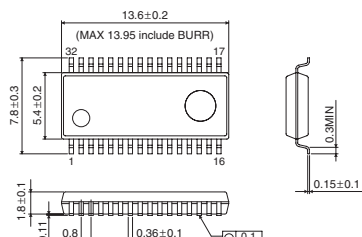
Embossed carrier tape:2,000pcs

SSOP-A24



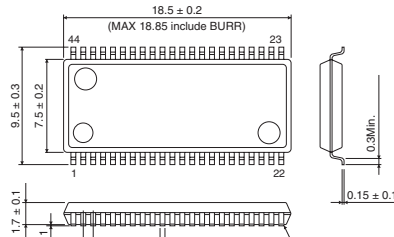
Embossed carrier tape:2,000pcs

SSOP-A32



Embossed carrier tape:2,000pcs

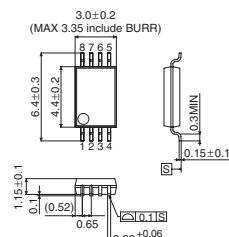
SSOP-A44



Embossed carrier tape:1,500pcs

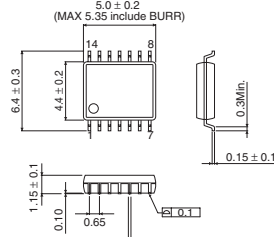
SSOP-B<Pin Pitch:0.65mm>

SSOP-B8



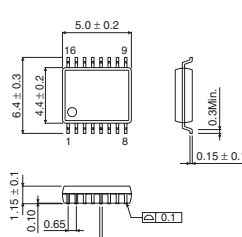
Embossed carrier tape:2,500pcs

SSOP-B14



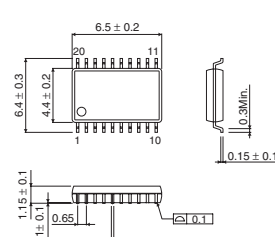
Embossed carrier tape:2,500pcs

SSOP-B16



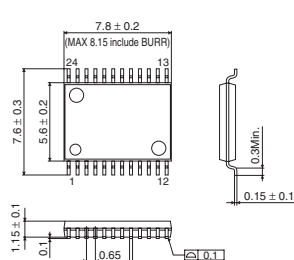
Embossed carrier tape:2,500pcs

SSOP-B20



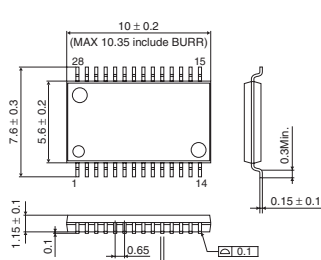
Embossed carrier tape:2,500pcs

SSOP-B24



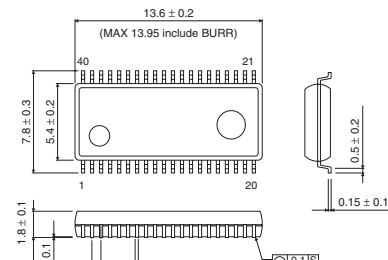
Embossed carrier tape:2,000pcs

SSOP-B28



Embossed carrier tape:2,000pcs

SSOP-B40



Embossed carrier tape:2,000pcs

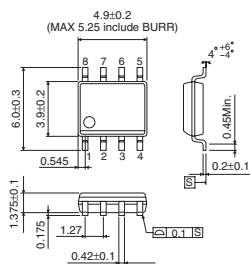
Please refer packages from page, A150 for LAPIS Semiconductor products.

SOP Packages

(Unit: mm)

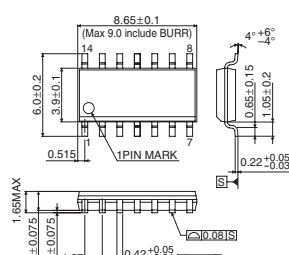
JEDEC<Pin Pitch:1.27mm/0.65mm>

SOP-J8



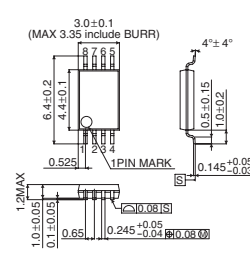
Embossed carrier tape:2,500pcs

SOP-J14



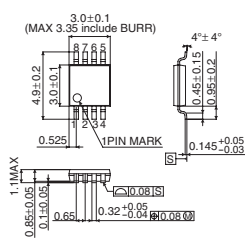
Embossed carrier tape:2,500pcs

TSSOP-B8



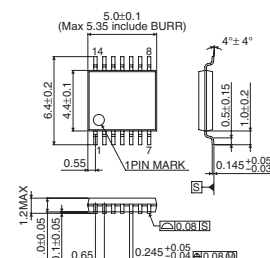
Embossed carrier tape:3,000pcs

TSSOP-B8J



Embossed carrier tape:2,500pcs

TSSOP-B14J



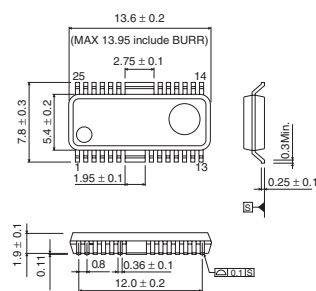
Embossed carrier tape:2,500pcs

HSOP Packages

(Unit: mm)

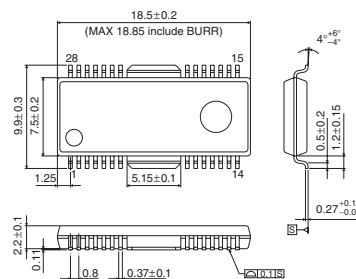
HSOP<Pin Pitch:0.8mm>

HSOP25



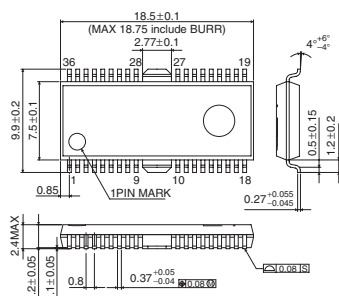
Embossed carrier tape:2,000pcs

HSOP-M28



Embossed carrier tape:1,500pcs

HSOP-M36



Embossed carrier tape:1,500pcs

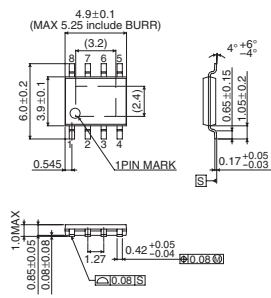
Please refer packages from page, A150 for LAPIS Semiconductor products.

HSOP Packages

(Unit: mm)

HTSOP-J<Pin Pitch:1.27mm>

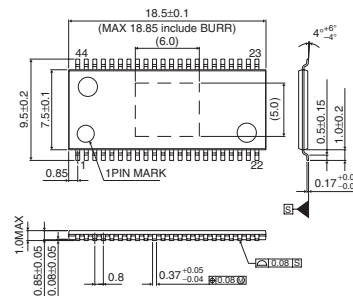
HTSOP-J8



Embossed carrier tape:2,500pcs

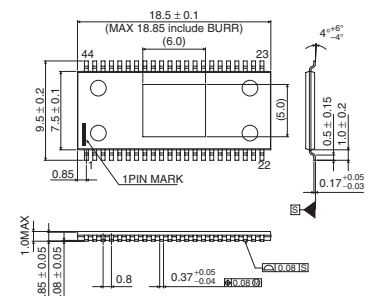
HTSSOP-A<Pin Pitch:0.8mm>

HTSSOP-A44



Embossed carrier tape:1,500pcs

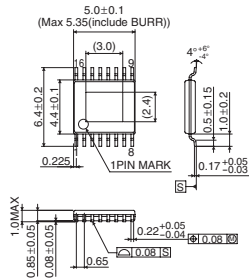
HTSSOP-A44R



Embossed carrier tape:1,500pcs

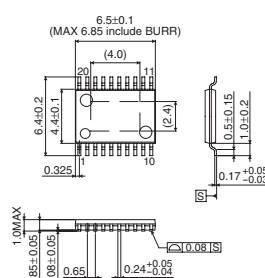
HTSSOP-B<Pin Pitch:0.65mm>

HTSSOP-B16



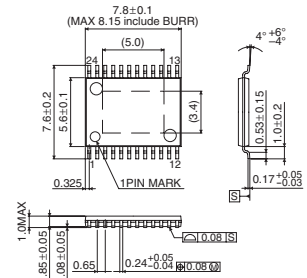
Embossed carrier tape:2,500pcs

HTSSOP-B20



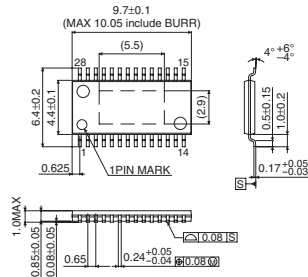
Embossed carrier tape:2,500pcs

HTSSOP-B24



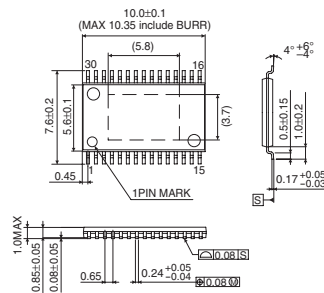
Embossed carrier tape:2,000pcs

HTSSOP-B28



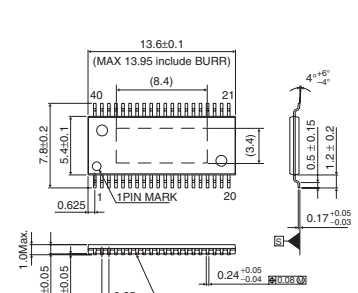
Embossed carrier tape:2,500pcs

HTSSOP-B30



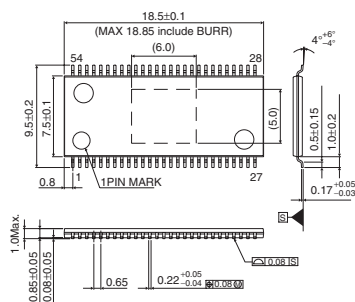
Embossed carrier tape:2,000pcs

HTSSOP-B40



Embossed carrier tape:2,000pcs

HTSSOP-B54



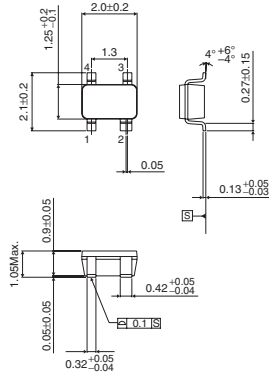
Embossed carrier tape:1,500pcs

Please refer packages from page, A150 for LAPIS Semiconductor products.

Small Packages

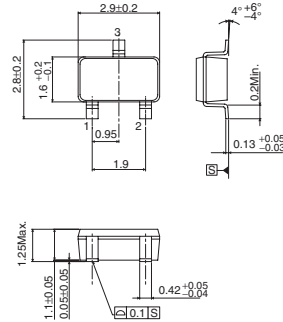
SOP type

SOP4



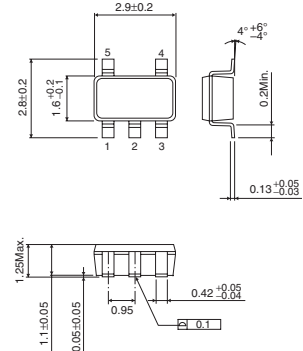
Embossed carrier tape:3,000pcs

SSOP3



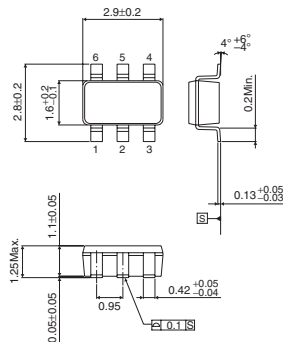
Embossed carrier tape:3,000pcs

SSOP5



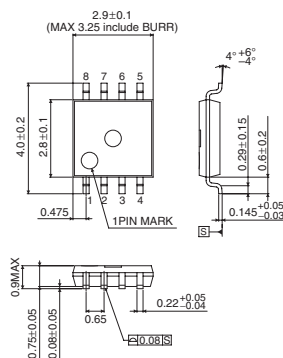
Embossed carrier tape:3,000pcs

SSOP6



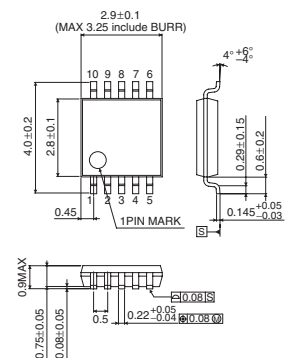
Embossed carrier tape:3,000pcs

MSOP8



Embossed carrier tape:3,000pcs

MSOP10

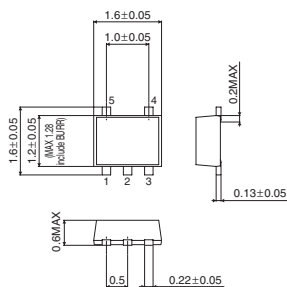


Embossed carrier tape:3,000pcs

Non-Lead Packages

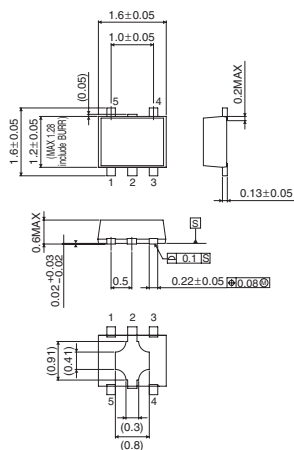
Non-Lead

VSO5



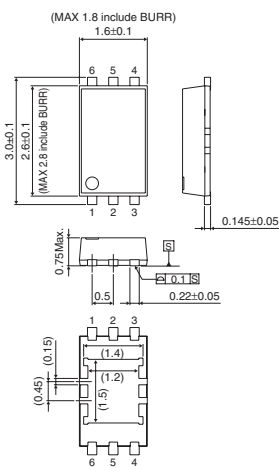
Embossed carrier tape:3,000pcs

HVSOF5



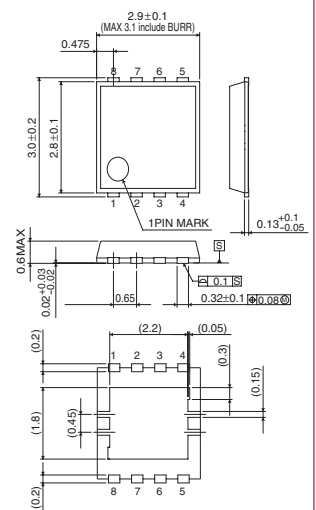
Embossed carrier tape:3,000pcs

HVSOF6



Embossed carrier tape:3,000pcs

HSO8



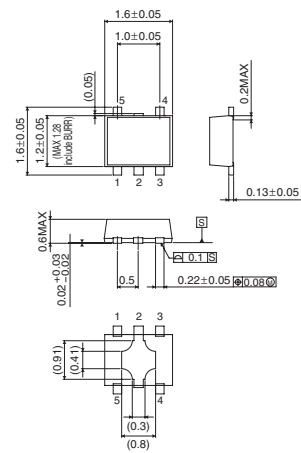
Embossed carrier tape:3,000pcs

Please refer packages from page, A150 for LAPIS Semiconductor products.

Non-Lead Packages

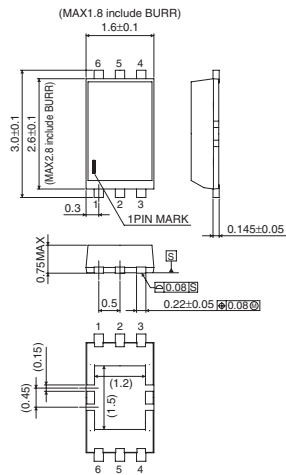
Optical Non-Lead

WSOF5(Clear type)



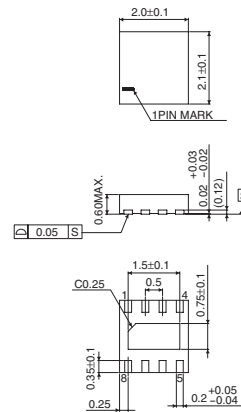
Embossed carrier tape:3,000pcs

WSOF6(Clear type)



Embossed carrier tape:3,000pcs

WSN008X2120(Clear type)

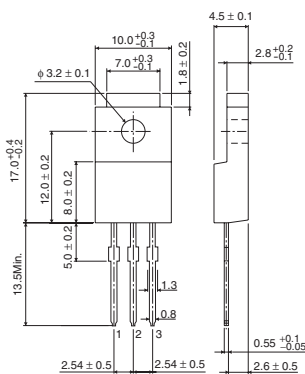


Embossed carrier tape:4,000pcs

Power Packages

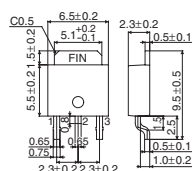
POWER-3PIN

TO220CP-3



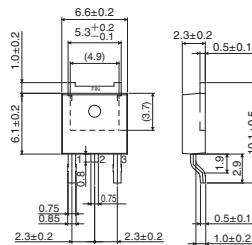
Container tube:500pcs

TO252-3



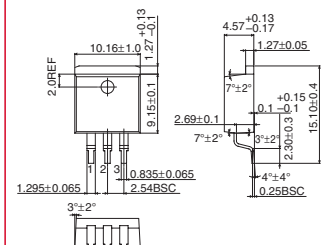
Embossed carrier tape:2,000pcs

TO252-J3



Embossed carrier tape:2,000pcs

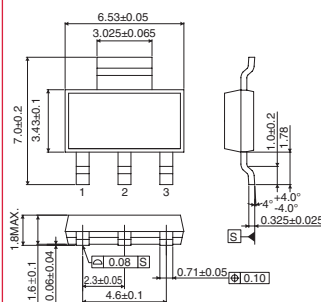
TO263-3



Embossed carrier tape:500pcs

POWER-4PIN

SOT223-4



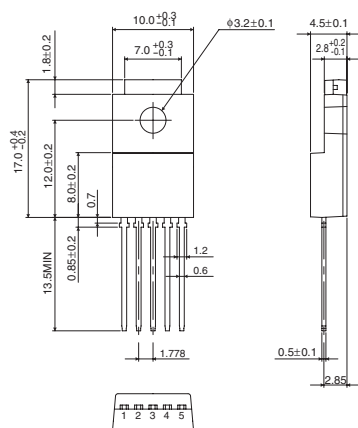
Embossed carrier tape:2,000pcs

Please refer packages from page, A150 for LAPIS Semiconductor products.

Power Packages

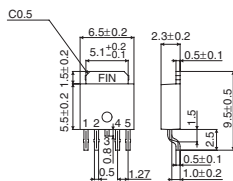
POWER-5PIN

TO220FP-5



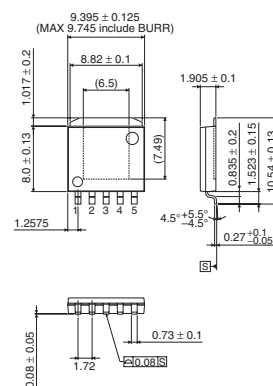
Container tube:500pcs

TO252-5



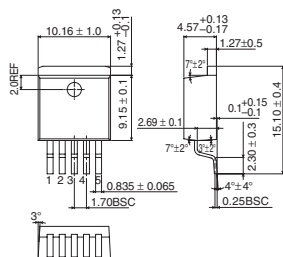
Embossed carrier tape:2,000pcs

HRP5



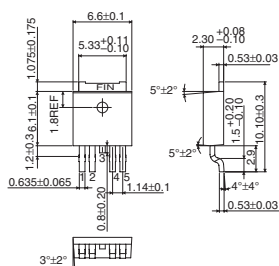
Embossed carrier tape:2,000pcs

TO263-5



Embossed carrier tape:500pcs

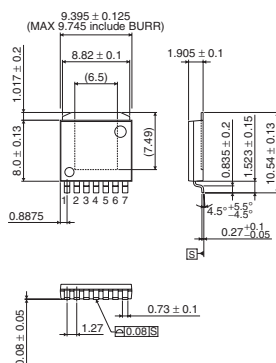
TO252-J5



Embossed carrier tape:2,000pcs

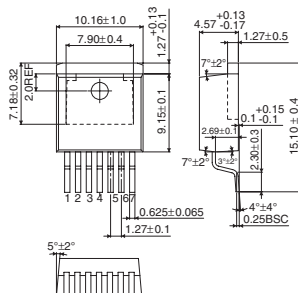
POWER-7PIN

HRP7



Embossed carrier tape:2,000pcs

TO263-7



Embossed carrier tape:2,000pcs

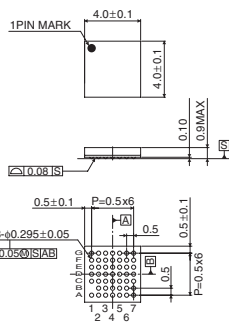
Please refer packages from page, A150 for LAPIS Semiconductor products.

BGA Packages

(Unit: mm)

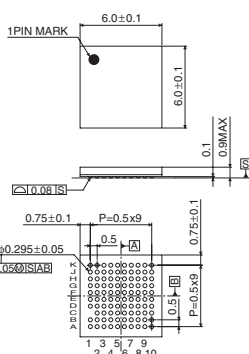
VBGA-W<Pin Pitch:0.5mm>

VBGA048W040



Embossed carrier tape:2,500pcs

VBGA099W060



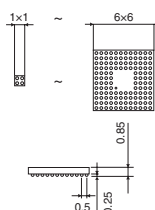
Embossed carrier tape:2,000pcs

WL-CSP Packages

(Unit: mm)

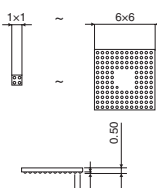
VCSP<Pin Pitch:0.5mm>

VCSP85H



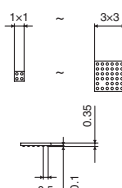
2.8mm[□] and under : 3,000pcs
Over 2.81mm[□] : 2,500pcs

VCSP50L



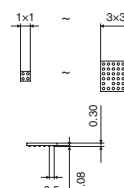
2.8mm[□] and under : 3,000pcs
Over 2.81mm[□] : 2,500pcs

VCSP35L



2.8mm[□] and under : 3,000pcs
Over 2.81mm[□] : 2,500pcs
Embossed carrier tape:3,000pcs

VCSP30L



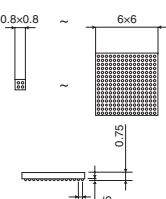
2.8mm[□] and under : 3,000pcs
Over 2.81mm[□] : 2,500pcs
Embossed carrier tape:3,000pcs

A

IC Packages

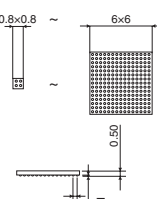
UCSP<Pin Pitch:0.4mm>

UCSP75M



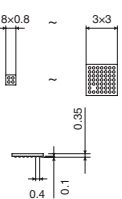
2.8mm[□] and under : 3,000pcs
Over 2.81mm[□] : 2,500pcs

UCSP50L



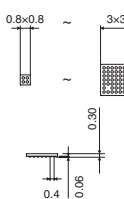
2.8mm[□] and under : 3,000pcs
Over 2.81mm[□] : 2,500pcs

UCSP35L



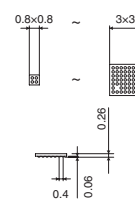
2.8mm[□] and under : 3,000pcs
Over 2.81mm[□] : 2,500pcs
Embossed carrier tape:3,000pcs

UCSP30L



2.8mm[□] and under : 3,000pcs
Over 2.81mm[□] : 2,500pcs
Embossed carrier tape:3,000pcs

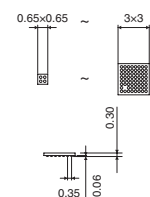
UCSP25L



Embossed carrier tape:3,000pcs

XCSP<Pin Pitch:0.35mm>

XCSP30L



Embossed carrier tape:3,000pcs

These package size are an example. For details, please inquire to the sales.

LAPIS Semiconductor LSI Package List

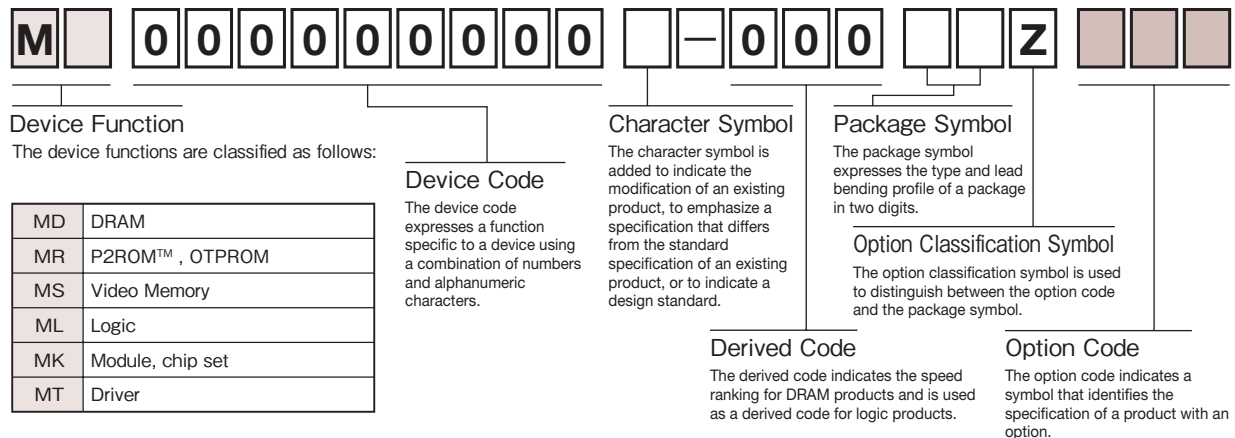
No	PKG type	PKG Symbol	Title	TRAY	T&R	TUBE
1	SOP	MA	SOP8-200-1.27	—	2,500	—
2	SSOP	MB	SSOP16-0225-0.65	4,760	2,500	—
3	SSOP	MB	SSOP30-56-0.65	2,000	2,000	—
4	SSOP	MB	SSOP32-430-1.00	1,280	1,000	—
5	SSOP	MB	SSOP60-700-0.65	600	600	—
6	SSOP	MB	SSOP64-525-0.80	—	800	—
7	TSSOP	TD	TSSOP20-0225-0.65	4,160	2,000	—
8	TSOP	TA	TSOP(I)28-08134-0.55	1,950	—	—
9	TSOP	TA	TSOP(II)50-400-0.80	1,170	1,000	—
10	TSOP	TA	TSOP(II)54-400-0.80	1,080	1,000	—
11	QFP	GA	QFP44-910-0.80	1,440	1,000	—
12	QFP	GA	QFP56-910-0.65	1,440	1,000	—
13	QFP	GA	QFP64-1414-0.50	840	—	—
14	QFP	GA	QFP64-1420-0.80	600	—	—
15	QFP	GA	QFP80-1414-0.65	840	—	—
16	QFP	GA	QFP100-1420-0.65	600	—	—
17	QFP	GA	QFP100-1414-0.50	750	—	—
18	QFP	GA	QFP128-1420-0.50	420	—	—
19	QFP	GA	QFP128-2828-0.80	240	—	—
20	QFP	GA	LQFP32-0707-0.80	2,500	1,000	—
21	QFP	GA	LQFP144-2020-0.50	600	—	—

*Regarding an unstated package, please inquire to the sales.

No	PKG type	PKG Symbol	Title	TRAY	T&R	TUBE
22	QFP	GA	TQFP32-0707-0.80	2,500	1,000	—
23	QFP	GA	TQFP48-0707-0.50	2,500	1,000	—
24	QFP	GA	TQFP52-1010-0.65	1,600	1,000	—
25	QFP	GA	TQFP64-1010-0.50	1,600	1,000	—
26	QFP	GA	TQFP64-1010-0.65	1,600	1,000	—
27	QFP	GA	TQFP80-1010-0.40	1,600	—	—
28	QFP	GA	TQFP80-1212-0.50	960/1,090	—	—
29	QFP	GA	TQFP80-1414-0.65	900	—	—
30	QFP	GA	TQFP100-1414-0.50	900	—	—
31	QFP	GA	TQFP120-1414-0.40	900	—	—
32	QFP	GA	TQFP128-1414-0.40	900	—	—
33	DIP	RA	DIP8-300-2.54	—	—	1,400
34	QFN	GD	VQFN28-0505-0.50	4,900	1,000	—
35	QFN	GD	WQFN16-0303-0.50	6,240	1,000	—
36	QFN	GD	WQFN16-0404-0.50	4,900	1,000	—
37	QFN	GD	WQFN24-0404-0.50	4,900	1,000	—
38	QFN	GD	WQFN28-0404-0.40	4,900	1,000	—
39	QFN	GD	WQFN32-0505-0.50	4,030	1,000	—
40	QFN	GD	WQFN40-0505-0.40	4,030	1,000	—
41	QFN	GD	WQFN40-0606-0.50	4,900	2,500	—
42	SON	MD	WSON10-0303-0.50	—	1,000	—

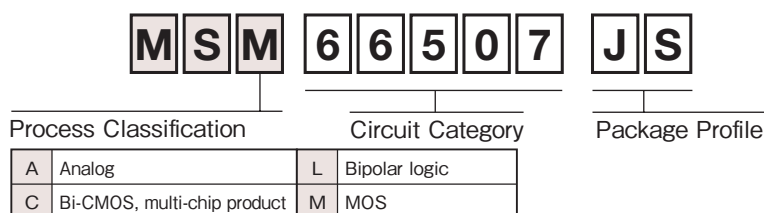
LAPIS Semiconductor LSI Part No. Explanation

Product names are assigned to our semiconductor devices using the following convention, starting with the character "M".



The following shows the convention of item name assignment for conventional products.

• The actual package profile is not shown here.

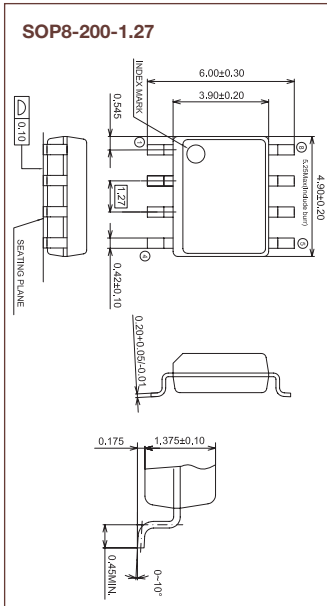


These package size are an example. For details, please inquire to the sales.

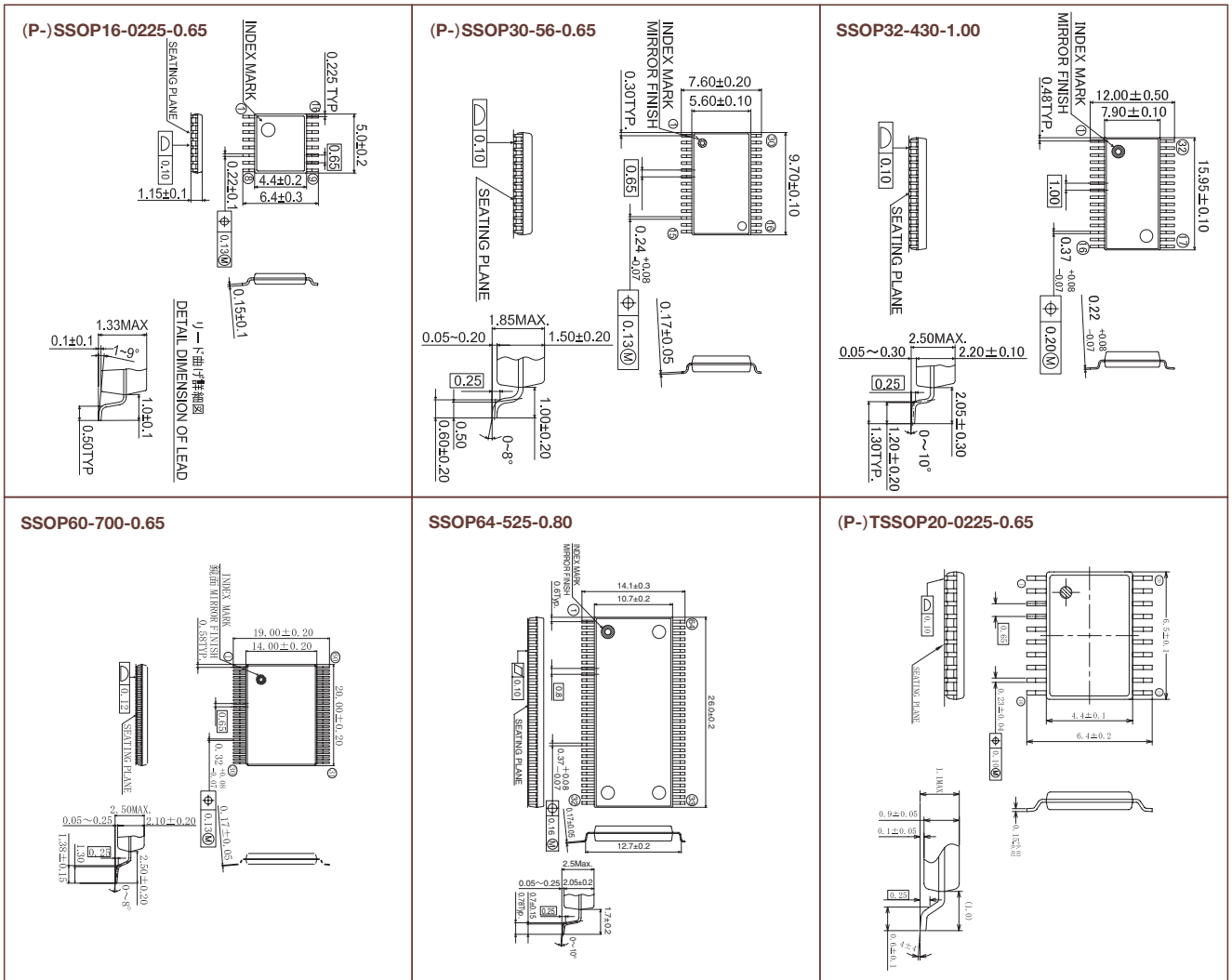
SOP Packages

(Unit: mm)

SOP



SSOP



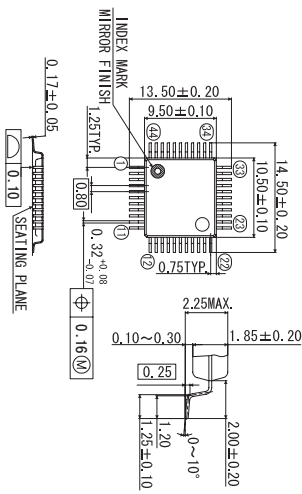
These package size are an example. For details, please inquire to the sales.

QFP Packages

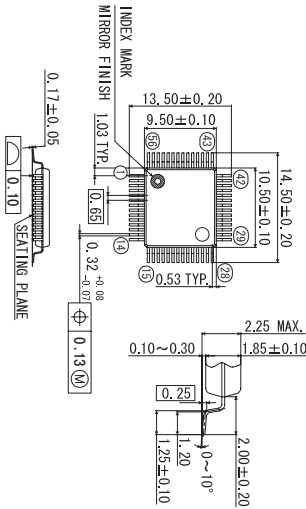
(Unit: mm)

QFP

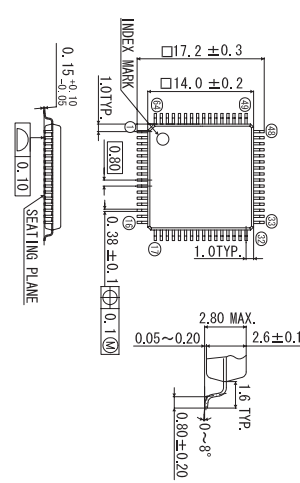
(P-)QFP44-910-0.80



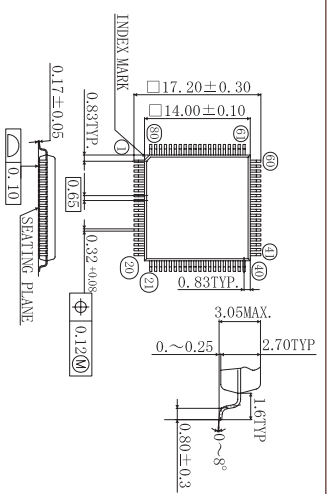
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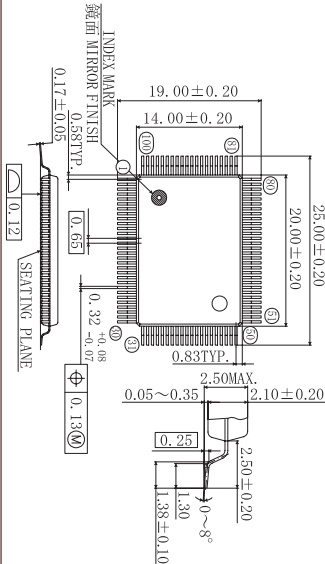
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(P-)QFP80-1414-0.65

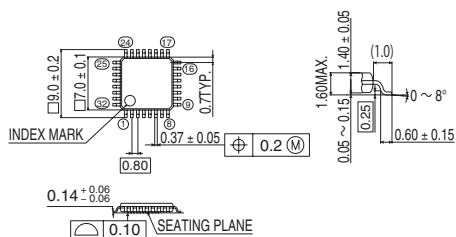


(P-)QFP100-1420-0.65

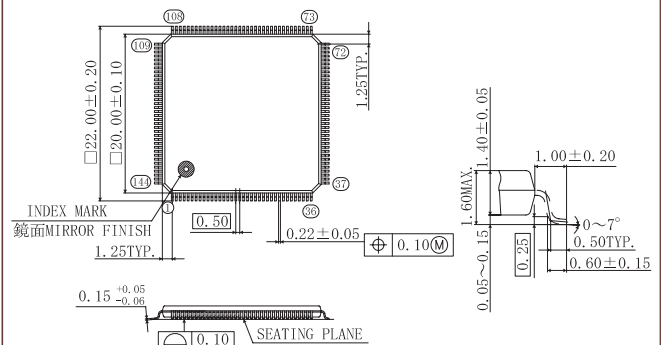


LQFP

(P-)LQFP32-0707-0.80



(P-)LQFP144-2020-0.50



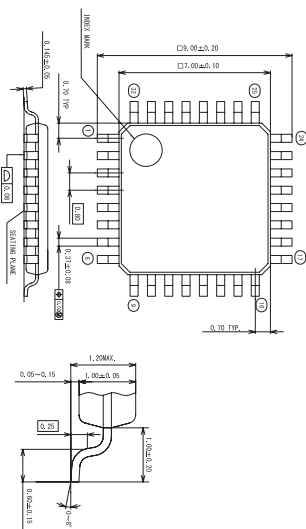
These package size are an example. For details, please inquire to the sales.

QFP Packages

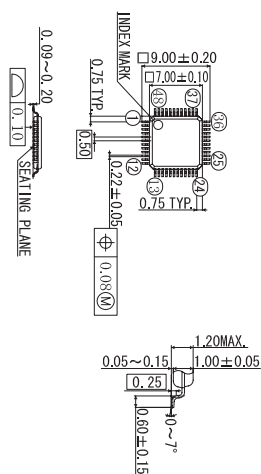
(Unit: mm)

TQFP

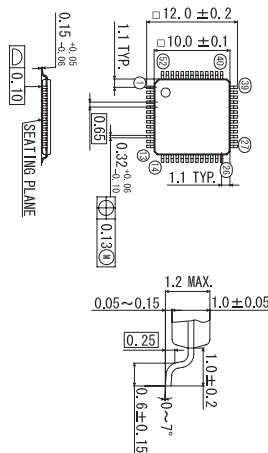
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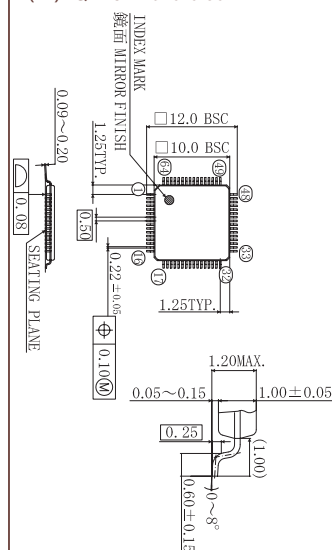
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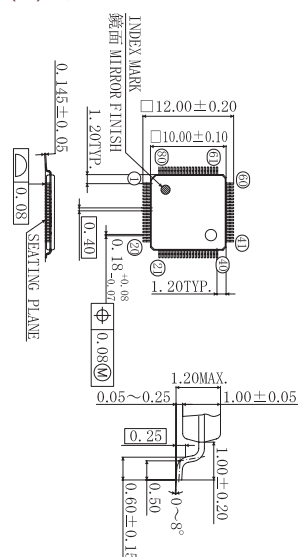
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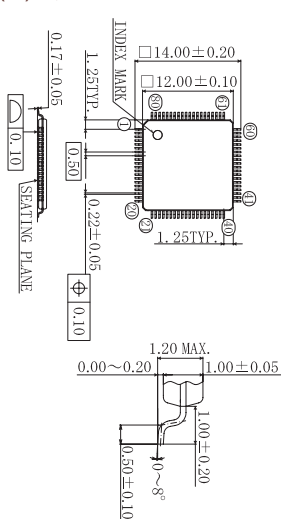
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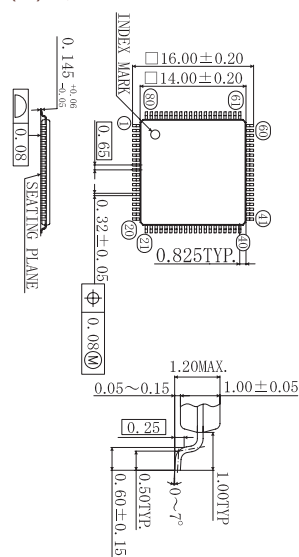
(P-)TQFP80-1010-0.40



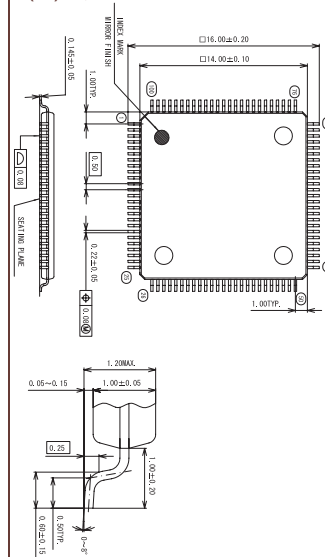
(P-)TQFP80-1212-0.50



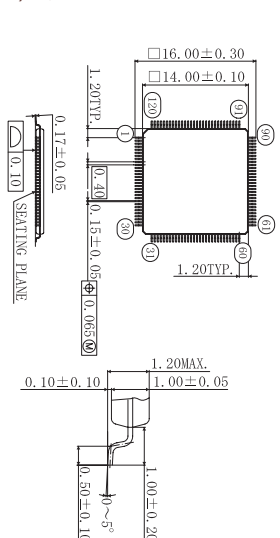
(P-)TQFP80-1414-0.65



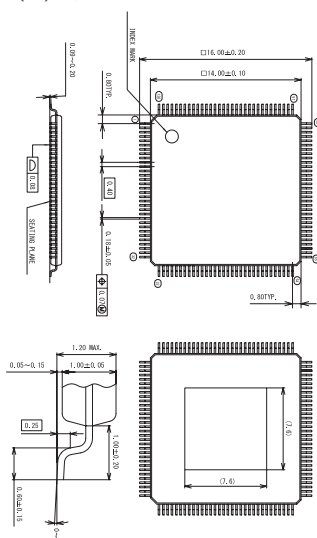
(P-)TQFP100-1414-0.50



(P-)TQFP120-1414-0.40



(P-)TQFP128-1414-0.40



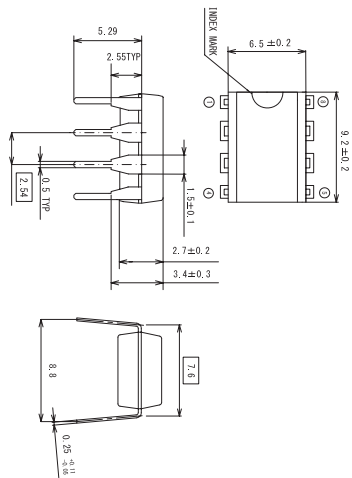
These package size are an example. For details, please inquire to the sales.

DIP Packages

(Unit: mm)

DIP8

DIP8-300-2.54

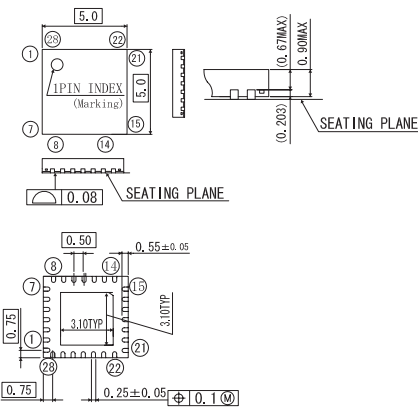


QFN Packages

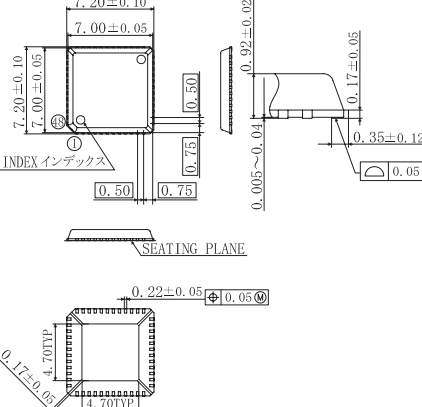
(Unit: mm)

VQFN

(P-)VQFN28-0505-0.50

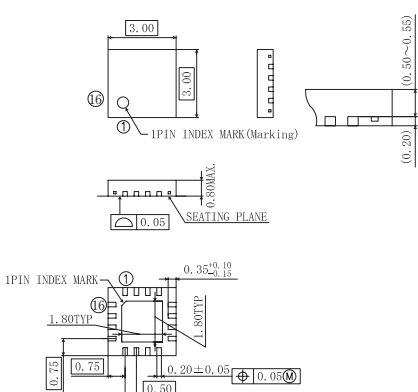


(P-)VQFN48-0707-0.50

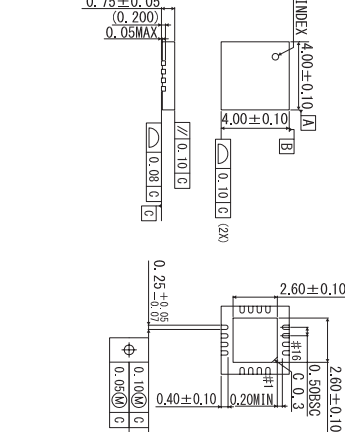


WQFN

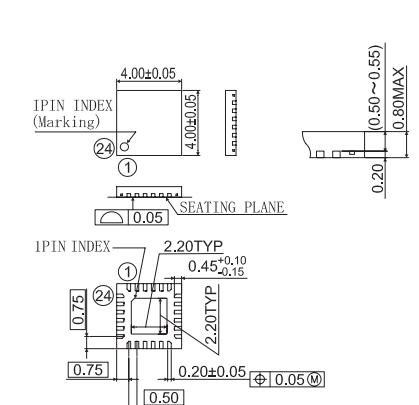
WQFN16-0303-0.50



WQFN16-0404-0.50



(P-)WQFN24-0404-0.50



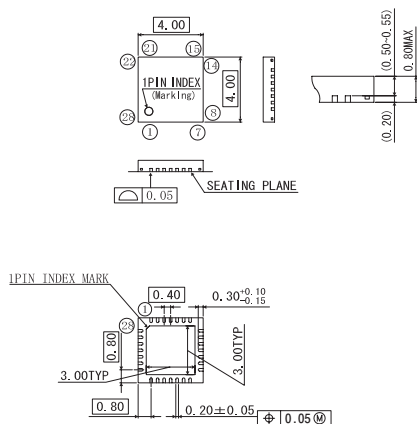
These package size are an example. For details, please inquire to the sales.

QFN Packages

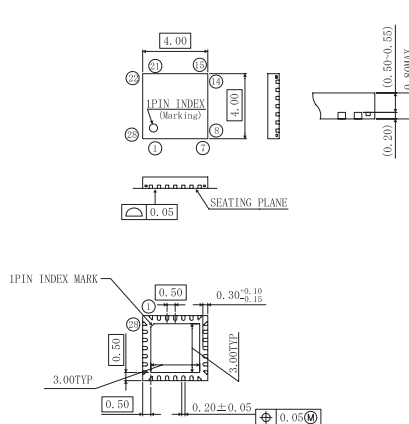
(Unit: mm)

WQFN

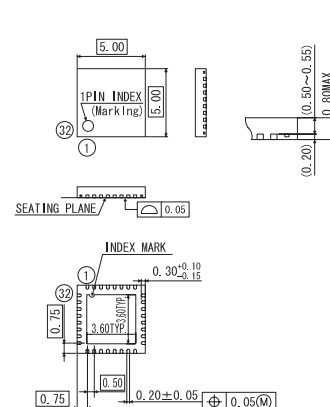
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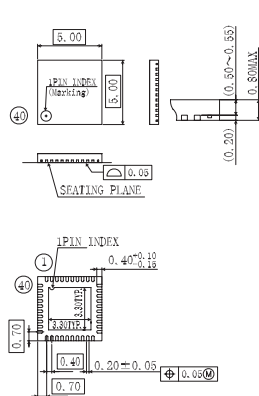
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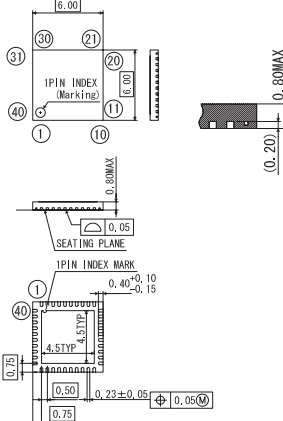
(P-)WQFN32-0505-0.50



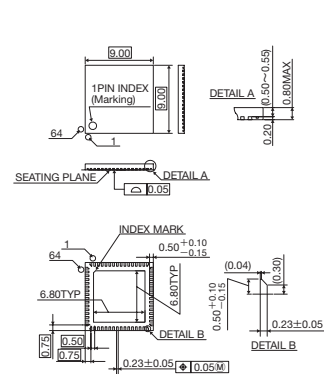
(P-)WQFN40-0505-0.40



(P-)WQFN40-0606-0.50

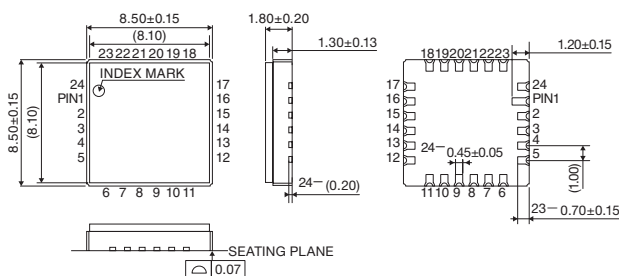


(P-)WQFN64-0909-0.50



C-QFN

C-QFN24-8585-1.00

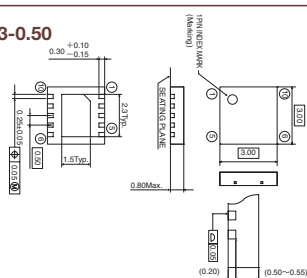


WSO Packages

(Unit: mm)

WSON

P-WSON10-0303-0.50



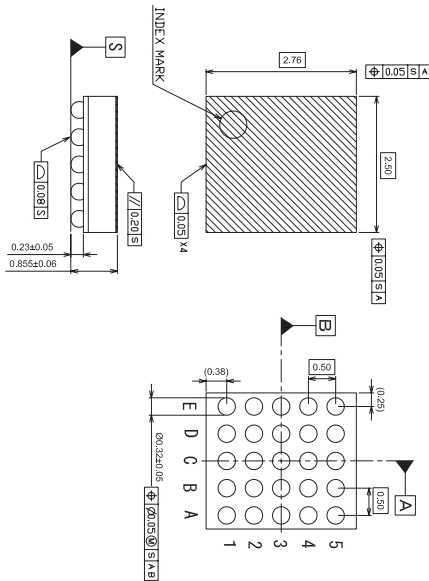
These package size are an example. For details, please inquire to the sales.

BGA Packages

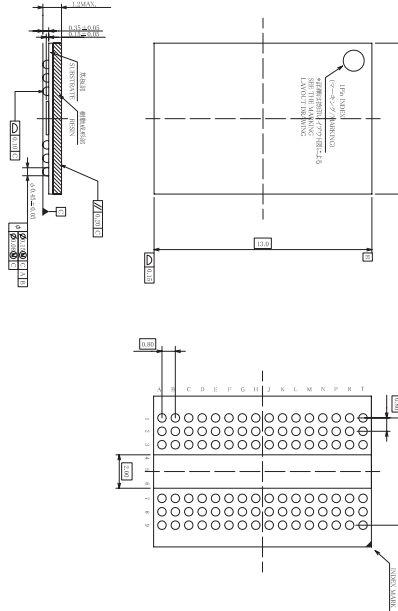
(Unit: mm)

TFBGA

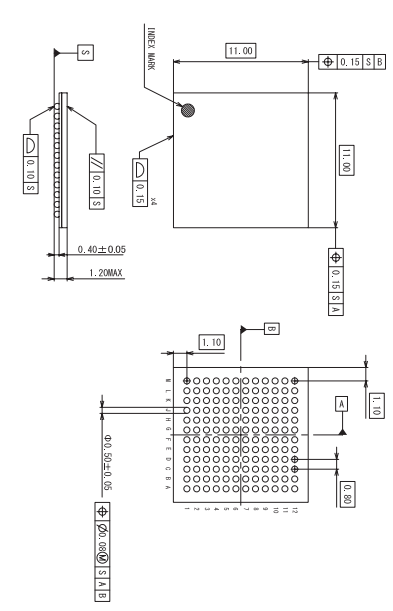
S-VFBGA25-2.76×2.50-0.5



TFBGA96-9.0×13.0-0.80



P-TFBGA144-11.11×0.80

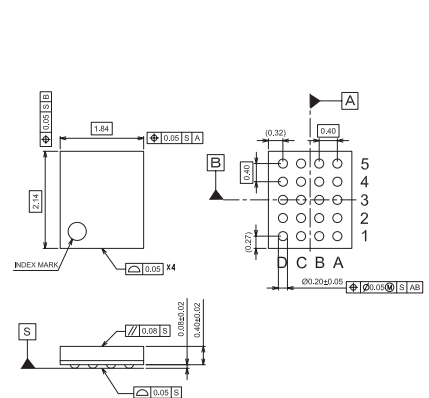


WL-CSP Packages

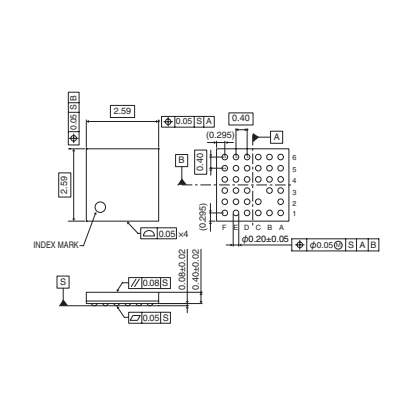
(Unit: mm)

WCSP

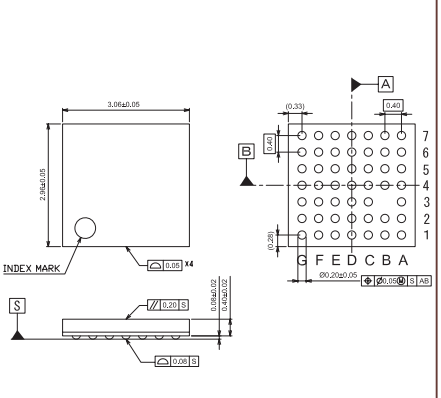
S-UFLGA20-1.84×2.14-0.40(WCSP20)



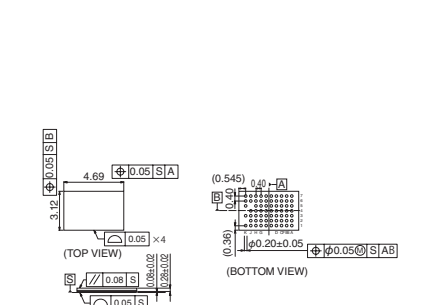
S-UFLGA34-2.59×2.59-0.40-W(WCSP34)



S-UFLGA48-3.06×2.96-0.40(WCSP48)



S-VFLGA67-4.69×3.12-0.40-W(WCSP67)





Power Devices

SiC Power Devices

CONTENTS

■ SiC Schottky Barrier Diodes	P. B2
■ SiC MOSFETs	P. B5
■ Full SiC Power Modules	P. B8

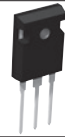
B

SiC Power Devices

ISO/TS 16949-approved

SiC Schottky Barrier Diodes

●Quick Reference for SiC Schottky Barrier Diodes

V _{RM} (V)	I _F (A)	Leaded type						Surface Mounted type		
										
		TO-220AC	TO-220AC (TO-220ACP)	TO-220FM	TO-247	TO-263AB (LPTL)				
650	2		New SCS302AHG	33			New SCS302AJ	13		
	4		New SCS304AHG	34	New SCS304AM	47	New SCS304AJ	14		
	6	SCS206AG SCS206AGHR	21 27 New SCS306AHG	35	SCS206AM New SCS306AM	41 48	SCS206AJ SCS206AJHR New SCS306AJ	1 7 15		
	8	SCS208AG SCS208AGHR	22 28 New SCS308AHG	36	SCS208AM New SCS308AM	42 49	SCS208AJ SCS208AJHR New SCS308AJ	2 8 16		
	10	SCS210AG SCS210AGHR	23 29 New SCS310AHG	37	SCS210AM New SCS310AM	43 50	SCS210AJ SCS210AJHR New SCS310AJ	3 9 17		
	12	SCS212AG SCS212AGHR	24 30 New SCS312AHG	38	SCS212AM New SCS312AM	44 51	SCS212AJ SCS212AJHR New SCS312AJ	4 10 18		
	15	SCS215AG SCS215AGHR	25 31 New SCS315AHG	39	SCS215AM New SCS315AM	45 52	SCS215AE	54	SCS215AJ SCS215AJHR New SCS315AJ	5 11 19
	20	SCS220AG SCS220AGHR	26 32 New SCS320AHG	40	SCS220AM New SCS320AM	46 53	SCS220AE SCS220AE2 SCS220AE2HR	55 56 59 New	SCS220AJ SCS220AJHR New SCS320AJ	6 12 20
	30						SCS230AE2 SCS230AE2HR	57 60		
	40						SCS240AE2 SCS240AE2HR	58 61		
1,200	5	SCS205KG SCS205KGHR	62 66							
	10	SCS210KG SCS210KGHR	63 67			SCS210KE2 SCS210KE2HR	70 74			
	15	SCS215KG SCS215KGHR	64 68							
	20	SCS220KG SCS220KGHR	65 69			SCS220KE2 SCS220KE2HR	71 75			
	30					SCS230KE2	72			
	40					SCS240KE2	73			

Note : Package is JEDEC code. () : ROHM Packages.

SiC Schottky Barrier Diodes												
No.	Part No.	Absolute Maximum Ratings(Ta=25°C)				Electrical Characteristics(Ta=25°C)				Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
		V _{RM} (V)	V _R (V)	I _F (A)	I _{FSM} (A) 50Hz.1~	V _F (V) Typ.	I _F (A)	I _R (μA) Max.	V _R (V)			
1	SCS206AJ	650	650	6	22	1.35	6	120	600	TO-263AB (LPTL)		—
2	SCS208AJ	650	650	8	29	1.35	8	160	600			—
3	SCS210AJ	650	650	10	38	1.35	10	200	600			—
4	SCS212AJ	650	650	12	42	1.35	12	240	600			—
5	SCS215AJ	650	650	15	52	1.35	15	300	600			—
6	SCS220AJ	650	650	20	67	1.35	20	400	600			—
7	SCS206AJHR	650	650	6	22	1.35	6	120	600			YES
8	SCS208AJHR	650	650	8	29	1.35	8	160	600			YES
9	SCS210AJHR	650	650	10	38	1.35	10	200	600			YES
10	SCS212AJHR	650	650	12	42	1.35	12	240	600			YES
11	SCS215AJHR	650	650	15	52	1.35	15	300	600			YES
12	SCS220AJHR	650	650	20	67	1.35	20	400	600			YES
13	New SCS302AJ	650	650	2	19	1.35	2	10	650			—
14	New SCS304AJ	650	650	4	27	1.35	4	20	650			—
15	New SCS306AJ	650	650	6	47	1.35	6	30	650			—
16	New SCS308AJ	650	650	8	67	1.35	8	40	650			—
17	New SCS310AJ	650	650	10	82	1.35	10	50	650			—
18	New SCS312AJ	650	650	12	96	1.35	12	60	650			—
19	New SCS315AJ	650	650	15	112	1.35	15	75	650			—
20	New SCS320AJ	650	650	20	123	1.35	20	100	650			—

Note : Package is JEDEC code. () : ROHM Packages.

SiC Schottky Barrier Diodes												
No.	Part No.	Absolute Maximum Ratings(Ta=25℃)				Electrical Characteristics(Ta=25℃)				Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
		V _{RM} (V)	V _R (V)	I _F (A)	I _{FSM} (A) 50Hz,1~	V _F (V) Typ.	I _F (A)	I _R (μA) Max.	V _R (V)			
21	SCS206AG	650	650	6	22	1.35	6	120	600	TO-220AC		—
22	SCS208AG	650	650	8	29	1.35	8	160	600			—
23	SCS210AG	650	650	10	38	1.35	10	200	600			—
24	SCS212AG	650	650	12	42	1.35	12	240	600			—
25	SCS215AG	650	650	15	52	1.35	15	300	600			—
26	SCS220AG	650	650	20	67	1.35	20	400	600			—
27	SCS206AGHR	650	650	6	22	1.35	6	120	600			YES
28	SCS208AGHR	650	650	8	29	1.35	8	160	600			YES
29	SCS210AGHR	650	650	10	38	1.35	10	200	600			YES
30	SCS212AGHR	650	650	12	42	1.35	12	240	600			YES
31	SCS215AGHR	650	650	15	52	1.35	15	300	600			YES
32	SCS220AGHR	650	650	20	67	1.35	20	400	600			YES
33	New SCS302AHG	650	650	2	19	1	2	10	650	TO-220AC (TO-220ACP)		—
34	New SCS304AHG	650	650	4	27	1	4	20	650			—
35	New SCS306AHG	650	650	6	47	1	6	30	650			—
36	New SCS308AHG	650	650	8	67	1	8	40	650			—
37	New SCS310AHG	650	650	10	82	1	10	50	650			—
38	New SCS312AHG	650	650	12	96	1	12	60	650			—
39	New SCS315AHG	650	650	15	112	1	15	75	650			—
40	New SCS320AHG	650	650	20	123	1	20	100	650			—
41	SCS206AM	650	650	6	22	1.35	6	120	600	TO-220FM		—
42	SCS208AM	650	650	8	29	1.35	8	160	600			—
43	SCS210AM	650	650	10	38	1.35	10	200	600			—
44	SCS212AM	650	650	12	42	1.35	12	240	600			—
45	SCS215AM	650	650	15	52	1.35	15	300	600			—
46	SCS220AM	650	650	20	67	1.35	20	400	600			—
47	New SCS304AM	650	650	4	27	1	4	20	650			—
48	New SCS306AM	650	650	6	47	1	6	30	650			—
49	New SCS308AM	650	650	8	67	1	8	40	650			—
50	New SCS310AM	650	650	10	82	1	10	50	650			—
51	New SCS312AM	650	650	12	96	1	12	60	650			—
52	New SCS315AM	650	650	15	112	1	15	75	650			—
53	New SCS320AM	650	650	20	123	1	20	100	650			—
54	SCS215AE	650	650	15	52	1.35	15	300	600	TO-247		—
55	SCS220AE	650	650	20	67	1.35	20	400	600			—
56	SCS220AE2	650	650	10/20 ^{*1}	38/76 ^{*1}	1.35	10	200	600			—
57	SCS230AE2	650	650	15/30 ^{*1}	52/104 ^{*1}	1.35	15	300	600			—
58	SCS240AE2	650	650	20/40 ^{*1}	67/135 ^{*1}	1.35	20	400	600			—
59	SCS220AE2HR	650	650	10/20 ^{*1}	38/76 ^{*1}	1.35	10	200	600			YES
60	SCS230AE2HR	650	650	15/30 ^{*1}	52/104 ^{*1}	1.35	15	300	600			YES
61	SCS240AE2HR	650	650	20/40 ^{*1}	67/135 ^{*1}	1.35	20	400	600			YES
62	SCS205KG	1,200	1,200	5	22	1.4	5	100	1,200	TO-220AC		—
63	SCS210KG	1,200	1,200	10	42	1.4	10	200	1,200			—
64	SCS215KG	1,200	1,200	15	62	1.4	15	300	1,200			—
65	SCS220KG	1,200	1,200	20	78	1.4	20	400	1,200			—
66	SCS205KGHR	1,200	1,200	5	22	1.4	5	100	1,200			YES
67	SCS210KGHR	1,200	1,200	10	42	1.4	10	200	1,200			YES
68	SCS215KGHR	1,200	1,200	15	62	1.4	15	300	1,200			YES
69	SCS220KGHR	1,200	1,200	20	78	1.4	20	400	1,200			YES
70	SCS210KE2	1,200	1,200	5/10 ^{*1}	22/45 ^{*1}	1.4	5	100	1,200	TO-247		—
71	SCS220KE2	1,200	1,200	10/20 ^{*1}	42/84 ^{*1}	1.4	10	200	1,200			—
72	SCS230KE2	1,200	1,200	15/30 ^{*1}	62/124 ^{*1}	1.4	15	300	1,200			—
73	SCS240KE2	1,200	1,200	20/40 ^{*1}	78/157 ^{*1}	1.4	20	400	1,200			—
74	SCS210KE2HR	1,200	1,200	5/10 ^{*1}	22/45 ^{*1}	1.4	5	100	1,200			YES
75	SCS220KE2HR	1,200	1,200	10/20 ^{*1}	42/84 ^{*1}	1.4	10	200	1,200			YES

Note : Package is JEDEC code. () : ROHM Packages.

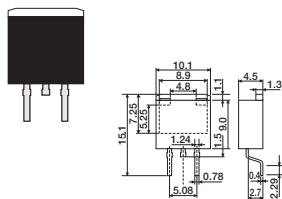
*1 : (Per Leg/Device)

SiC Schottky Barrier Diodes

●Dimensions(Unit : mm)

Surface Mounted type

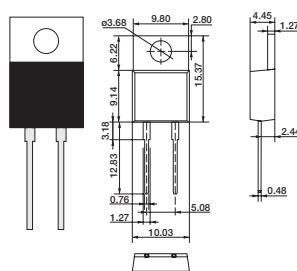
TO-263AB(LPTL)



Each lead has same dimensions

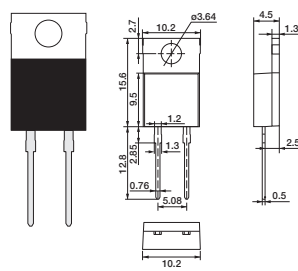
Leaded type

TO-220AC



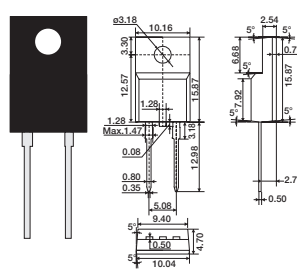
Each lead has same dimensions

TO-220AC(TO-220ACP)



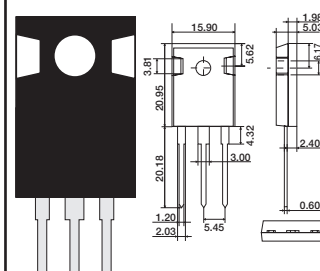
Each lead has same dimensions

TO-220FM



Each lead has same dimensions

TO-247



Each lead has same dimensions

Note : Package is JEDEC code. () : ROHM Packages.

●Part No. Explanation

●SiC Schottky Barrier Diode Part No. Explanation

S	C	S	2	1	0	A	G	H	R
①	②	③	④	⑤	⑥	⑦			

- ① SiC Discrete Device
 ② Schottky Barrier Diode
 ③ Generation
 ④ Rated Current[A]
 Example 05 → 5A
 10 → 10A

- ⑤ Rated Voltage
 Example A → 650V
 K → 1,200V
 ⑥ Package
 Example J → TO-263AB(LPTL)
 G → TO-220AC
 P → TO-220AC(TO-220ACP)
 M → TO-220FM
 E → TO-247
 E2 → TO-247(Dual Chip)
 ⑦ Automotive Grade

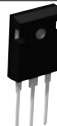
●Packaging type

Package	Code	Packaging Style	Basic Ordering Unit(pcs)
TO-263AB(LPTL)	TLL	Embossed Tape	1,000
TO-220AC	C	Tube	50
TO-220AC(TO-220ACP)	C9	Tube	50
TO-220FM	C	Tube	50
TO-247	C	Tube	30

Note : Package is JEDEC code. () : ROHM Packages.

SiC MOSFETs

● Quick Reference for SiC MOSFETs

V _{DSS} (V)	R _{DS (on)} (mΩ)	Leaded type								Surface Mounted type	
											
		TO-220AB	TO-247	TO-247 (TO-247N)	TO-3PFM	TO-268-2L					
650	17					SCT3017AL	10				
	22					SCT3022AL	11				
	30					SCT3030AL	12				
	60					SCT3060AL	13				
	80					SCT3080AL	14				
	120	SCT2120AF	1			SCT3120AL	15				
1,200	22					SCT3022KL	16				
	30					SCT3030KL	17				
	40					SCT3040KL	18				
	80			SCT2080KE SCH2080KE*1	3 2	SCT3080KL	19				
	105				<i>New</i>	SCT3105KL	20				
	160			SCT2160KE	4	SCT3160KL	21				
	280			SCT2280KE	5						
	450			SCT2450KE	6						
1,700	1,150							SCT2H12NZ	9	SCT2H12NY	8
	750									SCT2750NY	7

Note : Package is JEDEC code. () : ROHM Package.

*1 : Schottky barrier diode included

SiC MOSFETs

2nd Generation(Planer type)										
No.	Part No.	Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (T _C =25°C)	R _{DS(on)} Typ.(mΩ)	Q _g Typ.(nC)		Package	Automotive Grade AEC-Q101
						V _{GS} =18V	V _{GS} =18V	Drive Voltage (V)		
1	SCT2120AF	N	650	29	165	120	61	18	TO-220AB	—
2	SCH2080KE	N	1,200	40	262	80	106	18	TO-247	—
3	SCT2080KE	N	1,200	40	262	80	106	18		—
4	SCT2160KE	N	1,200	22	165	160	62	18		—
5	SCT2280KE	N	1,200	14	108	280	35	18		—
6	SCT2450KE	N	1,200	10	85	450	27	18		—
7	SCT2750NY	N	1,700	5.9	57	750	17	18	TO-268-2L	—
8	SCT2H12NY	N	1,700	4	44	1,150	14	18		—
9	SCT2H12NZ	N	1,700	3.7	35	1,150	14	18	TO-3PFM	—
3rd Generation(Trench type)										
10	SCT3017AL	N	650	118	427	17	172	18	TO-247 (TO-247N)	—
11	SCT3022AL	N	650	93	339	22	133	18		—
12	SCT3030AL	N	650	70	262	30	104	18		—
13	SCT3060AL	N	650	39	165	60	58	18		—
14	SCT3080AL	N	650	30	134	80	48	18		—
15	SCT3120AL	N	650	21	103	120	38	18		—
16	SCT3022KL	N	1,200	95	427	22	178	18		—
17	SCT3030KL	N	1,200	72	339	30	131	18		—
18	SCT3040KL	N	1,200	55	262	40	107	18		—
19	SCT3080KL	N	1,200	31	165	80	60	18		—
20	New SCT3105KL	N	1,200	24	134	105	51	18		—
21	SCT3160KL	N	1,200	17	103	160	42	18		—

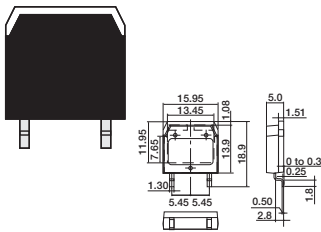
Note : Package is JEDEC code. () : ROHM Package.

SiC MOSFETs

●Dimensions(Unit : mm)

Surface Mounted type

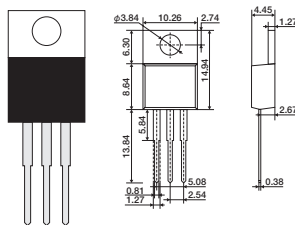
TO-268-2L



Each lead has same dimensions

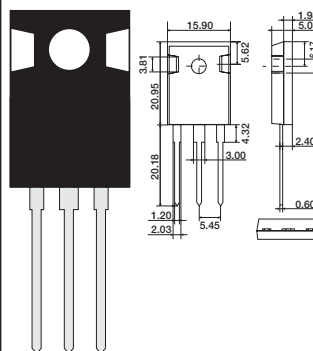
Leaded type

TO-220AB



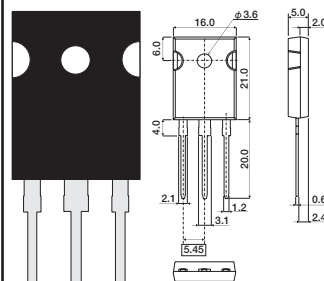
Each lead has same dimensions

TO-247



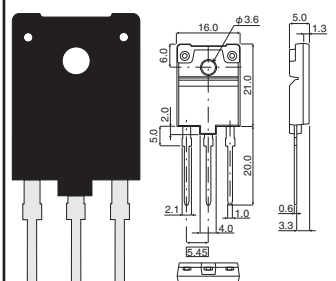
Each lead has same dimensions

TO-247(TO-247N)



Each lead has same dimensions

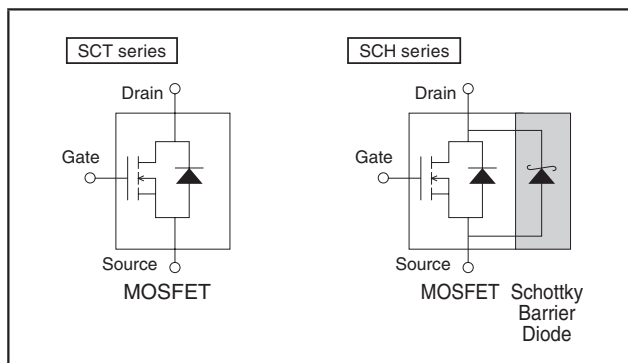
TO-3PFM



Each lead has same dimensions

Note : Package is JEDEC code. () : ROHM Package.

●Internal Circuit



●Part No. Explanation

●MOSFET Part No. Explanation

S	C	T	3	0	3	0	A	L	5	H	R
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩		

- ① SiC Discrete Device
 ② H → MOSFET+Schottky Barrier Diode
 T → MOSFET
 ③ Generation
 ④ } ON-resistance[mΩ]
 ⑤ } 080=80mΩ
 ⑥ } H12=1.2 Ω

- ⑦ Rated Voltage A → 650V
 K → 1,200V
 N → 1,700V
 ⑧ Package F → TO-220AB
 E → TO-247
 L → TO-247(TO-247N)
 Y → TO-268-2L
 Z → TO-3PFM
 ⑨ Special Specification
 ⑩ Automotive Grade

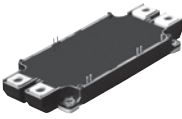
●Packaging type

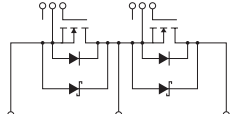
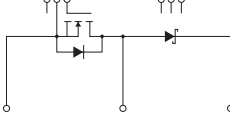
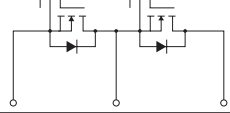
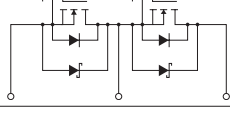
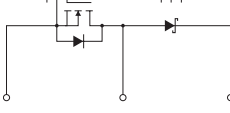
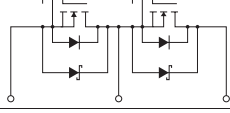
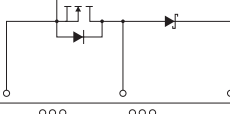
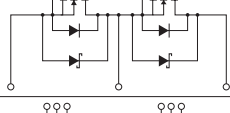
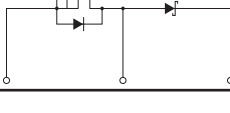
Package	Code	Packaging Style	Basic Ordering Unit(pcs)
TO-268-2L	TB	Embossed Tape	400
TO-220AB	C	Tube	50
TO-247	C	Tube	30
TO-247(TO-247N)	C11	Tube	30
TO-3PFM	C11	Tube	30

Note : Package is JEDEC code. () : ROHM Package.

Full SiC Power Modules

●Quick Reference for Full SiC Power Modules

V _{DSS} (V)	R _{DS(on)} (mΩ)	Case type		
				
		C type	E type	G type
1,200	34	BSM080D12P2C008		
	20	BSM120D12P2C005 BSM120C12P2C201		
	12.8	BSM180D12P2C101		
	12.2		New BSM180C12P2E202 BSM180D12P2E002	
	10	BSM180D12P3C007 BSM180C12P3C202		
	7.3		BSM300D12P2E001	
	6.3		BSM300C12P3E201	
	5.75			New BSM400D12P2G003
	4.5			BSM400D12P3G002 New BSM400C12P3G202
	3			BSM600D12P3G001 New BSM600C12P3G201

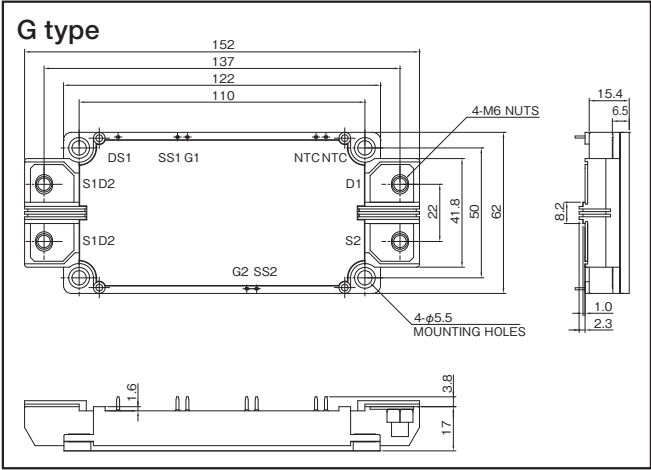
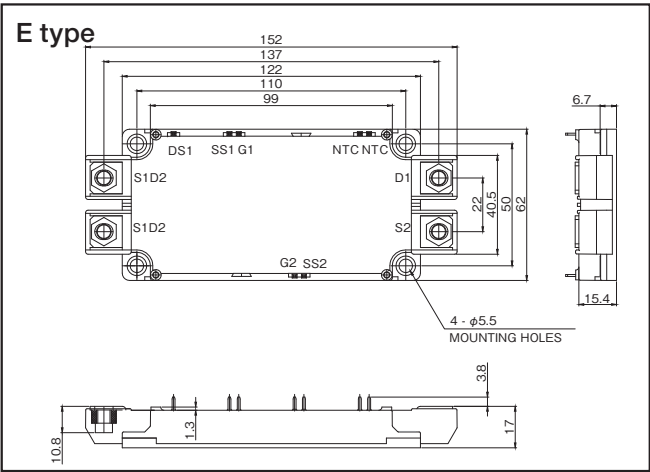
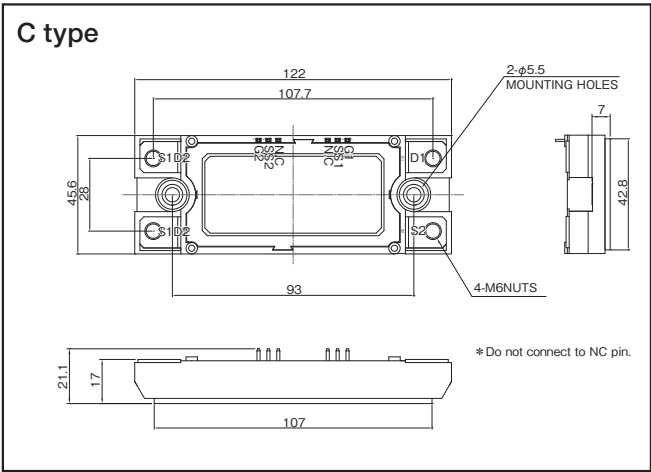
Full SiC Power Modules							
Part No.	Absolute Maximum Ratings(Tj=25°C)					Package	Internal Circuit
	V _{DSS} (V)	I _D (A)	T _j (°C)	T _{stg} (°C)	V _{iso} (V) AC 1min.		
BSM080D12P2C008	1,200	80	−40 to +175	−40 to +125	2,500	C type	
BSM120D12P2C005	1,200	120	−40 to +175	−40 to +125	2,500		
BSM120C12P2C201	1,200	120	−40 to +175	−40 to +125	2,500		
BSM180D12P2C101	1,200	180	−40 to +175	−40 to +125	2,500		
BSM180D12P3C007	1,200	180	−40 to +175	−40 to +125	2,500		
BSM180C12P3C202	1,200	180	−40 to +175	−40 to +125	2,500		
New BSM180C12P2E202	1,200	180	−40 to +175	−40 to +125	2,500	E type	
BSM180D12P2E002	1,200	180	−40 to +175	−40 to +125	2,500		
BSM300D12P2E001	1,200	300	−40 to +175	−40 to +125	2,500		
BSM300C12P3E201	1,200	300	−40 to +175	−40 to +125	2,500		
New BSM400C12P3G202	1,200	400	−40 to +175	−40 to +125	2,500	G type	
New BSM400D12P2G003	1,200	400	−40 to +175	−40 to +125	2,500		
BSM400D12P3G002	1,200	400	−40 to +175	−40 to +125	2,500		
New BSM600C12P3G201	1,200	600	−40 to +175	−40 to +125	2,500		
BSM600D12P3G001	1,200	600	−40 to +175	−40 to +125	2,500		

B

SiC Power Devices

Full SiC Power Modules

Dimensions(Unit : mm)



Part No. Explanation

B	S	M	1	2	0	D	1	2	P	2	C	0	0	5
①	②	③	④	⑤	⑥	⑦								

- ① SiC Power Module
- ② Rated Current
- ③ 2 in 1
- ④ Breakdown Voltage
Example 12 → 1,200V
- ⑤ Device type
P2...2nd generation SiC MOSFET
P3...3rd generation SiC MOSFET
- ⑥ Case type
- ⑦ Additional Number



Power Devices

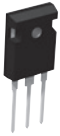
IGBT

CONTENTS

■ Field Stop Trench IGBT	P. B12
■ Ignition IGBT	P. B15

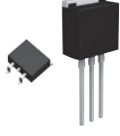
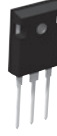
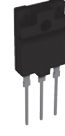
Field Stop Trench IGBT

●Quick Reference for Field Stop Trench IGBT Standard type

Series	V _{CES} (V)	I _C (A)	Package							
										
			TO-247N				TO-3PFM			
			IGBT Single		Built-in FRD		IGBT Single		Built-in FRD	
RGTH series (High speed switching)	650	20	RGTH40TS65	1	RGTH40TS65D	6	RGTH40TK65	11	RGTH40TK65D	16
		25	RGTH50TS65	2	RGTH50TS65D	7	RGTH50TK65	12	RGTH50TK65D	17
		30	RGTH60TS65	3	RGTH60TS65D	8	RGTH60TK65	13	RGTH60TK65D	18
		40	RGTH80TS65	4	RGTH80TS65D	9	RGTH80TK65	14	RGTH80TK65D	19
		50	RGTH00TS65	5	RGTH00TS65D	10	RGTH00TK65	15	RGTH00TK65D	20
RGW series (High speed fast switching)	650	30	New RGW60TS65	21	New RGW60TS65D	24	New RGW60TK65	27	New RGW60TK65D	30
		40	New RGW80TS65	22	New RGW80TS65D	25	New RGW80TK65	28	New RGW80TK65D New RGW80TK65E	31 32
		50	New RGW00TS65	23	New RGW00TS65D	26	New RGW00TK65	29	New RGW00TK65D	33
RGCL series (Low V _{CE(sat)})	600	30	RGCL60TS60	34	RGCL60TS60D	36	RGCL60TK60	38	RGCL60TK60D	40
		40	RGCL80TS60	35	RGCL80TS60D	37	RGCL80TK60	39	RGCL80TK60D	41
RGC series (RC-IGBT)	1,800	40			New RGC80TSX8R	42				

Note: Package is JEDEC code.

SCSOA Guaranteed type

Series	V _{CES} (V)	I _C (A)	Package									
												
			TO-252	TO-263S(LPDS)/TO-262	TO-263L(LPDL)	TO-220NFM	TO-247N		TO-3PFM			
			Built-in FRD	Built-in FRD	Built-in FRD	Built-in FRD	IGBT Single	Built-in FRD	IGBT Single	Built-in FRD	IGBT Single	Built-in FRD
RGTV series (tsc 2μs Min.)	650	30					New RGTV60TS65	65	New RGTV60TS65D	68	New RGTV60TK65	70
		50					New RGTV00TS65	66	New RGTV00TS65D	69	New RGTV00TK65	71
		80					New RGTVX6TS65	67				
RGT series (tsc 5μs Min.)	650	4	RGT8BM65D	43	RGT8NS65D	45	RGT8NL65D	50	RGT8TM65D	55		
		8	RGT16BM65D	44	RGT16NS65D	46	RGT16NL65D	51	RGT16TM65D	56		
		15			RGT30NS65D	47	RGT30NL65D	52	RGT30TM65D	57		
		20			RGT40NS65D	48	RGT40NL65D	53	RGT40TM65D	58		
		25			RGT50NS65D	49	RGT50NL65D	54	RGT50TM65D	59		
		30							RGT40TS65D	60		
		40							RGT50TS65D	61		
		50							RGT60TS65D	62		
RGS series (tsc 8μs Min.)	650	30							RGT80TS65D	63		
		40							RGT90TS65D	64		
		50							RGS80TS65DHR	74		
									RGS80TS65DHR	75		
RGS series (tsc 10μs Min.)	1,200	25							RGS00TS65DHR	76		
		40							RGS00TS65EHR	77		
									☆ RGS50TSX2DHR	78		
									☆ RGS80TSX2DHR	79		

Note: Package is JEDEC code. () : ROHM Packages

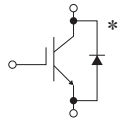
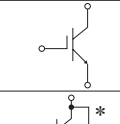
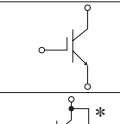
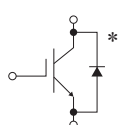
☆ : Under Development

Field Stop Trench IGBT															
No.	Part No.	V _{CE(S)} (V)	I _C (A)		P _D (W)	V _{CE(sat)} Typ.(V)	I _C (A)	t _{sc} Min. (μsec.)	I _F (Diode)(A)		V _F (Diode) Typ.(V)	I _F (A)	Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
			T _C =25°C	T _C =100°C					T _C =25°C	T _C =100°C					
1	RGTH40TS65	650	40	20	144	1.6	20	—	—	—	—	—	TO-247N		—
2	RGTH50TS65	650	50	25	174	1.6	25	—	—	—	—	—			—
3	RGTH60TS65	650	58	30	194	1.6	30	—	—	—	—	—			—
4	RGTH80TS65	650	70	40	234	1.6	40	—	—	—	—	—			—
5	RGTH00TS65	650	85	50	277	1.6	50	—	—	—	—	—			—
6	RGTH40TS65D	650	40	20	144	1.6	20	—	35	20	1.45	20			—
7	RGTH50TS65D	650	50	25	174	1.6	25	—	35	20	1.45	20			—
8	RGTH60TS65D	650	58	30	194	1.6	30	—	40	20	1.35	20			—
9	RGTH80TS65D	650	70	40	234	1.6	40	—	40	20	1.35	20			—
10	RGTH00TS65D	650	85	50	277	1.6	50	—	50	30	1.45	30			—
11	RGTH40TK65	650	23	14	56	1.6	20	—	—	—	—	—	TO-3PFM		—
12	RGTH50TK65	650	26	16	59	1.6	25	—	—	—	—	—			—
13	RGTH60TK65	650	28	17	61	1.6	30	—	—	—	—	—			—
14	RGTH80TK65	650	31	19	66	1.6	40	—	—	—	—	—			—
15	RGTH00TK65	650	35	21	72	1.6	50	—	—	—	—	—			—
16	RGTH40TK65D	650	23	14	56	1.6	20	—	26	15	1.45	20			—
17	RGTH50TK65D	650	26	16	59	1.6	25	—	26	15	1.45	20			—
18	RGTH60TK65D	650	28	17	61	1.6	30	—	28	16	1.35	20			—
19	RGTH80TK65D	650	31	19	66	1.6	40	—	28	16	1.35	20			—
20	RGTH00TK65D	650	35	21	72	1.6	50	—	34	19	1.45	30			—
21	New RGW60TS65	650	60	30	178	1.5	30	—	—	—	—	—	TO-247N		—
22	New RGW80TS65	650	78	40	214	1.5	40	—	—	—	—	—			—
23	New RGW00TS65	650	96	50	254	1.5	50	—	—	—	—	—			—
24	New RGW60TS65D	650	60	30	178	1.5	30	—	40	20	1.45	20		—	
25	New RGW80TS65D	650	78	40	214	1.5	40	—	40	20	1.45	20		—	
26	New RGW00TS65D	650	96	50	254	1.5	50	—	56	30	1.45	30		—	
27	New RGW60TK65	650	33	20	72	1.5	30	—	—	—	—	—	TO-3PFM		—
28	New RGW80TK65	650	39	23	81	1.5	40	—	—	—	—	—			—
29	New RGW00TK65	650	45	26	89	1.5	50	—	—	—	—	—			—
30	New RGW60TK65D	650	33	20	72	1.5	30	—	27	16	1.45	20			—
31	New RGW80TK65D	650	39	23	81	1.5	40	—	27	16	1.45	20			—
32	New RGW80TK65E	650	39	23	81	1.5	40	—	46	26	1.45	50	—		
33	New RGW00TK65D	650	45	26	89	1.5	50	—	34	19	1.45	30		—	
34	RGCL60TS60	600	48	30	111	1.4	30	—	—	—	—	—	TO-247N		—
35	RGCL80TS60	600	65	40	148	1.4	40	—	—	—	—	—			—
36	RGCL60TS60D	600	48	30	111	1.4	30	—	35	20	1.45	20		—	
37	RGCL80TS60D	600	65	40	148	1.4	40	—	35	20	1.45	20		—	
38	RGCL60TK60	600	30	18	54	1.4	30	—	—	—	—	—	TO-3PFM		—
39	RGCL80TK60	600	35	21	57	1.4	40	—	—	—	—	—			—
40	RGCL60TK60D	600	30	18	54	1.4	30	—	26	15	1.45	20			—
41	RGCL80TK60D	600	35	21	57	1.4	40	—	26	15	1.45	20			—
42	New RGC80TSX8R	1,800	80	40	535	2.2	40	—	80	40	1.8	40	TO-247N		—

Note: Package is JEDEC code.

*Built-in Fast Recovery Diodes

Field Stop Trench IGBT

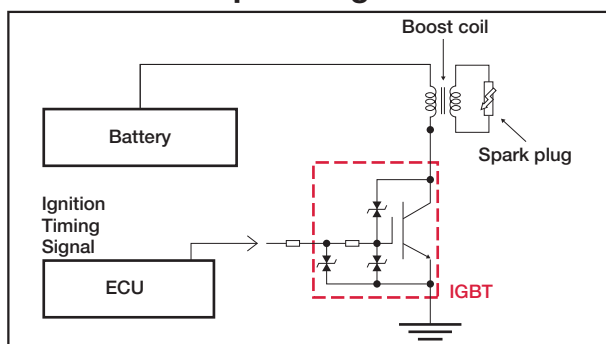
Field Stop Trench IGBT															
No.	Part No.	V _{GES} (V)	I _C (A)		P _D (W)	V _{CE(isat)} Typ.(V)	I _C (A)	t _{sc} Min. (μsec.)	I _F (Diode)(A)		V _F (Diode) Typ.(V)	I _F (A)	Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
			T _C =25°C	T _C =100°C					T _C =25°C	T _C =100°C					
43	RGT8BM65D	650	8	4	62	1.65	4	5	7	4	1.45	4	TO-252		—
44	RGT16BM65D	650	16	8	94	1.65	8	5	16	8	1.4	8			—
45	RGT8NS65D	650	8	4	65	1.65	4	5	7	4	1.45	4	TO-263S (LPDS)/ TO-262		—
46	RGT16NS65D	650	16	8	94	1.65	8	5	16	8	1.4	8			—
47	RGT30NS65D	650	30	15	133	1.65	15	5	26	15	1.5	15			—
48	RGT40NS65D	650	40	20	161	1.65	20	5	35	20	1.45	20			—
49	RGT50NS65D	650	48	25	194	1.65	25	5	35	20	1.45	20			—
50	RGT8NL65D	650	8	4	65	1.65	4	5	7	4	1.45	4	TO-263L (LPDL)		—
51	RGT16NL65D	650	16	8	94	1.65	8	5	16	8	1.4	8			—
52	RGT30NL65D	650	30	15	133	1.65	15	5	26	15	1.5	15			—
53	RGT40NL65D	650	40	20	161	1.65	20	5	35	20	1.45	20			—
54	RGT50NL65D	650	48	25	194	1.65	25	5	35	20	1.45	20			—
55	RGT8TM65D	650	5	3	16	1.65	4	5	5	3	1.45	4	TO-220NFM		—
56	RGT16TM65D	650	9	5	22	1.65	8	5	13	7	1.4	8			—
57	RGT30TM65D	650	14	8	32	1.65	15	5	17	9	1.5	15			—
58	RGT40TM65D	650	17	10	39	1.65	20	5	22	13	1.45	20			—
59	RGT50TM65D	650	21	13	47	1.65	25	5	22	13	1.45	20			—
60	RGT40TS65D	650	40	20	144	1.65	20	5	35	20	1.45	20	TO-247N		—
61	RGT50TS65D	650	48	25	174	1.65	25	5	35	20	1.45	20			—
62	RGT60TS65D	650	55	30	194	1.65	30	5	40	20	1.35	20			—
63	RGT80TS65D	650	70	40	234	1.65	40	5	40	20	1.35	20			—
64	RGT00TS65D	650	85	50	277	1.65	50	5	50	30	1.45	30			—
65	New RGTV60TS65	650	60	30	194	1.5	30	2	—	—	—	—	TO-247N		—
66	New RGTV00TS65	650	95	50	276	1.5	50	2	—	—	—	—			—
67	New RGTVX6TS65	650	144	80	404	1.5	80	2	—	—	—	—			—
68	New RGTV60TS65D	650	60	30	194	1.5	30	2	56	30	1.45	30			—
69	New RGTV00TS65D	650	95	50	276	1.5	50	2	84	50	1.45	50			—
70	New RGTV60TK65	650	33	20	76	1.5	30	2	—	—	—	—	TO-3PFM		—
71	New RGTV00TK65	650	45	26	94	1.5	50	2	—	—	—	—			—
72	New RGTV60TK65D	650	33	20	76	1.5	30	2	34	19	1.45	30			—
73	New RGTV00TK65D	650	45	26	94	1.5	50	2	46	26	1.45	50			—
74	RGS60TS65DHR	650	56	30	223	1.65	30	8	56	30	1.45	30	TO-247N		YES
75	RGS80TS65DHR	650	73	40	272	1.65	40	8	56	30	1.45	30			YES
76	RGS00TS65DHR	650	88	50	326	1.65	50	8	56	30	1.45	30			YES
77	RGS00TS65EHR	650	88	50	326	1.65	50	8	84	50	1.45	50			YES
78	☆RGS50TSX2DHR	1,200	50	25	395	1.7	25	10	50	25	1.65	25			YES
79	☆RGS80TSX2DHR	1,200	80	40	535	1.75	40	10	80	40	1.75	40			YES

Note: Package is JEDEC code. () : ROHM Packages

*Built-in Fast Recovery Diodes
☆ : Under Development

Ignition IGBT

● Circuit Example for Ignition IGBT



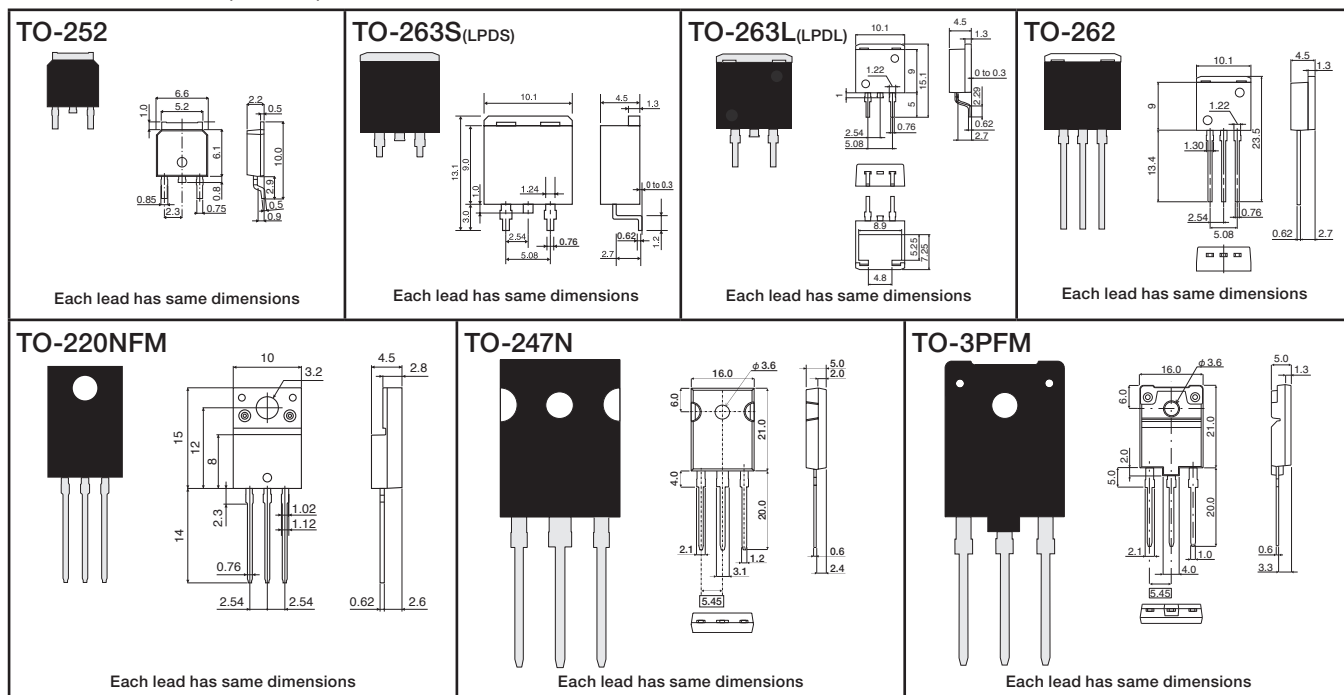
Ignition IGBT									
Part No.	V_{CES} (V)	V_{GES} (V)	I_C (A)	P_D (W)	E_{as} (mJ)	$V_{CE(sat)}$ Typ. (V)	Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
RGPR10BM40FH	430±30	±10	20	107	250	1.6	TO-252		YES
☆ RGPR20BM36HR	360±30	±10	20	107	250	1.6	TO-252		YES
RGPR10BM56HR	560±30	±10	30	166	300	1.4	TO-252		YES
☆ RGPR30BM40HR	400±30	±10	30	125	300	1.6	TO-252		YES
RGPR20NS43HR	430±30	±10	20	107	250	1.6	TO-263S(LPDS)		YES
☆ RGPR30NS40HR	400±30	±10	30	125	300	1.6	TO-263S(LPDS)		YES
RGPR30NS56HR	560±30	±10	30	166	300	1.4	TO-263S(LPDS)		YES
☆ RGPR50NS45HR	450±30	±10	50	187	500	1.6	TO-263S(LPDS)		YES

Note: Package is JEDEC code. () : ROHM Packages

☆ : Under Development

Ignition IGBT

●Dimensions (Unit : mm)



Note: Package is JEDEC code. () : ROHM Packages

●Product No. Explanation

R	G	T	H	4	0	T	S	6	5	D	H	R
①	②	③	④	⑤	⑥	⑦						

① IGBT	④ Package	⑤ V_{CES}
② Series Name	ex. BM → TO-252	ex. 65 → 650V
③ $I_C < T_C = 100^\circ C >$	NS → TO-263S(LPDS)/	⑥ Fast Recovery Diodes
ex. 8 → 4A	TO-262	ex. D → Built-in Fast Recovery Diodes
16 → 8A	NL → TO-263L(LPDL)	⑦ Automotive Grade
30 → 15A	TM → TO-220NFM	
40 → 20A	TS → TO-247N	
00 → 50A	TK → TO-3PFM	

●Packaging type

Package	Code	Packaging Style	Basic Ordering Unit(pcs)
TO-252	TL	Embossed tape	2,500
TO-263S(LPDS)	TL	Embossed tape	1,000
TO-263L(LPDL)	TL	Embossed tape	1,000
TO-262	C9	Tube	50
TO-220NFM	C9	Tube	50
TO-247N	C11	Tube	30
TO-3PFM	C11	Tube	30

Note: Package is JEDEC code. () : ROHM Packages



Power Devices

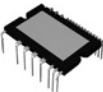
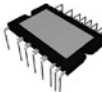
Intelligent Power Modules

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■ IGBT-IPM	P. B18
■ MOS-IPM	P. B18

Intelligent Power Modules

●Quick Reference for Intelligent Power Modules

V _{oss} /V _{CES} (V)	I _B /I _C (A)	Thermal protective function*	IGBT-IPM		MOS-IPM
			PWM Input Frequency up to 6kHz	PWM Input Frequency up to 20kHz	
			 HSDIP25	 HSDIP25-VC	
600	10	TSD	BM63363S-VA BM63363S-VC	BM63763S-VA BM63763S-VC	BM65364S-VA BM65364S-VC
		VOT	BM63563S-VA BM63563S-VC	BM63963S-VA BM63963S-VC	
	15	TSD	BM63364S-VA BM63364S-VC	BM63764S-VA BM63764S-VC	
		VOT	BM63564S-VA BM63564S-VC	BM63964S-VA BM63964S-VC	
	30	TSD		BM63767S-VA BM63767S-VC	
		VOT		BM63967S-VA BM63967S-VC	

*TSD : Thermal Shut Down, VOT : Analog Temperature Output

Intelligent Power Modules

IGBT-IPM								
Part No.	Power Device	V _{CES} (V)	I _C (A)	V _{CE(sat)} (V)	PWM Input Frequency (kHz)	Isolation Voltage* ¹ (Vrms)	Thermal Protective Function* ²	Package
BM63363S-VA	IGBT	600	10	1.5	up to 6	1,500	TSD	HSDIP25
BM63363S-VC	IGBT	600	10	1.5	up to 6	1,500	TSD	HSDIP25VC
BM63563S-VA	IGBT	600	10	1.5	up to 6	1,500	VOT	HSDIP25
BM63563S-VC	IGBT	600	10	1.5	up to 6	1,500	VOT	HSDIP25VC
BM63763S-VA	IGBT	600	10	1.7	up to 20	1,500	TSD	HSDIP25
BM63763S-VC	IGBT	600	10	1.7	up to 20	1,500	TSD	HSDIP25VC
BM63963S-VA	IGBT	600	10	1.7	up to 20	1,500	VOT	HSDIP25
BM63963S-VC	IGBT	600	10	1.7	up to 20	1,500	VOT	HSDIP25VC
BM63364S-VA	IGBT	600	15	1.5	up to 6	1,500	TSD	HSDIP25
BM63364S-VC	IGBT	600	15	1.5	up to 6	1,500	TSD	HSDIP25VC
BM63564S-VA	IGBT	600	15	1.5	up to 6	1,500	VOT	HSDIP25
BM63564S-VC	IGBT	600	15	1.5	up to 6	1,500	VOT	HSDIP25VC
BM63764S-VA	IGBT	600	15	1.7	up to 20	1,500	TSD	HSDIP25
BM63764S-VC	IGBT	600	15	1.7	up to 20	1,500	TSD	HSDIP25VC
BM63964S-VA	IGBT	600	15	1.7	up to 20	1,500	VOT	HSDIP25
BM63964S-VC	IGBT	600	15	1.7	up to 20	1,500	VOT	HSDIP25VC
BM63767S-VA	IGBT	600	30	1.7	up to 20	1,500	TSD	HSDIP25
BM63767S-VC	IGBT	600	30	1.7	up to 20	1,500	TSD	HSDIP25VC
BM63967S-VA	IGBT	600	30	1.7	up to 20	1,500	VOT	HSDIP25
BM63967S-VC	IGBT	600	30	1.7	up to 20	1,500	VOT	HSDIP25VC
MOS-IPM								
Part No.	Power Device	V _{CES} (V)	I _C (A)	R _{on} (mΩ)	Recommended Switching Frequency (kHz)	Isolation Voltage* ¹ (Vrms)	Thermal Protective Function* ²	Package
BM65364S-VA	MOSFET	600	15	120	up to 20	1,500	TSD	HSDIP25
BM65364S-VC	MOSFET	600	15	120	up to 20	1,500	TSD	HSDIP25VC

*1 : AC60Hz, 1 minutes, Corresponds to isolation voltage 2,500Vrms in the case the convex-shaped heat sink.

*2 : TSD : Thermal Shut Down, VOT : Analog Temperature Output



Discrete Devices

Transistors

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■ Packages	P. C54
■ Product No. Explanation	P. C56

Small Signal MOSFETs

● Quick Reference for Small Signal MOSFET series

Single type<Nch>

V_{DS} (V)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.5
20	0.15A DFN0604-3(VML0604) / P.C3										
	0.15A DFN0806-3(VML0806) / P.C3										
	0.18A DFN1006-3(VML1006)[SC-101] / P.C3										
	0.1A 0.2A SOT-723(VMT3)[SC-105AA] / P.C3										
	0.1A 0.2A SOT-416FL(EMT3F)[SC-89] / P.C3										
30	0.1A 0.2A SOT-323FL(UMT3F)[SC-85] / P.C3										
45	0.15A 0.5A SOT-23(SST3) / P.C3										
50	0.2A SOT-723(VMT3)[SC-105AA] / P.C3										
	0.2A SOT-416FL(EMT3F)[SC-89] / P.C3										
	0.2A SOT-323FL(UMT3F)[SC-85] / P.C3										
	0.2A SOT-23(SST3) / P.C3										
60	0.25A SOT-723(VMT3)[SC-105AA] / P.C3										
	0.25A SOT-416FL(EMT3F)[SC-89] / P.C3										
	0.31A 0.38A SOT-323(UMT3) / P.C3										
	0.25A SOT-323FL(UMT3F)[SC-85] / P.C3										
100	0.12A 0.6A SOT-23(SST3) / P.C3										
	0.2A SOT-23(SST3) / P.C3										

Dual type<Nch+Nch>

V_{DS} (V)	0.1	0.2	0.3	0.4	0.5
20/20	0.1A (VMT6)[SC-105B] / P.C3				
	0.2A 0.3A SOT-563(EMT6)[SC-107C] / P.C3				
50/50	0.2A SOT-563(EMT6)[SC-107C] / P.C3				
	0.2A SOT-363(UMT6)[SC-88] / P.C3				
60/60	0.25A SOT-563(EMT6)[SC-107C] / P.C3				
	0.25A SOT-363(UMT6)[SC-88] / P.C3				

Single type<Pch>

V_{DS} (V)	-0.1	-0.2	-0.3	-0.4	-0.5	-0.6	-0.7	-0.8	-0.9	-1	-1.5
-20	-0.1A DFN0604-3(VML0604) / P.C3										
	-0.1A DFN0806-3(VML0806) / P.C3										
	-0.1A DFN1006-3(VML1006)[SC-101] / P.C3										
	-0.1A -0.2A SOT-723(VMT3)[SC-105AA] / P.C3										
	-0.1A -0.2A SOT-416FL(EMT3F)[SC-89] / P.C3										
-30	-0.1A -0.2A SOT-323FL(UMT3F)[SC-85] / P.C3										
	-0.2A SOT-723(VMT3)[SC-105AA] / P.C3										
	-0.25A SOT-416FL(EMT3F)[SC-89] / P.C3										
	-0.25A SOT-323FL(UMT3F)[SC-85] / P.C3										
-60	-0.25A SOT-23(SST3) / P.C3										
	-0.23A SOT-23(SST3) / P.C3										

Dual type<Pch+Pch>

V_{DS} (V)	-0.1	-0.2	-0.3	-0.4	-0.5
-20/-20	-0.1A (VMT6)[SC-105B] / P.C3				
	-0.2A SOT-563(EMT6)[SC-107C] / P.C3				
-30/-30	-0.2A SOT-363(UMT6)[SC-88] / P.C3				

Dual type<Nch+Pch>

V_{DS} (V)	-0.1	-0.2	-0.3	-0.4	-0.5
20/-20	-0.1A (VMT6)[SC-105B] / P.C3				
	-0.2A SOT-563(EMT6)[SC-107C] / P.C3				

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code
 Notes2 : P.Cxx represents page number.

Small Signal MOSFET series																						
Package	Product No.		Polarity (ch)	V _{oss} (V)	I _D (A)	P _D (W) (T _a =25°C)	R _{DS(on)} (Ω)															
	Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =4.0V		V _{GS} =2.5V		V _{GS} =1.8V		V _{GS} =1.5V		V _{GS} =1.2V		V _{GS} =0.9V	
							Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.
DFN0604-3 (VML0604)  0604 size	RV3C002UN	T2CL	N	20	0.15	0.10	—	—	1.40	2.00	—	—	1.70	2.60	—	—	2.70	5.40	—	—		
	☆RV3CA01ZP*1	T2CL	P	—20	—0.10	0.10	—	—	2.50	3.80	—	—	3.40	5.10	—	—	6.00	13.20	—	—		
	New RV3C001ZP	T2CL		—20	—0.10	0.10	—	New	2.50	3.80	—	—	3.40	5.10	—	—	6.00	13.20	—	—		
DFN0806-3 (VML0806)  0806 size	RV1C002UN	T2CL	N	20	0.15	0.10	—	—	1.40	2.00	—	—	1.70	2.60	—	—	2.70	5.40	3.80	11.40		
	RV1C001ZP	T2CL	P	—20	—0.10	0.10	—	—	2.50	3.80	—	—	3.40	5.10	—	—	6.00	13.20	10.00	40.00		
DFN1006-3 (VML1006)  [SC-101] 1006 size	RV2C010UN	T2L	N	20	1.00	0.40	—	—	0.34	0.47	—	—	0.40	0.56	—	—	0.54	0.81	0.70	1.05		
	RV2C002UN	T2L		20	0.18	0.10	—	—	1.40	2.00	—	—	1.70	2.60	—	—	2.70	5.40	3.80	11.40		
	☆RV2E014AJ	T2CL		30	1.40*2	0.6*2	—	—	0.17	0.29	—	—	0.225	0.38	—	—	—	—	—	—		
	☆RV2L009GN	T2CL		60	0.90*2	0.60*2	0.48	0.72	0.66	1.06	—	—	—	—	—	—	—	—	—	—		
	RV2C014BC	T2CL	P	—20	—1.40*2	0.60*2	—	—	0.22	0.30	—	—	0.28	0.39	0.37	0.70	—	—	—	—		
	RV2C001ZP	T2L		—20	—0.10	0.10	—	—	2.50	3.80	—	—	3.40	5.10	—	—	6.00	13.20	10.00	40.00		
	☆RV2E012AT	T2CL		—30	—1.20*2	0.60*2	0.27	0.41	0.39	0.57	—	—	—	—	—	—	—	—	—	—		
SOT-723 (VMT3)  [SC-105AA] 1212 size	RUM002N02	T2L	N	20	0.20	0.15	—	—	—	—	—	—	0.80	1.20	—	—	1.20	2.40	1.60	4.80		
	RUM001L02	T2CL		20	0.10	0.15	—	—	2.50	3.50	—	—	3.00	4.20	—	—	4.50	9.00	6.00	18.00		
	RYM002N05	T2CL		50	0.20	0.15	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	2.80	2.20	3.30		
	RUM002N05	T2L		50	0.20	0.15	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	4.00	2.40	7.20		
	RSM002N06	T2L	60	0.25	0.15	1.70	2.40	2.10	3.00	2.30	3.20	3.00	12.00	—	—	—	—	—	—			
	RZM002P02	T2L	P	—20	—0.20	0.15	—	—	0.80	1.20	—	—	1.00	1.50	—	—	1.60	3.50	2.40	9.60		
	RZM001P02	T2L		—20	—0.10	0.15	—	—	2.50	3.80	—	—	3.40	5.10	—	—	6.00	13.20	10.00	40.00		
RSM002P03	T2L	—30	—0.20	0.15	0.90	1.40	1.40	2.10	1.60	2.40	—	—	—	—	—	—	—	—	—			
(VMT6) [SC-105B]  1212 size	VT6K1	T2CR	N+N	20	0.10	0.15	—	—	2.50	3.50	—	—	3.00	4.20	—	—	4.50	9.00	6.00	18.00		
	VT6J1	T2CR	P+P	—20	0.10	0.15	—	—	2.50	3.80	—	—	3.40	5.10	—	—	6.00	13.20	10.00	40.00		
	VT6M1	T2CR	N+P	20	0.10	0.15	—	—	2.50	3.50	—	—	3.00	4.20	—	—	4.50	9.00	6.00	18.00		
—20	—0.10	0.15	2.50	3.80	—	—	3.40	5.10	—	—	6.00	13.20	13.30	53.20	—	—	—	—	—			
SOT-416FL (EMT3F)  [SC-89] 1616 size	RE1C002UN	TCL	N	20	0.20	0.15	—	—	—	—	—	—	0.80	1.20	—	—	1.20	2.40	1.60	4.80		
	RE1C001UN	TCL		20	0.10	0.15	—	—	2.50	3.50	—	—	3.00	4.20	—	—	4.50	9.00	6.00	18.00		
	RE1J002YN	TCL		50	0.20	0.15	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	2.80	2.20	3.30		
	RE1L002SN	TL		60	0.25	0.15	1.70	2.40	2.10	3.00	2.30	3.20	3.00	12.00	—	—	—	—	—	9.00		
	RE1C002ZP	TL	P	—20	—0.20	0.15	—	—	0.80	1.20	—	—	1.00	1.50	—	—	1.60	3.50	2.40	9.60		
	RE1C001ZP	TL		—20	—0.10	0.15	—	—	2.50	3.80	—	—	3.40	5.10	—	—	6.00	13.20	10.00	40.00		
	RE1E002SP	TCL		—30	—0.25	0.15	0.90	1.40	1.40	2.10	1.60	2.40	—	—	—	—	—	—	—	—		
SOT-563 (EMT6)  [SC-107C] 1616 size	EM6K6	T2R	N+N	20	0.30	0.15	—	—	—	—	0.70	1.00	0.80	1.20	1.00	1.40	—	—	—	—		
	EM6K7	T2CR		20	0.20	0.15	—	—	—	—	—	—	0.80	1.20	—	—	1.20	2.40	1.60	4.80		
	EM6K33	T2R		50	0.20	0.15	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	4.00	2.40	7.20		
	EM6K34	T2CR		50	0.20	0.15	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	2.80	2.20	3.30		
	EM6K31	T2R	P+P	60	0.25	0.15	1.70	2.40	2.10	3.00	2.30	3.20	3.00	12.00	—	—	—	—	—	—		
	EM6J1	T2R		—20	—0.20	0.15	—	—	0.80	1.20	—	—	1.00	1.50	—	—	1.60	3.50	2.40	9.60		
	EM6M2	T2R	N+P	20	0.20	0.15	—	—	—	—	0.70	1.00	0.80	1.20	1.00	1.40	1.20	2.40	1.60	4.80		
—20	—0.20	0.15	0.80	1.20	—	—	1.00	1.50	1.30	2.20	1.60	3.50	2.40	9.60	—	—	—	—				
SOT-323 (UMT3)  2021 size	☆BSS138BKW	T106	N	60	0.38	0.30	0.50	0.70	0.60	0.84	—	—	1.00	4.00	—	—	—	—	—	—		
	☆BSS138W	T106		60	0.31	0.30	1.70	2.40	2.10	3.00	—	—	3.00	12.00	—	—	—	—	—	—		
	☆BSS84W	T106		P	—60	—0.21	0.30	3.60	5.30	4.30	6.40	—	—	—	—	—	—	—	—	—	—	
SOT-323FL (UMT3F)  [SC-85] 2021 size	RU1C002UN	TCL	N	20	0.20	0.15	—	—	—	—	—	—	0.80	1.20	—	—	1.20	2.40	1.60	4.80		
	RU1C001UN	TCL		20	0.10	0.15	—	—	2.50	3.50	—	—	3.00	4.20	—	—	4.50	9.00	6.00	18.00		
	RU1J002YN	TCL		50	0.20	0.15	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	2.80	2.20	3.30		
	RU1L002SN	TL		60	0.25	0.15	1.70	2.40	2.00	3.00	2.30	3.20	3.00	12.00	—	—	—	—	—	—		
	RU1C002ZP	TCL	P	—20	—0.20	0.15	—	—	0.80	1.20	—	—	1.00	1.50	—	—	1.60	3.50	2.40	9.60		
	RU1C001ZP	TL		—20	—0.10	0.15	—	—	2.50	3.80	—	—	3.40	5.10	—	—	6.00	13.20	10.00	40.00		
	RU1E002SP	TCL		—30	—0.25	0.15	0.90	1.40	1.40	2.10	1.60	2.40	—	—	—	—	—	—	—	—		
SOT-363 (UMT6)  [SC-88] 2021 size	UM6K34N	TCN	N+N	50	0.20	0.15	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	2.80	2.20	3.30		
	UM6K33N	TN		50	0.20	0.15	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	4.00	2.40	7.20		
	UM6K31N	TN		60	0.25	0.15	1.70	2.40	2.10	3.00	2.30	3.20	3.00	12.00	—	—	—	—	—	—		
	UM6J1N	TN	P+P	—30	—0.20	0.15	0.90	1.40	1.40	2.10	1.60	2.40	—	—	—	—	—	—	—	—		
SOT-23 (SST3)  2924 size	RYC002N05	T316	N	50	0.20	0.20	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	2.80	2.20	3.30		
	RUC002N05	T116		50	0.20	0.20	—	—	1.60	2.20	—	—	1.70	2.40	—	—	2.00	4.00	2.40	7.20		
	☆BSS670	T116		60	0.60	0.35	0.50	0.65	0.60	0.82	—	—	1.00	4.00	—	—	—	—	—	—		
	☆BSS138BK	T116		60	0.40	0.35	0.50	0.70	0.60	0.84	—	—	1.00	4.00	—	—	—	—	—	—		
	RK7002BM	T116	60	0.25	0.20	1.70	2.40	2.10	3.00	2.30	3.20	3.00	12.00	—	—	—	—	—	—			
	☆BSS123	T116	100	0.20	0.35	5.50	7.70	5.90	8.20	—	—	—	—	—	—	—	—	—	—			
	RSC002P03	T316	P	—30	—0.25	0.20	0.90	1.40	1.40	2.10	1.60	2.40	—	—	—	—	—	—	—	—		
	☆BSS84	T116		—60	—0.23	0.35	3.60	5.30	4.30	6.40	—	—	—	—	—	—	—	—	—	—		

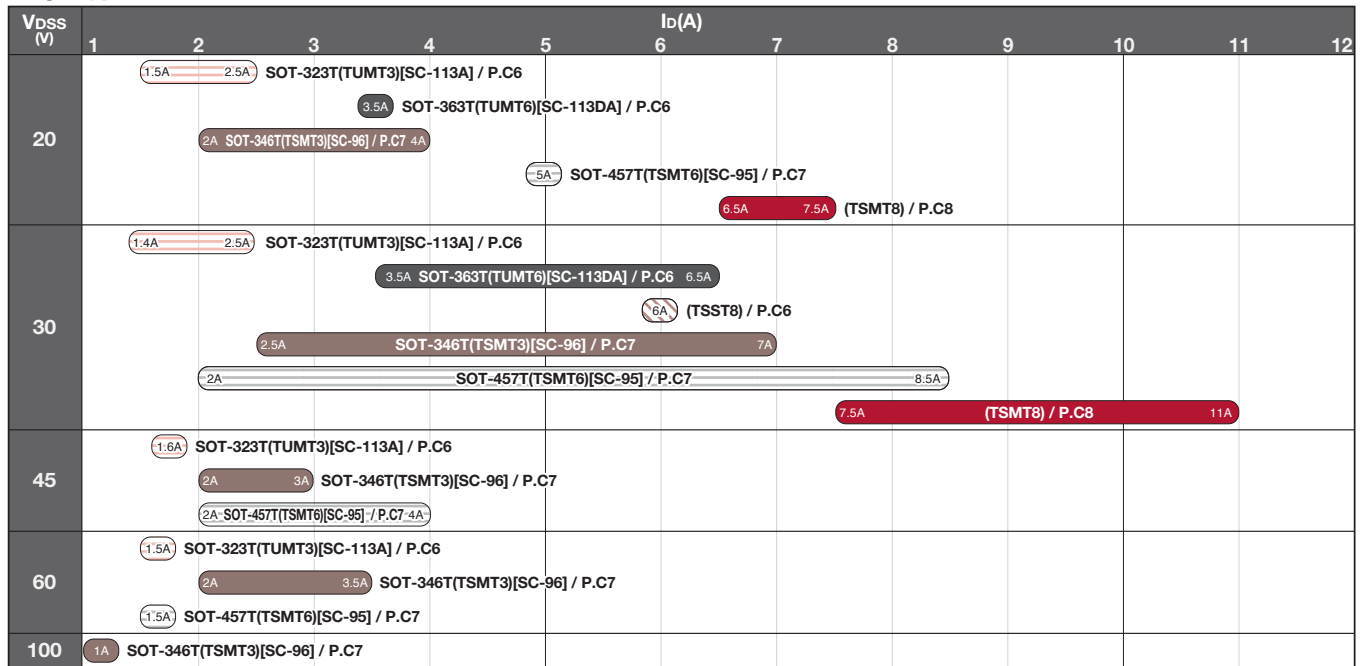
Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code
Notes2 : *1 : For overvoltage protection *2 : P_w≤5s

☆ : Under Development

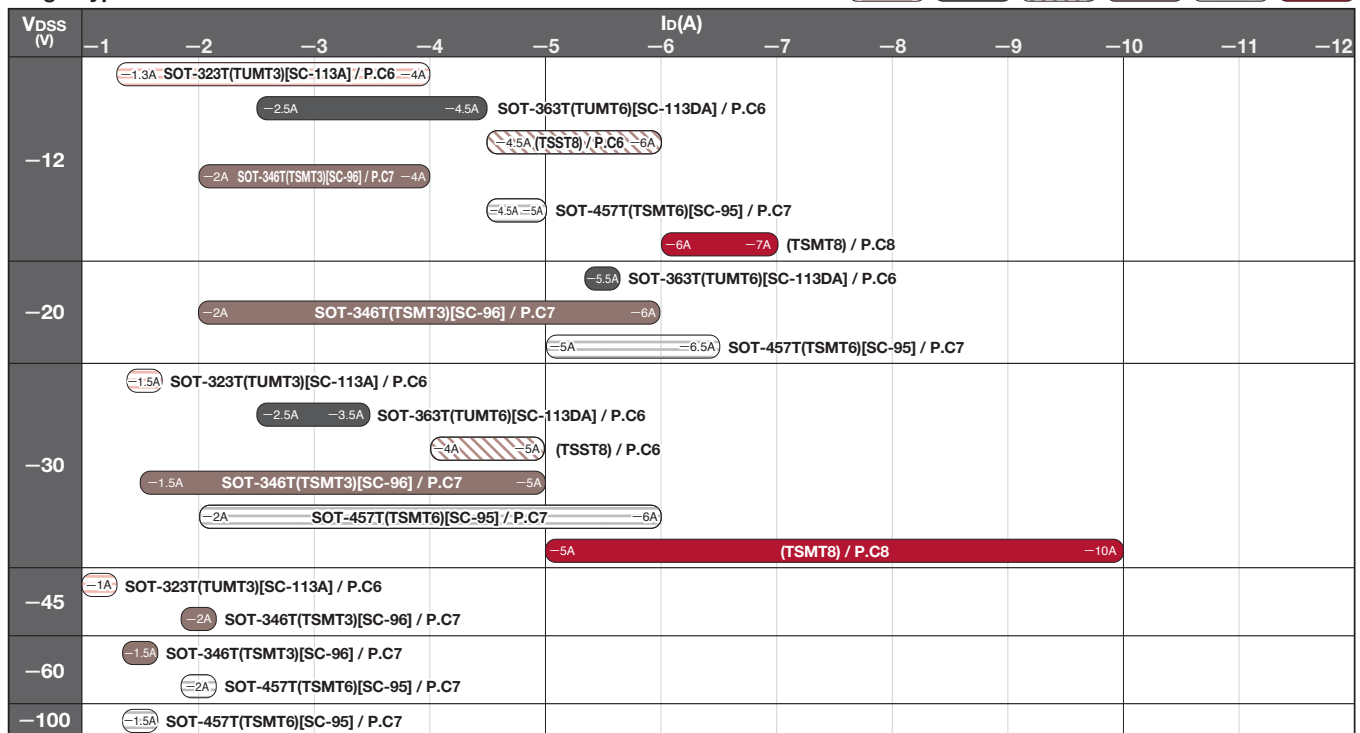
Small Signal MOSFETs

● Quick Reference for Small Signal MOSFET series

Single type<Nch>



Single type<Pch>



Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code
 Notes2 : P.Cxx represents page number.

Dual type<Nch+Nch>

SOT-363T
(TUMT6)
[SC-113DA]

(TSST8)

SOT-25T
(TSMT5)SOT-457T
(TSMT6)
[SC-95]

(TSMT8)

V _{DSS} (V)	1	2	3	4	5	6	7	8	9	10
20/20	1.5A SOT-363T(TUMT6)[SC-113DA] / P.C6	2.5A (TSST8) / P.C6								
30/30	1.4A 1.5A SOT-363T(TUMT6)[SC-113DA] / P.C6	2.5A 3.0A (TSST8) / P.C6	2A SOT-25T(TSMT5) / P.C7							
	1A SOT-457T(TSMT6)[SC-95] / P.C7			3.5A (TSMT8) / P.C8					9A	
40/40						6A	7A (TSMT8) / P.C8			
45/45	1A SOT-457T(TSMT6)[SC-95] / P.C7			4A (TSMT8) / P.C8						
100/100		2A (TSMT8) / P.C8								

Dual type<Pch+Pch>

SOT-363T
(TUMT6)
[SC-113DA]

(TSST8)

SOT-457T
(TSMT6)
[SC-95]

(TSMT8)

V _{DSS} (V)	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
-12/-12	-1.3A -2A SOT-363T(TUMT6)[SC-113DA] / P.C6	-2.5A -3.5A (TSST8) / P.C6	-2A SOT-457T(TSMT6)[SC-95] / P.C7	-4A (TSMT8) / P.C8	-5.5A					
-20/-20	-1.5A SOT-457T(TSMT6)[SC-95] / P.C7	-2.5A (TSST8) / P.C6		-5A (TSMT8) / P.C8						
-30/-30		-2.5A (TSST8) / P.C6		-4A -5A (TSMT8) / P.C8						

Dual type<Nch+Pch>

SOT-363T
(TUMT6)
[SC-113DA]

(TSST8)

SOT-457T
(TSMT6)
[SC-95]

(TSMT8)

V _{DSS} (V)	1	2	3	4	5	6	7	8	9	10
20/-12	3A 1.5A SOT-363T(TUMT6)[SC-113DA] / P.C6									
20/-20		2.4A 2.5A (TSST8) / P.C6								
30/-20	1A 1.5A SOT-363T(TUMT6)[SC-113DA] / P.C6	2.5A (TSST8) / P.C6								
	1.5A SOT-457T(TSMT6)[SC-95] / P.C7									
30/-30		2.5A 3A (TSST8) / P.C6								
			3A (TSMT8) / P.C8						9A	
40/-40		2A (TSMT8) / P.C8	4.5A							
60/-60		2A 3A (TSMT8) / P.C8								
100/-100	1.5A 2A (TSMT8) / P.C8									

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code
 Notes2 : P.Cxx represents page number.

Small Signal MOSFETs

Small Signal MOSFET series																	
Package	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (T _a =25°C)	R _{DS(on)} (mΩ)										Q _g (nC) (V _{GS} =4.5)
	Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =4.0V		V _{GS} =2.5V		V _{GS} =1.5V		
							Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	
SOT-323T (TUMT3) [SC-113A] 2021 size	RUF025N02	TL	N	20	2.5	0.8	—	—	39	54	—	—	49	68	80	160	5
	RUF020N02	TL		20	2	0.8	—	—	75	105	—	—	95	135	170	240	2
	RUF015N02	TL		20	1.5	0.8	—	—	130	180	—	—	170	240	220*1	310*1	1.8
	RTF025N03	TL		30	2.5	0.8	—	—	48	67	50	70	70	98	—	—	3.7
	RSF014N03	TL		30	1.4	0.8	170	240	250	350	270	380	—	—	—	—	1.4*2
	RTF016N05	TL		45	1.6	0.8	—	—	140	190	150	210	200	280	—	—	2.3
	RSF015N06	TL	60	1.5	0.8	210	290	240	330	255	350	—	—	—	—	2*2	
	RAF040P01	TCL	P	−12	−4	0.8	—	—	22	30	—	—	27	38	40	68	37
	RZF030P01	TL		−12	−3	0.8	—	—	28	39	—	—	39	54	72	144	18
	RZF020P01	TL		−12	−2	0.8	—	—	75	105	—	—	105	145	200	400	6.5
	RZF013P01	TL		−12	−1.3	0.8	—	—	190	260	—	—	280	390	530	1,060	2.4
	RRF015P03	TL		−30	−1.5	0.8	115	160	170	240	190	270	—	—	—	—	3.2*2
RSF010P05	TL	−45		−1	0.8	330	460	450	630	490	690	—	—	—	—	2.3*2	
SOT-363T (TUMT6) [SC-113DA] 2021 size	RUL035N02	TR	N	20	3.5	1	—	—	31	43	—	—	38	53	66	93	5.7
	RF6E065BN	TCR		30	6.5	1	12.9	15.3	18.5	22.7	—	—	—	—	—	—	8.3
	RF6E045AJ	TR		30	4.5	1	—	—	16.9	23.7	—	—	23.9	33.5	—	—	8.1
	RTL035N03	TR		30	3.5	1	—	—	40	56	42	59	56	79	—	—	4.6
	RXL035N03	TCR		30	3.5	1	35	50	45	65	50	70	—	—	—	—	3.3*2
	US6K4	TR	N+N	20	1.5	1	—	—	130	180	—	—	170	240	220*1	310*1	1.8
	US6K1	TR		30	1.5	1	—	—	170	240	180	250	240	340	—	—	1.6
	US6K2	TR		30	1.4	1	170	240	250	350	270	380	—	—	—	—	1.4*2
	RAL045P01	TCR	P	−12	−4.5	1	—	—	22	30	—	—	28	39	50	100	40
	RAL035P01	TR		−12	−3.5	1	—	—	30	42	—	—	40	56	75	150	22
	RAL025P01	TR		−12	−2.5	1	—	—	44	62	—	—	55	77	90	180	16
	RF6C055BC	TCR		−20	−5.5	1	—	—	19.5	25.7	—	—	24.7	33.1	33.7	63.6	15.2
	RRL035P03	TR		−30	−3.5	1	36	50	52	72	58	81	—	—	—	—	8*2
	RRL025P03	TR	P+P	−30	−2.5	1	55	75	85	115	95	125	—	—	—	—	5.2*2
	US6J12	TCR		−12	−2	1	—	—	75	105	—	—	105	145	200	400	7.6
	US6J11	TR		−12	−1.3	1	—	—	190	260	—	—	280	390	530	1,060	2.4
	US6M11	TR	N+P	20	1.5	1	—	—	130	180	—	—	170	240	300	600	1.8
	US6M2	TR		−12	−1.3	1	—	—	190	260	—	—	280	390	530	1,060	2.4
				30	1.5	1	—	—	170	240	180	250	240	340	—	—	1.6
				−20	−1	1	—	—	280	390	310	430	570	800	—	—	2.1
	US6M1	TR		30	1.4	1	170	240	250	350	270	380	—	—	—	—	1.4*2
	(TSST8) 3019 size	RT1E060XN	TR	N	30	6	1.25	16	22	21	29	23	32	—	—	—	—
TT8K1		TR	N+N	20	2.5	1.25	—	—	52	72	—	—	65	90	100	140	3.6
TT8K11		TR		30	3	1.25	51	71	67	94	78	109	—	—	—	—	2.5*2
TT8K2		TR		30	2.5	1.25	—	—	65	90	70	95	95	130	—	—	3.2
RT1A060AP		TR	P	−12	−6	1.25	—	—	14	19	—	—	17	24	27	54	80
RT1A050ZP		TR		−12	−5	1.25	—	—	19	26	—	—	26	36	48	96	34
RT1A045AP		TR		−12	−4.5	1.25	—	—	22	30	—	—	28	39	50	100	40
RT1E050RP		TR		−30	−5	1.25	26	36	36	50	40	56	—	—	—	—	13*2
RT1E040RP		TR		−30	−4	1.25	32	45	45	63	52	72	—	—	—	—	10.5
TT8J11		TR	P+P	−12	−3.5	1.25	—	—	31	43	—	—	43	60	80	160	22
TT8J13		TR		−12	−2.5	1.25	—	—	44	62	—	—	55	77	90	180	16
TT8J21		TR		−20	−2.5	1.25	—	—	49	68	—	—	68	95	140	280	12
TT8J2		TR		−30	−2.5	1.25	60	84	95	130	115	160	—	—	—	—	4.8*2
TT8J3		TR		−30	−2.5	1.25	65	84	100	130	120	160	—	—	—	—	4.8*2
TT8M1		TR	N+P	20	2.5	1.25	—	—	52	72	—	—	65	90	100	140	3.6
TT8M3		TR		−20	−2.5	1.25	—	—	49	68	—	—	68	95	140	280	12
				20	2.5	1.25	—	—	52	72	—	—	65	90	100	140	3.6
TT8M2		TR		−20	−2.4	1.25	—	—	80	105	—	—	105	140	180	360	6.7
				30	2.5	1.25	—	—	65	90	70	95	95	130	—	—	3.2
TT8M11		TCR		−20	−2.5	1.25	—	—	49	68	—	—	68	95	140	280	12
				30	3	1.25	51	71	67	94	78	109	—	—	—	—	2.5*2
				−30	−2.5	1.25	60	84	95	130	115	160	—	—	—	—	4.8*2

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

Notes2 : *1 : V_{GS}=1.8V *2 : V_{GS}=5V

Small Signal MOSFET series

Package	Product No.		Polarity (ch)	V _{bss} (V)	I _o (A)	P _D (W) (T _a =25°C)	R _{DS(on)} (mΩ)												Q _g (nC) (V _{GS} =4.5)
	Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =4.0V		V _{GS} =2.5V		V _{GS} =1.8V		V _{GS} =1.5V		
							Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	
SOT-346T (TSMT3) [SC-96] 2928 size	RUR040N02	TL	N	20	4	1	—	—	25	35	—	—	33	46	42	59	55	110	8
	RUR020N02	TCL		20	2	1	—	—	75	105	—	—	95	135	130	185	170	240	2
	RQ5E070BN	TCL		30	7	1	12.4	16.1	16.5	20.4	—	—	—	—	—	—	—	—	11.7
	RQ5E065AJ	TCL		30	6.5	1	—	—	13.7	18.1	—	—	17.9	23.7	—	—	—	—	12.2
	RQ5E040TN	TL		30	4	1	—	—	34	48	36	50	47	66	—	—	—	—	5.9
	RQ5E040AJ	TCL		30	4	1	—	—	27	37	—	—	39	54	—	—	—	—	4.3
	RQ5E035XN	TCL		30	3.5	1	35	50	45	65	50	70	—	—	—	—	—	—	3.3 ^{*1}
	RQ5E035BN	TCL		30	3.5	1	28	37	43	56	—	—	—	—	—	—	—	—	3.1
	RQ5E030AJ	TCL		30	3	1	—	—	57	75	—	—	81	109	—	—	—	—	2.1
	RQ5E025SN	TL		30	2.5	1	50	70	74	105	83	118	—	—	—	—	—	—	2.9 ^{*1}
	RQ5E025TN	TL		30	2.5	1	—	—	66	92	70	98	95	133	—	—	—	—	3.3
	RQ5H030TN	TL		45	3	1	—	—	48	67	53	74	68	95	—	—	—	—	6.2
	RQ5H025TN	TL		45	2.5	1	—	—	95	130	100	140	125	175	—	—	—	—	3.2
	RQ5H020TN	TL		45	2	1	—	—	130	180	135	190	180	250	—	—	—	—	2.9
	RQ5L035GN	TCL		60	3.5	1	38	51	53	72	—	—	—	—	—	—	—	—	3.8
	RQ5L030SN	TL		60	3	1	60	85	70	100	75	105	—	—	—	—	—	—	5 ^{*1}
	RQ5L020SN	TL		60	2	1	120	170	140	195	150	210	—	—	—	—	—	—	2.7 ^{*1}
	RQ5P010SN	TL		100	1	1	370	520	400	560	410	580	—	—	—	—	—	—	3.5 ^{*1}
	RQ5A040ZP	TL	-12	-4	1	—	—	22	30	—	—	30	42	40	60	55	110	30	
	RQ5A030AP	TL	-12	-3	1	—	—	44	62	—	—	55	77	75	110	90	180	16	
	RQ5A025ZP	TL	-12	-2.5	1	—	—	44	61	—	—	60	84	81	121	110	220	13	
	RQ5A020ZP	TL	-12	-2	1	—	—	75	105	—	—	105	145	150	225	200	400	6.5	
	RQ5C060BC	TCL	-20	-6	1	—	—	16.1	21.1	—	—	20.3	26.9	27.4	51.0	—	—	19.2	
	RQ5C035BC	TCL	-20	-3.5	1	—	—	42	59	—	—	54	76	84	135	—	—	6.5	
	RQ5C030TP	TL	-20	-3	1	—	—	55	75	60	85	90	125	—	—	—	—	9.3	
	RQ5C025TP	TL	-20	-2.5	1	—	—	70	95	75	105	115	160	—	—	—	—	7	
	RQ5C020TP	TL	-20	-2	1	—	—	100	135	110	150	180	250	—	—	—	—	4.9	
	RQ5E050AT	TCL	-30	-5	1	21	26	30	37	—	—	—	—	—	—	—	—	9.7	
	RQ5E040RP	TL	-30	-4	1	32	45	45	63	52	72	—	—	—	—	—	—	10.5 ^{*1}	
	RQ5E035AT	TCL	-30	-3.5	1	38	50	54	70	—	—	—	—	—	—	—	—	5.2	
	RQ5E030RP	TL	-30	-3	1	55	75	85	115	95	125	—	—	—	—	—	—	5.2 ^{*1}	
	RQ5E025SP	TL	-30	-2.5	1	70	98	100	140	115	160	—	—	—	—	—	—	5.4 ^{*1}	
RQ5E025AT	TCL	-30	-2.5	1	70	91	104	135	—	—	—	—	—	—	—	—	2.7		
RQ5E020SP	TL	-30	-2	1	85	120	135	190	150	210	—	—	—	—	—	—	4.3 ^{*1}		
RQ5E015RP	TL	-30	-1.5	1	115	160	170	240	190	270	—	—	—	—	—	—	3.2 ^{*1}		
RQ5H020SP	TL	-45	-2	1	130	190	180	260	200	280	—	—	—	—	—	—	9.5 ^{*2}		
RQ5L015SP	TL	-60	-1.5	1	200	280	240	340	255	360	—	—	—	—	—	—	10 ^{*2}		
SOT-25T (TSMT5) 2928 size	QS5K2	TR	N+N	30	2	1.25	—	—	71	100	76	107	110	154	—	—	—	—	2.8
SOT-457T (TSMT6) [SC-95] 2928 size	RQ6C050UN	TR	N	20	5	1.25	—	—	22	30	—	—	27	38	32	45	40	80	12
	RQ6E085BN	TCR		30	8.5	1.25	11.1	14.4	13.9	17.3	—	—	—	—	—	—	—	—	16.6
	RQ6E080AJ	TCR		30	8	1.25	—	—	12.5	16.5	—	—	15.7	19.5	—	—	—	—	16.2
	RQ6E055BN	TR		30	5.5	1.25	19	25	30	39	—	—	—	—	—	—	—	—	4.4
	RQ6E050AJ	TCR		30	5	1.25	—	—	26	35	—	—	38	50	—	—	—	—	4.7
	RQ6E045BN	TCR		30	4.5	1.25	21	30	35	49	—	—	—	—	—	—	—	—	4.7
	RQ6E045TN	TR		30	4.5	1.25	—	—	30	43	32	45	42	60	—	—	—	—	7.6
	RQ6E045SN	TR		30	4.5	1.25	27	38	36	51	40	56	—	—	—	—	—	—	6.8 ^{*1}
	RQ6E040XN	TCR		30	4	1.25	35	50	45	65	50	70	—	—	—	—	—	—	33 ^{*1}
	RQ6E035TN	TR		30	3.5	1.25	—	—	38	54	40	56	55	77	—	—	—	—	4.6
	RSQ020N03	TR		30	2	1.25	96	134	148	207	168	235	—	—	—	—	—	—	2.2 ^{*1}
	RTQ020N03	TR		30	2	1.25	—	—	89	125	94	132	138	194	—	—	—	—	2.4
	RVQ040N05	TR		45	4	1.25	38	53	47	66	53	74	—	—	—	—	—	—	6.3 ^{*1}
	RTQ020N05	TR		45	2	1.25	—	—	140	190	150	210	200	280	—	—	—	—	2.3
	RSQ015N06	TR		60	1.5	1.25	210	290	240	330	255	350	—	—	—	—	—	—	2 ^{*1}
	QS6K1	TR	N+N	30	1	1.25	—	—	170	238	180	252	260	364	—	—	—	—	1.7
	QS6K21	TR		45	1	1.25	—	—	300	420	310	435	415	585	—	—	—	—	1.5
	RQ6A050ZP	TR		-12	-5	1.25	—	—	19	26	—	—	26	36	33	49	44	88	35
	RQ6A045AP	TCR		-12	-4.5	1.25	—	—	22	30	—	—	28	39	38	57	50	100	40
	RQ6A045ZP	TR		-12	-4.5	1.25	—	—	25	35	—	—	31	43	39	58	50	100	31
	RQ6C065BC	TCR		-20	-6.5	1.25	—	—	14.9	21	—	—	18.6	26	25	50	—	—	22
	RQ6C050BC	TCR		-20	-5	1.25	—	—	27	36	—	—	35	47	48	77	—	—	10.4
	RQ6E060AT	TCR		-30	-6	1.25	20.3	26.4	26.8	34.6	—	—	—	—	—	—	—	—	12.9
	RQ6E050AT	TCR		-30	-5	1.25	21	27	29	38	—	—	—	—	—	—	—	—	10.4
	RQ6E045RP	TR		-30	-4.5	1.25	25	35	34	48	38	53	—	—	—	—	—	—	14 ^{*1}
	RQ6E035AT	TCR		-30	-3.5	1.25	38	50	54	70	—	—	—	—	—	—	—	—	5.2
	RQ6E035SP	TR		-30	-3.5	1.25	45	65	65	90	70	95	—	—	—	—	—	—	9.2 ^{*1}
	RQ6E030AT	TCR		-30	-3	1.25	70	91	104	135	—	—	—	—	—	—	—	—	2.7
	RQ6E030SP	TR		-30	-3	1.25	60	80	90	125	100	140	—	—	—	—	—	—	6 ^{*1}
	RRQ020P03	TR		-30	-2	1.25	115	160	170	240	190	270	—	—	—	—	—	—	3.2 ^{*1}
	New RQ6L020SP	TCR		-60	-2	1.25	150	210	180	252	190	266	—	—	—	—	—	—	7.2 ^{*1}
	RQ6P015SP	TR		-100	-1.5	1.25	350	470	380	510	400	540	—	—	—	—	—	—	17 ^{*1}
	QS6J11	TR	P+P	-12	-2	1.25	—	—	75	105	—	—	105	145	150	225	200	400	6.5
	QS6J1	TR		-20	-1.5	1.25	—	—	155	215	170	235	310	430	—	—	—	—	3
	QS6M4	TR	N+P	30	1.5	1.25	—	—	170	230	180	245	260	360	—	—	—	—	1.6
				-20	-1.5	1.25	—	—	155	215	170	235	310	430	—	—	—	—	3

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code Notes2 : *1 : V_{DS}=5V *2 : V_{DS}=10V

Small Signal MOSFETs

Small Signal MOSFET series																			
Package	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (Ta=25°C)	R _{DS(on)} (mΩ)												Qg(nC) (V _{GS} =4.5)
	Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =4.0V		V _{GS} =2.5V		V _{GS} =1.8V		V _{GS} =1.5V		
							Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	
(TSMT8) 3028 size 	RQ1C075UN	TR	N	20	7.5	1.5	—	—	11	16	—	—	14	20	17	24	20	40	18
	RQ1C065UN	TR		20	6.5	1.5	—	—	16	22	—	—	19	27	24	32	29	58	11
	RQ7E110AJ	TCR		30	11	1.5	—	—	6.8	9	—	—	9.1	12.4	—	—	—	—	22
	RQ1E100XN	TR		30	10	1.5	7.5	10.5	9.5	13.3	10	14	—	—	—	—	—	—	12.7*1
	RQ1E075XN	TCR		30	7.5	1.5	12	17	17	24	19	27	—	—	—	—	—	—	6.8*1
	QH8KA4	TCR		30	9	1.5	—	—	12.5	17	13	18	17	24	—	—	—	—	12
	QS8K13	TCR	N+N	30	6	1.5	20	28	25	35	28	39	—	—	—	—	—	—	5.5*1
	QH8KA2	TCR		30	4.5	1.5	25	35	40	56	—	—	—	—	—	—	—	—	4.7
	QH8KA1	TCR		30	4.5*2	2.4*2	56	73	86	112	—	—	—	—	—	—	—	—	1.5
	QS8K11	TCR		30	3.5	1.5	35	50	45	65	50	70	—	—	—	—	—	—	3.3*1
	QH8K26	TR		40	7*2	2.6*2	27	38	35	50	—	—	—	—	—	—	—	—	2.9*1
	QH8K22	TCR		40	6*2	2.5*2	34.6	46	43.9	59	—	—	—	—	—	—	—	—	1.3
	QS8K21	TR		45	4	1.5	38	53	48	67	53	75	—	—	—	—	—	—	5.4*1
	New QH8K51	TR		100	2	1.5	240	325	250	340	260	355	—	—	—	—	—	—	4.7*1
	RQ1A070AP	TR	P	-12	-7	1.5	—	—	10	14	—	—	13	19	18	27	24	48	80
	RQ1A060ZP	TR		-12	-6	1.5	—	—	16	23	—	—	22	31	28	42	39	78	34
	New RQ7E100AT	TCR		-30	-10	1.5	8.7	11.2	11.9	14.8	—	—	—	—	—	—	—	—	26
	RQ1E070RP	TR		-30	-7	1.5	12	17	17	24	19	27	—	—	—	—	—	—	26*1
	RQ7E055AT	TCR		-30	-5.5	1.5	19.3	24.5	28.2	36.1	—	—	—	—	—	—	—	—	9.4
	RQ1E050RP	TR		-30	-5	1.5	22	31	32	45	36	50	—	—	—	—	—	—	13*1
	QS8J13	TR	P+P	-12	-5.5	1.5	—	—	15	22	—	—	19	28	24	38	29	58	60
	QS8J2	TR		-12	-4	1.5	—	—	26	36	—	—	36	50	46	69	66	132	20
	New QH8JA1	TCR		-20	-5	1.5	—	—	28	38	—	—	35	48	49	77	—	—	10.2
	QS8J5	TR		-30	-5	1.5	28	39	40	56	45	63	—	—	—	—	—	—	10*1
	QS8J4	TR		-30	-4	1.5	40	56	55	77	60	84	—	—	—	—	—	—	8.4*1
	QH8MA4	TCR		30	9*2	2.6*2	12.3	16	18.2	23.7	—	—	—	—	—	—	—	—	7.9
	QH8MA3	TCR	-30	-8*2	2.6*2	22	28.6	31	40.3	—	—	—	—	—	—	—	—	—	9.8
			30	7*2	2.5*2	22	29	35	46	—	—	—	—	—	—	—	—	3.7	
	QH8MA2	TCR	-30	-5.5*2	2.5*2	37	48	55	72	—	—	—	—	—	—	—	—	—	5.2
			30	4.5	1.5	25	35	40	56	—	—	—	—	—	—	—	—	4.7	
	QH8M22	TCR	-30	-3	1.5	55	80	80	115	—	—	—	—	—	—	—	—	—	4.3
			40	4.5	1.5	34.6	46	43.9	59	—	—	—	—	—	—	—	—	1.3	
	QS8M31	TR	-40	-2	1.5	130	190	180	260	—	—	—	—	—	—	—	—	—	4.4
			60	3	1.5	80	112	93	130	98	137	—	—	—	—	—	—	—	4*1
	QS8M51	TR	-60	-2	1.5	150	210	180	252	190	266	—	—	—	—	—	—	—	7.2*1
			100	2	1.5	240	325	250	340	260	355	—	—	—	—	—	—	—	4.7*1
				-100	-1.5	1.5	350	470	380	510	400	540	—	—	—	—	—	—	17*1

Notes1 : () : ROHM Packages
 Notes2 : *1 : V_{GS}=5V *2 : P_W≤1s

●Quick Reference for Multiple Schottky Barrier Diodes Small Signal MOSFET series (TUMT • TSST • TSMT Package)

Dual type<MOSFET+SBD>



V _{DSS} (V)	0.5	1	1.5	2	2.5
20			1.5A	SOT-25T(TSMT5) / P.C9	2.5A
30			1.4A, 1.5A	SOT-353T(TUMT5)[SC-113CA] / P.C9	
				SOT-25T(TSMT5) / P.C9	2A
-20		-1A	SOT-353T(TUMT5)[SC-113CA] / P.C9		(TSST8) / P.C9
			SOT-25T(TSMT5) / P.C9	-1.5A	-2A
			-1.5A	SOT-457T(TSMT6)[SC-95] / P.C9	
-30				SOT-25T(TSMT5) / P.C9	-2A
		-1A	SOT-457T(TSMT6)[SC-95] / P.C9		
-45	-0.7A	SOT-353T(TUMT5)[SC-113CA] / P.C9			

Note : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

Multiple Schottky Barrier Diodes Small Signal MOSFET series

Package	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (Ta=25°C)	R _{DS(on)} (mΩ)										Qg(nC) (V _{GS} =4.5V)
	Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =4.0V		V _{GS} =2.5V		V _{GS} =1.5V		
							Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	
SOT-353T (TUMT5) [SC-113CA] 2021 size	US5U1	TR	N+SBD(0.5A)	30	1.5	1	—	—	170	240	180	250	240	340	—	—	1.6
	US5U2	TR		30	1.4	1	170	240	250	350	270	380	—	—	—	1.4*1	
	US5U30	TR	P+SBD(0.5A)	—20	—1	1	—	—	280	390	310	430	570	800	—	—	2.1
	US5U35	TR	P+SBD(0.1A)	—45	—0.7	1	600	800	900	1,300	1,000	1,400	—	—	—	—	1.7*1
(TSST8) 3019 size	TT8U1	TR	P+SBD(1A)	—20	—2.4	1.25	—	—	80	105	—	—	105	140	180	360	6.7
	TT8U2	TR		—20	—2.4	1.25	—	—	80	105	—	—	105	140	180	360	6.7
SOT-25T (TSMT5) 2928 size	QS5U36	TR	N+SBD(0.7A)	20	2.5	1.25	—	—	58	81	—	—	74	104	120	240	3.5
	QS5U34	TR	N+SBD(0.5A)	20	1.5	1.25	—	—	130	180	—	—	170	240	220*6	310*6	1.8
	QS5U13*2	TR	N+SBD(0.5A)	30	2	1.25	—	—	71	100	76	107	110	154	—	—	2.8
	QS5U16*2	TR		30	2	1.25	—	—	71	100	76	107	110	154	—	—	2.8
	QS5U12*3	TR		30	2	1.25	—	—	71	100	76	107	110	154	—	—	2.8
	QS5U17*3	TR		30	2	1.25	—	—	71	100	76	107	110	154	—	—	2.8
	QS5U28	TR	P+SBD(1A)	—20	—2	1.25	—	—	90	125	97	135	175	245	—	—	4.8
	QS5U23*4	TR	P+SBD(0.5A)	—20	—1.5	1.25	—	—	160	200	180	240	260	340	—	—	4.2
	QS5U26*4	TR		—20	—1.5	1.25	—	—	160	200	180	240	260	340	—	—	4.2
	QS5U21*5	TR	P+SBD(1A)	—20	—1.5	1.25	—	—	160	200	180	240	260	340	—	—	4.2
	QS5U27*5	TR		—20	—1.5	1.25	—	—	160	200	180	240	260	340	—	—	4.2
	QS5U33	TR	P+SBD(1A)	—30	—2	1.25	95	135	145	205	160	225	—	—	—	—	3.4*1
SOT-457T (TSMT6) [SC-95] 2928 size	QS6U22	TR	P+SBD(0.7A)	—20	—1.5	1.25	—	—	155	215	170	235	310	430	—	—	3
	QS6U24	TR		—30	—1	1.25	300	400	500	700	600	800	—	—	—	—	1.7*6

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

Notes2 : *1 : V_{GS}=5V *2,*3,*4,*5 : Please note that, although the internal circuit configuration may differ between part numbers, the electrical specifications remain the same. *6 : V_{GS}=1.8V

Power MOSFETs

● Quick Reference for Power MOSFET series

Single type<Nch>

V_{DS} (V)	1	2	3	4	5	6	7	8	9	10	20	30	40	50
30			(3A) SOT-89(MPT3)[SC-62] / P.C11			(6A) DFN2020-8S(HUML2020L8 Single) / P.C11				(11A)		(15A) (HSMT8) / P.C11	(39A)	
40						DFN2020-8S(HUML2020L8 Single) / P.C11			(9A)		(HSMT8) / P.C11	(27A) (39A)		
60		(2A) SOT-89(MPT3)[SC-62] / P.C11				(5.5A) DFN2020-8S(HUML2020L8 Single) / P.C11						(13A) (HSMT8) / P.C11	(30A)	
100												(HSMT8) / P.C11	(36A)	

Dual type<Nch+Nch>

V_{DS} (V)	1	2	3	4	5	6	7	8	9	10	20	30	40	50
30/30					(5.5A) DFN2020-8D(HUML2020L8 Dual) / P.C11									
60/60			(3A) DFN2020-8D(HUML2020L8 Dual) / P.C11				(7A) (HSML3030L10) / P.C11			(11A)				

Single type<Pch>

V_{DS} (V)	-1	-2	-3	-4	-5	-6	7	8	9	10	20	30	40	50
-20										(10A) DFN2020-8S(HUML2020L8 Single) / P.C11		(30A) (HSMT8) / P.C11		
-30							(7.5A) DFN2020-8S(HUML2020L8 Single) / P.C11					(18A) (HSMT8) / P.C11	(39A)	

Dual type<Pch+Pch>

V_{DS} (V)	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
-20/-20					(5A) DFN2020-8D(HUML2020L8 Dual) / P.C11					
-30/-30				(4A) DFN2020-8D(HUML2020L8 Dual) / P.C11						

Dual type<Nch+Pch>

V_{DS} (V)	1	2	3	4	5	6	7	8	9	10	20	30	40	50
20/-20					(5A 5.5A) DFN2020-8D(HUML2020L8 Dual) / P.C11									
30/-30				(4A) DFN2020-8D(HUML2020L8 Dual) / P.C11										

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code
 Notes2 : P.Cxx represents page number.

Power MOSFETs <MPT3·HUML2020L8·HSMT8·HSML3030L10 Package>

Package	Application	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (Ta=25°C)	R _{DS(on)} (mΩ)												Qg(nC) (V _{GS} =4.5V)	
		Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =4.0V		V _{GS} =2.5V		V _{GS} =1.8V		V _{GS} =1.5V			
								Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.		
 SOT-89 (MPT3) [SC-62] 4540 size	DC/DC Converter Motor Drive	RHP030N03	T100	N	30	3	2	90	120	—	—	160	210	—	—	—	—	—	—	6.5*2	
		RHP020N06	T100		60	2	2	150	200	200	280	240	340	—	—	—	—	—	7*2		
		RJP020N06	T100		60	2	2	—	—	165	240	170	250	210	300	—	—	—	—	5*3	
 DFN2020-8S (HUML2020L8) Single 2020 size	DC/DC Converter Motor Drive	RF4E110GN	TR	N	30	11	2	8.7	11.3	11.7	16.5	—	—	—	—	—	—	—	—	3.5	
		RF4E080GN	TR		30	8	2	13.5	17.6	17.6	31.2	—	—	—	—	—	—	—	—	2.8	
		RF4E070GN	TR		30	7	2	16.4	21.4	23	33	—	—	—	—	—	—	—	—	2.2	
	New RF4L055GN	TCR	60		5.5	2	31	43	45	66	—	—	—	—	—	—	—	—	4.1		
	Load Switch Switching	RF4E110BN	TR	30	11	2	8.5	11.1	11.8	15.4	—	—	—	—	—	—	—	—	—	12	
		RF4E100AJ	TCR	30	10	2	—	—	9.4	12.4	—	—	13.3	17.9	—	—	—	—	—	13	
		RF4E080BN	TR	30	8	2	13.5	17.6	18.9	24.6	—	—	—	—	—	—	—	—	—	7.2	
		RF4E060AJ	TCR	30	6	2	—	—	28	37	—	—	41	55	—	—	—	—	—	4	
		RF4C050AP	TR	−20	−10	2	—	—	18	26	—	—	22	31	27	45	32	65	55		
		RF4C100BC	TCR	−20	−10	2	—	—	12	15.6	—	—	15.4	20	23.5	37.6	—	—	—	23.5	
RF4E075AT		TCR	−30	−7.5	2	16.7	21.7	24.4	31.7	—	—	—	—	—	—	—	—	—	11		
 DFN2020-8D (HUML2020L8) Dual 2020 size	Load Switch Switching	UT6K3	TCR	N+N	30	5.5	2	—	—	30	42	—	—	45	63	—	—	—	—	4	
		New UT6K30	TCR		60	3	2	111	153	162	223	—	—	—	—	—	—	—	—	—	1.1*2
		UT6JA3	TCR	P+P	−20	−5	2	—	—	42	59	—	—	54	76	76	118	—	—	—	6.5
		UT6JA2	TCR		−30	−4	2	55	70	80	103	—	—	—	—	—	—	—	—	—	3.4
	Motor	UT6MA3	TBR	N+P	20	5.5	2	—	—	30	42	—	—	45	63	—	—	—	—	—	4
		UT6MA3	TBR		−20	−5	2	—	—	42	59	—	—	54	76	—	—	—	—	—	6.5
		UT6MA2	TCR		30	4	2	37	46	59	80	—	—	—	—	—	—	—	—	—	2.2
		UT6MA2	TCR		−30	−4	2	55	70	80	103	—	—	—	—	—	—	—	—	—	3.3
 (HSMT8) 3333 size	DC/DC Converter Switching	RQ3E180GN	TB	N	30	39*1	20*1	3.3	4.3	4.3	6.1	—	—	—	—	—	—	—	—	11	
		RQ3E150GN	TB		30	39*1	17*1	4.7	6.1	6.2	8.8	—	—	—	—	—	—	—	—	—	7.4
		RQ3E120GN	TB		30	27*1	15*1	6.7	8.8	9.1	13.8	—	—	—	—	—	—	—	—	—	4.8
		RQ3E100GN	TB		30	21*1	15*1	8.9	11.7	12	20	—	—	—	—	—	—	—	—	—	3.9
		RQ3E080GN	TB		30	18*1	14*1	12.9	16.7	17.5	31.2	—	—	—	—	—	—	—	—	—	2.8
		RQ3G150GN	TB		40	39*1	20*1	5.1	7.2	6.4	8.9	—	—	—	—	—	—	—	—	—	11.6
		RQ3G100GN	TB		40	27*1	15*1	11	14.3	14.1	18.3	—	—	—	—	—	—	—	—	—	4.3
		New RQ3L090GN	TB		60	30*1	20*1	10.3	13.9	14.6	21.4	—	—	—	—	—	—	—	—	—	13
		RQ3L050GN	TB		60	13*1	15*1	43	61	61	86	—	—	—	—	—	—	—	—	—	2.8
		New RQ3P300BE	TB1		100	36*1	32*1	16	21	—	—	—	—	—	—	—	—	—	—	—	19.1*1
		RQ3E180BN	TB		30	39*1	20*1	2.8	3.9	3.7	5.2	—	—	—	—	—	—	—	—	—	37
		RQ3E150BN	TB		30	39*1	17*1	3.8	5.3	5.3	7.4	—	—	—	—	—	—	—	—	—	23
	Load Switch Switching	RQ3E130BN	TB	30	39*1	16*1	4.4	6	6.7	9.4	—	—	—	—	—	—	—	—	—	16	
		RQ3E180AJ	TB	30	30*1	30*1	—	—	3.5	4.5	—	—	4.5	5.8	—	—	—	—	—	39	
		RQ3E110AJ	TB	30	24*1	15*1	—	—	8.8	11.7	—	—	12.6	16.5	—	—	—	—	—	13.5	
		RQ3E120BN	TB	30	21*1	16*1	6.6	9.3	8.6	11.9	—	—	—	—	—	—	—	—	—	14	
		RQ3E100BN	TB	30	21*1	15*1	7.7	10.4	11	15.3	—	—	—	—	—	—	—	—	—	10.5	
		RQ3E160AD	TB	30	16	2	3.5	4.5	5	7	—	—	—	—	—	—	—	—	—	25	
		RQ3E080BN	TB	30	15*1	14*1	11	15.2	16	22	—	—	—	—	—	—	—	—	—	7.2	
		RQ3E070BN	TB	30	15*1	13*1	20	27	29	39	—	—	—	—	—	—	—	—	—	4.6	
		RQ3C150BC	TB	−20	−30*1	20*1	—	—	4.8	6.7	—	—	6.1	8.5	8.8	14	—	—	—	60	
		RQ3E120AT	TB	−30	−39*1	20*1	6.1	8	8.7	11.3	—	—	—	—	—	—	—	—	—	33	
		New RQ3E100AT	TB	−30	−31*1	17*1	9	11.4	13.1	16.7	—	—	—	—	—	—	—	—	—	21	
		RQ3E075AT	TB	−30	−18*1	15*1	17.4	23	26	33	—	—	—	—	—	—	—	—	—	10.4	
 (HSML3030L10) 3030 size	DC/DC Converter	HS8S2	TB	N+N	30	10	2	11.2	14.6	14.7	20	—	—	—	—	—	—	—	—	2.7	
		HS8K1	TB		30	11	2	10.5	12.6	12.1	16.5	—	—	—	—	—	—	—	—	—	12
		HS8K1	TB		30	10	2	11.2	14.6	14.7	20	—	—	—	—	—	—	—	—	—	2.7
		HS8K1	TB		30	11	2	9.1	11.8	11.9	16.5	—	—	—	—	—	—	—	—	—	3.3
		HS8K11	TB		30	7	2	12.8	17.9	20.8	29.1	—	—	—	—	—	—	—	—	—	5.7
					30	11	2	10.2	13.3	11.8	15.4	—	—	—	—	—	—	—	9		

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code
Notes2 : *1 : T=25°C *2 : V_{GS}=10V *3 : V_{GS}=4V

Power MOSFETs

● Quick Reference for (SOP8)Single/Dual Package

Single type<Nch>

(SOP8)
Single(SOP8)
Dual

V _{DSS} (V)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
30							7A			(SOP8)Single / P.C13			13.5A					
45							7A			(SOP8)Single / P.C13								
60					4.5A					(SOP8)Single / P.C13				14A				

Dual type<Nch+Nch>

V _{DSS} (V)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
30/30				3.5A						(SOP8)Dual / P.C13					15A			
40/40					5.2A	6A				(SOP8)Dual / P.C13								
60/60					4.5A					(SOP8)Dual / P.C13				13A				
80/80				3.4A						(SOP8)Dual / P.C13								
100/100				3A						(SOP8)Dual / P.C13								

Single type<Pch>

V _{DSS} (V)	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18
-30				14A						(SOP8)Single / P.C13								18A
-45								17A		(SOP8)Single / P.C13								

Dual type<Pch+Pch>

V _{DSS} (V)	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18
-30/-30					-4.5A					(SOP8)Dual / P.C13								-9A
-60/-60					-4.5A					(SOP8)Dual / P.C13								

Dual type<Nch+Pch>

V _{DSS} (V)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
30/-30					4.5A					(SOP8)Dual / P.C13								9A
45/-45				3.5A	4.5A					(SOP8)Dual / P.C13								
60/-60					4.5A					(SOP8)Dual / P.C13								
80/-80				2.6A	3.4A					(SOP8)Dual / P.C13								
100/-100				2.5A	3A					(SOP8)Dual / P.C13								

Notes1 : () : ROHM Packages

Notes2 : P.Cxx represents page number.

C

<SOP8 Package> (Single type)

Package	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (Ta=25°C)	R _{DS(on)} (mΩ)						Qg(nC) (V _{GS} =5V)
	Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =4.0V		
							Typ.	Max.	Typ.	Max.	Typ.	Max.	
(SOP8) 5060 size 	RS3E135BN	TB	N	30	13.5	2	5.7	7.4	8.5	10.9	—	—	16.6 ^{*1}
	RXH125N03	TB		30	12.5	2	7.5	12	9.5	13.3	10	14	12.7
	RXH100N03	TB		30	10	2	9.5	13	12	17	13	18	11
	RS3E095BN	TB		30	9.5	2	11.9	14.6	17.5	21.9	—	—	8.3 ^{*1}
	RXH090N03	TB		30	9	2	12	17	17	24	19	27	6.8
	RXH070N03	TB		30	7	2	20	28	25	35	28	39	5.8
	RSH070N05	TB		45	7	2	18	25	23	32	25	35	12
	New RS3L140GN	TB		60	14	2	4.9	6.5	6.8	9.6	—	—	31 ^{*1}
	RSH065N06	TB		60	6.5	2	24	37	28	44	31	48	11
	New RS3L045GN	TB		60	4.5	2	43	59	62	92	—	—	3 ^{*1}
	New RS3E180AT	TB1	−30	−18	2	4.1	5.4	5	6.1	—	—	80 ^{*1}	
	RRH140P03	TB	−30	−14	2	5	7	6.7	9.4	7.3	10.2	80	
	RRH100P03	TB	−30	−10	2	9	12.6	12.5	17.5	14	19.6	39	
	RRH090P03	TB1	−30	−9	2	11	15.4	15	21	17	24	30	
	RS3E075AT	TB	−30	−7.5	2	18	23.5	24	31	—	—	12.8 ^{*1}	
	RSH050P03	TB	−30	−5	2	30	42	47	65	55	77	13	
	RRH050P03	TB1	−30	−5	2	36	50	52	72	58	80	9.2	
	RSH040P03	TB	−30	−4	2	42	58	68	92	78	106	8	
	RRH040P03	TB	−30	−4	2	55	75	85	115	95	125	5.2	
	RSH070P05	TB1	−45	−7	2	19	27	25	35	28	39	34	

<SOP8 Package> (Dual type)

Package	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (Ta=25°C)	R _{DS(on)} (mΩ)						Qg(nC) (V _{GS} =5V)
	Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =4.0V		
							Typ.	Max.	Typ.	Max.	Typ.	Max.	
(SOP8) 5060 size 	SH8K10S	TB	N N+SBD	30	7	2	17	24	23	33	25	35	8.4
				30	8.5		14	19.6	17.8	24.9	19	26.6	8.9
	SH8KA7	TB	N+N	30	15 ^{*3}	4.6 ^{*3}	7.1	9.1	8.3	10.7	—	—	41 ^{*1}
	SH8KA4	TB		30	9 ^{*3}	3 ^{*3}	16.5	21.4	22.2	28.9	—	—	7.9 ^{*1}
	SH8KA2	TB		30	8 ^{*3}	2.8 ^{*3}	23	28	34	43	—	—	4.1 ^{*1}
	SH8K12	TB		30	6 ^{*3}	2	30	42	40	56	45	63	4
	SH8KA1	TB		30	4.5 ^{*3}	2.7 ^{*3}	54	69	84	109	—	—	1.6 ^{*1}
	SH8K11	TB		30	3.5	2	70	98	90	126	100	140	1.9
	SH8K26	TB		40	6	2	27	38	35	50	—	—	2.9
	SH8K25	TB		40	5.2 ^{*3}	3 ^{*3}	60	85	80	112	—	—	1.7
	New SH8K39	TB		60	13 ^{*3}	5.8 ^{*3}	15	21	20	30	—	—	12.8 ^{*1}
	New SH8K37	TB		60	5.5	2	33	46	44	66	—	—	5.2 ^{*1}
	SH8K32	TB	P+P	60	4.5	2	46	65	52	73	55	77	7
	SH8K41	TB		80	3.4	2	90	130	110	150	120	160	6.6
	SH8K52	TB		100	3	2	120	170	135	190	—	—	8.5
	SH8J66	TB		−30	−9	2	13.5	18.5	17.5	23.6	19	24.7	35
	SH8J65	TB		−30	−7	2	21.5	29	29	39	31	40.8	18
	SH8J62	TB	N+P	−30	−4.5	2	40	56	55	77	60	84	8
	SH8J31	TB		−60	−4.5	2	50	70	55	80	60	85	40 ^{*2}
	New SH8MA4	TB1		30	9 ^{*3}	3.0 ^{*3}	16.5	21.4	22.2	32.5	—	—	7.9 ^{*1}
				−30	−8.5 ^{*3}		23	29.6	32	41.3	—	—	9.8 ^{*1}
	New SH8MA3	TB1		30	7 ^{*3}	2.8 ^{*3}	23	28	42	57	—	—	3.7 ^{*1}
				−30	−6 ^{*3}		40	50	60	73	—	—	5.2 ^{*1}
	New SH8MA2	TB		30	4.5 ^{*3}	2.7 ^{*3}	57	80	88	125	—	—	1.5 ^{*1}
				−30	−4.5 ^{*3}		63	82	89	115	—	—	3.4 ^{*1}
	SH8M24	TB	N+P	45	4.5	2	33	46	41	57	46	64	6.8
				−45	−3.5		45	63	60	84	66	92	13
	SH8M31	TB		60	4.5	2	46	65	52	73	55	77	7 ^{*1}
				−60	−4.5		50	70	55	80	60	85	20 ^{*1}
	SH8M41	TB		80	3.4	2	90	130	110	150	120	160	6.6
				−80	−2.6		165	240	220	300	230	310	8.2
	SH8M51	TB		100	3	2	120	170	130	180	135	190	8.5
				−100	−2.5		210	290	230	320	240	340	12.5

Notes1 : () : ROHM Packages

Notes2 : *1 : V_{GS}=4.5V *2 : V_{GS}=10V *3 : P_W≤1s

Power MOSFETs

●Quick Reference for Power MOSFET series (HSOP8)Single type

Single type<Nch>

(HSOP8)
Single

V _{DSS} (V)	Feature	10	20	30	40	50	60	70	80
30	Switching				35A		(HSOP8)Single		80A
40					34A		(HSOP8)Single		80A
60					36A		(HSOP8)Single	68A	
100							60A	(HSOP8)Single	

Single type<Pch>

V _{DSS} (V)	Feature	-10	-20	-30	-40	-50	-60	-70	-80
-30	Switching							(HSOP8)Single	-76A-80A

Notes1 : () : ROHM Packages

(HSOP8)Single type

Package	Application	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A) (T _C =25°C)	P _D (W) (T _C =25°C)	R _{DS(on)} (mΩ)				Q _g (nC) (V _{GS} =4.5V)	Drive Voltage (V)
		Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V			
								Typ.	Max.	Typ.	Max.		
(HSOP8) Single 	Load Switch	RS1E350BN	TB	N	30	80	35	1.2	1.7	1.8	2.5	95	4.5
		RS1E280BN	TB		30	80	30	1.7	2.3	2.3	3.2	50	
		RS1E200BN	TB		30	68	25	2.8	3.9	3.8	5.3	29	
		RS1E180BN	TB		30	60	25	3.5	4.9	4.9	6.9	23	
		RS1E240BN	TB		30	40	30	2.3	3.2	3.3	4.6	35	
		New RS1E260AT	TB1		P	-30	-80	40	2.5	3.1	3.5	4.3	
	New RS1E220AT	TB1	-30	-76		34	3.3	4.1	4.6	5.8	65		
	DC/DC Converter Switching	RS1E350GN	TB	N	30	80	39	1.48	1.76	1.92	2.40	32.7	
		RS1E321GN	TB1		30	80	34	1.4	1.9	1.8	2.9	19.6	
		RS1E301GN	TB1		30	80	33	1.7	2.2	2.2	3.3	18.5	
		RS1E280GN	TB		30	80	31	2.0	2.6	2.6	3.8	17.1	
		RS1E240GN	TB		30	72	27	2.6	3.3	3.3	5.2	11.2	
		RS1E200GN	TB		30	57	25	3.6	4.6	4.7	7.5	7.8	
		RS1E170GN	TB		30	40	23	5.1	6.7	6.7	10.3	5.9	
		RS1E150GN	TB		30	40	22	6.7	8.8	8.8	13.3	4.8	
		RS1E130GN	TB		30	35	22	8.9	11.7	11.7	17.7	3.9	
		RS1G300GN	TB		40	80	35	1.9	2.5	2.4	3.0	28.6	
		RS1G260MN	TB		40	80	35	2.4	3.3	3.2	4.4	44*	
		RS1G180MN	TB		40	57	30	5.0	7.0	6.7	9.2	19.5*	
		RS1G150MN	TB		40	43	25	7.6	10.6	10.2	13.3	15*	
		RS1G120MN	TB		40	34	25	11.6	16.2	15.6	20.7	9.4*	
		RS1L180GN	TB		60	68	39	4.2	5.6	5.9	8.5	34	
		RS1L145GN	TB		60	46	31	6.7	9.7	9.6	14.1	19.5	
		RS1L120GN	TB		60	36	27	9.3	12.7	13.4	19.8	14	
		New RS1P600BE	TB1		100	60	35	7.5	9.7	—	—	33*	

Notes1 : () : ROHM Packages Notes2 : *V_{GS}=10V

●Quick Reference for Power MOSFET series (HSOP8)Dual type

Dual type<Nch+Nch>

(HSOP8)
Dual

V _{DSS} (V)	Feature	10	20	30	40	50	60	70	80
30/30	Switching		14A		(HSOP8)Dual(N+N)				80A
				27A	(HSOP8)Dual(N+N+SBD)				80A

Dual type<Nch+Pch>

V _{DSS} (V)	Feature	1	5	10	15	20	25
30/-30	Motor				15A	18A	(HSOP8)Dual
60/-60				8.5A	(HSOP8)Dual		
100/-100			4.5A	(HSOP8)Dual			

Notes1 : () : ROHM Packages

(HSOP8)Dual type

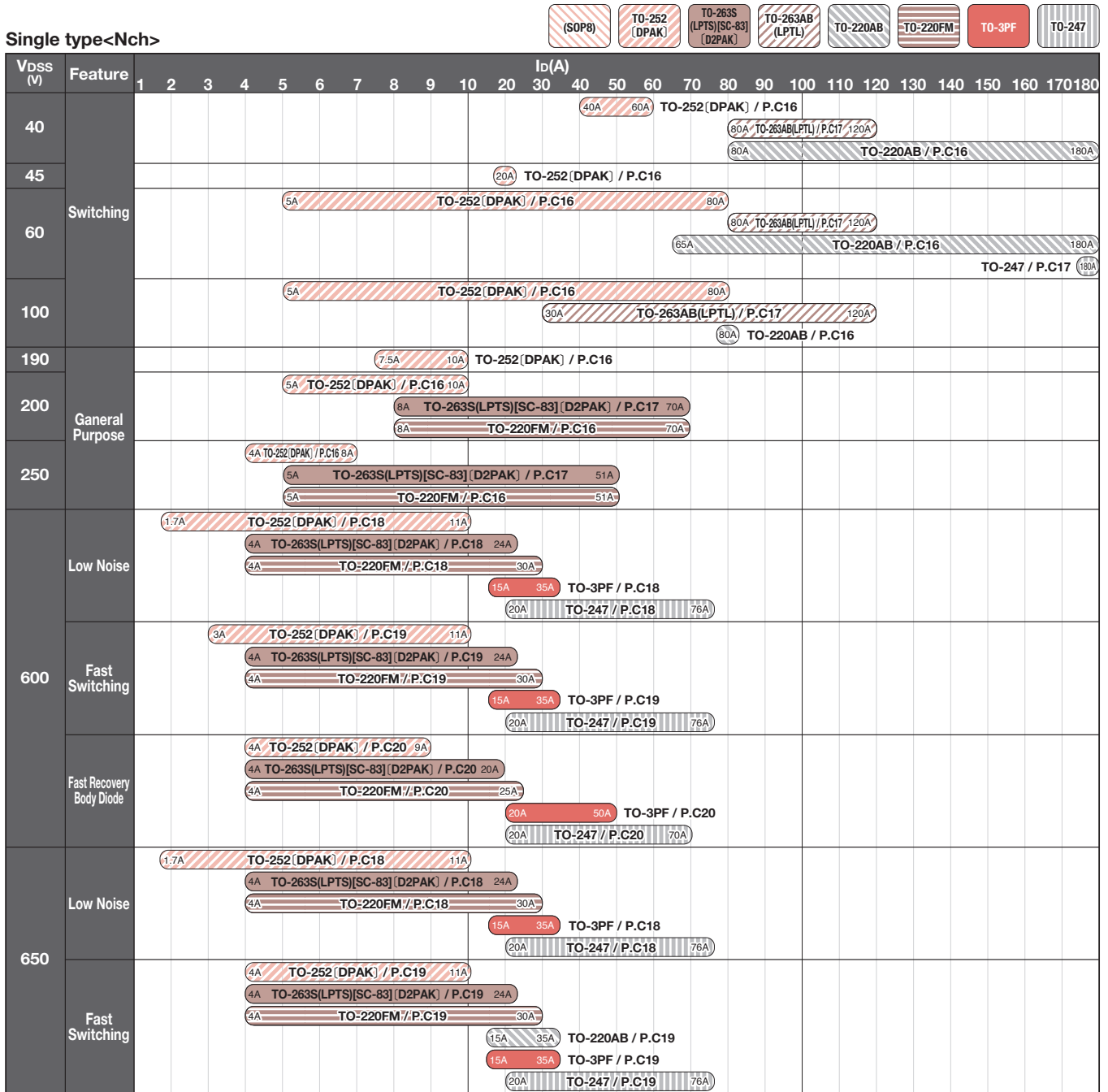
Package	Application	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A) (Ta=25°C)	P _D (W) (Ta=25°C)	R _{DS(on)} (mΩ)				Q _g (nC) (V _{GS} =4.5V)	Drive Voltage (V)	
		Part No.	Taping Code					V _{GS} =10V		V _{GS} =4.5V				
								Typ.	Max.	Typ.	Max.			
 (HSOP8) Asymmetry Dual	Switching	HP8K24	TB	N+N	30	80*1	31*1	2.3	3	3.2	4.2	17.2		
					30	27*1	22*1	6.7	8.8	9.1	13.3	4.8		
		HP8K22	TB		30	57*1	25*1	3.6	4.6	4.7	7.5	7.8		
					30	27*1	22*1	6.7	8.8	9.1	13.3	4.8		
		HP8S36	TB		N	30	80*1	29*1	2	2.4	2.3	2.8	47	
N+SBD	30				27*1	22*1	6.7	8.8	9.1	13.3	4.8			
 (HSOP8) Symmetry Dual	Motor	HP8MA2	TB1		N+P	30	18*2	7*2	7.5	9.6	11.7	16.5	10.5	
					P	-30	-15*2	7*2	13.2	17.9	21	29	12.8	
		New HP8M31	TB1		N+P	60	8.5*2	7*2	46	65	52	73	6.2	
						-60	-8.5*2	7*2	50	70	55	80	15.7	
						100	4.5*2	7*2	120	170	130	180	8.5	
		New HP8M51	TB1			-100	-4.5*2	7*2	210	290	230	320	12.5	
 (HSOP8) Drain Common Dual	Load Switch	HP8KA1	TB	N+N		30	14*1	3*1	3.5	5	5	7	24	

Notes1 : () : ROHM Packages

Notes2 : *1 : T_C=25°C *2 : P_W≤1s

● Quick Reference for Power MOSFET series

Single type<Nch>



Dual type<Nch+Nch>

V _{DS} (V)	Feature	I _D (A)	1
500/500	General Purpose	0.5A (SOP8) / P.C19	

Single type<Pch>

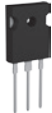
V _{DS} (V)	Feature	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-20	-30
-45	Switching												
-60													
-100													

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code, { } : GENERAL code
 Notes2 : P.Cxx represents page number.

Power MOSFETs

Power MOSFET series															
Package	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A) (T _C =25°C)	P _D (W) (T _C =25°C)	R _{DS(on)} (mΩ)								Q _g (nC) (V _{GS} =10V)
	Part No.	Taping Code					V _{GS} =10V		V _{GS} =6.0V		V _{GS} =4.5V		V _{GS} =4.0V		
							Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	
TO-252 〔DPAK〕 	New RD3G600GN	TL	N	40	60	40	2.8	3.6	—	—	3.3	4.3	—	—	46.5
	New RD3G500GN	TL		40	50	35	3.9	4.9	—	—	4.7	6.3	—	—	31
	RD3G400GN	TL		40	40	26	5.6	7.5	—	—	7	9.5	—	—	19
	New RD3H200SN	TL1		45	20	20	20	28	—	—	25	35	28	40	12*1
	New RD3L08BGN	TL		60	80*2	119	4.2	5.5	—	—	5.7	8.1	—	—	71
	RD3L220SN	TL1		60	22	20	18	26	—	—	21	30	23	33	30
	RD3L150SN	TL1		60	15	20	28	40	—	—	33	47	36	51	18
	RD3L080SN	TL1		60	8	15	57	80	—	—	70	98	78	109	9.4
	RD3L050SN	TL1		60	5	15	78	109	—	—	94	131	100	140	8
	New RD3P08BBD	TL		100	80*2	119	8.6	11.6	9.7	16	—	—	—	—	37
	RD3P200SN	TL1		100	20	20	33	46	—	—	—	—	36	50	55
	RD3P175SN	TL1		100	17.5	20	75	105	—	—	80	112	85	119	24
	RD3P100SN	TL1		100	10	20	95	133	—	—	100	140	105	147	18
	RD3P050SN	TL1		100	5	15	135	190	—	—	142	200	145	205	14
	RD3S100CN	TL1		190	10	85	130	182	—	—	—	—	136	190	52
	RD3S075CN	TL1		190	7.5	52	240	336	—	—	—	—	248	347	30
	RD3T100CN	TL1		200	10	85	140	182	—	—	—	—	—	—	25
	RD3T075CN	TL1		200	7.5	52	250	325	—	—	—	—	—	—	15
	RD3T050CN	TL1		200	5	29	540	760	—	—	—	—	—	—	8.3
	RD3U080CN	TL1		250	8	85	225	300	—	—	—	—	—	—	25
	RD3U060CN	TL1		250	6	52	410	530	—	—	—	—	—	—	15
	RD3U040CN	TL1		250	4	29	930	1,300	—	—	—	—	—	—	8.5
	RD3H160SP	TL1	P	−45	16	20	35	50	—	—	45	63	50	70	16*1
	RD3H080SP	TL1		−45	−8	15	65	91	—	—	95	133	105	147	9*1
	RD3H045SP	TL1		−45	−4.5	15	112	157	—	—	160	224	185	259	5.6*1
	RD3L140SP	TL1		−60	−14	20	60	84	—	—	73	103	77	108	27
	RD3P130SP	TL1		−100	−13	20	135	200	—	—	150	220	155	230	40
TO-220FM 	RCX700N20	—	N	200	70	83	30.5	42.7	—	—	—	—	—	—	125
	RCX450N20	—		200	45	69	42	55	—	—	—	—	—	—	80
	RCX300N20	—		200	30	61	60	80	—	—	—	—	—	—	60
	RCX200N20	—		200	20	48	100	130	—	—	—	—	—	—	40
	RCX160N20	—		200	16	43	135	180	—	—	—	—	—	—	26
	RCX120N20	—		200	12	40	250	325	—	—	—	—	—	—	15
	RCX081N20	—		200	8	40	470	770	—	—	—	—	—	—	9
	RCX511N25	—		250	51	84	48	65	—	—	—	—	—	—	120
	RCX330N25	—		250	33	69	77	105	—	—	—	—	—	—	80
	RCX220N25	—		250	22	61	105	140	—	—	—	—	—	—	60
	RCX120N25	—		250	12	48	180	235	—	—	—	—	—	—	35
	RCX100N25	—		250	10	43	245	320	—	—	—	—	—	—	26.5
	RCX080N25	—		250	8	35	460	600	—	—	—	—	—	—	15
	RCX051N25	—		250	5	30	970	1,360	—	—	—	—	—	—	9
TO-220AB 	RX1G18BGN	C10	N	40	180	125	1.17	1.64	—	—	1.33	1.87	—	—	168
	RX1G08CGN	C10		40	80	78	3.5	4.7	—	—	4.4	5.9	—	—	32
	RX1L18CGN	C10		60	180	208	1.59	2.15	—	—	2.17	3.26	—	—	190
	RX1L18BGN	C10		60	180	166	2	2.7	—	—	2.77	4.16	—	—	139
	RX1L16BGN	C10		60	160	125	2.9	4	—	—	4.1	6.2	—	—	88
	New RX1L08BGN	C10		60	80	96	5.2	7.2	—	—	7.3	10.9	—	—	55
	RX1L06BGN	C10		60	65	65	10.2	13.8	—	—	14.5	23.8	—	—	25

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code, [] : GENERAL code
Notes2 : *1 : V_{GS}=5V *2 : V_{GS}=10V

Power MOSFET series															
Package	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A) (T _C =25°C)	P _D (W) (T _C =25°C)	R _{DS(on)} (mΩ)								Q _g (nC) (V _{GS} =10V)
	Part No.	Taping Code					V _{GS} =10V		V _{GS} =6.0V		V _{GS} =4.5V		V _{GS} =4.0V		
							Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	
TO-263AB (LPTL) 	New RJ1G12BGN	TLL	N	40	120	178	1.38	1.86	—	—	1.54	2.08	—	—	165
	RJ1G08CGN	TLL		40	80	78	4.2	5.6	—	—	5	6.7	—	—	31.1
	RJ1L12BGN	TLL		60	120*2	192	2.1	2.9	—	—	2.7	4.1	—	—	175
	RJ1L12CGN	TLL		60	120*2	166	2.5	3.4	—	—	3.2	4.8	—	—	139
	RJ1L12DGN	TLL		60	120*2	125	3.9	5.3	—	—	5.1	7.7	—	—	88
	New RJ1L08CGN	TLL		60	80*2	96	5.3	7	—	—	7.4	10.7	—	—	55
	New RJ1P12BBD	TLL		100	120*2	178	3.8	5.3	4.9	7	—	—	—	—	91.5
TO-263S (LPTS) [SC-83] [D2PAK] 	RSJ650N10	TL	N	100	65	100	6.5	9.1	—	—	—	—	7	9.8	260
	RSJ550N10	TL		100	55	100	12	16.8	—	—	—	—	13.5	18.9	143
	RSJ400N10	TL		100	40	50	19	27	—	—	—	—	21	30	90
	RSJ301N10	TL		100	30	50	33	46	—	—	—	—	36	50	60
	RCJ700N20	TL		200	70	297	30.5	42.7	—	—	—	—	—	—	125
	RCJ450N20	TL		200	45	211	42	55	—	—	—	—	—	—	80
	RCJ300N20	TL		200	30	166	60	80	—	—	—	—	—	—	60
	RCJ200N20	TL		200	20	106	100	130	—	—	—	—	—	—	40
	RCJ160N20	TL		200	16	85	135	180	—	—	—	—	—	—	26
	RCJ120N20	TL		200	12	52	250	325	—	—	—	—	—	—	15
	RCJ081N20	TL		200	8	40	550	770	—	—	—	—	—	—	9
	RCJ510N25	TL		250	51	304	48	65	—	—	—	—	—	—	120
	RCJ330N25	TL		250	33	211	77	105	—	—	—	—	—	—	80
	RCJ220N25	TL		250	22	166	105	140	—	—	—	—	—	—	60
	RCJ120N25	TL		250	12	107	180	235	—	—	—	—	—	—	35
	RCJ100N25	TL		250	10	85	245	320	—	—	—	—	—	—	26.5
	RCJ050N25	TL		250	5	30	970	1360	—	—	—	—	—	—	9
	RSJ250P10	TL	P	−100	−25	50	45	63	—	—	48	67	50	70	60*1
	RSJ151P10	TL		−100	−15	50	85	120	—	—	95	135	100	140	64
TO-247 	New RZ2L18BGN	C11	N	60	180*2	208	2.1	2.9	—	—	—	—	—	—	190
	New RZ2L18CGN	C11		60	180*2	166	2.5	3.4	—	—	—	—	—	—	139

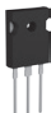
Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code, [] : GENERAL code
Notes2 : *1 : V_{GS}=5V *2 : V_{GS}=10V

Power MOSFETs

Low Noise type											
Package	Application	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (Tc=25℃)	R _{DS(on)} (Ω)		Qg (nC) V _{GS} =10V	Drive Voltage (V)
		Part No.	Taping Code					V _{GS} =10V			
								Typ.	Max.		
TO-252 〔DPAK〕		R6011END3	TL1	N	600	11	124	0.340	0.390	32	10
		R6009END3	TL1		600	9	94	0.500	0.535	23	10
		R6007END3	TL1		600	7	78	0.570	0.620	20	10
		R6004END3	TL1		600	4	59	0.900	0.980	15	10
		New R6002END3	TL1		600	1.7	26	2.800	3.400	6.5	10
		☆R6511END3	TL1		650	11	124	0.360	0.400	32	10
		☆R6509END3	TL1		650	9	94	0.530	0.585	24	10
		☆R6507END3	TL1		650	7	78	0.605	0.665	20	10
		☆R6504END3	TL1		650	4	59	0.955	1.050	15	10
		☆R6502END3	TL1		650	1.7	24	3.000	3.300	6.5	10
TO-263S (LPTS) 〔SC-83〕 〔D2PAK〕		R6024ENJ	TL	N	600	24	245	0.150	0.165	70	10
		R6020ENJ	TL		600	20	231	0.170	0.196	60	10
		R6015ENJ	TL		600	15	184	0.260	0.290	40	10
		R6011ENJ	TL		600	11	124	0.340	0.390	32	10
		R6009ENJ	TL		600	9	94	0.500	0.535	23	10
		R6007ENJ	TL		600	7	78	0.570	0.620	20	10
		R6004ENJ	TL		600	4	58	0.900	0.980	15	10
		R6524ENJ	TL		650	24	245	0.160	0.185	70	10
		R6520ENJ	TL		650	20	231	0.185	0.205	61	10
		R6515ENJ	TL		650	15	184	0.280	0.315	40	10
		R6511ENJ	TL		650	11	124	0.360	0.400	32	10
		R6509ENJ	TL		650	9	94	0.530	0.585	24	10
		R6507ENJ	TL		650	7	78	0.605	0.665	20	10
		R6504ENJ	TL		650	4	58	0.955	1.050	15	10
		TO-220FM			R6030ENX	—*	N	600	30	86	0.115
R6024ENX	—*			600	24	74		0.150	0.165	70	10
R6020ENX	—*			600	20	68		0.170	0.196	60	10
R6015ENX	—*			600	15	60		0.260	0.290	40	10
R6011ENX	—*			600	11	53		0.340	0.390	32	10
R6009ENX	—*			600	9	48		0.500	0.535	23	10
R6007ENX	—*			600	7	46		0.570	0.620	20	10
R6004ENX	—*			600	4	35		0.900	0.980	15	10
R6530ENX	—*			650	30	86		0.125	0.140	90	10
R6524ENX	—*			650	24	74		0.160	0.185	70	10
R6520ENX	—*			650	20	68		0.185	0.205	61	10
R6515ENX	—*			650	15	60		0.280	0.315	40	10
R6511ENX	—*			650	11	53		0.360	0.400	32	10
R6509ENX	—*			650	9	48		0.530	0.585	24	10
R6507ENX	—*			650	7	46		0.605	0.665	20	10
R6504ENX	—*			650	4	35		0.955	1.050	15	10
TO-3PF				R6035ENZ	C8	N		600	35	102	0.095
		R6030ENZ	C8	600	30		86	0.115	0.130	85	10
		R6024ENZ	C8	600	24		74	0.150	0.165	70	10
		R6020ENZ	C8	600	20		68	0.170	0.196	60	10
		R6015ENZ	C8	600	15		60	0.260	0.290	40	10
		R6535ENZ	C8	650	35		102	0.098	0.115	113	10
		R6530ENZ	C8	650	30		86	0.125	0.140	90	10
		R6524ENZ	C8	650	24		74	0.160	0.185	70	10
		R6520ENZ	C8	650	20		68	0.185	0.205	61	10
R6515ENZ	C8	650	15	60	0.280	0.315	40	10			
TO-247		New R6076ENZ4	C13	N	600	76	735	0.038	0.042	260	10
		New R6047ENZ4	C13		600	47	481	0.066	0.072	145	10
		☆R6035ENZ4	C13		600	35	379	0.095	0.102	110	10
		☆R6030ENZ4	C13		600	30	305	0.115	0.130	85	10
		☆R6024ENZ4	C13		600	24	245	0.150	0.165	70	10
		☆R6020ENZ4	C13		600	20	231	0.170	0.196	60	10
		New R6576ENZ4	C13		650	76	735	0.040	0.046	260	10
		☆R6547ENZ4	C13		650	47	481	0.070	0.080	145	10
		☆R6535ENZ4	C13		650	35	379	0.098	0.115	110	10
		☆R6530ENZ4	C13		650	30	305	0.125	0.140	85	10
		☆R6524ENZ4	C13		650	24	245	0.160	0.185	70	10
		☆R6520ENZ4	C13		650	20	231	0.185	0.205	60	10

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code, [] : GENERAL code
 Notes2 : * : Packaging type C7 G allows the tube.

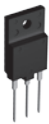
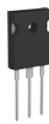
☆ : Under Development

Fast Switching type											
Package	Application	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (Tc=25°C)	R _{DS(on)} (Ω)		Q _g (nC) V _{GS} =10V	Drive Voltage (V)
		Part No.	Taping Code					V _{GS} =10V			
								Typ.	Max.		
TO-252 〔DPAK〕		R6011KND3	TL1	N	600	11	124	0.340	0.390	22	10
		R6009KND3	TL1		600	9	94	0.500	0.535	16.5	10
		R6007KND3	TL1		600	7	78	0.570	0.620	15	10
		R6006KND3	TL1		600	6	70	0.720	0.830	12	10
		R6003KND3	TL1		600	3	44	1.300	1.500	8	10
		☆R6511KND3	TL1		650	11	124	0.360	0.400	22	10
		☆R6509KND3	TL1		650	9	94	0.530	0.585	16.5	10
		☆R6507KND3	TL1		650	7	78	0.605	0.665	15	10
		☆R6504KND3	TL1		650	4	58	0.955	1.050	10	10
TO-263S (LPTS) 〔SC-83〕 〔D2PAK〕		R6024KNJ	TL	N	600	24	245	0.150	0.165	46	10
		R6020KNJ	TL		600	20	231	0.170	0.196	40	10
		R6015KNJ	TL		600	15	184	0.260	0.290	30	10
		R6011KNJ	TL		600	11	124	0.340	0.390	22	10
		R6009KNJ	TL		600	9	94	0.500	0.535	16.5	10
		R6007KNJ	TL		600	7	78	0.570	0.620	15	10
		R6004KNJ	TL		600	4	58	0.900	0.980	10	10
		R6524KNJ	TL		650	24	245	0.160	0.185	46	10
		R6520KNJ	TL		650	20	231	0.185	0.205	40	10
		R6515KNJ	TL		650	15	184	0.280	0.315	30	10
		R6511KNJ	TL		650	11	124	0.360	0.400	22	10
		R6509KNJ	TL		650	9	94	0.530	0.585	16.5	10
		R6507KNJ	TL		650	7	78	0.605	0.665	15	10
		R6504KNJ	TL		650	4	58	0.955	1.050	10	10
TO-220FM		R6030KNX	—*	N	600	30	86	0.115	0.130	56	10
		R6024KNX	—*		600	24	74	0.150	0.165	46	10
		R6020KNX	—*		600	20	68	0.170	0.196	40	10
		R6015KNX	—*		600	15	60	0.260	0.290	30	10
		R6011KNX	—*		600	11	53	0.340	0.390	22	10
		R6009KNX	—*		600	9	48	0.500	0.535	16.5	10
		R6007KNX	—*		600	7	46	0.570	0.620	15	10
		R6006KNX	—*		600	6	40	0.720	0.830	12	10
		R6004KNX	—*		600	4	35	0.900	0.980	10	10
		R6530KNX	—*		650	30	86	0.125	0.140	56	10
		R6524KNX	—*		650	24	74	0.160	0.185	46	10
		R6520KNX	—*		650	20	68	0.185	0.205	40	10
		R6515KNX	—*		650	15	60	0.280	0.315	30	10
		R6511KNX	—*		650	11	53	0.360	0.400	22	10
		R6509KNX	—*		650	9	48	0.530	0.585	16.5	10
		R6507KNX	—*		650	7	46	0.605	0.665	15	10
		R6504KNX	—*		650	4	35	0.955	1.050	10	10
TO-3PF		R6035KNZ	C8	N	600	35	102	0.095	0.102	72	10
		R6030KNZ	C8		600	30	86	0.115	0.130	56	10
		R6024KNZ	C8		600	24	74	0.150	0.165	46	10
		R6020KNZ	C8		600	20	68	0.170	0.196	40	10
		R6015KNZ	C8		600	15	60	0.260	0.290	30	10
		R6535KNZ	C8		650	35	102	0.098	0.115	72	10
		R6530KNZ	C8		650	30	86	0.125	0.140	56	10
		R6524KNZ	C8		650	24	74	0.160	0.185	46	10
		R6520KNZ	C8		650	20	68	0.185	0.205	40	10
		R6515KNZ	C8		650	15	60	0.280	0.315	30	10
TO-247		New R6076KNZ4	C13	N	600	76	735	0.040	0.042	165	10
		New R6047KNZ4	C13		600	47	481	0.070	0.072	100	10
		☆R6035KNZ4	C13		600	35	379	0.095	0.102	72	10
		☆R6030KNZ4	C13		600	30	305	0.115	0.130	56	10
		☆R6024KNZ4	C13		600	24	245	0.150	0.165	46	10
		☆R6020KNZ4	C13		600	20	231	0.170	0.196	40	10
		☆R6576KNZ4	C13		650	76	735	0.040	0.046	165	10
		New R6547KNZ4	C13		650	47	481	0.070	0.080	100	10
		☆R6535KNZ4	C13		650	35	379	0.098	0.115	72	10
		☆R6530KNZ4	C13		650	30	305	0.125	0.140	56	10
		☆R6524KNZ4	C13		650	24	245	0.160	0.185	45	10
		New R6520KNZ4	C13		650	20	231	0.185	0.205	40	10
TO-220AB		R6535KNX1	C10	N	650	35	102	0.098	0.115	72	10
		R6530KNX1	C10		650	30	86	0.125	0.140	56	10
		R6524KNX1	C10		650	24	74	0.160	0.185	45	10
		R6520KNX1	C10		650	20	68	0.185	0.205	40	10
		R6515KNX1	C10		650	15	60	0.280	0.315	27.5	10

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code, { } : GENERAL code
 Notes2 : * : Packaging type C7 G allows the tube.

☆ : Under Development

Power MOSFETs

Fast Recovery Body Diode type (PrestoMOST™)													
Package	Application	Product No.		Polarity (ch)	V _{DSS} (V)	I _D (A)	P _D (W) (T _C =25°C)	R _{DS(on)} (Ω)		Q _g Typ.(nC) V _{GS} =15V	trr (Typ.) (ns)	Drive Voltage (V)	
		Part No.	Taping Code					V _{GS} =15V					
								Typ.	Max.				
TO-252 [DPAK]		New R6009JND3	TL1	N	600	9	125	0.450	0.585	22	65	15	
		New R6007JND3	TL1		600	7	96	0.600	0.780	17.5	60	15	
		New R6006JND3	TL1		600	6	86	0.720	0.936	15.5	58	15	
		New R6004JND3	TL1		600	4	60	1.100	1.430	10.5	45	15	
TO-263S (LPTS) [SC-83] [D2PAK]		New R6020JNJ	TL	N	600	20	252	0.200	0.260	50	85	15	
		New R6018JNJ	TL		600	18	220	0.220	0.286	42	80	15	
		New R6012JNJ	TL		600	12	160	0.300	0.390	28	70	15	
		New R6009JNJ	TL		600	9	125	0.450	0.585	22	65	15	
		New R6007JNJ	TL		600	7	96	0.600	0.780	17.5	60	15	
		New R6006JNJ	TL		600	6	86	0.720	0.936	15.5	58	15	
		New R6004JNJ	TL		600	4	60	1.100	1.430	10.5	45	15	
TO-220FM		New R6025JNX	C7 G	N	600	25	85	0.140	0.182	57	90	15	
		New R6020JNX	C7 G		600	20	76	0.200	0.260	45	85	15	
		New R6018JNX	C7 G		600	18	72	0.220	0.286	42	80	15	
		New R6012JNX	C7 G		600	12	60	0.300	0.390	28	70	15	
		New R6009JNX	C7 G		600	9	53	0.450	0.585	22	65	15	
		New R6007JNX	C7 G		600	7	46	0.600	0.780	17.5	60	15	
		New R6006JNX	C7 G		600	6	43	0.720	0.936	15.5	58	15	
TO-3PF		New R6004JNX	C7 G	N	600	4	35	1.100	1.430	10.5	45	15	
		☆ R6050JNZ	C8		N	600	50	120	0.064	0.083	120	120	15
		New R6030JNZ	C8			600	30	93	0.110	0.143	75	100	15
		New R6025JNZ	C8			600	25	85	0.140	0.182	65	90	15
TO-247		New R6020JNZ	C8	N		600	20	76	0.180	0.234	50	85	15
		☆ R6070JNZ4	C13		N	600	70	770	0.045	0.058	160	135	15
		☆ R6050JNZ4	C13			600	50	615	0.064	0.083	120	120	15
		☆ R6042JNZ4	C13			600	42	495	0.080	0.104	100	110	15
		☆ R6030JNZ4	C13		N	600	30	370	0.110	0.143	74	100	15
		☆ R6025JNZ4	C13			600	25	306	0.150	0.195	65	90	15
☆ R6020JNZ4	C13	600	20	252	0.180	0.234	45	85	15				

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code, [] : GENERAL code

☆ : Under Development

Selector Guide for Automotive MOSFETs

Automotive MOSFETs																				
Package	Product No.			Polarity (ch)	V _{DSS} (V)	I _D (A)	V _{GS} (V)	R _{DS(on)} (mΩ)										Q _g Typ. (nC)	Ciss Typ. (pF)	Automotive Grade AEC-Q101
	Part No.	Grade Code	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =2.5V		V _{GS} =1.8V		V _{GS} =1.5V				
								Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.			
 SOT-323 (UMT3) [SC-70] 2021 size	RJU003N03	FRA	T106	N	30	0.3	±12	—	—	800	1,100	1,400	1,900	—	—	—	—	24	YES	
	RHU003N03	FRA	T106		30	0.3	±20	800	1,200	1,200	1,900	—	—	—	—	—	—	20	YES	
	RJU002N06	FRA	T106		60	0.2	±12	—	—	1,600	2,300	2,200	3,100	—	—	—	—	18	YES	
	RHU002N06	FRA	T106		60	0.2	±20	1,700	2,400	2,800*3	4,000*3	—	—	—	—	—	2.2*1	15	YES	
	☆BSS138BKW	HZG	T106		60	0.38	±20	500	700	600	840	1,000	4,000	—	—	—	—	—	YES	
	☆BSS138W	HZG	T106		60	0.31	±20	1,700	2,400	2,100	3,000	3,000	12,000	—	—	—	—	—	YES	
	☆BSS84W	HZG	T106	P	—60	—0.21	±20	3,600	5,300	4,300	6,400	—	—	—	—	—	—	—	YES	
 SOT-363 (UMT6) [SC-88] 2021 size	UM6K31N	FHA	TCN	N+N	60	0.25	±20	1,700	2,400	2,100	3,000	3,000	12,000	—	—	—	—	15*4	YES	
 SOT-323T (TUMT3) [SC-113A] 2021 size	RUF025N02	FRA	TL	N	20	2.5	±10	—	—	39	54	49	68	65	91	80	160	5*2	370	YES
	RTF025N03	FRA	TL		30	2.5	±12	—	—	48	67	70	98	—	—	—	—	3.7*2	270	YES
	RTF016N05	FRA	TL		45	1.6	±12	—	—	140	190	200	280	—	—	—	—	2.3*2	150	YES
	RSF015N06	FRA	TL		60	1.5	±20	210	290	240	330	—	—	—	—	—	—	2	110	YES
 SOT-363T (TUMT6) [SC-113DA] 2021 size	RTL035N03	FRA	TR	N	30	3.5	±12	—	—	40	56	56	79	—	—	—	—	4.6*2	350	YES
	US6K41	FRA	TR	N+N	20	1	±8	—	—	130	190	170	240	220	310	290	410	2*2	75	YES
	RTL020P02	FRA	TR	P	—20	—2	±12	—	—	100	135	180	250	—	—	—	—	4.9*2	430	YES
	RRL035P03	FRA	TR		—30	—3.5	±20	36	50	52	72	—	—	—	—	—	—	8	800	YES
	RRL025P03	FRA	TR		—30	—2.5	±20	55	75	85	115	—	—	—	—	—	—	5.2	480	YES
	RSL020P03	FRA	TR		—30	—2	±20	80	120	125	190	—	—	—	—	—	—	3.9	350	YES
	US6J41	FRA	TR	P+P	—20	—1	±8	—	—	180	260	240	340	320	450	400	560	2*2	80	YES
 SOT-23 (SST3) 2924 size	RUC002N05	HZG	T116	N	50	0.2	±8	—	—	1,600	2,200	1,700	2,400	—	—	2,000	4,000	—	25	YES
	New BSS670	HZG	T116		60	0.6	±20	500	650	600	820	—	—	—	—	—	—	—	—	YES
	New BSS138BKW	HZG	T116		60	0.4	±20	500	700	600	840	—	—	—	—	—	—	—	—	YES
	RK7002BM	HZG	T116		60	0.25	±20	1,700	2,400	2,100	3,000	3,000	12,000	—	—	—	—	15	YES	
	☆BSS123	HZG	T116		100	0.2	±20	5,500	7,700	5,900	8,200	—	—	—	—	—	—	—	—	YES
	New BSS84W	HZG	T116	P	—60	—0.2	±20	3,600	5,300	4,300	6,400	—	—	—	—	—	—	—	—	YES
 SOT-346 (SMT3HP) [SC-59] 2928 size	RJK005N03	FRA	T146	N	30	0.5	±12	—	—	400	580	650	940	—	—	—	—	2*3	60	YES
	RHK005N03	FRA	T146		30	0.5	±20	350	550	510	720	—	—	—	—	—	—	—	45	YES
	RHK003N06	FRA	T146		60	0.3	±20	700	1,000	1,100*3	1,500*3	—	—	—	—	—	—	3*1	33	YES
 SOT-346T (TSMT3) [SC-96] 2928 size	New RUR040N02	HZG	TL	N	20	4	±10	—	—	25	35	33	46	—	—	55	110	8*2	680	YES
	New RTR040N03	HZG	TL		30	4	±12	—	—	34	48	47	66	—	—	—	—	5.9*2	475	YES
	New RTR025N03	HZG	TL		30	2.5	±12	—	—	66	92	95	133	—	—	—	—	3.3*2	220	YES
	New RSR025N03	HZG	TL		30	2.5	±20	50	70	74	105	—	—	—	—	—	—	2.9	165	YES
	New RTR030N05	HZG	TL		45	3	±12	—	—	48	67	68	95	—	—	—	—	6.2*2	510	YES
	New RSR025N05	HZG	TL		45	2.5	±20	70	100	95	150	—	—	—	—	—	—	3.6	260	YES
	New RTR025N05	HZG	TL		45	2.5	±12	—	—	95	130	125	175	—	—	—	—	3.2*2	250	YES
	New RTR020N05	HZG	TL		45	2	±12	—	—	130	180	180	250	—	—	—	—	2.9*2	200	YES
	New RSR030N06	HZG	TL		60	3	±20	60	85	70	100	—	—	—	—	—	—	5	380	YES
	New RSR020N06	HZG	TL		60	2	±20	120	170	140	195	—	—	—	—	—	—	2.7	180	YES
	New RSR010N10	HZG	TL	100	1	±20	370	520	400	560	—	—	—	—	—	—	3.5	140*4	YES	
	New RTR030P02	HZG	TL	P	—20	—3	±12	—	—	55	75	90	125	—	—	—	—	9.3*2	840	YES
	New RTR025P02	HZG	TL		—20	—2.5	±12	—	—	70	95	115	160	—	—	—	—	7*2	630	YES
	New RTR020P02	HZG	TL		—20	—2	±12	—	—	100	135	180	250	—	—	—	—	4.9*2	430	YES
	New RRR040P03	HZG	TL		—30	—4	±20	32	45	45	63	—	—	—	—	—	—	10.5	1,000	YES
	New RRR030P03	HZG	TL		—30	—3	±20	55	75	85	115	—	—	—	—	—	—	5.2	480	YES
	New RSR025P03	HZG	TL		—30	—2.5	±20	70	98	100	140	—	—	—	—	—	—	5.4	460	YES
	New RSR020P05	HZG	TL		—45	—2	±20	130	190	180	260	—	—	—	—	—	—	4.5*2	500	YES
	New RSR015P06	HZG	TL		—60	—1.5	±20	200	280	240	340	—	—	—	—	—	—	10*1	500	YES
New RUQ050N02	HZG	TR	N		20	5	±10	—	—	22	30	27	38	—	—	40	80	12*2	900	YES
New RTQ045N03	HZG	TR		30	4.5	±12	—	—	30	43	42	60	—	—	—	—	7.6*2	540	YES	
New RSQ045N03	HZG	TR		30	4.5	±20	27	38	36	51	—	—	—	—	—	—	6.8	520	YES	
New RSQ035N03	HZG	TR		30	3.5	±20	44	62	60	84	—	—	—	—	—	—	5.3	290	YES	
New RTQ035N03	HZG	TR		30	3.5	±12	—	—	38	54	55	77	—	—	—	—	4.6*2	285	YES	
New RSQ020N03	HZG	TR		30	2	±20	96	134	148	207	—	—	—	—	—	—	2.2	110	YES	
New RVQ040N05	HZG	TR		45	4	±21	38	53	47	66	—	—	—	—	—	—	6.3	530	YES	
New RTQ020N05	HZG	TR		45	2	±12	—	—	140	190	200	280	—	—	—	—	2.3*2	150	YES	
New RSQ035N06	HZG	TR		60	3.5	±20	50	70	58	82	—	—	—	—	—	—	6.5	430	YES	
New RSQ015N06	HZG	TR		60	1.5	±20	210	290	240	330	—	—	—	—	—	—	2	110	YES	
 SOT-457T (TSMT6) [SC-95] 2928 size	QS6K1	FRA	TR	N+N	30	1	±12	—	—	170	238	260	364	—	—	—	—	1.7*2	77	YES
	QS6K21	FRA	TR		45	1	±12	—	—	300	420	415	585	—	—	—	—	1.5*2	95	YES
	New RTQ035P02	HZG	TR	P	—20	—3.5	±12	—	—	50	65	80	100	—	—	—	—	10.5*2	1,200	YES
	New RTQ025P02	HZG	TR		—20	—2.5	±12	—	—	72	100	140	190	—	—	—	—	6.4*2	580	YES
	New RRQ045P03	HZG	TR		—30	—4.5	±20	25	35	34	48	—	—	—	—	—	—	14	1,350	YES
	New RSQ035P03	HZG	TR		—30	—3.5	±20	45	65	65	90	—	—	—	—	—	—	9.2	780	YES
	New RRQ030P03	HZG	TR		—30	—3	±20	55	75	85	115	—	—	—	—	—	—	5.2	480	YES
	New RSQ025P03	HZG	TR		—30	—2.5	±20	80	110	120	165	—	—	—	—	—	—	4.4	320	YES
	New RSQ015P10	HZG	TR		—100	—1.5	±20	350	470	380	510	—	—	—	—	—	—	17	950*4	YES

Selector Guide for Automotive MOSFETs

Automotive MOSFETs																				
Package	Product No.			Polarity (ch)	V _{DSS} (V)	I _D (A)	V _{GS} (V)	R _{DS(on)} (mΩ)										Qg Typ. (nC)	Ciss Typ. (pF)	Automotive Grade AEC-Q101
	Part No.	Grade Code	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =2.5V		V _{GS} =1.8V		V _{GS} =1.5V		V _{GS} =5V	V _{DSS} =10V	
								Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.			
 (TSM8) 3028 size	New RQ1C075UN	HZG	TR	N	20	7.5	±10	—	—	11	16	14	20	—	—	20	40	18*1	1,400	YES
	New QS8K2	HZG	TR	N+N	30	3.5	±12	—	—	38	54	55	77	—	—	—	—	4.6*1	285	YES
	New RQ1A070ZP	HZG	TR	P	—12	—7	±10	—	—	8	12	11	16	—	—	19	38	58*1	7,400*3	YES
	New RQ1E070RP	HZG	TR		—30	—7	±20	12	17	17	24	—	—	—	—	—	26	2,700	YES	
	New RQ1E050RP	HZG	TR		—30	—5	±20	22	31	32	45	—	—	—	—	—	—	13	1,300	YES
	New QS8J4	HZG	TR		P+P	—30	—4	±20	40	56	55	77	—	—	—	—	—	8.4	800	YES
	New QS8M51	HZG	TR	N+P	100	2	±20	240	325	250	340	—	—	—	—	—	—	4.7	290*2	YES
				—100	—1.5	±20	350	470	380	510	—	—	—	—	—	—	17	950*2		

Notes1 : () : ROHM Packages.

Notes2 : *1 : V_{GS}=4.5V *2 : V_{DSS}=25V *3 : V_{GS}=6V

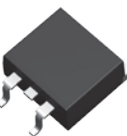
Selector Guide for Automotive Power MOSFETs

Automotive Power MOSFETs																
Package	Product No.			Polarity (ch)	V _{DSS} (V)	I _D (A)	V _{GS} (V)	R _{DS(on)} (mΩ)						Qg Typ. (nC)	Ciss Typ. (pF)	Automotive Grade AEC-Q101
	Part No.	Grade Code	Taping Code					V _{GS} =10V		V _{GS} =4.5V		V _{GS} =4.0V				
								Typ.	Max.	Typ.	Max.	Typ.	Max.	V _{GS} =5V	V _{DSS} =10V	
 SOT-89 (MPT3) [SC-62] 4540 size	RHP030N03	FRA	T100	N	30	3	±20	90	120	160	210	—	—	6.5*1	160	YES
	RJP020N06	FRA	T100		60	2	±12	—	—	165	240	210	300	5*2	160	YES
	RHP020N06	FRA	T100		60	2	±20	150	200	200	280	—	—	7*1	140	YES
 (HSM8T8AG) 3333 size	☆AG009DGQ3	—	TB	N	40	30	±20	6	8.8	7.3	11	—	—	32*1	1,790	YES
 (SOP8) 5060 size	RSS130N03	FRA	TB	N	30	13	±20	5.9	8.3	7.4	10.4	—	—	25	2,000	YES
	RSS100N03	FRA	TB		30	10	±20	9.5	13.3	12.5	17.5	—	—	14	1,070	YES
	RSS095N05	FRA	TB		45	9.5	±20	11	16	14	20	—	—	18.9	1,830	YES
	RSS070N05	FRA	TB		45	7	±20	18	25	23	32	—	—	12	1,000	YES
	RSS065N06	FRA	TB		60	6.5	±20	24	37	28	44	—	—	11	900	YES
	SP8K3	FRA	TB	N+N	30	7	±20	17	24	23	33	—	—	8.4	600	YES
	SP8K2	FRA	TB		30	6	±20	21	30	30	42	—	—	7.2	520	YES
	SP8K24	FRA	TB		45	6	±20	18	25	24	34	—	—	15.4	1,400	YES
	SP8K22	FRA	TB		45	4.5	±20	33	46	41	57	—	—	6.8	550	YES
	SP8K33	FRA	TB		60	5	±20	34	48	38	54	—	—	8	620	YES
	SP8K32	FRA	TB		60	4.5	±20	46	65	52	73	—	—	7	500	YES
	SP8K31	FRA	TB		60	3.5	±20	85	120	100	140	—	—	3.7	250	YES
	SP8K41	FRA	TB		80	3.4	±20	90	130	110	150	120	160	6.6	600	YES
	SP8K52	FRA	TB		100	3	±20	120	170	130	180	—	—	8.5	610*3	YES
	RRS140P03	FRA	TB	P	—30	—14	±20	5	7	6.7	9.4	—	—	80	8,000	YES
	RRS100P03	FRA	TB		—30	—10	±20	9	12.6	12.5	17.5	—	—	39	3,600	YES
	RRS090P03	FRA	TB		—30	—9	±20	11	15.4	15	21	—	—	30	3,000	YES
	RRS050P03	FRA	TB		—30	—5	±20	36	50	52	72	—	—	9.2	850	YES
	RSS070P05	FRA	TB		—45	—7	±20	19	27	25	35	—	—	34	4,100	YES
	RSS060P05	FRA	TB	P+P	—45	—6	±20	26	36	35	49	—	—	23	2,700	YES
	SP8J66	FRA	TB		—30	—9	±20	13.5	18.5	17.5	23.6	—	—	35	3,000	YES
	SP8M4	FRA	TB		30	9	±20	12	18	16	24	—	—	15	1,190	YES
	SP8M5	FRA	TB		—30	—7	±20	20	28	25	35	—	—	25	2,600	YES
	SP8M3	FRA	TB		30	6	±20	21	30	30	42	—	—	7.2	520	YES
	N+P	SP8M6	FRA	TB	—30	—7	±20	20	28	25	35	—	—	25	2,600	YES
		SP8M21	FRA	TB	30	5	±20	36	51	52	73	—	—	3.9	230	YES
					—30	—4.5	±20	40	56	57	80	—	—	8.5	850	YES
		30	5	±20	36	51	52	73	—	—	3.9	230	YES			
		—30	—3.5	±20	65	90	100	140	—	—	5.5	490	YES			
		45	6	±20	18	25	24	34	—	—	15.4	1,400	YES			
		—45	—4	±20	33	46	43	60	—	—	20	2,400				
		45	4.5	±20	33	46	41	57	—	—	6.8	550	YES			
		—45	—3.5	±20	45	63	60	84	—	—	13	1,700				
		80	3.4	±20	90	130	110	150	—	—	6.6	600	YES			
		—80	—2.6	±20	165	240	220	300	—	—	8.2	1,000				
		SP8M51	FRA	TB	100	3	±20	120	170	130	180	—	—	8.5	610*3	YES
	—100	—2.5	±20	210	290	230	320	—	—	12.5	1,550*3					

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code.

Notes2 : *1 : V_{GS}=10V *2 : V_{GS}=4V *3 : V_{DSS}=25V

☆ : Under Development

Automotive Power MOSFETs														
Package	Product No.			Polarity (ch)	V _{DSS} (V)	I _D (A)	V _{GS} (V)	R _{DS(on)} (mΩ)				Q _g Typ. (nC)	C _{iss} Typ. (pF)	Automotive Grade AEC-Q101
	Part No.	Grade Code	Taping Code					V _{GS} =10V		V _{GS} =4.5V				
								Typ.	Max.	Typ.	Max.	V _{GS} =10V	V _{DS} =10V	
 TO-252 [DPAK]	New RD3H200SN	FRA	TL	N	45	20	±20	20	28	25	35	12*3	950	YES
	New RD3L220SN	FRA	TL		60	22	±20	18	26	21	30	30	1,500	YES
	New RD3L150SN	FRA	TL		60	15	±20	28	40	33	47	18	930	YES
	New RD3L080SN	FRA	TL		60	8	±20	57	80	70	98	9.4	380	YES
	New RD3L050SN	FRA	TL		60	5	±20	78	109	94	131	8	290	YES
	New RD3P200SN	FRA	TL		100	20	±20	33	46	36*2	50*2	55	2,100*1	YES
	New RD3P175SN	FRA	TL		100	17.5	±20	75	105	80	112	24	950*1	YES
	New RD3P100SN	FRA	TL		100	10	±20	95	133	100	140	18	700*1	YES
	New RD3P050SN	FRA	TL		100	5	±20	135	190	142	200	14	530*1	YES
	☆ RD3U080AA	FRA	TL		250	8	±30	225	300	—	—	25	1,440*1	YES
	☆ RD3U041AA	FRA	TL		250	4	±30	930	1,300	—	—	8.5	350*1	YES
	☆ R5205PND3	FRA	TL		525	5	±25	1,300	1,600	—	—	10.8	320*1	YES
	☆ R6006PND3	FRA	TL		600	6	±30	900	1,200	—	—	15	460*1	YES
	☆ R6004PND3	FRA	TL		600	4	±25	1,400	1,800	—	—	11	280*1	YES
	☆ R8002CND3	FRA	TL		800	2	±30	3,300	4,300	—	—	12.1	240*1	YES
	☆ R8001CND3	FRA	TL		800	1	±30	6,700	8,700	—	—	7.2	60*1	YES
New RD3H160SP	FRA	TL	P	−45	−16	±20	35	50	45	63	16*3	2,000	YES	
New RD3H080SP	FRA	TL		−45	−8	±20	65	91	95	133	9*3	1,000	YES	
New RD3H045SP	FRA	TL		−45	−4.5	±20	110	155	160	225	12*3	550	YES	
New RD3L140SP	FRA	TL		−60	−14	±20	60	84	73	103	27	1,900	YES	
New RD3P130SP	FRA	TL		−100	−13	±20	135	200	150	220	40	2,400*1	YES	
 TO-263S (LPTS) [SC-83] [D2PAK]	RSJ451N04	FRA	TL	N	40	45	±20	9.5	13.5	—	—	43	2,400*1	YES
	RSJ400N06	FRA	TL		60	40	±20	11	16	—	—	52	2,400	YES
	RSJ400N10	FRA	TL		100	40	±20	19	27	21*2	30*2	90	3,600*1	YES
	RSJ301N10	FRA	TL		100	30	±20	33	46	36*2	50*2	60	2,100*1	YES
	RJ1U330AA	FRG	TL		250	33	±30	77	105	—	—	80	4,500*1	YES
	R6020PNJ	FRA	TL		600	20	±30	190	250	—	—	65	2,040*1	YES
	R8008ANJ	FRG	TL		800	8	±30	790	1,030	—	—	38	1,100*1	YES
	R8005ANJ	FRG	TL		800	5	±30	1,600	2,100	—	—	20	500*1	YES
	R8002ANJ	FRG	TL		800	2	±30	3,300	4,300	—	—	13	250*1	YES
	RSJ250P10	FRA	TL	P	−100	−25	±20	45	63	48	67	60*3	8,000*1	YES

Notes1 : Package is JEDEC code. () : ROHM Packages, [] : JEITA Code, [] : GENERAL Code.

☆ : Under Development

Notes2 : *1 : V_{DSS}=25V *2 : V_{GS}=4V *3 : V_{GS}=5V

Bipolar Transistors

Quick Reference for General Purpose Amplification Bipolar Transistors(Flat type)

Package Polarity Application	SOT-723 (VMT3) [SC-105AA] 1212 size		SOT-416FL (EMT3F) [SC-89] 1616 size		SOT-323FL (UMT3F) [SC-85] 2021 size		V _{CEO} (V)	I _c (A)	h _{FE} *2
	 P _D =0.15W*1		 P _D =0.15W*1		 P _D =0.2W*1				
	PNP	NPN	PNP	NPN	PNP	NPN			
	PNP	NPN	PNP	NPN	PNP	NPN			
General Purpose Amplification	2SAR522M	2SCR522M	2SAR522EB	2SCR522EB	2SAR522UB	2SCR522UB	20	0.2	120 to 560
	2SAR523M	2SCR523M	2SAR523EB	2SCR523EB	2SAR523UB	2SCR523UB	50	0.1	120 to 560
	2SA2029	2SC5658	2SA1774EB	2SC4617EB	2SA1576UB	2SC4081UB	50	0.15	120 to 560
Low V _{CE(sat)}	2SA2030	2SC5663					12	0.5	270 to 680
V _{CE(sat)}		2SD2696					30	0.4	270 to 680
Driver			2SAR502EB	2SCR502EB	2SAR502UB	2SCR502UB	30	0.5	200 to 500

Notes1 : *1 : With reference land installed

Notes2 : *2 : For h_{FE} , please see the technical specifications.

Notes3 : PNP (—) symbol omitted.

Notes4 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

General Purpose Amplification Bipolar Transistors(Flat type)

Package	Application	Product No.						Polarity (ch)	P _D *1 (W)	V _{CEO} (V)	I _c (A)	h _{FE} *2	Automotive Grade AEC-Q101		
		Part No.	Grade Code		Taping Code	h _{FE} *2 Code									
			General	Automotive											
 SOT-723 (VMT3) [SC-105AA] 1212 size	General Purpose Amplification	2SAR522M	*	—	T2L			PNP	0.15	—20	—0.2	120 to 560		—	
		2SAR523M		—	T2L				0.15	—50	—0.1	120 to 560		—	
		2SA2029		FHA	T2L	Q	R		S	0.15	—50	—0.15	120 to 560	S : No Recommended	YES
	Low V _{CE(sat)}	2SA2030		—	T2L				NPN	0.15	—12	—0.5	270 to 680		—
		2SCR522M		—	T2L					0.15	20	0.2	120 to 560		—
		2SCR523M		—	T2L					0.15	50	0.1	120 to 560		—
		2SC5658		FHA	T2L	Q	R	S		0.15	50	0.15	120 to 560	S : No Recommended	YES
		2SC5663		—	T2L					0.15	12	0.5	270 to 680		—
		2SD2696		—	T2L					0.15	30	0.4	270 to 680		—
 SOT-416FL (EMT3F) [SC-89] 1616 size	General Purpose Amplification	2SAR522EB	*	—	TL			PNP	0.15	—20	—0.2	120 to 560		—	
		2SAR523EB		—	T2L				0.15	—50	—0.1	120 to 560		—	
		2SA1774EB		HZG	T2L	Q	R		S	0.15	—50	—0.15	120 to 560	S : No Recommended	YES
	Driver	2SAR502EB		HZG	T2L			NPN	0.15	—30	—0.5	200 to 500		YES	
		2SCR522EB		—	TL				0.15	20	0.2	120 to 560		—	
		2SCR523EB		—	TL				0.15	50	0.1	120 to 560		—	
		2SC4617EB		HZG	TL	Q	R		S	0.15	50	0.15	120 to 560	S : No Recommended	YES
		2SCR502EB		HZG	TL				0.15	30	0.5	200 to 500		YES	
 SOT-323FL (UMT3F) [SC-85] 2021 size	General Purpose Amplification	2SAR522UB	*	—	TL			PNP	0.2	—20	—0.2	120 to 560		—	
		2SAR523UB		—	TL				0.2	—50	—0.1	120 to 560		—	
		2SA1576UB		HZG	TL	Q	R		S	0.2	—50	—0.15	120 to 560	S : No Recommended	YES
	Driver	2SAR502UB		HZG	TL			NPN	0.2	—30	—0.5	200 to 500		YES	
		2SCR522UB		—	TL				0.2	20	0.2	120 to 560		—	
		2SCR523UB		—	TL				0.2	50	0.1	120 to 560		—	
		2SC4081UB		HZG	TL	Q	R		S	0.2	50	0.15	120 to 560	S : No Recommended	YES
		2SCR502UB		HZG	TL				0.2	30	0.5	200 to 500		YES	

Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : *2 : For h_{FE} , N : 56 to 120, P : 82 to 180, Q : 120 to 270, R : 180 to 390, S : 270 to 560. Please see the technical specifications.

Notes4 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

Quick Reference for General Purpose Amplification Bipolar Transistors(Gull type)

Package Polarity Application	SOT-416 (EMT3) [SC-75A] 1616 size		SOT-323 (UMT3) [SC-70] 2021 size		SOT-346 (SMT3) [SC-59] 2928 size		SOT-23 (SST3) 2924 size		V _{CEO} (V)	I _C (A)	h _{FE} *2
	 P _D =0.15W	 P _D =0.2W	 P _D =0.2W	 P _D =0.2W							
	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN			
General Purpose Amplification	2SA1774	2SC4617	2SA1576A	2SC4081	2SA1037AK	2SC2412K			50	0.15	120 to 560
			2SA1576U3	2SC4081U3					50	0.15	120 to 560
Low V _{CE(sat)}	2SA2018	2SC5585			2SA2119K				12	0.5	270 to 680
			2SB1689	2SD2652					12	1.5	270 to 680
					2SB1690K	2SD2653K			12	2	270 to 680
						2SD1757K			15	0.5	120 to 560
					2SB1590K				15	1	120 to 390
						2SD2444K			15	1	180 to 390
			2SB1694	2SD2656					30	1	270 to 680
					2SB1695K				30	1.5	270 to 680
Driver			2SAR502U3						30	0.5	200 to 500
				2SCR502U3					30	0.5	200 to 500
			2SA1577	2SC4097	2SA1036K	2SC2411K			32	0.5	120 to 390
					2SB1197K	2SD1781K			32	0.8	120 to 390
				2SD1949		2SD1484K			50	0.5	120 to 390
					2SB1198K	2SD1782K			80	0.5	120 to 390
High Speed Switching			2SA2088U3	2SC5876U3					60	0.5	120 to 270
			2SA2088	2SC5876					60	0.5	120 to 270
High Voltage			2SA1579U3	2SC4102U3			2SARA41C	2SCRC41C	120	0.05	180 to 560
			2SA1579	2SC4102	2SA1514K	2SC3906K			120	0.05	180 to 560
						2SC4061K			300	0.1	56 to 120

Notes1 : *1 : With reference land installed

Notes2 : *2 : For h_{FE} , please see the technical specifications.

Notes3 : PNP (—) symbol omitted.

Notes4 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

General Purpose Amplification Bipolar Transistors(Gull type)															
Package	Application	Product No.							Polarity (ch)	P _D *1 (W)	V _{CE0} (V)	I _c (A)	h _{FE} *2		Automotive Grade AEC-Q101
		Part No.	Grade Code		Taping Code	h _{FE} *2 Code									
 SOT-416 (EMT3) [SC-75A] 1616 size	General Purpose Amplification	2SA1774	*	FRA	TL	Q	R	S	PNP	0.15	−50	−0.15	120 to 560	S : No Recommended	YES
	Low V _{CE(sat)}	2SA2018		—	TL					0.15	−12	−0.5	270 to 680		—
	General Purpose Amplification	2SC4617		FRA	TL	Q	R	S	NPN	0.15	50	0.15	120 to 560		YES
	Low V _{CE(sat)}	2SC5585		—	TL					0.15	12	0.5	270 to 680		—
 SOT-323 (UMT3) [SC-70] 2021 size	General Purpose Amplification	2SA1576A	*	FRA	T106	Q	R	S	PNP	0.2	−50	−0.15	120 to 560	S : No Recommended	YES
		2SA1576U3		HZG	T106	Q	R	S		0.2	−50	−0.15	120 to 560	S : No Recommended	YES
	Low V _{CE(sat)}	2SB1689		—	T106					0.2	−12	−1.5	270 to 680		—
		2SB1694		FRA	T106					0.2	−30	−1	270 to 680		YES
	Driver	2SAR502U3		HZG	T106					0.2	−30	−0.5	200 to 500		YES
		2SA1577		—	T106	Q	R			0.2	−32	−0.5	120 to 390		—
	High speed Switching	2SA2088U3		HZG	T106	Q				0.2	−60	−0.5	120 to 270		YES
		2SA2088		FRA	T106	Q				0.2	−60	−0.5	120 to 390		YES
	High Voltage	2SA1579U3		HZG	T106	R	S			0.2	−120	−0.05	180 to 560		YES
		2SA1579		FRA	T106	R	S			0.2	−120	−0.05	180 to 560		YES
	General Purpose Amplification	2SC4081		FRA	T106	Q	R	S	NPN	0.2	50	0.15	120 to 560	S : No Recommended	YES
		2SC4081U3		HZG	T106	Q	R	S		0.2	50	0.15	120 to 560	S : No Recommended	YES
	Low V _{CE(sat)}	2SD2652		—	T106					0.2	12	1.5	270 to 680		—
		2SD2656		FRA	T106					0.2	30	1	270 to 680		YES
	Driver	2SCR502U3		HZG	T106					0.2	30	0.5	200 to 500		YES
		2SC4097		—	T106	Q	R			0.2	32	0.5	120 to 390		—
	High speed Switching	2SD1949		—	T106	Q	R			0.2	50	0.5	120 to 390		—
		2SC5876U3		HZG	T106	Q	R			0.2	60	0.5	120 to 390		YES
	High Voltage	2SC5876		FRA	T106	Q	R			0.2	60	0.5	120 to 390		YES
		2SC4102U3		HZG	T106	R	S			0.2	120	0.05	180 to 560		YES
		2SC4102	FRA	T106	R	S		0.2	120	0.05	180 to 560		YES		
 SOT-346 (SMT3) [SC-59] 2928 size	General Purpose Amplification	2SA1037AK	*	—	T146	Q	R	S	PNP	0.2	−50	−0.15	120 to 560	S : No Recommended	—
		2SA2119K		—	T146					0.2	−12	−0.5	270 to 680		—
	Low V _{CE(sat)}	2SB1690K		—	T146					0.2	−12	−2	270 to 680		—
		2SB1590K		—	T146	Q				0.2	−15	−1	120 to 390		—
		2SB1695K		—	T146					0.2	−30	−1.5	270 to 680		—
	Driver	2SA1036K		FRA	T146	Q	R			0.2	−32	−0.5	120 to 390		YES
		2SB1197K		FRA	T146	Q	R			0.2	−32	−0.8	120 to 390		YES
		2SB1198K		FRA	T146	Q	R			0.2	−80	−0.5	120 to 390		YES
	High Voltage	2SA1514K		FRA	T146	R	S			0.2	−120	−0.05	180 to 560		YES
	General Purpose Amplification	2SC2412K		—	T146	Q	R	S	NPN	0.2	50	0.15	120 to 560	S : No Recommended	—
	Low V _{CE(sat)}	2SD2653K		—	T146					0.2	12	2	270 to 680		—
		2SD1757K		—	T146	Q	R	S		0.2	15	0.5	120 to 560		—
		2SD2444K		—	T146	R				0.2	15	1	180 to 390		—
		2SD2657K		—	T146					0.2	30	1.5	270 to 680		—
	Driver	2SC2411K		FRA	T146	Q	R			0.2	32	0.5	120 to 390		YES
		2SD1781K		FRA	T146	Q	R			0.2	32	0.8	120 to 390		YES
		2SD1484K		FRA	T146	Q	R			0.2	50	0.5	120 to 390		YES
		2SD1782K		FRA	T146	Q	R			0.2	80	0.5	120 to 390		YES
	High Voltage	2SC3906K		FRA	T146	R	S			0.2	120	0.05	180 to 560		YES
		2SC4061K		—	T146	N				0.2	300	0.1	56 to 120		—
 SOT-23 (SST3) 2924 size	High Voltage	2SARA41C	*	HZG	T116	R	S		PNP	0.2	−120	−0.05	180 to 560		YES
		2SCRC41C		HZG	T116	R	S		NPN	0.2	120	0.05	180 to 560		YES

Notes1 : * : General Part No. have no grade code.

Notes2 : *1 : With reference land installed

Notes3 : *2 : For h_{FE}, N : 56 to 120, P : 82 to 180, Q : 120 to 270, R : 180 to 390, S : 270 to 560. Please see the technical specifications.

Notes4 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

Bipolar Transistors

Quick Reference for Bipolar Transistors(For Oversea Customer)

Package Polarity Application	SOT-323 (UMT3) [SC-70] 2021 size		SOT-23 (SST3) 2924 size		V _{CEO} (V)	I _C (A)	h _{FE} *2
	 P _D =0.15W	 P _D =0.2W					
	PNP	NPN	PNP	NPN			
General Purpose Amplification	BC858BW	BC848BW	BC858B	BC848B	30	0.1	200 to 450
		☆BC847BU3		BC847B	45	0.1	200 to 450
	☆BC857BU3		BC857B		45	0.1	210 to 480
			☆BC857C	☆BC847C	45	0.15	420 to 800
				☆BC846B	65	0.12	200 to 450
			BC856B		65	0.1	220 to 475
Driver			New BSS63	New BSS64	100	0.1	30 or more
			New BSS5130	New BSS4130	30	1	270 to 680
			BC807-16	BC817-16	45	0.8	100 to 250
			BC807-25	BC817-25	45	0.8	160 to 400
			BC807-40	BC817-40	45	0.8	250 to 600
			BCX17	BCX19	45	0.5	100 to 600
Switching	UMT3906	UMT3904	SST3906	SST3904	80	0.5	100 or more
	UMT4403U3	UMT4401U3	SST4403	SST4401	40	0.2	100 to 300
		UM2222AU3		SST2222A	40	0.6	100 to 300
	UMT2907A		SST2907A		60	0.6	100 to 300
Darlington*3				SSTA28	80(V _{CES})	0.3	10,000 or more

Notes1 : *1 : With reference land installed

Notes2 : *2 : For h_{FE} , please see the technical specifications.

Notes3 : *3 : For internal circuit, please see the technical specifications.

Notes4 : PNP (—) symbol omitted.

Notes5 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

☆ : Under Development

Bipolar Transistors(For Oversea Customer)

Package	Application	Product No.			Polarity (ch)	P_D^{*1} (W)	V_{CE0} (V)	I_C (A)	h_{FE}^{*2}	Automotive Grade AEC-Q101
		Part No.	Grade Code	Taping Code						
			General	Automotive						
 SOT-323 (UMT3) [SC-70] 2021 size	General Purpose Amplification	BC858BW	—	—	T106	0.15	—30	—0.1	200 to 450	—
		☆BC857BU3	—	HZG	T106	0.15	—45	—0.1	210 to 480	YES
		UMT3906	—	—	T106	0.15	—40	—0.6	100 to 300	—
	Switching	UMT4403U3	—	HZG	T106	0.15	—40	—0.6	100 to 300	YES
		UMT2907A	—	—	T106	0.15	—60	—0.6	100 to 300	—
		BC848BW	—	—	T106	0.15	30	0.1	200 to 450	—
	General Purpose Amplification	☆BC847BU3	—	HZG	T106	0.15	45	0.1	200 to 450	YES
		UMT3904	—	—	T106	0.15	40	0.2	100 to 300	—
		UMT4401U3	—	HZG	T106	0.15	40	0.6	100 to 300	YES
	Switching	UM2222AU3	—	HZG	T106	0.15	40	0.6	100 to 300	YES
 SOT-23 (SST3) 2924 size	General Purpose Amplification	BC858B	—	HZG	T116	0.2	—30	—0.1	200 to 450	YES
		BC857B	—	HZG	T116	0.2	—45	—0.1	200 to 480	YES
		☆BC857C	—	HZG	T116	0.2	—45	—0.15	420 to 800	YES
		BC856B	—	HZG	T116	0.2	—65	—0.1	220 to 475	YES
		New BSS63	—	HZG	T116	0.2	—100	—0.1	30 or more	YES
		New BSS5130	—	HZG	T116	0.2	—30	—1	270 to 680	YES
	Driver	BCX17	—	HZG	T116	0.2	—45	—0.5	100 to 600	YES
		BC807-16	—	HZG	T116	0.2	—45	—0.8	100 to 250	YES
		BC807-25	—	HZG	T116	0.2	—45	—0.8	160 to 400	YES
		BC807-40	—	HZG	T116	0.2	—45	—0.8	250 to 600	YES
		SSTA56	—	HZG	T116	0.2	—80	—0.5	100 or more	YES
		SST4403	—	HZG	T116	0.2	—40	—0.6	100 to 300	YES
	Switching	SST2907A	—	HZG	T116	0.2	—60	—0.6	100 to 300	YES
		SST3906	—	HZG	T116	0.2	—40	—0.2	100 to 300	YES
		BC848B	—	HZG	T116	0.2	30	0.1	200 to 450	YES
	General Purpose Amplification	BC847B	—	HZG	T116	0.2	45	0.1	200 to 450	YES
		☆BC847C	—	HZG	T116	0.2	45	0.15	420 to 800	YES
		☆BC846B	—	HZG	T116	0.2	45	0.12	200 to 450	YES
	Driver	New BSS64	—	HZG	T116	0.2	100	0.1	30 or more	YES
		New BSS4130	—	HZG	T116	0.2	30	1	270 to 680	YES
		BCX19	—	HZG	T116	0.2	45	0.5	100 to 600	YES
		BC817-16	—	HZG	T116	0.2	45	0.8	100 to 250	YES
		BC817-25	—	HZG	T116	0.2	45	0.8	160 to 400	YES
		BC817-40	—	HZG	T116	0.2	45	0.8	250 to 600	YES
	Switching	SSTA06	—	HZG	T116	0.2	80	0.5	100 or more	YES
		SST3904	—	HZG	T116	0.2	40	0.2	100 to 300	YES
		SST4401	—	HZG	T116	0.2	40	0.6	100 to 300	YES
	Darlington*3	SST2222A	—	HZG	T116	0.2	40	0.6	100 to 300	YES
		SSTA28	—	—	T116	0.2	80 (V_{CES})	0.3	10,000 or more	—

Notes1 : * : General Part No. have no grade code.

Notes2 : *1 : With reference land installed

Notes3 : *2 : For h_{FE} , please see the technical specifications.

Notes4 : *3 : For internal circuit, please see the technical specifications.

Notes5 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

☆ : Under Development

Quick Reference for High h_{FE} • Muting/Darlington Bipolar Transistors

Package Polarity Application	SOT-723 (VMT3) [SC-105AA] 1212 size		SOT-416 (EMT3) [SC-75A] 1616 size		SOT-323 (UMT3) [SC-70] 2021 size		SOT-346 (SMT3) [SC-59] 2928 size		V _{CEO} (V)	I _C (A)	h _{FE} *2
	 P _O =0.15W*1		 P _O =0.15W*1		 P _O =0.2W*1		 P _O =0.2W*1				
	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN			
High h _{FE} • Muting								2SD2704K	25 (V _{EB0})	0.3	820 to 2,700
								2SD2114K	20	0.5	820 to 2,700
		2SD2707		2SD2654		2SD2351		2SD2226K	50	0.15	820 to 2,700
Darlington *3								2SD2142K	30	0.3	5,000 or more
							2SB852K	2SD1383K	32 (V _{CES})	0.3	5,000 or more

Notes1 : *1 : With reference land installed

Notes2 : *2 : For h_{FE} , please see the technical specifications.

Notes3 : *3 : For internal circuit, please see the technical specifications.

Notes4 : PNP (–) symbol omitted.

Notes5 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

High h_{FE} • Muting/Darlington Bipolar Transistors

Package	Application	Product No.						Polarity (ch)	P _D *1 (W)	V _{CEO} (V)	I _c (A)	h _{FE} *2		Automotive Grade AEC-Q101
		Part No.	Grade Code		Taping Code	h _{FE} *2 Code								
			General	Automotive										
 SOT-723 (VMT3) [SC-105AA] 1212 size	High h _{FE} • Muting	2SD2707	*	—	T2L	V	W	NPN	0.15	50	0.15	820 to 2,700	W : Not Recommended	—
 SOT-416 (EMT3) [SC-75A] 1616 size	High h _{FE} • Muting	2SD2654	*	—	TL	V	W	NPN	0.15	50	0.15	820 to 2,700		—
 SOT-323 (UMT3) [SC-70] 2021 size	High h _{FE} • Muting	2SD2351	*	—	T106	V	W	NPN	0.2	50	0.15	820 to 2700		—
 SOT-346 (SMT3HP) [SC-59] 2928 size	Darlington*3	2SB852K	*	—	T146	B		PNP	0.2	−32 (V _{CES})	−0.3	5,000 or more		—
	High h _{FE} • Muting	2SD2704K		—	T146			NPN	0.2	25 (V _{EBO})	0.3	820 to 2,700		—
		2SD2114K		—	T146	V	W		0.2	20	0.5	820 to 2,700		—
		2SD2226K		—	T146	V	W		0.2	50	0.15	820 to 2,700		—
		2SD2142K		—	T146				0.2	30	0.3	5,000 or more		—
	Darlington*3	2SD1383K		—	T146	B			0.2	32 (V _{CES})	0.3	5,000 or more		—

Notes1 : * : General Part No. have no grade code.

Notes2 : *1 : With reference land installed

Notes3 : *2 : For h_{FE} , B : 5,000 or more, V : 820 to 1,800, W : 1,200 to 2,700. Please see the technical specifications.

Notes4 : *3 : For internal circuit, please see the technical specifications.

Notes5 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

Bipolar Transistors

Quick Reference for High Frequency Bipolar Transistors

Package	SOT-723 (VMT3) [SC-105AA] 1212 size		SOT-416 (EMT3) [SC-75A] 1616 size		SOT-323 (UMT3) [SC-70] 2021 size		SOT-346 (SMT3) [SC-59] 2928 size		V _{CEO} (V)	I _C (A)	h _{FE} *2
	 P _D =0.15W*1		 P _D =0.15W*1		 P _D =0.2W*1		 P _D =0.2W*1				
Polarity	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN			
Application											
High Frequency				2SC4618		2SC4098			25	0.05	82 to 180 (f _T =300MHz)
						2SC4774		2SC4713K	6	0.05	180 to 560 (f _T =800MHz)
		2SC5661		2SC4725		2SC4082		2SC3837K	20	0.05	82 to 180 (f _T =1,500MHz)
		2SC5662		2SC4726		2SC4083		2SC3838K	11	0.05	56 to 180 (f _T =3,200MHz)

Notes1 : *1 : With reference land installed Notes2 : *2 : For h_{FE} , please see the technical specifications.
Notes3 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

High Frequency Bipolar Transistors

Package	Application	Product No.						Polarity (ch)	P _D *1 (W)	V _{CEO} (V)	I _C (A)	h _{FE} *2	f _T (MHz)	Automotive Grade AEC-Q101
		Part No.	Grade Code		Taping Code	h _{FE} *2 Code								
			General	Automotive										
 SOT-723 (VMT3) [SC-105AA] 1212 size	High Frequency	2SC5661	*	—	T2L	P		NPN	0.15	20	0.05	82 to 180	1,500	—
		2SC5662		—	T2L	P			0.15	11	0.05	56 to 180	3,200	—
 SOT-416 (EMT3) [SC-75A] 1616 size	High Frequency	2SC4618	*	—	TL	N	P	NPN	0.15	25	0.05	82 to 180	300	—
		2SC4725		—	TL	P			0.15	20	0.05	82 to 180	1,500	—
		2SC4726		—	TL	N	P		0.15	11	0.05	56 to 180	3,200	—
 SOT-323 (UMT3) [SC-70] 2021 size	High Frequency	2SC4098	*	—	T106	P		NPN	0.2	25	0.05	82 to 180	300	—
		2SC4774		—	T106	R	S		0.2	6	0.05	180 to 560	800	—
		2SC4082		—	T106	P			0.2	20	0.05	82 to 180	1,500	—
		2SC4083		—	T106	N	P		0.2	11	0.05	56 to 180	3,200	—
 SOT-346 (SMT3HP) [SC-59] 2928 size	High Frequency	2SC4713K	*	—	T146	R	S	NPN	0.2	6	0.05	180 to 560	800	—
		2SC3837K		—	T146	P			0.2	20	0.05	82 to 180	1,500	—
		2SC3838K		—	T146	N	P		0.2	11	0.05	56 to 180	3,200	—

Notes1 : * : General Part No. have no grade code. Notes2 : *1 : With reference land installed
Notes3 : *2 : For h_{FE} , N : 56 to 120, P : 82 to 180, R : 180 to 390, S : 270 to 560. Please see the technical specifications.
Notes4 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

Quick Reference for Low Saturation/Driver Bipolar Transistors

Package	SOT-323T/SOT-363T (TUMT3/TUMT6) [SC-113A/SC-113DA] 2021 size		SOT-346T/SOT-457T (TSMT3/TSMT6) [SC-96/SC-95] 2928 size		V _{CEO} (V)	I _C (A)	h _{FE} *2
	  P _D =0.4W*1	  P _D =0.5W*1					
Polarity	PNP	NPN	PNP	NPN			
Application							
Low V _{CE(sat)}	2SB1732	2SD2702	2SB1709	2SD2674	12	1.5	270 to 680
	2SB1730	2SD2700	2SB1690	2SD2653	12	2	270 to 680
	US6T4*3	US6X3*3	2SB1705	2SD2670	12	3	270 to 680
			2SB1707	2SD2672	12	4	270 to 680
			QST2*3	QSX1*3	12	6	270 to 680
	2SB1733	2SD2703	2SB1710	2SD2675	30	1	270 to 680
	2SB1731	2SD2701	2SB1695	2SD2657	30	1.5	270 to 680
	US6T5*3	US6X4*3	2SB1706	2SD2671	30	2	270 to 680
			2SB1708	2SD2673	30	3	270 to 680
			QST3*3	QSX2*3	30	5	270 to 680
Driver			2SAR512R	2SCR512R	30	2	200 to 500
			2SAR513R	2SCR513R	50	1	180 to 450
			2SAR553R	2SCR553R	50	2	180 to 450
			2SAR543R	2SCR543R	50	3	180 to 450
			2SAR514R	2SCR514R	80	0.7	120 to 390
			2SAR554R	2SCR554R	80	1.5	120 to 390
			2SAR544R	2SCR544R	80	2.5	120 to 390
High Speed Switching			2SA2094	2SC5866	60	2	120 to 270 120 to 390
High Voltage			2SAR340Q*3	2SCR341Q*3	400	0.1	82 to 270

Notes1 : *1 : With reference land installed Notes2 : *2 : For h_{FE} , please see the technical specifications.
Notes3 : *3 : 6pin package (TSMT6/TUMT6) For internal circuit, please see the technical specifications.
Notes4 : PNP (—) symbol omitted. Notes5 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

Low Saturation/Driver Bipolar Transistors													
Package	Application	Product No.						Polarity (ch)	P _D *1 (W)	V _{CE0} (V)	I _c (A)	h _{FE} *2	Automotive Grade AEC-Q101
		Part No.	Grade Code		Taping Code	h _{FE} *2 Code							
			General	Automotive									
 SOT-323T (TUMT3) [SC-113A] 2021 size	Low V _{CE(sat)}	2SB1732	*	—	TL			PNP	0.4	−12	−1.5	270 to 680	—
		2SB1730		—	TL				0.4	−12	−2	270 to 680	—
		2SB1733		—	TL				0.4	−30	−1	270 to 680	—
		2SB1731		—	TL				0.4	−30	−1.5	270 to 680	—
		2SD2702		—	TL			NPN	0.4	12	1.5	270 to 680	—
		2SD2700		—	TL				0.4	12	2	270 to 680	—
		2SD2703		—	TL				0.4	30	1	270 to 680	—
		2SD2701		—	TL				0.4	30	1.5	270 to 680	—
 SOT-363T (TUMT6) [SC-113DA] 2021 size	Low V _{CE(sat)}	US6T4 *3	*	—	TR			PNP	0.4	−12	−3	270 to 680	—
		US6T5 *3		—	TR				0.4	−30	−2	270 to 680	—
		US6X3 *3		—	TR			NPN	0.4	12	3	270 to 680	—
		US6X4 *3		—	TR				0.4	30	2	270 to 680	—
 SOT-346T (TSMT3) [SC-96] 2928 size	Low V _{CE(sat)}	2SB1709	*	—	TL			PNP	0.5	−12	−1.5	270 to 680	—
		2SB1690		—	TL				0.5	−12	−2	270 to 680	—
		2SB1705		—	TL				0.5	−12	−3	270 to 680	—
		2SB1707		—	TL				0.5	−12	−4	270 to 680	—
		2SB1710		—	TL				0.5	−30	−1	270 to 680	—
		2SB1695		—	TL				0.5	−30	−1.5	270 to 680	—
		2SB1706		—	TL				0.5	−30	−2	270 to 680	—
		2SB1708		—	TL				0.5	−30	−3	270 to 680	—
	Driver	2SAR512R		—	TL				0.5	−30	−2	200 to 500	—
		2SAR513R		—	TL				0.5	−50	−1	180 to 450	—
		2SAR553R		—	TL				0.5	−50	−2	180 to 450	—
		2SAR543R		—	TL				0.5	−50	−3	180 to 450	—
		2SAR514R		—	TL				0.5	−80	−0.7	120 to 390	—
		2SAR554R		—	TL				0.5	−80	−1.5	120 to 390	—
		2SAR544R		—	TL				0.5	−80	−2.5	120 to 390	—
	High Speed Switching	2SA2094		—	TL	Q			0.5	−60	−2	120 to 270	—
	Low V _{CE(sat)}	2SD2674		—	TL			NPN	0.5	12	1.5	270 to 680	—
		2SD2653		—	TL				0.5	12	2	270 to 680	—
		2SD2670		—	TL				0.5	12	3	270 to 680	—
		2SD2672		—	TL				0.5	12	4	270 to 680	—
		2SD2675		—	TL				0.5	30	1	270 to 680	—
		2SD2657		—	TL				0.5	30	1.5	270 to 680	—
		2SD2671		—	TL				0.5	30	2	270 to 680	—
		2SD2673		—	TL				0.5	30	3	270 to 680	—
	Driver	2SCR512R		—	TL				0.5	30	2	200 to 500	—
		2SCR513R		—	TL				0.5	50	1	180 to 450	—
		2SCR553R		—	TL				0.5	50	2	180 to 450	—
		2SCR543R		—	TL				0.5	50	3	180 to 450	—
		2SCR514R		—	TL				0.5	80	0.7	120 to 390	—
		2SCR554R		—	TL				0.5	80	1.5	120 to 390	—
		2SCR544R		—	TL				0.5	80	2.5	120 to 390	—
	High Speed Switching	2SC5866		—	TL	Q	R	0.5	60	2	120 to 390	—	
 SOT-457T (TSMT6) [SC-95] 2928 size	Low V _{CE(sat)}	QST2 *3	*	—	TR			PNP	0.5	−12	−6	270 to 680	—
		QST3 *3		—	TR				0.5	−30	−5	270 to 680	—
	High Voltage	2SAR340Q *3		—	TR	P	Q	0.5	−400	−0.1	82 to 270	—	
	Low V _{CE(sat)}	QSX1 *3		—	TR			NPN	0.5	12	6	270 to 680	—
		QSX2 *3		—	TR				0.5	30	5	270 to 680	—
	High Voltage	2SCR341Q *3		—	TR	P	Q	0.5	400	0.1	82 to 270	—	

Notes1 : * : General Part No. have no grade code.

Notes2 : *1 : With reference land installed

Notes3 : *2 : For h_{FE}, P : 82 to 180, Q : 120 to 270, R : 180 to 390. Please see the technical specifications.

Notes4 : *3 : 6pin package(TSMT6/TUMT6) For internal circuit, please see the technical specifications.

Notes5 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code

Bipolar Transistors

Quick Reference for Power Bipolar Transistors

Package Polarity Application	DFN2020-3S (HUML2020L3) 2020 size		SOT-89 (MPT3) [SC-62] 4540 size		SOT-428 (CPT3)[SC-63] [DPAK]		TO-252 [DPAK]		TO-263AB (LPTL)		V _{CEO} (V)	I _C (A)	h _{FE} *3
	 *1 P _D =0.5W	 *1 P _D =0.5W	 *2 P _D =10W	 *2 P _D =10W	 *2 P _D =40W								
	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN			
Driver			2SB1697	2SD2661							12	2	270 to 680
			2SAR293P 2SAR293P5	2SCR293P 2SCR293P5							30	1	270 to 680
			2SAR512P 2SAR512P5	2SCR512P 2SCR512P5							30	2	200 to 500
			2SAR552P 2SAR552P5	2SCR552P 2SCR552P5							30	3	200 to 500
	2SAR542F3	2SCR542F3									30	3	200 to 500
			2SAR542P	2SCR542P			2SAR572D3	2SCR572D3			30	5	200 to 500
	2SAR562F3	2SCR562F3									30	6	200 to 500
							New 2SAR582D3	New 2SCR582D3			30	10	200 to 500
			2SAR513P 2SAR513P5	2SCR513P 2SCR513P5							50	1	180 to 450
			2SAR553P 2SAR553P5	2SCR553P 2SCR553P5							50	2	180 to 450
			2SAR533P 2SAR533P5	2SCR533P 2SCR533P5							50	3	180 to 450
							2SAR573D3	2SCR573D3			50	3	180 to 450
							New 2SAR583D3	New 2SCR583D3			50	7	180 to 450
			2SAR514P 2SAR514P5	2SCR514P 2SCR514P5							80	0.7	120 to 390
			2SAR554P 2SAR554P5	2SCR554P 2SCR554P5							80	1.5	120 to 390
							2SAR574D3	2SCR574D3			80	2	120 to 390
			2SAR544P 2SAR544P5	2SCR544P 2SCR544P5							80	2.5	120 to 390
							2SAR586D3	2SCR586D3		New 2SCR586J	80	5	120 to 390
			New 2SAR372P5	2SCR372P 2SCR372P5							120	0.7	120 to 390
			New 2SAR375P5	2SCR375P 2SCR375P5							120	1.5	120 to 390
							New 2SAR587D3	New 2SCR587D3			120	3	120 to 390
					2SB1275	2SD1918					160	1.5	82 to 180 120 to 270
High Voltage			2SAR340P	2SCR346P							400	0.1	82 to 270
High Speed Switching			2SA2071P5	2SC5824							60	3	120 to 270 120 to 390
High h _{FE}				2SD2537							25	1.2	820 to 1,800
			2SB1427								20	2	390 to 820
				2SD2153							25	2	560 to 2,700
Darlington*4				2SD1834							60 (V _{CES})	1	2k or more
							2SD2143				60±10	2	1k to 10k
					2SB1316	2SD1980					100	2	1k to 10k

Notes1 : *1 : With reference land installed

Notes2 : *2 : T_C=25°CNotes3 : *3 : For h_{FE}, please see the technical specifications.

Notes4 : *4 : For internal circuit, please see the technical specifications.

Notes5 : PNP (–) symbol omitted.

Notes6 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code, [] : GENERAL code

Power Bipolar Transistors														
Package	Application	Product No.							Polarity (ch)	P _D *1 (W)	V _{CEO} (V)	I _C (A)	h _{FE} *3	Automotive Grade AEC-Q101
		Part No.	Grade Code		Taping Code	h _{FE} *3 Code								
			General	Automotive										
	Driver	2SAR542F3	*	—	TR				PNP	0.5	−30	−3	200 to 500	—
		2SAR562F3		—	TR					0.5	−30	−6	200 to 500	—
		2SCR542F3		—	TR					0.5	30	3	200 to 500	—
		2SCR562F3		—	TR					0.5	30	6	200 to 500	—
	Driver	2SB1697	*	—	T100				PNP	0.5	−12	−2	270 to 680	—
		2SAR293P	—	FRA	T100					0.5	−30	−1	270 to 680	YES
		2SAR293P5	*	—	T100					0.5	−30	−1	270 to 680	—
		2SAR512P	—	FRA	T100					0.5	−30	−2	200 to 500	YES
		2SAR512P5	*	—	T100					0.5	−30	−2	200 to 500	—
		2SAR552P	—	FRA	T100					0.5	−30	−3	200 to 500	YES
		2SAR552P5	*	—	T100					0.5	−30	−3	200 to 500	—
		2SAR542P	*	FRA	T100					0.5	−30	−5	200 to 500	YES
		2SAR513P	—	FRA	T100					0.5	−50	−1	180 to 450	YES
		2SAR513P5	*	—	T100					0.5	−50	−1	180 to 450	—
		2SAR553P	—	FRA	T100					0.5	−50	−2	180 to 450	YES
		2SAR553P5	*	—	T100					0.5	−50	−2	180 to 450	—
		2SAR533P	—	FRA	T100					0.5	−50	−3	180 to 450	YES
		2SAR533P5	*	—	T100					0.5	−50	−3	180 to 450	—
		2SAR514P	—	FRA	T100					0.5	−80	−0.7	120 to 390	YES
		2SAR514P5	*	—	T100					0.5	−80	−0.7	120 to 390	—
		2SAR554P	—	FRA	T100					0.5	−80	−1.5	120 to 390	YES
		2SAR554P5	*	—	T100					0.5	−80	−1.5	120 to 390	—
		2SAR544P	—	FRA	T100					0.5	−80	−2.5	120 to 390	YES
		2SAR544P5	*	—	T100					0.5	−80	−2.5	120 to 390	—
		New 2SAR372P5	*	—	T100	Q	R			0.5	−120	−0.7	120 to 390	—
		New 2SAR375P5	*	—	T100	Q	R			0.5	−120	−1.5	120 to 390	—
	High Voltage	2SAR340P	*	—	T100	P	Q			0.5	−400	−0.1	82 to 270	—
	High Speed Switching	2SA2071P5	*	—	T100	Q				0.5	−60	−3	120 to 270	—
	High h _{FE}	2SB1427	*	—	T100	E				0.5	−20	−2	390 to 820	—
	Driver	2SD2661	*	—	T100					NPN	0.5	12	2	270 to 680
		2SCR293P	—	FRA	T100				0.5		30	1	270 to 680	YES
		2SCR293P5	*	—	T100				0.5		30	1	270 to 680	—
		2SCR512P	—	FRA	T100				0.5		30	2	200 to 500	YES
		2SCR512P5	*	—	T100				0.5		30	2	200 to 500	—
		2SCR552P	—	FRA	T100				0.5		30	3	200 to 500	YES
		2SCR552P5	*	—	T100				0.5		30	3	200 to 500	—
		2SCR542P	*	FRA	T100				0.5		30	5	200 to 500	YES
		2SCR513P	—	FRA	T100				0.5		50	1	180 to 450	YES
		2SCR513P5	*	—	T100				0.5		50	1	180 to 450	—
		2SCR553P	—	FRA	T100				0.5		50	2	180 to 450	YES
		2SCR553P5	*	—	T100				0.5		50	2	180 to 450	—
		2SCR533P	—	FRA	T100				0.5		50	3	180 to 450	YES
		2SCR533P5	*	—	T100				0.5		50	3	180 to 450	—
		2SCR514P	—	FRA	T100				0.5		80	0.7	120 to 390	YES
		2SCR514P5	*	—	T100				0.5		80	0.7	120 to 390	—
		2SCR554P	—	FRA	T100				0.5		80	1.5	120 to 390	YES
		2SCR554P5	*	—	T100				0.5		80	1.5	120 to 390	—
		2SCR544P	—	FRA	T100				0.5		80	2.5	120 to 390	YES
		2SCR544P5	*	—	T100				0.5		80	2.5	120 to 390	—
		2SCR372P	—	FRA	T100	Q	R		0.5		120	0.7	120 to 390	YES
		2SCR372P5	*	—	T100	Q	R		0.5		120	0.7	120 to 390	—
		2SCR375P	—	FRA	T100	Q	R		0.5		120	1.5	120 to 390	YES
	2SCR375P5	*	—	T100	Q	R		0.5	120		1.5	120 to 390	—	
	High Voltage	2SCR346P	*	—	T100	P	Q		0.5		400	0.1	82 to 270	—
	High Speed Switching	2SD5824	*	—	T100	Q	R		0.5		60	3	120 to 390	—
	High h _{FE}	2SD2537	*	—	T100	V			0.5		25	1.2	820 to 1,800	—
		2SD2153	*	—	T100	U	V	W	0.5		25	2	560 to 2,700	—
	Darlington*4	2SD1834	*	—	T100				0.5	60 (V _{CEs})	1	2k or more	—	
	Driver	2SB1275	*	—	TL	P		PNP	10*2	−160	−1.5	82 to 180	—	
	Darlington*4	2SB1316		—	TL				10*2	−100	−2	1k to 10k	—	
	Driver	2SD1918		—	TL	Q		NPN	10*2	160	1.5	120 to 270	—	
	Darlington*4	2SD2143		—	TL				10*2	60±10	2	1k to 10k	—	
		2SD1980		—	TL				10*2	100	2	1k to 10k	—	

Notes1: *: General Part No. have no grade code.

Notes2: *1: With reference land installed

Notes3: *2: Tc=25° C

Notes4: *3: h_{FE} P: 82 to 180, Q: 120 to 270, R: 180 to 390, U: 560 to 1,200, V: 820 to 1,800, W: 1,200 to 2,700. Please see the technical specifications.

Notes5: *4: For internal circuit, please see the technical specifications.

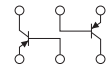
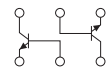
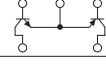
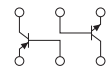
Notes6: Package is JEDEC code. (): ROHM Packages, []: JEITA code, []: GENERAL code

Bipolar Transistors

Power Bipolar Transistors											
Package	Application	Part No.	Product No.			Polarity (ch)	P _D *1 (W)	V _{CEO} (V)	I _C (A)	h _{FE}	Automotive Grade AEC-Q101
			Grade Code		Taping Code						
 TO-252 (DPAK)	Driver	New 2SAR572D3	*	—	TL1	PNP	10	−30	−5	200 to 500	—
		New 2SAR582D3	*	FRA	TL		10	−30	−5	200 to 500	YES
		New 2SAR573D3	*	—	TL1		10	−30	−10	200 to 500	—
		New 2SAR573D3	*	—	TL1		10	−50	−3	180 to 450	—
		New 2SAR583D3	*	FRA	TL		10	−50	−3	180 to 450	YES
		New 2SAR583D3	*	—	TL1		10	−50	−7	180 to 450	—
		New 2SAR574D3	*	—	TL1		10	−80	−2	120 to 390	—
		New 2SAR574D3	*	FRA	TL		10	−80	−2	120 to 390	YES
		New 2SAR586D3	*	—	TL1		10	−80	−5	120 to 390	—
		New 2SAR586D3	*	FRA	TL		10	−80	−5	120 to 390	YES
		New 2SAR587D3	*	—	TL1		10	−120	−3	120 to 390	—
		New 2SCR572D3	*	—	TL1	NPN	10	30	5	200 to 500	—
		New 2SCR572D3	*	FRA	TL		10	30	5	200 to 500	YES
		New 2SCR582D3	*	—	TL1		10	30	10	200 to 500	—
		New 2SCR573D3	*	—	TL1		10	50	3	180 to 450	—
		New 2SCR573D3	*	FRA	TL		10	50	3	180 to 450	YES
		New 2SCR583D3	*	—	TL1		10	50	7	180 to 450	—
		New 2SCR574D3	*	—	TL1		10	80	2	120 to 390	—
		New 2SCR574D3	*	FRA	TL		10	80	2	120 to 390	YES
		New 2SCR586D3	*	—	TL1		10	80	5	120 to 390	—
		New 2SCR586D3	*	FRA	TL		10	80	5	120 to 390	YES
		New 2SCR587D3	*	—	TL1		10	120	3	120 to 390	—
 TO-263AB (LPTL)	Driver	New 2SCR586J	G	—	TLL	NPN	40	80	5	120 to 390	—
			—	FRG	TLL		40	80	5	120 to 390	YES

Notes1 : * : General Part No. have no grade code.
Notes2 : *1 : Tc=25°C
Notes3 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code, [] : GENERAL code

Complex Bipolar Transistors

Quick Reference for General Purpose Amplification Complex Bipolar Transistors										
Configuration	Package		(VMT6) [SC-105B] 1212 size	SOT-553/SOT-563 (EMT5/EMT6) [SC-107BB/SC-107C] 1616 size	SOT-353/SOT-363 (UMT5/UMT6) [SC-88A/SC-88] 2021 size	SOT-25/SOT-457 (SMT5/SMT6) [SC-74A/SC-74] 2928 size	Equivalent Element Transistors	V _{CEO} (V)	I _C (A)	h _{FE}
										
	Application	Item	Equivalent Circuit Diagram (TOP View)	Part No.						
PNP×2	Pre Amplifier		VT6T1	EMT51			2SAR522EB×2	−20	−0.2	120 to 560
			VT6T2	EMT52			2SAR523EB×2	−50	−0.1	120 to 560
				EMT1	UMT1N	IMT1A	2SA1037AK×2	−50	−0.15	120 to 560
				EMT18	UMT18N	IMT18	2SA2018×2	−12	−0.5	270 to 680
NPN×2	Pre Amplifier		VT6X1	EMX51			2SCR522EB×2	20	0.2	120 to 560
			VT6X2	EMX52			2SCR523EB×2	50	0.1	120 to 560
				EMX1	UMX1N	IMX1	2SC2412K×2	50	0.15	120 to 560
				EMX26			2SD2654×2	50	0.15	820 to 2,700
				EMX18	UMX18N		2SC5585×2	12	0.5	270 to 680
						IMX25	2SD2704K×2	20	0.3	820 to 2,700
PNP + NPN	Pre Amplifier			EMY1	UMY1N	FMY1A	2SA1037AK	−50	−0.15	120 to 560
							2SC2412K	50	0.15	120 to 560
			VT6Z1	EMZ51			2SAR522EB	−20	−0.2	120 to 560
							SCR522EB	20	0.2	120 to 560
			VT6Z2	EMZ52			2SAR523EB	−50	−0.1	120 to 560
							2SCR523EB	50	0.1	120 to 560
				EMZ1	UMZ1N	IMZ1A	2SA1037AK	−50	−0.15	120 to 560
							2SC2412K	50	0.15	120 to 560
				EMZ7			2SA2018	−12	−0.5	270 to 680
							2SC5585	12	0.5	270 to 680
				EMZ8			2SA2018	−12	−0.5	270 to 680
							2SC2412K	50	0.15	120 to 560

Notes1 : For Pin location, please see the technical specifications.
Notes2 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code.

General Purpose Amplification Complex Bipolar Transistors											
Package	Configuration	Application	Product No.				Equivalent Element Transistors	V _{CEO} (V)	I _C (A)	h _{FE}	Automotive Grade AEC-Q101
			Part No.	Grade Code		Taping Code					
				General	Automotive						
 (VMT6) [SC-105B] 1212 size	PNP×2	Pre Amplifier	VT6T1	*	—	T2R	2SAR522EB×2	−20	−0.2	120 to 560	—
			VT6T2		—	T2R	2SAR523EB×2	−50	−0.1	120 to 560	—
	NPN×2		VT6X1		—	T2R	2SCR522EB×2	20	0.2	120 to 560	—
			VT6X2		—	T2R	2SCR523EB×2	50	0.1	120 to 560	—
	PNP+NPN		VT6Z1		—	T2R	2SAR522EB	−20	−0.2	120 to 560	—
			VT6Z2		—	T2R	2SCR522EB	20	0.2	120 to 560	—
	2SAR523EB	−50		−0.1			120 to 560				
	2SCR523EB	50	0.1	120 to 560							
 SOT-553 (EMT5) [SC-107BB] 1616 size	PNP+NPN	Pre Amplifier	EMY1	*	—	T2R	2SA1037AK	−50	−0.15	120 to 560	—
					—	T2R	2SC2412K	50	0.15	120 to 560	
 SOT-563 (EMT6) [SC-107C] 1616 size	PNP×2	Pre Amplifier	EMT51	*	—	T2R	2SAR522EB×2	−20	−0.2	120 to 560	—
			EMT52		—	T2R	2SAR523EB×2	−50	−0.1	120 to 560	—
			EMT1		FHA	T2R	2SA1037AK×2	−50	−0.15	120 to 560	YES
			EMT18		—	T2R	2SA2018×2	−12	−0.5	270 to 680	—
	NPN×2		EMX51		—	T2R	2SCR522EB×2	20	0.2	120 to 560	—
			EMX52		—	T2R	2SCR523EB×2	50	0.1	120 to 560	—
			EMX1		FHA	T2R	2SC2412K×2	50	0.15	120 to 560	YES
			EMX26		—	T2R	2SD2654×2	50	0.15	820 to 2,700	—
	PNP+NPN		EMX18		—	T2R	2SC5585×2	12	0.5	270 to 680	—
			EMZ51		—	T2R	2SAR522EB	−20	−0.2	120 to 560	—
			EMZ52		—	T2R	2SCR522EB	20	0.2	120 to 560	—
							2SAR523EB	−50	−0.1	120 to 560	
							2SCR523EB	50	0.1	120 to 560	
			EMZ1		FHA	T2R	2SA1037AK	−50	−0.15	120 to 560	YES
							2SC2412K	50	0.15	120 to 560	
			EMZ7		—	T2R	2SA2018	−12	−0.5	270 to 680	—
	2SC5585×2	12					0.5	270 to 680			
	EMZ8	—	T2R		2SA2018	−12	−0.5	270 to 680	—		
2SC2412K	50	0.15	120 to 560								
 SOT-353 (UMT5) [SC-88A] 2021 size	PNP+NPN	Pre Amplifier	UMY1N	*	—	TR	2SA1037AK	−50	−0.15	120 to 560	—
							2SC2412K	50	0.15	120 to 560	
 SOT-363 (UMT6) [SC-88] 2021 size	PNP×2	Pre Amplifier	UMT18N	*	—	TR	2SA2018×2	−12	−0.5	270 to 680	—
			UMT1N		FHA	TN	2SA1037AK×2	−50	−0.15	120 to 560	YES
	NPN×2		UMX18N		—	TN	2SC5585×2	12	0.5	270 to 680	—
			UMX1N		FHA	TN	2SC2412K×2	50	0.15	120 to 560	YES
	PNP+NPN		UMZ1N		FHA	TR	2SA1037AK	−50	−0.15	120 to 560	YES
							2SC2412K	50	0.15	120 to 560	
 SOT-25 (SMT5) [SC-74A] 2928 size	PNP+NPN	Pre Amplifier	FMY1A	*	—	T148	2SA1037AK	−50	−0.15	120 to 560	YES
							2SC2412K	50	0.15	120 to 560	
 SOT-457 (SMT6) [SC-74] 2928 size	PNP×2	Pre Amplifier	IMT1A	*	—	T110	2SA1037AK×2	−50	−0.5	120 to 560	—
			IMT18		—	T110	2SA2018×2	−12	−0.5	270 to 680	—
	NPN×2		IMX1		—	T110	2SC2412K×2	50	0.15	120 to 560	—
			IMX25		—	T110	2SD2704K×2	20	0.3	820 to 2,700	—
	PNP+NPN		IMZ1A		—	T108	2SA1037AK	−50	−0.15	120 to 560	—
							2SC2412K	50	0.15	120 to 560	

Notes1 : * : General Part No. have no grade code.

Notes2 : For Pin location, please see the technical specifications.

Notes3 : Package is JEDEC code. () : ROHM packages, [] : JEITA code.

Complex Bipolar Transistors

Quick Reference for Complex Bipolar Transistors(For Current Mirror Circuit)

Configuration	Package	Equivalent Circuit Diagram (TOP View)	(VMT6) [SC-105B] 1212 size	Equivalent Element Transistors	V _{CEO} (V)	I _C (A)	h _{FE}	h _{FE} Ratio
	Item		◆					
	Application		Part No.					
PNP×2	Suitable for Current Mirror Circuit		VT6T11	2SAR522M×2	−20	−0.2	120 to 560	±10%
			VT6T12	2SAR523M×2	−50	−0.1	120 to 560	
NPN×2	Suitable for Current Mirror Circuit		VT6X11	2SCR522M×2	20	0.2	120 to 560	
			VT6X12	2SCR523M×2	50	0.1	120 to 560	

Notes1 : For Pin location, please see the technical specifications.

Notes2 : () : ROHM Packages , [] : JEITA code.

Complex Bipolar Transistors(For Current Mirror Circuit)

Package	Configuration	Application	Product No.				Equivalent Element Transistors	V _{CEO} (V)	I _C (A)	h _{FE}	h _{FE} Ratio	Automotive Grade AEC-Q101
			Part No.	Grade Code		Taping Code						
				General	Automotive							
◆ (VMT6) [SC-105B] 1212 size	PNP×2	Suitable for Current Mirror Circuit	VT6T11	*	—	T2R	2SAR522M×2	−20	−0.2	120 to 560	±10%	—
			VT6T12		—	T2R	2SAR523M×2	−50	−0.1	120 to 560	±10%	—
	NPN×2		VT6X11		—	T2R	2SCR522M×2	20	0.2	120 to 560	±10%	—
			VT6X12		—	T2R	2SCR523M×2	50	0.1	120 to 560	±10%	—

Notes1 : * : General Part No. have no grade code.

Notes2 : For Pin location, please see the technical specifications.

Notes3 : () : ROHM packages, [] : JEITA code.

Complex Bipolar Transistors

Quick Reference for Complex Bipolar Transistors for Driver											
Configuration	Package	Item	Equivalent Circuit Diagram (TOP View)	SOT-363T (TUMT6) [SC-113DA] 2021 size	SOT-25T/SOT-457T (TSMT5/TSMT6) [—/SC-95] 2928 size	Equivalent Element Transistors	V _{CEO} (V)	I _C (A)	h _{FE}		
	Application										
	Part No.										
PNP×2	Driver		US6T8	QST8	2SB1709×2	−12	−1.5	270 to 680			
			US6T9	QST9	2SB1710×2	−30	−1	270 to 680			
NPN×2	Driver		US6X7	QSX7	2SD2674×2	12	1.5	270 to 680			
			US6X8	QSX8	2SD2675×2	30	1	270 to 680			
	DC-DC Converter			QS5W1	Exclusive Chip	30	3	200 to 500			
				QS5W2	2SCR533P×2	50	3	180 to 450			
PNP + NPN	Pre Amplifier			QS6Z5	2SAR513P 2SCR513P	−50 50	−1 1	180 to 450 180 to 450			
	DC-DC Converter			QSZ2	2SB1695 2SD2657	−30 30	−1.5 1.5	270 to 680 270 to 680			
				QSZ4	2SB1706 2SD2671	−30 30	−2 2	270 to 680 270 to 680			
				QS5Y1	Exclusive Chip	−30 30	−3 3	200 to 500 200 to 500			
				QS5Y2	2SAR533P 2SCR533P	−50 50	−3 3	180 to 450 180 to 450			

Notes1 : For Pin location, please see the technical specifications.

Notes2 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Bipolar Transistors for Driver											
Package	Configuration	Application	Product No.				Equivalent Element Transistors	V _{CEO} (V)	I _C (A)	h _{FE}	Automotive Grade AEC-Q101
			Part No.	Grade Code		Taping Code					
				General	Automotive						
 SOT-363T (TUMT6) [SC-113DA] 2021 size	PNP×2	Driver	US6T8	*	—	TR	2SB1709×2	−12	−1.5	270 to 680	—
			US6T9	*	—	TR	2SB1710×2	−30	−1	270 to 680	—
	NPN×2		US6X7	*	—	TR	2SD2674×2	12	1.5	270 to 680	—
			US6X8	*	—	TR	2SD2675×2	30	1	270 to 680	—
 SOT-25T (TSMT5) 2928 size	NPN×2	DC-DC Converter	QS5W1	—	—	TR	Exclusive Chip	30	3	200 to 500	—
			QS5W2	*	—	TR	2SCR533P×2	50	3	180 to 450	—
	PNP+NPN		QSZ2	*	—	TR	2SB1695 2SD2657	−30 30	−1.5 1.5	270 to 680 270 to 680	—
			QSZ4	*	—	TR	2SB1706 2SD2671	−30 30	−2 2	270 to 680 270 to 680	—
			QS5Y1	*	—	TR	Exclusive Chip	−30 30	−3 3	200 to 500 200 to 500	—
			QS5Y2	*	—	TR	2SAR533P 2SCR533P	−50 50	−3 3	180 to 450 180 to 450	—
 SOT-457T (TSMT6) [SC-95] 2928 size	PNP×2	Driver	QST8	*	—	TR	2SB1709×2	−12	−1.5	270 to 680	—
			QST9	*	—	TR	2SB1710×2	−30	−1	270 to 680	—
	NPN×2		QSX7	*	—	TR	2SD2674×2	12	1.5	270 to 680	—
			QSX8	*	—	TR	2SD2675×2	30	1	270 to 680	—
	PNP+NPN	Pre Amplifier	QS6Z5	*	—	TR	2SAR513P 2SCR513P	−50 50	−1 1	180 to 450 180 to 450	—

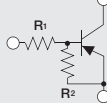
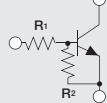
Notes1 : * : General Part No. have no grade code.

Notes2 : For Pin location, please see the technical specifications.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Digital Transistors

Quick Reference for 100mA Digital Transistors(For Automotive use)

Item	Part No.		R ₁ (kΩ)	R ₂ (kΩ)	Package																V _{CC} (V _{CE0}) (V)	I _O (I _C) (A)	G _I (h _{FE})
	PNP	NPN			SOT-723 (VMT3) [SC-105AA] 1212 size	SOT-416FL (EMT3F) [SC-89] 1616 size	SOT-416 (EMT3) [SC-75A] 1616 size	SOT-323FL (UMT3F) [SC-85] 2021 size	SOT-323 (UMT3) [SC-70] 2021 size	SOT-23 (SST3) 2924 size	SOT-346 (SMT3) [SC-59] 2928 size												
																							
	P _O =150mW*1								P _O =200mW*1														
	PNP	NPN			PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN			
Specifications	Quick Reference No.																						
R ₁ =R ₂ Potential Divider type	DTA123Ex	DTC123Ex	2.2	2.2	1	20	40	55	70	85	100	115	130	154	New 179	New 194	211	232	253	268	50	0.1	20 or more
	DTA143Ex	DTC143Ex	4.7	4.7	2	21	41	56	71	86	101	116	131	155	New 180	New 195	212	233	254	269		0.1	30 or more
	DTA114Ex	DTC114Ex	10	10	3	22	42	57	72	87	102	117	132	156	New 181	New 196	213	234	255	270		0.05	30 or more
	DTA124Ex	DTC124Ex	22	22	4	23	43	58	73	88	103	118	133	157	New 182	New 197	214	235	256	271		0.03	56 or more
	DTA144Ex	DTC144Ex	47	47	5	24	44	59	74	89	104	119	134	158	New 183	New 198	215	236	257	272		0.03	68 or more
	DTA115Ex	DTC115Ex	100	100	6	25	45	60	75	90	105	120	135	159	New 184	New 199	216	237	258	273		0.02	82 or more
R ₁ ≠R ₂ Leak Absorption type	DTA113Zx	DTC113Zx	1	10	New 7	New 26	46	62	76	91	106	121	136	160	New 185	New 200	217	238	259	274		0.1	33 or more
	DTA123Yx	DTC123Yx	2.2	10	New 8	New 27	47	63	77	92	107	122	137	161	New 186	New 201	218	239	260	275		0.1	33 or more
	DTA123Jx	DTC123Jx	2.2	47	9	28	48	64	78	93	108	123	138	162	New 187	New 202	219	240	261	276		0.1	80 or more
	DTA143Xx	DTC143Xx	4.7	10	10	29	49	65	79	94	109	124	139	163	New 188	New 203	220	241	262	277		0.1	30 or more
	DTA143Zx	DTC143Zx	4.7	47	11	30	50	66	80	95	110	125	140	164	New 189	New 204	221	242	263	278		0.1	80 or more
	DTA114Wx	DTC114Wx	10	4.7	New 12	New 31							141	165								0.1	24 or more
	DTA114Yx	DTC114Yx	10	47	13	32	51	67	81	96	111	126	142	166	New 190	New 205	222	243	264	279		0.07	68 or more
	DTA124Xx	DTC124Xx	22	47	14	33	52	68	82	97	112	127	143	167	New 191	New 206	223	244	265	280		0.05	68 or more
	DTA144Vx	DTC144Vx	47	10	New 15	New 34											New 224	New 245				0.03	33 or more
	DTA144Wx	DTC144Wx	47	22	New 16	New 35							144	168			New 225	New 246				0.03	56 or more
Type Using R ₁ Alone as Input Resistor	DTA123Tx	DTC123Tx	2.2	—	New 17	New 36							New 145	New 169			New 226	New 247				0.1	100 to 600
	DTA143Tx	DTC143Tx	4.7	—	18	37	53	61	83	98	113	128	146	170	New 192	New 207	227	248	266	281		0.1	100 to 600
	DTA114Tx	DTC114Tx	10	—	19	38	54	69	84	99	114	129	147	171	New 193	New 208	228	249	267	282	0.1	100 to 600	
	DTA124Tx	DTC124Tx	22	—									148	172			New 229	New 250			0.1	100 to 600	
	DTA144Tx	DTC144Tx	47	—		39							149	173			New 230	New 251			0.1	100 to 600	
	DTA115Tx	DTC115Tx	100	—									150	174			New 231	New 252			0.1	100 to 600	
Type Using R ₂ Alone as Input Resistor	DTA114Gx	DTC114Gx	—	10									151	175	New 209						0.1	30 or more	
	DTA124Gx	DTC124Gx	—	22										176							0.1	56 or more	
	DTA144Gx	DTC144Gx	—	47									152	177							0.1	68 or more	
	DTA115Gx	DTC115Gx	—	100									153	178	New 210						0.1	82 or more	
x: Packaging designation symbol					M	EB	E	UB	UA	U3	CA	KA											

Notes 1: VMT3, EMT3F, EMT3 and UMT3F without suffix A.

Notes 2: *1: With reference land installed.

Notes 3: PNP (—) symbol omitted.

Notes 4: Package is JEDEC code. () : ROHM packages, [] : JEITA code.

100mA Digital Transistors(For Automotive use)													
Package	Product No.					Polarity	P _D *1 (mW)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I _O (I _C) (A)	G _I (h _{FE})	Automotive Grade AEC-Q101
	Quick Reference No.	Part No.	Grade Code		Taping Code								
			General	Automotive									
 SOT-723 (VMT3) [SC-105AA] 1212 size	1	DTA123EM	*	FHA	T2L	PNP	150	2.2	2.2	−50	−0.1	20 or more	YES
	2	DTA143EM		FHA	T2L		150	4.7	4.7	−50	−0.1	30 or more	YES
	3	DTA114EM		FHA	T2L		150	10	10	−50	−0.05	30 or more	YES
	4	DTA124EM		FHA	T2L		150	22	22	−50	−0.03	56 or more	YES
	5	DTA144EM		FHA	T2L		150	47	47	−50	−0.03	68 or more	YES
	6	DTA115EM		FHA	T2L		150	100	100	−50	−0.02	82 or more	YES
	7	New DTA113ZM		FHA	T2L		150	1	10	−50	−0.1	33 or more	YES
	8	New DTA123YM		FHA	T2L		150	2.2	10	−50	−0.1	33 or more	YES
	9	DTA123JM		FHA	T2L		150	2.2	47	−50	−0.1	80 or more	YES
	10	DTA143XM		FHA	T2L		150	4.7	10	−50	−0.1	30 or more	YES
	11	DTA143ZM		FHA	T2L		150	4.7	47	−50	−0.1	80 or more	YES
	12	New DTA114WM		FHA	T2L		150	10	4.7	−50	−0.1	24 or more	YES
	13	DTA114YM		FHA	T2L		150	10	47	−50	−0.07	68 or more	YES
	14	DTA124XM		FHA	T2L		150	22	47	−50	−0.05	68 or more	YES
	15	New DTA144VM		FHA	T2L		150	47	10	−50	−0.03	33 or more	YES
	16	New DTA144WM		FHA	T2L		150	47	22	−50	−0.03	56 or more	YES
	17	New DTA123TM		FHA	T2L		150	2.2	—	−50	−0.1	100 to 600	YES
	18	DTA143TM		FHA	T2L		150	4.7	—	−50	−0.1	100 to 600	YES
	19	DTA114TM		FHA	T2L		150	10	—	−50	−0.1	100 to 600	YES
	20	DTC123EM		FHA	T2L	NPN	150	2.2	2.2	50	0.1	20 or more	YES
	21	DTC143EM		FHA	T2L		150	4.7	4.7	50	0.1	30 or more	YES
	22	DTC114EM		FHA	T2L		150	10	10	50	0.05	30 or more	YES
	23	DTC124EM		FHA	T2L		150	22	22	50	0.03	56 or more	YES
	24	DTC144EM		FHA	T2L		150	47	47	50	0.03	68 or more	YES
	25	DTC115EM		FRA	T2L		150	100	100	50	0.02	82 or more	YES
	26	New DTC113ZM		FHA	T2L		150	1	10	50	0.1	33 or more	YES
	27	New DTC123YM		FHA	T2L		150	2.2	10	50	0.1	33 or more	YES
	28	DTC123JM		FHA	T2L		150	2.2	47	50	0.1	80 or more	YES
	29	DTC143XM		FHA	T2L		150	4.7	10	50	0.1	30 or more	YES
	30	DTC143ZM		FHA	T2L		150	4.7	47	50	0.1	80 or more	YES
	31	New DTC114WM		FHA	T2L		200	10	4.7	50	0.1	24 or more	YES
	32	DTC114YM		FHA	T2L		150	10	47	50	0.07	68 or more	YES
	33	DTC124XM		FHA	T2L		150	22	47	50	0.05	68 or more	YES
	34	New DTC144VM		FHA	T2L		150	47	10	50	0.03	33 or more	YES
	35	New DTC144WM		FHA	T2L		150	47	22	50	0.03	56 or more	YES
	36	New DTC123TM		FHA	T2L		150	2.2	—	50	0.1	100 to 600	YES
	37	DTC143TM		FHA	T2L		150	4.7	—	50	0.1	100 to 600	YES
	38	DTC114TM		FHA	T2L		150	10	—	50	0.1	100 to 600	YES
	39	DTC144TM		FHA	T2L		0.15	47	—	50	0.1	100 to 600	YES
 SOT-416FL (EMT3F) [SC-89] 1616 size	40	DTA123EEB	*	HZG	TL	PNP	150	2.2	2.2	−50	−0.1	20 or more	YES
	41	DTA143EEB		HZG	TL		150	4.7	4.7	−50	−0.1	30 or more	YES
	42	DTA114EEB		HZG	TL		150	10	10	−50	−0.05	30 or more	YES
	43	DTA124EEB		HZG	TL		150	22	22	−50	−0.03	56 or more	YES
	44	DTA144EEB		HZG	TL		150	47	47	−50	−0.03	68 or more	YES
	45	DTA115EEB		HZG	TL		150	100	100	−50	−0.02	82 or more	YES
	46	DTA113ZEB		HZG	TL		150	1	10	−50	−0.1	33 or more	YES
	47	DTA123YEB		HZG	TL		150	2.2	10	−50	−0.1	33 or more	YES
	48	DTA123JEB		HZG	TL		150	2.2	47	−50	−0.1	80 or more	YES
	49	DTA143XEB		HZG	TL		150	4.7	10	−50	−0.1	30 or more	YES
	50	DTA143ZEB		HZG	TL		150	4.7	47	−50	−0.1	80 or more	YES
	51	DTA114YEB		HZG	TL		150	10	47	−50	−0.07	68 or more	YES
	52	DTA124XEB		HZG	TL		150	22	47	−50	−0.05	68 or more	YES
	53	DTA143TEB		HZG	TL		150	4.7	—	−50	−0.1	100 to 600	YES
	54	DTA114TEB		HZG	TL		150	10	—	−50	−0.1	100 to 600	YES
	55	DTC123EEB		HZG	TL	NPN	150	2.2	2.2	50	0.1	20 or more	YES
	56	DTC143EEB		HZG	TL		150	4.7	4.7	50	0.1	30 or more	YES
	57	DTC114EEB		HZG	TL		150	10	10	50	0.05	30 or more	YES
	58	DTC124EEB		HZG	TL		150	22	22	50	0.03	56 or more	YES
	59	DTC144EEB		HZG	TL		150	47	47	50	0.03	68 or more	YES
	60	DTC115EEB		HZG	TL		150	100	100	50	0.02	82 or more	YES
	61	DTC143TEB		HZG	TL		150	4.7	—	50	0.1	100 to 600	YES
	62	DTC113ZEB		HZG	TL		150	1	10	50	0.1	33 or more	YES
	63	DTC123YEB		HZG	TL		150	2.2	10	50	0.1	33 or more	YES
	64	DTC123JEB		HZG	TL		150	2.2	47	50	0.1	80 or more	YES
	65	DTC143XEB		HZG	TL		150	4.7	10	50	0.1	30 or more	YES
	66	DTC143ZEB		HZG	TL		150	4.7	47	50	0.1	80 or more	YES
	67	DTC114YEB		HZG	TL		150	10	47	50	0.07	68 or more	YES
	68	DTC124XEB		HZG	TL		150	22	47	50	0.05	68 or more	YES
69	DTC114TEB	HZG	TL	150	10		—	50	0.1	100 to 600	YES		

Notes1: *: General part No. have no grade code.

Notes2: *1: With reference land installed.

Notes3: Package is JEDEC code. () : ROHM packages, [] : JEITA code.

Digital Transistors

100mA Digital Transistors(For Automotive use)

Package	Product No.					Polarity	P _D *1 (mW)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I _O (I _C) (A)	G _I (h _{FE})	Automotive Grade AEC-Q101
	Quick Reference No.	Part No.	Grade Code		Taping Code								
			General	Automotive									
 SOT-416 (EMT3) [SC-75A] 1616 size	70	DTA123EE	*	FRA	TL	PNP	150	2.2	2.2	−50	−0.1	20 or more	YES
	71	DTA143EE		FRA	TL		150	4.7	4.7	−50	−0.1	30 or more	YES
	72	DTA114EE		FRA	TL		150	10	10	−50	−0.05	30 or more	YES
	73	DTA124EE		FRA	TL		150	22	22	−50	−0.03	56 or more	YES
	74	DTA144EE		FRA	TL		150	47	47	−50	−0.03	68 or more	YES
	75	DTA115EE		FRA	TL		150	100	100	−50	−0.02	82 or more	YES
	76	DTA113ZE		FRA	TL		150	1	10	−50	−0.1	33 or more	YES
	77	DTA123YE		FRA	TL		150	2.2	10	−50	−0.1	33 or more	YES
	78	DTA123JE		FRA	TL		150	2.2	47	−50	−0.1	80 or more	YES
	79	DTA143XE		FRA	TL		150	4.7	10	−50	−0.1	30 or more	YES
	80	DTA143ZE		FRA	TL		150	4.7	47	−50	−0.1	80 or more	YES
	81	DTA114YE		FRA	TL		150	10	47	−50	−0.07	68 or more	YES
	82	DTA124XE		FRA	TL		150	22	47	−50	−0.05	68 or more	YES
	83	DTA143TE		FRA	TL		150	4.7	—	−50	−0.1	100 to 600	YES
	84	DTA114TE		FRA	TL		150	10	—	−50	−0.1	100 to 600	YES
	85	DTC123EE		FRA	TL	NPN	150	2.2	2.2	50	0.1	20 or more	YES
	86	DTC143EE		FRA	TL		150	4.7	4.7	50	0.1	30 or more	YES
	87	DTC114EE		FRA	TL		150	10	10	50	0.05	30 or more	YES
	88	DTC124EE		FRA	TL		150	22	22	50	0.03	56 or more	YES
	89	DTC144EE		FRA	TL		150	47	47	50	0.03	68 or more	YES
	90	DTC115EE		FRA	TL		150	100	100	50	0.02	82 or more	YES
	91	DTC113ZE		FRA	TL		150	1	10	50	0.1	33 or more	YES
	92	DTC123YE		FRA	TL		150	2.2	10	50	0.1	33 or more	YES
	93	DTC123JE		FRA	TL		150	2.2	47	50	0.1	80 or more	YES
	94	DTC143XE		FRA	TL		150	4.7	10	50	0.1	30 or more	YES
	95	DTC143ZE		FRA	TL		150	4.7	47	50	0.1	80 or more	YES
	96	DTC114YE		FRA	TL		150	10	47	50	0.07	68 or more	YES
	97	DTC124XE		FRA	TL		150	22	47	50	0.05	68 or more	YES
	98	DTC143TE		FRA	TL		150	4.7	—	50	0.1	100 to 600	YES
	99	DTC114TE		FRA	TL		150	10	—	50	0.1	100 to 600	YES
 SOT-323FL (UMT3F) [SC-85] 2021 size	100	DTA123EUB	*	HZG	TL	PNP	200	2.2	2.2	−50	−0.1	20 or more	YES
	101	DTA143EUB		HZG	TL		200	4.7	4.7	−50	−0.1	30 or more	YES
	102	DTA114EUB		HZG	TL		200	10	10	−50	−0.05	30 or more	YES
	103	DTA124EUB		HZG	TL		200	22	22	−50	−0.03	56 or more	YES
	104	DTA144EUB		HZG	TL		200	47	47	−50	−0.03	68 or more	YES
	105	DTA115EUB		HZG	TL		200	100	100	−50	−0.02	82 or more	YES
	106	DTA113ZUB		HZG	TL		200	1	10	−50	−0.1	33 or more	YES
	107	DTA123YUB		HZG	TL		200	2.2	10	−50	−0.1	33 or more	YES
	108	DTA123JUB		HZG	TL		200	2.2	47	−50	−0.1	80 or more	YES
	109	DTA143XUB		HZG	TL		200	4.7	10	−50	−0.1	30 or more	YES
	110	DTA143ZUB		HZG	TL		200	4.7	47	−50	−0.1	80 or more	YES
	111	DTA114YUB		HZG	TL		200	10	47	−50	−0.07	68 or more	YES
	112	DTA124XUB		HZG	TL		200	22	47	−50	−0.05	68 or more	YES
	113	DTA143TUB		HZG	TL		200	4.7	—	−50	−0.1	100 to 600	YES
	114	DTA114TUB		HZG	TL		200	10	—	−50	−0.1	100 to 600	YES
	115	DTC123EUB		HZG	TL	NPN	200	2.2	2.2	50	0.1	20 or more	YES
	116	DTC143EUB		HZG	TL		200	4.7	4.7	50	0.1	30 or more	YES
	117	DTC114EUB		HZG	TL		200	10	10	50	0.05	30 or more	YES
	118	DTC124EUB		HZG	TL		200	22	22	50	0.03	56 or more	YES
	119	DTC144EUB		HZG	TL		200	47	47	50	0.03	68 or more	YES
	120	DTC115EUB		HZG	TL		200	100	100	50	0.02	82 or more	YES
	121	DTC113ZUB		HZG	TL		200	1	10	50	0.1	33 or more	YES
	122	DTC123YUB		HZG	TL		200	2.2	10	50	0.1	33 or more	YES
	123	DTC123JUB		HZG	TL		200	2.2	47	50	0.1	80 or more	YES
	124	DTC143XUB		HZG	TL		200	4.7	10	50	0.1	30 or more	YES
	125	DTC143ZUB		HZG	TL		200	4.7	47	50	0.1	80 or more	YES
	126	DTC114YUB		HZG	TL		200	10	47	50	0.07	68 or more	YES
	127	DTC124XUB		HZG	TL		200	22	47	50	0.05	68 or more	YES
	128	DTC143TUB		HZG	TL		200	4.7	—	50	0.1	100 to 600	YES
	129	DTC114TUB		HZG	TL		200	10	—	50	0.1	100 to 600	YES

Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

100mA Digital Transistors(For Automotive use)

Package	Product No.					Polarity	P _D *1 (mW)	R ₁ (k.Ω)	R ₂ (k.Ω)	V _{CC} (V _{CE0}) (V)	I ₀ (I _C) (A)	G _I (hFE)	Automotive Grade AEC-Q101
	Quick Reference No.	Part No.	Grade Code		Taping Code								
			General	Automotive									
 SOT-323 (UMT3) [SC-70] 2021 size	130	DTA123EUA	*	FRA	T106	PNP	200	2.2	2.2	−50	−0.1	20 or more	YES
	131	DTA143EUA		FRA	T106		200	4.7	4.7	−50	−0.1	30 or more	YES
	132	DTA114EUA		FRA	T106		200	10	10	−50	−0.05	30 or more	YES
	133	DTA124EUA		FRA	T106		200	22	22	−50	−0.03	56 or more	YES
	134	DTA144EUA		FRA	T106		200	47	47	−50	−0.03	68 or more	YES
	135	DTA115EUA		FRA	T106		200	100	100	−50	−0.02	82 or more	YES
	136	DTA113ZUA		FRA	T106		200	1	10	−50	−0.1	33 or more	YES
	137	DTA123YUA		FRA	T106		200	2.2	10	−50	−0.1	33 or more	YES
	138	DTA123JUA		FRA	T106		200	2.2	47	−50	−0.1	80 or more	YES
	139	DTA143XUA		FRA	T106		200	4.7	10	−50	−0.1	30 or more	YES
	140	DTA143ZUA		FRA	T106		200	4.7	47	−50	−0.1	80 or more	YES
	141	DTA114WUA		FRA	T106		200	10	4.7	−50	−0.1	24 or more	YES
	142	DTA114YUA		FRA	T106		200	10	47	−50	−0.07	68 or more	YES
	143	DTA124XUA		FRA	T106		200	22	47	−50	−0.05	68 or more	YES
	144	DTA144WUA		FRA	T106		200	47	22	−50	−0.03	56 or more	YES
	145	New DTA123TUA		FRA	T106		200	2.2	—	−50	−0.1	100 to 600	YES
	146	DTA143TUA		FRA	T106		200	4.7	—	−50	−0.1	100 to 600	YES
	147	DTA114TUA		FRA	T106		200	10	—	−50	−0.1	100 to 600	YES
	148	DTA124TUA		FRA	T106		200	22	—	−50	−0.1	100 to 600	YES
	149	DTA144TUA		FRA	T106		200	47	—	−50	−0.1	100 to 600	YES
	150	DTA115TUA		FRA	T106		200	100	—	−50	−0.1	100 to 600	YES
	151	DTA114GUA		FRA	T106		200	—	10	−50	−0.1	30 or more	YES
	152	DTA144GUA		FRA	T106		200	—	47	−50	−0.1	68 or more	YES
	153	DTA115GUA		FRA	T106		200	—	100	−50	−0.1	82 or more	YES
	154	DTC123EUA		FRA	T106	NPN	200	2.2	2.2	50	0.1	20 or more	YES
	155	DTC143EUA		FRA	T106		200	4.7	4.7	50	0.1	30 or more	YES
	156	DTC114EUA		FRA	T106		200	10	10	50	0.05	30 or more	YES
	157	DTC124EUA		FRA	T106		200	22	22	50	0.03	56 or more	YES
	158	DTC144EUA		FRA	T106		200	47	47	50	0.03	68 or more	YES
	159	DTC115EUA		FRA	T106		200	100	100	50	0.02	82 or more	YES
	160	DTC113ZUA		FRA	T106		200	1	10	50	0.1	33 or more	YES
	161	DTC123YUA		FRA	T106		200	2.2	10	50	0.1	33 or more	YES
	162	DTC123JUA		FRA	T106		200	2.2	47	50	0.1	80 or more	YES
	163	DTC143XUA		FRA	T106		200	4.7	10	50	0.1	30 or more	YES
	164	DTC143ZUA		FRA	T106		200	4.7	47	50	0.1	80 or more	YES
	165	DTC114WUA		FRA	T106		200	10	4.7	50	0.1	24 or more	YES
	166	DTC114YUA		FRA	T106		200	10	47	50	0.07	68 or more	YES
	167	DTC124XUA		FRA	T106		200	22	47	50	0.05	68 or more	YES
	168	DTC144WUA		FRA	T106		200	47	22	50	0.03	56 or more	YES
	169	New DTC123TUA		FRA	T106		200	2.2	—	50	0.1	100 to 600	YES
	170	DTC143TUA		FRA	T106		200	4.7	—	50	0.1	100 to 600	YES
	171	DTC114TUA		FRA	T106		200	10	—	50	0.1	100 to 600	YES
	172	DTC124TUA		FRA	T106		200	22	—	50	0.1	100 to 600	YES
	173	DTC144TUA		FRA	T106		200	47	—	50	0.1	100 to 600	YES
	174	DTC115TUA		FRA	T106		200	100	—	50	0.1	100 to 600	YES
	175	DTC114GUA		FRA	T106		200	—	10	50	0.1	30 or more	YES
	176	DTC124GUA		FRA	T106		200	—	22	50	0.1	56 or more	YES
	177	DTC144GUA		FRA	T106		200	—	47	50	0.1	68 or more	YES
	178	DTC115GUA		FRA	T106		200	—	100	50	0.1	82 or more	YES

Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Digital Transistors

100mA Digital Transistors(For Automotive use)

Product No.													
Package	Quick Reference No.	Part No.	Grade Code		Taping Code	Polarity	P _D *1 (mW)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I ₀ (I _C) (A)	G ₁ (hFE)	Automotive Grade AEC-Q101
			General	Automotive									
 SOT-323 (UMT3) [SC-70] 2021 size	179	New DTA123EU3	*	HZG	T106	PNP	200	2.2	2.2	−50	−0.1	20 or more	YES
	180	New DTA143EU3		HZG	T106		200	4.7	4.7	−50	−0.1	30 or more	YES
	181	New DTA114EU3		HZG	T106		200	10	10	−50	−0.05	30 or more	YES
	182	New DTA124EU3		HZG	T106		200	22	22	−50	−0.03	56 or more	YES
	183	New DTA144EU3		HZG	T106		200	47	47	−50	−0.03	68 or more	YES
	184	New DTA115EU3		HZG	T106		200	100	100	−50	−0.02	82 or more	YES
	185	New DTA113ZU3		HZG	T106		200	1	10	−50	−0.1	33 or more	YES
	186	New DTA123YU3		HZG	T106		200	2.2	10	−50	−0.1	33 or more	YES
	187	New DTA123JU3		HZG	T106		200	2.2	47	−50	−0.1	80 or more	YES
	188	New DTA143XU3		HZG	T106		200	4.7	10	−50	−0.1	30 or more	YES
	189	New DTA143ZU3		HZG	T106		200	4.7	47	−50	−0.1	80 or more	YES
	190	New DTA114YU3		HZG	T106		200	10	47	−50	−0.07	68 or more	YES
	191	New DTA124XU3		HZG	T106		200	22	47	−50	−0.05	68 or more	YES
	192	New DTA143TU3		HZG	T106		200	4.7	—	−50	−0.1	100 to 600	YES
	193	New DTA114TU3		HZG	T106		200	10	—	−50	−0.1	100 to 600	YES
	194	New DTC123EU3		HZG	T106	NPN	200	2.2	2.2	50	0.1	20 or more	YES
	195	New DTC143EU3		HZG	T106		200	4.7	4.7	50	0.1	30 or more	YES
	196	New DTC114EU3		HZG	T106		200	10	10	50	0.05	30 or more	YES
	197	New DTC124EU3		HZG	T106		200	22	22	50	0.03	56 or more	YES
	198	New DTC144EU3		HZG	T106		200	47	47	50	0.03	68 or more	YES
	199	New DTC115EU3		HZG	T106		200	100	100	50	0.02	82 or more	YES
	200	New DTC113ZU3		HZG	T106		200	1	10	50	0.1	33 or more	YES
	201	New DTC123YU3		HZG	T106		200	2.2	10	50	0.1	33 or more	YES
	202	New DTC123JU3		HZG	T106		200	2.2	47	50	0.1	80 or more	YES
	203	New DTC143XU3		HZG	T106		200	4.7	10	50	0.1	30 or more	YES
	204	New DTC143ZU3		HZG	T106		200	4.7	47	50	0.1	80 or more	YES
	205	New DTC114YU3		HZG	T106		200	10	47	50	0.07	68 or more	YES
	206	New DTC124XU3		HZG	T106		200	22	47	50	0.05	68 or more	YES
	207	New DTC143TU3		HZG	T106		200	4.7	—	50	0.1	100 to 600	YES
	208	New DTC114TU3		HZG	T106		200	10	—	50	0.1	100 to 600	YES
	209	New DTC114GU3		HZG	T106		200	—	10	50	0.1	30 or more	YES
	210	New DTC115GU3		HZG	T106		200	—	100	50	0.1	82 or more	YES
 SOT-23 (SST3) 2924 size	211	DTA123ECA	*	HZG	T116	PNP	200	2.2	2.2	−50	−0.1	20 or more	YES
	212	DTA143ECA		HZG	T116		200	4.7	4.7	−50	−0.1	30 or more	YES
	213	DTA114ECA		HZG	T116		200	10	10	−50	−0.05	30 or more	YES
	214	DTA124ECA		HZG	T116		200	22	22	−50	−0.03	56 or more	YES
	215	DTA144ECA		HZG	T116		200	47	47	−50	−0.03	68 or more	YES
	216	DTA115ECA		HZG	T116		200	100	100	−50	−0.02	82 or more	YES
	217	DTA113ZCA		HZG	T116		200	1	10	−50	−0.1	33 or more	YES
	218	DTA123YCA		HZG	T116		200	2.2	10	−50	−0.1	33 or more	YES
	219	DTA123JCA		HZG	T116		200	2.2	47	−50	−0.1	80 or more	YES
	220	DTA143XCA		HZG	T116		200	4.7	10	−50	−0.1	30 or more	YES
	221	DTA143ZCA		HZG	T116		200	4.7	47	−50	−0.1	80 or more	YES
	222	DTA114YCA		HZG	T116		200	10	47	−50	−0.07	68 or more	YES
	223	DTA124XCA		HZG	T116		200	22	47	−50	−0.05	68 or more	YES
	224	New DTA144VCA		HZG	T116		200	47	10	−50	−0.03	33 or more	YES
	225	New DTA144WCA		HZG	T116		200	47	22	−50	−0.03	56 or more	YES
	226	New DTA123TCA		HZG	T116		200	2.2	—	−50	−0.1	100 to 600	YES
	227	DTA143TCA		HZG	T116		200	4.7	—	−50	−0.1	100 to 600	YES
	228	DTA114TCA		HZG	T116		200	10	—	−50	−0.1	100 to 600	YES
	229	New DTA124TCA		HZG	T116		200	22	—	−50	−0.1	100 to 600	YES
	230	New DTA144TCA		HZG	T116		200	47	—	−50	−0.1	100 to 600	YES
	231	New DTA115TCA		HZG	T116	200	100	—	−50	−0.1	100 to 600	YES	
	232	DTC123ECA		HZG	T116	NPN	200	2.2	2.2	50	0.1	20 or more	YES
	233	DTC143ECA		HZG	T116		200	4.7	4.7	50	0.1	30 or more	YES
	234	DTC114ECA		HZG	T116		200	10	10	50	0.05	30 or more	YES
	235	DTC124ECA		HZG	T116		200	22	22	50	0.03	56 or more	YES
	236	DTC144ECA		HZG	T116		200	47	47	50	0.03	68 or more	YES
	237	DTC115ECA		HZG	T116		200	100	100	50	0.02	82 or more	YES
	238	DTC113ZCA		HZG	T116		200	1	10	50	0.1	33 or more	YES
	239	DTC123YCA		HZG	T116		200	2.2	10	50	0.1	33 or more	YES
	240	DTC123JCA		HZG	T116		200	2.2	47	50	0.1	80 or more	YES
	241	DTC143XCA		HZG	T116		200	4.7	10	50	0.1	30 or more	YES
	242	DTC143ZCA		HZG	T116		200	4.7	47	50	0.1	80 or more	YES
	243	DTC114YCA		HZG	T116		200	10	47	50	0.07	68 or more	YES
	244	DTC124XCA		HZG	T116		200	22	47	50	0.05	68 or more	YES
	245	New DTC144VCA		HZG	T116		200	47	10	50	0.03	33 or more	YES
	246	New DTC144WCA		HZG	T116		200	47	22	50	0.03	56 or more	YES
	247	New DTC123TCA		HZG	T116		200	2.2	—	50	0.1	100 to 600	YES
	248	DTC143TCA		HZG	T116		200	4.7	—	50	0.1	100 to 600	YES
	249	DTC114TCA		HZG	T116		200	10	—	50	0.1	100 to 600	YES
	250	New DTC124TCA		HZG	T116		200	22	—	50	0.1	100 to 600	YES
	251	New DTC144TCA		HZG	T116		200	47	—	50	0.1	100 to 600	YES
	252	New DTC115TCA		HZG	T116		200	100	—	50	0.1	100 to 600	YES

Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

100mA Digital Transistors(For Automotive use)

Package	Product No.					Polarity	P _D *1 (mW)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CEO}) (V)	I _O (I _C) (A)	G _I (h _{FE})	Automotive Grade AEC-Q101
	Quick Reference No.	Part No.	Grade Code		Taping Code								
			General	Automotive									
 SOT-346 (SMT3) [SC-59] 2928 size	253	DTA123EKA	*	FRA	T146	PNP	200	2.2	2.2	−50	−0.1	20 or more	YES
	254	DTA143EKA		FRA	T146		200	4.7	4.7	−50	−0.1	30 or more	YES
	255	DTA114EKA		FRA	T146		200	10	10	−50	−0.05	30 or more	YES
	256	DTA124EKA		FRA	T146		200	22	22	−50	−0.03	56 or more	YES
	257	DTA144EKA		FRA	T146		200	47	47	−50	−0.03	68 or more	YES
	258	DTA115EKA		FRA	T146		200	100	100	−50	−0.02	82 or more	YES
	259	DTA113ZKA		FRA	T146		200	1	10	−50	−0.1	33 or more	YES
	260	DTA123YKA		FRA	T146		200	2.2	10	−50	−0.1	33 or more	YES
	261	DTA123JKA		FRA	T146		200	2.2	47	−50	−0.1	80 or more	YES
	262	DTA143XKA		FRA	T146		200	4.7	10	−50	−0.1	30 or more	YES
	263	DTA143ZKA		FRA	T146		200	4.7	47	−50	−0.1	80 or more	YES
	264	DTA114YKA		FRA	T146		200	10	47	−50	−0.07	68 or more	YES
	265	DTA124XKA		FRA	T146		200	22	47	−50	−0.05	68 or more	YES
	266	DTA143TKA		FRA	T146		200	4.7	—	−50	−0.1	100 to 600	YES
	267	DTA114TKA		FRA	T146		200	10	—	−50	−0.1	100 to 600	YES
	268	DTC123EKA		FRA	T146	NPN	200	2.2	2.2	50	0.1	20 or more	YES
	269	DTC143EKA		FRA	T146		200	4.7	4.7	50	0.1	30 or more	YES
	270	DTC114EKA		FRA	T146		200	10	10	50	0.05	30 or more	YES
	271	DTC124EKA		FRA	T146		200	22	22	50	0.03	56 or more	YES
	272	DTC144EKA		FRA	T146		200	47	47	50	0.03	68 or more	YES
	273	DTC115EKA		FRA	T146		200	100	100	50	0.02	82 or more	YES
	274	DTC113ZKA		FRA	T146		200	1	10	50	0.1	33 or more	YES
	275	DTC123YKA		FRA	T146		200	2.2	10	50	0.1	33 or more	YES
	276	DTC123JKA		FRA	T146		200	2.2	47	50	0.1	80 or more	YES
	277	DTC143XKA		FRA	T146		200	4.7	10	50	0.1	30 or more	YES
	278	DTC143ZKA		FRA	T146		200	4.7	47	50	0.1	80 or more	YES
	279	DTC114YKA		FRA	T146		200	10	47	50	0.07	68 or more	YES
	280	DTC124XKA		FRA	T146		200	22	47	50	0.05	68 or more	YES
	281	DTC143TKA		FRA	T146		200	4.7	—	50	0.1	100 to 600	YES
	282	DTC114TKA		FRA	T146		200	10	—	50	0.1	100 to 600	YES

Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Digital Transistors

Quick Reference for 100mA Digital Transistors(For Consumer only)

Item	Part No.		R ₁ (kΩ)	R ₂ (kΩ)	Package						V _{CC} (V _{CE0}) (V)	I _O (I _C) (A)	G _I (h _{FE})
	PNP	NPN			SOT-723 (VMT3) [SC-105AA] 1212 size		SOT-416FL (EMT3F) [SC-89] 1616 size		SOT-323FL (UMT3F) [SC-85] 2021 size				
	P _D =150mW*1				P _D =200mW*1								
	PNP	NPN			PNP	NPN	PNP	NPN					
	Quick Reference No.												
Specifications	DTA023Ex	DTC023Ex	2.2	2.2	1	18	35	52	69	86	50	0.1	20 or more
	DTA043Ex	DTC043Ex	4.7	4.7	2	19	36	53	70	87		0.1	20 or more
	DTA014Ex	DTC014Ex	10	10	3	20	37	54	71	88		0.05	35 or more
	DTA024Ex	DTC024Ex	22	22	4	21	38	55	72	89		0.03	60 or more
	DTA044Ex	DTC044Ex	47	47	5	22	39	56	73	90		0.03	80 or more
	DTA015Ex	DTC015Ex	100	100	6	23	40	57	74	91		0.02	80 or more
R ₁ ≠R ₂ Leak Absorption type	DTA013Zx	DTC013Zx	1	10	7	24	41	58	75	92		0.1	30 or more
	DTA023Yx	DTC023Yx	2.2	10	8	25	42	59	76	93		0.1	35 or more
	DTA023Jx	DTC023Jx	2.2	47	9	26	43	60	77	94		0.1	80 or more
	DTA043Xx	DTC043Xx	4.7	10	10	27	44	61	78	95		0.1	35 or more
	DTA043Zx	DTC043Zx	4.7	47	11	28	45	62	79	96		0.1	80 or more
	DTA014Yx	DTC014Yx	10	47	12	29	46	63	80	97		0.07	80 or more
	DTA024Xx	DTC024Xx	22	47	13	30	47	64	81	98		0.05	80 or more
Type Using R ₁ Alone as Input Resistor	DTA043Tx	DTC043Tx	4.7	—	14	31	48	65	82	99		0.1	100 to 600
	DTA014Tx	DTC014Tx	10	—	15	32	49	66	83	100		0.1	100 to 600
	DTA044Tx	DTC044Tx	47	—	16	33	50	67	84	101		0.06	100 to 600
	DTA015Tx	DTC015Tx	100	—	17	34	51	68	85	102		0.1	100 to 600
x:Packaging designation symbol					M		EB		UB				

Notes1 : PNP (—) symbol omitted.
Notes2 : *1 : With reference land installed.
Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

100mA Digital Transistors(For Consumer only)

Package	Product No.					Polarity	P _D *1 (mW)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I ₀ (I _C) (A)	G _I (h _{FE})	Automotive Grade AEC-Q101
	Quick Reference No.	Part No.	Grade Code		Taping Code								
			General	Automotive									
 SOT-723 (VMT3) [SC-105AA] 1212 size	1	DTA023EM	*	—	T2L	PNP	150	2.2	2.2	—50	—0.1	20 or more	—
	2	DTA043EM		—	T2L		150	4.7	4.7	—50	—0.1	20 or more	—
	3	DTA014EM		—	T2L		150	10	10	—50	—0.05	35 or more	—
	4	DTA024EM		—	T2L		150	22	22	—50	—0.03	60 or more	—
	5	DTA044EM		—	T2L		150	47	47	—50	—0.03	80 or more	—
	6	DTA015EM		—	T2L		150	100	100	—50	—0.02	80 or more	—
	7	DTA013ZM		—	T2L		150	1	10	—50	—0.1	30 or more	—
	8	DTA023YM		—	T2L		150	2.2	10	—50	—0.1	35 or more	—
	9	DTA023JM		—	T2L		150	2.2	47	—50	—0.1	80 or more	—
	10	DTA043XM		—	T2L		150	4.7	10	—50	—0.1	35 or more	—
	11	DTA043ZM		—	T2L		150	4.7	47	—50	—0.1	80 or more	—
	12	DTA014YM		—	T2L		150	10	47	—50	—0.07	80 or more	—
	13	DTA024XM		—	T2L		150	22	47	—50	—0.05	80 or more	—
	14	DTA043TM		—	T2L		150	4.7	—	—50	—0.1	100 to 600	—
	15	DTA014TM		—	T2L		150	10	—	—50	—0.1	100 to 600	—
	16	DTA044TM		—	T2L		150	47	—	—50	—0.06	100 to 600	—
	17	DTA015TM		—	T2L		150	100	—	—50	—0.1	100 to 600	—
	18	DTC023EM		—	T2L	NPN	150	2.2	2.2	50	0.1	20 or more	—
	19	DTC043EM		—	T2L		150	4.7	4.7	50	0.1	20 or more	—
	20	DTC014EM		—	T2L		150	10	10	50	0.05	35 or more	—
	21	DTC024EM		—	T2L		150	22	22	50	0.03	60 or more	—
	22	DTC044EM		—	T2L		150	47	47	50	0.03	80 or more	—
	23	DTC015EM		—	T2L		150	100	100	50	0.02	80 or more	—
	24	DTC013ZM		—	T2L		150	1	10	50	0.1	30 or more	—
	25	DTC023YM		—	T2L		150	2.2	10	50	0.1	35 or more	—
	26	DTC023JM		—	T2L		150	2.2	47	50	0.1	80 or more	—
	27	DTC043XM		—	T2L		150	4.7	10	50	0.1	35 or more	—
	28	DTC043ZM		—	T2L		150	4.7	47	50	0.1	80 or more	—
	29	DTC014YM		—	T2L		150	10	47	50	0.07	80 or more	—
	30	DTC024XM		—	T2L		150	22	47	50	0.05	80 or more	—
	31	DTC043TM		—	T2L		150	4.7	—	50	0.1	100 to 600	—
	32	DTC014TM		—	T2L		150	10	—	50	0.1	100 to 600	—
	33	DTC044TM		—	T2L		150	47	—	50	0.06	100 to 600	—
	34	DTC015TM		—	T2L		150	100	—	50	0.1	100 to 600	—
 SOT-416FL (EMT3F) [SC-89] 1616 size	35	DTA023EEB	*	—	TL	PNP	150	2.2	2.2	—50	—0.1	20 or more	—
	36	DTA043EEB		—	TL		150	4.7	4.7	—50	—0.1	20 or more	—
	37	DTA014EEB		—	TL		150	10	10	—50	—0.05	35 or more	—
	38	DTA024EEB		—	TL		150	22	22	—50	—0.03	60 or more	—
	39	DTA044EEB		—	TL		150	47	47	—50	—0.03	80 or more	—
	40	DTA015EEB		—	TL		150	100	100	—50	—0.02	80 or more	—
	41	DTA013ZEB		—	TL		150	1	10	—50	—0.1	30 or more	—
	42	DTA023YEB		—	TL		150	2.2	10	—50	—0.1	35 or more	—
	43	DTA023JEB		—	TL		150	2.2	47	—50	—0.1	80 or more	—
	44	DTA043XEB		—	TL		150	4.7	10	—50	—0.1	35 or more	—
	45	DTA043ZEB		—	TL		150	4.7	47	—50	—0.1	80 or more	—
	46	DTA014YEB		—	TL		150	10	47	—50	—0.07	80 or more	—
	47	DTA024XEB		—	TL		150	22	47	—50	—0.05	80 or more	—
	48	DTA043TEB		—	TL		150	4.7	—	—50	—0.1	100 to 600	—
	49	DTA014TEB		—	TL		150	10	—	—50	—0.1	100 to 600	—
	50	DTA044TEB		—	TL		150	47	—	—50	—0.06	100 to 600	—
	51	DTA015TEB		—	TL		150	100	—	—50	—0.1	100 to 600	—
	52	DTC023EEB		—	TL	NPN	150	2.2	2.2	50	0.1	20 or more	—
	53	DTC043EEB		—	TL		150	4.7	4.7	50	0.1	20 or more	—
	54	DTC014EEB		—	TL		150	10	10	50	0.05	35 or more	—
	55	DTC024EEB		—	TL		150	22	22	50	0.03	60 or more	—
	56	DTC044EEB		—	TL		150	47	47	50	0.03	80 or more	—
	57	DTC015EEB		—	TL		150	100	100	50	0.02	80 or more	—
	58	DTC013ZEB		—	TL		150	1	10	50	0.1	30 or more	—
	59	DTC023YEB		—	TL		150	2.2	10	50	0.1	35 or more	—
	60	DTC023JEB		—	TL		150	2.2	47	50	0.1	80 or more	—
	61	DTC043XEB		—	TL		150	4.7	10	50	0.1	35 or more	—
	62	DTC043ZEB		—	TL		150	4.7	47	50	0.1	80 or more	—
	63	DTC014YEB		—	TL		150	10	47	50	0.07	80 or more	—
	64	DTC024XEB		—	TL		150	22	47	50	0.05	80 or more	—
	65	DTC043TEB		—	TL		150	4.7	—	50	0.1	100 to 600	—
	66	DTC014TEB		—	TL		150	10	—	50	0.1	100 to 600	—
	67	DTC044TEB		—	TL		150	47	—	50	0.06	100 to 600	—
	68	DTC015TEB		—	TL		150	100	—	50	0.1	100 to 600	—

Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Digital Transistors

100mA Digital Transistors(For Consumer only)

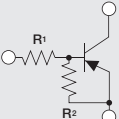
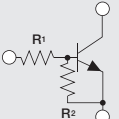
RoomX Digital Transistors (P or NPN Consumer Only)													
Package	Product No.					Polarity	P _D *1 (mW)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I ₀ (I _c) (A)	G _I (h _{FE})	Automotive Grade AEC-Q101
	Quick Reference No.	Part No.	Grade Code		Taping Code								
			General	Automotive									
 SOT-323FL (UMT3F) [SC-85] 2021 size	69	DTA023EUB	*	—	TL	PNP	200	2.2	2.2	−50	−0.1	20 or more	—
	70	DTA043EUB		—	TL		200	4.7	4.7	−50	−0.1	20 or more	—
	71	DTA014EUB		—	TL		200	10	10	−50	−0.05	35 or more	—
	72	DTA024EUB		—	TL		200	22	22	−50	−0.03	60 or more	—
	73	DTA044EUB		—	TL		200	47	47	−50	−0.03	80 or more	—
	74	DTA015EUB		—	TL		200	100	100	−50	−0.02	80 or more	—
	75	DTA013ZUB		—	TL		200	1	10	−50	−0.1	30 or more	—
	76	DTA023YUB		—	TL		200	2.2	10	−50	−0.1	35 or more	—
	77	DTA023JUB		—	TL		200	2.2	47	−50	−0.1	80 or more	—
	78	DTA043XUB		—	TL		200	4.7	10	−50	−0.1	35 or more	—
	79	DTA043ZUB		—	TL		200	4.7	47	−50	−0.1	80 or more	—
	80	DTA014YUB		—	TL		200	10	47	−50	−0.07	80 or more	—
	81	DTA024XUB		—	TL		200	22	47	−50	−0.05	80 or more	—
	82	DTA043TUB		—	TL		200	4.7	—	−50	−0.1	100 to 600	—
	83	DTA014TUB		—	TL		200	10	—	−50	−0.1	100 to 600	—
	84	DTA044TUB		—	TL		200	47	—	−50	−0.06	100 to 600	—
	85	DTA015TUB		—	TL		200	100	—	−50	−0.1	100 to 600	—
	86	DTC023EUB		—	TL	200	2.2	2.2	50	0.1	20 or more	—	
	87	DTC043EUB		—	TL	200	4.7	4.7	50	0.1	20 or more	—	
	88	DTC014EUB		—	TL	200	10	10	50	0.05	35 or more	—	
	89	DTC024EUB		—	TL	200	22	22	50	0.03	60 or more	—	
	90	DTC044EUB		—	TL	200	47	47	50	0.03	80 or more	—	
	91	DTC015EUB		—	TL	200	100	100	50	0.02	80 or more	—	
	92	DTC013ZUB		—	TL	200	1	10	50	0.1	30 or more	—	
	93	DTC023YUB		—	TL	200	2.2	10	50	0.1	35 or more	—	
	94	DTC023JUB		—	TL	200	2.2	47	50	0.1	80 or more	—	
	95	DTC043XUB		—	TL	200	4.7	10	50	0.1	35 or more	—	
	96	DTC043ZUB		—	TL	200	4.7	47	50	0.1	80 or more	—	
	97	DTC014YUB		—	TL	200	10	47	50	0.07	80 or more	—	
	98	DTC024XUB		—	TL	200	22	47	50	0.05	80 or more	—	
	99	DTC043TUB		—	TL	200	4.7	—	50	0.1	100 to 600	—	
	100	DTC014TUB		—	TL	200	10	—	50	0.1	100 to 600	—	
	101	DTC044TUB		—	TL	200	47	—	50	0.06	100 to 600	—	
	102	DTC015TUB		—	TL	200	100	—	50	0.1	100 to 600	—	

Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Quick Reference for 500mA Digital Transistors

Item Specifications	Part No.		R_1 (k Ω)	R_2 (k Ω)	Package						V_{CC} (V_{CE0}) (V)	I_o (I_C) (A)	G_i (h_{FE})	
	PNP	NPN			SOT-323 (UMT3) [SC-70] 2021 size		SOT-23 (SST3) 2924 size		SOT-346 (SMT3) [SC-59] 2928 size					
														
	$P_D=200mW^{*1}$													
	PNP	NPN			PNP	NPN	PNP	NPN						
	Quick Reference No.													
$R_1=R_2$ Potential Divider type	DTB113Ex	DTD113Ex	1	1	☆1	☆9	17	25	33	41	50	0.5	33 or more	
	DTB123Ex	DTD123Ex	2.2	2.2	☆2	☆10	18	26	34	42			39 or more	
	DTB143Ex	DTD143Ex	4.7	4.7	☆3	☆11	19	27	35	43			47 or more	
	DTB114Ex	DTD114Ex	10	10	☆4	☆12	20	28	36	44			56 or more	
$R_1 \neq R_2$ Leak Absorption type	DTB113Zx	DTD113Zx	1	10	☆5	☆13	21	29	37	45			56 or more	
	DTB123Yx	DTD123Yx	2.2	10	☆6	☆14	22	30	38	46			56 or more	
Type Using R_2 Alone as Bleeder Resistor	DTB114Gx	DTD114Gx	—	10	☆7	☆15	23	31	39	47	40		56 or more	
Type Using R_1 Alone as Input Resistor	DTB123Tx	DTD123Tx	2.2	—	☆8	☆16	24	32	40	48			100 to 600	
x: Packaging designation symbol					U		C		K					

Notes1 : PNP (—) symbol omitted. Notes2 : *1 : With reference land installed.
Notes3 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code.

☆ : Under Development

500mA Digital Transistors

Package	Product No.					Polarity	P _D *1 (mW)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I _o (I _C) (A)	G _i (h _{FE})	Automotive Grade AEC-Q101
	Quick Reference No.	Part No.	Grade Code		Taping Code								
			General	Automotive									
 SOT-323 (UMT3) [SC-70] 2021 size	1	☆DTB113EU3	*	HZG	T106	PNP	200	1	1	−50	−0.5	33 or more	YES
	2	☆DTB123EU3		HZG	T106		200	2.2	2.2	−50	−0.5	39 or more	YES
	3	☆DTB143EU3		HZG	T106		200	4.7	4.7	−50	−0.5	47 or more	YES
	4	☆DTB114EU3		HZG	T106		200	10	10	−50	−0.5	56 or more	YES
	5	☆DTB113ZU3		HZG	T106		200	1	10	−50	−0.5	56 or more	YES
	6	☆DTB123YU3		HZG	T106		200	2.2	10	−50	−0.5	56 or more	YES
	7	☆DTB114GU3		HZG	T106		200	—	10	−50	−0.5	56 or more	YES
	8	☆DTB123TU3		HZG	T106	NPN	200	2.2	—	−40	−0.5	100 to 600	YES
	9	☆DTD113EU3		HZG	T106		200	1	1	50	0.5	33 or more	YES
	10	☆DTD123EU3		HZG	T106		200	2.2	2.2	50	0.5	39 or more	YES
	11	☆DTD143EU3		HZG	T106		200	4.7	4.7	50	0.5	47 or more	YES
	12	☆DTD114EU3		HZG	T106		200	10	10	50	0.5	56 or more	YES
	13	☆DTD113ZU3		HZG	T106		200	1	10	50	0.5	56 or more	YES
	14	☆DTD123YU3		HZG	T106		200	2.2	10	50	0.5	56 or more	YES
	15	☆DTD114GU3		HZG	T106		200	—	10	50	0.5	56 or more	YES
	16	☆DTD123TU3		HZG	T106		200	2.2	—	40	0.5	100 to 600	YES
 SOT-23 (SOT-23) 2924 size	17	DTB113EC	*	HZG	T116	PNP	200	1	1	−50	−0.5	33 or more	YES
	18	DTB123EC		HZG	T116		200	2.2	2.2	−50	−0.5	39 or more	YES
	19	DTB143EC		HZG	T116		200	4.7	4.7	−50	−0.5	47 or more	YES
	20	DTB114EC		HZG	T116		200	10	10	−50	−0.5	56 or more	YES
	21	DTB113ZC		HZG	T116		200	1	10	−50	−0.5	56 or more	YES
	22	DTB123YC		HZG	T116		200	2.2	10	−50	−0.5	56 or more	YES
	23	DTB114GC		HZG	T116	NPN	200	—	10	−50	−0.5	56 or more	YES
	24	DTB123TC		HZG	T116		200	2.2	—	−40	−0.5	100 to 600	YES
	25	DTD113EC		HZG	T116		200	1	1	50	0.5	33 or more	YES
	26	DTD123EC		HZG	T116		200	2.2	2.2	50	0.5	39 or more	YES
	27	DTD143EC		HZG	T116		200	4.7	4.7	50	0.5	47 or more	YES
	28	DTD114EC		HZG	T116		200	10	10	50	0.5	56 or more	YES
	29	DTD113ZC		HZG	T116		200	1	10	50	0.5	56 or more	YES
	30	DTD123YC		HZG	T116		200	2.2	10	50	0.5	56 or more	YES
	31	DTD114GC		HZG	T116		200	—	10	50	0.5	56 or more	YES
	32	DTD123TC		HZG	T116		200	2.2	—	40	0.5	100 to 600	YES
 SOT-346 (SMT3) [SC-59] 2928 size	33	DTB113EK	*	FRA	T146	PNP	200	1	1	−50	−0.5	33 or more	YES
	34	DTB123EK		FRA	T146		200	2.2	2.2	−50	−0.5	39 or more	YES
	35	DTB143EK		FRA	T146		200	4.7	4.7	−50	−0.5	47 or more	YES
	36	DTB114EK		FRA	T146		200	10	10	−50	−0.5	56 or more	YES
	37	DTB113ZK		FRA	T146		200	1	10	−50	−0.5	56 or more	YES
	38	DTB123YK		FRA	T146		200	2.2	10	−50	−0.5	56 or more	YES
	39	DTB114GK		—	T146	NPN	200	—	10	−50	−0.5	56 or more	—
	40	DTB123TK		—	T146		200	2.2	—	−40	−0.5	100 to 600	—
	41	DTD113EK		FRA	T146		200	1	1	50	0.5	33 or more	YES
	42	DTD123EK		FRA	T146		200	2.2	2.2	50	0.5	39 or more	YES
	43	DTD143EK		FRA	T146		200	4.7	4.7	50	0.5	47 or more	YES
	44	DTD114EK		FRA	T146		200	10	10	50	0.5	56 or more	YES
	45	DTD113ZK		FRA	T146		200	1	10	50	0.5	56 or more	YES
	46	DTD123YK		FRA	T146		200	2.2	10	50	0.5	56 or more	YES
	47	DTD114GK		—	T146		200	—	10	50	0.5	56 or more	—
	48	DTD123TK		—	T146		200	2.2	—	40	0.5	100 to 600	—

Notes1 : * : General part No. have no grade code. Notes2 : *1 : With reference land installed.
Notes3 : Package is JEDEC code. () : ROHM packages, [] : JEITA code.

☆ : Under Development

Digital Transistors

Quick Reference for 12V/500mA Digital Transistors

Item	Part No.		R_1 (k Ω)	R_2 (k Ω)	Package				V_{CC} (V_{CE0}) (V)	I_o (I_c) (A)	G_I (h_{FE})
	PNP	NPN			SOT-723 (VMT3) [SC-105AA] 1212 size		SOT-416 (EMT3) [SC-75A] 1616 size				
	$P_o=150mW^{*1}$										
	PNP	NPN			PNP	NPN					
	Quick Reference No.										
Specifications											
$R_1=R_2$ Potential Divider type	DTB543Ex	DTD543Ex	4.7	4.7	1	6	11	16	12	0.5	115 or more
$R_1 \neq R_2$ Leak Absorption type	DTB513Zx	DTD513Zx	1	10	2	7	12	17			140 or more
	DTB523Yx	DTD523Yx	2.2	10	3	8	13	18			140 or more
	DTB543Xx	DTD543Xx	4.7	10	4	9	14	19			140 or more
	DTB543Zx	DTD543Zx	4.7	47	5	10	15	20			140 or more
x : Packaging designation symbol				M		E					

Notes1 : PNP (—) symbol omitted.

Notes2 : *1 : With reference land installed.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

12V/500mA Digital Transistors

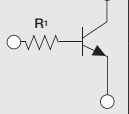
Package	Product No.					Polarity	P _D *1 (mW)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I _O (I _C) (A)	G _i (h _{FE})	Automotive Grade AEC-Q101
	Quick Reference No.	Part No.	Grade Code		Taping Code								
			General	Automotive									
 SOT-723 (VMT3) [SC-105AA] 1212 size	1	DTB543EM	*	—	T2L	PNP	150	4.7	4.7	—12	—0.5	115 or more	—
	2	DTB513ZM		—	T2L		150	1	10	—12	—0.5	140 or more	—
	3	DTB523YM		—	T2L		150	2.2	10	—12	—0.5	140 or more	—
	4	DTB543XM		—	T2L		150	4.7	10	—12	—0.5	140 or more	—
	5	DTB543ZM		—	T2L		150	4.7	47	—12	—0.5	140 or more	—
	6	DTD543EM		—	T2L	NPN	150	4.7	4.7	12	0.5	115 or more	—
	7	DTD513ZM		—	T2L		150	1	10	12	0.5	140 or more	—
	8	DTD523YM		—	T2L		150	2.2	10	12	0.5	140 or more	—
	9	DTD543XM		—	T2L		150	4.7	10	12	0.5	140 or more	—
	10	DTD543ZM		—	T2L		150	4.7	47	12	0.5	140 or more	—
 SOT-416 (EMT3) [SC-75A] 1616 size	11	DTB543EE	*	—	TL	PNP	150	4.7	4.7	—12	—0.5	115 or more	—
	12	DTB513ZE		—	TL		150	1	10	—12	—0.5	140 or more	—
	13	DTB523YE		—	TL		150	2.2	10	—12	—0.5	140 or more	—
	14	DTB543XE		—	TL		150	4.7	10	—12	—0.5	140 or more	—
	15	DTB543ZE		—	TL		150	4.7	47	—12	—0.5	140 or more	—
	16	DTD543EE		—	TL	NPN	150	4.7	4.7	12	0.5	115 or more	—
	17	DTD513ZE		—	TL		150	1	10	12	0.5	140 or more	—
	18	DTD523YE		—	TL		150	2.2	10	12	0.5	140 or more	—
	19	DTD543XE		—	TL		150	4.7	10	12	0.5	140 or more	—
	20	DTD543ZE		—	TL		150	4.7	47	12	0.5	140 or more	—

Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Quick Reference for Muting Digital Transistors

Item	Part No.		R₁ (kΩ)	R₂ (kΩ)	Package			V_{CC} (V_{CE0}) (V)	I_O (I_C) (A)	G_i (h_{FE})
	PNP	NPN			SOT-323FL (UMT3F) [SC-85] 2021 size	SOT-323 (UMT3) [SC-70] 2021 size	SOT-346 (SMT3) [SC-59] 2928 size			
	—									
Specifications					P _D =200mW*1					
Type Using R ₁ Alone as Input Resistor	—	DTC623Tx	2.2	—		DTC623TU	DTC623TK	20	0.6	820 to 2,700
	—	DTC643Tx	4.7	—		DTC643TU	DTC643TK			820 to 2,700
	—	DTC614Tx	10	—		DTC614TU	DTC614TK			820 to 2,700
	—	DTC923TUB	2.2	—	DTC923TUB			40 (V _{EB0})	0.4	820 to 2,700
	—	DTC943TUB	4.7	—	DTC943TUB					820 to 2,700
	—	DTC914TUB	10	—	DTC914TUB					820 to 2,700
x : Packaging designation symbol				UB	U	K				

Notes1 : *1 : With reference land installed.

Notes2 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Muting Digital Transistors

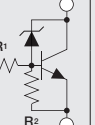
Package	Product No.				Polarity	P _D *1 (mW)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CEO}) (V)	I _O (I _C) (A)	G _I (h _{FE})	Automotive Grade AEC-Q101
	Part No.	Grade Code		Taping Code								
		General	Automotive									
 SOT-323FL (UMT3F) [SC-85] 2021 size	DTC923TUB	*	—	TL	NPN	200	2.2	—	40(V _{EB0})	0.4	820 to 2,700	—
	DTC943TUB		—	TL		200	4.7	—	40(V _{EB0})	0.4	820 to 2,700	—
	DTC914TUB		—	TL		200	10	—	40(V _{EB0})	0.4	820 to 2,700	—
 SOT-323 (UMT3) [SC-70] 2021 size	DTC623TU	*	—	T106	NPN	200	2.2	—	20	0.6	820 to 2,700	—
	DTC643TU		—	T106		200	4.7	—	20	0.6	820 to 2,700	—
	DTC614TU		—	T106		200	10	—	20	0.6	820 to 2,700	—
 SOT-346 (SMT3) [SC-59] 2928 size	DTC623TK	*	—	T146	NPN	200	2.2	—	20	0.6	820 to 2,700	—
	DTC643TK		—	T146		200	4.7	—	20	0.6	820 to 2,700	—
	DTC614TK		—	T146		200	10	—	20	0.6	820 to 2,700	—

Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Quick Reference for Power Digital Transistors

Item Specifications	Part No.				Package			
	PNP	NPN			SOT-89 (MPT3) [SC-62] 4540 size			
	—							

Notes1 : *1 : With reference land installed.

Notes2 : For internal circuit, please see the technical specifications.

Notes3 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Power Digital Transistors

Package	Product No.				Polarity	P _D *1 (W)	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I _O (I _C) (A)	G _I (h _{FE})	Automotive Grade AEC-Q101
	Part No.	Grade Code		Taping Code								
		General	Automotive									
 SOT-89 (MPT3) [SC-62] 4540 size	DTDG23YP	*	FRA	T100	NPN	0.5	2.2	10	60±10	1	300 or more	YES
	DTDG14GP		FRA	T100		0.5	—	10	60±10	1	300 or more	YES

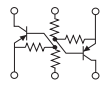
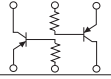
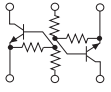
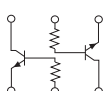
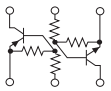
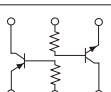
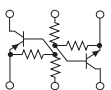
Notes1 : * : General part No. have no grade code.

Notes2 : *1 : With reference land installed.

Notes3 : For internal circuit, please see the technical specifications.

Notes4 : Package is JEDEC code. () : ROHM packages , [] : JEITA code.

Complex Digital Transistors

100mA Complex Digital Transistors(Including Automotive use)									
Configuration	Equivalent Circuit Diagram (TOP View)	SOT-563 (EMT6) [SC-107C] 1616 size	SOT-363 (UMT6) [SC-88] 2021 size	SOT-457 (SMT6) [SC-74] 2928 size	Equivalent Element Transistors	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CEO}) (V)	I _O (I _C) (A)
									
		Part No.							
PNP×2		EMB10	UMB10N	IMB10A	DTA123J×2	2.2	47	50	0.1
		EMB11	UMB11N	IMB11A	DTA114E×2	10	10		0.05
		EMB2	UMB2N	IMB2A	DTA144E×2	47	47		0.03
		EMB3	UMB3N	IMB3A	DTA143T×2	4.7	—		0.1
		EMB4	UMB4N		DTA114T×2	10	—		0.1
NPN×2		EMH10	UMH10N		DTC123J×2	2.2	47		0.1
		EMH25	☆UMH25N		DTC143Z×2	4.7	47		0.1
		EMH11	UMH11N	IMH11A	DTC114E×2	10	10		0.05
		EMH9	UMH9N	IMH9A	DTC114Y×2	10	47		0.07
		EMH1	UMH1N	IMH1A	DTC124E×2	22	22		0.03
		EMH2	UMH2N	IMH2A	DTC144E×2	47	47		0.03
		EMH3	UMH3N	IMH3A	DTC143T×2	4.7	—		0.1
		EMH4	UMH4N	IMH4A	DTC114T×2	10	—		0.1
			UMH8N						
		PNP+NPN Complimentary			New UMD25N		DTA123J		
					DTC123J	2.2	47		
EMD22	UMD22N				DTA143Z	4.7	47	0.1	
					DTC143Z	4.7	47		
EMD3	UMD3N			IMD3A	DTA114E	10	10	0.05	
					DTC114E	10	10		
EMD9	UMD9N			IMD9A	DTA114Y	10	47	0.07	
					DTC114Y	10	47		
EMD2	UMD2N			IMD2A	DTA124E	22	22	0.03	
					DTC124E	22	22		
EMD12	UMD12N				DTA144E	47	47	0.03	
					DTC144E	47	47		
	EMD6		UMD6N	IMD6A	DTA143T	4.7	—	0.1	
					DTC143T	4.7	—		
PNP+NPN Different type		EMD5	UMD5N		DTA143X	4.7	10	0.1	
					DTC144E	47	47	0.03	
		EMD4	UMD4N		DTA114Y	10	47	0.1	
					DTA114Y	47	47	0.03	

Notes1 : For Pin location, please see the technical specifications.

Notes2 : PNP (—) symbol omitted.

Notes3 : Package is JEDEC code. () : ROHM Packages , [] : JEITA code.

☆ : Under Development

100mA Complex Digital Transistors(Including Automotive use)												
Package	Configuration	Product No.			Equivalent Element Transistors	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CEQ}) (V)	I _o (I _c) (A)	Automotive Grade AEC-Q101		
		Part No.	Grade Code								Taping Code	
General	Automotive											
 SOT-563 (EMT6) [SC-107C] 1616 size	PNP×2	EMB10	*	FHA	T2R	DTA123J×2	2.2	47	-50	-0.1	YES	
		EMB11		FHA	T2R	DTA114E×2	10	10		-0.05	YES	
		EMB2		FHA	T2R	DTA144E×2	47	47		-0.03	YES	
		EMB3		FHA	T2R	DTA143T×2	4.7	—		-0.1	YES	
		EMB4		FHA	T2R	DTA114T×2	10	—		-0.1	YES	
	NPN×2	EMH10		FHA	T2R	DTC123J×2	2.2	47	50	0.1	YES	
		EMH25		FHA	T2R	DTC143Z×2	4.7	47		0.1	YES	
		EMH11		FHA	T2R	DTC114E×2	10	10		0.05	YES	
		EMH9		FHA	T2R	DTC114Y×2	10	47		0.07	YES	
		EMH1		FHA	T2R	DTC124E×2	22	22		0.03	YES	
		EMH2		FHA	T2R	DTC144E×2	47	47		0.03	YES	
		EMH3		FHA	T2R	DTC143T×2	4.7	—		0.1	YES	
		EMH4		FHA	T2R	DTC114T×2	10	—		0.1	YES	
		PNP+NPN Complimentary		EMD22	FHA	T2R	DTA143Z	4.7		47	-50	-0.1
	EMD3			FHA	T2R	DTC143Z	4.7	47	50	0.1		
						DTA114E	10	10	-50	-0.05	YES	
						DTC114E	10	10	50	0.05		
	EMD9			FHA	T2R	DTA114Y	10	47	-50	-0.07	YES	
						DTC114Y	10	47	50	0.07		
	EMD2			FHA	T2R	DTA124E	22	22	-50	-0.03	YES	
						DTC124E	22	22	50	0.03		
	EMD12			FHA	T2R	DTA144E	47	47	-50	-0.03	YES	
						DTC144E	47	47	50	0.03		
	EMD6			FHA	T2R	DTA143T	4.7	—	-50	-0.1	YES	
						DTC143T	4.7	—	50	0.1		
	PNP+NPN Different type	EMD5		—	T2R	DTA143X	4.7	10	-50	-0.1	—	
						DTC144E	47	47	50	0.03		
		EMD4		—	T2R	DTA114Y	10	47	-50	-0.1	—	
	DTC144E					7	47	50	0.03			
 SOT-363 (UMT6) [SC-88] 2021 size	PNP×2	UMB10N	*	FHA	TN	DTA123J×2	2.2	47	-50	-0.1	YES	
		UMB11N		FHA	TN	DTA114E×2	10	10		-0.05	YES	
		UMB2N		FHA	TN	DTA144E×2	47	47		-0.03	YES	
		UMB3N		FHA	TN	DTA143T×2	4.7	—		-0.1	YES	
		UMB4N		FHA	TN	DTA114T×2	10	—		-0.1	YES	
	NPN×2	UMH10N		FHA	TN	DTC123J×2	2.2	47	50	0.1	YES	
		☆UMH25N		FHA	TN	DTC143Z×2	4.7	47		0.1	YES	
		UMH11N		FHA	TN	DTC114E×2	10	10		0.05	YES	
		UMH9N		FHA	TN	DTC114Y×2	10	47		0.07	YES	
		UMH1N		FHA	TN	DTC124E×2	22	22		0.03	YES	
		UMH2N		FHA	TN	DTC144E×2	47	47		0.03	YES	
		UMH3N		FHA	TN	DTC143T×2	4.7	—		0.1	YES	
		UMH4N		FHA	TN	DTC114T×2	10	—		0.1	YES	
		PNP+NPN Complimentary		New UMD25N	—	TR	DTA123J	2.2		47	-50	-0.1
	UMD22N			FHA	TR	DTC123J	2.2	47	50	0.1		
						DTA143Z	4.7	47	-50	-0.1	YES	
						DTC143Z	4.7	47	50	0.1		
	UMD3N			FHA	TR	DTA114E	10	10	-50	-0.05	YES	
						DTC114E	10	10	50	0.05		
	UMD9N			FHA	TR	DTA114Y	10	47	-50	-0.07	YES	
						DTC114Y	10	47	50	0.07		
	UMD2N			FHA	TR	DTA124E	22	22	-50	-0.03	YES	
						DTC124E	22	22	50	0.03		
	UMD12N			FHA	TR	DTA144E	47	47	-50	-0.03	YES	
						DTC144E	47	47	50	0.03		
	UMD6N			FHA	TR	DTA143T	4.7	—	-50	-0.1	YES	
						DTC143T	4.7	—	50	0.1		
	PNP+NPN Different type	UMD5N		—	TR	DTA143X	4.7	10	-50	-0.1	—	
						DTC144E	47	47	50	0.03		
		UMD4N		—	TR	DTA114Y	10	47	-50	-0.1	—	
						DTC144E	47	47	50	0.03		

Notes1 : * : General part No. have no grade code.

Notes2 : For Pin location, please see the technical specifications.

Notes3 : Package is JEDEC code. () : ROHM Packages , [] : JEITA code.

☆ : Under Development

Complex Digital Transistors

100mA Complex Digital Transistors(Including Automotive use)													
Package	Configuration	Product No.				Equivalent Element Transistors	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I _O (I _C) (A)	Automotive Grade AEC-Q101		
		Part No.	Grade Code		Taping Code								
General	Automotive												
 SOT-457 (SMT6) [SC-74] 2928 size	PNP×2	IMB10A	*	—	T110	DTA123J×2	2.2	47	-50	-0.1	—		
		IMB11A		—	T110	DTA114E×2	10	10		-0.05	—		
		IMB2A		—	T110	DTA144E×2	47	47		-0.03	—		
		IMB3A		—	T110	DTA143T×2	4.7	—		-0.1	—		
	NPN×2	IMH11A		FRA	T110	DTC114E×2	10	10	50	0.05	—		
		IMH9A		FRA	T110	DTC114Y×2	10	47		0.07	—		
		IMH1A		—	T110	DTC124E×2	22	22		0.03	—		
		IMH2A		—	T110	DTC144E×2	47	47		0.03	—		
		IMH3A		—	T110	DTC143T×2	4.7	—		0.1	—		
		IMH4A		—	T110	DTC114T×2	10	—		0.1	—		
		PNP+NPN Complimentary		IMD3A	FRA	T108	DTA114E	10		10	-50	-0.05	—
							DTC114E	10		10	50	0.05	
	IMD9A			FRA	T108	DTA114Y	10	47	-50	-0.07	—		
						DTC114Y	10	47	50	0.07			
	IMD2A			—	T108	DTA124E	22	22	-50	-0.03	—		
						DTC124E	22	22	50	0.03			
	IMD6A	—		T108	DTA143T	4.7	—	-50	-0.1	—			
					DTC143T	4.7	—	50	0.1				

Notes1 : * : General part No. have no grade code.

Notes2 : For Pin location, please see the technical specifications.

Notes3 : Package is JEDEC code. () : ROHM Packages , [] : JEITA code.

Quick Reference for 100mA Complex Digital Transistors(For Consumer only) 1

Configuration	Equivalent Circuit Diagram (TOP View)	SOT-563 (EMT6) [SC-107C] 1616 size	Equivalent Element Transistors	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I _o (I _c) (A)
		Part No.					
PNP×2		EMB60	DTA023J×2	2.2	47	50	0.1
		EMB75	DTA043Z×2	4.7	47		0.1
		EMB59	DTA014Y×2	10	47		0.07
		EMB61	DTA014E×2	10	10		0.05
		EMB51	DTA024E×2	22	22		0.03
		EMB52	DTA044E×2	47	47		0.03
		EMB53	DTA043T×2	4.7	—		0.1
NPN×2		EMH60	DTC023J×2	2.2	47		0.1
		EMH75	DTC043Z×2	4.7	47		0.1
		EMH61	DTC014E×2	10	10		0.05
		EMH59	DTC014Y×2	10	47		0.07
		EMH51	DTC024E×2	22	22		0.03
		EMH52	DTC044E×2	47	47		0.03
		EMH53	DTC043T×2	4.7	—		0.1
PNP+NPN Complimentary		EMD72	DTA043Z	4.7	47	50	0.1
			DTC043Z	4.7	47		
		EMD53	DTA014E	10	10		0.05
			DTC014E	10	10		
		EMD59	DTA014Y	10	47		0.07
			DTC014Y	10	47		
		EMD52	DTA024E	22	22		0.03
			DTC024E	22	22		
		EMD62	DTA044E	47	47		0.03
			DTC044E	47	47		

Notes1: For Pin location, please see the technical specifications.

Notes2: PNP (—) symbol omitted.

Notes3: Package is JEDEC code. () : ROHM Packages, [] : JEITA code.

100mA Complex Digital Transistors(For Consumer only) 1

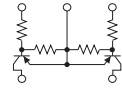
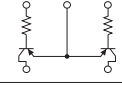
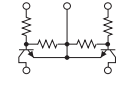
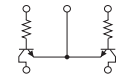
Package	Configuration	Product No.				Equivalent Element Transistors	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I _o (I _c) (A)	Automotive Grade AEC-Q101	
		Part No.	Grade Code		Taping Code							
			General	Automotive								
 SOT-563 (EMT6) [SC-107C] 1616 size	PNP×2	EMB60	*	—	T2R	DTA023J×2	2.2	47	—50	—0.1	—	
		EMB75		—	T2R	DTA043Z×2	4.7	47		—0.1	—	
		EMB59		—	T2R	DTA014Y×2	10	47		—0.07	—	
		EMB61		—	T2R	DTA014E×2	10	10		—0.05	—	
		EMB51		—	T2R	DTA024E×2	22	22		—0.03	—	
		EMB52		—	T2R	DTA044E×2	47	47		—0.03	—	
	EMB53	—		T2R	DTA043T×2	4.7	—	—0.1	—			
	NPN×2	EMH60		—	T2R	DTC023J×2	2.2	47	50	0.1	—	
		EMH75		—	T2R	DTC043Z×2	4.7	47		0.1	—	
		EMH61		—	T2R	DTC014E×2	10	10		0.05	—	
		EMH59		—	T2R	DTC014Y×2	10	47		0.07	—	
		EMH51		—	T2R	DTC024E×2	22	22		0.03	—	
		EMH52		—	T2R	DTC044E×2	47	47		0.03	—	
	EMH53	—		T2R	DTC043T×2	4.7	—	0.1	—			
	PNP+NPN Complimentary	EMD72	—	—	T2R	DTA043Z	4.7	47	—50	—0.1	—	
						DTC043Z	4.7	47	50	0.1		
		EMD59				T2R	DTA014Y	10	47	—50	—0.07	—
							DTC014Y	10	47	50	0.07	
		EMD53				T2R	DTA014E	10	10	—50	—0.05	—
							DTC014E	10	10	50	0.05	
		EMD52				T2R	DTA024E	22	22	—50	—0.03	—
							DTC024E	22	22	50	0.03	
		EMD62				T2R	DTA044E	47	47	—50	—0.03	—
							DTC044E	47	47	50	0.03	

Notes1: *: General part No. have no grade code.

Notes2: For Pin location, please see the technical specifications.

Notes3: Package is JEDEC code. () : ROHM Packages, [] : JEITA code.

Complex Digital Transistors

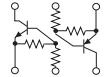
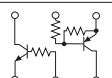
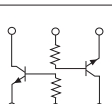
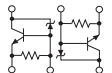
Quick Reference for 100mA Complex Digital Transistors(For Consumer only) 2									
Configuration	Equivalent Circuit Diagram (TOP View)	SOT-553 (EMT5) [SC-107BB] 1616 size	SOT-353 (UMT5) [SC-88A] 2021 size	SOT-25 (SMT5) [SC-74A] 2928 size	Equivalent Element Transistors	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CEO}) (V)	I _o (I _c) (A)
									
		Part No.							
PNP×2		EMA5	UMA5N	FMA5A	DTA123J×2	2.2	47	50	0.1
			UMA9N	FMA9A	DTA114E×2	10	10		0.05
			UMA1N	FMA1A	DTA124E×2	22	22		0.03
			UMA2N	FMA2A	DTA144E×2	47	47		0.03
		EMA3	UMA3N	FMA3A	DTA143T×2	4.7	—		0.1
		EMA4	UMA4N	FMA4A	DTA114T×2	10	—		0.1
NPN×2		EMG11	UMG11N		DTC123J×2	2.2	47		0.1
		EMG8	UMG8N		DTC143Z×2	4.7	47		0.1
		EMG9	UMG9N	FMG9A	DTC114E×2	10	10		0.05
		EMG5	UMG5N		DTC114Y×2	10	47		0.07
		EMG1	UMG1N	FMG1A	DTC124E×2	22	22		0.03
		EMG2	UMG2N	FMG2A	DTC144E×2	47	47		0.03
		EMG3	UMG3N	FMG3A	DTC143T×2	4.7	—		0.1
		EMG4	UMG4N	FMG4A	DTC114T×2	10	—		0.1

Notes1 : For Pin location, please see the technical specifications.
Notes2 : PNP (—) symbol omitted.
Notes3 : Package is JEDEC code. () : ROHM Packages , [] : JEITA code.

100mA Complex Digital Transistors(For Consumer only) 2											
Package	Configuration	Product No.				Equivalent Element Transistors	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CE0}) (V)	I _o (I _c) (A)	Automotive Grade AEC-Q101
		Part No.	Grade Code		Taping Code						
			General	Automotive							
 SOT-553 (EMT5) [SC-107BB] 1616 size	PNP×2	EMA5	*	—	T2R	DTA123J×2	2.2	47	—50	—0.1	—
		EMA3		—	T2R	DTA143T×2	4.7	—	—50	—0.1	—
		EMA4		—	T2R	DTA114T×2	10	—	—50	—0.1	—
	NPN×2	EMG11		—	T2R	DTC123J×2	2.2	47	50	0.1	—
		EMG8		—	T2R	DTC143Z×2	4.7	47	50	0.1	—
		EMG9		—	T2R	DTC114E×2	10	10	50	0.05	—
		EMG5		—	T2R	DTC114Y×2	10	47	50	0.07	—
		EMG1		—	T2R	DTC124E×2	22	22	50	0.03	—
		EMG2		—	T2R	DTC144E×2	47	47	50	0.03	—
		EMG3		—	T2R	DTC143T×2	4.7	—	50	0.1	—
		EMG4		—	T2R	DTC114T×2	10	—	50	0.1	—
		EMG6		—	T2R	DTC144T×2	47	—	50	0.1	—
 SOT-353 (UMT5) [SC-88A] 2021 size	PNP×2	UMA5N	*	—	TR	DTA123J×2	2.2	47	—50	—0.1	—
		UMA9N		—	TR	DTA114E×2	10	10	—50	—0.05	—
		UMA1N		—	TR	DTA124E×2	22	22	—50	—0.03	—
		UMA2N		—	TR	DTA144E×2	47	47	—50	—0.03	—
		UMA3N		—	TR	DTA143T×2	4.7	—	—50	—0.1	—
	NPN×2	UMA4N		—	TR	DTA114T×2	10	—	—50	—0.1	—
		UMG11N		—	TR	DTC123J×2	2.2	47	50	0.1	—
		UMG8N		—	TR	DTC143Z×2	4.7	47	50	0.1	—
		UMG9N		—	TR	DTC114E×2	10	10	50	0.05	—
		UMG5N		—	TR	DTC114Y×2	10	47	50	0.07	—
		UMG1N		—	TR	DTC124E×2	22	22	50	0.03	—
		UMG2N		—	TR	DTC144E×2	47	47	50	0.03	—
		UMG3N		—	TR	DTC143T×2	4.7	—	50	0.1	—
		UMG4N		—	TR	DTC114T×2	10	—	50	0.1	—
		UMG6N		—	TR	DTC144T×2	47	—	50	0.1	—
 SOT-25 (SMT5) [SC-74A] 2928 size	PNP×2	FMA5A	*	—	T148	DTA123J×2	2.2	47	—50	—0.1	—
		FMA9A		—	T148	DTA114E×2	10	10	—50	—0.05	—
		FMA1A		—	T148	DTA124E×2	22	22	—50	—0.03	—
		FMA2A		—	T148	DTA144E×2	47	47	—50	—0.03	—
		FMA3A		—	T148	DTA143T×2	4.7	—	—50	—0.1	—
	NPN×2	FMA4A		—	T148	DTA114T×2	10	—	—50	—0.1	—
		FMG9A		—	T148	DTC114E×2	10	10	50	0.05	—
		FMG1A		—	T148	DTC124E×2	22	22	50	0.03	—
		FMG2A		—	T148	DTC144E×2	47	47	50	0.03	—
		FMG3A		—	T148	DTC143T×2	4.7	—	50	0.1	—
		FMG4A		—	T148	DTC114T×2	10	—	50	0.1	—
		FMG6A		—	T148	DTC144T×2	47	—	50	0.1	—

Notes1 : * : General part No. have no grade code.
Notes2 : For No.1 Pin location, please see the technical specifications.
Notes3 : Package is JEDEC Code. () : ROHM Packages, [] : JEITA code.

Quick Reference for Complex Digital Transistors(For Power Management, Muting and Driver)

Configuration	Equivalent Circuit Diagram (TOP View)	SOT-563 (EMT6) [SC-107C] 1616 size	SOT-363 (UMT6) [SC-88] 2021 size	SOT-457 (SMT6) [SC-74] 2928 size	SOT-457T (TSMT6) [SC-95] 2928 size	Equivalent Element Transistors	R ₁ (kΩ)	R ₂ (kΩ)
								
		Part No.						
PNP+NPN Power Management		EMD29				DTB513Z DTC114E	1 10	10 10
				IMD10A		−50V/−0.5A DTC114T	0.1 10	10 —
			IMD16A		−50V/−0.5A DTC115T	2.2 100	22 —	
NPN×2 Muting				IMH23		DTC643T×2	4.7	—
				IMH21		DTC614T×2	10	—
			UMH33N		DTC923TUB×2	2.2	—	
			UMH32N		DTC943TUB×2	4.7	—	
		UMH37N			DTC914TUB×2	10	—	
NPN×2 Driver					QSH29	60±10V/500mA×2	—	10

Notes1 : No.1 pin is located on the upper right of equivalent circuit diagram for SOT-563(EMT6) and SOT-363(UMT6) packages. No.1 pin is located on the lower right of equivalent circuit diagram for SOT-457(SMT6) packages.

Notes2 : PNP (—) symbol omitted.

Notes3 : Package is JEDEC code. () : ROHM Packages , [] : JEITA code.

Complex Digital Transistors(For Power Management, Muting and Driver)

Package	Configuration	Product No.			Equivalent Element Transistors	R ₁ (kΩ)	R ₂ (kΩ)	V _{CC} (V _{CEO}) (V)	I _O (I _C) (A)	Automotive Grade AEC-Q101
		Part No.	Grade Code General	Automotive	Taping Code					
 SOT-563 (EMT6) [SC-107C] 1616 size	PNP+NPN Power Management	EMD29	*	—	T2R	DTB513Z DTC114E	1 10	10 10	—12 50	—0.5 0.1
 SOT-363 (UMT6) [SC-88] 2021 size	NPN×2 Muting	UMH33N	*	—	TN	DTC923TUB×2	2.2	—	40(V _{EB0})	0.4
		UMH32N		—	TN	DTC943TUB×2	4.7	—	40(V _{EB0})	0.4
		UMH37N		—	TN	DTC914TUB×2	10	—	40(V _{EB0})	0.4
 SOT-457 (SMT6) [SC-74] 2928 size	PNP+NPN Power Management	IMD10A	*	—	T108	Exclusive Chip DTC114T	0.1 10	10 —	—50 50	—0.5 0.1
		IMD16A		—	T108	Exclusive Chip DTC115T	2.2 100	22 —	—50 50	—0.5 0.1
	NPN×2 Muting	IMH23		—	T110	DTC643T×2	4.7	—	20	0.6
		IMH21		—	T110	DTC614T×2	10	—	20	0.6
 SOT-457T (TSMT6) [SC-95] 2928 size	NPN×2 Driver	QSH29	*	—	TR	Exclusive Chip×2	—	10	60±10	0.5

Notes1 : * : General part No. have no grade code.

Notes2 : No.1 pin is located on the upper right of equivalent circuit diagram for SOT-563(EMT6) and SOT-363(UMT6) packages. No.1 pin is located on the lower right of equivalent circuit diagram for SOT-457(SMT6) packages.

Notes3 : Package is JEDEC code. () : ROHM Packages , [] : JEITA code.

IC Transistor Array

* The following products are belonging to ICs. (Refer P.A18) Please ask IC product group for inquiry.

Transistor Arrays

Part No.	Number of bit	Output Withstand Voltage (V)	Output Saturation Voltage (V)	Output Current (mA)	Input Resistance (kΩ)	Input/Output Relation	Input Active Level	Output Current Relation	Circuit Construction	Features	Package
BA12003DF-Z	7	60	1.46*	500	2.7	Inverting type	H	Sink	Darlington	Built-in surge/Absorbing diode	SOP-J16A
BA12004DF-Z	7	60	1.46*	500	10.5	Inverting type	H	Sink	Darlington	Built-in surge/Absorbing diode	SOP-J16A

* : Output Current=350mA

Packages

●Dimensions (Unit : mm)

DFN0604-3 (VML0604) 	DFN0806-3 (VML0806) 	DFN1006-3 (VML1006) [SC-101] 	SOT-723 (VMT3) [SC-105AA] 	(VMT6) [SC-105B] 	SOT-416FL (EMT3F) [SC-89] 	SOT-416 (EMT3) [SC-75A] 	SOT-553 (EMT5) [SC-107BB]
SOT-563 (EMT6) [SC-107C] 	SOT-323FL (UMT3F) [SC-85] 		SOT-323 (UMT3) [SC-70] 		SOT-353 (UMT5) [SC-88A] 		SOT-363 (UMT6) [SC-88]
SOT-23 (SST3) 	SOT-346 (SMT3) [SC-59] 		SOT-25 (SMT5) [SC-74A] 		SOT-457 (SMT6) [SC-74] 		(TSST8)
SOT-323T (TUMT3) [SC-113A] 	SOT-353T (TUMT5) [SC-113CA] 		SOT-363T (TUMT6) [SC-113DA] 		SOT-563T (WEMT6) [SC-120] 		SOT-346T (TSMT3) [SC-96]
SOT-457T (TSMT6) [SC-95] 	(TSMT8) 		DFN2020-3S (HUML2020L3) 		DFN2020-8S (HUML2020L8 Single) 		DFN2020-8D (HUML2020L8 Dual)
(HSMT8) 		(HSMT8AG) 		(HSML3030L10) 		SOT-89 (MPT3) [SC-62] 	
(SOP8) 				(HSOP8 Single) 			

Notes1 : Package is JEDEC code. () : ROHM Packages , [] : JEITA code
Notes2 : For details of dimensions, please refer to the technical specifications.

Dimensions (Unit : mm)

(HSOP8 Asymmetry Dual)		(HSOP8 Symmetry Dual)		(HSOP8 Drain Common Dual)	
SOT-428 (CPT3) [SC-63] (DPAK) 		TO-252 *1 (DPAK) 		TO-252 *2 (DPAK) 	
TO-263AB (LPTL) 		TO-220AB 		TO-220FM *3 	
TO-3PF 		TO-247 *5 		TO-247N *6 	
TO-263S (LPTS) [SC-83] (D2PAK) 		TO-220FM *4 			

Notes1 : *1 : Taping code : TL, *2 : Taping code : TL1

Notes2 : *3 : Packing code : —, *4 : Packing code : C7 G

Notes3 : *5 : Packing code : C13, *6 : Packing code : C11

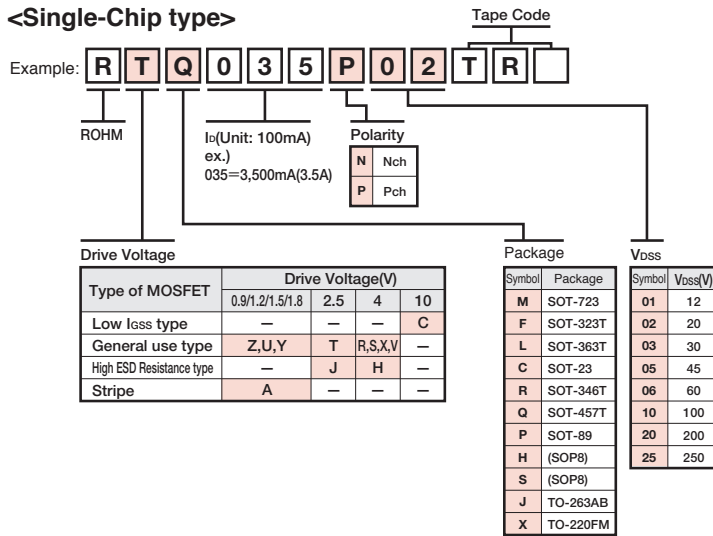
Notes4 : Package is JEDEC code. () : ROHM Packages, [] : JEITA code, [] : GENERAL code

Notes5 : For details of dimensions, please refer to the technical specifications.

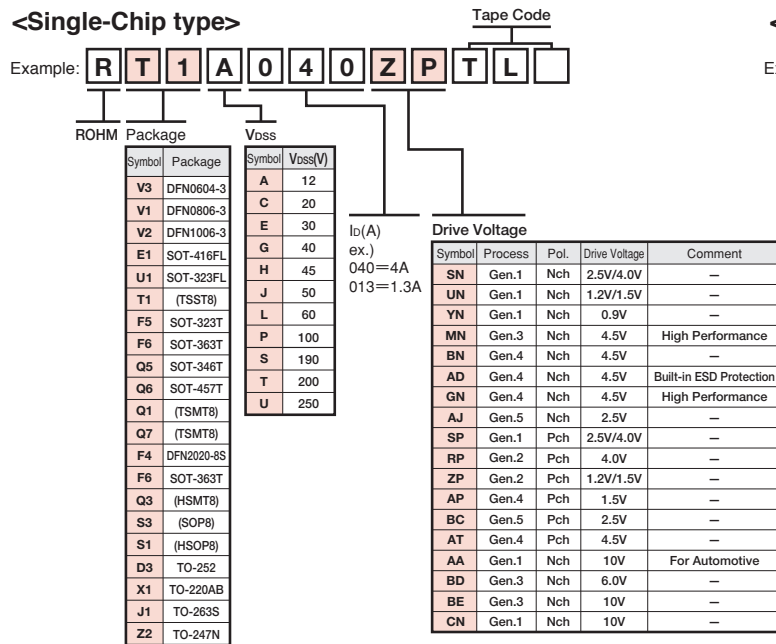
Product No. Explanation

•MOSFET Part No. Explanation

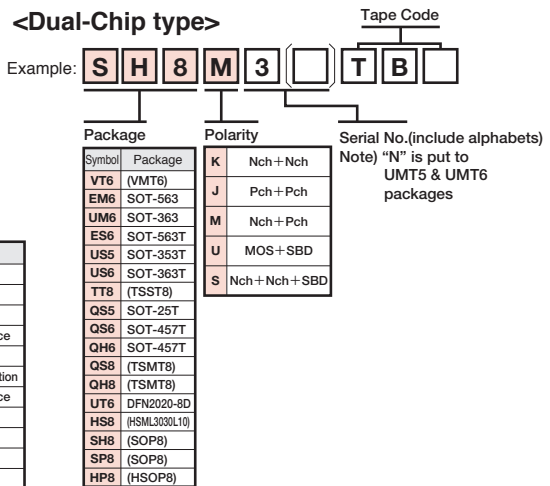
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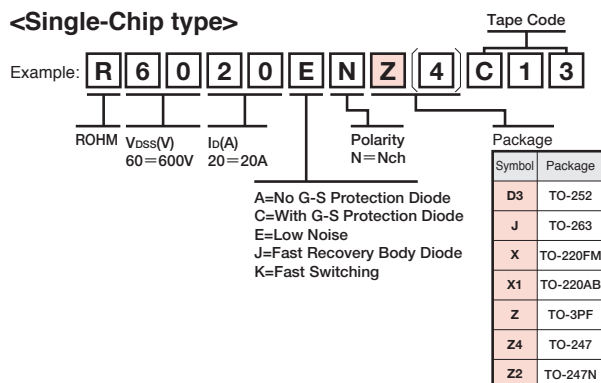
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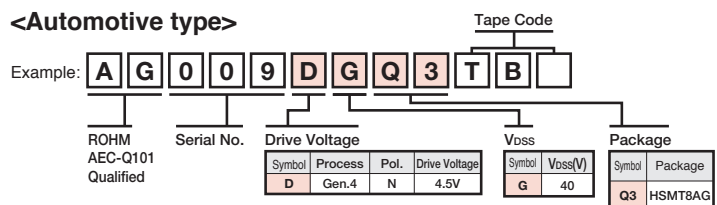
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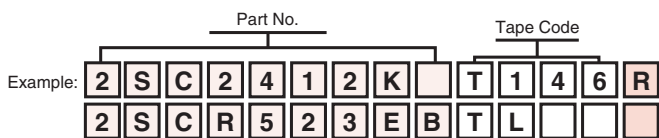
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<Automotive type>



• Bipolar Transistor Part No. Explanation



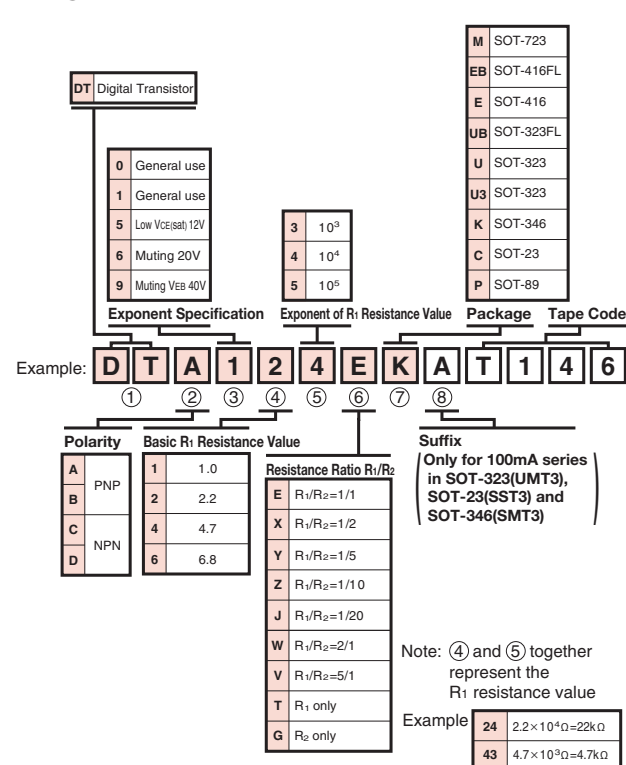
• Package

Code	Package
M	SOT-723
EB	SOT-416FL
E	SOT-416
UB	SOT-323FL
U	SOT-323
U3	SOT-323
K	SOT-346
C	SOT-23
R	SOT-346T
F3	DFN2020-3S
P	SOT-89
P5	SOT-89
D	SOT-428
D3	TO-252
J	TO-263

• hFE Ranking Code

Code	hFE Range
N	56 to 120
P	82 to 180
Q	120 to 270
R	180 to 390
S	270 to 560
U	560 to 1200
V	820 to 1800
W	1200 to 2700

• Digital Transistor Part No. Explanation



• Packaging type

	Package	Code	ROHM Package	JEITA Package	Size	Height	Package Style	Direction	Basic ordering unit(pcs)
Surface Mount type	DFN0604-3	T2L,T2CL	VML0604	—	0604	0.36	Embossed tape	Terminal No.1 on opposite side from sprocket hole side	8,000
	DFN0806-3	T2L,T2CL	VML0806	—	0806	0.36	Embossed tape	Terminal No.1 on opposite side from sprocket hole side	8,000
	DFN1006-3	T2L,T2CL	VML1006	SC-101	1006	0.37	Embossed tape	Terminal No.1 on opposite side from sprocket hole side	8,000
	SOT-723	T2L,T2CL	VMT3	SC-105AA	1212	0.5	Embossed tape	One terminal on sprocket hole side	8,000
	(VMT6)	T2R,T2CR	VMT6	SC-105B	1212	0.5	Embossed tape	Terminal No.1 on sprocket hole side	8,000
	SOT-416FL	TL,TCL	EMT3F	SC-89	1616	0.7	Embossed tape	One terminal on sprocket hole side	3,000
	SOT-416	TL,TCL	EMT3	SC-75A	1616	0.7	Embossed tape	One terminal on sprocket hole side	3,000
	SOT-553	T2R,T2CR	EMT5	SC-107BB	1616	0.5	Embossed tape	Three terminals on sprocket hole side	8,000
	SOT-563	T2R,T2CR	EMT6	SC-107C	1616	0.5	Embossed tape	Terminal No.1 on sprocket hole side	8,000
	SOT-323FL	TL,TCL	UMT3F	SC-85	2120	0.9	Embossed tape	One terminal on sprocket hole side	3,000
	SOT-323	T106,T306	UMT3	SC-70	2120	0.9	Embossed tape	One terminal on sprocket hole side	3,000
	SOT-353	TR,TCR	UMT5	SC-88A	2120	0.9	Embossed tape	Three terminals on sprocket hole side	3,000
	SOT-363	TR,TCR	UMT6	SC-88	2120	0.9	Embossed tape	Terminal No.1 on sprocket hole side	3,000
		TN,TCN					Embossed tape	Non-direction	3,000
	SOT-563T	T2R,T2CR	WEMT6	SC-120	1616	0.6	Embossed tape	Terminal No.1 on sprocket hole side	8,000
	SOT-323T	TL,TCL	TUMT3	SC-113A	2120	0.77	Embossed tape	One terminal on sprocket hole side	3,000
	SOT-353T	TR,TCR	TUMT5	SC-113CA	2120	0.77	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	SOT-363T	TR,TCR	TUMT6	SC-113DA	2120	0.77	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	SOT-23	T116,T316	SST3	SOT-23	2429	0.95	Embossed tape	One terminal on sprocket hole side	3,000
	SOT-346	T146	SMT3	SC-59	2829	1.1	Embossed tape	One terminal on sprocket hole side	3,000
	SOT-25	T148	SMT5	SC-74A	2829	1.1	Embossed tape	Three terminals on sprocket hole side	3,000
		T108					Embossed tape	Terminal No.1 on opposite side from sprocket hole side	3,000
	SOT-457	T110	SMT6	SC-74	2829	1.1	Embossed tape	Non-direction	3,000
	(TSST8)	TR,TCR	TSST8	—	1930	0.8	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	SOT-346T	TL,TCL	TSMT3	SC-96	2829	0.85	Embossed tape	One terminal on sprocket hole side	3,000
	SOT-25T	TR,TCR	TSMT5	SC-95	2829	0.85	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	SOT-457T	TR,TCR	TSMT6	SC-95	2829	0.85	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	(TSMT8)	TR,TCR	TSMT8	—	2830	0.8	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	DFN2020-3S	TR,TCR	HUML2020L3	—	2020	0.6	Embossed tape	Terminal No.1 on opposite side from sprocket hole side	3,000
	DFN2020-8	TR,TCR,TR1	HUML2020L8	—	2020	0.6	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	(HSMT8)	TB,TB1	HSMT8	—	3333	0.8	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	(HSMT8AG)	TB	HSMT8AG	—	3333	0.8	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	(HSML3030L10)	TB	HSML3030L10	—	3030	0.6	Embossed tape	Terminal No.1 on sprocket hole side	3,000
	(SOP8)	TB,TB1	SOP8	—	6050	1.75	Embossed tape	Terminal No.1 on sprocket hole side	2,500
	SOT-89	T100	MPT3	SC-62	4045	1.5	Embossed tape	Three terminals on sprocket hole side	1,000
	(HSOP8)	TB,TB1	HSOP8	SC-111BB	6050	1	Embossed tape	Three terminals on sprocket hole side	2,500
	SOT-428	TL	CPT3	SC-63	—	2.3	Embossed tape	Fin on sprocket hole side	2,500
	TO-252	TL,TL1	TO-252	SC-63	—	2.2	Embossed tape	Fin on sprocket hole side	2,500
		TL	LPTS	SC-83	—	4.5	Embossed tape	Fin on sprocket hole side	1,000
	TO-263	TLL	LPTL	—	—	4.5	Embossed tape	Fin on sprocket hole side	1,000
Leaded type	(TO-220FM)	—	TO-220FM	[SC-46]	29×10	4.5	Balk	—	500
		C7 G				4.7	Stick	—	2,000
	TO-220AB	C10	TO-220AB	SC-46	29×9.9	4.5	Stick	—	1,000
	TO-3PF	C8	TO-3PF	[SC-94]	43.3×15.5	5.5	Stick	—	360
	TO-247AD	C13	TO-247	[SC-65]	41.26×15.94	5.02	Stick	—	600
	(TO-247N)	C11	TO-247N		41×16	5	Stick	—	450

Note : Package is JEDEC code. () : ROHM Packages, [] : Correspond of JEITA Packages.



Discrete Devices

Diodes

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Small Signal/Middle Power Fast Recovery Diodes	P. C71
Power Fast Recovery Diodes	P. C72
■ Rectifier Diodes	P. C75
■ Zener Diodes	P. C76
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■ TVS	P. C80
■ Switching Diodes	P. C83
■ High Frequency Diodes	P. C85
■ Packages	P. C86
■ Product No. Explanation	P. C88

Schottky Barrier Diodes

●Quick Reference for Small Signal type Schottky Barrier Diodes

V _R (V)	I _O (mA)	Surface Mount type									
		0603 size				1006 size				2924 size	
		DSN0603-2 (SMD0603)	DSN0603-2 (SMD0603B)	DSN1006-2 (SMD1006)	SOD-923 (VMN2M)	SOT-23 (SSD3)					
20	2,000			RASMID RB061QS-20	4						
30	30					RB751CM-40	6				
	100	RASMID RB522ES-30	1			RB520CM-30 RB521CM-30 RB530CM-30 RB531CM-30	7 8 9 10				
	200		RASMID New RB520HS-30 RASMID New RB532HS-30	2 3				BAT54CHM BAT54AHM BAT54SHM BAT54HM	98 102 108 112		
40	100					RB530CM-40 RB531CM-40 RB520CM-40 RB521CM-40	11 12 13 14				
	120							BAS40-05HM BAS40-04HM BAS40HM	99 109 113		
	500							BAS40-06HM	103		
	1,000			RASMID RB161QS-40	5						
60	100					RB530CM-60 RB520CM-60	15 16				

©RASMID : ROHM's proprietary New method that enables superior dimensional precision, making it possible to develop the ultra-compact products.
 Note : Package is JEDEC code. () : ROHM Packages.

V _R (V)	I _O (mA)	Surface Mount type									
		1608 size		2512 size		2514 size		1616 size		2120 size	
											
		SOD-523 (EMD2)		SOD-323FL (UMD2)		(TUMD2M)		SOT-416FL (EMD3F)		SOT-323FL (UMD3F)	
20	500			RB551VM-30	35	RB411VAM-50	60				
	1,000					RB162VAM-20 RB161VAM-20 RBE1VAM20A	61 62 63				
	2,000					RBE2VAM20A	64				
30	30	RB751SM-40	17	RB751VM-40	36						
	100	RB510SM-30	18	RB510VM-30	37			RB548WM	104		
		RB511SM-30	19	RB530VM-30	38			RB557WM	100		
		RB500SM-30	20	RB511VM-30	39			RB558WM	105		
		RB501SM-30	21	RB531VM-30	40						
	200	RB520SM-30	22	RB520VM-30	41						
		RB521SM-30	23	RB521VM-30	42						
		RB530SM-30	24	RB540VM-30	43						
		RB531SM-30	25	RB541VM-30	44						
	500			RB550VM-30	45	RSX051VAM30 RSX051VYM30	65 66				
	700					RSX071VAM30 RSX071VYM30	67 68				
	1,000					RB168VAM-30 RB168VYM-30 RB550VAM-30 RB550VYM-30 RSX101VAM30 RSX101VYM30	69 70 71 72 73 74				
	1,500					RSX201VAM30 RSX201VYM30	75 76				
40	30							RB715WM RB706WM-40	96 106	RB715UM RB717UM RB706UM-40	97 101 107
	100	RB510SM-40	26	RB510VM-40	46						
		RB511SM-40	27	RB511VM-40	47						
		RB530SM-40	28	RB530VM-40	48					RB451UM RB450UM	110 111
		RB531SM-40	29	RB531VM-40	49						
				RB500VM-40	50						
				RB501VM-40	51						
	200	RB540SM-40	30	RB540VM-40	52						
		RB541SM-40	31	RB541VM-40	53						
		RB520SM-40	32	RB520VM-40	54						
		RB521SM-40	33	RB521VM-40	55						
				RB550VM-40	56						
				RB551VM-40	57						
	500			RB560VM-40 RB561VM-40	58 59	RB400VAM-50 RB400VYM-50	77 78				
	1,000					RB160VAM-40 RB160VYM-40 RB168VAM-40 RB168VYM-40	79 80 81 82				
60	200	RB521SM-60	34								
	1,000					RB160VAM-60 RB160VYM-60 RB168VAM-60 RB168VYM-60	83 84 85 86				
90	200					RB021VAM90	87				
100	700					RB578VAM100 RB578VYM100	88 89				
	1,000					RB168VAM100 RB168VYM100	90 91				
150	500					RB558VAM150 RB558VYM150	92 93				
	1,000					RB168VAM150 RB168VYM150	94 95				

Note : Package is JEDEC code. () : ROHM Packages

Schottky Barrier Diodes

Schottky Barrier Diodes

Example:

R	B	7	5	1	S	M	-	4	0	F	H	T	2	R
Part No.										Grade Code		Taping Code		

Small Signal Type Schottky Barrier Diodes 1

Quick Reference No.	Product No.				Absolute Maximum Ratings(TC=25℃)				Electrical Characteristics(Tj=25℃)*2				Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O *1 (mA)	I _{FSM} (A)*2 60Hz.1~	V _F (V) Max.	I _F (mA)	I _R (μA) Max.	V _R (V)			
		General	Automotive												
1	RASMD RB522ES-30	*	—	T15R	30	30	100	0.5	0.37	10	7	10	DSN0603-2 (SMD0603)		—
2	New RASMD RB520HS-30		—	T15R	30	30	200	1.5	0.43	10	0.3	10	DSN0603-2 (SMD0603B)		—
3	New RASMD RB532HS-30		—	T15R	30	30	200	1.5	0.3	10	15	10	DSN0603-2 (SMD0603B)		—
4	RASMD RB061QS-20		—	T18R	20	20	2,000	15	0.47	2,000	200	10	DSN1006-2 (SMD1006)		—
5	RASMD RB161QS-40		—	T18R	40	40	1,000	7	0.6	1,000	100	10	DSN1006-2 (SMD1006)		—
6	RB751CM-40		—	T2R	40	30	30	0.2	0.37	1	0.5	30	SOD-923 (VMN2M)		—
7	RB520CM-30		—	T2R	—	30	100	0.5	0.45	10	0.5	10			—
8	RB521CM-30		—	T2R	—	30	100	0.5	0.35	10	10	10			—
9	RB530CM-30		—	T2R	30	30	100	0.5	0.46	10	0.3	10			—
10	RB531CM-30		—	T2R	30	30	100	0.5	0.37	10	7	10			—
11	RB530CM-40		—	T2R	40	40	100	0.5	0.48	10	2	40			—
12	RB531CM-40		—	T2R	40	40	100	0.5	0.41	10	25	40			—
13	RB520CM-40		—	T2R	40	40	100	1	0.71	100	15	40			—
14	RB521CM-40		—	T2R	40	40	100	1	0.61	100	100	40			—
15	RB530CM-60		—	T2R	60	60	100	0.2	0.54	10	1	60			—
16	RB520CM-60		—	T2R	60	60	100	0.5	0.44	10	3	60			—
17	RB751SM-40		FH	T2R	40	30	30	0.2	0.37	1	0.5	30	SOD-523 (EMD2)		YES
18	RB510SM-30		FH	T2R	30	30	100	0.5	0.46	10	0.3	10			YES
19	RB511SM-30		FH	T2R	30	30	100	0.5	0.37	10	7	10			YES
20	RB500SM-30		FH	T2R	30	30	100	1	0.45	10	0.5	10			YES
21	RB501SM-30		FH	T2R	30	30	100	1	0.35	10	10	10			YES
22	RB520SM-30		FH	T2R	—	30	200	1	0.58	200	1	10			YES
23	RB521SM-30		FH	T2R	—	30	200	1	0.47	200	30	10			YES
24	RB530SM-30		FH	T2R	—	30	200	1	0.45	10	0.5	10			YES
25	RB531SM-30		FH	T2R	—	30	200	1	0.35	10	10	10			YES
26	RB510SM-40		FH	T2R	40	40	100	0.5	0.48	10	2	40			YES
27	RB511SM-40		FH	T2R	40	40	100	0.5	0.41	10	25	40			YES
28	RB530SM-40		FH	T2R	40	40	100	1	0.71	100	15	40			YES
29	RB531SM-40		FH	T2R	40	40	100	1	0.61	100	100	40			YES
30	RB540SM-40		FH	T2R	40	40	200	1	0.71	100	15	40			YES
31	RB541SM-40		FH	T2R	40	40	200	1	0.61	100	100	40			YES
32	RB520SM-40		FH	T2R	45	40	200	1	0.55	100	10	40			YES
33	RB521SM-40		FH	T2R	45	40	200	1	0.54	200	90	40			YES
34	RB521SM-60		FH	T2R	60	60	200	1	0.6	200	100	60			YES
35	RB551VM-30		—	TE-17	30	20	500	2	0.47	500	100	20	SOD-323FL (UMD2)		—
36	RB751VM-40		FH	TE-17	40	30	30	0.2	0.37	1	0.5	30			YES
37	RB510VM-30		FH	TE-17	30	30	100	0.5	0.46	10	0.3	10			YES
38	RB530VM-30		FH	TE-17	30	30	100	0.5	0.45	10	0.5	10			YES
39	RB511VM-30		FH	TE-17	30	30	100	0.5	0.37	10	7	10			YES
40	RB531VM-30		FH	TE-17	30	30	100	1	0.49	100	10	10			YES
41	RB520VM-30		FH	TE-17	30	30	200	1	0.58	200	1	10			YES

©RASMD : ROHM's proprietary new method that enables superior dimensional precision, making it possible to develop the ultra-compact products.

* : General Part No. have no grade code.

*1 : I_O : Average output current per chip. In case of 1, 2 or 3 chip diodes. I_O indicates average output current of 1, 2 or 3 chips.

*2 : Value/Chip

Note : Package is JEDEC code. () : ROHM Packages

Schottky Barrier Diodes

Example: **R B 5 2 1 V M - 3 0 F H T E - 1 7**

Part No. Grade Code Taping Code

Small Signal type Schottky Barrier Diodes 2

Quick Reference No.	Product No.				Absolute Maximum Ratings(TC=25°C)				Electrical Characteristics(Tj=25°C)*2				Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101	
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O *1 (mA)	I _{FSM} (A)*2 60Hz.1~	V _F (V) Max.	I _F (mA)	I _R (μA) Max.	V _R (V)				
		General	Automotive													
42	RB521VM-30	*	FH	TE-17	30	30	200	1	0.47	200	30	10	SOD-323FL (UMD2)		YES	
43	RB540VM-30		FH	TE-17	30	30	200	1	0.45	10	0.5	10			YES	
44	RB541VM-30		FH	TE-17	30	30	200	1	0.64	200	10	10			YES	
45	RB550VM-30		FH	TE-17	30	30	500	1	0.59	500	35	30			YES	
46	RB510VM-40		FH	TE-17	40	40	100	0.5	0.48	10	2	40			YES	
47	RB511VM-40		FH	TE-17	40	40	100	0.5	0.41	10	25	40			YES	
48	RB530VM-40		FH	TE-17	40	40	100	1	0.69	100	15	40			YES	
49	RB531VM-40		FH	TE-17	40	40	100	1	0.61	100	100	40			YES	
50	RB500VM-40		FH	TE-17	45	40	100	1	0.45	10	1	10			YES	
51	RB501VM-40		FH	TE-17	45	40	100	1	0.55	100	30	10			YES	
52	RB540VM-40		FH	TE-17	40	40	200	1	0.71	100	15	40			YES	
53	RB541VM-40		FH	TE-17	40	40	200	1	0.61	100	100	40			YES	
54	RB520VM-40		FH	TE-17	40	40	200	1	0.55	100	10	40			YES	
55	RB521VM-40		FH	TE-17	40	40	200	1	0.54	200	90	40			YES	
56	RB550VM-40		FH	TE-17	40	40	200	1	0.51	200	40	40			YES	
57	RB551VM-40		FH	TE-17	40	40	200	1	0.43	200	300	40			YES	
58	RB560VM-40		FH	TE-17	40	40	500	2	0.64	500	40	40			YES	
59	RB561VM-40		—	TE-17	40	40	500	2	0.56	500	300	40			—	
60	RB411VAM-50		—	TR	50	20	500	3	0.5	500	30	10	(TUMD2M)		—	
61	RB162VAM-20		—	TR	25	20	1,000	5	0.4	1,000	1,200	20			—	
62	RB161VAM-20		—	TR	30	20	1,000	5	0.42	1,000	1,000	20			—	
63	RBE1VAM20A		—	TR	30	20	1,000	3	0.53	1,000	200	20			—	
64	RBE2VAM20A		—	TR	30	20	2,000	5	0.46	2,000	700	20			—	
65	RSX051VAM30		—	TR	30	30	500	5	0.39	500	200	30			—	
66	RSX051VYM30		—	FH	TR	30	30	500	5	0.39	500	200			30	YES
67	RSX071VAM30		*	—	TR	30	30	700	5	0.42	700	200			30	—
68	RSX071VYM30		—	FH	TR	30	30	700	5	0.42	700	200			30	YES
69	RB168VAM-30		*	—	TR	30	30	1,000	5	0.73	1,000	0.3			30	—
70	RB168VYM-30	—	FH	TR	30	30	1,000	5	0.73	1,000	0.3	30		YES		
71	RB550VAM-30	*	—	TR	30	30	1,000	5	0.52	1,000	30	10		—		
72	RB550VYM-30	—	FH	TR	30	30	1,000	3	0.52	1,000	30	10		YES		
73	RSX101VAM30	*	—	TR	30	30	1,000	5	0.47	1,000	200	30		—		
74	RSX101VYM30	—	FH	TR	30	30	1,000	5	0.47	1,000	200	30	YES			
75	RSX201VAM30	*	—	TR	30	30	1,500	8	0.46	1,500	300	30	—			
76	RSX201VYM30	—	FH	TR	30	30	1,500	8	0.46	1,500	0.3	30	YES			
77	RB400VAM-50	*	—	TR	50	40	500	3	0.55	500	50	30	—			
78	RB400VYM-50	—	FH	TR	50	40	500	3	0.55	500	50	30	YES			
79	RB160VAM-40	*	—	TR	40	40	1,000	10	0.55	700	50	40	—			
80	RB160VYM-40	—	FH	TR	40	40	1,000	10	0.55	700	50	40	YES			
81	RB168VAM-40	*	—	TR	40	40	1,000	5	0.79	1,000	0.5	40	—			
82	RB168VYM-40	—	FH	TR	40	40	1,000	5	0.79	1,000	0.5	40	YES			

*: General Part No. have no grade code.

*1: I_O: Average output current per chip. In case of 1, 2 or 3 chip diodes. I_O indicates average output current of 1, 2 or 3 chips.

*2: Value/Chip

Note: Package is JEDEC code. () : ROHM Packages

Schottky Barrier Diodes

Schottky Barrier Diodes

Example:

RB160VYM-60

FH

TR

Part No.

Grade Code

Taping Code

Small Signal type Schottky Barrier Diodes 3															
Quick Reference No.	Product No.				Absolute Maximum Ratings(TC=25°C)				Electrical Characteristics(Tj=25°C)*2				Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O *1 (mA)	I _{FSM} (A)*2 60Hz.1~	V _F (V) Max.	I _F (mA)	I _R (μA) Max.	V _R (V)			
		General	Automotive												
83	RB160VAM-60	*	—	TR	60	60	1,000	5	0.67	1,000	40	60	(TUMD2M)		—
84	RB160VYM-60	—	FH	TR	60	60	1,000	5	0.67	1,000	40	60			YES
85	RB168VAM-60	*	—	TR	60	60	1,000	5	0.82	1,000	1	60			—
86	RB168VYM-60	—	FH	TR	60	60	1,000	5	0.82	1,000	1	60			YES
87	RB021VAM90	*	—	TR	90	90	200	5	0.49	200	900	90			—
88	RB578VAM100	*	—	TR	100	100	700	5	0.85	700	0.2	100			—
89	RB578VYM100	—	FH	TR	100	100	700	5	0.85	700	200	100			YES
90	RB168VAM100	*	—	TR	100	100	1,000	5	0.84	1,000	0.3	100			—
91	RB168VYM100	—	FH	TR	100	100	1,000	5	0.84	1,000	0.3	100			YES
92	RB558VAM150	*	—	TR	150	150	500	3	0.95	500	0.5	150			—
93	RB558VYM150	—	FH	TR	150	150	500	3	0.95	500	0.5	150			YES
94	RB168VAM150	*	—	TR	150	150	1,000	5	0.89	1,000	1	150			—
95	RB168VYM150	—	FH	TR	150	150	1,000	5	0.89	1,000	1	150			YES
96	RB715WM	*	FH	TL	40	40	30*2	0.2	0.37	1	1	10	SOT-416FL (EMD3F)		YES
97	RB715UM		FH	TL	40	40	30	0.2	0.37	1	1	10	SOT-323FL (UMD3F)		YES
98	BAT54CHM		FH	T116	30	30	200*2	0.6	0.8	100	2	25	SOT-23 (SSD3)		YES
99	BAS40-05HM		FH	T116	40	40	120*2	0.6	0.5	10	1	30			YES
100	RB557WM		FH	TL	—	30	100*2	0.5	0.49	100	10	10	SOT-416FL (EMD3F)		YES
101	RB717UM		FH	TL	45	40	30*2	0.2	0.37	1	1	30	SOT-323FL (UMD3F)		YES
102	BAT54AHM		FH	T116	30	30	200*2	0.6	0.8	100	2	25	SOT-23 (SSD3)		YES
103	BAS40-06HM		FH	T116	40	40	120*2	0.6	0.5	10	1	30			YES
104	RB548WM		FH	TL	—	30	100*2	0.5	0.45	10	0.5	10	SOT-416FL (EMD3F)		YES
105	RB558WM		FH	TL	—	30	100*2	0.5	0.49	100	10	10			YES
106	RB706WM-40		FH	TL	45	40	30*2	0.2	0.37	1	0.5	30			YES
107	RB706UM-40		FH	TL	45	40	30*2	0.2	0.37	1	1	30	SOT-323FL (UMD3F)		YES
108	BAT54SHM		FH	T116	30	30	200*2	0.6	0.8	100	2	25	SOT-23 (SSD3)		YES
109	BAS40-04HM	FH	T116	40	40	120*2	0.6	0.5	10	1	30	YES			
110	RB451UM	FH	TL	40	40	100	1	0.45	100	90	40	SOT-323FL (UMD3F)	YES		
111	RB450UM	FH	TL	45	40	100	1	0.55	100	10	40		YES		
112	BAT54HM	FH	T116	30	30	200	0.6	0.8	100	2	25	SOT-23 (SSD3)	YES		
113	BAS40HM	FH	T116	40	40	120	0.6	0.5	10	1	30		YES		

* : General Part No. have no grade code.

*1 : I_O : Average output current per chip. In case of 1, 2 or 3 chip diodes. I_O indicates average output current of 1, 2 or 3 chips.

*2 : Value/Chip

Note : Package is JEDEC code. () : ROHM Packages

●Quick Reference for Middle Power Schottky Barrier Diodes(High Efficient type)

V _R (V)	I _O (A)	Surface Mount type											
		2513 size		3516 size				4725 size				5026 size	
													
		(PMDE)		SOD-123FL (PMDU)				SOD-128 (PMDTM)				DO-214AC(PMDS) 〔SMA〕	
		Low V _F type		Super Low V _F type		Low V _F type		Super Low V _F type		Low V _F type		Low V _F type	
20	1			RBS1MM40A	1			RBS1LAM40A	7				
	2			RBS2MM40A RBS2MM40B RBS2MM40C	2 3 4			RBS2LAM40A RBS2LAM40B RBS2LAM40C	8 9 10				
	3			RBS3MM40A RBS3MM40B	5 6			RBS3LAM40A RBS3LAM40B RBS3LAM40C	11 12 13				
	5							RBS5LAM40A	14				
30	1	☆RBR1VWM30A	15			RBR1MM30A	21			RBR1LAM30A	37	RBR1L30A	55
	2	☆RBR2VWM30A	16			RBR2MM30A RBR2MM30B	22 23			RBR2LAM30A	38	RBR2L30A	56
	3					RBR3MM30A	24			RBR3LAM30A RBR3LAM30B	39 40	RBR3L30A RBR3L30B	57 58
	5									RBR5LAM30A RBR5LAM30B	41 42	RBR5L30A RBR5L30B	59 60
40	1	☆RBR1VWM40A	17			RBR1MM40A	25			RBR1LAM40A	43	RBR1L40A	61
	2	☆RBR2VWM40A	18			RBR2MM40A RBR2MM40B RBR2MM40C	26 28 27			RBR2LAM40A	44	RBR2L40A	62
	3					RBR3MM40A RBR3MM40B	30 29			RBR3LAM40A RBR3LAM40B RBR3LAM40C	45 46 47	RBR3L40A RBR3L40B RBR3L40C	63 64 65
	5									RBR5LAM40A	48	RBR5L40A	66
60	1	☆RBR1VWM60A	19			RBR1MM60A	31			RBR1LAM60A	49	RBR1L60A	67
	2	☆RBR2VWM60A	20			RBR2MM60A RBR2MM60B RBR2MM60C	32 33 34			RBR2LAM60A RBR2LAM60B	50 51	RBR2L60A RBR2L60B	68 69
	3					RBR3MM60B RBR3MM60A	35 36			RBR3LAM60A RBR3LAM60B	52 53	RBR3L60A RBR3L60B	70 71
	5									RBR5LAM60A	54	RBR5L60A	72

Note : Package is JEDEC code. () : ROHM Packages. [] : GENERAL code

☆ : Under Development

●Quick Reference for Middle Power Schottky Barrier Diodes(Standard type)

V _R (V)	I _O (A)	Surface Mount type																			
		2513 size				3516 size				4725 size				5026 size							
																					
		(PMDE)		SOD-123FL (PMDU)				SOD-128 (PMDTM)				DO-214AC(PMDS) [SMA]									
Super Low I _n type		Super Low V _F type		Low V _F type		Super Low I _n type		Super Low V _F type		Low V _F type		Super Low I _n type		Super Low V _F type		Low V _F type		Super Low I _n type			
20	5								RSX501LAM20	2											
30	1	☆RB168VWM-30	12	RSX101MM-30	1			RB168MM-30	17					RB168LAM-30	26					RB168L-30	46
	2							RB068MM-30	18	RSX201LAM30 RSX205LAM30	3 4			RB068LAM-30	27	RSX201L-30 RSX205L-30	6 7			RB068L-30	47
	3									RSX301LAM30	5			RB058LAM-30	28	RSX301L-30	8			RB058L-30	48
	5													RB088LAM-30	29						
40	1	☆RB168VWM-40	13					RB168MM-40	19					RB168LAM-40	30					RB168L-40	49
	2							RB068MM-40	20					RB068LAM-40	31					RB068L-40	50
	3													RB058LAM-40	32					RB058L-40	51
	5												New	RB088LAM-40	33						
60	1	☆RB168VWM-60	14					RB168MM-60	21					RB168LAM-60	34					RB168L-60	52
	2							RB068MM-60	22					RB068LAM-60	35					RB068L-60	53
	3													RB058LAM-60	36					RB058L-60	54
	5													RB088LAM-60	37						
90	1					RB160MM-90	9					RB160LAM-90	10					RB160L-90	11		
100	1	☆RB168VWM100	15					RB168MM100	23					RB168LAM100	38					RB168L100	55
	2							RB068MM100	24					RB068LAM100	39					RB068L100	56
	3													RB058LAM100	40						
	5													RB088LAM100	41						
150	1	☆RB168VWM150	16					RB168MM150	25					RB168LAM150	42					RB168L150	57
	2													RB068LAM150	43					RB068L150	58
	3													RB058LAM150	44					RB058L150	59
	5													RB088LAM150	45						

Note : Package is JEDEC code. () : ROHM Packages. [] : GENERAL code

☆ : Under Development

Schottky Barrier Diodes

Schottky Barrier Diodes

Example:

R	B	R	1	M	M	3	0	A	T	F	T	R
Part No.				Grade Code				Taping Code				

Middle Power Schottky Barrier Diodes(High Efficient type)

Quick Reference No.	Product No.				Absolute Maximum Ratings(T _C =25°C)				Electrical Characteristics(T _J =25°C)				Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O (A)	I _{FSM} (A) 60Hz.1~	V _F (V) Max.	I _F (A)	I _R (mA) Max.	V _R (V)			
		General	Automotive												
Super Low V _F type															
1	RBS1MM40A	*	—	TR	40	20	1	25	0.38	1	0.4	20	SOD-123FL (PMDU)		—
2	RBS2MM40A		—	TR	40	20	2	25	0.48	2	0.4	20			—
3	RBS2MM40B		—	TR	40	20	2	35	0.41	2	0.5	20			—
4	RBS2MM40C		—	TR	40	20	2	45	0.39	2	0.6	20			—
5	RBS3MM40A		—	TR	40	20	3	35	0.49	3	0.5	20			—
6	RBS3MM40B		—	TR	40	20	3	45	0.45	3	0.6	20			—
7	RBS1LAM40A		—	TR	40	20	1	40	0.38	1	0.4	20	SOD-128 (PMDTM)		—
8	RBS2LAM40A		—	TR	40	20	2	40	0.48	2	0.4	20			—
9	RBS2LAM40B		—	TR	40	20	2	50	0.41	2	0.5	20			—
10	RBS2LAM40C		—	TR	40	20	2	80	0.37	2	0.8	20			—
11	RBS3LAM40A		—	TR	40	20	3	50	0.49	3	0.5	20			—
12	RBS3LAM40B		—	TR	40	20	3	60	0.45	3	0.6	20			—
13	RBS3LAM40C		—	TR	40	20	3	80	0.4	3	0.8	20			—
14	RBS5LAM40A		—	TR	40	20	5	80	0.49	5	0.8	20			—

Low V_F type

15	☆RBR1VWM30A	*	TF	TR	30	30	1	30	0.48	1	0.05	30	(PMDE)		YES
16	☆RBR2VWM30A		TF	TR	30	30	2	30	0.53	2	0.05	30			YES
17	☆RBR1VWM40A		TF	TR	40	40	1	20	0.52	1	0.05	40			YES
18	☆RBR2VWM40A		TF	TR	40	40	2	20	0.62	2	0.05	40			YES
19	☆RBR1VWM60A		TF	TR	60	60	1	20	0.53	1	0.075	60			YES
20	☆RBR2VWM60A		TF	TR	60	60	2	20	0.65	2	0.075	60			YES
21	RBR1MM30A		TF	TR	30	30	1	30	0.48	1	0.05	30	SOD-123FL (PMDU)		YES
22	RBR2MM30A		TF	TR	30	30	2	30	0.53	2	0.05	30			YES
23	RBR2MM30B		TF	TR	30	30	2	30	0.49	2	0.08	30			YES
24	RBR3MM30A		TF	TR	30	30	3	30	0.51	3	0.1	30			YES
25	RBR1MM40A		TF	TR	40	40	1	20	0.52	1	0.05	40			YES
26	RBR2MM40A		TF	TR	40	40	2	20	0.62	2	0.05	40			YES
27	RBR2MM40C		TF	TR	40	40	2	30	0.52	2	0.1	40			YES
28	RBR2MM40B		TF	TR	40	40	2	30	0.55	2	0.08	40			YES
29	RBR3MM40B		TF	TR	40	40	3	30	0.58	3	0.1	40			YES
30	RBR3MM40A		TF	TR	40	40	3	30	0.62	3	0.08	40			YES
31	RBR1MM60A		TF	TR	60	60	1	20	0.53	1	0.075	60			YES
32	RBR2MM60A		TF	TR	60	60	2	20	0.65	2	0.075	60			YES
33	RBR2MM60B		TF	TR	60	60	2	30	0.58	2	0.1	60			YES
34	RBR2MM60C		TF	TR	60	60	2	30	0.55	2	0.12	60			YES
35	RBR3MM60B		TF	TR	60	60	3	30	0.61	3	0.12	60			YES
36	RBR3MM60A		TF	TR	60	60	3	30	0.66	3	0.1	60			YES
37	RBR1LAM30A		TF	TR	30	30	1	40	0.48	1	0.05	30	SOD-128 (PMDTM)		YES
38	RBR2LAM30A		TF	TR	30	30	2	45	0.49	2	0.08	30			YES
39	RBR3LAM30A		TF	TR	30	30	3	40	0.58	3	0.05	30			YES
40	RBR3LAM30B		TF	TR	30	30	3	45	0.53	3	0.08	30			YES
41	RBR5LAM30A		TF	TR	30	30	5	75	0.54	5	0.1	30			YES
42	RBR5LAM30B		TF	TR	30	30	5	100	0.49	5	0.15	30			YES
43	RBR1LAM40A		TF	TR	40	40	1	40	0.52	1	0.05	40			YES
44	RBR2LAM40A		TF	TR	40	40	2	45	0.55	2	0.08	40			YES
45	RBR3LAM40A		TF	TR	40	40	3	40	0.69	3	0.05	40			YES
46	RBR3LAM40B		TF	TR	40	40	3	45	0.62	3	0.08	40			YES
47	RBR3LAM40C		TF	TR	40	40	3	75	0.55	3	0.1	40			YES
48	RBR5LAM40A		TF	TR	40	40	5	100	0.53	5	0.2	40			YES
49	RBR1LAM60A		TF	TR	60	60	1	40	0.53	1	0.075	60			YES
50	RBR2LAM60A		TF	TR	60	60	2	40	0.65	2	0.075	60			YES
51	RBR2LAM60B		TF	TR	60	60	2	75	0.52	2	0.15	60			YES
52	RBR3LAM60A		TF	TR	60	60	3	45	0.66	3	0.1	60			YES
53	RBR3LAM60B		TF	TR	60	60	3	75	0.56	3	0.15	60	YES		
54	RBR5LAM60A		TF	TR	60	60	5	100	0.55	5	0.25	60	DO-214AC (PMDS) (SMA)		YES
55	RBR1L30A		DD	TE25	30	30	1	30	0.48	1	0.05	30			YES
56	RBR2L30A		DD	TE25	30	30	2	40	0.49	2	0.08	30			YES
57	RBR3L30A	DD	TE25	30	30	3	30	0.58	3	0.05	30	YES			
58	RBR3L30B	DD	TE25	30	30	3	40	0.53	3	0.08	30	YES			
59	RBR5L30A	DD	TE25	30	30	5	50	0.54	5	0.1	30	YES			
60	RBR5L30B	DD	TE25	30	30	5	50	0.49	5	0.15	30	YES			
61	RBR1L40A	DD	TE25	40	40	1	30	0.52	1	0.05	40	YES			
62	RBR2L40A	DD	TE25	40	40	2	40	0.55	2	0.08	40	YES			
63	RBR3L40A	DD	TE25	40	40	3	30	0.69	3	0.05	40	YES			
64	RBR3L40B	DD	TE25	40	40	3	40	0.62	3	0.08	40	YES			
65	RBR3L40C	DD	TE25	40	40	3	50	0.55	3	0.1	40	YES			
66	RBR5L40A	DD	TE25	40	40	5	50	0.53	5	0.2	40	YES			
67	RBR1L60A	DD	TE25	60	60	1	30	0.53	1	0.075	60	YES			
68	RBR2L60A	DD	TE25	60	60	2	30	0.65	2	0.075	60	YES			
69	RBR2L60B	DD	TE25	60	60	2	50	0.52	2	0.15	60	YES			
70	RBR3L60A	DD	TE25	60	60	3	40	0.66	3	0.1	60	YES			
71	RBR3L60B	DD	TE25	60	60	3	50	0.56	3	0.15	60	YES			
72	RBR5L60A	DD	TE25	60	60	5	50	0.55	5	0.25	60	YES			

☆ : General Part No. have no grade code.

Note : Package is JEDEC code. () : ROHM Packages. [] : GENERAL code

☆ : Under Development

Schottky Barrier Diodes

Example:

R	S	X	1	0	1	M	M	-	3	0	T	F	T	R

Part No. Grade Code Taping Code

Middle Power Schottky Barrier Diodes(Standard type)

Quick Reference No.	Product No.			Absolute Maximum Ratings(Tc=25°C)				Electrical Characteristics(Tj=25°C)				Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101	
	Part No.	Grade Code	Taping Code	V _{RM} (V)	V _R (V)	I _O (A)	I _{FSM} (A) 60Hz,1~	V _F (V) Max.	I _R (A)	I _R (mA) Max.	V _R (V)				
		General													Automotive
Super Low V _F type															
1	RSX101MM-30	*	TF	TR	30	30	1	45	0.39	1	0.2	30	SOD-123FL (PMDU)		YES
2	RSX501LAM20		—	TR	20	20	5	100	0.39	3	0.5	20	SOD-128 (PMDTM)		—
3	RSX201LAM30		TF	TR	30	30	2	60	0.44	2	0.15	30			YES
4	RSX205LAM30		TF	TR	30	30	2	60	0.49	2	0.2	30			YES
5	RSX301LAM30		TF	TR	30	30	3	100	0.42	3	0.2	15	DO-214AC (PMDS) [SMA]	YES	
6	RSX201L-30	—	DD	TE25	30	30	2	60	0.44	2	0.15	30		YES	
7	RSX205L-30		TF	TE25	30	30	2	60	0.49	2	0.2	30		YES	
8	RSX301L-30		DD	TE25	30	30	3	70	0.42	3	0.2	30	YES		
Low V _F type															
9	RB160MM-90	*	TF	TR	90	90	1	30	0.73	1	0.1	90	SOD-123FL (PMDU)		YES
10	RB160LAM-90		TF	TR	95	90	1	50	0.73	1	0.1	90	SOD-128 (PMDTM)		YES
11	RB160L-90	—	TF	TE25	95	90	1	30	0.73	1	0.1	90	DO-214AC (PMDS) [SMA]	YES	
Super Low I _R type															
12	☆RB168VWM-30	*	TF	TR	30	30	1	30	0.69	1	0.0006	30	(PMDE)		YES
13	☆RB168VWM-40		TF	TR	40	40	1	30	0.69	1	0.0005	40			YES
14	☆RB168VWM-60		TF	TR	60	60	1	30	0.76	1	0.0005	60			YES
15	☆RB168VWM100		TF	TR	100	100	1	30	0.84	1	0.0003	100			YES
16	☆RB168VWM150		TF	TR	150	150	1	30	0.89	1	0.001	150			YES
17	RB168MM-30		TF	TR	30	30	1	30	0.69	1	0.0006	30	SOD-123FL (PMDU)		YES
18	RB068MM-30		TF	TR	30	30	2	50	0.7	2	0.0008	30			YES
19	RB168MM-40		TF	TR	40	40	1	40	0.65	1	0.00055	40			YES
20	RB068MM-40		TF	TR	40	40	2	40	0.725	2	0.00055	40			YES
21	RB168MM-60		TF	TR	60	60	1	40	0.68	1	0.0015	60			YES
22	RB068MM-60		TF	TR	60	60	2	40	0.765	2	0.0015	60			YES
23	RB168MM100		TF	TR	100	100	1	40	0.81	1	0.0004	100			YES
24	RB068MM100		TF	TR	100	100	2	40	0.87	2	0.0004	100			YES
25	RB168MM150		TF	TR	150	150	1	35	0.84	1	0.004	150			YES
26	RB168LAM-30		TF	TR	30	30	1	40	0.69	1	0.0006	30	SOD-128 (PMDTM)		YES
27	RB068LAM-30		TF	TR	30	30	2	50	0.7	2	0.0008	30			YES
28	RB058LAM-30		TF	TR	30	30	3	80	0.68	3	0.0025	30			YES
29	RB088LAM-30		TF	TR	30	30	5	80	0.69	5	0.0025	30			YES
30	RB168LAM-40		TF	TR	40	40	1	40	0.69	1	0.0005	40			YES
31	RB068LAM-40		TF	TR	40	40	2	50	0.69	2	0.001	40			YES
32	RB058LAM-40		TF	TR	40	40	3	90	0.69	3	0.005	40			YES
33	New RB088LAM-40		TF	TR	40	40	5	90	0.71	5	0.0036	40			YES
34	RB168LAM-60		TF	TR	60	60	1	40	0.68	1	0.0015	60			YES
35	RB068LAM-60		TF	TR	60	60	2	70	0.68	2	0.002	60			YES
36	RB058LAM-60		TF	TR	60	60	3	90	0.64	3	0.004	60	YES		
37	RB088LAM-60		TF	TR	60	60	5	90	0.71	5	0.004	60	YES		
38	RB168LAM100		TF	TR	100	100	1	40	0.81	1	0.0004	100	DO-214AC (PMDS) [SMA]		YES
39	RB068LAM100		TF	TR	100	100	2	70	0.81	2	0.0015	100			YES
40	RB058LAM100		TF	TR	100	100	3	80	0.81	3	0.003	100			YES
41	RB088LAM100		TF	TR	100	100	5	80	0.87	5	0.003	100			YES
42	RB168LAM150		TF	TR	150	150	1	50	0.84	1	0.0025	150			YES
43	RB068LAM150		TF	TR	150	150	2	70	0.81	2	0.003	150			YES
44	RB058LAM150		TF	TR	150	150	3	80	0.84	3	0.003	150			YES
45	RB088LAM150		TF	TR	150	150	5	80	0.9	5	0.003	150			YES
46	RB168L-30	—	TF	TE25	30	30	1	30	0.69	1	0.0006	30		YES	
47	RB068L-30		DD	TE25	30	30	2	60	0.7	2	0.0008	30		YES	
48	RB058L-30		DD	TE25	30	30	3	90	0.68	3	0.0025	30	YES		
49	RB168L-40		TF	TE25	40	40	1	50	0.65	1	0.00055	40	YES		
50	RB068L-40		DD	TE25	40	40	2	50	0.69	2	0.001	40	YES		
51	RB058L-40		DD	TE25	40	40	3	100	0.7	3	0.005	40	YES		
52	RB168L-60		TF	TE25	60	60	1	50	0.68	1	0.0015	60	YES		
53	RB068L-60		DD	TE25	60	60	2	90	0.68	2	0.002	60	YES		
54	RB058L-60		DD	TE25	60	60	3	120	0.64	3	0.004	60	YES		
55	RB168L100		DD	TE25	100	100	1	50	0.81	1	0.0004	100	YES		
56	RB068L100		DD	TE25	100	100	2	110	0.79	2	0.003	100	YES		
57	RB168L150		DD	TE25	150	150	1	50	0.84	1	0.004	150	YES		
58	RB068L150		DD	TE25	150	150	2	90	0.81	2	0.003	150	YES		
59	RB058L150		DD	TE25	150	150	3	90	0.85	3	0.003	150	YES		

*: General Part No. have no grade code.

Note: Package is JEDEC code. (): ROHM Packages. []: GENERAL code

☆: Under Development

Schottky Barrier Diodes

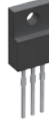
●Quick Reference for Power Schottky Barrier Diodes(High Efficient type)

V_R (V)	I_O (A)	Surface Mount type						Through Hole type								
																
		TO-252GE [DPAK]	TO-252 [DPAK]		TO-263S [D2PAK]		TO-220FN <3pin>		TO-220FN <2pin>							
		Low I_R type	Low V_F type	Low I_R type	Low V_F type	Low I_R type		Low V_F type	Low I_R type	Low I_R type						
30	10		RBR10BM30A	1		RBR10NS30A	10		RBR10T30A	22						
	15		RBR15BM30A	2												
	20		RBR20BM30A	3		RBR20NS30A	11		RBR20T30A	23						
	30					RBR30NS30A	12		RBR30T30A	24						
	40					RBR40NS30A	13									
40/45	10		RBR10BM40A	4	RBQ10BM45A	34	RBR10NS40A	14	RBQ10NS45A	43	RBR10T40A	25	RBQ10T45A	53		
	15		RBR15BM40A	5	RBQ15BM45A	35										
	20		RBR20BM40A	6	RBQ20BM45A	36	RBR20NS40A	15	RBQ20NS45A	44	RBR20T40A	26	RBQ20T45A	54		
	30						RBR30NS40A	16	RBQ30NS45A RBQ30NS45B	45 52	RBR30T40A	27	RBQ30T45A	55	RBQ30TB45B	62
	40						RBR40NS40A	17								
60/65	10		RBR10BM60A	7	RBQ10BM65A	37	RBR10NS60A	18	RBQ10NS65A	46	RBR10T60A	28	RBQ10T65A	56		
	15		RBR15BM60A	8	RBQ15BM65A	38										
	20		RBR20BM60A	9	RBQ20BM65A	39	RBR20NS60A	19	RBQ20NS65A	47	RBR20T60A	29	RBQ20T65A	57		
	30						RBR30NS60A	20	RBQ30NS65A	48	RBR30T60A	30	RBQ30T65A	58		
	40						RBR40NS60A	21								
100	10	☆RBQ10BGE100A	31		New RBQ10BM100A	40		New RBQ10NS100A	49		New RBQ10T100A	59				
	15	☆RBQ15BGE100A	32		New RBQ15BM100A	41										
	20	☆RBQ20BGE100A	33		New RBQ20BM100A	42		New RBQ20NS100A	50		New RBQ20T100A	60				
	30							New RBQ30NS100A	51		New RBQ30T100A	61				

Note : Package is JEDEC code. [] : GENERAL code.

☆ : Under Development

●Quick Reference for Power Schottky Barrier Diodes(Standard type)

V_R (V)	I_O (A)	Surface Mount type						Through Hole type	
									
		TO-252GE [DPAK]	TO-252 [DPAK]	TO-263S [D2PAK]	TO-220FN [3pin]				
		Super Low I_R type	Super Low I_R type	Super Low I_R type	Super Low I_R type				
30	5		RB078BM30S 2						
	6		RB098BM-30 3						
	10		RB088BM-30 4	RB088NS-30 14	RB088T-30 35				
	20			RB218NS-30 15	RB218T-30 36				
	30			RB228NS-30 16	RB228T-30 37				
	40			RB238NS-30 17	RB238T-30 38				
40	5		RB075BM40S 5						
	6		RB098BM-40 6						
	10		RB088BM-40 7	RB088NS-40 18	RB088T-40 39				
	20			RB218NS-40 19	RB218T-40 40				
	30			RB228NS-40 20	RB228T-40 41				
	40			RB238NS-40 21	RB238T-40 42				
60	6		RB098BM-60 8						
	10		RB088BM-60 9	RB088NS-60 22	RB088T-60 43				
	20			RB218NS-60 23	RB218T-60 44				
	30			RB228NS-60 24	RB228T-60 45				
	40			RB238NS-60 25	RB238T-60 46				
100	6		RB098BM100 10						
	10		RB088BM100 11	RB088NS100 26	RB088T100 47				
	20			RB218NS100 27	RB218T100 48				
	30			RB228NS100 28	RB228T100 49				
	40			RB238NS100 29	RB238T100 50				
150	6		RB098BM150 12						
	10	New RB088BGE150 1	RB088BM150 13	RB088NS150 31	RB088T150 52				
	20			RB218NS150 32	RB218T150 53				
	30			RB228NS150 33	RB228T150 54				
	40			RB238NS150 34	RB238T150 55				

Note : Package is JEDEC code. [] : GENERAL code.

Schottky Barrier Diodes

Example:

R	B	R	1	0	B	M	3	0	A	F	H	T	L
Part No.										Grade Code		Taping Code	

Power Schottky Barrier Diodes(High Efficient type)

Quick Reference No.	Product No.				Absolute Maximum Ratings(T _C =25°C)				Electrical Characteristics(T _J =25°C)				Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101	
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O *1 (A)	I _{FSM} (A)*2 60Hz,1~	V _F (V) Max.	I _F (A)	I _R (mA) Max.	V _R (V)				
		General	Automotive													
Low V _F type																
1	RBR10BM30A	*	FH	TL	30	30	10	50	0.55	5	0.1	30	TO-252 (DPAK)		YES	
2	RBR15BM30A		FH	TL	30	30	15	100	0.51	7.5	0.2	30			YES	
3	RBR20BM30A		FH	TL	30	30	20	100	0.51	10	0.3	30			YES	
4	RBR10BM40A		FH	TL	40	40	10	50	0.62	5	0.12	40			YES	
5	RBR15BM40A		FH	TL	40	40	15	100	0.55	7.5	0.24	40			YES	
6	RBR20BM40A		FH	TL	40	40	20	100	0.55	10	0.36	40			YES	
7	RBR10BM60A		FH	TL	60	60	10	50	0.65	5	0.2	60			YES	
8	RBR15BM60A		FH	TL	60	60	15	100	0.58	7.5	0.4	60			YES	
9	RBR20BM60A		FH	TL	60	60	20	100	0.59	10	0.6	60			YES	
10	RBR10NS30A		FH	TL	30	30	10	50	0.55	5	0.1	30	TO-263S (D2PAK)		YES	
11	RBR20NS30A		FH	TL	30	30	20	100	0.55	10	0.2	30			YES	
12	RBR30NS30A		FH	TL	30	30	30	100	0.55	15	0.3	30			YES	
13	RBR40NS30A		FH	TL	30	30	40	100	0.52	20	0.6	30			YES	
14	RBR10NS40A		FH	TL	40	40	10	50	0.62	5	0.12	40			YES	
15	RBR20NS40A		FH	TL	40	40	20	100	0.62	10	0.24	40			YES	
16	RBR30NS40A		FH	TL	40	40	30	100	0.62	15	0.36	40			YES	
17	RBR40NS40A		FH	TL	40	40	40	100	0.55	20	0.43	40			YES	
18	RBR10NS60A		FH	TL	60	60	10	50	0.65	5	0.2	60			YES	
19	RBR20NS60A		FH	TL	60	60	20	100	0.64	10	0.4	60			YES	
20	RBR30NS60A		FH	TL	60	60	30	100	0.67	15	0.6	60			YES	
21	RBR40NS60A		FH	TL	60	60	40	100	0.6	20	0.8	60			YES	
22	RBR10T30A	NZ	HZ	C9	30	30	10	50	0.55	5	0.1	30	TO-220FN <3pin>	YES		
23	RBR20T30A	NZ	HZ	C9	30	30	20	100	0.55	10	0.2	30		YES		
24	RBR30T30A	NZ	HZ	C9	30	30	30	100	0.55	15	0.3	30		YES		
25	RBR10T40A	NZ	HZ	C9	40	45	10	50	0.62	5	0.12	40		YES		
26	RBR20T40A	NZ	HZ	C9	40	45	20	100	0.62	10	0.24	40		YES		
27	RBR30T40A	NZ	HZ	C9	40	45	30	100	0.62	15	0.36	40		YES		
28	RBR10T60A	NZ	HZ	C9	60	60	10	50	0.65	5	0.2	60		YES		
29	RBR20T60A	NZ	HZ	C9	60	60	20	100	0.64	10	0.4	60		YES		
30	RBR30T60A	NZ	HZ	C9	60	60	30	100	0.67	15	0.6	60		YES		
Low I _R type																
31	☆RBQ10BGE100A	*	—	TL	100	100	10	100	0.77	5	0.08	100	TO-252GE (DPAK)		—	
32	☆RBQ15BGE100A		—	TL	100	100	15	100	0.71	7.5	0.14	100			—	
33	☆RBQ20BGE100A		—	TL	100	100	20	100	0.69	10	0.2	100			—	
34	RBQ10BM45A		FH	TL	45	45	10	50	0.65	5	0.07	45	TO-252 (DPAK)		YES	
35	RBQ15BM45A		FH	TL	45	45	15	100	0.59	7.5	0.14	45			YES	
36	RBQ20BM45A		FH	TL	45	45	20	100	0.59	10	0.2	45			YES	
37	RBQ10BM65A		FH	TL	65	65	10	50	0.69	5	0.07	65			YES	
38	RBQ15BM65A		FH	TL	65	65	15	100	0.63	7.5	0.14	65			YES	
39	RBQ20BM65A		FH	TL	65	65	20	100	0.63	10	0.2	65			YES	
40	New RBQ10BM100A		—	FH	TL	100	100	10	100	0.77	5	0.08	100		TO-263S (D2PAK)	YES
41	New RBQ15BM100A			FH	TL	100	100	15	100	0.71	7.5	0.14	100			YES
42	New RBQ20BM100A			FH	TL	100	100	20	100	0.69	10	0.2	100			YES
43	RBQ10NS45A	*	FH	TL	45	45	10	100	0.65	5	0.07	45	TO-263S (D2PAK)	YES		
44	RBQ20NS45A		FH	TL	45	45	20	100	0.65	10	0.14	45		YES		
45	RBQ30NS45A		FH	TL	45	45	30	100	0.65	15	0.2	45		YES		
46	RBQ10NS65A		FH	TL	65	65	10	100	0.69	5	0.07	65		YES		
47	RBQ20NS65A		FH	TL	65	65	20	100	0.69	10	0.14	65		YES		
48	RBQ30NS65A		FH	TL	65	65	30	100	0.69	15	0.2	65		YES		
49	New RBQ10NS100A		FH	TL	100	100	10	100	0.77	5	0.08	100		YES		
50	New RBQ20NS100A		FH	TL	100	100	20	100	0.77	10	0.14	100		YES		
51	New RBQ30NS100A		FH	TL	100	100	30	100	0.77	15	0.2	100		YES		
52	RBQ30NS45B		FH	TL	45	45	30	100	0.59	30	0.7	45			YES	
53	RBQ10T45A	NZ	HZ	C9	45	45	10	100	0.65	5	0.07	45	TO-220FN <3pin>	YES		
54	RBQ20T45A	NZ	HZ	C9	45	45	20	100	0.65	10	0.14	45		YES		
55	RBQ30T45A	NZ	HZ	C9	45	45	30	100	0.65	15	0.2	45		YES		
56	RBQ10T65A	NZ	HZ	C9	65	65	10	100	0.69	5	0.07	65		YES		
57	RBQ20T65A	NZ	HZ	C9	65	65	20	100	0.69	10	0.14	65		YES		
58	RBQ30T65A	NZ	HZ	C9	65	65	30	100	0.69	15	0.2	65		YES		
59	New RBQ10T100A	NZ	HZ	C9	100	100	10	100	0.77	5	0.08	100		YES		
60	New RBQ20T100A	NZ	HZ	C9	100	100	20	100	0.77	10	0.14	100		YES		
61	New RBQ30T100A	NZ	HZ	C9	100	100	30	100	0.77	15	0.2	100		YES		
62	RBQ30TB45B	NZ	HZ	C9	45	45	30	100	0.59	30	0.7	45		TO-220FN <2pin>		YES

*: General Part No. have no grade code.

*1: I_O: Average rectified output current per die. In case of 2 dies, I_O indicates average output current of 2 dies.

*2: Value/Die

Note: Package is JEDEC code. []: GENERAL code.

☆: Under Development

Schottky Barrier Diodes

Schottky Barrier Diodes

Example:

R	B	0	7	8	B	M	3	0	S	F	H	T	L
Part No.										Grade Code		Taping Code	

Power Schottky Barrier Diodes(Standard type)																
Quick Reference No.	Product No.				Absolute Maximum Ratings(T _C =25°C)				Electrical Characteristics(T _J =25°C)				Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101	
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O *1 (A)	I _{FSM} (A)*2 60Hz.1~	V _F (V) Max.	I _F (A)	I _R (mA) Max.	V _R (V)				
		General	Automotive													
Super Low I _R type																
1	New RB088BGE150	*	—	TL	150	150	10	50	0.88	5	0.015	150	TO-252GE [DPAK]		—	
2	RB078BM30S		FH	TL	35	30	5	50	0.72	5	0.005	30	TO-252 [DPAK]		YES	
3	RB098BM-30		FH	TL	35	30	6	50	0.72	3	0.0015	30			YES	
4	RB088BM-30		FH	TL	35	30	10	50	0.72	5	0.003	30			YES	
5	RB075BM40S		FH	TL	40	40	5	50	0.75	5	0.005	40			YES	
6	RB098BM-40		FH	TL	45	40	6	50	0.77	3	0.0015	40			YES	
7	RB088BM-40		FH	TL	45	40	10	50	0.77	5	0.003	40			YES	
8	RB098BM-60		FH	TL	60	60	6	50	0.83	3	0.0015	60			YES	
9	RB088BM-60		FH	TL	60	60	10	50	0.83	5	0.003	60			YES	
10	RB098BM100		FH	TL	110	100	6	100	0.77	3	0.003	100			YES	
11	RB088BM100		FH	TL	100	100	10	100	0.87	5	0.005	100			YES	
12	RB098BM150		FH	TL	150	150	6	100	0.83	3	0.007	150			YES	
13	RB088BM150		—	FH	TL	150	150	10	100	0.88	5	0.015			150	YES
14	RB088NS-30	*	FH	TL	35	30	10	50	0.72	5	0.003	30	TO-263S [D2PAK]		YES	
15	RB218NS-30		FH	TL	35	30	20	100	0.72	10	0.005	30			YES	
16	RB228NS-30		FH	TL	35	30	30	100	0.72	15	0.01	30			YES	
17	RB238NS-30		FH	TL	35	30	40	100	0.75	20	0.012	30			YES	
18	RB088NS-40		FH	TL	45	40	10	50	0.77	5	0.003	40			YES	
19	RB218NS-40		FH	TL	45	40	20	100	0.77	10	0.005	40			YES	
20	RB228NS-40		FH	TL	45	40	30	100	0.77	15	0.01	40			YES	
21	RB238NS-40		FH	TL	45	40	40	100	0.8	20	0.012	40			YES	
22	RB088NS-60		FH	TL	60	60	10	50	0.83	5	0.003	60			YES	
23	RB218NS-60		FH	TL	60	60	20	100	0.83	10	0.005	60			YES	
24	RB228NS-60		FH	TL	60	60	30	100	0.83	15	0.01	60			YES	
25	RB238NS-60		FH	TL	60	60	40	100	0.86	20	0.012	60			YES	
26	RB088NS100		FH	TL	110	100	10	100	0.87	5	0.005	100			YES	
27	RB218NS100		FH	TL	110	100	20	100	0.87	10	0.007	100			YES	
28	RB228NS100		FH	TL	110	100	30	100	0.87	5	0.005	100			YES	
29	RB298NS100		FH	TL	110	100	30	100	0.87	15	0.01	100			YES	
30	RB238NS100		FH	TL	110	100	40	100	0.86	20	0.02	100			YES	
31	RB088NS150		FH	TL	150	150	10	50	0.88	5	0.015	150			YES	
32	RB218NS150		FH	TL	150	150	20	100	0.88	10	0.02	150			YES	
33	RB228NS150		FH	TL	150	150	30	100	0.88	15	0.025	150			YES	
34	RB238NS150		FH	TL	150	150	40	100	0.87	20	0.03	150			YES	
35	RB088T-30	NZ	HZ	C9	35	30	10	50	0.72	5	0.003	30	TO-220FN <3pin>		YES	
36	RB218T-30	NZ	HZ	C9	35	30	20	100	0.72	10	0.005	30			YES	
37	RB228T-30	NZ	HZ	C9	35	30	30	100	0.72	15	0.01	30			YES	
38	RB238T-30	NZ	HZ	C9	35	30	40	100	0.75	20	0.012	30			YES	
39	RB088T-40	NZ	HZ	C9	45	40	10	50	0.77	5	0.003	40			YES	
40	RB218T-40	NZ	HZ	C9	45	40	20	100	0.77	10	0.005	40			YES	
41	RB228T-40	NZ	HZ	C9	45	40	30	100	0.77	15	0.01	40			YES	
42	RB238T-40	NZ	HZ	C9	45	40	40	100	0.8	20	0.012	40			YES	
43	RB088T-60	NZ	HZ	C9	60	60	10	50	0.83	5	0.003	60			YES	
44	RB218T-60	NZ	HZ	C9	60	60	20	100	0.83	10	0.005	60			YES	
45	RB228T-60	NZ	HZ	C9	60	60	30	100	0.83	15	0.01	60			YES	
46	RB238T-60	NZ	HZ	C9	60	60	40	100	0.86	20	0.012	60			YES	
47	RB088T100	NZ	HZ	C9	110	100	10	100	0.87	5	0.005	100			YES	
48	RB218T100	NZ	HZ	C9	110	100	20	100	0.87	10	0.007	100			YES	
49	RB228T100	NZ	HZ	C9	110	100	30	100	0.87	5	0.005	100			YES	
50	RB298T100	NZ	HZ	C9	110	100	30	100	0.87	15	0.01	100			YES	
51	RB238T100	NZ	HZ	C9	110	100	40	100	0.86	20	0.02	100			YES	
52	RB088T150	NZ	HZ	C9	150	150	10	50	0.88	5	0.015	150			YES	
53	RB218T150	NZ	HZ	C9	150	150	20	100	0.88	10	0.02	150			YES	
54	RB228T150	NZ	HZ	C9	150	150	30	100	0.88	15	0.025	150			YES	
55	RB238T150	NZ	HZ	C9	150	150	40	100	0.87	20	0.03	150			YES	

*: General Part No. have no grade code.

*1 : I_O : Average rectified output current per die. In case of 2 dies , I_O indicates average output current of 2 dies.

*2 : Value/Die

Note : Package is JEDEC code. [] : GENERAL code.

Fast Recovery Diodes

● Quick Reference for Small Signal/Middle Power Fast Recovery Diodes

Fast Recovery Diodes

Example:  Part No. Grade Code Taping Code

V _R (V)	I _O (A)	Surface Mount type											
													
		1608 Size SOD-523 (EMD2)	2512 Size SOD-323FL (UMD2)	2514 Size (TUMD2M)		3516 Size SOD-123FL (PMDU)		4725 Size SOD-128 (PMDTM)		5026 size DO-214AC(PMDS) [SMA]		2928 Size SOT-457T (TSMD6)	
100	0.5			RF05VAM1S RF05VYM1S	3 4								
200	0.4										RF04UA2D	34	
	0.5			RF05VAM2S RF05VYM2S	5 6		RFC02MM2S	9					
	0.7						RF071MM2S	10					
	0.8						RF081MM2S	11					
	1							RF101LAM2S	12	RF101L2S	24		
	1.1							RF081LAM2S	13	RF081L2S	25		
	2							RF201LAM2S RF202LAM2S	14 15	RF201L2S	26		
	3							RF302LAM2S	16				
250	0.1		RF01VM2S	2									
400	1							RF071LAM4S RF101LAM4S	17 18	RF071L4S RF101L4S	27 28		
	1.5							RF201LAM4S RFN2LAM4S	19 20	RF201L4S RFN2L4S	29 30		
450	0.1	RFU01SM4S	1										
600	0.2				RFU02VSM6S	7							
	0.8							RFN1LAM6S	21	RFN1L6S	31		
	1.5							RFN2LAM6S	22	RFN2L6S	32		
700	0.8							RFN1LAM7S	23	RFN1L7S	33		
800	0.2				RFU02VSM8S	8							

Note : Package is JEDEC code. () : ROHM Packages. [] : GENERAL code.

Small Signal/Middle Power Fast Recovery Diodes

Quick Reference No.	Product No.				Absolute Maximum Ratings (Tc=25°C or Tl=25°C)				Electrical Characteristics(Tj=25°C)*1								Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O (A)	I _{FSM} (A) 60Hz,1~	V _F (V) Max.	I _F (A)	I _R (μA) Max.	V _{RR} (V)	tr(ns) Max.	I _F (A)	I _R (A)				
		General	Automotive																
1	RFU01SM4S	*	—	T2R	450	450	0.1	1	1.8	0.1	10	450	35	0.1	0.1	SOD-523 (EMD2)		—	
2	RF01VM2S		FH	TE-17	250	250	0.1	1	1.2	0.1	10	250	50	* 2		SOD-323FL (UMD2)		YES	
3	RF05VAM1S		—	TR	100	100	0.5	6	0.98	0.5	10	100	25	0.5	1	(TUMD2M)		—	
4	RF05VYM1S	—	FH	TR	100	100	0.5	6	0.98	0.5	10	100	25	0.5	1			YES	
5	RF05VAM2S	*	—	TR	200	200	0.5	6	0.98	0.5	10	200	25	0.5	1			—	
6	RF05VYM2S	—	FH	TR	200	200	0.5	6	0.98	0.5	10	200	25	0.5	1	(TUMD2SM)		YES	
7	RFU02VSM6S	*	—	TR	600	600	0.2	1	2.2	0.2	10	600	35	0.1	0.1			—	
8	RFU02VSM8S		—	TR	800	800	0.2	1	3	0.2	10	800	35	0.1	0.1			—	
9	RFC02MM2S		TF	TR	200	200	0.5	10	0.95	0.5	1	200	35	0.1	0.2	YES			
10	RF071MM2S	*	TF	TR	200	200	0.7	15	0.85	0.7	10	200	25	0.5	1	SOD-123FL (PMDU)		YES	
11	RF081MM2S		TF	TR	200	200	0.8	20	0.95	0.8	10	200	25	0.5	1			YES	
12	RF101LAM2S		TF	TR	200	200	1	20	0.87	1	10	200	25	0.5	1			YES	
13	RF081LAM2S	*	TF	TR	200	200	1.1	25	0.98	1	10	200	25	0.5	1	SOD-128 (PMDTM)		YES	
14	RF201LAM2S		TF	TR	200	200	2	20	0.87	2	10	200	25	0.5	1			YES	
15	RF202LAM2S		TF	TR	200	200	2	20	0.93	2	10	200	25	0.5	1			YES	
16	RF302LAM2S	*	TF	TR	200	200	3	20	0.92	3	10	200	25	0.5	1	DO-214AC (PMDS) (SMA)		YES	
17	RF071LAM4S		TF	TR	400	400	1	15	1.25	0.7	10	400	25	0.5	1			YES	
18	RF101LAM4S		TF	TR	400	400	1	25	1.25	1	10	400	25	0.5	1			YES	
19	RF201LAM4S	*	TF	TR	400	400	1.5	50	1.2	1.5	1	400	30	0.5	1	DO-214AC (PMDS) (SMA)		YES	
20	RFN2LAM4S		TF	TR	400	400	1.5	50	1.2	1.5	1	400	30	0.5	1			YES	
21	RFN1LAM6S		TF	TR	600	600	0.8	15	1.45	0.8	1	600	35	0.5	1			YES	
22	RFN2LAM6S	*	TF	TR	600	600	1.5	40	1.55	1.5	1	600	35	0.5	1	DO-214AC (PMDS) (SMA)		YES	
23	RFN1LAM7S		TF	TR	700	700	0.8	15	1.5	0.8	1	700	80	0.5	1			YES	
24	RF101L2S		DD	TE25	200	200	1	20	0.87	1	10	200	25	0.5	1			YES	
25	RF081L2S	*	TF	TE25	200	200	1.1	25	0.98	1	10	200	25	0.5	1	DO-214AC (PMDS) (SMA)		YES	
26	RF201L2S		DD	TE25	200	200	2	20	0.87	2	10	200	25	0.5	1			YES	
27	RF071L4S		TF	TE25	400	400	1	15	1.25	0.7	10	400	25	0.5	1			YES	
28	RF101L4S	*	TF	TE25	400	400	1	25	1.25	1	10	400	25	0.5	1	DO-214AC (PMDS) (SMA)		YES	
29	RF201L4S		DD	TE25	400	400	1.5	50	1.2	1.5	1	400	30	0.5	1			YES	
30	RFN2L4S		DD	TE25	400	400	1.5	50	1.2	1.5	1	400	30	0.5	1			YES	
31	RFN1L6S	*	DD	TE25	600	600	0.8	15	1.45	0.8	1	600	35	0.5	1	DO-214AC (PMDS) (SMA)		YES	
32	RFN2L6S		DD	TE25	600	600	1.5	40	1.55	1.5	1	600	35	0.5	1			YES	
33	RFN1L7S		DD	TE25	700	700	0.8	15	1.5	0.8	1	700	80	0.5	1			YES	
34	RF04UA2D	*	FH	TR	200	200	0.4	1	0.98	0.2	10	200	25	0.5	1	SOT-457T (TSMD6)			YES

* : General Part No. have no grade code.

*1 : Value/Chip *2 : V_R=6V, I_R=10mA, I_{rr}=0.1I_R

Note : Package is JEDEC code. () : ROHM Packages. [] : GENERAL code.

Fast Recovery Diodes

● Quick Reference for Power Fast Recovery Diodes

V _R (V)	I _O (A)	Surface Mount type					Through Hole type						
													
		TO-252GE [DPAK]	TO-252 [DPAK]	TO-263S [D2PAK]	TO-220FN <2pin>	TO-220FN <3pin>	TO-220NFM <2pin>	TO-220AC	TO-220ACFP	TO-247			
200	3	RF301BGE2S	21	RF301BM2S RFN3BM2S	25 26								
	5			RF501BM2S	27								
				RFN5BM2S	28								
	6			RF601BM2D RFN6BM2D	1 2		RFN6T2D RF601T2D	8 9					
	10				RF1001NS2D	3	RF1001T2D RFN10T2D	10 11					
	16				RF1601NS2D	4	RF1601T2D RFN16T2D	12 13					
300	20				RF2001NS2D	5	RF2001T2D RFN20T2D	14 15					
	20				RF2001NS3D	6	RF2001T3D	16	RF1501TF3S	59			
350	5	RFN5BGE3S	22	RFN5BM3S	29								
	10			RFN10BM3S	37	RFN10NS3S	39						
	20				RFN20NS3S RFUH25NS3S RFUH20NS3S	40 41 42	RFUH25TB3S RFUH20TB3S	53 54					
430	10				RFN10NS4S RFUH10NS4S	43 44	RFN10TB4S RFUH10TB4S	55 56					
	20				RFN20NS4S RFUH20NS4S	45 46	RFN20TB4S RFUH20TB4S	57 58					
600	3	RFN3BGE6S	23	RFN3BM6S RF305BM6S	30 31								
	5	RFN5BGE6S	24	RFN5BM6S RFN5BM6S RF505BM6S RFV5BM6S	32 33 34 35			RFN5TF6S RFUH5TF6S RF505TF6S	60 61 62		RFN5TJ6S	69	
				RFV8BM6S	36				RFV8TG6S RFV8TG6S	79 80	RFV8TJ6S RFV8TJ6S	70 71	
	10			RFN10BM6S	38	RFUH10NS6S RFN10NS6S	47 48		RFUH10TF6S RFN10TF6S RF1005TF6S	63 64 65		RFN10TJ6S	72
	12								RFV12TG6S	81	RFV12TJ6S	73	
	15								RFV15TG6S	82	RFN15TJ6S RFV15TJ6S	75 74	
	20				RFN20NS6S RFUH20NS6S	49 50		RFN20TF6S RFUH20TF6S	66 67		RFUH20TJ6S RFN20TJ6S RFN20TJ6S	76 77 78	
	30								RFV30TG6S	83		RFUH30TS6D RFN30TS6D RFUH30TS6S RFN30TS6S	17 18 51 52
60											RFUH60TS6D RFN60TS6D	19 20	
800	5							RFN5TF8S	68				
	10				RFN10NS8D	7							

Note : Package is JEDEC code. [] : GENERAL code.

Fast Recovery Diodes

Example: **R F 6 0 1 B M 2 D F H T L**

Part No. Grade Code Taping Code

Power Fast Recovery Diodes 1

Quick Reference No.	Product No.				Absolute Maximum Ratings(Tc=25°C)				Electrical Characteristics(Tj=25°C)*2						Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101		
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O *1 (A)	I _{FSM} (A)*2 60Hz,1ms	V _F (V) Max.	I _F (A)	I _R (μA) Max.	V _R (V)	trr(ns) Max.	I _F (A)				I _R (A)	
		General	Automotive																
1	RF601BM2D	*	FH	TL	200	200	6	60	0.93	3	10	200	25	0.5	1	TO-252 [DPAK]		YES	
2	RFN6BM2D		FH	TL	200	200	6	40	0.98	3	10	200	25	0.5	1			YES	
3	RF1001NS2D		FH	TL	200	200	10	80	0.93	5	10	200	25	0.5	1	YES			
4	RF1601NS2D		FH	TL	200	200	16	100	0.93	8	10	200	30	0.5	1	YES			
5	RF2001NS2D		FH	TL	200	200	20	100	0.93	10	10	200	30	0.5	1	YES			
6	RF2001NS3D		FH	TL	350	300	20	100	1.3	10	10	300	25	0.5	1	YES			
7	RFN10NS8D		FH	TL	800	800	10	60	2.1	5	10	800	40	0.5	1	YES			
8	RFN6T2D	NZ	HZ	C9	200	200	6	40	0.98	3	10	200	25	0.5	1	TO-220FN <3pin>		YES	
9	RF601T2D	NZ	HZ	C9	200	200	6	60	0.93	3	10	200	25	0.5	1			YES	
10	RF1001T2D	NZ	HZ	C9	200	200	10	80	0.93	5	10	200	30	0.5	1			YES	
11	RFN10T2D	NZ	HZ	C9	200	200	10	80	0.98	5	10	200	25	0.5	1			YES	
12	RF1601T2D	NZ	HZ	C9	200	200	16	100	0.93	8	10	200	30	0.5	1			YES	
13	RFN16T2D	NZ	HZ	C9	200	200	16	100	0.98	8	10	200	30	0.5	1			YES	
14	RF2001T2D	NZ	HZ	C9	200	200	20	100	0.93	10	10	200	30	0.5	1			YES	
15	RFN20T2D	NZ	HZ	C9	200	200	20	100	0.98	10	10	200	30	0.5	1	YES	TO-247		YES
16	RF2001T3D	NZ	HZ	C9	350	300	20	100	1.3	10	10	300	25	0.5	1	YES			
17	RFUH30TS6D	G	—	C11	600	600	30	80	2.8	15	10	600	30	0.5	1	—			
18	RFN30TS6D	G	—	C11	600	600	30	120	1.55	15	10	600	55	0.5	1	—			
19	RFUH60TS6D	G	—	C11	600	600	60	120	2.8	30	10	600	35	0.5	1	—	TO-252GE [DPAK]		—
20	RFN60TS6D	G	—	C11	600	600	60	180	1.55	30	10	600	60	0.5	1	—			
21	RF301BGE2S	*	—	TL	200	200	3	40	0.93	3	10	200	25	0.5	1	—			
22	RFN5BGE3S			TL	350	350	5	50	1.5	5	10	350	30	0.5	1	—			
23	RFN3BGE6S			TL	600	600	3	20	1.55	3	10	600	30	0.5	1	—			
24	RFN15BGE6S			TL	600	600	5	50	1.3	5	10	600	60	0.5	1	—			
25	RF301BM2S	—	FH	TL	200	200	3	40	0.93	3	10	200	25	0.5	1	TO-252 [DPAK]		YES	
26	RFN3BM2S	*	FH	TL	200	200	3	40	0.98	3	10	200	25	0.5	1			YES	
27	RF501BM2S		FH	TL	200	200	5	40	0.92	5	1	200	25	0.5	1			YES	
28	RFN5BM2S		FH	TL	200	200	5	40	0.98	5	10	200	25	0.5	1			YES	
29	RFN5BM3S	—	FH	TL	350	350	5	50	1.5	5	10	350	30	0.5	1			YES	
30	RFN3BM6S	—	FH	TL	600	600	3	20	1.55	3	10	600	30	0.5	1			YES	
31	RF305BM6S	*	FH	TL	600	600	3	50	1.7	3	10	600	30	0.5	1			YES	
32	RFN15BM6S	—	FH	TL	600	600	5	50	1.3	5	10	600	60	0.5	1			YES	
33	RFN5BM6S	*	FH	TL	600	600	5	30	1.55	5	10	600	50	0.5	1			YES	
34	RF505BM6S		FH	TL	600	600	5	50	1.7	5	10	600	30	0.5	1			YES	
35	RFV5BM6S		FH	TL	600	600	5	60	2.8	5	10	600	20	0.5	1			YES	
36	RFV8BM6S		FH	TL	600	600	8	100	2.8	8	10	600	25	0.5	1			YES	
37	RFN10BM3S	*	FH	TL	350	350	10	80	1.5	10	10	350	30	0.5	1	TO-252 [DPAK]		YES	
38	RFN10BM6S		FH	TL	600	600	10	100	1.55	10	10	600	50	0.5	1			YES	
39	RFN10NS3S		FH	TL	350	350	10	100	1.5	10	10	350	30	0.5	1	YES			
40	RFN20NS3S		FH	TL	350	350	20	100	1.35	20	10	350	35	0.5	1	YES			
41	RFUH25NS3S		FH	TL	350	350	20	100	1.45	20	10	350	30	0.5	1	YES			
42	RFUH20NS3S		FH	TL	350	350	20	100	1.5	20	10	350	25	0.5	1	YES			
43	RFN10NS4S		FH	TL	430	430	10	80	1.55	10	10	430	30	0.5	1	YES			
44	RFUH10NS4S		FH	TL	430	430	10	80	1.7	10	10	430	25	0.5	1	YES			
45	RFN20NS4S		FH	TL	430	430	20	100	1.55	20	10	430	30	0.5	1	YES			
46	RFUH20NS4S		FH	TL	430	430	20	100	1.7	20	10	430	25	0.5	1	YES			
47	RFUH10NS6S		FH	TL	600	600	10	60	2.8	10	10	600	25	0.5	1	YES			
48	RFN10NS6S		FH	TL	600	600	10	100	1.55	10	10	600	50	0.5	1	YES			
49	RFN20NS6S		FH	TL	600	600	20	100	1.55	20	10	600	60	0.5	1	YES			
50	RFUH20NS6S		FH	TL	600	600	20	100	2.8	20	10	600	35	0.5	1	YES			
51	RFUH30TS6S	G	—	C11	600	600	30	150	2.8	30	10	600	35	0.5	1	TO-247	—		
52	RFN30TS6S	G	—	C11	600	600	30	200	1.55	30	10	600	60	0.5	1		—		

*: General Part No. have no grade code.

*1: IO: Average rectified output current die. In case of 2 dies, IO indicates average output current of 2 chips. *2: Value/Chip

Note: Package is JEDEC code. []: GENERAL code.

Fast Recovery Diodes

Fast Recovery Diodes

Example: **R F U H 2 5 T B 3 S H Z C 9**

Part No. Grade Code Taping Code

Power Fast Recovery Diodes 2

Quick Reference No.	Product No.				Absolute Maximum Ratings(T _C =25°C)				Electrical Characteristics(T _J =25°C)								Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O (A)	I _{FSM} (A) 60Hz,1 $\frac{1}{2}$ φ	V _F (V) Max.	I _F (A)	I _R (μA) Max.	V _R (V)	trr(ns) Max.	I _F (A)	I _R (A)				
		General	Automotive																
53	RFUH25TB3S	NZ	HZ	C9	350	350	20	100	1.45	20	10	350	30	0.5	1	TO-220FN <2pin>		YES	
54	RFUH20TB3S	NZ	HZ	C9	350	350	20	100	1.5	20	10	350	25	0.5	1			YES	
55	RFN10TB4S	NZ	HZ	C9	430	430	10	80	1.7	10	10	430	25	0.5	1			YES	
56	RFUH10TB4S	NZ	HZ	C9	430	430	10	80	1.55	10	10	430	30	0.5	1			YES	
57	RFN20TB4S	NZ	HZ	C9	430	430	20	100	1.55	20	10	430	30	0.5	1			YES	
58	RFUH20TB4S	NZ	HZ	C9	430	430	20	100	1.7	20	10	430	25	0.5	1			YES	
59	RF1501TF3S	*	FH	C9	350	300	20	100	1.5	20	10	300	30	0.5	1	TO-220NFN <2pin>		YES	
60	RFN5TF6S		FH	C9	600	600	5	30	1.55	5	10	600	50	0.5	1			YES	
61	RFUH5TF6S		FH	C9	600	600	5	30	2.8	5	10	600	25	0.5	1			YES	
62	RF505TF6S		FH	C9	600	600	5	80	1.7	5	10	600	30	0.5	1			YES	
63	RFUH10TF6S		FH	C9	600	600	10	60	2.8	10	10	600	25	0.5	1			YES	
64	RFN10TF6S		FH	C9	600	600	10	100	1.55	10	10	600	50	0.5	1			YES	
65	RF1005TF6S		FH	C9	600	600	10	100	1.7	10	10	600	40	0.5	1			YES	
66	RFN20TF6S		FH	C9	600	600	20	100	1.55	20	10	600	60	0.5	1			YES	
67	RFUH20TF6S		FH	C9	600	600	20	100	2.8	20	10	600	35	0.5	1			YES	
68	RFN5TF8S		FH	C9	800	800	5	60	2.1	5	10	800	40	0.5	1			YES	
69	RFNL5TJ6S	G	FHG	C9	600	600	5	50	1.3	5	10	600	60	0.5	1	TO-220ACFP		YES	
70	RFVS8TJ6S	G	—	C9	600	600	8	60	3	8	10	600	20	0.5	1			—	
71	RFV8TJ6S	G	—	C9	600	600	8	100	2.8	8	10	600	25	0.5	1			—	
72	RFNL10TJ6S	G	FHG	C9	600	600	10	120	1.25	8	10	600	65	0.5	1			YES	
73	RFV12TJ6S	G	—	C9	600	600	12	120	2.8	12	10	600	25	0.5	1			—	
74	RFV15TJ6S	G	—	C9	600	600	15	150	2.8	15	10	600	30	0.5	1			—	
75	RFNL15TJ6S	G	FHG	C9	600	600	15	160	1.3	15	10	600	65	0.5	1			YES	
76	RFUH20TJ6S	G	FHG	C9	600	600	20	120	2.8	20	10	600	35	0.5	1			YES	
77	RFN20TJ6S	G	FHG	C9	600	600	20	150	1.55	20	10	600	60	0.5	1			YES	
78	RFNL20TJ6S	G	FHG	C9	600	600	20	200	1.3	20	10	600	70	0.5	1			YES	
79	RFVS8TG6S	G	—	C9	600	600	8	60	3	8	10	600	20	0.5	1	TO-220AC		—	
80	RFV8TG6S	G	—	C9	600	600	8	100	2.8	8	10	600	25	0.5	1			—	
81	RFV12TG6S	G	—	C9	600	600	12	120	2.8	12	10	600	25	0.5	1			—	
82	RFV15TG6S	G	—	C9	600	600	15	150	2.8	15	10	600	30	0.5	1			—	
83	RFV30TG6S	G	—	C9	600	600	30	200	2.8	30	10	600	40	0.5	1			—	

*: General Part No. have no grade code.

Note : Package is JEDEC code. [] : GENERAL code.

Rectifier Diodes

● Quick Reference for Rectifier Diodes

Rectifier Diodes

Example:

R	R	1	V	W	M	4	S	T	F	T	R
Part No.							Grade Code		Taping Code		

	V_R (V)	I_O (A)	Surface Mount type								Through Hole type	
												
			2513 size (PMDE)		2514 size (TUMD2SM)		3516 size SOD-123FL (PMDU)		TO-252 [DPAK]		TO-220ACFP	
General Purpose Rectifier Diodes	400	0.2		RRE02VSM4S RRE02VTM4S	3 4							
		0.7		RRE07VSM4S RRE07VTM4S	5 6	RRD07MM4S RR264MM-400	11 12					
		1	RR1VWM4S	1								
	600	0.2		RRE02VSM6S RRE02VTM6S	7 8							
		0.7		RRE07VSM6S RRE07VTM6S	9 10							
		1	RR1VWM6S	2		RR268MM-600	13					
Power Rectifier Diodes	400	6					RR601BM4S	14				
	1,000	20							RRD20TJ10S		15	

Note : Package is JEDEC code. () : ROHM Packages. [] : GENERAL code.

General Purpose Rectifier Diodes

Quick Reference No.	Product No.				Absolute Maximum Ratings (T _C =25° C or T _I =25° C)				Electrical Characteristics(T _J =25° C)							Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
	Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _O (A)	I _{FSM} (A) 60Hz,1ms	V _F (V) Max.	I _F (A)	I _R (μA) Max.	V _R (V)	trr(ns) Max.	I _F (mA)	I _R (mA)			
		General	Automotive															
1	RR1VWM4S	*	TF	TR	400	400	1	15	1.2	1	10	400	—	—	—	(PMDE)		YES
2	RR1VWM6S		TF	TR	600	600	1	15	1.2	1	10	600	—	—	—			YES
3	RRE02VSM4S		—	TR	400	400	0.2	1	1.1	0.2	1	400	—	—	—			—
4	RRE02VTM4S	—	FH	TR	400	400	0.2	1	1.1	0.2	1	400	—	—	—	(TUMD2SM)		YES
5	RRE07VSM4S	*	—	TR	400	400	0.7	2	1.1	0.7	1	400	—	—	—			—
6	RRE07VTM4S	—	FH	TR	400	400	0.7	2	1.1	0.7	1	400	—	—	—			YES
7	RRE02VSM6S	*	—	TR	600	600	0.2	1	1.1	0.2	1	600	—	—	—			—
8	RRE02VTM6S	—	FH	TR	600	600	0.2	1	1.1	0.2	1	600	—	—	—			YES
9	RRE07VSM6S	*	—	TR	600	600	0.7	2	1.1	0.7	1	600	—	—	—			—
10	RRE07VTM6S	—	FH	TR	600	600	0.7	2	1.1	0.7	1	600	—	—	—			YES
11	RRD07MM4S	*	—	TR	400	400	0.7	150 ^{*1}	0.98	0.7	1	400	—	—	—	SOD-123FL (PMDU)		—
12	RR264MM-400		TF	TR	400	400	0.7	25	1.1	0.7	10	400	—	—	—			YES
13	RR268MM-600		TF	TR	600	400	1	25	0.98	1	10	400	—	—	—			YES

Power Rectifier Diodes

14	RR601BM4S	*	FH	TL	400	400	6	40	1.1	6	10	400	—	—	—	TO-252 (DPAK)		YES
15	RRD20TJ10S	G	—	C9	1,000	1,000	20	200	1.05	20	10	1,000	—	—	—	TO-220ACFP		—

* : General Part No. have no grade code.

*1 : I_{RM} (guaranteed) : charged waveform t=500μs(1/2peak), 1pulse/4s, Rth<80°C/W

Note : Package is JEDEC code. () : ROHM Packages. [] : GENERAL code.

Zener Diodes

Zener Diodes

Example:

E	D	Z	V	F	H	T	2	R	2	.	0	B
Part No.				Grade Code		Tuning Code			Zener Voltage			Sub Division

Zener Diodes 1

Surface Mount type																	
Package																	
	0603 size DSN0603-2(SMD0603)				1006 size SOD-923(VMN2M)				1608 size SOD-523(EMD2)				2512 size SOD-323FL(UMD2)				
Equivalent Circuit Diagram																	
series Name	RASMID SDZ series				CDZV series				EDZV series				UFZV series				
Automotive Grade Code	—				—				FH				FH				
Power(mW)	100				100				150				500				
Taping Code	T15R				T2R				T2R				TE-17				
Electrical Characteristics (Ta=25°C)	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101		
Voltage	—	—	—	—	2.0B	2.02 to 2.20	5	—	—	2.0B	2.02 to 2.20	5	YES	—	—	—	
	—	—	—	—	2.2B	2.22 to 2.41	5	—	—	2.2B	2.22 to 2.41	5	YES	—	—	—	
	—	—	—	—	2.4B	2.43 to 2.63	5	—	—	2.4B	2.43 to 2.63	5	YES	—	—	—	
	—	—	—	—	2.7B	2.69 to 2.91	5	—	—	2.7B	2.69 to 2.91	5	YES	—	—	—	
	—	—	—	—	3.0B	3.01 to 3.22	5	—	—	3.0B	3.01 to 3.22	5	YES	—	—	—	
	—	—	—	—	3.3B	3.32 to 3.53	5	—	—	3.3B	3.32 to 3.53	5	YES	—	—	—	
	—	—	—	—	3.6B	3.600 to 3.845	5	—	—	3.6B	3.600 to 3.845	5	YES	3.6B	3.580 to 3.836	20	YES
	—	—	—	—	3.9B	3.89 to 4.16	5	—	—	3.9B	3.89 to 4.16	5	YES	3.9B	3.870 to 4.151	20	YES
	—	—	—	—	4.3B	4.17 to 4.43	5	—	—	4.3B	4.17 to 4.43	5	YES	4.3B	4.151 to 4.423	20	YES
	—	—	—	—	4.7B	4.55 to 4.75	5	—	—	4.7B	4.55 to 4.75	5	YES	4.7B	4.534 to 4.795	20	YES
	5.1	4.84 to 5.37	5	—	5.1B	4.98 to 5.20	5	—	—	5.1B	4.98 to 5.20	5	YES	5.1B	4.940 to 5.200	20	YES
	5.6	5.31 to 5.92	5	—	5.6B	5.49 to 5.73	5	—	—	5.6B	5.49 to 5.73	5	YES	5.6B	5.450 to 5.730	20	YES
	6.2	5.86 to 6.53	5	—	6.2B	6.06 to 6.33	5	—	—	6.2B	6.06 to 6.33	5	YES	6.2B	5.976 to 6.307	20	YES
	6.8	6.47 to 7.14	5	—	6.8B	6.65 to 6.93	5	—	—	6.8B	6.65 to 6.93	5	YES	6.8B	6.525 to 6.865	20	YES
	7.5	7.06 to 7.84	5	—	7.5B	7.28 to 7.60	5	—	—	7.5B	7.28 to 7.60	5	YES	7.5B	7.104 to 7.509	20	YES
	8.2	7.76 to 8.64	5	—	8.2B	8.02 to 8.36	5	—	—	8.2B	8.02 to 8.36	5	YES	8.2B	7.827 to 8.265	20	YES
	—	—	—	—	9.1B	8.85 to 9.23	5	—	—	9.1B	8.85 to 9.23	5	YES	9.1B	8.635 to 9.106	20	YES
	—	—	—	—	10B	9.77 to 10.21	5	—	—	10B	9.77 to 10.21	5	YES	10B	9.497 to 10.050	20	YES
	—	—	—	—	11B	10.76 to 11.22	5	—	—	11B	10.76 to 11.22	5	YES	11B	10.550 to 11.160	10	YES
	—	—	—	—	12B	11.74 to 12.24	5	—	—	12B	11.74 to 12.24	5	YES	12B	11.510 to 12.160	10	YES
	—	—	—	—	13B	12.91 to 13.49	5	—	—	13B	12.91 to 13.49	5	YES	13B	12.640 to 13.340	10	YES
	—	—	—	—	15B	14.34 to 14.98	5	—	—	15B	14.34 to 14.98	5	YES	15B	14.000 to 14.790	10	YES
	—	—	—	—	16B	15.85 to 16.51	5	—	—	16B	15.85 to 16.51	5	YES	16B	15.390 to 16.240	10	YES
	—	—	—	—	18B	17.56 to 18.35	2	—	—	18B	17.56 to 18.35	5	YES	18B	17.000 to 17.950	10	YES
	—	—	—	—	20B	19.52 to 20.39	2	—	—	20B	19.52 to 20.39	5	YES	20B	18.870 to 19.890	10	YES
	—	—	—	—	22B	21.54 to 22.47	2	—	—	22B	21.54 to 22.47	5	YES	22B	20.770 to 21.920	5	YES
	—	—	—	—	24B	23.72 to 24.78	2	—	—	24B	23.72 to 24.78	5	YES	24B	22.780 to 24.020	5	YES
	—	—	—	—	27B	26.19 to 27.53	2	—	—	27B	26.19 to 27.53	2	YES	27B	25.190 to 26.560	5	YES
	—	—	—	—	30B	29.19 to 30.69	2	—	—	30B	29.19 to 30.69	2	YES	30B	27.980 to 29.500	5	YES
	—	—	—	—	33B	32.15 to 33.79	2	—	—	33B	32.15 to 33.79	2	YES	33B	30.660 to 32.320	5	YES
	—	—	—	—	36B	35.07 to 36.87	2	—	—	36B	35.07 to 36.87	2	YES	36B	33.230 to 35.010	5	YES
	—	—	—	—	—	—	—	—	—	—	—	—	—	39B	35.880 to 37.790	5	YES
Surface Mount type																	
Package																	
	2512 size SOD-323FL(UMD2)				2512 size SOD-323FL(UMD2)				2514 size (TUMD2M)				2514 size (TUMD2M)				
Equivalent Circuit Diagram																	
series Name	UDZV series				UDZLV series				TFZV series				YFZV series				
Automotive Grade Code	FH				FH				—				FH				
Power(mW)	200				200				500				500				
Taping Code	TE-17				TE-17				TR				TR				
Electrical Characteristics (Ta=25°C)	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)	I _Z (mA)	Automotive Grade AEC-Q101		
Voltage	2.0B	2.02 to 2.20	5	YES	51	48 to 54	2	YES	—	2.0B	2.02 to 2.20	20	—	2.0B	2.02 to 2.20	20	YES
	2.2B	2.22 to 2.41	5	YES	56	53 to 60	2	YES	2.2B	2.22 to 2.41	20	—	2.2B	2.22 to 2.41	20	YES	
	2.4B	2.43 to 2.63	5	YES	62	58 to 66	2	YES	2.4B	2.43 to 2.63	20	—	2.4B	2.43 to 2.63	20	YES	
	2.7B	2.69 to 2.91	5	YES	68	64 to 72	2	YES	2.7B	2.69 to 2.91	20	—	2.7B	2.69 to 2.91	20	YES	
	3.0B	3.01 to 3.22	5	YES	75	70 to 79	2	YES	3.0B	3.01 to 3.22	20	—	3.0B	3.01 to 3.22	20	YES	
	3.3B	3.32 to 3.53	5	YES	82	77 to 87	2	YES	3.3B	3.32 to 3.53	20	—	3.3B	3.32 to 3.53	20	YES	
	3.6B	3.600 to 3.845	5	YES	91	85 to 96	1	YES	3.6B	3.600 to 3.845	20	—	3.6B	3.600 to 3.845	20	YES	
	3.9B	3.89 to 4.16	5	YES	100	94 to 106	1	YES	3.9B	3.89 to 4.16	20	—	3.9B	3.89 to 4.16	20	YES	
	4.3B	4.17 to 4.43	5	YES	110	104 to 116	1	YES	4.3B	4.17 to 4.43	20	—	4.3B	4.17 to 4.43	20	YES	
	4.7B	4.55 to 4.75	5	YES	120	114 to 126	1	YES	4.7B	4.55 to 4.80	20	—	4.7B	4.55 to 4.80	20	YES	
	5.1B	4.98 to 5.20	5	YES	130	122 to 138	1	YES	5.1B	4.94 to 5.20	20	—	5.1B	4.94 to 5.20	20	YES	
	5.6B	5.49 to 5.73	5	YES	150	140 to 160	1	YES	5.6B	5.45 to 5.73	20	—	5.6B	5.45 to 5.73	20	YES	
	6.2B	6.06 to 6.33	5	YES	—	—	—	—	6.2B	5.96 to 6.27	20	—	6.2B	5.96 to 6.27	20	YES	
	6.8B	6.65 to 6.93	5	YES	—	—	—	—	6.8B	6.49 to 6.83	20	—	6.8B	6.49 to 6.83	20	YES	
	7.5B	7.28 to 7.60	5	YES	—	—	—	—	7.5B	7.07 to 7.45	20	—	7.5B	7.07 to 7.45	20	YES	
	8.2B	8.02 to 8.36	5	YES	—	—	—	—	8.2B	7.78 to 8.19	20	—	8.2B	7.78 to 8.19	20	YES	
	9.1B	8.85 to 9.23	5	YES	—	—	—	—	9.1B	8.57 to 9.01	20	—	9.1B	8.57 to 9.01	20	YES	
	10B	9.77 to 10.21	5	YES	—	—	—	—	10B	9.41 to 9.90	20	—	10B	9.41 to 9.90	20	YES	
	11B	10.76 to 11.22	5	YES	—	—	—	—	11B	10.50 to 11.05	10	—	11B	10.50 to 11.05	10	YES	
	12B	11.74 to 12.24	5	YES	—	—	—	—	12B	11.44 to 12.03	10	—	12B	11.44 to 12.03	10	YES	
	13B	12.91 to 13.49	5	YES	—	—	—	—	13B	12.55 to 13.21	10	—	13B	12.55 to 13.21	10	YES	
	15B	14.34 to 14.98	5	YES	—	—	—	—	15B	13.89 to 14.62	10	—	15B	13.89 to 14.62	10	YES	
	16B	15.85 to 16.51	5	YES	—	—	—	—	16B	15.25 to 16.04	10	—	16B	15.25 to 16.04	10	YES	
	18B	17.56 to 18.35	5	YES	—	—	—	—	18B	16.82 to 17.70	10	—	18B	16.82 to 17.70	10	YES	
	20B	19.52 to 20.39	5	YES	—	—	—	—	20B	18.63 to 19.59	10	—	20B	18.63 to 19.59	10	YES	
	22B	21.54 to 22.47	5	YES	—	—	—	—	22B	20.64 to 21.71	5	—	22B	20.64 to 21.71	5	YES	
	24B	23.72 to 24.78	5	YES	—	—	—	—	24B	22.61 to 23.77	5	—	24B	22.61 to 23.77	5	YES	
	27B	26.19 to 27.53	5	YES	—	—	—	—	27B	24.97 to 26.26	5	—	27B	24.97 to 26.26	5	YES	
	30B	29.19 to 30.69	5	YES	—	—	—	—	30B	27.70 to 29.13	5	—	30B	27.70 to 29.13	5	YES	
	33B	32.15 to 33.79	5	YES	—	—	—	—	33B	30.32 to 31.88	5	—	33B	30.32 to 31.88	5	YES	
	36B	35.07 to 36.87	5	YES	—	—	—	—	36B	32.79 to 34.49	5	—	36B	32.79 to 34.49	5	YES	
	39B	38.02 to 39.98	2	YES	—	—	—	—	39B	35.36 to 37.19	5	—	39B	35.36 to 37.19	5	YES	
43	40.00 to 45.00	2	YES	—	—	—	—	—	—	—	—	—	—	—	—		
47	44.00 to 49.00	2	YES	—	—	—	—	—	—	—	—	—	—	—	—		

● **RASMID** : ROHM's proprietary new method that enables superior dimensional precision, making it possible to develop the ultra-compact products

Notes 1 : This table shows available voltages

Notes 2 : Package is JEDEC code. () : BOHM Packages

Zener Diodes

Example: **Y D Z V F H T R 5 . 1**

Part No. Grade Code Taping Code Zener Voltage

Zener Diodes 2																
Package	Surface Mount type															
																
Equivalent Circuit Diagram																
series Name	TDZV series				YDZV series				BZX84B series				BZX84C series			
Automotive Grade Code	—				FH				FH				FH			
Power(mW)	500				500				250				250			
Taping Code	TR				TR				T116				T116			
Electrical Characteristics (Ta=25°C)	V _Z (V)		I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)		I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)		I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)		I _Z (mA)	Automotive Grade AEC-Q101
Voltage	—	—	—	—	—	—	—	—	—	—	—	—	2V4L	2.20 to 2.60	5	YES
	—	—	—	—	—	—	—	—	—	—	—	—	2V7L	2.50 to 2.90	5	YES
	—	—	—	—	—	—	—	—	—	—	—	—	3V0L	2.80 to 3.20	5	YES
	—	—	—	—	—	—	—	—	—	—	—	—	3V3L	3.10 to 3.50	5	YES
	—	—	—	—	—	—	—	—	—	—	—	—	3V6L	3.40 to 3.80	5	YES
	—	—	—	—	—	—	—	—	—	—	—	—	3V9L	3.70 to 4.10	5	YES
	—	—	—	—	—	—	—	—	—	—	—	—	4V3L	4.00 to 4.60	5	YES
	—	—	—	—	—	—	—	—	—	—	—	—	4V7L	4.40 to 5.00	5	YES
	5.1	4.60 to 5.60	10	—	5.1	4.60 to 5.60	10	YES	5V1L	5.00 to 5.20	5	YES	5V1L	4.80 to 5.40	5	YES
	5.6	5.10 to 6.10	10	—	5.6	5.10 to 6.10	10	YES	5V6L	5.49 to 5.71	5	YES	5V6L	5.20 to 6.00	5	YES
	6.2	5.60 to 6.80	10	—	6.2	5.60 to 6.80	10	YES	6V2L	6.08 to 6.32	5	YES	6V2L	5.80 to 6.60	5	YES
	6.8	6.20 to 7.40	10	—	6.8	6.20 to 7.40	10	YES	6V8L	6.66 to 6.94	5	YES	6V8L	6.40 to 7.20	5	YES
	7.5	6.80 to 8.30	10	—	7.5	6.80 to 8.30	10	YES	7V5L	7.35 to 7.65	5	YES	7V5L	7.00 to 7.90	5	YES
	8.2	7.40 to 9.00	10	—	8.2	7.40 to 9.00	10	YES	8V2L	8.04 to 8.36	5	YES	8V2L	7.70 to 8.70	5	YES
	9.1	8.20 to 10.00	10	—	9.1	8.20 to 10.00	10	YES	9V1L	8.92 to 9.28	5	YES	9V1L	8.50 to 9.60	5	YES
	10	9.00 to 11.00	10	—	10	9.00 to 11.00	10	YES	10V1L	9.80 to 10.20	5	YES	10V1L	9.40 to 10.60	5	YES
	11	9.90 to 12.10	10	—	11	9.90 to 12.10	10	YES	11V1L	10.80 to 11.20	5	YES	11V1L	10.40 to 11.60	5	YES
	12	10.80 to 13.20	10	—	12	10.80 to 13.20	10	YES	12V1L	11.80 to 12.20	5	YES	12V1L	11.40 to 12.70	5	YES
	13	11.70 to 14.30	10	—	13	11.70 to 14.30	10	YES	13V1L	12.70 to 13.30	5	YES	13V1L	12.40 to 14.10	5	YES
	15	13.50 to 16.50	10	—	15	13.50 to 16.50	10	YES	15V1L	14.70 to 15.30	5	YES	15V1L	13.80 to 15.60	5	YES
	16	14.40 to 17.60	10	—	16	14.40 to 17.60	10	YES	16V1L	15.70 to 16.30	5	YES	16V1L	15.30 to 17.10	5	YES
	18	16.20 to 19.80	10	—	18	16.20 to 19.80	10	YES	18V1L	17.60 to 18.40	5	YES	18V1L	16.80 to 19.10	5	YES
	20	18.00 to 22.00	10	—	20	18.00 to 22.00	10	YES	20V1L	19.60 to 20.40	5	YES	20V1L	18.80 to 21.20	5	YES
	22	19.80 to 24.20	10	—	22	19.80 to 24.20	10	YES	22V1L	21.60 to 22.40	5	YES	22V1L	20.80 to 23.30	5	YES
	24	21.60 to 26.40	10	—	24	21.60 to 26.40	10	YES	24V1L	23.50 to 24.50	5	YES	24V1L	22.80 to 25.60	5	YES
	27	24.30 to 29.70	10	—	27	24.30 to 29.70	10	YES	27V1L	26.50 to 27.50	2	YES	27V1L	25.10 to 28.90	2	YES
	30	27.00 to 33.00	10	—	30	27.00 to 33.00	10	YES	30V1L	29.40 to 30.60	2	YES	30V1L	28.00 to 32.00	2	YES
	—	—	—	—	—	—	—	—	33V1L	32.30 to 33.70	2	YES	33V1L	31.00 to 35.00	2	YES
	—	—	—	—	—	—	—	—	36V1L	35.30 to 36.70	2	YES	36V1L	34.00 to 38.00	2	YES
Package	Surface Mount type															
																
Equivalent Circuit Diagram																
series Name	KDZV series				KDZLV series				PDZV series				PTZ series*			
Automotive Grade Code	TF				TF				TF				TF			
Power(mW)	1,000				1,000				1,000				1,000			
Taping Code	TR				TR				TR				TE25			
Electrical Characteristics (Ta=25°C)	V _Z (V)		I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)		I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)		I _Z (mA)	Automotive Grade AEC-Q101	V _Z (V)		I _Z (mA)	Automotive Grade AEC-Q101
Voltage	2.0B	2.00 to 2.24	40	YES	51	48 to 54	2	YES	2.0B	2.00 to 2.24	40	YES	2.0B	2.00 to 2.24	40	YES
	2.2B	2.20 to 2.45	40	YES	56	53 to 60	2	YES	2.2B	2.20 to 2.45	40	YES	2.2B	2.20 to 2.45	40	YES
	2.4B	2.40 to 2.70	40	YES	62	58 to 66	2	YES	2.4B	2.40 to 2.70	40	YES	2.4B	2.40 to 2.70	40	YES
	2.7B	2.70 to 3.10	40	YES	68	64 to 72	2	YES	2.7B	2.70 to 3.10	40	YES	2.7B	2.70 to 3.10	40	YES
	3.0B	3.00 to 3.40	40	YES	75	70 to 79	2	YES	3.0B	3.00 to 3.40	40	YES	3.0B	3.00 to 3.40	40	YES
	3.3B	3.30 to 3.70	40	YES	82	77 to 87	2	YES	3.3B	3.30 to 3.70	40	YES	3.3B	3.30 to 3.70	40	YES
	3.6B	3.60 to 4.00	40	YES	91	85 to 96	2	YES	3.6B	3.60 to 4.00	40	YES	3.6B	3.60 to 4.00	40	YES
	3.9B	3.90 to 4.40	40	YES	100	94 to 106	2	YES	3.9B	3.90 to 4.40	40	YES	3.9B	3.90 to 4.40	40	YES
	4.3B	4.30 to 4.80	40	YES	110	104 to 116	2	YES	4.3B	4.30 to 4.80	40	YES	4.3B	4.30 to 4.80	40	YES
	4.7B	4.70 to 5.20	40	YES	120	114 to 126	2	YES	4.7B	4.70 to 5.20	40	YES	4.7B	4.70 to 5.20	40	YES
	5.1B	5.10 to 5.70	40	YES	130	122 to 138	2	YES	5.1B	5.10 to 5.70	40	YES	5.1B	5.10 to 5.70	40	YES
	5.6B	5.60 to 6.30	40	YES	150	140 to 160	2	YES	5.6B	5.60 to 6.30	40	YES	5.6B	5.60 to 6.30	40	YES
	6.2B	6.20 to 7.00	40	YES	—	—	—	—	6.2B	6.20 to 7.00	40	YES	6.2B	6.20 to 7.00	40	YES
	6.8B	6.80 to 7.70	40	YES	—	—	—	—	6.8B	6.80 to 7.70	40	YES	6.8B	6.80 to 7.70	40	YES
	7.5B	7.50 to 8.40	40	YES	—	—	—	—	7.5B	7.50 to 8.40	40	YES	7.5B	7.50 to 8.40	40	YES
	8.2B	8.20 to 9.30	40	YES	—	—	—	—	8.2B	8.20 to 9.30	40	YES	8.2B	8.20 to 9.30	40	YES
	9.1B	9.10 to 10.20	40	YES	—	—	—	—	9.1B	9.10 to 10.20	40	YES	9.1B	9.10 to 10.20	40	YES
	10B	10.00 to 11.20	40	YES	—	—	—	—	10B	10.00 to 11.20	40	YES	10B	10.00 to 11.20	40	YES
	11B	11.00 to 12.30	20	YES	—	—	—	—	11B	11.00 to 12.30	20	YES	11B	11.00 to 12.30	20	YES
	12B	12.00 to 13.50	20	YES	—	—	—	—	12B	12.00 to 13.50	20	YES	12B	12.00 to 13.50	20	YES
	13B	13.30 to 15.00	20	YES	—	—	—	—	13B	13.30 to 15.00	20	YES	13B	13.30 to 15.00	20	YES
	15B	14.70 to 16.50	20	YES	—	—	—	—	15B	14.70 to 16.50	20	YES	15B	14.70 to 16.50	20	YES
	16B	16.20 to 18.30	20	YES	—	—	—	—	16B	16.20 to 18.30	20	YES	16B	16.20 to 18.30	20	YES
	18B	18.00 to 20.30	20	YES	—	—	—	—	18B	18.00 to 20.30	20	YES	18B	18.00 to 20.30	20	YES
	20B	20.00 to 22.40	20	YES	—	—	—	—	20B	20.00 to 22.40	20	YES	20B	20.00 to 22.40	20	YES
	22B	22.00 to 24.50	10	YES	—	—	—	—	22B	22.00 to 24.50	10	YES	22B	22.00 to 24.50	10	YES
	24B	24.00 to 27.60	10	YES	—	—	—	—	24B	24.00 to 27.60	10	YES	24B	24.00 to 27.60	10	YES
	27B	27.00 to 30.80	10	YES	—	—	—	—	27B	27.00 to 30.80	10	YES	27B	27.00 to 30.80	10	YES
	30B	30.00 to 34.00	10	YES	—	—	—	—	30B	30.00 to 34.00	10	YES	30B	30.00 to 34.00	10	YES
	33B	33.00 to 37.00	10	YES	—	—	—	—	33B	33.00 to 37.00	10	YES	33B	33.00 to 37.00	10	YES
	36B	36.00 to 40.00	10	YES	—	—	—	—	36B	36.00 to 40.00	10	YES	36B	36.00 to 40.00	10	YES

* : Only Automotive Grade

Notes 1 : This table shows available voltages.

Notes 2 : Package is JEDEC code. () : ROHM Packages

Zener Diodes as ESD Protection

●Quick Reference for Protection Devices [2 to 4 Elements]

V _Z (V)	Surface Mount type	
	2120 size	
		
	SOT-323FL (UMD3F)	
5.1	UMZ5.1NUM	
6.8	UMZ6.8NUM	
8.2	UMZ8.2NUM	
12	UMZ12NUM	
16	UMZ16NUM	
18	UMZ18NUM	
27	UMZ27NUM	
30	UMZ30NUM	
36	UMZ36NUM	

Note : Package is JEDEC code. () : ROHM Packages.

●Quick Reference for Low Capacitance Protection Devices

V _Z (V)	Surface Mount type	
	1006 size	1608 size
		
SOD-923 (VMN2M)		
5.1	CDZCV5.1B	
6.8	CDZCV6.8B RSAC6.8CM	EDZCV6.8B
16	RSAC16CM	

Note : Package is JEDEC code. () : ROHM Packages.

●Quick Reference for ESD Protection Devices

V _Z (V)	Surface Mount type	
	3516 size	5026 size
		
SOD-123FL (PMDU)		
6.7	☆RSA5MM	RSA5L
14	☆RSA12MM	RSA12L
30		RSA30L

Note : Package is JEDEC code. () : ROHM Packages. [] : GENERAL code. ☆ : Under Development

●Quick Reference for Bi-Directional Zener Diode

V _Z (V)	Surface Mount type	
	1616 size	
		
	SOT-416FL (EMD3F)	
12	RSB12WM	

Note : Package is JEDEC code. () : ROHM Packages.

●Quick Reference for Ultra Low Capacitance Bi-Directional Zener Diode

V _Z (V)	Surface Mount type		
	1006 size		
			
	SOD-923 (VMN2M)		
6.8	RSBC6.8CM		

Note : Package is JEDEC code. () : ROHM Packages.

Zener Diodes as ESD Protection

Zener Diodes as ESD Protection

Example: **UMZ5.1NUM** **FH** **TL**

Part No. Grade Code Taping Code

Quick Reference for Protection Devices [2 to 4 Elements]

Product No.				Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)		Remarks	Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code	P _D (mW)	V _Z (V)	I _Z (mA)				
	General	Automotive								
UMZ5.1NUM	*	FH	TL	200	4.84 to 5.37	5	IEC61000-4-2 150pF, 330Ω , Contact 8kV, Air 15kV	SOT-323FL (UMD3F)		YES
UMZ6.8NUM		FH	TL	200	6.47 to 7.14	5				YES
UMZ8.2NUM		FH	TL	200	7.76 to 8.64	5				YES
UMZ12NUM		FH	TL	200	11.00 to 13.00	5				YES
UMZ16NUM		FH	TL	200	15.85 to 16.51	5				YES
UMZ18NUM		FH	TL	200	17.56 to 18.53	5				YES
UMZ27NUM		FH	TL	200	26.19 to 27.35	5				YES
UMZ30NUM		FH	TL	200	29.19 to 30.69	5				YES
UMZ36NUM		FH	TL	200	35.07 to 36.87	5				YES

*: General Part No. have no grade code.

Note: Package is JEDEC code. (): ROHM Packages

Low Capacitance Protection Devices

Product No.				Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)					Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code	P _D (mW)	V _Z (V)	I _Z (mA)	Ct(pF) (Typ.)	f (MHz)	V _R (V)			
	General	Automotive										
CDZCV5.1B	*	—	T2R	100	4.98 to 5.20	5	5.5	1	0	SOD-923 (VMN2M)		—
CDZCV6.8B		—	T2R	100	6.65 to 6.93	5	3	1	0	SOD-523 (EMD2)		—
EDZCV6.8B		FH	T2R	150	6.65 to 6.93	5	3	1	0			YES
RSAC6.8CM		—	T2R	100	6.70 to 7.33	5	0.3	1	0	SOD-923 (VMN2M)		—
RSAC16CM		—	T2R	100	16.49 to 17.51	5	0.3	1	0			—

*: General Part No. have no grade code.

Note: Package is JEDEC code. (): ROHM Packages

ESD Protection Devices

Product No.				Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)		Peak Pulse Power (W) (tp=10×1,000μs)	Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code	P _D (mW)	V _Z (V)	I _Z (mA)				
	General	Automotive								
☆RSA5MM	*	TF	TR	1,000	6.4 to 7.0	10	200	SOD-123FL (PMDU)		YES
☆RSA12MM		TF	TR	1,000	13.3 to 14.7	1	200			YES
RSA5L	—	TF	TE25	1,000	6.45 to 7.14	10	600	DO-214AC (PMD5) [SMA]		YES
RSA12L		TF	TE25	1,000	13.3 to 14.7	1	600			YES
RSA30L		TF	TE25	1,000	28.5 to 31.5	1	600			YES

*: General Part No. have no grade code.

Note: Package is JEDEC code. (): ROHM Packages. [] : GENERAL code

☆: Under Development

Bi-Directional Zener Diode

Product No.				Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)		Peak Pulse Power (W) (tp=10×1,000µs)	Ct(pF) (Typ.)			Remarks	Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code	Pd(mW)	Vz(V)	Iz(mA)		f (MHz)	VR (V)					
	General	Automotive												
RSB12WM	*	FH	TL	150	9.6 to 14.4	5	—	1	1	0	IEC61000-4-2, 150pF, 330Ω Contact 8kV, Air 15kV	SOT-416FL (EMD3F)		YES

*: General Part No. have no grade code.

*1: (3)pin must be open when using.

Note: Package is JEDEC code. (): ROHM Packages

Ultra Low Capacitance Bi-Directional Zener Diode

Product No.				Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)		Ct(pF) (Typ.)			Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code	P _D (mW)	V _Z (V)	I _Z (mA)		f (MHz)	V _R (V)			
	General	Automotive										
RSBC6.8CM	*	—	T2N	100	6.62 to 7.24	5	1	1	0	SOD-923 (VMN2M)		—

*: General Part No. have no grade code.

Note: Package is JEDEC code. (): ROHM Packages

TVS

●Quick Reference TVS(ESD Protection Devices)

V _{RWM} (V)	Surface Mount type		
	2924 size 	3516 size 	4725 size 
	SOT-23 (SSD3)	SOD-123FL (PMDU)	SOD-128 (PMDTM)
3.0	MMBZ5V6AL MMBZ6V2AL		
4.5	MMBZ6V8AL		
5.0		SMF5V0	VS5V0UA1LAM
6.0	MMBZ9V1AL	SMF6V0	VS6V0UA1LAM
6.5	MMBZ10VAL	SMF6V5	
7.0		SMF7V0	VS7V0UA1LAM
7.5		SMF7V5	
8.0		SMF8V0	VS8V0UA1LAM
8.5	MMBZ12VAL		
9.0		SMF9V0	VS9V0UA1LAM
10.0		SMF10V	VS10VUA1LAM
11.0		SMF11V	VS11VUA1LAM
12.0	MMBZ15VAL	SMF12V	VS12VUA1LAM
13.0	MMBZ16VAL	SMF13V	VS13VUA1LAM
14.0		SMF14V	VS14VUA1LAM
14.5	MMBZ18VAL		
15.0		SMF15V	VS15VUA1LAM
16.0		SMF16V	VS16VUA1LAM
17.0	MMBZ20VAL	SMF17V	VS17VUA1LAM
18.0		SMF18V	VS18VUA1LAM
20.0	MMBZ24VAL	SMF20V	VS20VUA1LAM
22.0	MMBZ27VAL MMBZ27VCL	SMF22V	VS22VUA1LAM
24.0	RES1CAN MMBZ30VAL	SMF24V	VS24VUA1LAM
26.0	MMBZ33VAL	SMF26V	VS26VUA1LAM
28.0		SMF28V	VS28VUA1LAM
30.0		SMF30V	VS30VUA1LAM
33.0		SMF33V	

Note : Package is JEDEC code. () : ROHM Packages.

●Quick Reference Bi-Directional TVS

V _Z (V)	Surface Mount type		
	0603 size 		2012 size 
	DSN0603-2 (SMD0603)	DSN0603-2 (SMD0603B)	DSN2012-2 (SMD2012)
3.3	RASMD VS3V3BA1ES RASMD VS3V3BB1ES	RASMD VS3V3BC1HS	
4.8			RASMD New VS4V8BU1AR
5.0	RASMD VS5V0BA1ES RASMD VS5V0BB1ES RASMD VS5V0BC1ES	RASMD VS5V0BL1HS RASMD VS5V0BN1HS	
12.0		RASMD New VS12VBA1HS	

©RASMD : ROHM's proprietary New method that enables superior dimensional precision, making it possible to develop the ultra-compact products.

Note : Package is JEDEC code. () : ROHM Packages.

TVS

Example: **R** **E** **S** **D** **1** **C** **A** **N** **F** **H** **T** **1** **1** **6**

Part No. Grade Code Taping Code

TVS											
Product No.				V _{RWM} (V)	Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)		Peak Pulse Power (W) (tp=10×1,000μs)	Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code		P _D (mW)	V _Z (V) or V _{BR} (V)	I _Z (mA)				
	General	Automotive									
RESD1CAN	*	FH	T116	24	225	26.20 to 32.00	1	350(8/20μs)	SOT-23 (SSD3)		YES
MMBZ27VCL		FH	T116	22	225	25.65 to 28.35	1	40	SOT-23 (SSD3)		YES
MMBZ5V6AL		FH	T116	3	225	5.32 to 5.88	20	24	SOT-23 (SSD3)		YES
MMBZ6V2AL		FH	T116	3	225	5.89 to 6.51	1	24			YES
MMBZ6V8AL		FH	T116	4.5	225	6.46 to 7.14	1	24			YES
MMBZ9V1AL		FH	T116	6	225	8.65 to 9.56	1	24			YES
MMBZ10VAL		FH	T116	6.5	225	9.50 to 10.50	1	24			YES
MMBZ12VAL		FH	T116	8.5	225	11.40 to 12.60	1	40			YES
MMBZ15VAL		FH	T116	12	225	14.25 to 15.75	1	40			YES
MMBZ16VAL		FH	T116	13	225	15.20 to 16.80	1	40			YES
MMBZ18VAL		FH	T116	14.5	225	17.10 to 18.90	1	40			YES
MMBZ20VAL		FH	T116	17	225	19.00 to 21.00	1	40			YES
MMBZ24VAL		FH	T116	20	225	22.80 to 25.20	1	40			YES
MMBZ27VAL		FH	T116	22	225	25.65 to 28.35	1	40			YES
MMBZ30VAL		FH	T116	24	225	28.50 to 31.50	1	40			YES
MMBZ33VAL		FH	T116	26	225	31.35 to 34.65	1	40			YES
SMF5V0		TF	TR	5	1,000	6.40 or more	40	200	SOD-123FL (PMDU)		YES
SMF6V0		TF	TR	6	1,000	6.67 or more	40	200			YES
SMF6V5		TF	TR	6.5	1,000	7.22 or more	40	200			YES
SMF7V0		TF	TR	7	1,000	7.78 or more	40	200			YES
SMF7V5		TF	TR	7.5	1,000	8.33 or more	40	200			YES
SMF8V0		TF	TR	8	1,000	8.89 or more	40	200			YES
SMF9V0		TF	TR	9	1,000	10.0 or more	40	200			YES
SMF10V		TF	TR	10	1,000	11.1 or more	20	200			YES
SMF11V		TF	TR	11	1,000	12.2 or more	20	200			YES
SMF12V		TF	TR	12	1,000	13.3 or more	20	200			YES
SMF13V		TF	TR	13	1,000	14.4 or more	20	200			YES
SMF14V		TF	TR	14	1,000	15.6 or more	20	200			YES
SMF15V		TF	TR	15	1,000	16.7 or more	20	200			YES
SMF16V		TF	TR	16	1,000	17.2 or more	20	200			YES
SMF17V		TF	TR	17	1,000	18.9 or more	20	200			YES
SMF18V		TF	TR	18	1,000	20.0 or more	20	200			YES
SMF20V		TF	TR	20	1,000	22.2 or more	10	200			YES
SMF22V		TF	TR	22	1,000	24.4 or more	10	200			YES
SMF24V		TF	TR	24	1,000	26.7 or more	10	200			YES
SMF26V		TF	TR	26	1,000	28.9 or more	10	200			YES
SMF28V		TF	TR	28	1,000	31.1 or more	10	200	YES		
SMF30V		TF	TR	30	1,000	33.3 or more	10	200	YES		
SMF33V		TF	TR	33	1,000	36.7 or more	10	200	YES		
VS5V0UA1LAM		TF	TR	5	—	6.45 to 7.14	10	600	SOD-128 (PMDTM)		YES
VS6V0UA1LAM		TF	TR	6	—	6.67 to 7.37	10	600			YES
VS7V0UA1LAM		TF	TR	7	—	7.78 to 8.60	10	600			YES
VS8V0UA1LAM		TF	TR	8	—	8.89 to 9.83	1	600			YES
VS9V0UA1LAM		TF	TR	9	—	10.0 to 11.1	1	600			YES
VS10VUA1LAM		TF	TR	10	—	11.1 to 12.3	1	600			YES
VS11VUA1LAM	TF	TR	11	—	12.2 to 13.5	1	600	YES			
VS12VUA1LAM	TF	TR	12	—	13.3 to 14.7	1	600	YES			
VS13VUA1LAM	TF	TR	13	—	14.4 to 15.9	1	600	YES			
VS14VUA1LAM	TF	TR	14	—	15.6 to 17.2	1	600	YES			
VS15VUA1LAM	TF	TR	15	—	16.7 to 18.5	1	600	YES			
VS16VUA1LAM	TF	TR	16	—	17.8 to 19.7	1	600	YES			
VS17VUA1LAM	TF	TR	17	—	18.9 to 20.9	1	600	YES			
VS18VUA1LAM	TF	TR	18	—	20.0 to 22.1	1	600	YES			
VS20VUA1LAM	TF	TR	20	—	22.2 to 24.5	1	600	YES			
VS22VUA1LAM	TF	TR	22	—	24.4 to 26.9	1	600	YES			
VS24VUA1LAM	TF	TR	24	—	26.7 to 29.5	1	600	YES			
VS26VUA1LAM	TF	TR	26	—	28.9 to 31.9	1	600	YES			
VS28VUA1LAM	TF	TR	28	—	31.1 to 34.4	1	600	YES			
VS30VUA1LAM	TF	TR	30	—	33.3 to 36.8	1	600	YES			

*: General Part No. have no grade code.

Note : Package is JEDEC code. () : ROHM Packages

TVS

TVS

Example:

V	S	3	V	3	B	C	1	H	S	T	1	5	R
Part No.										Taping Code			

Bi-Directional TVS													
Product No.				Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)		Peak Pulse Power (W) (tp=8/20μs)	Ct (pF)			Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code		P _D (mW)	V _{BR} (V)		I _Z (mA)	f (MHz)	V _R (V)			
	General	Automotive											
RASMD VS3V3BC1HS	*	—	T15R	100	4.0 or more	1	70	18	1	0	DSN0603-2 (SMD0603B)		—
RASMD VS3V3BA1ES		—	T15R	100	4.0 or more	1	28	6	1	0	DSN0603-2 (SMD0603B)		—
RASMD VS3V3BB1ES		—	T15R	100	4.0 or more	1	45	10	1	0			—
RASMD VS5V0BA1ES		—	T15R	100	6.0 to 8.0	1	10	5	1	0			—
RASMD VS5V0BB1ES		—	T15R	100	6.0 to 9.0	1	25	7	1	0			—
RASMD VS5V0BC1ES		—	T15R	100	6.0 to 9.0	1	60	15	1	0			—
New RASMD VS12VBA1HS		—	T15R	100	12.5 to 15.0	1	70	7	1	0	DSN0603-2 (SMD0603B)		—
New RASMD VS4V8BU1AR		—	T7R	—	—	4.85 to 6.00	1	1,100	480	1	0		DSN2012-2 (SMD2012)
Low Capacitance Bi-Directional TVS													
Product No.				Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)		Remarks	Ct (pF)			Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code		P _D (mW)	V _{BR} (V)		I _Z (mA)	f (MHz)	V _R (V)			
	General	Automotive											
RASMD VS5V0BL1HS	*	—	T15R	100	6.00 to 10.00	1	IEC61000-4-2, 150pF, 330Ω, Contact 11kV, Air 15kV	0.25	1	0	DSN0603-2 (SMD0603B)		—
RASMD VS5V0BN1HS		—	T15R	100	6.00 to 10.00	1		0.5	1	0			—

ⒸRASMD : ROHM's proprietary new method that enables superior dimensional precision, making it possible to develop the ultra-compact products.

* : General Part No. have no grade code.

Note : Package is JEDEC code. () : ROHM Packages

Switching Diodes

● Quick Reference for Switching Diodes

V _R (V)	Surface Mount type					
	1006 size	1608 size	1616 size	2120 size	2512 size	2924 size
						
	SOD-923 (VMN2M)	SOD-523 (EMD2)	SOT-416FL (EMD3F)	SOT-323FL (UMD3F)	SOD-323FL (UMD2)	SOT-23 (SSD3)
80	1SS400CM	1SS400SM	DAN222WM DAP222WM DAN217WM DA228WM	DAN202UM DAP202UM DAN217UM DA228UM BAW156UM BAV199UM	1SS355VM 1SS380VM	BAS16HM BAV70HM BAW56HM BAV99HM BAW156HM BAV199HM BAS116HM BAV170HM
200					BAS21VM	BAS21HM

Note : Package is JEDEC code. () : ROHM Packages.

Switching Diodes

Switching Diodes

Example:

1	S	S	3	5	5	V	M	F	H	T	E	-	1	7
Part No.							Grade Code			Taping Code				

High-speed type																		
Product No.				Absolute Maximum Ratings(Ta=25°C)*1					Electrical Characteristics(Ta=25°C)*1						Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101	
Part No.	Grade Code		Taping Code	V _{RM} (V)	V _R (V)	I _{FM} (mA)	I _O (mA)	I _{surge} (mA)	V _F (V) Max.	I _F (mA)	I _R (μ A) Max.	V _R (V)	trr(ns) Max.	V _R (V)				I _F (mA)
	General	Automotive																
1SS400CM	*	—	T2R	90	80	225	100	500(1s)	1.2	100	0.1	80	4	6	10	SOD-923 (VMN2M)		—
1SS355VM		FH	TE-17	90	80	225	100	500(1s)	1.2	100	0.1	80	4	6	10	SOD-323FL (UMD2)		YES
1SS400SM		FH	T2R	90	80	225	100	500(1s)	1.2	100	0.1	80	4	6	10	SOD-523 (EMD2)		YES
BAS16HM		FH	T116	100	80	500	215*3	4,000(1μs)	1.25	150	0.1	80	4	10*2	10	SOT-23 (SSD3)		YES
DAN222WM		FH	TL	80	80	300	100	4,000(1μs)	1.2	100	0.1	70	4	6	5	SOT-416FL (EMD3F)		YES
DAN202UM		FH	TL	80	80	300	100	4,000(1μs)	1.2	100	0.1	70	4	6	5	SOT-323FL (UMD3F)		YES
BAV70HM		FH	T116	90	80	450	215*3	4,000(1μs)	1.25	150	0.5	80	4	10*2	10	SOT-23 (SSD3)		YES
DAP222WM		FH	TL	80	80	300	100	4,000(1μs)	1.2	100	0.1	70	4	6	5	SOT-416FL (EMD3F)		YES
DAP202UM		FH	TL	80	80	300	100	4,000(1μs)	1.2	100	0.1	70	4	6	5	SOT-323FL (UMD3F)		YES
BAW56HM		FH	T116	100	80	500	215*3	4,000(1μs)	1.25	150	0.1	80	4	10*2	10	SOT-23 (SSD3)		YES
DAN217WM		FH	TL	80	80	300	100	4,000(1μs)	1.2	100	0.1	70	4	6	5	SOT-416FL (EMD3F)		YES
DAN217UM		FH	TL	80	80	300	100	4,000(1μs)	1.2	100	0.2	70	4	6	5	SOT-323FL (UMD3F)		YES
BAV99HM		FH	T116	100	80	500	215*3	4,000(1μs)	1.25	150	0.1	80	4	10*2	10	SOT-23 (SSD3)		YES
BAS21HM		FH	T116	250	200	—	200*3	10,000(1μs)	1	100	0.1	200	50	30*2	30	SOT-23 (SSD3)		YES
BAS21VM		FH	TE-17	250	200	—	200*3	10,000(1μs)	1	100	0.1	200	50	30*2	30	SOD-323FL (UMD2)		YES
Low Leak type																		
1SS380VM	*	FH	TE-17	80	80	225	100	400(1s)	1.2	100	0.01	80	—	—	—	SOD-323FL (UMD2)		YES
BAW156HM		FH	T116	100	80	500	215*3	4,000(1μs)	1.25	150	0.005	75	3,000	10*2	10	SOT-23 (SSD3)		YES
BAW156UM		FH	TL	100	80	500	215*3	4,000(1μs)	1.25	150	0.005	75	3,000	10*2	10	SOT-323FL (UMD3F)		YES
BAV199HM		FH	T116	100	80	500	215*3	4,000(1μs)	1.25	150	0.005	75	3,000	10*2	10	SOT-23 (SSD3)		YES
BAV199UM		FH	TL	100	80	500	215*3	4,000(1μs)	1.25	150	0.005	75	3,000	10*2	10	SOT-323FL (UMD3F)		YES
DA228UM		FH	TL	80	80	200	100	300(1μs)	1.2	100	0.01	80	—	—	—	SOT-416FL (EMD3F)		YES
DA228WM		FH	TL	80	80	200	100	4,000(1μs)	1.2	100	0.1	80	—	—	—	SOT-416FL (EMD3F)		YES
BAV170HM		FH	T116	90	80	500	215*3	4,000(1μs)	1.25	150	0.005	75	3,000	10*2	10	SOT-23 (SSD3)		YES
BAS116HM		FH	T116	100	80	500	215*3	4,000(1μs)	1.25	150	0.005	75	3000	10*2	—			YES

*: General Part No. have no grade code.

*1 : Value/Chip *2 : Not V_R(V) but I_R(mA) Value *3 : I_R Value

Note : Package is JEDEC code. () : ROHM Packages

High Frequency Diodes

High Frequency Diodes

Example:

1	S	S	3	9	0	S	M	F	H	T	2	R
Part No.							Grade Code		Taping Code			

Quick Reference for High Frequency Diodes

	V_R (V)	Surface Mount type	
		1006 size	1608 size
			
		SOD-923 (VMN2M)	SOD-523 (EMD2)
Band Switching Diode	35		1SS390SM
PIN Diodes	50	RN141CM	
	60		RN142SM
Detection Schottky Diode	5	RB886CM	

Note : Package is JEDEC code. () : ROHM Packages.

Band Switching Diode

Product No.				Absolute Maximum Ratings(Ta=25°C)			Electrical Characteristics(Ta=25°C)						Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code	V _R (V)	T _j (°C)	Tstg (°C)	Ct(pF) Max.	V _R (V)	f (MHz)	rF(Ω) Max.	I _F (mA)	f (MHz)			
	General	Automotive													
1SS390SM	*	FH	T2R	35	150	−55 to +150	1.2	6	1	0.9	2	100	SOD-523 (EMD2)		YES

PIN Diodes

Product No.			Absolute Maximum Ratings(Ta=25°C)					Electrical Characteristics(Ta=25°C)					Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101	
Part No.	Grade Code		Taping Code	V _R (V)	I _F (mA)	T _J (°C)	T _{stg} (°C)	Ct(pF) Max.	V _R (V)	f (MHz)	rF(Ω) Max.	I _F (mA)				f (MHz)
	General	Automotive														
RN142SM	*	—	T2R	60	100	150	—55 to +150	0.45	1	1	3	3	100	SOD-523 (EMD2)		—
RN141CM		—	T2R	50	100	150	—55 to +150	0.8	1	1	2	3	100	SOD-923 (VMN2M)		—

Detection Schottky Diode

Product No.				Absolute Maximum Ratings(Ta=25°C)				Electrical Characteristics(Ta=25°C)					Package	Equivalent Circuit Diagram	Automotive Grade AEC-Q101
Part No.	Grade Code		Taping Code	V _R (V)	I _F (mA)	T _j (°C)	Tstg (°C)	V _F (V) Max.	C _t (pF) Max.	V _R (V)	f (MHz)				
	General	Automotive													
RB886CM	*	—	T2R	5	10	125	−40 to +125	0.35	1	0.80	1	1	SOD-923 (VMN2M)		—

* : General Part No. have no grade code.

Note : Package is JEDEC code. () : ROHM Packages.

Packages

■ Dimensions (Unit : mm)

Surface Mount Type

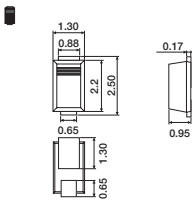
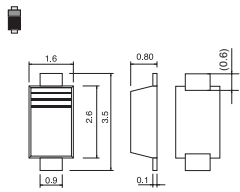
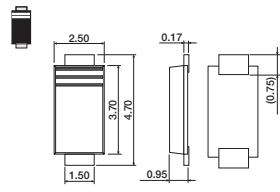
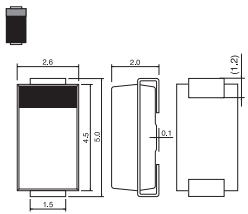
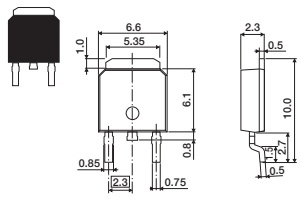
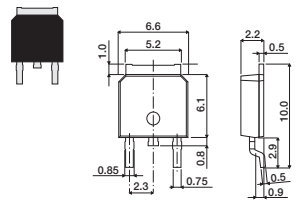
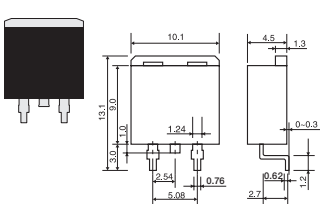
DSN0603-2(SMD0603) (SMD0603B)	DSN1006-2(SMD1006)	DSN2012-2(SMD2012)	SOD-923(VMN2M)
SOD-523(EMD2) [SC-79]	SOT-416FL(EMD3F) [SC-89]	SOD-323FL(UMD2) [SC-90A]	SOT-323FL(UMD3F) [SC-85]
SOT-23(SSD3)	SOD-323HE(TUMD2M) [SC-108B]	SOD-323HE(TUMD2SM)	

Note : Package is JEDEC code. () : ROHM Packages, [] : JEITA Code

Power Packages

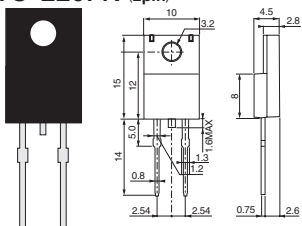
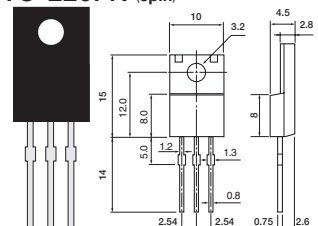
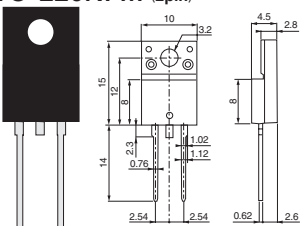
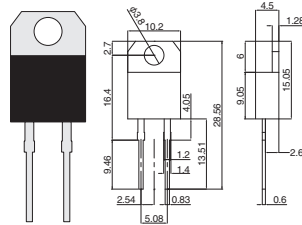
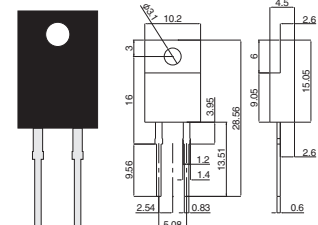
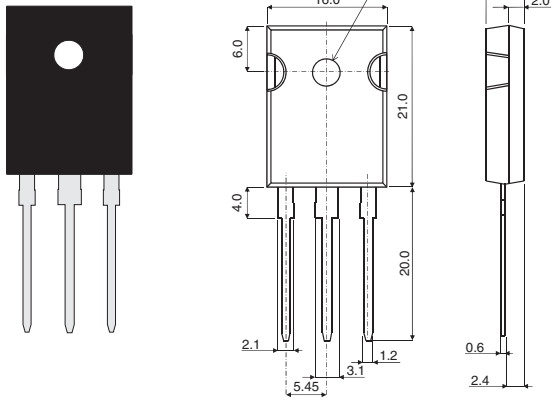
●Dimensions (Unit : mm)

Surface Mount type

(PMDE) 	SOD-123FL(PMDU) [SC-109B] 	SOD-128(PMDTM) 	DO-214AC(PMDS) (SMA) 
TO-252GE (DPAK)  Each lead has same dimensions	TO-252 (DPAK)  Each lead has same dimensions	TO-263S [SC-83] (D2PAK)  Each lead has same dimensions	

Note : Package is JEDEC code. () : ROHM Packages. [] : JEITA Code. [] : GENERAL code

Through Hole type

TO-220FN (2pin)  Each lead has same dimensions	TO-220FN (3pin)  Each lead has same dimensions	TO-220NFM (2pin)  Each lead has same dimensions
TO-220AC  Each lead has same dimensions	TO-220ACFP  Each lead has same dimensions	
TO-247  Each lead has same dimensions		

Note : Package is JEDEC code.

Product No. Explanation

- When ordering, specify the part number.
- Check each code against the tables shown below.
- Fill in from the left, leaving any extra boxes empty on the right.

• Schottky Barrier Diodes

Example:

R	B	7	5	1	S	M	-	4	0	F	H	T	2	R

Part No. Grade Code Taping Code

• Fast Recovery Diodes

Example:

R	F	0	1	V	M	2	S	F	H	T	E	-	1	7

Part No. Grade Code Taping Code

• Rectifier Diodes

Example:

R	R	1	V	W	M	4	S	T	F	T	R

Part No. Grade Code Taping Code

• Zener Diodes

Example:

E	D	Z	V	F	H	T	2	R	2	.	0	B

Part No. Grade Code Taping Code Zener voltage Sub division

• Zener Diodes as ESD Protection

Example:

U	M	Z	5	.	1	N	U	M	F	H	T	L

Part No. Grade Code Taping Code

• TVS

Example:

R	E	S	D	1	C	A	N	F	H	T	1	1	6

Part No. Grade Code Taping Code

• Switching Diodes

Example:

1	S	S	3	5	5	V	M	F	H	T	E	-	1	7

Part No. Grade Code Taping Code

• High Frequency Diodes

Example:

1	S	S	3	9	0	S	M	F	H	T	2	R

Part No. Grade Code Taping Code

• Packaging type

	Package	Code	ROHM Package	JEITA Package	Size	Height	Package Style	Direction	Basic ordering unit(pcs)
Surface Mount type	DSN0603-2	T15R	SMD0603	—	0603	0.28	Embossed tape	Cathode on sprocket hole side	15,000
	DSN1006-2	T18R	SMD1006	—	1006	0.22	Embossed tape	Cathode on sprocket hole side	18,000
	DSN2012-2	T7R	SMD2012	—	2012	0.3	Embossed tape	Cathode on sprocket hole side	7,000
	SOD-923	T2R	VMN2M	—	1006	0.37	Embossed tape	Cathode on sprocket hole side	8,000
	SOD-523	T2R	EMD2	SC-79	1608	0.6	Embossed tape	Cathode on sprocket hole side	8,000
		T2N					Embossed tape	Non-direction	8,000
	SOT-416FL	TL	EMD3F	SC-89	1616	0.7	Embossed tape	One terminal on sprocket hole side	3,000
	SOD-323FL	TE-17	UMD2	SC-90A	25125	0.7	Embossed tape	Cathode on sprocket hole side	3,000
	SOT-323FL	TL	UMD3F	SC-85	2120	0.9	Embossed tape	One terminal on sprocket hole side	3,000
	SOT-23	T116	SSD3	—	2429	0.95	Embossed tape	One terminal on sprocket hole side	3,000
	SOD-323HE	TR	TUMD2M	[SC-108B]	2514	0.6	Embossed tape	Cathode on sprocket hole side	3,000
		TR	TUMD2SM	—	2514	0.6	Embossed tape	Cathode on sprocket hole side	3,000
	[PMDE]	TR	PMDE	—	2513	0.95	Embossed tape	Cathode on sprocket hole side	3,000
	SOD-123FL	TR	PMDU	SC-109B	3516	0.8	Embossed tape	Cathode on sprocket hole side	3,000
	SOD-128	TR	PMDTM	—	4725	0.95	Embossed tape	Cathode on sprocket hole side	3,000
	DO-214AC [SMA]	TE25	PMDS	—	5026	2	Embossed tape	Cathode on sprocket hole side	1,500
Through Hole type	TO-252GE [DPAK]	TL	—	[SC-63]	9866	2.3	Embossed tape	Fin on sprocket hole side	2,500
	TO-252 [DPAK]	TL	—	[SC-63]	10066	2.2	Embossed tape	Fin on sprocket hole side	2,500
	TO-263S [D2PAK]	TL	LPDS	SC-83	131101	4.5	Embossed tape	Fin on sprocket hole side	1,000
	TO-220FN	C9	—	—	29×10	4.5	Stick	box	1,000
	TO-220NFM	C9	—	—	29×10	4.5	Stick	box	1,000
	TO-220AC	C9	—	—	28.56×10.2	4.5	Stick	box	1,000
	TO-220ACFP	C9	—	—	28.56×10.2	4.5	Stick	box	1,000
	TO-247	C11	—	—	41.13×15.9	5.03	Stick	box	450

Note : Package is JEDEC code. [] : GENERAL code. [] : Correspond of JEITA Packages



Passive Devices

Resistors

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ISO 9001-/IATF 16949-approved



Quick Reference of Resistance Range

Low Ohmic Resistor Lineup

Part No./mm[inch]/Page

PSR GMR PML PMR Metal Strip UCR LHR LTR MCR Thick Film

Power Rating (W)	Resistance(Ω)	0.1m	1m	10m	100m	1	10
5	0.1m	PSR500/15×7.75[5931]/P.D17	2m	5m	☆GMR320/7142[2817]/P.D18	100m	
4	0.2m	PSR400/10×5.2[3921]/P.D17	3m				
3	0.3m	PSR100/6432[2512]/P.D17	3m	5m	GMR100/6432[2512]/P.D18	220m	
2	0.5m		2.2m	PML100/3264[1225]/P.D16			
				5m	☆GMR50/5025[2010]/P.D18	200m	
			1m	PMR100/6432[2512]/P.D15	10m	100m	LTR100/3264[1225]/P.D14 910m
1.25	0.5m		2.2m	PML50/2550[1020]/P.D16			
					10m	LTR50/2550[1020]/P.D14	910m
1					33m	LHR18/1632[0612]/P.D14	1
		PMR25/3225[1210]/P.D15	1m	PMR50/5025[2010]/P.D15	10m		
			1m	5m		47m	MCR100/6432[2512]/P.D12 9.1
			1m	PMR18/3216[1206]/P.D15	10m	10m	LTR18/1632[0612]/P.D14 1
0.66		PML10/1220[0508]/P.D16	1m	2.5m			
					11m	39m	UCR18/3216[1206]/P.D13
0.5					47m		MCR50/5025[2010]/P.D12 9.1
					47m		MCR25/3225[1210]/P.D12 9.1
			2m	PMR10/2012[0805]/P.D15	10m	11m	UCR18/3216[1206]/P.D13 100m
1/3					47m		LTR10/1220[0508]/P.D14 9.1
					11m		UCR10/2012[0805]/P.D13 100m
0.25					47m		MCR18/3216[1206]/P.D12 9.1
					47m		MCR10/2012[0805]/P.D12 9.1
0.2				PMR03/1608[0603]/P.D15	10m	20m	UCR03/1608[0603]/P.D13 200m
				PMR01/1005[0402]/P.D15	10m		UCR03/1608[0603]/P.D13 220m 910m
0.125					68m		UCR01/1005[0402]/P.D13 910m
0.1						100m	UCR006/0603[0201]/P.D13 910m
1/16							MCR03/1608[0603]/P.D12 1 9.1
0.05							MCR01/1005[0402]/P.D12 1 9.1
							MCR006/0603[0201]/P.D12 1 9.1

☆: Under Development

1 Ω or more Resistor Lineup

Part No./mm[inch]/Page

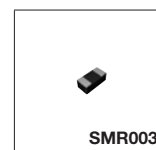
ESR SDR KTR LTR MCR SFR SMR Thick Film

Power Rating (W)	Resistance(Ω)	1	10	100	1k	10k	100k	1M	10M	30M
2								1M		
1								1M		
								100k		
0.75								1M		
3/2									10M	
0.5								560k		
									15M	
								1M		
0.4										30M
1/3									10M	
0.3									10M	
0.25								3.3M		
									10M	
									15M	
								1M		
0.2									10M	
									10M	
									10M	
0.125									30M	
									10M	
0.1									10M	
									10M	
									10M	
1/16									10M	
0.05									10M	
1/32									3M	
0.02									1M	

Class-leading Compact Size Chip Resistors (RASMID series)

Ultra-Compact Chip Resistors (SMR003 <009005>)

- Original process technology ensures greater accuracy
- Chip dimensional precision improved from $\pm 20\mu\text{m}$ to $\pm 10\mu\text{m}$
- Gold electrodes utilized for superior solderability and reliability



SMR003 <009005>								
Part No.	Size Code mm(inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
SMR003	03015 (009005)	0.02W	10	J($\pm 5\%$)	± 200	10 to 1M Ω (E24 series)	-55 to +125	—
				F($\pm 1\%$)		10 to 1M Ω (E24, E96 series)		

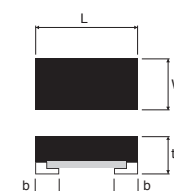
*E24 : Standard products E96 : Custom products

Jumper type					
Part No.	Size Code mm(inch)	Rated Current (A)	Resistance	Operating Temperature(°C)	Automotive Grade AEC-Q200
SMR003	03015(009005)	0.5	50m Ω Max.	-55 to +125	—

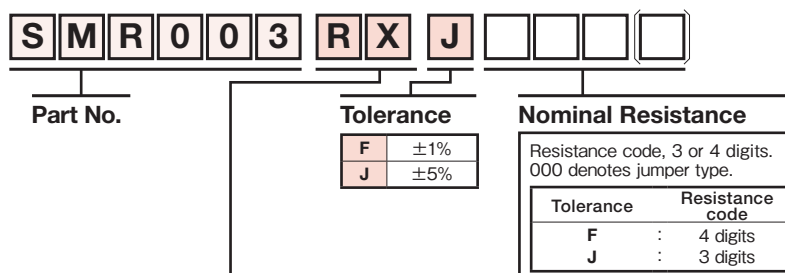
Dimensions(Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	a	b
SMR003	03015 (009005)	0.30 ± 0.01	0.15 ± 0.01	0.11 ± 0.01	—	0.07 ± 0.01

● SMR003



Part No. Explanation



Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J($\pm 5\%$)	F($\pm 1\%$)			
SMR003	RX	○	○	Embossed tape(1mm Pitch)	$\phi 180\text{mm}$ (7inch)	40,000

Reel ($\phi 180\text{mm}$) : Compatible with JEITA standard "EIAJ ET-7200B"

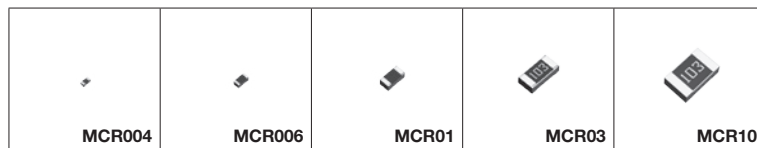
○ : Standard product

*RASMID : ROHM's proprietary new method that enables superior dimensional precision, making it possible to develop the ultra-compact products

Thick Film Chip Resistors (Standard series)

Compact Chip Resistors (MCR series <01005 to 0805>)

- High reliability chip resistors optimized for a variety of applications.
- Nine package sizes, ranging from 01005 to 2512.
- Market-proven reliability.



MCR series <01005 to 0805>								
Part No.	Size Code mm(inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
MCR004	0402 (01005)	0.031W (1/32W)	15	J(±5%)	+600/−200 ±300 ±250	1Ω to 9.1Ω (E24 series) 10Ω to 91Ω (E24 series) 100Ω to 3MΩ (E24 series)	−55 to +125	—
				F(±1%)	±300 ±250	10Ω to 97.6Ω (E24, E96 series) 100Ω to 3MΩ (E24, E96 series)		
MCR006	0603 (0201)	0.05W	25	J(±5%)	+600/−200 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	−55 to +125	YES
				F(±1%)	±200	10Ω to 10MΩ (E24, E96 series)		
				D(±0.5%)	±200 ±100	10Ω to 97.6Ω (E24, E96 series) 1kΩ to 1MΩ (E24, E96 series)		
MCR01	1005 (0402)	0.063W (1/16W)	50	J(±5%)	+500/−250 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	−55 to +155	YES
				F(±1%)	±100	10Ω to 2.2MΩ (E24, E96 series)		
				D(±0.5%)	±100 ±50	10Ω to 97.6Ω (E24, E96 series) 100Ω to 1MΩ (E24, E96 series)		
MCR03	1608 (0603)	0.1W	50	J(±5%)	±400 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	−55 to +155	YES
				FX(±1%)	±100	10Ω to 10MΩ (E24, E96 series)		
				D(±0.5%)	±100 ±50	10Ω to 97.6Ω (E24, E96 series) 100Ω to 1MΩ (E24, E96 series)		
MCR10	2012 (0805)	0.125W	150	J(±5%)	±400 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	−55 to +155	YES
		0.1W		F(±1%)	±100	10Ω to 2.2MΩ (E24, E96 series)		
				D(±0.5%)	±100 ±50	10Ω to 97.6Ω (E24, E96 series) 100Ω to 1MΩ (E24, E96 series)		

*E24 : Standard products E96 : Custom products

Jumper type

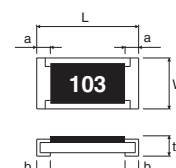
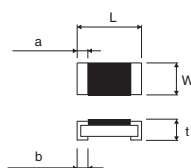
Part No.	Size Code mm(inch)	Rated Current (A)	Resistance	Operating Temperature(°C)	Automotive Grade AEC-Q200
MCR004	0402(01005)	0.5	50mΩ Max.	−55 to +125	—
MCR006	0603(0201)	0.5			YES
MCR01	1005(0402)	1		−55 to +155	YES
MCR03	1608(0603)	1			YES
MCR10	2012(0805)	2			YES

Dimensions(Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	a	b
MCR004	0402(01005)	0.4 ± 0.02	0.2 ± 0.02	0.13 ± 0.02	0.1 ± 0.03	0.1 ± 0.03
MCR006	0603(0201)	0.6 ± 0.03	0.3 ± 0.03	0.23 ± 0.03	0.1 ± 0.05	0.15 ± 0.05
MCR01	1005(0402)	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05	0.2 ± 0.1	0.25 +0.05 −0.10
MCR03	1608(0603)	1.6 ± 0.1	0.8 ± 0.1	0.45 ± 0.1	0.3 ± 0.2	0.3 ± 0.2
MCR10	2012(0805)	2.0 ± 0.1	1.25 ± 0.1	0.55 ± 0.1	0.4 ± 0.2	0.4 ± 0.2

- MCR004/006/01
- MCR03 (Partially marked)

- MCR10



Part No. Explanation

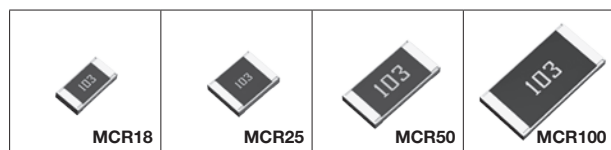
M	C	R	0	0	6	Y	L	P	J				
Part No.						Tolerance				Nominal Resistance			
						D	±0.5%			Resistance code, 3 or 4 digits. 000 denotes jumper type.			
						F(X)	±1%						
						J	±5%						
						J is also used for jumper							
						Tolerance		Resistance code					
						D, F(X)		:	4 digits				
						J		:	3 digits				

Packaging Specifications Code

Part No.	Code	Tolerance			Packaging Specifications	Reel	Basic Ordering Unit (pcs)	Remarks
		J(±5%)	F(±1%)	D(±0.5%)				
MCR004	QLP	○	○	—	Paper tape(2mm Pitch)	φ180mm(7inch)	20,000	—
MCR006	YLP	○	○	○	Paper tape(2mm Pitch)	φ180mm(7inch)	15,000	—
MCR01	MZP	○	○	○	Paper tape(2mm Pitch)	φ180mm(7inch)	10,000	—
MCR03	EZP	○	○(FX)	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000	—
MCR10	EZP	○	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000	—

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
 ○ : Standard product

Thick Film Chip Resistors (Standard series) Chip Resistors (MCR series <1206 to 2512>)



MCR series <1206 to 2512>								
Part No.	Size Code mm(inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
MCR18	3216 (1206)	0.25W	200	J(±5%)	±400 ±200	1Ω to 9.1Ω(E24 series) 10Ω to 10MΩ(E24 series)	-55 to +155	YES
		F(±1%)		±100	10Ω to 2.2MΩ(E24, E96 series)			
		D(±0.5%)		±100 ± 50	10Ω to 97.6Ω(E24, E96 series) 100Ω to 1MΩ(E24, E96 series)			
MCR25	3225 (1210)	0.25W to 0.5W*1	200	J(±5%)	500±350 ±500 ±200	1Ω to 2Ω(E24 series) 2.2Ω to 5.1Ω(E24 series) 5.6Ω to 3.3MΩ(E24 series)	-55 to +155	YES
				F(±1%)	±100	10Ω to 1.0MΩ(E24, E96 series)		
MCR50	5025 (2010)	0.5W	200	J(±5%)	500±350 ±500 ±200 ±350	1Ω to 2Ω(E24 series) 2.2Ω to 9.1Ω(E24 series) 10Ω to 330kΩ(E24 series) 360kΩ to 560kΩ(E24 series)	-55 to +125	YES
				F(±1%)	±100	10Ω to 180kΩ(E24, E96 series)		
MCR100	6432 (2512)	1W	200	J(±5%)	500±350 ±500 ±350 ±200	1Ω to 2Ω(E24 series) 2.2Ω to 9.1Ω(E24 series) 10Ω to 22Ω(E24 series) 24Ω to 100kΩ(E24 series)	-55 to +125	YES
				F(±1%)	±100	10Ω to 82kΩ(E24, E96 series)		

*1 : Rated power 1Ω to 9.76kΩ : 0.25W, 10Ω to 9.76kΩ : 0.5W, 10kΩ to 3.3MΩ : 0.33W

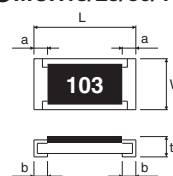
*E24 : Standard products E96 : Custom products

Jumper type					
Part No.	Size Code mm(inch)	Rated Current (A)	Resistance	Operating Temperature(°C)	Automotive Grade AEC-Q200
MCR18	3216(1206)	2	50mΩ Max.	-55 to +155	YES
MCR25	3225(1210)	2			YES
MCR50	5025(2010)	3			YES
MCR100	6432(2512)	4		-55 to +125	YES

Dimensions(Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	a	b
MCR18	3216(1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.5±0.25	0.5±0.25
MCR25	3225(1210)	3.2±0.15	2.5±0.15	0.55±0.15	0.5±0.25	0.5±0.25
MCR50	5025(2010)	5.0±0.15	2.5±0.15	0.55±0.15	0.6±0.25	0.6±0.25
MCR100	6432(2512)	6.3±0.15	3.2±0.15	0.55±0.15	0.6±0.25	0.6±0.25

MCR18/25/50/100



Part No. Explanation

Part No.	Tolerance	Nominal Resistance
M C R 1 8 E Z P J	D ±0.5%	Resistance code, 3 or 4 digits. 000 denotes jumper type.
	F ±1%	
	J ±5%	
	J is also used for jumper	
		Tolerance Resistance code
		D, F : 4 digits
		J : 3 digits

Packaging Specifications Code

Part No.	Code	Tolerance J(±5%) F(±1%) D(±0.5%)	Packaging Specifications	Reel	Basic Ordering Unit (pcs)
MCR18	EZP	○ ○ ○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
MCR25	JZH	○ ○ —	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000
MCR50	JZH	○ ○ —	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000
MCR100	JZH	○ ○ —	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
○ : Standard product

Thick Film Chip Resistors (Standard series)

Compact Chip Resistor Networks (MNR series <0402×2 to 1206×4>)

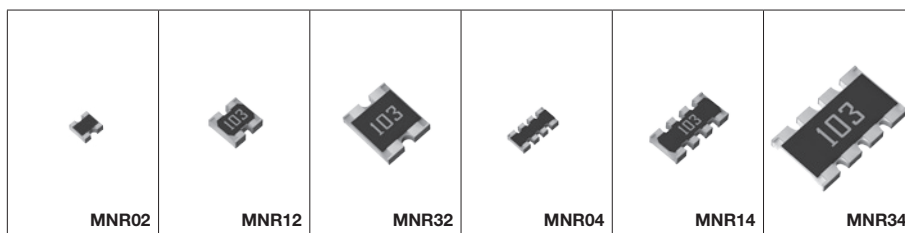
• Reduces cost

Use of chip networks reduces the number of components and saves mounting space.

• Easy fillet inspection

Convex type electrodes facilitate visual inspection of fillets.

Inspection can be performed with automatic inspection equipment.



MNR series <0402×2 to 1206×4>

Part No.	Size Code mm(inch)	No. of Terminals	No. of Elements	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
MNR02	1005(0402)×2	4	2	0.063W/Element	25	J(±5%)	±200	10Ω to 1MΩ (E24 series)	-55 to +155	YES
MNR04	1005(0402)×4	8	4	0.063W/Element	25	J(±5%)	+500/-250 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 1MΩ (E24 series)		YES
MNR12	1608(0603)×2	4	2	0.063W/Element	50	J(±5%) F(±1%)	±200 ±100	10Ω to 1MΩ (E24 series)		YES
MNR14	1608(0603)×4	8	4	0.063W/Element	50	J(±5%) F(±1%)	±500 ±200 ±100	2.2Ω to 6.8Ω (E6 series) 10Ω to 1MΩ (E24 series) 10Ω to 1MΩ (E24 series)		YES
MNR32	3216(1206)×2	4	2	0.125W/Element	200	J(±5%)	±200	10Ω to 1MΩ (E24 series)	-55 to +125	YES
MNR34	3216(1206)×4	8	4	0.125W/Element	200	J(±5%)	±200	10Ω to 1MΩ (E24 series)		YES

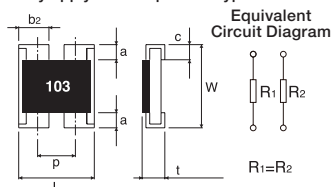
Jumper type

Part No.	Size Code mm(inch)	Rated Current	Resistance	Operating Temperature(°C)	Automotive Grade AEC-Q200
MNR02	1005(0402)×2	1A/Element	50mΩ Max.	-55 to +155	YES
MNR04	1005(0402)×4	1A/Element			YES
MNR12	1608(0603)×2	1A/Element			YES
MNR14	1608(0603)×4	1A/Element			YES
MNR32	3216(1206)×2	2A/Element		-55 to +125	YES
MNR34	3216(1206)×4	2A/Element			YES

■ Dimensions (Unit : mm)

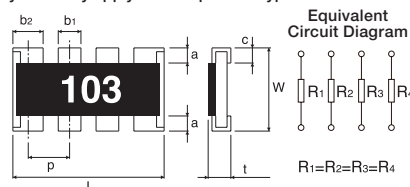
● MNR02/MNR12/MNR32 (Marked except MNR02)

Different marking system may apply to each product type.



● MNR04/MNR14/MNR34 (Marked except MNR04)

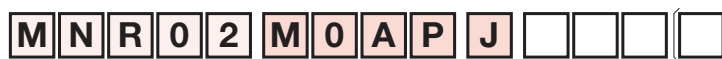
Different marking system may apply to each product type.



Part No.	L	W	t	a	b2	c	p
MNR02	1.0±0.1	1.0±0.1	0.35±0.1	0.2±0.1	0.33 ^{+0.1} _{-0.05}	0.25±0.1	0.68
MNR12	1.6±0.1	1.6±0.1	0.5±0.1	0.3±0.2	0.6±0.15	0.25±0.15	0.8
MNR32	2.6±0.2	3.1±0.2	0.55±0.1	0.5±0.3	1.0±0.2	0.5Max.	1.27

Part No.	L	W	t	a	b1	b2	c	p
MNR04	2.0±0.1	1.0±0.1	0.35±0.1	0.2±0.1	0.3±0.1	0.4±0.1	0.25±0.1	0.5
MNR14	3.2±0.1	1.6±0.1	0.5±0.1	0.3±0.2	0.4±0.15	0.6±0.15	0.25±0.15	0.8
MNR34	5.2±0.4	3.1±0.2	0.55±0.1	0.5±0.3	0.8±0.2	1.0±0.2	0.5Max.	1.27

■ Part No. Explanation



Part No.

Tolerance

F	±1%
J	±5%
J is also used for jumper	

Nominal Resistance

Resistance code, 3 or 4 digits.
000 denotes jumper type.

Tolerance	Resistance code
F	: 4 digits
J	: 3 digits

Packaging Specifications Code

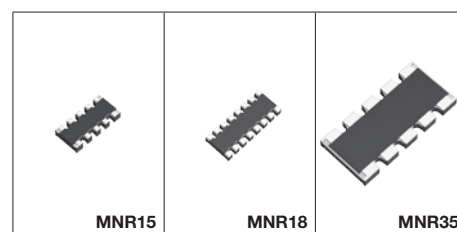
Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J(±5%)	F(±1%)			
MNR02	M0AP	○	—	Paper tape(2mm Pitch)	φ180mm(7inch)	10,000
MNR04	M0AP	○	—	Paper tape(2mm Pitch)	φ180mm(7inch)	10,000
MNR12	E0AP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
MNR14	E0AP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
MNR32	J0AB	○	—	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000
MNR34	J5AB	○	—	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
○ : Standard product

Thick Film Chip Resistors (Standard series)

8-element Chip Resistor Networks (MNR series <0603×5 to 1206×5>)

- One package built in 8-element chip contributes to space-saving
- 8 resistor elements reduce mounting cost
- Convex type electrodes facilitate visual inspection of fillets.
Inspection can be performed with automatic inspection equipment.
- Suitable for pull-up resistor, damping resistor
- No direction to be mounted



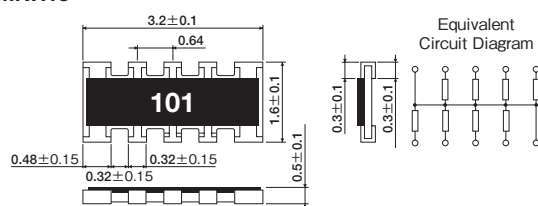
MNR series <0603×5 to 1206×5>										
Part No.	Size Code mm(inch)	No. of Terminals	No. of Elements	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
MNR15	1608 (0603)×5	10	8	0.031W/Element	12.5	J(±5%)	±200	56Ω to 100kΩ(E24 series)	-55 to +125	YES
MNR18	1605 (0602)×8	16	8	0.063W/Element*	25	J(±5%)	±200	10Ω to 1MΩ(E24 series)		YES
MNR35	3216 (1206)×5	10	8	0.063W/Element	50	J(±5%)	±200	56Ω to 100kΩ(E12 series)		YES

*Power for a packing Max. 0.25W in all elements

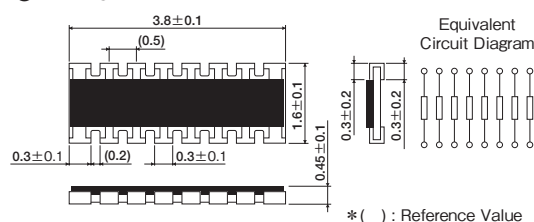
Jumper type					
Part No.	Size Code mm(inch)	Rated Current	Resistance	Operating Temperature(°C)	Automotive Grade AEC-Q200
MNR18	1605(0602)×8	1A/Element	50mΩ Max.	-55 to +125	YES

Dimensions (Unit : mm)

● MNR15

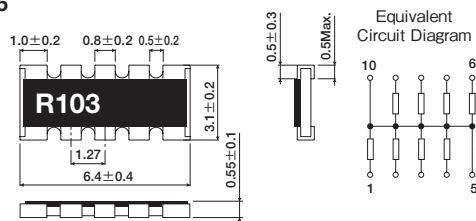


● MNR18

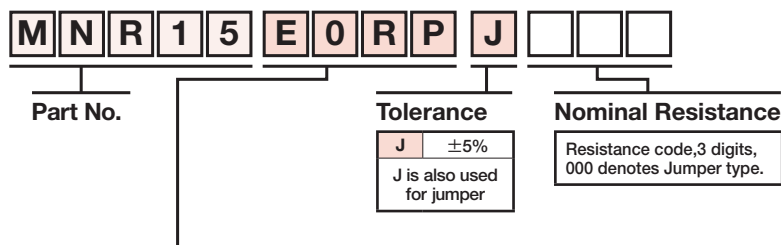


*() : Reference Value

● MNR35



Part No. Explanation



Packaging Specifications Code

Part No.	Code	Tolerance J(±5%)	Packaging Specifications	Reel	Basic Ordering Unit (pcs)
MNR15	E0RP	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
MNR18	E0AP	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
MNR35	J5R	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
○ : Standard product

Thick Film Chip Resistors (High Reliability series)

High Anti-surge Chip Resistors (SDR series)

Anti-surge Chip Resistors (ESR series)

- Exclusive resistive element pattern and laser trimming technology results in significantly improved surge resistance characteristics.
- Superior power ratings.

						
SDR03	SDR10	ESR01	ESR03	ESR10	ESR18	ESR25

SDR series

Part No.	Size Code mm(inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
SDR03	1608 (0603)	0.3W	150	J(±5%)	±200	1Ω to 10MΩ(E24 series)	-55 to +155	YES
				F(±1%)	±200 ±100	1Ω to 9.76kΩ(E24, E96 series) 10Ω to 10MΩ(E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ(E24, E96 series)		
New SDR10	2012 (0805)	0.5W	400	J(±5%)	±200	1Ω to 10MΩ(E24 series)	-55 to +155	YES
				F(±1%)	±100	1Ω to 10MΩ(E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ(E24, E96 series)		

ESR series

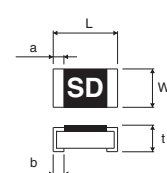
ESR01	1005 (0402)	0.2W	50	J(±5%)	+500/-250 ±200	1Ω to 9.1kΩ(E24 series) 10Ω to 10MΩ(E24 series)	-55 to +155	YES
				F(±1%)	±100	10Ω to 976kΩ(E24, E96 series) 1MΩ to 2.2MΩ(E24 series)		
ESR03	1608 (0603)	0.25W	150	J(±5%)	±200	1Ω to 10MΩ(E24 series)		YES
				F(±1%)	±200 ±100	1Ω to 9.76kΩ(E24, E96 series) 10Ω to 10MΩ(E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ(E24, E96 series)		
ESR10	2012 (0805)	0.4W	150	J(±5%)	±200	1Ω to 30MΩ(E24 series)		YES
				F(±1%)	±100	1Ω to 10MΩ(E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ(E24, E96 series)		
ESR18	3216 (1206)	0.5W	200	J(±5%)	±200	1Ω to 15MΩ(E24 series)		YES
				F(±1%)	±100	1Ω to 10MΩ(E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ(E24, E96 series)		
ESR25	3225 (1210)	0.66W (2/3W)	200	J(±5%)	±200	1Ω to 10MΩ(E24 series)		YES
				F(±1%)	±100	1Ω to 10MΩ(E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ(E24, E96 series)		

*E24 : Standard products E96 : Custom products

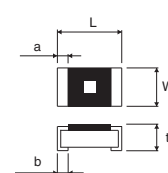
■ Dimensions (Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	a	b
SDR03	1608(0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.25±0.1	0.25±0.1
SDR10	2012(0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.25±0.1	0.4 ±0.2
ESR01	1005(0402)	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	0.25 ^{+0.05} _{-0.1}
ESR03	1608(0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3 ±0.2
ESR10	2012(0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.3±0.2	0.4 ±0.2
ESR18	3216(1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.3±0.25	0.5 ±0.25
ESR25	3225(1210)	3.2±0.15	2.5±0.15	0.55±0.1	0.3±0.25	0.5 ±0.25

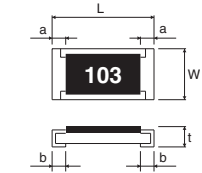
● SDR03/10



● ESR01/03



● ESR10/18/25



■ Part No. Explanation

E	S	R	1	0	E	Z	P	J										
Part No.					Tolerance				Nominal Resistance									
					D	±0.5%			Resistance code, 3 or 4 digits. <table><tr><td>Tolerance</td><td>Resistance code</td></tr><tr><td>F, D</td><td>: 4 digits</td></tr><tr><td>J</td><td>: 3 digits</td></tr></table>				Tolerance	Resistance code	F, D	: 4 digits	J	: 3 digits
Tolerance	Resistance code																	
F, D	: 4 digits																	
J	: 3 digits																	
					F	±1%												
					J	±5%												

Packaging Specifications Code

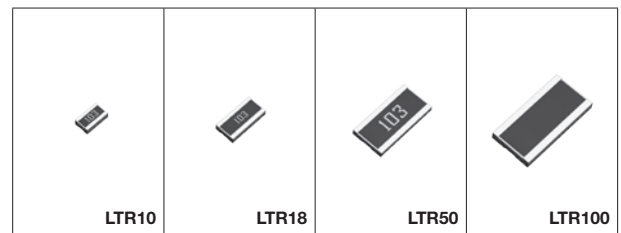
Part No.	Code	Tolerance			Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J(±5%)	F(±1%)	D(±0.5%)			
SDR03	EZP	○	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
SDR10	EZP	○	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
ESR01	MZP	○	○	—	Paper tape(4mm Pitch)	φ180mm(7inch)	10,000
ESR03	EZP	○	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
ESR10	EZP	○	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
ESR18	EZP	○	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
ESR25	JZP	○	○	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
○ : Standard product

Thick Film Chip Resistors (High Reliability series)

High Power Chip Resistors <Wide Terminal type> (LTR series)

- High joint reliability with long side terminations.
- Highest power ratings in their class.
- Guaranteed anti-surge characteristic in all series.



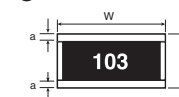
LTR series								
Part No.	Size Code mm(inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
LTR10	1220 (0508)	0.25W	150	J(±5%)	±200	1Ω to 1MΩ (E24 series)	-55 to +155	YES
				F(±1%)	±100	1Ω to 1MΩ (E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		
LTR18	1632 (0612)	0.75W	200	J(±5%)	±200	1Ω to 1MΩ (E24 series)		YES
				F(±1%)	±100	1Ω to 1MΩ (E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		
LTR50	2550 (1020)	1W	200	J(±5%)	±200	1Ω to 1MΩ (E24 series)		YES
				F(±1%)	±100	1Ω to 1MΩ (E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		
LTR100	3264 (1225)	2W	200	J(±5%)	±200	1Ω to 1MΩ (E24 series)		YES
				F(±1%)	±100	1Ω to 1MΩ (E24, E96 series)		
				D(±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		

*E24 : Standard products E96 : Custom products

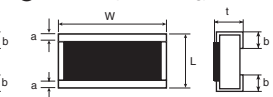
Dimensions (Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	a	b
LTR10	1220(0508)	1.2±0.1	2.0±0.1	0.55±0.1	0.25±0.1	0.35±0.2
LTR18	1632(0612)	1.6±0.15	3.2±0.15	0.55±0.1	0.3±0.2	0.5±0.2
LTR50	2550(1020)	2.5±0.15	5.0±0.15	0.55±0.1	0.38±0.2	0.9±0.2
LTR100	3264(1225)	3.2±0.15	6.4±0.15	0.55±0.15	0.4±0.25	1.13±0.25

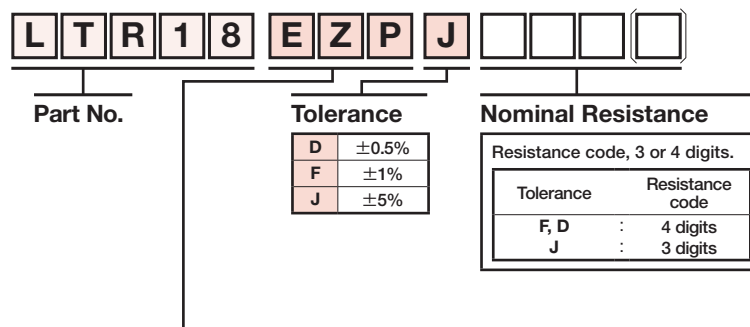
● LTR10/18/50



● LTR100 (No marking)



Part No. Explanation



Packaging Specifications Code

Part No.	Code	Tolerance			Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J(±5%)	F(±1%)	D(±0.5%)			
LTR10	EZP	○	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
LTR18	EZP	○	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
LTR50	UZP	○	○	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	5,000
LTR100	JZP	○	○	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
 ○ : Standard product

Thick Film Chip Resistors (High Reliability series) High Voltage Resistance Chip Resistors (KTR series)

- Twice the rated voltage of conventional products.
- Perfect for use in Camera Flash circuit, etc.



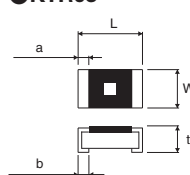
KTR series								
Part No.	Size Code mm(inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
KTR03	1608 (0603)	0.1W	350	J(±5%)	±200	1Ω to 10MΩ (E24 series)	-55 to +155	YES
				F(±1%)	±100	1Ω to 10MΩ (E24, E96 series)		
KTR10	2012 (0805)	0.125W	400	J(±5%)	±200	1Ω to 30MΩ (E24 series)		YES
				F(±1%)	±100	1Ω to 10MΩ (E24, E96 series)		
KTR18	3216 (1206)	0.25W	500	J(±5%)	±200	1Ω to 15MΩ (E24 series)		YES
				F(±1%)	±100	1Ω to 10MΩ (E24, E96 series)		
KTR25	3225 (1210)	0.33W (1/3W)	600	J(±5%)	±200	1Ω to 10MΩ (E24 series)		YES
				F(±1%)	±100	1Ω to 10MΩ (E24, E96 series)		

*E24 : Standard products E96 : Custom products

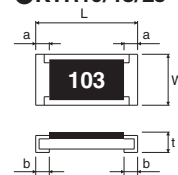
Dimensions (Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	a	b
KTR03	1608(0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2
KTR10	2012(0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.3±0.2	0.4±0.2
KTR18	3216(1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.3±0.25	0.5±0.25
KTR25	3225(1210)	3.2±0.15	2.5±0.15	0.55±0.1	0.3±0.25	0.5±0.25

●KTR03



●KTR10/18/25



Part No. Explanation



Part No.

Tolerance

F	±1%
J	±5%

Nominal Resistance

Resistance code, 3 or 4 digits.

Tolerance	Resistance code
F	: 4 digits
J	: 3 digits

Packaging Specifications Code

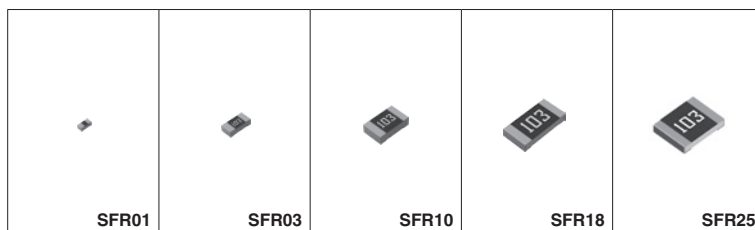
Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J(±5%)	F(±1%)			
KTR03	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
KTR10	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
KTR18	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
KTR25	JZP	○	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
○ : Standard product

Thick Film Chip Resistors (High Reliability series)

Tolerance for Sulfurization Chip Resistor (SFR series)

- Improved Anti-sulfur reliability by ROHM original structure.



SFR series								
Part No.	Size Code mm(inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
SFR01	1005 (0402)	0.063W (1/16W)	50	J(±5%) F(±1%)	+500/-250 ±200 ±100	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series) 10Ω to 2.2MΩ (E24, E96 series)	-55 to +155	YES
SFR03	1608 (0603)	0.1W	50	J(±5%) F(±1%)	±400 ±200 ±100	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series) 10Ω to 10MΩ (E24, E96 series)		YES
SFR10	2012 (0805)	0.125W	150	J(±5%) F(±1%)	±400 ±200 ±100	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series) 10Ω to 2.2MΩ (E24, E96 series)		YES
New SFR18	3216 (1206)	0.25W	200	J(±5%) F(±1%)	±400 ±200 ±100	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series) 10Ω to 2.2MΩ (E24, E96 series)		YES
New SFR25	3225 (1210)	0.5W	200	J(±5%) F(±1%)	±200 ±100	1Ω to 1MΩ (E24 series) 10Ω to 1MΩ (E24, E96 series)		YES

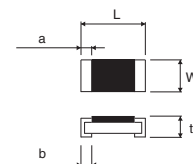
*E24 : Standard products E96 : Custom products

Jumper type					
Part No.	Size Code mm(inch)	Rated Current (A)	Resistance	Operating Temperature(°C)	Automotive Grade AEC-Q200
SFR01	1005(0402)	1	50mΩ Max.	-55 to +155°C	YES
SFR03	1608(0603)	1			YES
SFR10	2012(0805)	2			YES
New SFR18	3216(1206)	2			YES
New SFR25	3225(1210)	2			YES

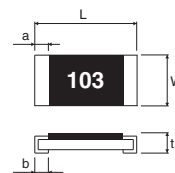
Dimensions(Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	a	b
SFR01	1005(0402)	1.0±0.05	0.5±0.05	0.35±0.05	0.33±0.08	0.25 ^{+0.05} _{-0.10}
SFR03	1608(0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.4±0.2	0.3 ±0.2
SFR10	2012(0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.4±0.2	0.4 ±0.2
SFR18	3216(1206)	3.2 ^{+0.15} _{-0.20}	1.6±0.15	0.55±0.1	0.5±0.25	0.5 ±0.25
SFR25	3225(1210)	3.2 ^{+0.15} _{-0.20}	2.5±0.15	0.55±0.1	0.55±0.25	0.5 ±0.25

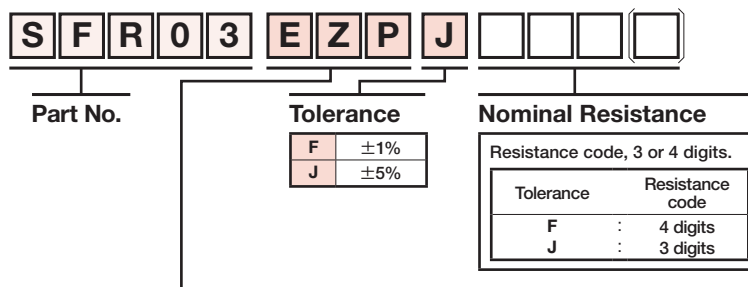
●SFR01



●SFR03/10/18/25



Part No. Explanation



Packaging Specifications Code

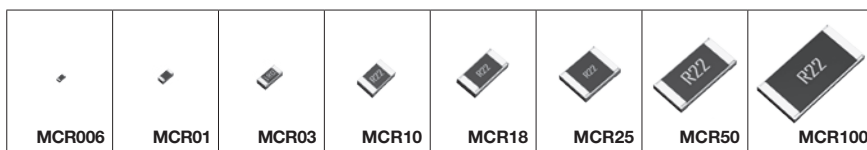
Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J(±5%)	F(±1%)			
SFR01	MZP	○	○	Paper tape(2mm Pitch)	φ180mm(7inch)	10,000
SFR03	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
SFR10	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
SFR18	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
SFR25	JZP	○	○	Embossed tape(4mm Pitch)	φ180mm(8inch)	4,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
 ○ : Standard product

Chip Resistors for Current Detection (Thick Film type)

Chip Resistors (Low Ohmic MCR series)

- Very-low ohmic resistance from 47m Ohm is in lineup by thick-film resistive element.
- High-reliability chip resistor employing metal glaze as resistive element.



Low Ohmic MCR series

Part No.	Size Code mm(inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
MCR006	0603 (0201)	0.05W	F(±1%)	+600/-200	1Ω to 9.1Ω (E24 series)	-55 to +155	YES
MCR01	1005 (0402)	0.063W (1/16W)	F(±1%)	±400	1Ω to 9.1Ω (E24 series)		YES
MCR03	1608 (0603)	0.1W	F(±1%)	±400	1Ω to 9.1Ω (E24 series)		YES
MCR10	2012 (0805)	0.25W	J(±5%) F(±1%)	*Table 1 *Table 1	0.047Ω to 0.91Ω (E24 series) 0.047Ω to 0.91Ω (E24 series)		YES
MCR18	3216 (1206)	0.25W	J(±5%) F(±1%)	*Table 1 *Table 1	0.047Ω to 0.91Ω (E24 series) 0.047Ω to 0.91Ω (E24 series)		YES
MCR25	3225 (1210)	0.5W	J(±5%) F(±1%)	300±300 ±200 300±300 ±200	0.047Ω to 0.091Ω (E24 series) 0.1Ω to 0.91Ω (E24 series) 0.047Ω to 0.091Ω (E24 series) 0.1Ω to 0.91Ω (E24 series)		YES
MCR50	5025 (2010)	0.5W	J(±5%) F(±1%)	*Table 1 *Table 1	0.047Ω to 0.91Ω (E24 series) 0.047Ω to 0.91Ω (E24 series)	-55 to +125	YES
MCR100	6432 (2512)	1W	J(±5%) F(±1%)	*Table 1 *Table 1	0.047Ω to 0.91Ω (E24 series) 0.047Ω to 0.91Ω (E24 series)		YES

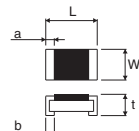
*Table 1

Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range
J(±5%) F(±1%)	500±300	0.047Ω to 0.091Ω (E24 Series)
	400±200	0.1Ω to 0.13Ω (E24 Series)
	±250	0.15Ω to 9.1Ω (E24 Series)

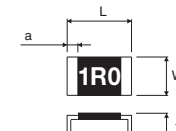
■ Dimensions (Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	a	b
MCR006	0603(0201)	0.6±0.03	0.3±0.03	0.23±0.03	0.1±0.05	0.15±0.05
MCR01	1005(0402)	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	0.25 ^{+0.05} _{-0.1}
MCR03	1608(0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2
MCR10	2012(0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.4±0.2	0.4±0.2
MCR18	3216(1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.5±0.25	0.5±0.25
MCR25	3225(1210)	3.2±0.15	2.5±0.15	0.55±0.15	0.5±0.25	0.5±0.25
MCR50	5025(2010)	5.0±0.15	2.5±0.15	0.55±0.15	0.6±0.25	0.6±0.25
MCR100	6432(2512)	6.3±0.15	3.2±0.15	0.55±0.15	0.6±0.25	0.6±0.25

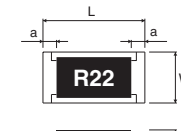
● MCR006/01



● MCR03



● MCR10/18/25/50/100



■ Part No. Explanation

Part No.	Tolerance	Special Part Code	Nominal Resistance
M C R 1 0 E Z H J L	F ±1% J ±5%	L 0.1 to 9.1Ω (F) 0.1 to 0.91Ω (J) S 0.047 to 0.091Ω	Resistance code, 3 or 4 digits. Tolerance +Special P/N Resistance code FL, FS, JS : 4 digits JL : 3 digits

Packaging Specifications Code

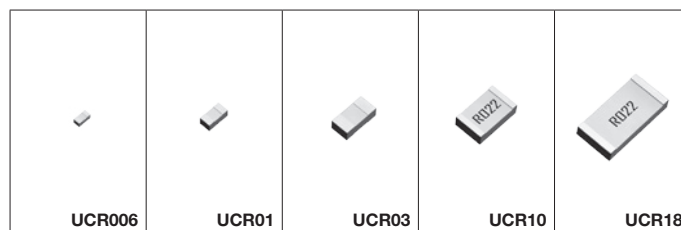
Part No.	Code	Tolerance J(±5%) F(±1%)	Packaging Specifications	Reel	Basic Ordering Unit (pcs)
MCR006	YLP	—	Paper tape(2mm Pitch)	φ180mm(7inch)	15,000
MCR01	MZP	—	Paper tape(2mm Pitch)	φ180mm(7inch)	10,000
MCR03	EZP	—	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
MCR10	EZH	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
MCR18	EZH	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
MCR25	JZH	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000
MCR50	JZH	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000
MCR100	JZH	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
 ○ : Standard product

Chip Resistors for Current Detection (Thick Film type)

Low Ohmic Chip Resistors <Face Down type> (UCR series)

- Chip resistors for current detection. (11mΩ or more)
- Resistive element is located at bottom side, which reduces the resistance shift during mounting process.
- ROHM's unique structure achieved improvement of heat.



UCR series							
Part No.	Size Code mm(inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
UCR006	0603 (0201)	0.1W	J(±5%) F(±1%)	0 to 300	100mΩ to 910mΩ (E24 series)	-55 to +155	YES
UCR01	1005 (0402)	0.125W	J(±5%) F(±1%)	0 to 300 0 to 250 0 to 200	68mΩ to 91mΩ (E24 series) 100mΩ to 200mΩ (E24 series) 220mΩ to 910mΩ (E24 series)		YES
UCR03	1608 (0603)	0.25W	J(±5%) F(±1%)	0 to 250 0 to 200 0 to 150	20mΩ to 47mΩ (E24 series) 51mΩ to 91mΩ (E24 series) 100mΩ to 200mΩ (E24 series)		YES*
		0.2W	J(±5%) F(±1%)	0 to 150	220mΩ to 910mΩ (E24 series)		
UCR10	2012 (0805)	0.33W (1/3W)	J(±5%) F(±1%)	250±200 0 to 250 0 to 150	11mΩ to 18mΩ (E24 series) 20mΩ to 47mΩ (E24 series) 51mΩ to 100mΩ (E24 series)		YES
					11mΩ to 47mΩ (E24 series) 51mΩ to 100mΩ (E24 series)		
UCR18	3216 (1206)	0.5W	J(±5%) F(±1%)	0 to 350 0 to 200 0 to 150	11mΩ to 18mΩ (E24 series) 20mΩ to 39mΩ (E24 series) 43mΩ to 100mΩ (E24 series)		YES
		New 1W	J(±5%) F(±1%)	0 to 350 0 to 200	11mΩ to 18mΩ (E24 series) 20mΩ to 39mΩ (E24 series)		YES

*Limited to 100mΩ and higher

Dimensions (Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	a	b
UCR006	0603(0201)	0.62±0.05	0.32±0.05	0.24±0.05	0.18±0.1	0.22±0.1
UCR01	1005(0402)	1.0±0.1	0.55±0.1	0.37±0.05	0.28±0.1	0.34±0.1
UCR03	1608(0603)	1.6±0.1	0.87±0.1	0.5±0.1	0.45±0.2	0.45±0.2
UCR10	2012(0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.24±0.2	0.5±0.2
UCR18	3216(1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.3±0.2	0.9±0.25

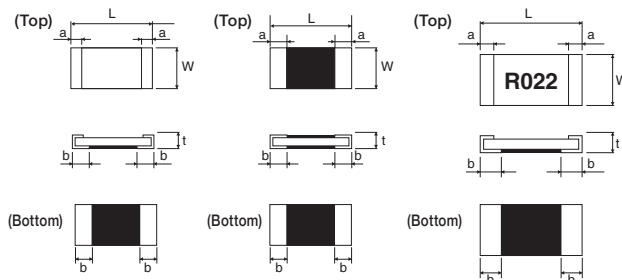
●UCR006/01

●UCR03
(50mΩ ≤ R ≤ 910mΩ)

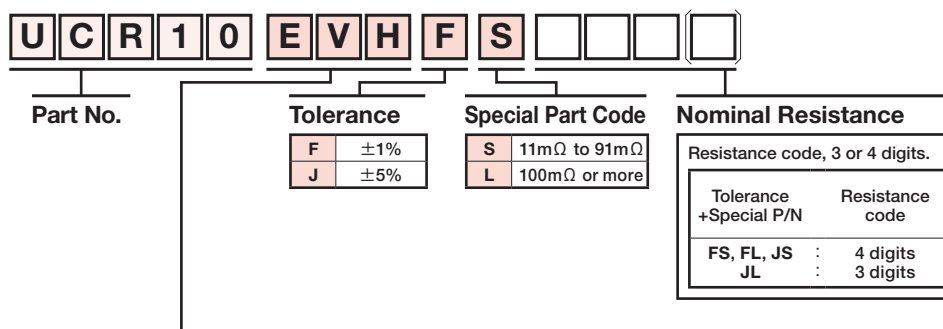
●UCR03

(20mΩ ≤ R < 50mΩ)

●UCR10/18



Part No. Explanation



Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)	Remarks
		J(±5%)	F(±1%)				
UCR006	YVP	○	○	Paper tape(2mm Pitch)	φ180mm(7inch)	15,000	—
UCR01	MVP	○	○	Paper tape(2mm Pitch)	φ180mm(7inch)	10,000	—
UCR03	EWP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000	20mΩ to 47mΩ
	EVP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000	51mΩ to 910mΩ
UCR10	EVH	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000	—
UCR18	EVH	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000	—

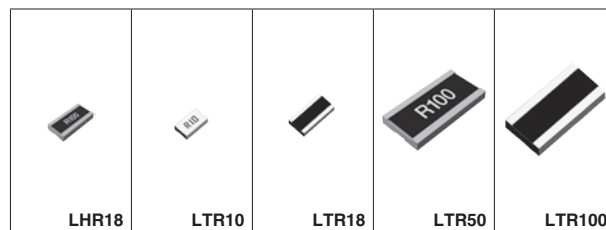
Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
○ : Standard product

Chip Resistors for Current Detection (Thick Film type)

High Power Chip Resistors <Wide Terminal type> <Low TCR> (LHR series)

High Power Chip Resistors <Wide Terminal type> (Low Ohmic LTR series)

- Chip resistors for current detection. (10mΩ or more)
- High joint reliability with long side terminations.
- Improvement of rated power enables to displace smaller size of resistors, and it contributes space savings in your set.



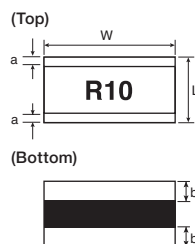
LHR series							
Part No.	Size Code mm(inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
New LHR18	1632 (0612)	1.25W	J(±5%) F(±1%)	0 to 125 0 to 100 0 to 75	33mΩ to 39mΩ(E24 series) 43mΩ to 270mΩ(E24 series) 300mΩ to 1Ω(E24 series)	-55 to +155	YES
Low Ohmic LTR series							
LTR10	1220 (0508)	0.5W	J(±5%) F(±1%)	±150	47mΩ to 9.1Ω(E24 series)	-55 to +155	YES
LTR18	1632 (0612)	1W	J(±5%) F(±1%)	0 to 300 0 to 200 0 to 150 ±100	10mΩ to 18mΩ(E24 series) 20mΩ to 47mΩ(E24 series) 51mΩ to 470mΩ(E24 series) 510mΩ to 1Ω(E24 series)		YES
New LTR50	2550 (1020)	2W	J(±5%) F(±1%)	0 to 300 0 to 200 0 to 150 ±100	10mΩ to 18mΩ(E24 series) 20mΩ to 47mΩ(E24 series) 51mΩ to 91mΩ(E24 series) 100mΩ to 910mΩ(E24 series)		YES
LTR100	3264 (1225)	2W ☆3W	J(±5%) F(±1%) J(±5%) F(±1%)	±200 0 to 150 0 to 300 0 to 200 0 to 150	100mΩ to 910mΩ(E24 series) 10mΩ to 18mΩ(E24series) 20mΩ to 47mΩ(E24series) 51mΩ to 91mΩ(E24series)		YES

☆ : Under Development

■ Dimensions (Unit : mm)

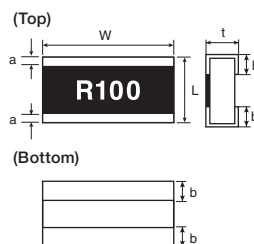
Part No.	Size Code mm(inch)	L	W	t	a	b
LHR18	1632(0612)	1.6±0.1	3.2±0.1	0.58±0.1	0.3±0.2	0.5±0.2
LTR10	1220(0508)	1.2±0.1	2.0±0.1	0.55±0.1	0.3±0.2	0.35±0.2
LTR18	1632(0612)	1.6±0.1	3.2±0.1	0.58±0.1	0.5±0.2	0.5±0.2
LTR50	2550(1020)	2.5±0.15	5.0±0.15	0.58±0.15	0.38±0.2	0.9±0.2
LTR100	3264(1225)	3.2±0.15	6.4±0.15	0.55±0.15	0.4±0.25	1.13±0.25

● LTR10

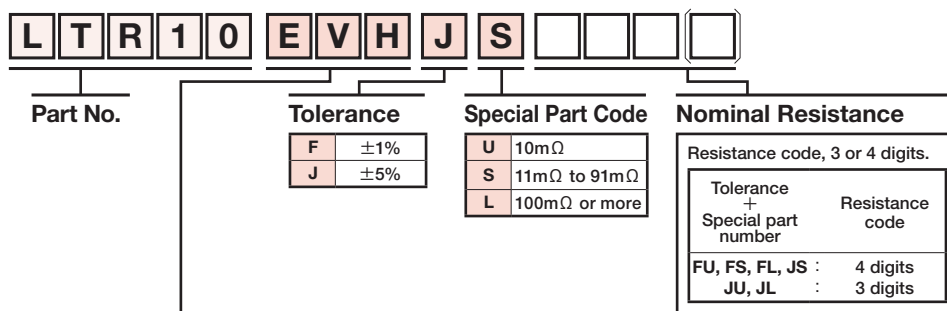


● LHR18/LTR50 (marking)

● LTR18/LTR100 (No marking)



■ Part No. Explanation



Packaging Specifications Code

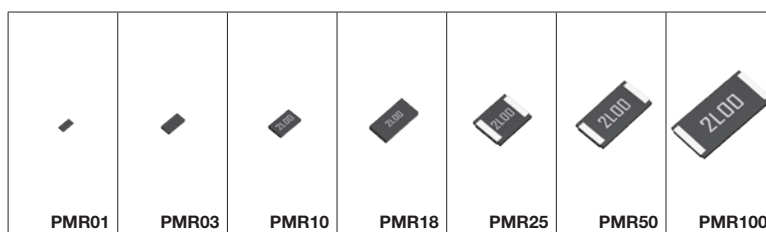
Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J(±5%)	F(±1%)			
LHR18	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
LTR10	EVH	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
LTR18	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
LTR50	UZP	○	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	5,000
LTR100	JZP	○	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	4,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
 ◎ : Standard product

Chip Resistors for Current Detection (Metal Plate type)

Ultra Low Ohmic Chip Shunt Resistors (PMR series)

- Ultra low-ohmic resistance range (1mΩ or more)
- Improved current detection accuracy by trimming-less structure.
Highly recommended for large current/
High speed switching circuit.
- Special low resistance temperature coefficient (TCR) alloy utilized for the resistive element.



PMR series							
Part No.	Size Code mm(inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Value (mΩ)	Operating Temperature (°C)	Automotive Grade AEC-Q200
PMR01	1005(0402)	0.2W	J(±5%)	0 to 200	10	-55 to +155	YES
PMR03	1608(0603)	0.25W	J(±5%) F(±1%)	0 to 150	10(☆5)		YES
PMR10	2012(0805)	0.5W	J(±5%) F(±1%)	±150	2, 3, 4, 5, 6, 7, 8, 9, 10		YES
PMR18	3216(1206)	1W	J(±5%) F(±1%)	±100	1, 2, 3, 4, 5, 6, 7, 8, 9, 10		YES
PMR25	3225(1210)	1W	J(±5%) F(±1%)	±100	1, 2, 3, 4, 5		YES
PMR50	5025(2010)	1W	J(±5%) F(±1%)	±100	1, 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10		YES
PMR100	6432(2512)	2W	J(±5%) F(±1%)	±150	1, 2		YES
		☆3W	J(±5%) F(±1%)	±100	3, 4, 5, 6, 7, 8, 9, 10		
				±150	1, 2		

☆ : Under Development

Large Current Jumper type					
Part No.	Size Code mm(inch)	Rated Current (A)	Resistance	Operating Temperature(°C)	Automotive Grade AEC-Q200
PMR01	1005(0402)	20.0	0.5mΩ Max.	-55 to +155	YES
PMR03	1608(0603)	22.4			YES
PMR10	2012(0805)	31.6			YES
PMR18	3216(1206)	38.7			YES
PMR25	3225(1210)	44.7			YES
PMR50	5025(2010)	50.0			YES
PMR100	6432(2512)	63.2			YES

Dimensions (Unit : mm)

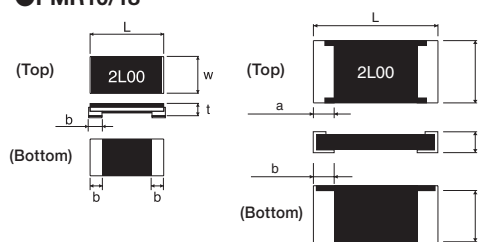
Part No.	Size Code mm(inch)	L	W	t	a	b	c
PMR01	1005(0402)	1.0±0.05	0.5±0.05	0.25±0.1	—	0.30±0.10	—
PMR03	1608(0603)	1.6±0.15	0.8±0.15	0.25±0.1	—	0.35±0.15	—
PMR10	2012(0805)	2.0±0.15	1.2±0.15	0.42 to 0.28*±0.15	—	0.75 to 0.35*±0.25	—
PMR18	3216(1206)	3.2±0.15	1.6±0.15	0.42 to 0.28*±0.15	—	1.20 to 0.5*±0.25	—
PMR25	3225(1210)	3.2±0.2	2.5±0.2	0.52 to 0.32*±0.15	0.5±0.2	1.00 to 0.8*±0.2	1.95±0.2
PMR50	5025(2010)	5.0±0.2	2.5±0.2	0.52 to 0.32*±0.15	0.5±0.2	1.85 to 0.9*±0.2	1.95±0.2
PMR100	6432(2512)	6.4±0.25	3.2±0.25	0.52 to 0.32*±0.15	0.5±0.25	2.3 to 1.1*±0.25	2.65±0.25

* Each value range varies with the resistance. Please contact a ROHM sales representative for further details.

● PMR01/03 (No marking)

● PMR10/18

● PMR25/50/100



Part No. Explanation



Part No.

Tolerance

Special Part Code

Nominal Resistance

F	±1%
J	±5%

U	5 to 10mΩ
V	1 to 4mΩ

* Jumper type doesn't have a special part code

Resistance code, 3 or 4 digits.	
Tolerance	Resistance code
F	: 4 digits
J	: 3 digits

Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J(±5%)	F(±1%)			
PMR01	ZZP	○	—	Embossed tape(2mm Pitch)	φ180mm(7inch)	10,000
PMR03	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
PMR10	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
PMR18	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
PMR25	HZP	○	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	2,000
PMR50	HZP	○	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	2,000
PMR100	HZP	○	○	Embossed tape(4mm Pitch)	φ180mm(7inch)	2,000

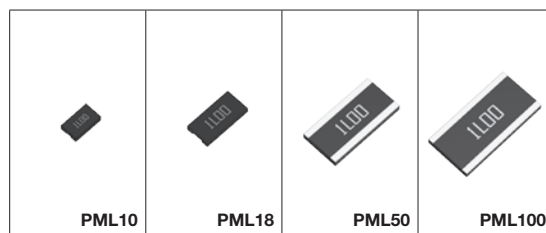
Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
○ : Standard product

Resistance Value(Ω)	Tolerance	
	J	F
Jumper	000	—
1mΩ	1L0	1L00
2mΩ	2L0	2L00
3mΩ	3L0	3L00
4mΩ	4L0	4L00
5mΩ	5L0	5L00
6mΩ	6L0	6L00
7mΩ	7L0	7L00
8mΩ	8L0	8L00
9mΩ	9L0	9L00
10mΩ	10L	10L0

Chip Resistors for Current Detection (Metal Plate type)

Ultra Low Ohmic Chip Shunt Resistors <Wide Terminal type> (PML series)

- Ultra-low resistance range (0.5mΩ or more).
- Wide terminal configuration for high joint reliability.
- Improved current detection accuracy by trimming-less structure.



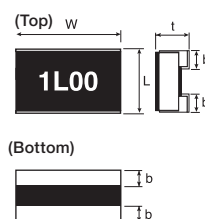
PML series							
Part No.	Size Code mm(inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Value (mΩ)	Operating Temperature (°C)	Automotive Grade AEC-Q200
PML10	1220 (0508)	0.66W	J(±5%) G(±2%)	±200	1.0, 1.5, 2.0, 2.5	-55 to +155	YES
PML18	1632 (0612)	1W	J(±5%) G(±2%)	±150	0.5, 1.0, 1.5, 2.0, 2.5		YES
PML50	2550 (1020)	2W	J(±5%)	±200	0.5, 2.2		YES
PML100	3264 (1225)	2W (3W at 25°C)	J(±5%)	±100	1.0, 1.5, 2.0, 2.2		YES
		2W		±150	0.5		

Dimensions (Unit : mm)

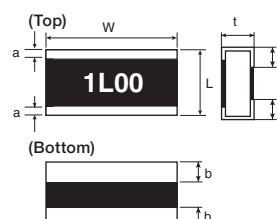
Part No.	Size Code mm(inch)	L	W	t	a	b
PML10	1220(0508)	1.2±0.15	2.0±0.15	0.42±0.15	—	0.45 to 0.3* ±0.2
PML18	1632(0612)	1.6±0.15	3.2±0.15	0.42 to 0.28* ±0.15	—	0.55 to 0.3* ±0.2
PML50	2550(1020)	2.5±0.2	5.0±0.2	0.5 to 0.36* ±0.15	0.4±0.2	0.75 to 0.7* ±0.2
PML100	3264(1225)	3.2±0.25	6.4±0.25	0.5 to 0.36* ±0.15	0.45±0.25	0.9 to 0.7* ±0.25

* Each value range varies with the resistance. Please contact a ROHM sales representative for further details.

● PML10/18



● PML50/100



Part No. Explanation



Part No.

Tolerance

Special Part Code

Nominal Resistance

G	±2%
J	±5%

Resistance code, 3 or 4 digits.	
Tolerance	Resistance code
J	: 3 digits
G	: 4 digits

Resistance Value(Ω)	Tolerance	
	J	G
0.5mΩ	0L5	0L50
1mΩ	1L0	1L00
1.5mΩ	1L5	1L50
2mΩ	2L0	2L00
2.2mΩ	2L2	—
2.5mΩ	2L5	2L50

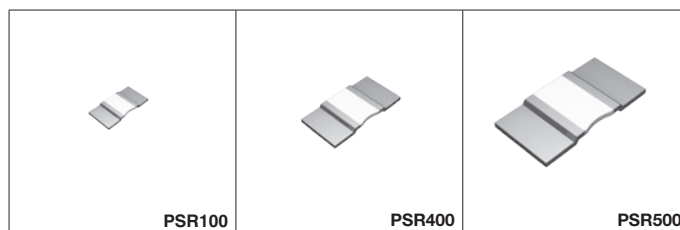
Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J(±5%)	G(±2%)			
PML10	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
PML18	EZP	○	○	Paper tape(4mm Pitch)	φ180mm(7inch)	5,000
PML50	HZP	○	—	Embossed tape(4mm Pitch)	φ180mm(7inch)	2,000
PML100	HZP	○	—	Embossed tape(4mm Pitch)	φ180mm(7inch)	2,000

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
○ : Standard product

Chip Resistors for Current Detection (Metal Plate type) High Power Ultra Low Ohmic Chip Shunt Resistors (PSR series)

- High power 3W to 5W
- Ultra low resistance range (0.1mΩ or more).
- Excellent TCR characteristics
- Convex structure



PSR series							
Part No.	Size Code mm(inch)	Rated Power (70°C)	Tolerance	Temperature* coefficient (ppm/°C)	Resistance Range (mΩ)	Operating Temperature (°C)	Automotive Grade AEC-Q200
	6432 (2512)	3W	F(±1%)	±150	0.3	−55 to +170	YES
				±115	0.5		
				±100	1.0		
				±50	2.0, 3.0		
PSR400	10×5.2 (3921)	4W	F(±1%)	125±50	☆0.2		YES
				±175	0.3, 0.5		
				±75	1.0, 2.0, 3.0		
PSR500	15×7.75 (5931)	5W	F(±1%)	200±50	☆0.1		YES
				±225	0.2		
				±150	0.3, 0.4, 0.5		
				±75	1.0, 2.0		

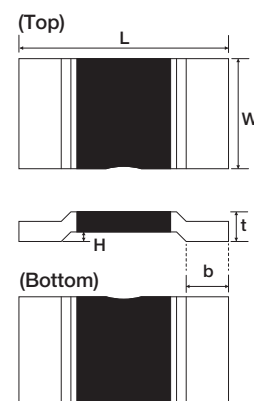
*(+20°C to +125°C)
☆ : Under Development

■ Dimensions (Unit : mm)

Part No.	Resistance	L	W	t	H	b
PSR100	0.3mΩ	6.35±0.15	3.05±0.25	1.45±0.15	0.35±0.15	1.12±0.3
	0.5mΩ			1.15±0.15		
	1.0mΩ			0.75±0.15		
	2.0mΩ			1.00±0.15		
	3.0mΩ			0.75±0.15		
PSR400	☆0.2mΩ	10±0.3	5.2±0.3	1.96±0.15	0.5±0.15	2.0±0.6
	0.3mΩ			1.85±0.15		
	0.5mΩ			1.3±0.15		
	1.0mΩ			0.9±0.15		
	2.0mΩ			1.1±0.15		
PSR500	3.0mΩ	15±0.3	7.75±0.3	0.9±0.15	0.5±0.15	4.0±0.6
	☆0.1mΩ			1.9±0.15		
	0.2mΩ			1.85±0.15		
	0.3mΩ			1.4±0.15		
	0.4mΩ			1.15±0.15		
	0.5mΩ			1.05±0.15		
	1.0mΩ			1.35±0.15		
2.0mΩ	0.9±0.15					

☆ : Under Development

●PSR100/400/500



■Part No. Explanation

P S R 4 0 0 I T Q F

Part No.

Tolerance

Special Part Code

Nominal Resistance

F	1%

B	0.1mΩ
C	0.2mΩ
D	0.3mΩ
E	0.4mΩ
F	0.5mΩ
H	1.0mΩ
J	2.0mΩ
L	3.0mΩ

Resistance code, 4 digits.	
Tolerance	Resistance code
F	: 4 digits

Resistance	F
0.1mΩ	0L10
0.2mΩ	0L20
0.3mΩ	0L30
0.4mΩ	0L40
0.5mΩ	0L50
1.0mΩ	1L00
2.0mΩ	2L00
3.0mΩ	3L00

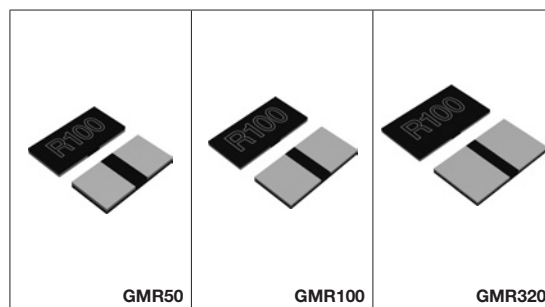
Packaging Specifications Code

Part No.	Code	Tolerance	Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		±(1%)			
PSR100	KTQ	○	Embossed tape(8mm Pitch)	φ330mm(13inch)	5,000
PSR400	ITQ	○	Embossed tape(8mm Pitch)	φ330mm(13inch)	3,000
PSR500	HTQ	○	Embossed tape(12mm Pitch)	φ330mm(13inch)	2,000

Reel(φ330mm) : Compatible with JEITA standard "EIAJ ET-7200B"
 ○ : Standard product

Chip Resistors for Current Detection (Metal Plate type) High Power Low Ohmic Chip Shunt Resistors (GMR series)

- High power (2W to 5W)
- High heat dissipation
- Excellent TCR characteristics
- Low ohmic ($5\text{m}\Omega$ to $220\text{m}\Omega$)



GMR series							
Part No.	Size Code mm(inch)	Rated Power (70°C)	Tolerance	Temperature ^{*1} Coefficient (ppm/°C)	Resistance Range (mΩ)	Operating Temperature (°C)	Automotive Grade AEC-Q200
☆GMR50	5025 (2010)	2W	F(±1%)	0 to +50 ±25	5mΩ 10mΩ to 200mΩ (E6 series ^{*2*3})	-55 to +170	Preparing
New GMR100	6432 (2512)	3W	F(±1%)	0 to +50 ±20	☆5mΩ 10mΩ to 220mΩ (E6 series ^{*2})		YES
☆GMR320	7142 (2817)	5W	F(±1%)	0 to +100 ±25	5mΩ 10mΩ to 100mΩ (E6 series ^{*2*3})		Preparing

^{*1} (+20°C to +60°C)

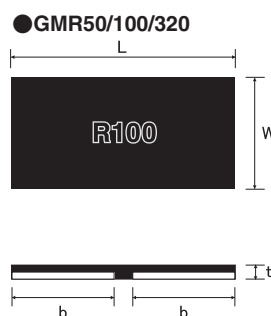
^{*2} Please contact us for another standard nominal resistance values.

^{*3} Development schedule will vary depending on resistance value.

☆ : Under Development (Development schedule will vary depending on resistance value. Please contacts us.)

■ Dimensions (Unit : mm)

Part No.	Size Code mm(inch)	L	W	t	b
GMR50	5025 (2010)	5.00±0.25	2.50±0.25	0.40±0.15	2.05±0.25
GMR100	6432 (2512)	6.40±0.25	3.20±0.25	0.40±0.15	2.75±0.25
GMR320	7142 (2817)	7.10±0.25	4.20±0.25	0.40±0.15	3.10±0.25



■ Part No. Explanation

G M R 1 0 0 H T B F A

Part No.

Special Part Code I

TB	10mΩ to 68mΩ
TC	100mΩ to 220mΩ

Tolerance

F	±1%

Special Part Code II

A	10mΩ, 100mΩ
E	15mΩ, 150mΩ
I	22mΩ, 220mΩ
M	33mΩ
Q	47mΩ
U	68mΩ

Nominal Resistance

Resistance code, 4 digits.

Tolerance	Resistance code
F	: 4 digits

Resistance	F
5mΩ	5L00
10mΩ	10L0
15mΩ	R015
22mΩ	R022
33mΩ	R033
47mΩ	R047
68mΩ	R068
100mΩ	R100
150mΩ	R150
220mΩ	R220

*Product No. of 5mΩ is an exception.
GMR50HTAAFD5L00
GMR100HTAAFD5L00
GMR320HTAAFD5L00

Packaging Specifications Code

Part No.	Code	Tolerance F(±1%)	Packaging Specifications	Reel	Basic Ordering Unit (pcs)
GMR50	H	☆	Embossed tape(4mm Pitch)	φ180mm	2,000
GMR100	H	◎	Embossed tape(8mm Pitch)	φ180mm	2,000
GMR320	H	☆	Embossed tape(8mm Pitch)	φ180mm	2,000

☆ : Under Development

Reel(φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"

◎ : Standard product

Standard Nominal Resistance Values

E3	10				22						47						
E6	10		15		22		33		47		68						
E12	10	12	15	18	22	27	33	39	47	56	68	82					
E24	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47
	51	56	62	68	75	82	91										
E96	100	102	105	107	110	113	115	118	121	124	127	130	133	137	140	143	147
	150	154	158	162	165	169	174	178	182	187	191	196	200	205	210	215	221
	226	232	237	243	249	255	261	267	274	280	287	294	301	309	316	324	332
	340	348	357	365	374	383	392	402	412	422	432	442	453	464	475	487	499
	511	523	536	549	562	576	590	604	619	634	649	665	681	698	715	732	750
	768	787	806	825	845	866	887	909	931	953	976						

Nominal Resistance

Resistors of a series fall into one of nominal resistance ranges shown in the table above. Nominal resistance is determined by the common ratio shown right.

Resistance Coding

Nominal resistance is expressed in 3 digits when the resistance tolerance is $\pm 5\%$ and in 4 digits when $\pm 1\%$.

The leading 2 or 3 digits indicate significant figure while the last digit indicates the number of zeros. The letter R or L denotes the decimal point if necessary.

Ex.1 $22\Omega \rightarrow 22 \times 10^0\Omega \rightarrow 220$ (the last digit indicates the number "0" of a multiplier)

Ex.2 $47k\Omega \rightarrow 47 \times 10^3\Omega \rightarrow 473$ (the last digit indicates the number "3" of a multiplier)

Ex.3 $1.2M\Omega \rightarrow 12 \times 10^5\Omega \rightarrow 125$ (the last digit indicates the number "5" of a multiplier)

Ex.4 $2.7\Omega \rightarrow 2R7$ (the decimal point indicate the letter R/the letter R apply to the low Resistance less than 10Ω)

Ex.5 $1130\Omega \rightarrow 113 \times 10^1\Omega \rightarrow 1131$ (the last digit indicates the number "1" of a multiplier/Resistance Tolerance 1%(F) products)

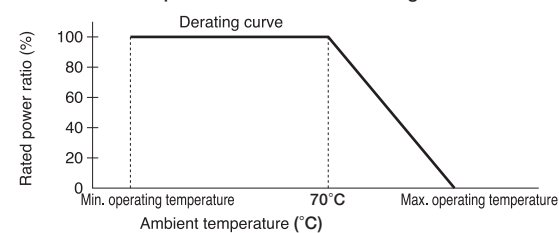
Ex.6 $0.10\Omega \rightarrow R10$

Ex.7 $1m\Omega \rightarrow 1L0$

Series	Common ratio	Remarks
E6	$\sqrt[6]{10} \approx 1.46$	Rounded off to a 2-digit figure.
E12	$\sqrt[12]{10} \approx 1.21$	
E24	$\sqrt[24]{10} \approx 1.10$	
E96	$\sqrt[96]{10} \approx 1.02$	Rounded off to a 3-digit figure.

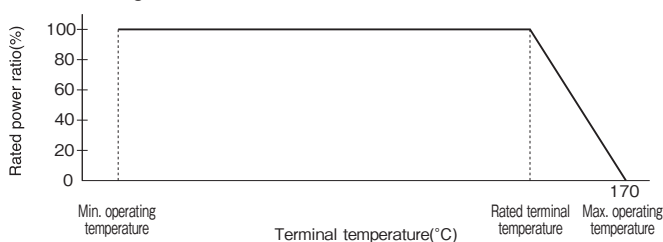
Supplement of Rated Power

When the ambient temperature exceeds the rated ambient temperature, derate the load power based on the derating curve.



(PSR100, GMR100)

When the terminal temperature with load exceeds the rated terminal temperature(PSR100:140°C, GMR100:110°C), derate the load power based on the derating curve.



Supplementary to Notes

* 1 : When resistor is to be exposed to a transient load (excessive large load, such as pulse), mount the resistor on your product and check the condition and evaluate the result. Constant application of a voltage above the rated voltage will degrade the performance and reliability of the resistor.

Do not apply a voltage exceeding the rated voltage across any ROHM resistors.

* 2 : Rated voltage(V) $= \sqrt{\text{rated power(W)} \times \text{nominal resistance}(\Omega)}$ or the limiting element voltage, whichever smaller, is the rated voltage.

For basic guidelines on using resistors, see the technical reports issued by Japan Electronics and Information Technology Industries Association. JEITA RCR-2121A. "Guideline of notabilia for fixed resistors for use in electronic equipment (Safety Application Guide for fixed resistors for use in electronic equipment)"



Passive Devices

Tantalum Capacitors

CONTENTS

Conductive Polymer Capacitors

■ New Bottom Surface Electrode(Extra Large Capacitance) : TCSO series P. D22

M case : 1608-10(0603)size

PS case : 2012-09(0805)Ultra-Low Profile size

PL case : 2012-10(0805)Low Profile size

P case : 2012-12(0805)size

■ Bottom Surface Electrode(Large Capacitance) : TCTO series P. D23,24

U2 case : 1005-064(0402)size P. D23

M case : 1608-09(0603)size P. D23

PL case : 2012-10(0805)Low Profile size P. D23

P case : 2012-12(0805)size P. D23

AS case : 3216-10(1206)Ultra-Low Profile size P. D24

AL case : 3216-12(1206)Low Profile size P. D24

A case : 3216-18(1206)size P. D24

BL case : 3528-12(1411)Low Profile size P. D24

■ Standard : TCO series P. D25

B case : 3528-21(1411)size

Tantalum Capacitors

■ New Bottom Surface Electrode(Extra Large Capacitance) : TCS series P. D26

M case : 1608-10(0603)size

PS case : 2012-09(0805)Ultra-Low Profile size

P case : 2012-12(0805)size

■ Bottom Surface Electrode(Large Capacitance) : TCT, TC series P. D27,28

U case : 1005-055(0402)size P. D27

ML case : 1608-06(0603)Low Profile size P. D27

M case : 1608-09(0603)size P. D27

PL case : 2012-10(0805)Low Profile size P. D28

P case : 2012-12(0805)size P. D28

AS case : 3216-10(1206)Ultra-Low Profile size P. D28

AL case : 3216-12(1206)Low Profile size P. D28

■ Standard : TC series P. D29

P case : 2012-12(0805)size

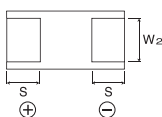
A case : 3216-18(1206)size

Conductive Polymer New Bottom Surface Electrode(Extra Large Capacitance) : TCSO series

- M case : 1608-10(0603)size
 ■ PS case : 2012-09(0805)Ultra-Low Profile size
 ■ PL case : 2012-10(0805)Low Profile size
 ■ P case : 2012-12(0805)size

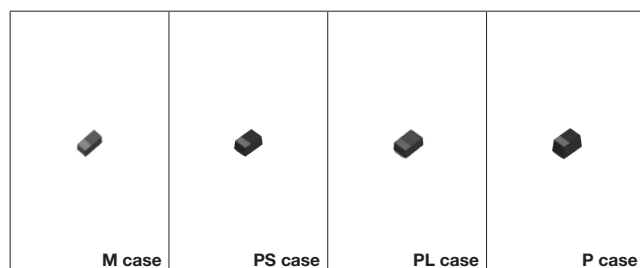
■ Dimensions

Anode mark



(Unit : mm)

Dimensions	Size			
	M case	PS case	PL case	P case
L	1.6+0.2/-0	2.0±0.2	2.0±0.2	2.0±0.2
W ¹	0.85±0.1	1.25±0.2	1.25±0.2	1.25±0.2
W ²	0.55±0.1	0.85±0.2	0.85±0.2	0.85±0.2
H	0.8+0.2/-0	0.8±0.1	0.9±0.1	Max. 1.2
S	0.5±0.1	0.5±0.1	0.5±0.1	0.5±0.1



Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCSO series	M case 1608-10 (0603)size	±20%(M)	-55°C to +105°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +105°C	Max. 15% at 120Hz(25°C)*	Max. 0.1 CV (25°C, 5 min.)	Max. 300mΩ(at 100kHz)*
	PS case 2012-09 (0805)Ultra-Low Profile size					Max. 500mΩ(at 100kHz)*
	PL case 2012-10 (0805)Low Profile size					Max. 500mΩ(at 100kHz)*
	P case 2012-12 (0805)size					Max. 200mΩ(at 100kHz)*

*Spec. values are specified for each parts number.

■ Capacitance Range

- M case : 1608-10(0603)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
10 (106)				☆300
22 (226)			300	
47 (476)			300	

☆:Under Development

- PS case : 2012-09(0805)Ultra-Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)						
	4	6.3	8	10	16	25	35
1 (105)							☆500
2.2 (225)							
4.7 (475)							
10 (106)							
22 (226)				☆200			
47 (476)		150/200	150/200				
100 (107)							

☆:Under Development

- PL case : 2012-10(0805)Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
4.7 (475)						500
10 (106)						
22 (226)			200			
33 (336)			☆200			
47 (476)		150/200				
68 (686)		☆150/☆200				

☆:Under Development

- P case : 2012-12(0805)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	16
10 (106)				
22 (226)				
47 (476)			☆200	
100 (107)				

☆:Under Development

*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Conductive Polymer Bottom Surface Electrode(Large Capacitance) : TCTO series

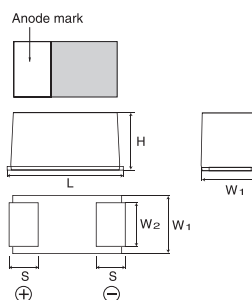
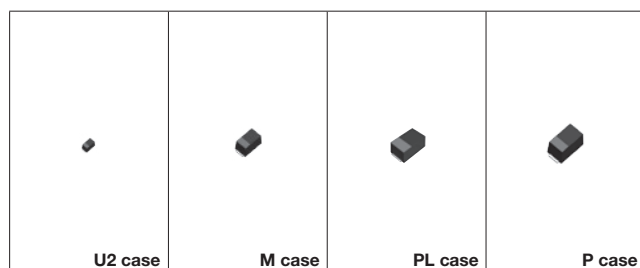
■ U2 case : 1005-064(0402)size

■ M case : 1608-09(0603)size

■ PL case : 2012-10(0805)Low Profile size

■ P case : 2012-12(0805)size

■ Dimensions



(Unit : mm)

Dimensions	Size			
	U2 case	M case	PL case	P case
L	1.0+0.3/-0	1.6±0.1	2.0±0.2	2.0±0.2
W ₁	0.5+0.2/-0	0.85±0.1	1.25±0.2	1.25±0.2
W ₂	0.35±0.1	0.55±0.1	0.85±0.2	0.85±0.2
H	Max. 0.64	0.8±0.1	0.9±0.1	Max. 1.2
S	0.35±0.1	0.5±0.1	0.5±0.2	0.5±0.2

Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCTO series	U2 case 1005-064 (0402)size	±20%(M)	-55°C to +105°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +105°C	Max. 30% at 120Hz(25°C)*	3μA or 0.1CV whichever is greater (25°C, 5 min.)	Max. 700mΩ(at 100kHz)*
	M case 1608-09 (0603)size			Max. 8% at 120Hz(25°C)*	Max. 0.1CV (25°C, 5 min.)	Max. 500mΩ(at 100kHz)*
	PL case 2012-10 (0805)Low Profile size			Max. 15% at 120Hz(25°C)*	3μA or 0.1CV whichever is greater (25°C, 5 min.)	Max. 300mΩ(at 100kHz)*
	P case 2012-12 (0805)size					

*Spec. values are specified for each parts number.

■ Capacitance Range

● U2 case : 1005-064(0402)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
0.47 (474)				
1 (105)				
2.2 (225)				
4.7 (475)			☆700	

☆:Under Development

● M case : 1608-09(0603)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
2.2 (225)				500
3.3 (335)				500
4.7 (475)				500
10 (106)			☆500	

☆:Under Development

● PL case : 2012-10(0805)Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
10 (106)			☆300	
22 (226)			300	
47 (476)				
100 (107)				

☆:Under Development

● P case : 2012-12(0805)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	2.5	4	6.3	10
10 (106)				300
22 (226)				☆300
47 (476)		300		
100 (107)				

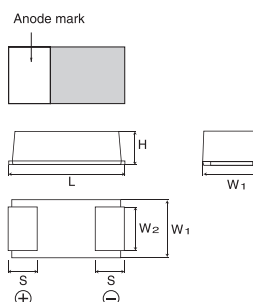
☆:Under Development

*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Conductive Polymer Bottom Surface Electrode(Large Capacitance) : TCTO series

- AS case : 3216-10(1206)Ultra-Low Profile size
- AL case : 3216-12(1206)Low Profile size
- A case : 3216-18(1206)size
- BL case : 3528-12(1411)Low Profile size

■Dimensions



(Unit : mm)

Dimensions	Size			
	AS case	AL case	A case	BL case
L	3.2±0.2	3.2±0.2	3.2±0.2	3.5±0.2
W ¹	1.6±0.2	1.6±0.2	1.6±0.2	2.8±0.2
W ²	1.2±0.2	1.2±0.2	1.2±0.2	2.0±0.2
H	0.9±0.1	1.1±0.1	1.6±0.2	1.1±0.1
S	0.8±0.2	0.8±0.2	0.8±0.2	0.8±0.2

Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCTO series	AS case 3216-10 (1206)Ultra-Low Profile size	±20%(M)	-55°C to +105°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +105°C	Max. 10% at 120Hz(25°C)*	3μA or 0.1CV whichever is greater (25°C, 5 min.)	Max. 200mΩ(at 100kHz)*
	AL case 3216-12 (1206)Low Profile size			Max. 400mΩ(at 100kHz)*		
	A case 3216-18 (1206)size			Max. 15% at 120Hz(25°C)*	Max. 0.1CV (25°C, 5 min.)	Max. 200mΩ(at 100kHz)*
	BL case 3528-12 (1411)Low Profile size				Max. 0.2CV (25°C, 5 min.)	Max. 150mΩ(at 100kHz)*

*Spec. values are specified for each parts number.

■Capacitance Range

- AS case : 3216-10(1206)Ultra-Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	16
22 (226)				
47 (476)		200	100/200	
100 (107)		55/70		

- AL case : 3216-12(1206)Low Profile size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V)				
	4	6.3	10	16	20
22 (226)			200	☆400	☆400
33 (336)			200		
47 (476)		70/200			
100 (107)	200	70/200			

☆:Under Development

- A case : 3216-18(1206)size (ESR : mΩ)

Capacitance (μF)	Rated Voltage(V)			
	2.5	6.3	10	16
10 (106)				☆200
47 (476)			200	
100 (107)		☆35/45/70		
150 (157)		☆35/200		
220 (227)	35			
330 (337)	☆35/☆200			

☆:Under Development

- BL case : 3528-12(1411)Low Profile size

(ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)							
	2	2.5	4	6.3	10	16	25	35
6.8 (685)								150
10 (106)							☆100	☆150
15 (156)							☆100	
22 (226)							☆100	
33 (336)						70		
47 (476)					☆70	☆70		
100 (107)				☆25/☆35				
150 (157)				25/35				
220 (227)				☆25/☆35				
330 (337)		☆15	☆25/☆35/☆45					
470 (477)	☆15							

☆:Under Development

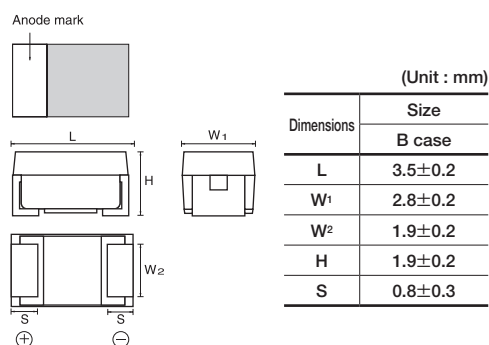
*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Conductive Polymer Standard : TCO series

■ B case : 3528-21(1411)size



■ Dimensions



Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCO series	B case 3528-21 (1411)size	±20%(M)	−55°C to +105°C Rated Voltage at −55°C to +85°C DeRated Voltage at +85°C to +105°C	Max. 15% at 120Hz(25°C)*	Max. 0.1CV (25°C, 5 min.)	Max. 150mΩ(at 100kHz)*

*Spec. values are specified for each parts number.

■ Capacitance Range

● B case : 3528-21(1411)size

(ESR : mΩ)

Capacitance (μF)	Rated Voltage(V.DC)					
	2.5	4	6.3	10	16	25
15 (156)						100
33 (336)				150	100	
47 (476)			70	150		
100 (107)			35/45			
150 (157)			35/45			
220 (227)	35		35/45			
330 (337)	35/45					

New Bottom Surface Electrode(Extra Large Capacitance) : TCS series

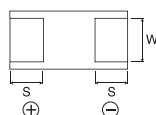
■ M case : 1608-10(0603)size

■ PS case : 2012-09(0805)Ultra-Low Profile size

■ P case : 2012-12(0805)size

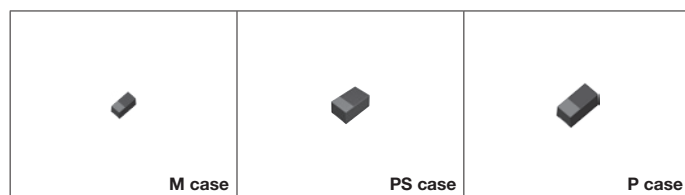
■ Dimensions

Anode mark



(Unit : mm)

Dimensions	Size		
	M case	PS case	P case
L	1.6+0.2/-0	2.0±0.2	2.0±0.2
W ¹	0.85±0.1	1.25±0.2	1.25±0.2
W ²	0.55±0.1	0.85±0.2	0.85±0.2
H	0.8+0.2/-0	Max. 0.9	Max. 1.2
S	0.5±0.1	0.5±0.1	0.5±0.1



Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCS series	M case 1608-10 (0603)size	±20%(M)	-55°C to +125°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +125°C	Max. 40% at 120Hz(25°C)*	Max. 0.2CV (25°C, 5 min.)*	Max. 6.0Ω(at 100kHz)*
	PS case 2012-09 (0805) Ultra-Low Profile size				Max. 0.1CV (25°C, 5 min.)*	
	P case 2012-12 (0805)size					

*Spec. values are specified for each parts number.

■ Capacitance Range

● M case : 1608-10(0603)size

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	16
10 (106)				M
22 (226)			M	
47 (476)		M		
100 (107)	M			

● PS case : 2012-09(0805)Ultra-Low Profile size

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	16
22 (226)				
47 (476)			PS	
100 (107)				
220 (227)				

● P case : 2012-12(0805)size

Capacitance (μF)	Rated Voltage(V.DC)			
	4	6.3	10	20
10 (106)				P
47 (476)			P	
100 (107)		P		
150 (157)		P		
220 (227)	P			

*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

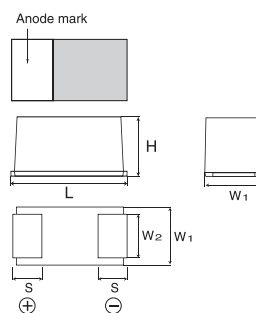
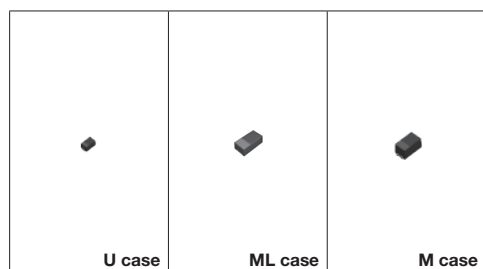
Bottom Surface Electrode(Large Capacitance) : TCT, TC series

■ U case : 1005-055(0402)size

■ ML case : 1608-06(0603)Low Profile size

■ M case : 1608-09(0603)size

■ Dimensions



(Unit : mm)

Dimensions	Size		
	U case	ML case	M case
L	1.0+0.2/-0	1.6±0.1	1.6±0.1
W ₁	0.5+0.2/-0	0.85±0.1	0.85±0.1
W ₂	0.35±0.1	0.55±0.1	0.55±0.1
H	Max. 0.55	0.55±0.1	0.8±0.1
S	0.35±0.1	0.5±0.1	0.5±0.1

Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCT series	U case 1005-055 (0402)size	±10%(K) ±20%(M)	-55°C to +125°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +125°C	Max. 50% at 120Hz(25°C)*	0.5μA or 0.1CV whichever is greater (25°C, 5 min.)*	Max. 35.0Ω(at 100kHz)*
	ML case 1608-06 (0603)Low Profile size	±20%(M)		Max. 30% at 120Hz(25°C)*		Max. 15.0Ω(at 100kHz)*
TC series	M case 1608-09 (0603)size				0.5μA or 0.01CV whichever is greater (25°C, 5 min.)*	

*Spec. values are specified for each parts number.

■ Capacitance Range

● U case : 1005-055(0402)size

Capacitance (μF)	Rated Voltage(V.DC)					
	2.5	4	6.3	10	16	20
0.33 (334)						U
0.47 (474)			U			
1 (105)			U	☆U	☆U	
2.2 (225)			U			
4.7 (475)		U	U			
10 (106)		☆U				
15 (156)	U					

☆:Under Development

● ML case 1608-06(0603)Low Profile size

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
1 (105)						ML
2.2 (225)						
4.7 (475)						
10 (106)						
22 (226)						

● M case : 1608-09(0603)size

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
1 (105)				M		M
2.2 (225)			M	M		
4.7 (475)		M	M			
10 (106)	M	M	M			
22 (226)	M	M				
33 (336)	☆M	M				

☆:Under Development

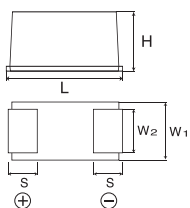
*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Bottom Surface Electrode(Large Capacitance) : TCT series

- PL case : 2012-10(0805)Low Profile size
- P case : 2012-12(0805)size
- AS case : 3216-10(1206)Ultra-Low Profile size
- AL case : 3216-12(1206)Low Profile size

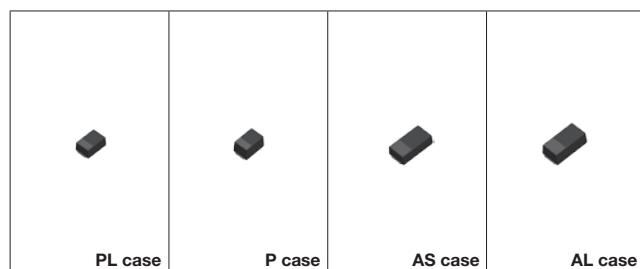
■ Dimensions

Anode mark



(Unit : mm)

Dimensions	Size			
	PL case	P case	AS case	AL case
L	2.0±0.2	2.0±0.2	3.2±0.2	3.2±0.2
W ¹	1.25±0.2	1.25±0.2	1.6±0.2	1.6±0.2
W ²	0.85±0.2	0.85±0.2	1.2±0.2	1.2±0.2
H	0.9±0.1	Max. 1.2	0.9±0.1	1.1±0.1
S	0.5±0.2	0.5±0.2	0.8±0.2	0.8±0.2



Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TCT series	PL case 2012-10 (0805)Low Profile size	±20%(M)	-55°C to +125°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +125°C	Max. 30% at 120Hz(25°C)*	Max. 0.05CV (25°C, 5 min.)*	Max. 8.0Ω (at 100kHz)*
	P case 2012-12 (0805)size					
	AS case 3216-10 (1206)Ultra-Low Profile size					
	AL case 3216-12 (1206)Low Profile size					

*Spec. values are specified for each parts number.

■ Capacitance Range

● PL case : 2012-10(0805)Low Profile size

● P case : 2012-12(0805)size

Capacitance (μF)	Rated Voltage(V.DC)				
	4	6.3	10	16	20
1 (105)					
2.2 (225)					
4.7 (475)					☆PL
10 (106)				PL	
22 (226)			PL		
33 (336)			☆PL		
47 (476)		PL			
100 (107)	PL				

☆:Under Development

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
2.2 (225)						P
4.7 (475)						
10 (106)				P		
22 (226)			P			
33 (336)			P			
47 (476)	P	P	☆P			
100 (107)	P					

☆:Under Development

● AS case : 3216-10(1206)Ultra-Low Profile size

● AL case : 3216-12(1206)Low Profile size

Capacitance (μF)	Rated Voltage(V.DC)						
	4	6.3	10	16	20	25	35
1 (105)							AS
2.2 (225)							☆AS
4.7 (475)						☆AS	
10 (106)					☆AS		
22 (226)				☆AS			
33 (336)			☆AS				
47 (476)		AS	AS				
100 (107)		AS					
220 (227)	AS						

☆:Under Development

Capacitance (μF)	Rated Voltage(V.DC)							
	2.5	4	6.3	10	16	20	25	35
3.3 (335)								AL
4.7 (475)							AL	
10 (106)						AL		
22 (226)					AL	AL		
33 (336)					AL			
47 (476)				AL				
100 (107)			AL	☆AL				
150 (157)			AL					
220 (227)		AL	☆AL					
330 (337)	☆AL							

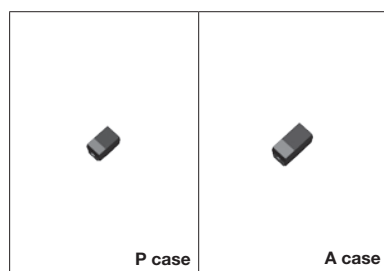
☆:Under Development

*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Standard : TC series

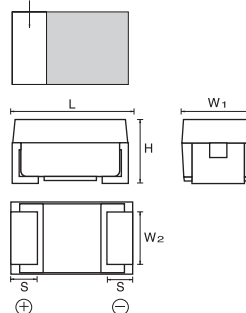
■ P case : 2012-12(0805)size

■ A case : 3216-18(1206)size



Dimensions

Anode mark



(Unit : mm)

Dimensions	Size	
	P case	A case
L	2.0±0.2	3.2±0.2
W ¹	1.25±0.2	1.6±0.2
W ²	0.9±0.2	1.2±0.2
H	Max. 1.2	1.6±0.2
S	0.45±0.3	0.8±0.3

Series Name	Case Name	Capacitance Tolerance	Operating Temperature	Tangent of Loss Angle	Leakage Current	ESR
TC series	P case 2012-12 (0805)size	±20%(M)	-55°C to +125°C Rated Voltage at -55°C to +85°C DeRated Voltage at +85°C to +125°C	Max. 25% at 120Hz(25°C)*	0.5μA or 0.01CV whichever is greater (25°C, 1 min.)*	Max. 17.5Ω(at 100kHz)*
	A case 3216-18 (1206)size			Max. 30% at 120Hz(25°C)*		Max. 8.8Ω(at 100kHz)*

*Spec. values are specified for each parts number.

Capacitance Range

● P case : 2012-12(0805)size

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
1 (105)			P	P		P
2.2 (225)		P	P			
4.7 (475)		P	P			
10 (106)	P		P			
22 (226)	P	P				

● A case : 3216-18(1206)size

Capacitance (μF)	Rated Voltage(V.DC)					
	4	6.3	10	16	20	25
1 (105)					A	A
4.7 (475)				A	A	A
10 (106)			A	A		
22 (226)			A			
47 (476)		A				
100 (107)	A					

*Usage precaution : Based on JEITA Technical Report "EIAJ RCR-2368A"

Part Number Explanation

Conductive Polymer Capacitors

Series Name	Case	Rated Voltage	Capacitance	Capacitance Tolerance	Packaging	Product Specification	ESR	Discrimination Code
TCSO(New Bottom Surface Electrode)	Code Size mm[inch]	Code Rated Voltage (V)	Nominal capacitance (in pF) is denoted by 3 digits : 2 significant figures followed by a 3rd digit representing the number of zeroes (i.e. 226 = 22,000,000pF)	Code Capacitance Tolerance	Code Tape Width Parts Orientation	Code Specifications	Code ESR Max.(mΩ)	Code Specifications
TCTO(Bottom Surface Electrode)	U2 1005-064[0402]	0E 2.5		M ±20%	8R 8mm Positive electrode on the side opposite to sprocket hole	Z ESR sorting product	E 15	1 Usually
TCO(Standard)	M 1608-09[0603]	0G 4				E Halogen-free materials product TCO(B Case)	K 25	Other than 1 Special specifications
	PS 2012-09[0805] Ultra-Low Profile	0J 6.3					N 35	
	PL 2012-10[0805] Low Profile	0K 8					S 45	
	P 2012-12[0805]	1A 10					U 55	
	AS 3216-10[1206] Ultra-Low Profile	1C 16					W 70	
	AL 3216-12[1206] Low Profile	1D 20					B 100	
	A 3216-18[1206]	1E 25					F 150	
	BL 3528-12[1411] Low Profile	1V 35					D 200	
	B 3528-21[1411]						M 300	
							T 500	

Tantalum Capacitors

Series Name	Case	Rated Voltage	Capacitance	Capacitance Tolerance	Packaging	Discrimination Code
TCS (New Bottom Surface Electrode)	Code Size mm[inch]	Code Rated Voltage(V)	Nominal capacitance(pF) is denoted by 3 digits : 2 significant figures followed by a 3rd digit representing the number of zeroes that follow	Code Capacitance Tolerance	Code Tape Width Parts Orientation	
TCT/TCTC(M Case) (Bottom Surface Electrode)	U 1005-055[0402]	0E 2.5		K ±10%	8R 8mm Positive electrode on the side opposite to sprocket hole	
TC(Standard)	ML 1608-06[0603] Low Profile	0G 4		M ±20%		
	M 1608-09[0603]	0J 6.3				
	M 1608-10[0603]	1A 10				
	PS 2012-09[0805] Ultra-Low Profile	1C 16				
	PL 2012-10[0805] Low Profile	1D 20				
	P 2012-12[0805]	1E 25				
	AS 3216-10[1206] Ultra-Low Profile	1V 35				
	AL 3216-12[1206] Low Profile					
	A 3216-18[1206]					

Package Quantity

Conductive Polymer Capacitors

Case(mm[inch])	Series	Package Quantity(pcs)
U2(1005-064[0402])	TCTO	10,000
M(1608-09[0603])	TCTO	4,000
PS(2012-09[0805] Ultra-Low Profile)	TCSO	3,000
PL(2012-10[0805] Low Profile)	TCSO	
P(2012-12[0805])	TCSO/TCTO	
AS(3216-10[1206] Ultra-Low Profile)	TCSO/TCTO	
AL(3216-12[1206] Low Profile)	TCTO	2,000
A(3216-18[1206])	TCTO	
BL(3528-12[1411] Low Profile)	TCTO	3,000
B(3528-21[1411])	TCO	2,000

Tantalum Capacitors

Case(mm[inch])	Series	Package Quantity(pcs)
U(1005-055[0402])	TCT	10,000
ML(1608-065[0603] Low Profile)	TCT	5,000
M(1608-09[0603])	TC	4,000
M(1608-10[0603])	TCS	3,000
PS(2012-09[0805] Ultra-Low Profile)	TCS	
PL(2012-10[0805] Low Profile)	TCT	
P(2012-12[0805])	TCS/TCT/TC	
AS(3216-10[1206] Ultra-Low Profile)	TCT	3,000
AL(3216-12[1206] Low Profile)	TCT	
A(3216-18[1206])	TC	2,000



Opto Devices

LEDs

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ISO/TS 16949-approved



SMD LEDs

ROHM's chip LEDs are designed for automatic surface mount processes and are available in a wide variety of package sizes (from 1.0×0.6mm)

Red(V, U) Quick Reference of Brightness

Package Structure	Package Size (mm)	Height (mm)	Luminous Intensity (cd)	1.0 to 1.6	1.6 to 2.5	2.5 to 4.0	4.0 to 6.3	6.3 to 10	10 to 16	16 to 25	25 to 40	40 to 63	63 to 100	100 to 160	160 to 250	250 to 400	400 to 630	630 to 1000	1000 to 1600	1600 to 2500	2500 to 3120	
Mini-mold	1006	0.2	1	SML-P11VT(R)																		
			5	SML-P11UT(R)																		
			20									☆SML-P15UT(A)*										
	1608	0.36	20								SML-P12VT(R)											
											SML-P12UT(R)											
											SML-P12U2T(R)											
											SML-E12V8W											
											SML-E12U8W											
												☆SML-E12UW										
													SML-D15VW									
													SML-D14VW(A)*									
												SML-D13VW(A)*										
												SML-D12V1W										
												SML-D12V8W										
														SML-D15UW								
														SML-D15U2W								
														SML-D14U2W(A)*								
															SML-D13UW(A)*							
															SML-D13U8W							
															SML-D12U1W							
															SML-D12U8W							
Reflector	20125	0.8	20								SML-H12V8T											
											SML-H12U8T											
											SML-M13VT											
PLCC2	3528	1.9	50													SML-Z14V4T*						
			20														SML-Z14VT(A)*			SML-Z14U4T*		
Side View (mold)	16115	0.55	20								SML-A12V8T											
																	SML-Z14UT(A)*					
Reverse Mount	34125	1.1	10								SML-A12U8T											
																	☆SML-A12UT(J)					
Lens	1608	1.24	20								SML-811VT(A)*											
											SML-811UT(A)*											
																	☆CSL1001VT					
																	CSL0901VT					
	3216	1.85	20														CSL0901UT					
																☆CSL0902VT						
																☆CSL0902UT						
															SML-S13VT							
																	SML-S13UT					

Package Structure	Package Size (mm)	Height (mm)	Luminous Intensity (cd)	4.5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 12	12 to 14	14 to 16	16 to 18	18 to 20	20 to 22	22 to 25
Lens	2924	3.1	20												CSL0701UT
PLCC	3528	1.9	200			☆SML-Y18U2T(C)									

Orange(D) Quick Reference of Brightness

Package Structure	Package Size (mm)	Height (mm)	Luminous Intensity (cd)	1.0 to 1.6	1.6 to 2.5	2.5 to 4.0	4.0 to 6.3	6.3 to 10	10 to 16	16 to 25	25 to 40	40 to 63	63 to 100	100 to 160	160 to 250	250 to 400	400 to 630	630 to 1000	1000 to 1600	1600 to 2800
Mini-mold	1006	0.2	1																	
			5																	
			20										☆SML-P15DT(A)*							
		0.36	20										SML-P12DT(R)							
													☆SML-E12DW							
													SML-E12D8W							
	1608	0.55	20														SML-D15DW			
																	SML-D14DW(A)*			
																	SML-D13DW(A)*			
		0.8	20														SML-D12D8W			
																	SML-D12D1W			
																	SML-H12D8T			
Reflector	20125	0.8	20														SML-M13DT			
PLCC2	3528	1.9	50																	
			20														SML-Z14D4T*			
Side View (mold)	16115	0.55	20										SML-A12D8T							
Reverse Mount	34125	1.1	10										☆SML-A12DT(J)							
Lens	1608	1.24	20																	
																	CSL0901DT			
																	☆CSL0902DT			
	3216	1.85																		SML-S13DT

Package Structure	Package Size (mm)	Height (mm)	Luminous Intensity (cd)	6 to 7	7 to 8	8 to 9	9 to 10	10 to 12	12 to 14	14 to 16	16 to 18	18 to 20	20 to 22	22 to 24	24 to 27	27 to 30	30 to 33	33 to 36	36 to 40	40 to 45	45 to 56
Lens	2924	3.1	20																		CSL0701DT

※:Please note that the brightness of some products may fall between ranks (half rank).

※:Brightness on specification sheet include tolerance of within ±10%. Note: Please be sure to refer the specifications about the rank.

☆:Under Development

Yellow(Y, W) Quick Reference of Brightness

Package Structure	Package Size (mm)	Height (mm)	Luminous Intensity (mcd)	1.0 to 1.6	1.6 to 2.5	2.5 to 4.0	4.0 to 6.3	6.3 to 10	10 to 16	16 to 25	25 to 40	40 to 63	63 to 100	100 to 160	160 to 250	250 to 400	400 to 630	630 to 1000	1000 to 1600	1600 to 2800
Mini-mold	1006	0.2	1				SML-P11YT(R)						SML-P12YT(R)							
			20									SML-P12Y3T(R)								
	1608	0.55	20									SML-P12WT(R)								
			2			SML-D11YW						SML-E12Y8W								
						SML-D12W8W(A)*														
															SML-D15YW					
															SML-D14YW(A)*					
															SML-D14WW(A)*					
															SML-D13WW(A)*					
															SML-D13Y8W					
												SML-D13Y2W								
												SML-D12Y3W								
												SML-D12Y1W								
												SML-D12Y8W								
Reflector	20125	0.8	20										SML-H12Y8T							
PLCC2	3528	1.9	50											SML-M13YT				SML-Z14Y4T*		
			20											SML-Z14YT(A)*						
Side View (mold)	16115	0.55	20									SML-A12Y8T								
												SML-A12WT(J)								
Reverse Mount	34125	1.1	10							SML-811WT(A)*							SML-A15YT			
Lens	1608	1.06	20												☆CSL1001YT					
													CSL0901YT							
													CSL0901WT							
															☆CSL0902YT					
	3216	1.85													☆CSL0902WT					
																	SML-S13YT			

Yellow Green(M), Green(P, F) Quick Reference of Brightness

Package Structure	Package Size (mm)	Height (mm)	Luminous Intensity (mcd)	0.63 to 1.0	1.0 to 1.6	1.6 to 2.5	2.5 to 4.0	4.0 to 6.3	6.3 to 10	10 to 16	16 to 25	25 to 40	40 to 63	63 to 100	100 to 160	160 to 250	250 to 400	400 to 630	630 to 1000	1000 to 1800	1800 to 2500
Mini-mold	1006	0.2	1		SML-P11MT(R)						SML-P12M2T(R)										
	20								SML-P12MT(R)												
	1608	0.36	20				SML-P13PT(R)			SML-P13FT(R)											
	SML-E12P8W				SML-E12M8W																
					SML-D15MW																
					SML-D14MW(A)*																
					SML-D13MW(A)*																
					SML-D13FW																
					SML-D13M8W																
					SML-D12P8W																
Reflector	20125	0.8	20				SML-D12M1W														
				SML-D12M8W																	
				SML-D12FW																	
				SML-D12M8T																	
				SML-H12P8T																	
PLCC2	3528	1.9	50							SML-M13PT		SML-M13MT					SMLMN2PB1CW(C)				
			20									SML-Z14P4T*		SML-Z14M4T*							
Side View (mold)	16115	0.55	20																		
Reverse Mount	34125	1.1	20				SML-A12P8T														
Lens	1608	1.06	20								SML-812MT										
		1.24																			
				1.85																	

Green(E)/Blue Green(E2, E3) Quick Reference of Brightness

Package Structure	Package Size (mm)	Height (mm)	Luminous Intensity (mcd)	9.0 to 14	14 to 22	22 to 36	36 to 56	56 to 90	90 to 140	140 to 220	220 to 360	360 to 560	560 to 900	900 to 1400	1400 to 2200	2200 to 3600	3600 to 5600
Mini-mold	1006	0.2	5					SMLP13EC8T									
	1608	0.36	5					SMLE13EC8T									
				SMLD12EN1W													
		0.55		SMLD12E2N1W													
				SMLD12E3N1W													
	1.06						CSL1001ET										
Reflector	20125	0.8	5					☆SMLM22EN1T(C)									
					SMLMN2ECT(C)												
PLCC2	3528	1.9	20											SMLZ24E2N3T			
Side View(mold)	16115	0.55	5				SMLA12EC6T							SMLZ14EGT(A)*			
	3216	1.85															
Lens	1608	1.24	20								☆CSL0901ET					SMLS14EET	
												CSL 0902ET					

*Please note that the brightness of some products may fall between ranks (half rank).

*:Brightness on specification sheet include tolerance of within $\pm 10\%$. Note: Please be sure to refer the specifications about the rank.

☆:Under Development



SMD LEDs

Blue(B) Quick Reference of Brightness

Package Structure	Package Size (mm)	Height (mm)	Ir (mA)	Luminous Intensity (mcd)	0.9 to 1.4	1.4 to 2.2	2.2 to 3.6	3.6 to 5.6	5.6 to 9.0	9 to 14	14 to 22	22 to 36	36 to 56	56 to 90	90 to 140	140 to 220	220 to 360	360 to 560	560 to 900	900 to 1400
Mini-mold	1006	0.2	5								SMLP13BC8T									
		0.36									SMLN3BC8T									
	1608	0.55	5								SMLD12BN1W									
		1.06		1				CSL1001BT												
Reflector	1608	0.55	5											CSL1101SBAW1(C)						
	20125	0.8	5								☆SMLM22BN1T(C)			SMLMN2SB1CW(C)						
PLCC2	3528	1.9	20													SMLZ14BGT(A)*				
																SMLZ24BN3T				
Side View(mold)	16115	0.55	5													SMLZ14BGT(A)*				
Reverse Mount	34125	1.1	20								SMLA13BC8T					SML812BCT				
Lens	3216	1.85	20															SMLS14BET		
	1608	1.24	5										☆CSL0901BT							
			20													CSL0902BT				

White(WB) Quick Reference of Brightness

Package Structure	Package Size (mm)	Height (mm)	Ir (mA)	Luminous Intensity (mcd)	9 to 14	14 to 22	22 to 36	36 to 56	56 to 90	90 to 140	140 to 220	220 to 360	360 to 560	560 to 900	900 to 1100	1100 to 1400	1400 to 1800	1800 to 2200	2200 to 2800	2800 to 3600	3600 to 7000	7000 to 8500
Mini-mold	1006	0.2	5							SMLP13WBC9W												
		0.36								SCMP13WBC8W												
	1608	0.55	5							SMLN3WBC8W												
		0.55								☆SMLD12WBN1W												
Side View	16115	0.55	5					SMLA12WBC7W														
(Reflector)	2812	0.8	20														CSL0406WBCW					
Reverse Mount	34125	1.1	5					SML813WBC8W														
Reflector	1608	0.55	5							☆CSL1101WBCW1(C)												
	20125	0.8	5							☆SMLM22WBN1CW1T(C)				☆SMLMN3WB2ZW(C)								
										SMLMN2WB1CW(C)												
	3528	1.9	20															SMLZ14WBGUW(A)*				
																		☆SMLZ24WBN3WT				

Package Structure	Package Size (mm)	Height (mm)	Luminous Intensity cd Ir(mA)	2.2 to 2.8	2.8 to 3.3	3.3 to 4.0	4.0 to 4.8	4.8 to 5.8	5.8 to 7.0	7.0 to 8.5	8.5 to 10.2	10.2 to 12.3	12.3 to 14.8	14.8 to 19	19 to 21.8	21.8 to 24.5	24.5 to 27.2	27.2 to 29.3	29.3 to 32.6	32.6 to 35.4
Reflector	4520	0.6	90					SMLK18WBJCW												
								SMLK18WBJDW												
								SMLK28WBJCW												

2 Colors Quick Reference of Brightness

Package Structure	Package Size (mm)	Height (mm)	Ir (mA)	Luminous Intensity (mcd)	4.0 to 6.3	6.3 to 10	10 to 16	16 to 25	25 to 40	40 to 63	63 to 100	100 to 160
Mini-mold	1010	0.2	20	Red								
				Yellow Green								
		5	5	Red								
				Blue								
	1315	0.6	20	Red								
				Yellow Green								
				Red								
				Yellow Green								
				Red								
				Yellow Green								
				Orange								
				Yellow Green								
	1608	0.55	5	Yellow Green								
				Yellow								
				Yellow Green								
				Red								
Reverse Mount	34125	1.1	20	Yellow Green								
				Red								
				Yellow Green								
				Red								

*:Please note that the brightness of some products may fall between ranks (half rank).

※:Brightness on specification sheet include tolerance of within ±10%. Note: Please be sure to refer the specifications about the rank.

☆:Under Development

3 Colors Quick Reference of Brightness

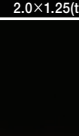
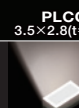
Package Structure	Package Size (mm)	Height (mm)	If (mA)	Luminous Intensity (mcd) Emitting Color	5.6 to 9.0	9.0 to 14	14 to 22	22 to 36	36 to 56	56 to 90	90 to 140	140 to 220	220 to 360	360 to 560	560 to 900	900 to 1400	1400 to 1800		
Mini-mold	1010	0.2	5	Red															
				Green					SMLP34RGB2W										
				Blue															
				Red															
	1510	0.2	5	Green					SMLP36RGB2W(R)										
Reflector	1816	0.5	20	Red															
				Green															
				Blue															
				Red															
	3528	0.6		Green															
				Blue															
				Red															
				Green															
				Blue															
				Red															
				Green															
				Blue															
				Red															
				Green															
				Blue															
				Red															
				Side View (Reflector)	6922	2.15	20	Red											
Green																			
Blue																			
Red																			
Green																			
2910	1.35	Blue																	
		Red																	
		Green																	
		Blue																	
		Red																	

SMD LEDs

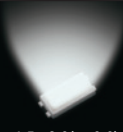
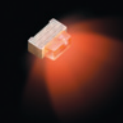
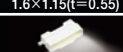
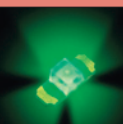
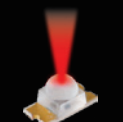
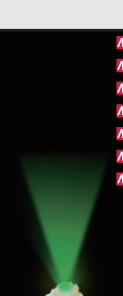
(PICOLED™)																			
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)						Electrical and Optical Characteristics(Ta=25°C)										Automotive Grade AEC-Q101
			Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	V _R (V)	Dominant Wavelength λ _D / Chromaticity Coordinates(x, y)		Luminous Intensity I _v					
									Typ. (V)	I _F (mA)	Max. (μA)		Typ.* (nm)	I _F (mA)	Min. (mcd)	Typ. (mcd)	Max. (mcd)	I _F (mA)	
	SML-P11VT(R)	Red	50						1.8				626		2	4	6		
	SML-P11UT(R)	Red											621		1	3			
	SML-P11DT(R)	Orange	52	20	100*2	5	-40 to +85	-40 to +100	1	10	5		605	1	4	7	16	1	—
	SML-P11YT(R)	Yellow							1.9				586			8			
	SML-P11MT(R)	Yellow Green	54										569		1	2	4		
	SML-P12VT(R)	Red	50						2.0				630		25	60	100		
	SML-P12UT(R)	Red											620		40	85	160		
	SML-P12U2T(R)	Orange											615		25	70			
	SML-P12DT(R)	Orange											605		63	100	250		
	SML-P12Y3T(R)	Yellow	52	20	100*2				2.1	20	10		596		40	90			
	SML-P12YT(R)	Yellow											590	20	40	100	160	20	—
	SML-P12WT(R)	Yellow											585		25	70			
	SML-P12Y2T(R)	Yellow											580		16	50	100		
	SML-P12M2T(R)	Yellow Green	54			5	-40 to +85	-40 to +100	2.2			5	576		10	25	63		
	SML-P12MT(R)	Yellow Green											572						
	SML-P13FT(R)	Green	52						2.1				566		6	18	40		
	SML-P13PT(R)	Green											560		4	10	16		
	SMLP13EC8T	Blue	34						3.0				527		56	110	220		
	SMLP13BC8T	Blue											470		9	25	56		
	SCMP13WBC8W	White	33	10	50*2				2.9	5	100		(x, y)(0.30, 0.30)	5	90	150	360	5	—
	SMLP13WBC9W	White											(x, y)(0.29, 0.28)		56				
	☆SML-P15UT(A)	Red	36	15	100*2	5	-40 to +85	-40 to +100	1.9	5	10	5	620		5	(45)	(80)	(112)	5
☆SML-P15DT(A)	Orange							2.0				604		5	(56)	(105)	(180)		
(Mold type(1608))																			
	SML-E12UW	Red	62	25	60*1		-30 to +85	-40 to +85	2.0				624		36	85	280		
	SML-E12DW	Orange											607		56	150	450		
	SML-E12V8W	Red											630		16	40	100		
	SML-E12U8W	Red								20			620	20	25	63	160	20	
	SML-E12D8W	Orange	54						2.2		10	5	605		40	100	250		—
	SML-E12Y8W	Yellow		20	100*2	5	-40 to +85	-40 to +100					590		25	63	160		
	SML-E12M8W	Yellow Green											572		10	25	63		
	SML-E12P8W	Green											560		3	6	16		
	SML-E13EC8T	Blue	68						3.0				527		56	120	360		
	SML-E13BC8T	Blue	66						2.9	5			470	5	14	40	90	5	
SML-E12W8W(A)	White	33	10	50*2								(x, y)(0.30, 0.30)		56	120	220			
	SML-D11YW	Yellow	67	25	100*2	5	-40 to +85	-40 to +100	1.9	2	10	5	588	2	2	4	6	2	—
	SML-D12W8W(A)	Yellow	52	20		12	-40 to +100	-40 to +100	2.0		12				5	7	9		YES
	SML-D12V1W	Red											630		25	40	63		
	SML-D12U1W	Red											620		40	63	100		
	SML-D12D1W	Orange	54	20	100*2	5	-40 to +85	-40 to +100	2.2	20	10	5	605	20	63	100	160	20	—
	SML-D12Y1W	Yellow											590						
	SML-D12M1W	Yellow Green											572		16	30	63		
	SML-D12V8W	Red					-40 to +85	-40 to +85					630		16	40	100		
	SML-D12U8W	Red											620		25	63	160		
	SML-D12D8W	Orange											605		40	100	250		YES
	SML-D12Y8W	Yellow	54	20			-40 to +85	-40 to +85	2.2	20			590	20	25	63	160	20	—
	SML-D12Y3W	Yellow											581		16	40	100		—
	SML-D12M8W	Yellow Green											572		10	25	63		
	SML-D12P8W	Green			100*2	5		-40 to +100			10	5	560		3	6	16		YES
	SML-D12FW	Green	67	25									565		14	18	28		—
	New SMLD12EN1W	Blue Green	70						3.0				527			140	220		
	New SMLD12E2N1W	Blue Green											505		56	120			
	New SMLD12E3N1W	Blue	66	20			-40 to +100	-40 to +100	2.9	5			496	5	85	140		5	YES
	New SMLD12BN1W	Blue											470		14	40	56		
	New SMLD12WBN1W	White											(x, y)(0.295, 0.280)		56	120	220		
	SML-D13VW(A)	Red	72	30					2.0				630		36	55	90		
	SML-D13UW(A)	Red											620		56	85	140		
	SML-D13DW(A)	Orange					-40 to +100	-40 to +100					605		71	120	180		YES
SML-D13WW(A)	Yellow	75										587			110				
SML-D13MW(A)	Yellow Green			100*2	5		-40 to +100	2.1	20	10	5	571	20	28	45	71	20		
SML-D13U8W	Red	52	20									620		40	70				
SML-D13Y8W	Yellow	54						2.2				590		63	100	160		—	
SML-D13Y2W	Yellow	78	30			-40 to +85	-40 to +85	2.1				581		40	80				
SML-D13M8W	Yellow Green	54	20					2.2				572		16	30	63			
SML-D13FW	Green	81	30					2.1				565		18	22	36		YES	
SML-D14VW(A)	Red	72										630		71	100	180			
SML-D14U2W(A)	Red							2.0				615		90	160	224			
SML-D14DW(A)	Orange											605							
SML-D14YW(A)	Yellow	75	30	100*2	5	-40 to +100	-40 to +100		20	10	5	590		112	200		280	20	YES
SML-D14WW(A)	Yellow							2.1				587			180				
SML-D14MW(A)	Yellow Green											571		36	60	90			
SML-D15VW	Red											630		71	90	112			
SML-D15UW	Red	84						2.0				620		90	112	140			
SML-D15U2W	Red											615		112	140	180			
SML-D15DW	Orange		35	100*2	5	-40 to +100	-40 to +100		20	10	5	605	20	180	224	280	20	YES	
SML-D15YW	Yellow											590							
SML-D15MW	Yellow Green	87						2.1				571		56	71	90			

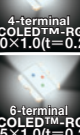
*1 : Duty1/5, 200Hz *2 : Duty1/10, 1kHz *3 : Duty≤1/20, 1ms *4 : Duty≤1/5, 1kHz *5 : Duty1/10, pulse width 10ms Max.
 * : Brightness for white color is noted with chromaticity coordinate(x, y).
 Notes1 : "PICOLED™" is a pending trademarks of ROHM Co., Ltd. () : Reference ☆ : Under Development

SMD LEDs

(Mold type(1608))																								
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)						Electrical and Optical Characteristics(Ta=25°C)								Automotive Grade AEC-Q101							
			Power Dissipation Pd (mW)	Forward Current If (mA)	Peak Forward Current Ifp (mA)	Reverse Voltage Vr (V)	Operating Temperature Topr (°C)	Storage Temperature Tstg (°C)	Forward Voltage Vf (V)	Reverse Current Ir (μA)	Dominant Wavelength λd		Luminous Intensity Iv											
	New CSL0901VT	Red	62.5	25	100 ⁺²	12	-40 to +100	-40 to +100	2.1	20	12	630	20	112	180	355	YES							
	New CSL0901UT	Orange										620		140	280	450								
	New CSL0901DT	Yellow										605		224	400	710								
	New CSL0901YT	Yellow Green										590		320	560	20								
	New CSL0901WT	Yellow Green	70	20	5	5	-40 to +100	-40 to +100	2.1	20	12	587	180	280	560	YES								
	New CSL0901MT	Green										571	56	100	180									
	New CSL0901PT	Blue										560	14	30	45									
	☆CSL0901ET	Red										(527)	(220)	(360)	(560)									
	☆CSL0901BT	Orange	87	35	100 ⁺²	12	-40 to +100	-40 to +100	2.1	20	12	(470)	(36)	(56)	(90)	(YES)								
	☆CSL0902VT	Yellow										(630)	(140)	(250)	(450)									
	☆CSL0902UT	Yellow Green										(620)	(180)	(350)	(560)									
	☆CSL0902DT	Green										(605)	(355)	(560)	(1,120)									
	☆CSL0902YT	Yellow	95	25	5	5	-40 to +100	-40 to +100	2.1	20	12	(590)	(280)	(500)	(900)	YES								
	☆CSL0902WT	Yellow Green										(587)	(224)	(400)	(710)									
	☆CSL0902MT	Green										(571)	(71)	(140)	(280)									
	☆CSL0902PT	Blue										(560)	(28)	(45)	(90)									
New CSL0902ET	Red	33	10	50 ⁺²	5	-40 to +100	-40 to +100	2.1	20	12	527	710	1,100	1,800	YES									
New CSL0902BT	Orange										(470)	220	360	560										
☆CSL1001VT	Yellow										630	(71)	(112)	(180)										
☆CSL1001YT	Yellow Green										590	(112)	(180)	(280)										
	☆CSL1001MT	Green	33	10	50 ⁺²	5	-40 to +100	-40 to +100	2.1	20	12	571	(36)	(56)	(90)	YES								
	New CSL1001ET	Red										527	90	140	224									
	New CSL1001BT	Orange										(470)	4	6	9									
(Mold type (20125))																								
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)						Electrical and Optical Characteristics(Ta=25°C)								Automotive Grade AEC-Q101							
			Power Dissipation Pd (mW)	Forward Current If (mA)	Peak Forward Current Ifp (mA)	Reverse Voltage Vr (V)	Operating Temperature Topr (°C)	Storage Temperature Tstg (°C)	Forward Voltage Vf (V)	Reverse Current Ir (μA)	Dominant Wavelength λd/ Chromaticity Coordinates(x, y)		Luminous Intensity Iv											
	SML-H12V8T	Red	54	20	100 ⁺²	5	-40 to +85	-40 to +100	2.2	20	10	630	20	16	25	63	YES							
	SML-H12U8T	Orange										620		25	40	100								
	SML-H12D8T	Yellow										605		40	63	160								
	SML-H12Y8T	Yellow Green										590		10	25	40								
	SML-H12M8T	Green										572		10	25	40								
	SML-H12P8T	Blue										560		3	4	10								
	SML-M13VT	Red	75	30	100 ⁺²	5	-40 to +85	-40 to +100	2.0	20	5	630	20	40	75	100	—							
	SML-M13UT	Orange										620		63	120	160								
	SML-M13DT	Yellow										605		100	160	250								
	SML-M13YT	Yellow Green										590		25	45	100								
	SML-M13MT	Green	81	20	100 ⁺²	5	-40 to +85	-40 to +100	2.2	10	5	572	6	16	25	YES								
	SML-M13PT	Blue										560	14	25	40									
	SMLMN2ECT(C)	Red										527	56	140	360									
	SMLMN2BCT(C)	Orange										470	14	36	90									
	New SMLMN2PB1CW(C)	Yellow	68	20	100 ⁺²	12	-40 to +100	-40 to +100	2.9	5	12	(x, y)(0.42, 0.55)	140	210	280	YES								
	New SMLMN2SB1AW(C)	Yellow Green										(x, y)(0.195, 0.187)	71	90	140									
	SMLMN2WB1CW(C)	Green										(x, y)(0.30, 0.28)	56	140	220									
	☆SMLM22EN1T(C)	Blue										527	(56)	(140)	(360)									
	☆SMLM22BN1T(C)	Orange	68	30	100 ⁺²	12	-40 to +85	-40 to +100	2.9	10	5	470	(14)	(36)	(90)	(YES)								
	☆SMLM22WB1CW1T(C)	Yellow Green										(x, y)(0.30, 0.28)	(56)	(140)	(220)									
	☆SMLMN3WB2ZW(C)	Green										(x, y)(0.28, 0.30)	(180)	(280)	(360)									
		SML-Z14V4T	Red	189	70	200 ⁺²	12	-40 to +100	-40 to +100	2.0	50	12	630	50	140	280	560	—						
SML-Z14U4T		Orange	620										280		560	1,120								
SML-Z14D4T		Yellow	605										355		710	1,400								
SML-Z14Y4T		Yellow Green	590										112		224	450								
SML-Z14M4T		Green	572										56		120	180								
SML-Z14F4T		Blue	168	30	100 ⁺²	12	-40 to +85	-40 to +100	2.1	20	12	561	22	56	90	YES								
SML-Z14P4T		Red										630	56	112	180									
SML-Z14VT(A)		Orange										620	112	224	355									
SML-Z14UT(A)		Yellow										605	140	280	450									
SML-Z14DT(A)		Yellow Green	175	30	100 ⁺²	12	-40 to +85	-40 to +100	2.0	20	12	589	45	90	140	YES								
SML-Z14YT(A)		Green										571	22	45	71									
SML-Z14FT(A)		Blue										564	11	22	36									
SMLZ14EGT(A)		Red										560	710	1,100	1,800									
SMLZ14BGT(A)		Orange	120	30	100 ⁺²	12	-40 to +85	-40 to +100	3.4	20	5	528	140	280	450	—								
SMLZ14BGT(A)		Yellow										470	280	560	1,120									
SMLZN4WBGUW(A)		Yellow Green										(x, y)(0.30, 0.28)	1,800	2,400	3,600									
New SMLZ24E2N3T	Green	505										900	1,140	1,800										
	New SMLZ24BN3T	Blue	114	30	100 ⁺²	0.5	-40 to +85	-40 to +100	3.2	—	—	470	220	300	450	YES								
	☆SMLZ24WBN3WT	White																						
	☆SML-Y18U2T(C)	Red	600	(200)	1,000 ⁺²	—	-40 to +100	-40 to +100	—	140	—	618	140	(4,500)	—	(9,000)	140	—						
	☆CSL1101SBAW1(C)	Blue	68	(20)	100 ⁺²	12	-40 to +100	-40 to +100	2.9	5	10	12	(x, y)(0.185, 0.170)	5	(56)	(90)	(140)	5	(YES)					
	☆CSL1101WBCW1(C)	White											(x, y)(0.30, 0.28)		(71)	(120)	(180)							

SMD LEDs

(Reflector(High Power) type)																					
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)						Electrical and Optical Characteristics(Ta=25°C)										Automotive Grade AEC-Q101		
			Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	Max. V _R (V)	Chromaticity Coordinates*		Luminous Intensity I _v							
 4.5×2.0(t=0.6)	SMLK18WBJCW	White	675	150	230*5	5	-40 to +100	-40 to +100	3.9	90	10	5	(0.30, 0.28)	90	4,800	5,900	8,500	90	21	—	
	SMLK18WBJDW												(0.34, 0.34)			6,000			22		90
	SMLK28WBJCW												(0.30, 0.28)			5,900			21		
(Side View type)																					
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings (Ta=25°C)						Electrical and Optical Characteristics(Ta=25°C)										Automotive Grade AEC-Q101		
			Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	Max. V _R (V)	Dominant Wavelength λ _D / Chromaticity Coordinates(x, y)		Luminous Intensity I _v							
 1.6×1.15(t=0.55)	SML-A12V8T	Red	54	20	100*2	5	-40 to +85	-40 to +100	2.2	20	10	5	630	20	16	40	100	20	—		
	SML-A12U8T	Orange											620		25	63	160				
	SML-A12D8T	Yellow											605		40	100	250				
	SML-A12Y8T	Yellow Green											590		25	63	160				
	SML-A12M8T	Green	75	30	100*2	5	-40 to +85	-40 to +100	2.0	10	5	572	20	10	25	63	20	—			
	SML-A12P8T	Red										560		3	6	16					
	SML-A12UT(J)	Orange										624		36	100	280					
	SML-A12DT(J)	Yellow										606		36	100	280					
	SML-A12WT(J)	Yellow Green	65	25	100	5	-30 to +85	-40 to +85	2.1	100	5	570	20	14	40	110	20	—			
	SML-A15YT	Yellow	87	35								590		180	—	280					
	SMLA12EC6T	Green	68	20								527		56	140	5					
	SMLA13BC8T	Blue	66	20								470		36	56	5					
	SMLA12WBC7W	White	33	10	50*2	5	-40 to +85	-40 to +100	2.9	5	10	(x, y)(0.30, 0.30)	56	140	—	—	—				
	 2.8×1.2(t=0.8)	CSL0406WBCW	White	117	30	100*2	5	-40 to +85	-40 to +100	3.2	20	50	5	(x, y)(0.30, 0.28)	20	1,400	2,200	3,600	20	—	
(Reverse Mount Available type)																					
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings (Ta=25°C)						Electrical and Optical Characteristics(Ta=25°C)										Automotive Grade AEC-Q101		
			Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	Max. V _R (V)	Dominant Wavelength λ _D		Luminous Intensity I _v							
 Mold type 3.4×1.25(t=1.1)	SML-811VT(A)	Red	62	25	100*2	5	-40 to +85	-40 to +100	2.0	10	100	5	630	10	11	22	45	10	YES		
	SML-811UT(A)	Orange											620		25	63	160				
	SML-811DT(A)	Yellow											605		40	100	250				
	SML-811WT(A)	Yellow Green											590		25	63	160				
	SML-812MT	Blue	65	20	60*1	4	-30 to +85	-40 to +85	2.1	20	4	571	20	14	40	110	20	—			
	SML812BCT	Blue	80	20	100*2	5	-40 to +85	-40 to +100	3.3	20	5	470	20	56	140	20	—				
	SML813WBC8W	White	33	10	50*2	5	-40 to +85	-40 to +100	2.9	5	10	(x, y)(0.30, 0.30)	5	22	45	90	5	—			
	 Surface Mount Circular type 3.2×1.6(t=1.85)	SML-S13VT	Red	75	30	100*2	5	-40 to +85	-40 to +100	1.9	20	10	5	630	20	160	450	630	20	—	
SML-S13UT		Orange	620											400		700	1600				
SML-S13DT		Yellow	605											630		1,400	2,500				
SML-S13YT		Yellow Green	590											160		400	630				
SML-S13MT		Green	78	20	100	5	-40 to +85	-40 to +100	2.0	20	10	5	572	20	63	160	400	20	—		
SML-S13PT		Blue	560	63									160		400						
SMLS14EET		Yellow Green	527	1,800									3,000		4,500						
SMLS14BET		Blue	470	450									800		1,400						
 2 Color type 3.4×1.25(t=1.1)	SML-822MV8W	Yellow Green	54	20	100*2	5	-40 to +85	-40 to +100	2.2	20	100	5	572	20	16	25	40	20	—		
	SML-822MV8W	Red											630		30	63					
	SML-825MVW	Yellow Green											80		30	572	40			63	100
	SML-825MVW	Red											2.0		630						
(Surface Mount Circular type)																					
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings (Ta=25°C)						Electrical and Optical Characteristics(Ta=25°C)										Automotive Grade AEC-Q101		
			Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	Max. V _R (V)	Dominant Wavelength λ _D		Luminous Intensity I _v							
 1.6×0.8(t=1.24)	New CSL0901VT	Red	62.5	25	100*2	12	-40 to +100	-40 to +100	2.1	20	10	12	630	20	112	180	355	20	YES		
	New CSL0901UT	Orange											620		140	280	450				
	New CSL0901DT	Yellow											605		224	400	710				
	New CSL0901YT	Yellow Green											590		180	320	560				
	New CSL0901WT	Green	70	20	100	5	-40 to +100	-40 to +100	3.0	5	5	571	20	56	100	180	20	—			
	New CSL0901MT	Blue	572	14								30		45							
	☆CSL0901ET	Red	3.0	5								(527)		(220)	(360)	(560)			5	(YES)	
	☆CSL0901BT	Orange	2.9	5								(470)		(36)	(56)	(90)			5	(YES)	
	☆CSL0902VT	Yellow	87	35	100*2	12	-40 to +100	-40 to +100	2.1	20	10	12	(630)	20	(140)	(250)	(450)	20	(YES)		
	☆CSL0902UT	Yellow Green											(620)		(180)	(350)	(560)				
	☆CSL0902DT	Green											(605)		(355)	(560)	(1,120)				
	☆CSL0902YT	Blue											(590)		(280)	(500)	(900)				
	☆CSL0902WT	Red	95	25	100	5	-40 to +100	-40 to +100	3.4	5	5	12	(587)	20	(224)	(400)	(710)	20	—		
	☆CSL0902MT	Yellow											(571)		(71)	(140)	(280)				
	☆CSL0902PT	Yellow Green											(560)		(28)	(45)	(90)				
	New CSL0902ET	Green											527		710	1,100	1,800				
	New CSL0902BT	Blue	3.3	470	220	360	560	YES													

(Surface Mount Circular type)																
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings (Ta=25°C)						Electrical and Optical Characteristics (Ta=25°C)							
			Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	Dominant Wavelength λ _D (nm)	Luminous Intensity I _v (mcd)				Automotive Grade AEC-Q101
 Reverse Mount Available 3.2×1.6(t=1.85)	SML-S13VT	Red	75						1.9		630	160	450	630		
	SML-S13UT	Red									620	400	700	1,600		
	SML-S13DT	Orange									605					
	SML-S13YT	Yellow									590	630	1,400	2,500		
	SML-S13MT	Yellow Green	78	30	100*2	5	-40 to +85	-40 to +100	2.0	20	572	160	400	630	20	
	SML-S13PT	Green									560	63	160	400		
	SMLS14EET	Green							3.3		527	1,800	3,000	4,500		
	SMLS14BET	Blue	117						3.2		470	450	800	1,400		
 2.9×2.4(t=3.1)	CSL0701UT	Red	120	50	150*2	5	-40 to +85	-40 to +100	2.1	20	624	9,000	18,000	25,000	20	
	CSL0701DT	Orange									605	20,000	35,000	50,000		
(2 Colors type)																
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings (Ta=25°C)						Electrical and Optical Characteristics (Ta=25°C)							
			Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	Dominant Wavelength λ _D (nm)	Luminous Intensity I _v (mcd)				Automotive Grade AEC-Q101
 PICOLED™ Duo 1.0×1.0(t=0.2)	SML-P24MUW(R)	Yellow Green	54	20	100*2	5	-40 to +85	-40 to +100	2.2	20	572	10	21	40	20	
		Red	52						2.1		620	25	52	100		
 1.3×1.5(t=0.6)	SML522BU1W	Blue	66			5			2.9	5	470	9	22	36	5	
		Red	50		60*2				1.9	10	624	10	21	40		
	SML-522MUW	Yellow Green	52						2.1		570	14	40	71		
		Red	50						1.9		630	22	63	110		
	SML-522MU8W	Yellow Green		20			-40 to +85	-40 to +100			572	16	40	63		
		Red				4				20	620	25	63	100	20	
	SML-522MD8W	Yellow Green	54		100*2				2.2		572	10	25	40		
		Orange									605	40	100	160		
 Reverse Mount Available 3.4×1.25(t=1.1)	SML-522MY8W	Yellow Green									572	16	40	63		
		Yellow									590	40	63	160		
	SML-822MV8W	Yellow Green	54	20		5	-40 to +85	-40 to +100	2.2	20	572	16	25	40		
		Red			100*2						630	20	30	63	20	
	SML-825MVW	Yellow Green	80	30					2.1	100	572	40	63	100		
		Red							2.0		630					
	New SML-D22MUW	Yellow Green	67			5	-40 to +105	-40 to +110	2.0		570	6	10	16		
	New SML-D22YVW	Yellow	65	25	100*2				1.9	5	620	10	16	25	5	
 1.6×0.8(t=0.55)		Red	67						2.0		588	16	25	40		
		Red	65						1.9		629	10	16	25		
(3 Colors type)																
Package (mm)	Part No.	Emitting Color	Absolute Maximum Ratings (Ta=25°C)						Electrical and Optical Characteristics (Ta=25°C)							
			Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	Dominant Wavelength λ _D (nm)	Luminous Intensity I _v (mcd)				Automotive Grade AEC-Q101
 4-terminal PICOLED™-RGB 1.0×1.0(t=0.2)	SMLP34RGB2W	Red							2.1		624	14	35	56		
		Green	35	10	50*3	5	-40 to +85	-40 to +100	3.1	5	527	5	56	110	220	5
		Blue							3.0		470		28	45	110	
 6-terminal PICOLED™-RGB 1.5×1.0(t=0.2)	SMLP36RGB2W(R)	Red							2.1		624	14	35	56		
		Green	26	10	50*3	5	-40 to +85	-40 to +100	3.1	5	527	5	56	110	220	5
		Blue							3.0		470		14	35	56	
 1.8×1.6(t=0.5)	MSL0402RGBU*9	Red							2.1		624	220	400	560		
		Green	180*6	30	100	5	-40 to +85	-40 to +100	3.5	20	527	20	360	550	900	20
		Blue							3.3		470		90	180	360	
 3.5×2.8(t=0.6)	MSL0501RGBW	Red		50					2.1		624	450	700	1,100		
		Green							3.3		527	710	1,200	1,800		
		Blue		40							470	220	400	560		
	New SMLVN6RGB1U*9	Red		50		5			2.1	10	624	450	700	1,100		
		Green	400*6	40					3.3		527	710	1,200	1,800		YES
		Blue							3.3		470	220	400	560		
	SMLVN6RGB1W*8	Red		50		5			2.1	10	624	450	700	1,100		
		Green		40	100		-40 to +85	-40 to +100	3.3	20	527	710	1,200	1,800	20	
		Blue									470	220	400	560		
	New SMLVN6RGB7W	Red				5			2.1	10	624	280	500	900		
		Green	180*6	30					3.5		527	560	1,000	1,800		
		Blue							3.3		470	140	300	560		
	☆ SMLVN6RGB1H*8	Red		50		5			2.1	10	624	(450)	(700)	(1,100)		
		Green	400*6	40					3.3		527	(800)	(1,500)	(1,900)		(YES)
		Blue									470	(220)	(400)	(560)		
 3 Colors Side View type 6.9×2.2(t=2.15)	New MSL0104RGBU*9	Red		50		5			2.1	10	624	450	700	1,100		
		Green							3.3		527	710	1,200	1,800		YES
		Blue	400*6	40					3.2		470	220	400	560		
	MSL0104RGBW*8	Red		50	100	5	-40 to +85	-40 to +100	2.1	20	624	450	700	1,100	20	
		Green							3.3		527	710	1,200	1,800		
		Blue		40					3.2		470	220	400	560		
 2.9×1.35(t=1.0)	MSL0601RGBU	Red		40					2.1		624	600	700	830		
		Green	300*6		100	5	-40 to +85	-40 to +100	3.3	20	527	1,100	1,250	1,500	20	
		Blue		30					3.2		470	290	360	500		

*1: Duty1/5, 200Hz *2: Duty1/10, 1kHz *3: Duty≤1/20, 1ms *4: Duty≤1/5, 1kHz *5: Duty1/10, pulse width 10ms Max.
 *6: Total power dissipation in case of lighting three colors. (when lighting three colors, it will be reduced down to 30% of it.)
 *7: 50mm×50mm, Substrate: FR4 : t=1.6mm Cu foil : t=0.07mm
 *8: Epoxy resin *9: Silicon resin

Note : *PICOLED™ is a pending trademarks of ROHM Co., Ltd.
 (YES) : Planning () : Reference ☆ : Under Development

SMD LEDs

(Surface Mount type Infrared LEDs)																										
Package (mm)	Part No.	LED Chip	Emitting Color	Absolute Maximum Rating(Ta=25℃)						Electrical and Optical Characteristics(Ta=25℃)																
				Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (℃)	Storage Temperature T _{stg} (℃)	Forward Voltage V _F		Reverse Current I _R		Light Wavelength λ _P		Radiant Intensity										
										Typ. (V)	I _F (mA)	Typ. (μA)	V _R (V)	Typ. (nm)	I _F (mA)	Min. (mW/sr)	Typ. (mW/sr)	Max. (mW/sr)	I _F (mA)							
 1.0 × 0.6(t = 0.2)	☆SML-P15R2T	AlGaAs	Infrared	(40)	(20)	(100)*1	(5)	(−40 to +85)	(−40 to +100)	(1.6)	20	(100)	5	(870)	20	(0.6)	(1.1)	(2.2)	20							
 Reverse Mount Available 3.2 × 1.6(t = 1.85)	☆SML-S15R2T			(100)	(50)	(300)*1	(5)	−40 to +85	−40 to +100	(1.4)		(10)		(870)		(5.6)	(12)	(22)								
 2.0 × 1.25 (t = 0.8)	SML-M13RT			60	30	100*1	5	−40 to +85	−40 to +100	1.4		10		870		0.5	1.7	3.5								
	☆SML-M15R2T			(60)	(30)	(100)*1	(5)	(−40 to +85)	(−40 to +100)	(1.4)		(10)		(870)		(1.5)	(2.5)	(3.5)								
 3.2 × 1.6 (t = 1.85)	SML-S13RT			60	30	300*1	5	−40 to +85	−40 to +100	1.4		10		850		1.5	2.5	3.6								
 3.0 × 1.5(t = 2.2)	SCM-013RT			57										850		0.5	2.0	5.0								
 1.6 × 0.8 (t = 1.24)	☆CSL0901R2T			(60)	(30)	(100)*1	(5)	(−40 to +85)	(−40 to +100)	(1.4)		(10)		(870)		(2.5)	(3.5)	(6.3)								
 1.6 × 0.8 (t = 1.24)	☆CSL1001R2T															(1.0)	(1.6)	(2.5)								
 1.6 × 1.24 (t = 0.8)	☆CSL1201R2T															(2.5)	(3.5)	(6.3)								
 1.6 × 1.24 (t = 0.8)	☆CSL1301R2T															(1.0)	(1.6)	(2.5)								
(Surface Mount photo transistor)																										
Package (mm)	Part No.	LED Chip	Absolute Maximum Ratings(Ta=25℃)						Electrical and Optical Characteristics(Ta=25℃)																	
			Collector- Emitter Voltage (V)	Emitter- Collector Voltage (V)	Collector Current (mA)	Collector Power Dissipation (mW)	Operating Temperature T _{opr} (℃)	Storage Temperature T _{stg} (℃)	Light Current		Dark Current		Sensitivity Wavelength λ _P Typ. (nm)	Collector-Emitter Saturation Voltage												
									Min. (mA)	Max. (mA)	V _{CE} (V) /I _E (Lx)	Max. (μA)		V _{CE} (V)	Min. (V)	Typ. (V)	Max. (V)	I _C (mA) /I _E (Lx)								
 2.0 × 1.25(t = 0.8)	SML-H10TB	Si	32	5	30	80	−30 to +85	−30 to +100	2.0	4.0	5/ 500	0.5	10	800	—	—	0.4	0.1/ 500								
 Reverse Mount Available 3.4 × 1.25(t = 1.1)	SML-810TB								2.3	3.8																
 3.0 × 1.5(t = 2.2)	SCM-014TB								0.3																	
 1.6 × 0.8(t = 1.24)	☆CSL1001TB		(30)	(5)	(20)	(75)	(−40 to +85)	(−40 to +100)	(1.0)	(4.0)		(0.5)	(800)	—	—	(0.4)										
 1.6 × 1.24(t = 0.8)	☆CSL1301TB																									

*1 : Duty 1/10, 1kHz

() : Reference ☆ : Under Development

Product No. Configuration

(Chip LEDs)

■ Exclude Mono-color(Blue(B), Green(E), White(WB) and RGB)

[SML series/SCM series]

Series name	Package shape	Type of Element	Color	Chip control symbol	Remarks	Resin color	Packaging type	Brightness rank	Special control symbol
SML chip LED series SCM chip LED series	P1 1.0×0.6 t=0.2mm E1 1.6×0.8 t=0.36mm D1/D2 1.6×0.8 t=0.55mm H1 2.0×1.25 t=0.8mm M1 2.0×1.25 t=0.8mm Z1/Y1 3.5×2.8 t=1.9mm A1 1.6×1.15 t=0.55mm S1 3.2×1.6 t=1.85mm P2 1.0×1.0 t=0.2mm 52 1.5×1.3 t=0.6mm	1 Low current type 2 High brightness type 3 Ultra high brightness type 4 5	V Red U Red D Orange Y Yellow W Yellow M2 Yellow green	M Yellow green F Green P Green MV Yellow green/Red MU Yellow green/Red MD Yellow green/Orange MY Yellow green/Yellow R Infrared T Phototransistor	8	T Transparent colorless W Milky white B Black	T86 Cathode at sprocket hole side(the top) (in case of S1 series) T86 Cathode at sprocket hole side(the back) T68 Cathode at sprocket hole side(the top)	Refer to specification	

[CSL series]

Series name	Package shape	Color	Chip control symbol	Remarks	Chromaticity rank(for white LED)	Packaging type	Brightness rank	Special control symbol
CSL chip LED series	04 2.8×1.2 t=0.8mm 07 2.9×2.4 t=3.1mm 09 1.6×0.8 t=1.24mm 10 1.6×0.8 t=1.06mm 11 1.6×0.8 t=0.55mm	V Red U Red D Orange Y Yellow W Yellow	M Yellow green P Green E Green B Blue WB White	T5	1 Cathode at sprocket hole side(the top) 5 Cathode at sprocket hole side(big reel)	Refer to specification		

■ Mono-color(Blue(B), Green(E), White(WB) and RGB)

[SML series/SCM series]

SML series/SCM series

Chip control symbol

Remarks

SMLP34RGB2W, SMLP36RGB2W(R) is not applied.

Special control symbol

S

M

L

E

N

3

W

B

C

8

W

1

Series name

Package shape

Type of Element

Color

Resin color

Packaging type

Brightness rank

SML chip LED series

SCM chip LED series

P1 1.0×0.6 t=0.2mm

E1/EN 1.6×0.8 t=0.36mm

D1 1.6×0.8 t=0.55mm

MN/M2 2.0×1.25 t=0.8mm

Z1/Z2/ZN 3.5×2.8 t=1.9mm

A1 1.6×1.15 t=0.55mm

S1 3.2×1.6 t=1.85mm

52 1.5×1.3 t=0.6mm

P34 1.0×1.0 t=0.2mm

P36 1.5×1.0 t=0.2mm

VN 3.5×2.8 t=0.6mm

2 High brightness type

3

4 Ultra high brightness type

5

8

E Green

E2/E3 Blue Green

B Blue

PB Green

SB Sapphire blue

WB White

BU Blue/Red

RGB Red/Green/Blue

Resin color

T Transparent Colorless

W Milky white

Resin (in case of VN6 series)

U Silicone

W Epoxy

T86 Cathode at sprocket hole side(the top)

(in case of white, RGB)

1 Cathode at sprocket hole side(the top)

3 Cathode at sprocket hole side (the top 2mm pitch)

(in case of S1 and 81 series)

T86 Cathode at sprocket hole side(the back)

T68 Cathode at sprocket hole side(the top)

*81 series is nothing "T68".

Refer to specification

[MSL series]

Series name	Package shape	Color	Chip control symbol	Remarks	Chromaticity rank(for RGB LED)	Packaging type	Brightness rank	Special control symbol
MSL Multi color series	01 6.9×2.2 t=2.15mm 04 1.8×1.6 t=0.5mm 05 3.5×2.8 t=0.6mm 06 2.9×1.35 t=1.0mm	RGB Red/Green/Blue	04	U1	1 Cathode at sprocket hole side(the top)	Refer to specification		

SMD LEDs

● Dimensions (Unit:mm)

◁ Mold type ▷

● SML-P1 series (PICOLED™)	● SML-E1/EN series	● SML-D1 series	● CSL10 series	● SML-H1 series	● SML-H10TB

*PICOLED™ is a pending trademarks of ROHM Co., Ltd.

◁ Reflector type ▷

● SML-M1/MN series	● CSL11 series☆	● SML-Z1/Z2/ZN series	● SML-Y1 series☆	● SMLK1/K2 series

◁ Side View type ▷

● SML-A1 series	● CSL04 series

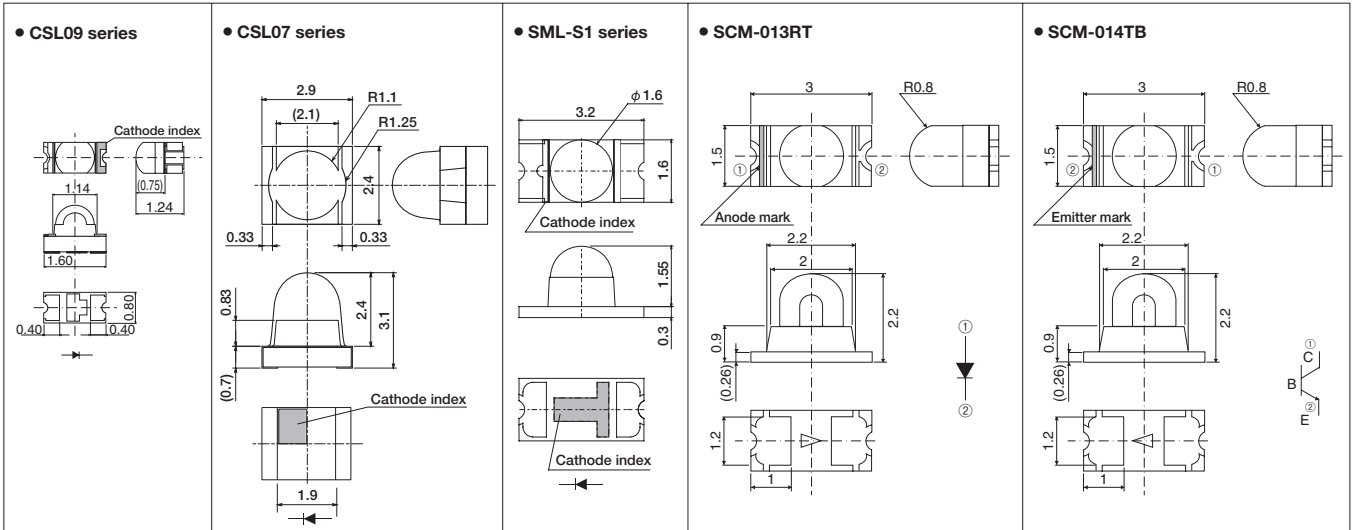
◁ Reverse Mount type ▷

● SML-81 series	● SML-82 series	● SML-810TB

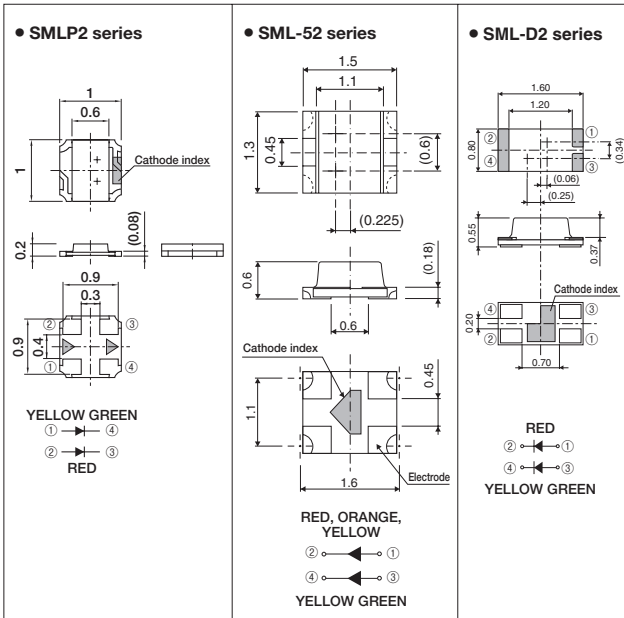
*For further information, please refer to the data sheets.

☆ : Under Development

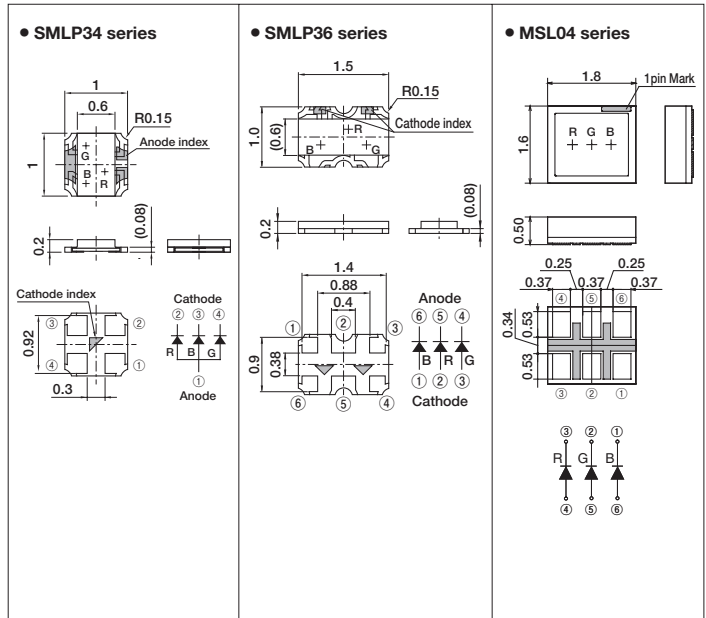
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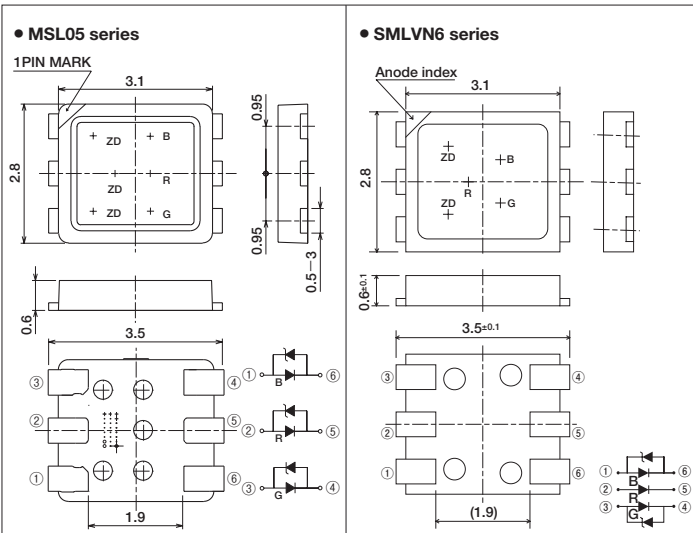
(2 Color type)



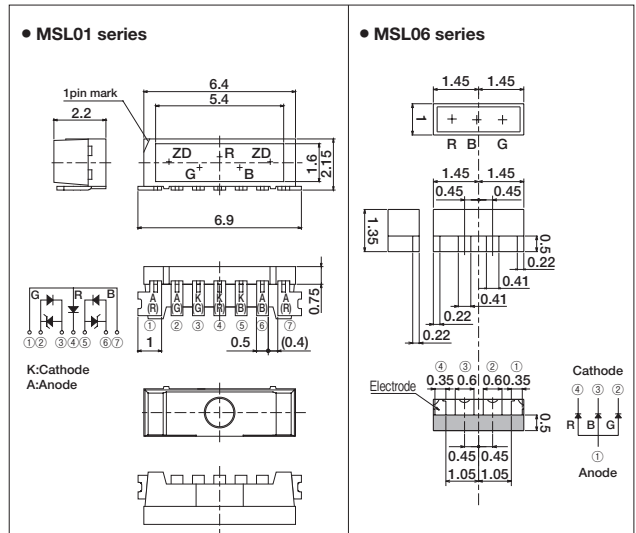
(3 Color type)



(3 Color type)



(3 Color Side View type)



*For further information, please refer to the data sheets.

Through-hole LEDs

ROHM offers a wide variety of through-hole LEDs, including lamps that can be automatically mounted onto the PCB as well as high brightness units suitable for public outdoor displays.

Red(V, U) Quick Reference of Brightness

<High Brightness Rank Table>

XE	XF	XG	XH	XJ	XK	XL	XM	XN	XP	XQ	XR	XS	XT	XU
47 to 68	68 to 100	100 to 150	150 to 220	220 to 330	330 to 470	470 to 680	680 to 1000	1000 to 1500	1500 to 2200	2200 to 3300	3300 to 4700	4700 to 6800	6800 to 10000	10000 to 15000

	Viewing angle (2θ1/2)	Resin Color	Brightness Rank Brightness (mcd) If (mA)	K	L	M	N	P	Q	R	S	T	U	V
				4.0 to 6.3	6.3 to 10	10 to 16	16 to 25	25 to 40	40 to 63	63 to 100	100 to 160	160 to 250	250 to 400	400 to 630
φ3 Circular type	40°	Transparent Colored	20									*SLI-343URC		
												SLI-343V8RC*		
		Diffused Colored	10								*SLI-343URC(W)			
	85°	Transparent Colored	20									*SLI-343UR		
												SLI-343V8R*		
		Diffused Colored	10								*SLI-343UR(W)			
φ3 Circular type (Direct mount 5mm pitch type)	40°	Transparent Colored	20											
		Colored	10											
		Diffused Colored	20											
			10											
φ3 Flat disc type	35°	Transparent Colored	10											
	50°	Diffused Colored												
φ4 Oval type	140°	Diffused Colored	20											
	10°													
φ5 Circular type	20°	Transparent Colorless	20											
	40°	Transparent Colored												
		Diffused Colored	10											

<High Brightness Rank Table>

XE	XF	XG	XH	XJ	XK	XL	XM	XN	XP	XQ	XR	XS	XT	XU
47 to 68	68 to 100	100 to 150	150 to 220	220 to 330	330 to 470	470 to 680	680 to 1000	1000 to 1500	1500 to 2200	2200 to 3300	3300 to 4700	4700 to 6800	6800 to 10000	10000 to 15000

Orange(D) Quick Reference of Brightness

	Viewing angle (2θ1/2)	Resin Color	Brightness Rank Brightness (mcd) If (mA)	J	K	L	M	N	P	Q	R	S	T	U	V
				2.5 to 4.0	4.0 to 6.3	6.3 to 10	10 to 16	16 to 25	25 to 40	40 to 63	63 to 100	100 to 160	160 to 250	250 to 400	400 to 630
φ3 Circular type	40°	Transparent Colored	20												
		Diffused Colored	10												
	85°	Transparent Colored	20												
		Diffused Colored	10												
φ3 Circular type (Direct mount 5mm pitch type)	40°	Transparent Colored	20												
		Colored	10												
		Diffused Colored	20												
			10												
φ3 Flat disc type	35°	Transparent Colored	10												
	50°	Diffused Colored													
φ4 Oval type	140°	Diffused Colored	20												
	10°														
φ5 Circular type	20°	Transparent Colorless	20												
	40°	Transparent Colored													
		Diffused Colored	10												

<High Brightness Rank Table>

XE	XF	XG	XH	XJ	XK	XL	XM	XN	XP	XQ	XR	XS	XT	XU
47 to 68	68 to 100	100 to 150	150 to 220	220 to 330	330 to 470	470 to 680	680 to 1000	1000 to 1500	1500 to 2200	2200 to 3300	3300 to 4700	4700 to 6800	6800 to 10000	10000 to 15000

Yellow(Y) Quick Reference of Brightness

	Viewing angle (2θ1/2)	Resin Color	Brightness Rank Brightness (mcd) If (mA)	J	K	L	M	N	P	Q	R	S	T	U	V
				2.5 to 4.0	4.0 to 6.3	6.3 to 10	10 to 16	16 to 25	25 to 40	40 to 63	63 to 100	100 to 160	160 to 250	250 to 400	400 to 630
φ3 Circular type	40°	Transparent Colored	20												
		Diffused Colored	10												
	85°	Transparent Colored	20												
		Diffused Colored	10												
φ3 Circular type (Direct mount 5mm pitch type)	40°	Transparent Colored	20												
		Colored	10												
		Diffused Colored	20												
			10												
φ3 Flat disc type	35°	Transparent Colored	10												
	50°	Diffused Colored													
φ4 Oval type	140°	Diffused Colored	20												
	10°														
φ5 Circular type	20°	Transparent Colorless	20												
	40°	Transparent Colored													
		Diffused Colored	10												

※: Brightness on specification sheet include tolerance of within ±10%. ★: This product refer to high brightness rank table.

<High Brightness Rank Table>

XA	XB	XC	XD	XE	XF	XG	XH	XJ	XK	XL	XM	XN	XP	XQ	XR	XS	XT	XU
10 to 15	15 to 22	22 to 33	33 to 47	47 to 68	68 to 100	100 to 150	150 to 220	220 to 330	330 to 470	470 to 680	680 to 1000	1000 to 1500	1500 to 2200	2200 to 3300	3300 to 4700	4700 to 6800	6800 to 10000	10000 to 15000

Green(M, P, E) Quick Reference of Brightness

[illegible]

Blue(B) Quick Reference of Brightness

	Viewing angle (2θ/2)	Resin Color	Brightness Rank Brightness (mcd) Ir(mA)	XH	XJ	XK	XL	XM	XN	XP	XQ	XR	XS	XT	XU
				150 to 220	220 to 330	330 to 470	470 to 680	680 to 1000	1000 to 1500	1500 to 2200	2200 to 3300	3300 to 4700	4700 to 6800	6800 to 10000	10000 to 15000
φ3 Circular type	40°	Transparent Colorless	20	SLR343BC7T				SLR343BD2T							
				*SLR343BC4T											
				*SLR343BCT											
φ4 Oval type	140°	Milky White	20	SLD430BD2W											
φ5 Circular type	10°	Transparent Colorless	20					*SLA580BC4T							
					*SLA580BCT										
					SLA560BD2T										
	*SLA560BC4T														
	40°			*SLA560BCT											

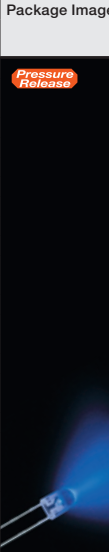
White(WB) Quick Reference of Brightness

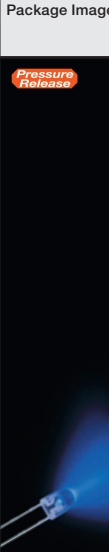
	Viewing angle (2θ/2)	Resin Color	Brightness Rank	XJ	XK	XL	XM	XN	XP	XQ	XR	XS	XT	XU
			Brightness (mcd)	220 to 330	330 to 470	470 to 680	680 to 1000	1000 to 1500	1500 to 2200	2200 to 3300	3300 to 4700	4700 to 6800	6800 to 10000	10000 to 15000
			Ir(mA)											
φ3 Circular type	40°	Transparent Colorless	20	SLR343WBC7T										
								SLR343WBD2PT						
φ4 Oval type	140°	Milky White	20				SLD430WBD2PT							
φ5 Circular type	40°	Transparent Colorless	20					SLA560WBD2PT						

※:Brightness on specification sheet include tolerance of within $\pm 10\%$.

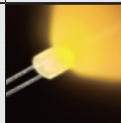
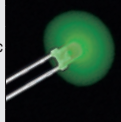
*:This product refer to high brightness rank table.

Through-hole LEDs

φ3 type																																				
Shape	Package Image	Viewing Angle 2θ1/2 (Element type)	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)							Electrical and Optical Characteristics(Ta=25°C)								Automotive Grade AEC-Q101																
					Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	Dominant Wavelength λ _d / Chromaticity Coordinates(x, y)	Luminous Intensity I _v																						
φ3 Circular type		40°	Standard	SLI-343V8RC	Red	54	20	100*2	-30 to +85	-40 to +100	2.2	10	639	20	150	330	(680)	20	—																	
				SLI-343V8R											100	220	(470)																			
				SLI-343U8RC											Orange	150	330			(680)																
				SLI-343U8R												100	220			(470)																
				SLI-343D8C												330	680			(1,500)																
				SLI-343D8U	220										470	(1,000)																				
				SLI-343Y8C	Yellow										330	680	(1,500)																			
				SLI-343Y8Y											220	470	(1,000)																			
				SLI-343M8C											Yellow Green	68	150			(330)																
				SLI-343M8G												Green	10			22	(47)															
		SLI-343P8C	560	10		22	(47)																													
		SLI-343P8G	40°	High Brightness	SLI-343URC	Red	125	50	200*2	-25 to +85	1.9	20	630	100	611	90	450	710	—																	
		SLI-343UR			350																															
		SLI-343DC			500																															
		SLI-343DU			350																															
		SLI-343YC			300																															
		SLI-343YY			56	200											—																			
		SLI-343MC			Yellow Green	56											180			—																
		SLI-343MG				105											30			100*2	5	-20 to +80	3.2	470	220	470	—									
		SLR343BD2T				126											30			470					1,000	(2,200)										
	SLR343WBC7T	105				25											330			680					(1,000)											
	SLR343WBD2PT	126	30	1,500		3,300	—																													
	SLR-343VC	40°	Standard	SLR-343VR	Red	60	20	60*1	3	-25 to +85	-30 to +100	2.0	10	650	10	9	25	(71)	10	—																
	SLR-343DC			6												16	(45)																			
	SLR-343DU			9												25	(71)																			
	SLR-343YC			6												16	(45)																			
	SLR-343YY			4												10	(28)																			
	SLR-343MC			Yellow Green	9											25	(71)																			
	SLR-343MG				6											16	(45)																			
	SLR-343PC				2											6	(18)																			
	SLR-343PG				555											2	6	(18)																		
	SLR343ECT				3.3											3.2	3.3	900			2,200	5	523	420	1,500	—										
	SLR343EC4T	3.2	468	200	470																															
	SLR343BCT	3.2	468	200	470																															
	SLR343BC4T	40°	Low Current	SLI-343URC(W)	Red	125	50	200*2	9	-25 to +85	1.9	20	100	9	630	20	36	200	(280)	20	—															
	SLI-343UR(W)			160																																
	SLI-343DC(W)			300													(450)																			
	SLI-343DU(W)			250																																
	SLI-343YC(W)			200													(280)																			
	SLI-343YY(W)			160	200												(280)																			
SLR-332VC	85°			Standard	SLR-332VR												Red	60	20			60*1	3	-25 to +85	-30 to +100	2.0	10	10	3	650	10	4	10	(28)	10	—
SLR-332DC					6																											16	(45)			
SLR-332DU					4																											10	(28)			
SLR-332YC					2																											6	(18)			
SLR-332YY		6	16		(45)																															
SLR-332MC		Yellow Green	75		25	563	900	2,200	5	523	420	1,500	—																							
SLR-332MG			2		6	(18)																														
SLR-332VC			3.3		3.2	3.3	200	470																												
SLR-332DC			3.2		468	200	470																													
SLR-332DU			3.2		468	200	470																													

φ5 type																																							
Shape	Package Image	Viewing Angle 2θ1/2 (Element type)	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)							Electrical and Optical Characteristics(Ta=25°C)								Automotive Grade AEC-Q101																			
					Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F (V)	Reverse Current I _R (μA)	Dominant Wavelength λ _d / Chromaticity Coordinates(x, y)	Luminous Intensity I _v																									
φ5 Circular type		10°	High Brightness	SLI-580UT	Red	125	50	200*2	9	-30 to +85	-40 to +100	1.9	100	9	630	2,000	5,000	(11,000)	20	—																			
				SLI-580DT	Orange										611						1,350	(7,500)																	
				SLI-580YT	Yellow										591																								
				SLA-580MT	Yellow Green										563						200	470	(240)																
				SLA580ECT	Green										518						3,000	8,000	—																
				SLA580EC4T	523										2,000						4,500																		
				SLA580BCT	468										900						2,500	—																	
				SLA580BC4T	Blue										3.2						610		1,500																
				SLI-570UT	20°										High Brightness						SLI-570U2T		Red	125	50	200*2	9	-30 to +85	-40 to +100	1.9	20	100	9	630	900	3,000	(5,200)	20	—
				SLI-570DT																	Orange	611	2,200											4,000					
	SLI-570YT	Yellow	591	900		3,000	(5,200)																																
	SLI-570Y2T	Yellow Green	563	610		2,500	(3,600)																																
	SLA-570MT	523	2,200	5,200		(10,000)																																	
	SLA-570MT	200	470	(1,100)																																			
	SLI-560UT	40°	High Brightness	SLI-560DT		Red	125	50	200*2	9	-30 to +85	-40 to +100	1.9	100		9	630	300	1,000	(1,650)	20	—																	
	SLI-560YT			Orange		611											42						100											(240)					
	SLA-560MT			Yellow Green		591											1,000						2,200											(4,700)					
	SLA560BD2T			Blue		563											42						100											(240)					
	SLA560WBD2PT			White	470*3	1,500									3,300		(6,800)																						
	SLA560ECT			Green	518	610									2,000		—																						
	SLA560EC4T			523	610	1,500																																	
	SLA560BCT			468	200	600									—																								
	SLA560BC4T			Blue	3.2	200											470																						
	SLR-56VC			40°	Standard	SLR-56VR											Red						60	20	60*1	3	-25 to +85	-30 to +100	2.0	10	10	3	650	9	25	(71)	10	—	
	SLR-56DC	Orange	610			4	10	(28)																															
	SLR-56DU	610	4			10	(28)																																
	SLR-56YC	Yellow	585			9	25	(71)																															
	SLR-56YY	6	16			(45)																																	
	SLR-56MC	Yellow Green	563			14	40	(110)																															
	SLR-56MG	75	25			6	16	(45)																															
SLR-56VC	40°	Standard	SLR-56VR			Red	60	20	60*1	3	-25 to +85	-30 to +100	2.0	10	10	3	650	9	25	(71)	10	—																	
SLR-56DC			Orange			610											4																10						(28)
SLR-56DU			610			4											10																(28)						
SLR-56YC			Yellow	585	9	25											(71)																						
SLR-56YY			6	16	(45)																																		
SLR-56MC			Yellow Green	563	14	40											(110)																						
SLR-56MG			75	25	6	16											(45)																						

*1 : Duty1/5, 200Hz *2 : Duty1/10, 1kHz *3 : Dominant Wavelength
* : Brightness for white color is noted with chromaticity coordinate(x, y).

◀Oval type▶																							
Shape	Package Image	Viewing Angle 2θ1/2 (Element type)	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25℃)						Electrical and Optical Characteristics(Ta=25℃)										Automotive Grade AEC-Q101		
					Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FM} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (℃)	Storage Temperature T _{stg} (℃)	Forward Voltage V _F	Reverse Current I _R	Dominant Wavelength λ _d / Chromaticity Coordinates(x,y)		Luminous Intensity I _v								
Oval type φ4		140° Standard	SLI-430U2R	Red	75	30	100*2	9	-40 to +85	-40 to +100	2.0	20	10	9	620*±3		220	400 470		(680)	20	—	
			SLI-430DU	Orange							605*±3												
			SLI-430Y2U	Yellow							590*±3												
			SLI-430MG	Yellow Green	120	5					3.2	5			570*±3		68	120	(220)				
			SLD430BD2W	Blue											470*±3								
			SLD430WBD2PT	White											(x, y)(0.31, 0.31)								
			680 1,850 (3,300)																				
◀Other▶																							
φ3.2 Circular type Direct Mount 5mm Pitch type		40° Low Current	SLI-325URC(W)*±1	Red	48	20	60*±1	4	-25 to +85	-30 to +100	1.9	20	100	4	630		20	36	160 100		(280)	20	—
			SLI-325UR(W)*±1	Orange											611								
			SLI-325DC(W)*±1	Orange											591								
			SLI-325DU(W)*±1	Yellow											570								
			SLI-325YC(W)*±1	Yellow											563								
		40° Standard	SLR-325VC*±1	Red	60	25	60*±1	3	-25 to +85	-30 to +100	2.0	10	10	3	650		10	6	16	(45)	10	—	
			SLR-325VR*±1	Orange											610								
			SLR-325DC*±1	Orange											585								
			SLR-325DU*±1	Yellow											563								
			SLR-325YC*±1	Yellow Green											563								
φ3 Flat Disc type		35° Standard	SLR-322VC	Red	60	20	60*±1	3	-25 to +85	-30 to +100	2.0	10	10	3	650		10	6	16	(45)	10	—	
			SLR-322DC	Orange											610								
			SLR-322YC	Yellow											585								
			SLR-322MC	Yellow Green											563								
			SLR-322VR	Red											650								
		50° Standard	SLR-322DU	Orange	60	20	60*±1	3	-25 to +85	-30 to +100	2.0	10	10	3	610		10	6	16	(45)	10	—	
			SLR-322YY	Yellow											585								
			SLR-322MG	Yellow Green											563								
			SLR-322VC	Red											650								
			SLR-322DC	Orange											610								

*SLI-325/SLR-325 series : straight taping only.

*1 : Duty1/5, 200Hz *2 : Duty1/10, 1kHz *3 : Dominant Wavelength

●Product No. Configuration (Through-hole LEDs)

■Exclude Mono-color(Blue(B), Green(E), White(WB))

Series name		Package shape		Color		Chip control symbol		Remarks		Resin color		Packaging type		Special control symbol		Brightness rank	
S L I — 3 4 3 V		8 R C 3 F															
SLA	1-Die Circular type High Brightness LED Lamps	343	φ3 Circular type	V	Red	R	<Red>Diffused colored	3F	1-Die straight bulk	Refer to specification							
SLI	1-Die Circular type Low Current High Brightness LED Lamps	332	φ3 Circular type	U	Red	U	<Orange>Diffused colored	T31	Refer to taping specification								
SLR	1-Die Circular type LED Lamp	56	φ5 Circular type	U2	Red	Y	<Yellow>Diffused colored	T32									
		560	φ5 Circular type	D	Orange	G	<Yellowish green> Diffused colored										
		570	φ5 Circular type	Y	Yellow	C	Transparent colored										
		580	φ5 Circular type	Y2	Yellow	T	Transparent colorless										
		430	Oval type φ4	M	Yellowish green												
		325	φ3.2 Circular type	P	Green												
		322	φ3 Flat disc type														

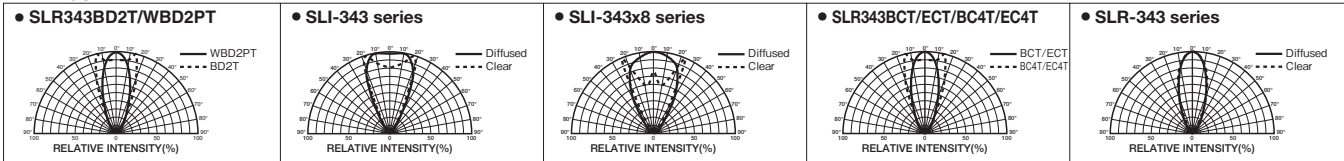
■Mono-color(Blue(B), Green(E), White(WB))

Series name			Package shape			Color			Resin color			Packaging type			Brightness rank		
SLR			343			WB			T			3F			Refer to specification		
SLR			560			EC			W			T31			Refer to specification		
SLD			430			WB						T32			(in case of white)		

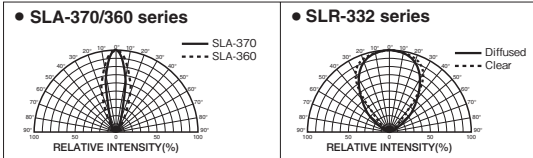
Through-hole LEDs

● Viewing Angle (Unit:deg)

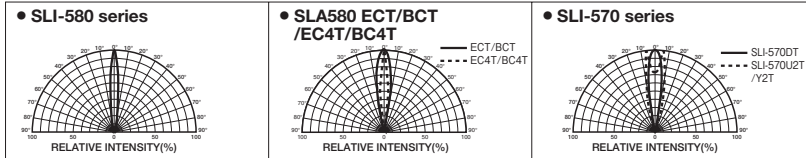
〈φ 3 type〉



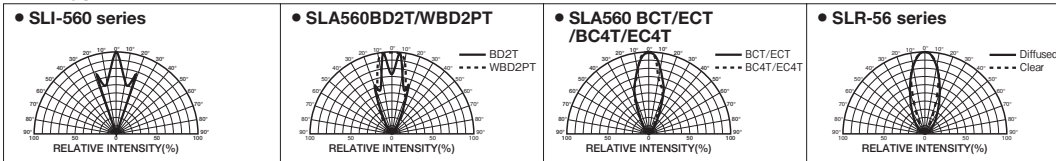
〈φ 3 type〉



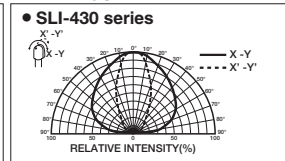
〈φ 5 type〉



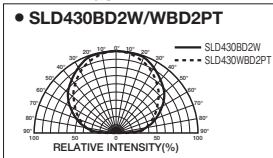
〈φ 5 type〉



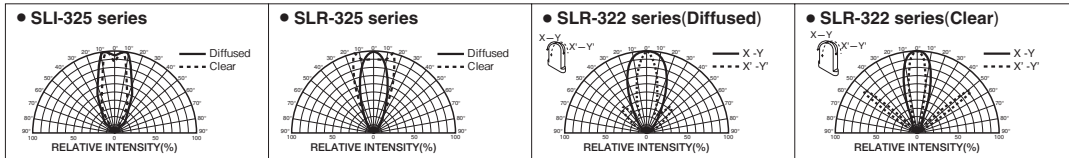
〈Oval type〉



〈Oval Type〉



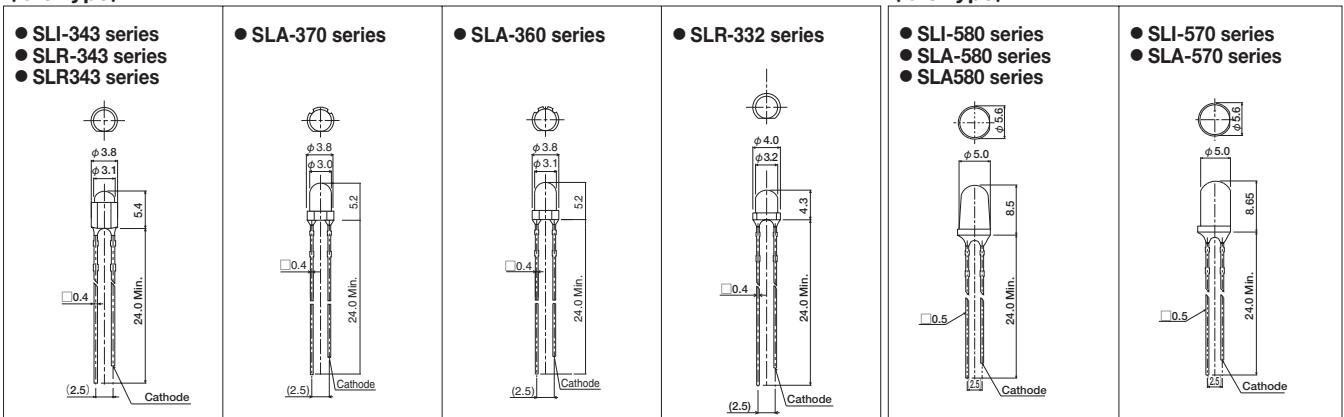
〈Others〉



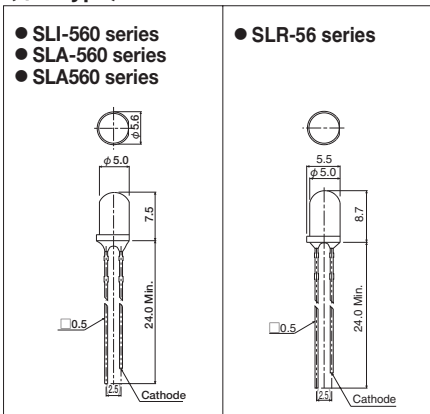
Notes: Viewing Angle shown above are the reference data from standard product. For the part numbers other than the above, please contact us.

● Dimensions (Unit:mm)

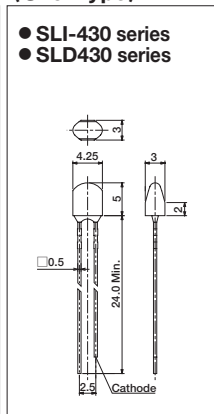
〈φ 3 type〉



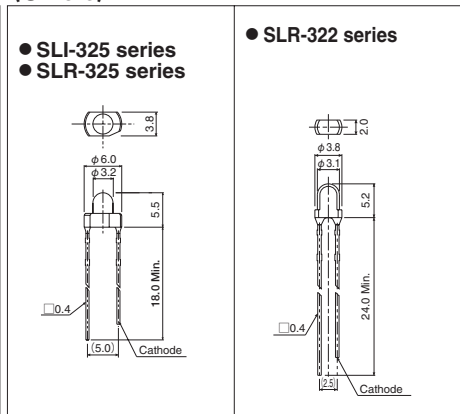
〈φ 5 type〉



〈Oval type〉



〈Others〉



* For further information, please refer to specification.



Opto Devices

LED Displays

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High Brightness LED Numeric Displays

High brightness, low power consumption, and high reliability.

High Brightness LED Numeric Displays																		
Shape	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)				Absolute Maximum Ratings		Electrical and Optical Characteristics(Ta=25°C)									
			Power Dissipation P _o (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} * (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F		Reverse Current I _R		Light Wavelength Peak Half-wave		Brightness/Digit I _v			
									Typ. (V)	I _F (mA)	Max. (μA)	V _R (V)	λ _p Typ. (nm)	Δλ Typ. (nm)	I _F (mA)	Min. (mcd)	Typ. (mcd)	I _F (mA)
 Character Height:8mm External Dimensions:(7×11)	LAP-301VB/VL	Red											650			14	36	
	LAP-301MB/ML	Green	448	20	60	5	-25 to +75	-30 to +85	1.9	10	100	3	572	20	10	36	100	10
	LAP-301DB/DL	Orange											605			56	250	
 Character Height:10.16mm External Dimensions:(9.6×13)	LAP-401VD/VN	Red											650			14	36	
	LAP-401MD/MN	Green	448	20	60	5	-25 to +75	-30 to +85	1.9	10	100	3	572	20	10	36	100	10
	LAP-401DD/DN	Orange											605			56	250	
 Character Height:14.6mm External Dimensions:(12.5×19)	LAP-601VB/VL	Red											650			14	36	
	LAP-601MB/ML	Green	448	20	60	5	-25 to +75	-30 to +85	1.9	10	100	3	572	20	10	36	100	10
	LAP-601DB/DL	Orange											605			56	250	
 Character Height:14.3mm External Dimensions:(25×19)	LBP-602VA2/VK2	Red											650			14	36	
	LBP-602MA2/MK2	Green	896	20	60	5	-25 to +75	-30 to +85	1.9	10	100	3	572	20	10	36	100	10
	LBP-602DA2/DK2	Orange											605			56	250	

Notes: *I_{FP} measured under duty ≤ 1/5, Pulse width ≤ 1ms

LED Numeric Displays

ROHM's LED numeric displays are compatible with automatic reflow processes.

Single Digit LED Numeric Displays(Surface Mount type)																		
Shape	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)				Absolute Maximum Ratings		Electrical and Optical Characteristics(Ta=25°C)									
			Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} * (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F		Reverse Current I _R		Light Wavelength Peak Half-wave		Brightness/Digit I _v			
									Typ. (V)	I _F (mA)	Max. (μA)	V _R (V)	λ _p Typ. (nm)	Δλ Typ. (nm)	I _F (mA)	Min. (mcd)	Typ. (mcd)	I _R (mA)
 Character Height:8mm External Dimensions:(6.8×11)	LF-3011VA/VK	Red	320	15	60	5	-25 to +75	-30 to +85	2.0	10	100	3	650	40	10	3.6	10	10
	LF-3011MA/MK	Green	480	20					2.1				563					

Notes: *I_{FP} measured under duty ≤ 1/5, Pulse width ≤ 1ms

These single digit numeric displays are 8 to 25.4mm in height and available in a range of colors.

Single Digit LED Numeric Displays																
Shape	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)				Absolute Maximum Ratings		Electrical and Optical Characteristics(Ta=25°C)							
			Power Dissipation P _o (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} [*] (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F		Reverse Current I _R		Light Wavelength Peak Half-wave		Brightness/Digit I _V	
									Typ. (V)	I _F (mA)	Max. (μA)	V _R (V)	λ _p Typ. (nm)	λ _h Typ. (nm)	I _F (mA)	I _V Min. (mcd)
	LA-301VB/VL	Red	320	15	60				2.0	10			650	40	10	3.6
	LA-301MB/ML	Green	480	20	60				2.1	10			563	40	10	5.6
	LA-301AB/AL	High Brightness Red	520	25	50				2.05	20			626	18	20	36
	LA-301EB/EL	High Brightness Orange											610	17		90
	LA-401VD/VN	Red	320	15	60				2.0	10			650	40	10	5.6
	LA-401MD/MN	Green	480	20	60				2.1	10			563	40	10	16
	LA-401AD/AN	High Brightness Red	520	25	50				2.05	20			626	18	20	36
	LA-401ED/EN	High Brightness Orange											610	17		90
	LA-501VD/VN	Red				5	-25 to +75	-30 to +85	2.0		100	3	650			10
	LA-501MD/MN	Green							2.1				563		5.6	16
	LA-601VB/VL	Red	480	20	60				2.0	10			650	40	10	14
	LA-601MB/ML	Green							2.1				563		9.0	22
	LA-601AB/AL	High Brightness Red	520	25	50				2.05	20			626	18	20	36
	LA-601EB/EL	High Brightness Orange											610	17		90
	LA-101VA/VK	Red	640	15	60				4.0				650	40	10	3.6
	LA-101MA/MK	Green		20					4.2	10			563		5.6	16

Notes: *I_{FP} measured under duty ≤ 1/5, Pulse width ≤ 1ms, High Brightness and Blue I_{FP} measured under duty ≤ 1/10, Pulse width ≤ 0.1 ms Notes2: LA-101 series : order-based production

These two digit numeric displays are 10.16 to 14.3mm in height and available in a range of colors.

Two Digit LED Numeric Displays																
Shape	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)				Absolute Maximum Ratings		Electrical and Optical Characteristics(Ta=25°C)							
			Power Dissipation P _o (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} [*] (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F		Reverse Current I _R		Light Wavelength Peak Half-wave		Brightness/Digit I _V	
									Typ. (V)	I _F (mA)	Max. (μA)	V _R (V)	λ _p Typ. (nm)	λ _h Typ. (nm)	I _F (mA)	I _V Min. (mcd)
	LB-402VD/VN	Red	640	15					2.0				650		5.6	16
	LB-402MD/MN	Green			60	5	-25 to +75	-30 to +85	2.1	10			563	40	10	9.0
	LB-502VD/VN	Red	960	20					2.0				650		5.6	16
	LB-502MD/MN	Green							2.1				563		9.0	25
	LB-602VA2/VK2	Red							2.0		100	3	650		5.6	16
	LB-602MA2/MK2	Green	960	20	60				2.1	10			563	40	10	9.0
	LB-602AA2/AK2	High Brightness Red				5	-25 to +75	-30 to +85					626	18		
	LB-602EA2/EK2	High Brightness Orange	1,040	25	50				2.05	20			610	17	20	36

Notes: *I_{FP} measured under duty ≤ 1/5, Pulse width ≤ 1ms, High Brightness and Blue I_{FP} measured under duty ≤ 1/10, Pulse width ≤ 0.1 ms

Three Digit LED Numeric Display																
Shape	Part No.	Emitting Color	Absolute Maximum Ratings(Ta=25°C)				Absolute Maximum Ratings		Electrical and Optical Characteristics(Ta=25°C)							
			Power Dissipation P _o (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FP} [*] (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F		Reverse Current I _R		Light Wavelength Peak Half-wave		Brightness/Digit I _V	
									Typ. (V)	I _F (mA)	Max. (μA)	V _R (V)	λ _p Typ. (nm)	λ _h Typ. (nm)	I _F (mA)	I _V Min. (mcd)
	LB-603VF/VP	Red	960	15	60	5	-25 to +75	-30 to +85	2.0	10	100	3	650	40	10	5.6

Notes: *I_{FP} measured under duty ≤ 1/5, Pulse width ≤ 1ms



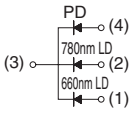
Opto Devices

Laser Diodes

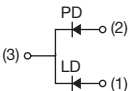
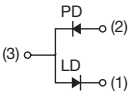
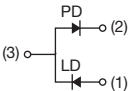
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■ Part Numbers, Symbols and Definitions ...	P. E26
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Laser Diodes

Red/Infrared Dual Wavelength Lasers															
Part No.	Pitch (μm)	Wavelength λ _P (nm)	Absolute Maximum Ratings (T _C =25°C)			Electrical and Optical Characteristics (T _C =25°C)							P _O (mW)	Package	Equivalent Circuit
			P _O (mW)	V _R (V)	T _{opr} Max. (°C)	I _{TH} (mA)	I _{op} (mA)	η (W/A)	V _{op} (V)	I _m (mA)	θ _⊥ (deg.)	θ _∥ (deg.)			
RLD2WMNL2-00x (Higher temp.)	110	663	7	2	85	18	24	0.70	2.3	0.25	28	10.0	5		
		785	7	2	85	15	20	0.70	1.8	0.25	32	10.0	5		
RLD2WMNL2-01x (Standard)	110	663	7	2	80	18	24	0.70	2.3	0.25	28	10.0	5		
		785	7	2	80	15	20	0.70	1.8	0.25	32	10.0	5		

Notes: 1.Unless otherwise specifi ed, the Electrical and Optical Characteristics are typical values.
2.The Control number is applied in the x of part No.

Red Lasers														
Part No.	Wavelength λ _P (nm)	Absolute Maximum Ratings (T _C =25°C)			Electrical and Optical Characteristics (T _C =25°C)							P _O (mW)	Package	Equivalent Circuit
		P _O (mW)	V _R (V)	T _{opr} Max. (°C)	I _{TH} (mA)	I _{op} (mA)	η (W/A)	V _{op} (V)	I _m (mA)	θ _⊥ (deg.)	θ _∥ (deg.)			
RLD65MZT7	655	7	2	70	20	30	0.70	2.3	0.24	27.0	8.0	5		
RLD65MQX1 (Higher ESD)	663	10	2	70	15	21	0.85	2.3	0.15	27.0	9.0	5		
RLD63NPC5 (Pure red)	635	6	2	40	24	33	0.55	2.2	0.18	32.0	8.0	5		
RLD63NPC6 (Pure red)	638	12	2	50	28	43	0.70	2.3	0.15	32.0	8.0	10		
RLD63NPC7 (Pure red)	638	17	2	50	32	57	0.60	2.2	0.16	30.0	8.0	15		
RLD63NPC8 (Pure red)	638	24	2	50	32	65	0.60	2.25	0.20	30.0	8.0	20		
New RLD65NZX1 (Higher temp.)	663	10	2	80	15	24	0.85	2.3	0.30	27.0	9.0	7		
RLD65NZX2 (Higher ESD)	658	7	2	70	25	33	0.60	2.3	0.20	28.0	8.5	5		
New RLD65NZX3 (Higher ESD)	658	12	2	70	25	42	0.60	2.3	0.30	28.0	8.5	10		
RLD65PZX2 (Higher ESD)	658	7	2	70	25	33	0.60	2.3	0.20	28.0	8.5	5		
RLD65PZX3 (Higher ESD)	658	12	2	70	25	42	0.60	2.3	0.30	28.0	8.5	10		

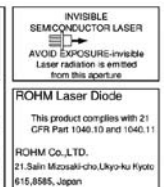
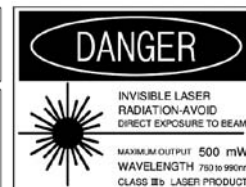
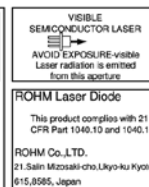
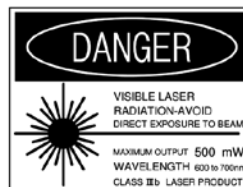
Note: Unless otherwise specified, the Electrical and Optical Characteristics are typical values.

Infrared Lasers														
Part No.	Wavelength λ_P (nm)	Absolute Maximum Ratings (T _C =25°C)			Electrical and Optical Characteristics (T _C =25°C)							P _O (mW)	Package	Equivalent Circuit
		P _O (mW)	V _R (V)	Topr Max. (°C)	I _{TH} (mA)	I _{OP} (mA)	η (W/A)	V _{OP} (V)	I _m (mA)	$\theta_{\perp}$ (deg.)	$\theta_{//}$ (deg.)			
RLD78MZA6	790	4.5	2	70	25	35	0.35	1.9	0.15	37.0	11.0	3		
RLD78MZM7	792	20	2	60	11	33	0.65	1.8	0.50	24.0	8.5	15		
RLD78NZM5	793	10	2	60	10	20	0.55	1.8	1.15	28.0	9.0	6		
RLD78NZM7	792	20	2	60	11	33	0.65	1.8	0.90	24.0	8.5	15		
RLD82NZJ1	822	220	2	60	50	255	0.95	2.4	0.30	17.0	9.5	200		
RLD84NZJ2	842	220	2	60	40	250	0.95	2.4	0.40	19.0	9.5	200		
RLD85NZJ4	852	220	2	60	40	250	0.95	2.4	0.40	19.0	9.5	200		
New RLD94NZJ5	942	285	2	65	55	325	0.75	2.2	0.90	30.0	35.0	200		
New RLD94NZJ7	942	220	2	60	40	300	0.75	2.4	1.00	17.0	9.5	200		
RLD78PZM7	792	20	2	60	11	33	0.65	1.8	0.65	24.0	8.5	15		
RLD82PZJ1	822	220	2	60	50	255	0.95	2.4	0.30	17.0	9.5	200		
RLD84PZJ2	842	220	2	60	40	250	0.95	2.4	0.40	19.0	9.5	200		
RLD85PZJ4	852	220	2	60	40	250	0.95	2.4	0.40	19.0	9.5	200		
New RLD94PZJ5	942	285	2	65	55	325	0.75	2.2	0.90	30.0	35.0	200		
New RLD94PZJ7	942	220	2	60	40	300	0.75	2.4	1.00	17.0	9.5	200		

Note: Unless otherwise specified, the Electrical and Optical Characteristics are typical values.

●Safety

The light emitted from laser diodes, can cause retinal damage if viewed directly. Never look directly into the laser beam or through any lenses or fibers when the system is operating. For optical axis alignment or other operations, we recommend the use of an infrared-sensitive camera (ITV) or wearing protective goggles.

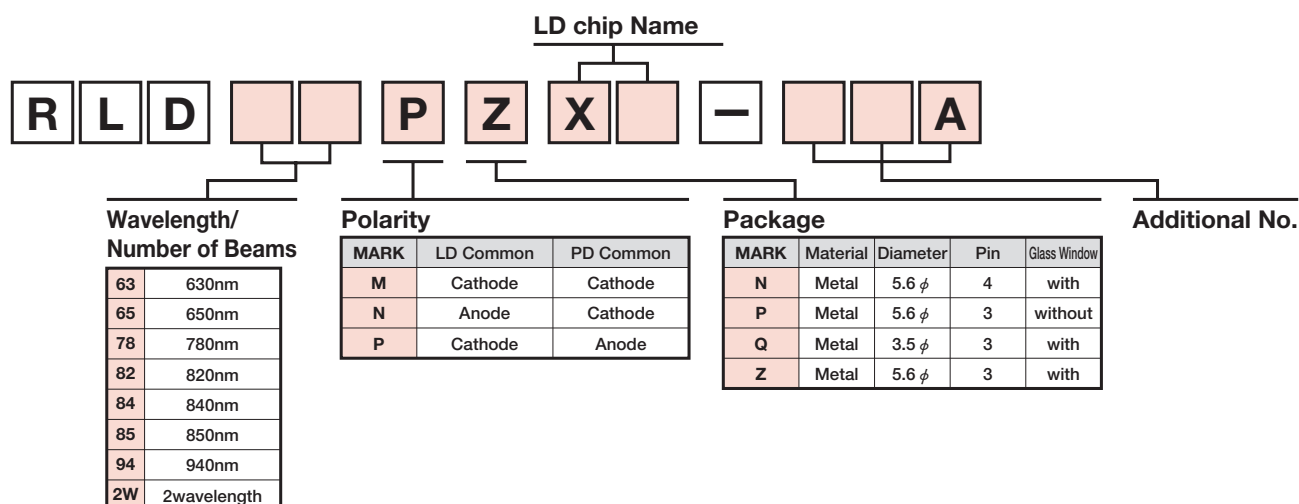


The products described in this specification are designed to be used with ordinary electronic equipment or devices (such as audio-visual equipment, office-automation equipment, communication device, electrical appliances, and electronic toys). If you intend to use these products or devices which require an extremely high level of reliability and malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

●About open package products

With the open package product (Package mark is P), the external environment could deteriorate the characteristics and reliability of Laser Diodes. Please be careful to foreign matter including toner, human substance and smoke, corrosion due to ion, the volatilization component from the glue and flux, condensation, optical tweezers effect and etc. Do not touch the components including the laser chip emission point.

Part Numbers



Symbols and Definitions

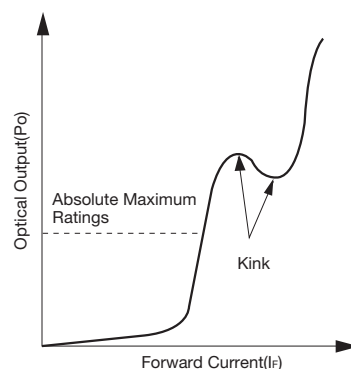
Absolute Maximum Ratings

Absolute maximum ratings are values which must not be exceeded even momentarily regardless of external conditions.

These values are specified for a case temperature T_c of 25°C.

Parameter	Symbol	Definition
Optical Output	P_o	Maximum allowable optical output during continuous or pulse operation. No kinks will appear in the output vs. forward current curve up to this output value. (Fig.1)
Reverse Voltage	V_R	The maximum allowable voltage when a reverse bias is applied to the device. Lasers and photo diodes are rated separately.
Operating Temperature	T_{opr}	Allowed ambient temperature range when the device is in operation. Delined to be the case temperature of the device.
Storage Temperature	T_{stg}	Allowed temperature range when the device is being stored.

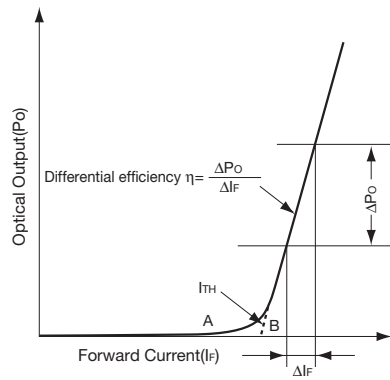
Fig.1 Optical Output vs. Forward Current



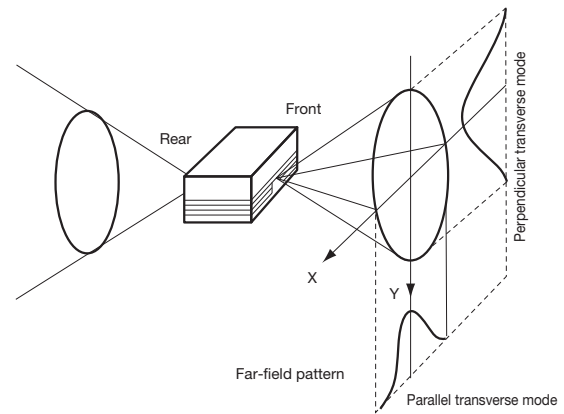
Electrical and Optical Characteristics

Item	Symbol	Definition
Threshold Current	I_{TH}	In Fig.2, A is the spontaneous emission range and B is the stimulated emission range. The threshold current is the current at which laser emission begins.
Operating Current	I_{OP}	The forward current required to generate the specified optical output.
Operating Voltage	V_{OP}	The forward voltage required to generate the specified optical output.
Differential Efficiency	η	The average increase in the output per unit of drive current. In the laser emission range, this is the slope of the linear optical output vs. forward current curve. (Fig.2)
Monitor Current	I_m	When the specified optical output is generated, this is the output current of the photodiode when a specified reverse voltage is applied to the monitor photodiode.
Parallel Divergence Angle Perpendicular Divergence Angle	$\theta_{//}$ $\theta_{\perp}$	Light emitted from the laser spreads as shown in Fig.3. The result of measurements of this spread in the parallel (x) and perpendicular (y) directions with respect to the junction surface is shown in Fig.3. The widths of the spread at the points where the strength drops to 1/2 the peak strength (half value full angles) are defined as angles and called $\theta_{//}$ and $\theta_{\perp}$. (Fig.4)
Parallel Deviation Angle Perpendicular Deviation Angle	$\Delta \phi_{//}$ $\Delta \phi_{\perp}$	These values express the deviation of the optical axis with respect to the reference plane, and are defined for the parallel and perpendicular spread angles (Fig.4) to be (a - b)/2 (Fig.5).
Emission Point Accuracy	$\Delta X, \Delta Y, \Delta Z$	This indicates the amount of deviation of the emission point. ΔX and ΔY indicate deviation from the center of the package, and ΔZ indicates deviation from the reference plane. (Fig.6)
Peak Emission Wavelength	λ	Peak emission wavelength when generating the specified output. As shown in Fig.7, the emission spectrum has both a single mode and a multimode. In the multimode, the wavelength is delined as the wavelength with the highest intensity.

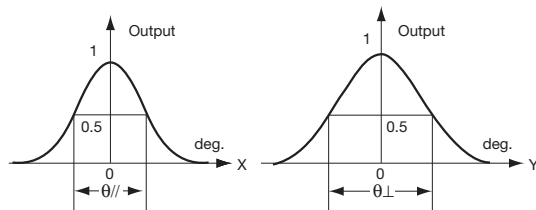
■Fig.2 Optical Output vs. Forward Current



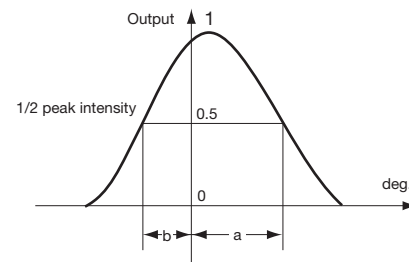
■Fig.3 Radiation Characteristics



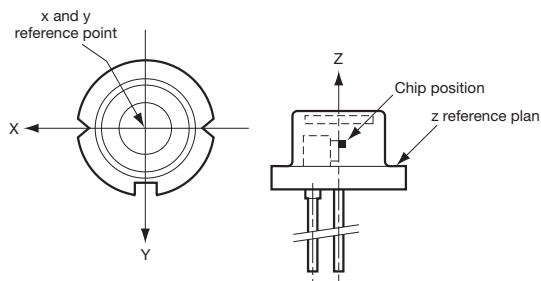
■Fig.4 Radiation Characteristics



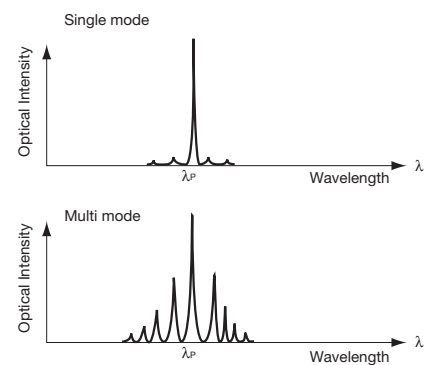
■Fig.5 Deviation Angle



■Fig.6 Deviation Angle



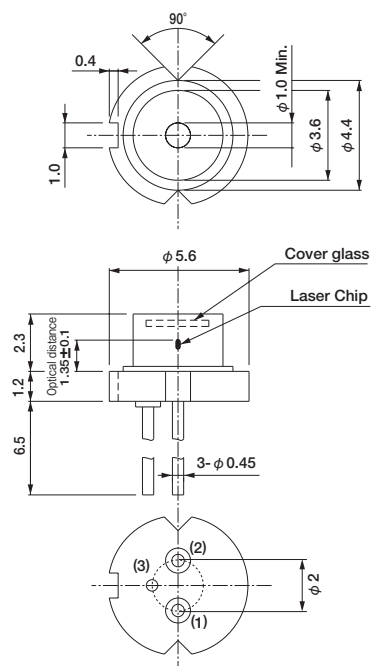
■Fig.7 Emission Spectrum



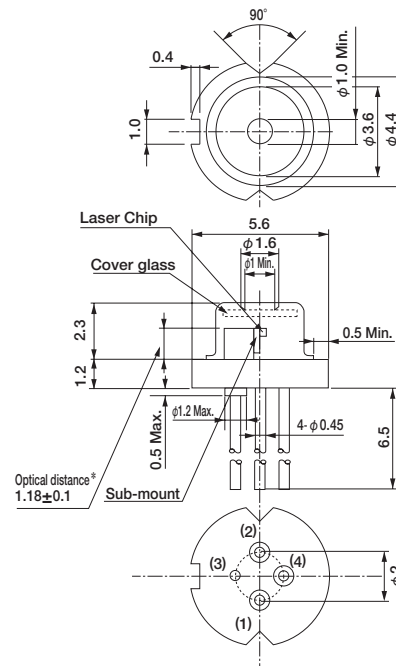
Packaging Specifications

●Dimensions (Unit : mm)

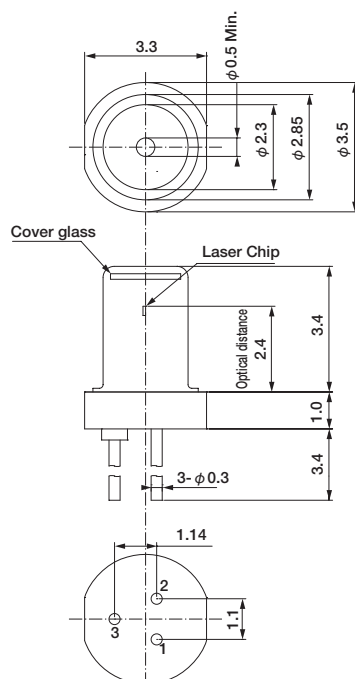
φ 5.6mm



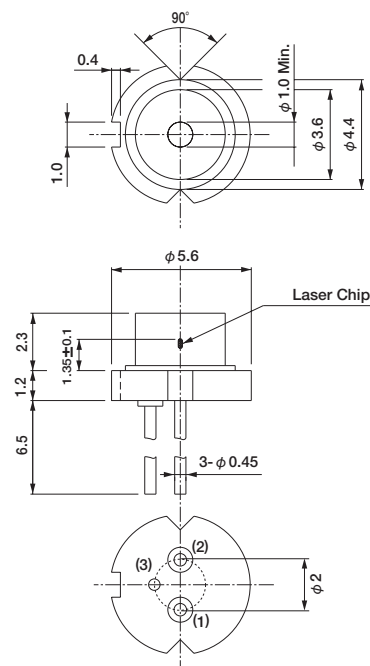
φ 5.6mm(4pin)



φ 3.5mm



φ 5.6mm(Open)



*Please note that differences may exist depending on the part number. Therefore, it is strongly recommended that the customer verify the actual specifications before usage.



Opto Devices

Optical Sensors

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Photointerrupter Selection Guide

●Transmission type Photointerrupters

Part No.	Package	Output type	Standard Characteristics				
			Detection Groove Width(mm)	Slit Width(mm)	Screw stop	Positioning	Remarks
RPI-0125	Surface Mount type	Phototransistor	1.2	0.3			
RPI-0226			2.0	0.3		✓	Wide Gap Surface Mount type
RPI-122	0.8		0.25				
RPI-121	0.8		0.4				
RPI-125	1.2		0.3				
RPI-221	2.3		0.4				
RPI-222	2.0		0.2				
RPI-243	2.0		0.4	✓			
RPI-246	2.0		0.2	✓			
RPI-352	3.0		0.4		✓		
RPI-441C1	4.0		0.5		✓		

●Energysaving Photointerrupters(Eco-friendly type)

Part No.	Package	Output type	Standard Characteristics			
			Detection Groove Width(mm)	Slit Width(mm)	Remarks	
RPI-0352E	Surface Mount type	Phototransistor	3.0	0.4	Energy Saving, High Efficiency	
RPI-441C1E	Leaded type	Phototransistor	4.0	0.5	Energy Saving, High Efficiency	

●Reflective type Photosensors(Photoreflectors)

Part No.	Package	Output type	Standard Characteristics		
			Focal Length(mm)	Light Wave Length(nm)	Remarks
RPR-220	Leaded type	Phototransistor	6.0	940	
RPR-220UC30N		Phototransistor	6.0	630	Emitting Color : Red
RPR-220PC30N		Phototransistor	6.0	470	Emitting Color : Blue

●4 Direction Detector

Part No.	Package	Output type	Standard Characteristics	
			Light Wave Length(nm)	Remarks
RPI-1035	Surface Mount type	Phototransistor	950	

Transmission type Photointerrupters

Linear Phototransistor Output								
Package	Exterior	Part No.	Standard Characteristics					
			Detection Groove Width (mm)	Slit Width (mm)	I _c (mA)	V _{CE} (V)	I _f (mA)	t _r , t _f (μs)
Ultra-Miniature SMD type		RPI-0125	1.2	0.3	0.45Min. 4.95Max.	5	20	10
Miniature SMD type		RPI-0226	2.0	0.3	0.1Min.	5	5	50
Ultra-Compact type		RPI-122	0.8	0.25	0.18Min. 1.08Max.	0.7	3	10
		RPI-121	0.8	0.4	0.7Min.	5	20	10
		RPI-125	1.2	0.3	0.45Min. 4.95Max.	5	20	10
Compact type		RPI-221	2.3	0.4	0.2Min.	5	20	10
		RPI-222	2.0	0.2	0.18Min. 0.95Max.	5	10	10
		RPI-243	2.0	0.4	0.5Min.	5	20	10
		RPI-246	2.0	0.2	0.35Min. 1.2Max.	5	20	10
		RPI-352	3.0	0.4	0.2Min.	5	20	10
		RPI-441C1	4.0	0.5	0.2Min.	5	20	10
Eco-Friendly type		RPI-0352E	3.0	0.4	0.18Min.	5	10	10
		RPI-441C1E	4.0	0.5	0.2Min.	5	10	10

Reflective type Photosensors

Photoreflectors type								
Package	Exterior	Part No.	Standard Characteristics					tr, tf (μs)
			LEDλ _P (nm)	PTTrλ _P (nm)	I _c (mA)	V _{CE} (V)	I _F (mA)	
Case type		RPR-220	940	800	0.08Min. 0.8Max.	2	10	10
		RPR-220UC30N	630	800	0.08Min. 0.8Max.	5	10	10
		RPR-220PC30N	470	800	0.08Min. 0.8Max.	5	10	10

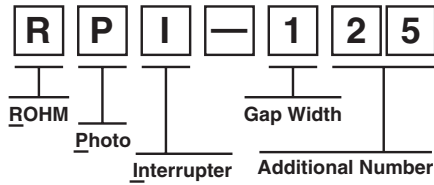
4 Direction Detector

4 Direction Detector								
Package	Exterior	Part No.	Standard Characteristics					tr, tf (μs)
			LEDλ _P (nm)	PTTrλ _P (nm)	I _c (mA)	V _{CE} (V)	I _F (mA)	
Surface Mount type		RPI-1035	950	800	0.1Min.	5	5	10

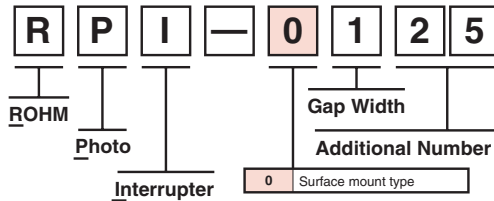
●Product No. Explanation

●Transmission type

7characters

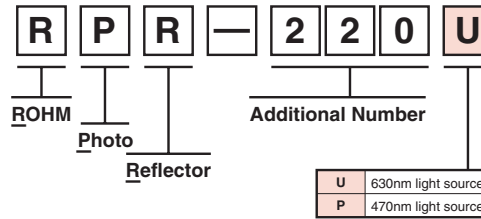


8characters



●Reflective type

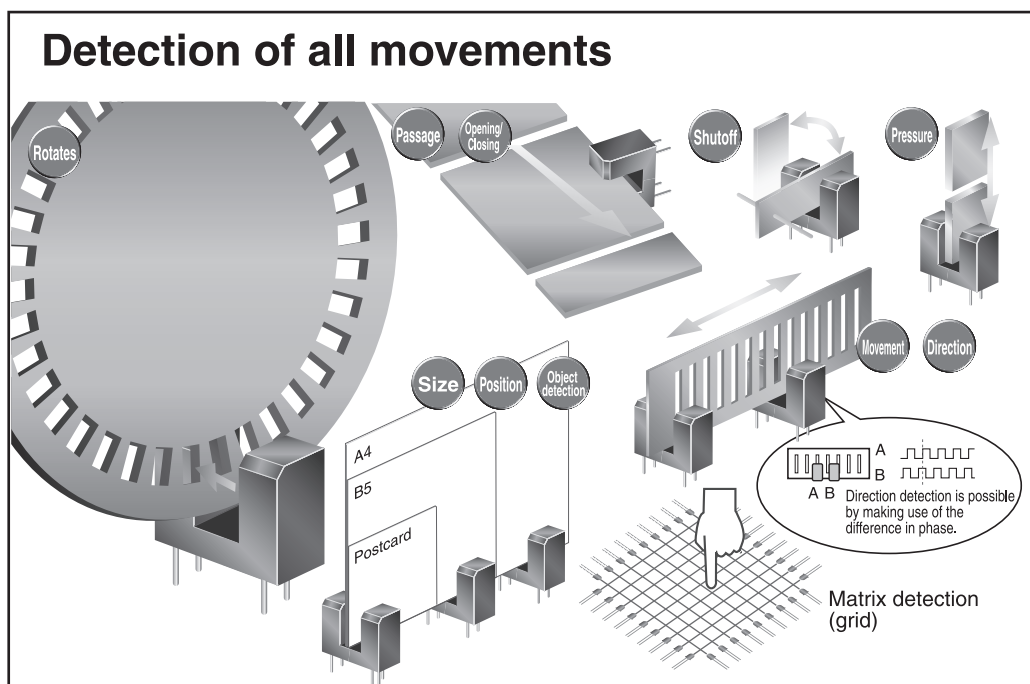
7characters



●Packaging Specifications

Packaging Style	Part No.	Specifications		Quantity Per Unit (pcs)	Basic Ordering Unit (pcs)
		Item Packaging	Case		
Bulk	RPI-243*	Polyethylene bag	Paper box	250/bag	1,000/box
Taping	RPI-0125*	Reel + Aluminum bag	Paper box	750/reel	750/reel
Bulk	RPR-220	Polyethylene bag	Paper box	100/bag	500
Tube	RPR-220UC30N	Stick	Paper box	100/tube	2,500

* Examples



Infrared Light Emitting Diodes

These Ir-LEDs can be used for various remote control applications.

Infrared Light Emitting Diodes 1

Package	Exterior	Part No.	Features	Absolute Maximum Rating	Standard Characteristics						
				I_F (mA)	I_E (mW/sr)	I_F (mA)	V_F (V)	I_F (mA)	λ_P (nm)	tr,tf (μs)	θ1/2 (deg.)
φ3 resin		SIR-34ST3F	Optimized for remote controls	100	10.5	50	1.3	100	950	1	27
		SIR-341ST3F	Compact, high power	75	18.1	50	1.3	50	940	1	16
φ5 resin		SIR-56ST3F	Optimized for remote controls	100	15	50	1.3	100	950	1	15
		SIR-563ST3F	High output, Optimized for remote controls	100	21	50	1.34	50	940	1	15
		SIR-568ST3F	High speed LED for optical communications	100	38	50	1.6	50	850	f _c =50MHz	13
Resin Side View type		SIM-20ST	General purpose molded type	50	7.5	50	1.3	50	950	1	15
		SIM-22ST	General purpose molded type	50	0.8	10	1.3	50	950	1	30
Surface Mount type(Top View)		SIM-030ST	Low Profile(0.9mm)	100	25	100	1.7	100	870	0.1	20
		SIM-040ST	High power	100	40	100	1.7	100	870	0.1	20

The following products are belonging to LEDs.(Refer P.E10)Please ask LED Product group for in query.

Infrared Light Emitting Diodes 2

Package (mm)	Part No.	LED Chip	Emitting Color	Absolute Maximum Rating(Ta=25°C)						Electrical and Optical Characteristics(Ta=25°C)									
				Power Dissipation P _D (mW)	Forward Current I _F (mA)	Peak Forward Current I _{FM} (mA)	Reverse Voltage V _R (V)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Forward Voltage V _F		Reverse Current I _R		Light Wavelength λ _P		Radiant Intensity			
										Typ. (V)	I _F (mA)	Typ. (μA)	V _R (V)	Typ. (nm)	I _F (mA)	Min. (mW/sr)	Typ. (mW/sr)	Max. (mW/sr)	I _F (mA)
 Surface mount type Infrared LEDs 1.0×0.6(t= 0.2)	☆SML-P15R2T	AlGaAs	Infrared	(40)	(20)	(100)*1	(5)	(-40 to +85)	(-40 to +100)	(1.6)	20	(100)	5	(870)	20	(0.6)	(1.1)	(2.2)	20
 Surface mount type Infrared LEDs (Reverse mount available) 3.2×1.6(t=1.85)	☆SML-S15R2T			(100)	(50)	(300)*1	(5)	-40 to +85	-40 to +100	(1.4)		(10)		(870)		(5.6)	(12)	(22)	
 Surface mount type Infrared LEDs 2.0×1.25(t= 0.8)	SML-M13RT			60	30	100*1	5	-40 to +85	-40 to +100	1.4		10		870		0.5	1.7	3.5	
 Surface mount type Infrared LEDs 2.0×1.25(t= 0.8)	☆SML-M15R2T			(60)	(30)	(100)*1	(5)	(-40 to +85)	(-40 to +100)	(1.4)		(10)		(870)		(1.5)	(2.5)	(3.5)	
 Surface mount type Infrared LEDs (Reverse mount available) 3.2×1.6(t=1.85)	SML-S13RT			60	30	300*1	5	-40 to +85	-40 to +100	1.4		10		850		1.5	2.5	3.6	
 Surface mount type Infrared LEDs 3.0×1.5(t=2.2)	SCM-013RT			57										850		0.5	2.0	5.0	
 Surface mount type Infrared LEDs 1.6×0.8 (t=1.24)	☆CSL0901R2T			(60)	(30)	(100)*1	(5)	(-40 to +85)	(-40 to +100)	(1.4)		(10)		(870)		(2.5)	(3.5)	(6.3)	
 Surface mount type Infrared LEDs 1.6×0.8 (t=1.24)	☆CSL1001R2T															(1.0)	(1.6)	(2.5)	
 Surface mount type Infrared LEDs 1.6×1.24 (t=0.8)	☆CSL1201R2T															(2.5)	(3.5)	(6.3)	
 Surface mount type Infrared LEDs 1.6×1.24 (t=0.8)	☆CSL1301R2T															(1.0)	(1.6)	(2.5)	

*1:Duty1/10, 1kHz

(): Reference ☆ : Under Development

●Product No. Explanation

S	I	R	-	3	4	1	S	T	3	F
Series Name				Additional Number		Output configuration		Package color		Terminal shape
SIR φ3 and φ5 types lamp infrared LED						S Infrared LED		B Colored		3F Straight
SIM Side view infrared LED						R Infrared LED		T Clear		T31 Taping
SML Surface mount Infrared LED										T32 Taping
										A47 Taping
										T68 Embossed taping
										T86 Embossed taping

●Packaging Specifications

Packaging Style	Package	Specifications	Quantity Per Unit (pcs)	Basic Ordering Unit (pcs)
Taping	Surface mount type	Embossed taping	—	3,000/reel, 2,000/reel
	All Part No.	Radial taping	—	2,000/reel
Bulk	φ3, φ5 types	Item Packaging: polyethylene bag	500/bag	φ5mm lamps 1,000/box.
	Side-view	Case: paper box	200/bag	φ3mm and side view 2,000/box.

Phototransistors

ROHM phototransistors have high reliability and large collector currents, side view packages, and $\phi 3$ mm lamp packages are available.

Phototransistors 1												
Package	Exterior	Part No.	Feature	Visible Light Filter	Visible Light Filter		Standard Characteristics					
					V_{CE} (V)	P_c Max. (mW)	I_{CE} Max. (μ A)	V_{CE} (V)	I_c (mA)	λ_p (nm)	tr, tf (μ s)	$\theta_{1/2}$ (deg.)
$\phi 3$ resin		RPT-34PB3F	Visible light filter	✓	32	150	0.5	10	2.0Min.	800	10	36
		RPT-37PB3F	Visible light filter, Polarity discrimination	✓	32	150	0.5	10	2.0Min.	800	10	36
		RPT-38PB3F	Visible light filter	✓	32	150	0.5	10	2.0Min.	800	10	36
Resin Side View type		RPM-20PB	Visible light filter	✓	32	100	0.5	10	0.5Min.	800	10	14
		RPM-22PB	Visible light filter, Wide viewing angle	✓	32	100	0.5	10	0.48Min.	800	10	32

The following products are belonging to LEDs.(Refer P.E10)Please ask LED Product group for in query.

Phototransistors 2																		
Package (mm)	Part No.	LED Chip	Absolute Maximum Ratings(Ta=25°C)						Electrical and Optical Characteristics(Ta=25°C)									
			Collector- Emitter Voltage (V)	Emitter- Collector Voltage (V)	Collector Current (mA)	Collector Power Dissipation (mW)	Operating Temperature T _{opr} (°C)	Storage Temperature T _{stg} (°C)	Light Current		Dark Current		Sensitivity Wavelength	Collector-emitter Saturation Voltage				
 Surface Mount Photo Transistor 2.0×1.25(t=0.8)	SML-H10TB	Si	32	5	30	80	-30 to +85	-30 to +100	2.0	4.0	5/ 500	0.5	10	800	—	—	0.4	0.1/ 500
 Surface Mount Photo Transistor (Reverse Mount available) 3.4×1.25(t=1.1)	SML-810TB								2.3	3.8								
 Surface Mount Photo Transistor 3.0×1.5(t=2.2)	SCM-014TB				100				0.3									
 Surface Mount Photo Transistor 1.6×0.8(t=1.24)	☆CSL1001TB																	
 Surface Mount Photo Transistor 1.6×1.24(t=0.8)	☆CSL1301TB		(30)	(5)	(20)	(75)	(-40 to +85)	(-40 to +100)	(1.0)	(4.0)			(0.5)		(800)	—	—	

(): Reference ☆: Under Development

●Product No. Explanation

R	P	T	—	3	4		P	B	3	F																		
Series Name			Additional Number	Output configuration			Package color	Terminal shape																				
RPT	φ3 type Photo Detector			<table><tr><td>P</td><td>Phototransistor</td></tr><tr><td>T</td><td></td></tr></table>			P	Phototransistor	T		<table><tr><td>B</td><td>Colored</td></tr><tr><td>T</td><td>Clear</td></tr></table>	B	Colored	T	Clear	<table><tr><td>3F</td><td>Straight</td></tr><tr><td>T31</td><td>Radial taping</td></tr><tr><td>T32</td><td>Radial taping</td></tr><tr><td>T68</td><td>Embossed taping</td></tr><tr><td>T86</td><td>Embossed taping</td></tr></table>			3F	Straight	T31	Radial taping	T32	Radial taping	T68	Embossed taping	T86	Embossed taping
P	Phototransistor																											
T																												
B	Colored																											
T	Clear																											
3F	Straight																											
T31	Radial taping																											
T32	Radial taping																											
T68	Embossed taping																											
T86	Embossed taping																											
RPM	Side View type Photo Detector																											
SML	Surface Mount type																											
SCM																												
CSL																												

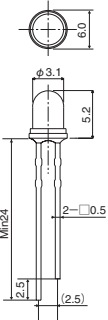
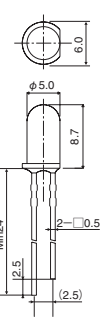
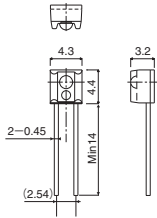
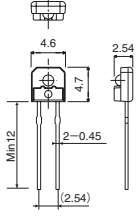
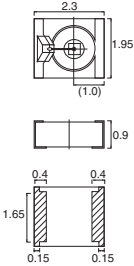
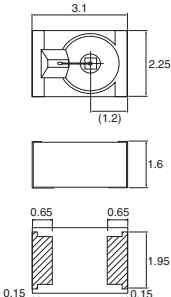
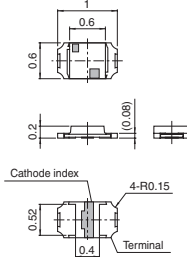
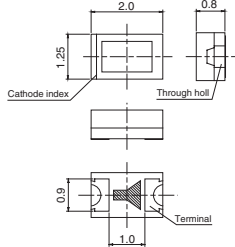
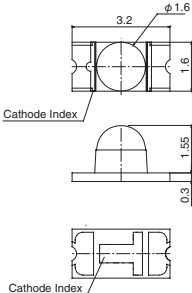
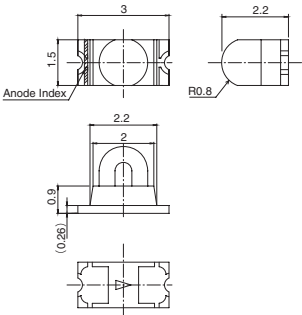
Packages

●Dimensions (Unit : mm)

(Photointerrupter)

●RPI-0125	●RPI-0226	●RPI-122	●RPI-121
●RPI-125	●RPI-221	●RPI-222	●RPI-243
●RPI-246	●RPI-0352E	●RPI-352	●RPI-441C1, RPI-441C1E
●RPR-220	●RPR-220UC30N ●RPR-220PC30N	●RPI-1035	

〈Infrared Light Emitting Diodes〉

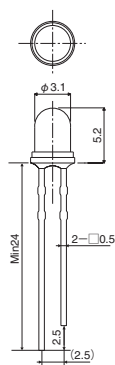
●SIR-34ST3F/341ST3F 	●SIR-56ST3F/563ST3F/568ST3F 	●SIM-20ST 	●SIM-22ST 
●SIM-030ST 	●SIM-040ST 	●SML-P15R2T (PICOLED™) 	●SML-M13RT 
●SML-S13RT, SCM-S15R2T 	●SCM-013RT 		

Packages

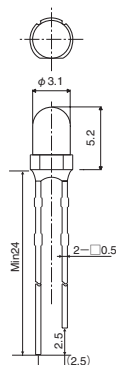
●Dimensions (Unit : mm)

〈Phototransistors〉

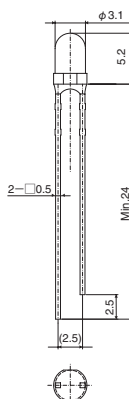
●RPT-34PB3F



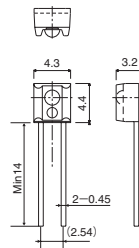
●RPT-37PB3F



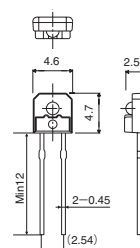
●RPT-38PB3F



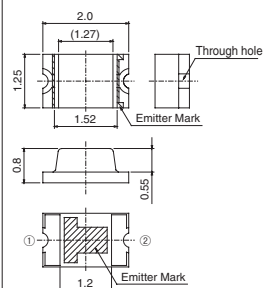
●RPM-20PB



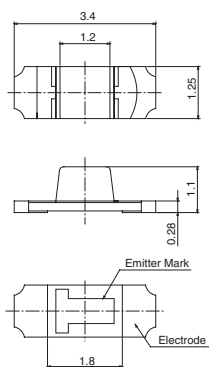
●RPM-22PB



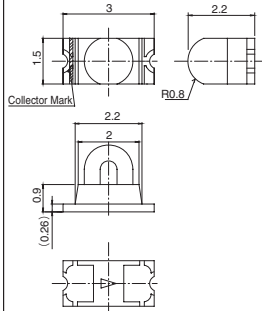
●SML-H10TB



●SML-810TB

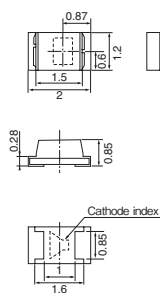


●SCM-014TB



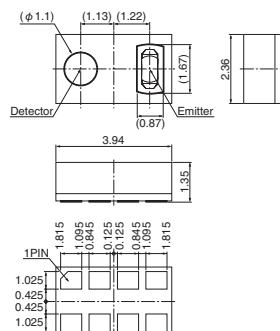
〈Photodiode〉

●RPMD-0100



〈Proximity Sensor〉

●RPR-0521RS





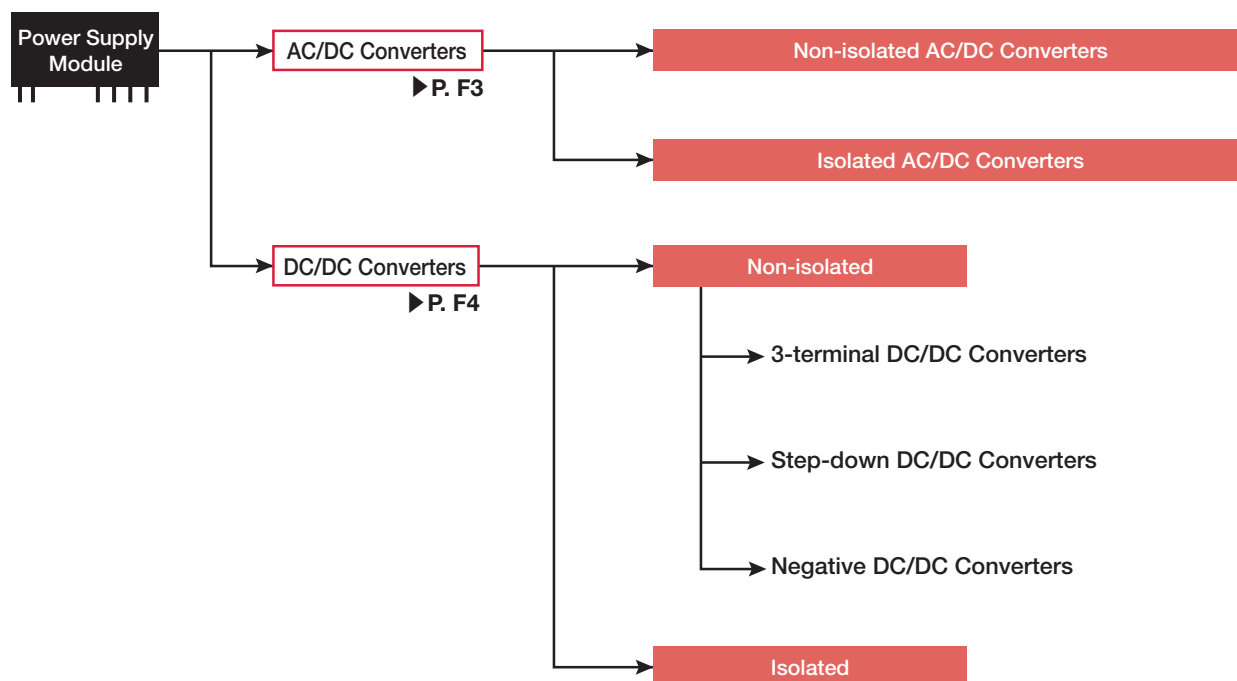
Modules

Power Supply Modules

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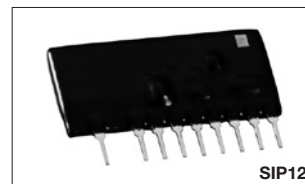
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■ AC/DC Converters	P. F3
■ DC/DC Converters	P. F4

Power Supply Module Selection Guide



AC/DC Converters

- **No transformer(Non-isolation)**
Few external components required, simplifying the DC power supply.
- **Reduces the size and weight of the power supply unit(Non-isolation type)**
Footprint and weight reduced to 1/4th and 1/30th the value, respectively, compared to transformer-equipped power supplies.
- **Wider input voltage range**
- **For industrial equipment, lighting fixtures, and home electronics**



SIP12

Non-isolated AC/DC Converters

Part No.	Input Voltage(V)	Output Voltage(V)	Output Current(mA)	Dimensions(mm)	Package*
BP5038A1	113 to 170(AC conversion 80 to 120VAC)	+5	30	18.0×16.8×9.1	SIP6
BP5063-5			200	28.2×17.9×9.1	SIP10
BP5033-12		+12	100	28.2×15.5×10.5	SIP10
BP5037B12			200	28.2×16.8×9.0	SIP10
BP5039B12			300	35.0×18.0×9.1	SIP12
BP5067-12			350	34.5×20.0×9.9	SIP12
BP5037B15		+15	170	28.2×16.8×9.0	SIP10
BP5039-15			200	35.0×19.5×9.1	SIP12
BP5067-15			300	35.0×22.0×9.2	SIP12
BP5039A		+24	200	35.0×19.5×9.1	SIP12
BP5048	226 to 358(AC conversion 160 to 253VAC)	+12	300	34.5×19.1×9.2	SIP12
BP5047B15	240 to 430(AC conversion 170 to 304VAC)	+15	150	32.5×19.1×10.1	SIP10
BP5048-15	180 to 390(AC conversion 127 to 276VAC)		200	34.5×19.1×9.2	SIP12
BP5047A24	240 to 358(AC conversion 176 to 253VAC)	+24	150	34.5×19.1×9.2	SIP12
BP5048-24	249 to 358(AC conversion 176 to 253VAC)		200	34.5×19.1×9.2	SIP12
BP5045A5	-113 to -390(AC conversion 80 to 276VAC)	-5	200	28.2×17.9×10.1	SIP10
BP5045A			200	28.2×17.9×10.1	SIP10
BP5053-12		-12	200	28.2×17.9×10.1	SIP10
BP5055-12			-240 to -420(AC conversion 170 to 300VAC)	250	28.2×21.5×9.9
	-420 to -600(AC conversion 300 to 425VAC)		130		

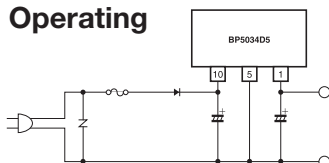
Isolated AC/DC Converters

Part No.	Input Voltage(V)	Output Voltage(V)	Output Current(mA)	Dimensions(mm)	Package*
BP5710-1	120 to 162(AC conversion 85 to 115VAC)	+12	350	35.0×24.0×14.9	SIP11
Part No.	Input Voltage(V)	Output Electric Power(W)	Switching Method	Dimensions(mm)	Package*
BP5725	119 to 405(AC conversion 85 to 286VAC)	6	PWM(light load compatible)	22.5×24.0×7.8	SIP7

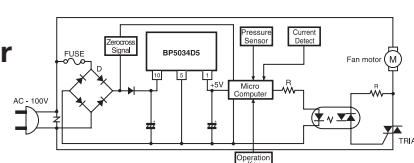
* Original power supply module package used

Typical Applications

Typical Operating Circuit



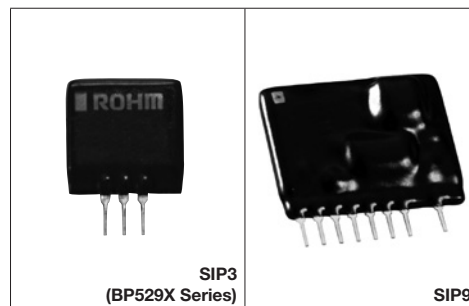
Typical Supply for Vacuum Cleaner



DC/DC Converters

- **High efficiency**
High energy conversion factor(85 to 93%)contributes to compact, power-saving supplies.
- **Few external parts**
Because the external part is only two condensers, it can compose a powersupply circuit easily.
- **Internal output switch**
Enables full use of power saving feature.
- **Wider input voltage range**
Can operate with unregulated mains.(BP5220A/5221A : 8 to 38V)
- **Universal**
Wide applicability(i.e. output switches, protection circuits)
- **Small footprint**
SIP package requires less mounting space.(Board footprint: 65mm²)

*Because there is a product which doesn't have some of these features and characteristic, too, confirm details with each specification.



3-terminal DC/DC Converters(Non-isolated)

Part No.	Input Voltage(V)	Output Voltage(V)	Output Current (mA)	Output Voltage Accuracy(%)	Dimensions(mm)	Package*
BP5293-33	7 to 26	+3.3	1,000	±3.0	17.0×17.8×7.2	SIP3
BP5293-50	7 to 26	+5.0	1,000	±2.0	17.0×17.8×7.2	SIP3
BP5293-12	17 to 26	+12.0	1,000	±5.0	17.0×17.8×7.2	SIP3

• Non need external parts.(Incorporates input and output Capacitor and Inductor) • Pin compatible with Three-terminal LDO.

Step-down DC/DC Converters(Non-isolated)

Part No.	Input Voltage(V)	Output Voltage(V)	Output Current(mA)	Dimensions(mm)	Package*
BP5220A	8 to 38	+5	1,000	28.0×19.5×12.0	SIP9
BP5221A	8 to 38	+5	500	28.0×19.5×12.0	SIP9
BP5222A	15 to 38	+12	500	28.0×19.5×12.0	SIP9

Negative DC/DC Converters(Non-isolated)

Part No.	Input Voltage(V)	Output Voltage(V)	Output Current(mA)	Dimensions(mm)	Package*
BP5122	8 to 20	-12	100	26.7×19.5×12.7	SIP9

• The output voltage can be controlled with the PWM signal or the DC signal. This product is best to control a motor and so on.

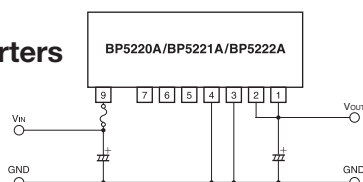
Isolated DC/DC Converters

Part No.	Input Voltage(V)	Output Voltage(V)	Output Current(mA)	Isolation Voltage(V)	Dimensions(mm)	Package*
BP5512A	4.5 to 6.5	+5	200	AC2300	28.2×21.4×17.2	SIP7
BP5324A	4.5 to 5.5	+12	250	AC500	38.5×27.0×13.6	SIP12
BP5510-24	10.8 to 13.2	+24	200	AC500	32.6×24.2×13.6	SIP11

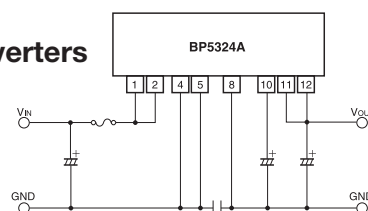
* Original power supply module package used

Typical Applications(Basic)

Step-down DC/DC Converters (Non-isolated)



Isolated DC/DC Converters





Modules

Wireless Modules

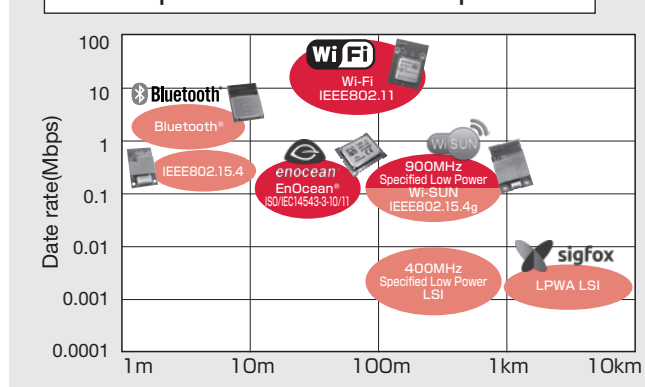
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■ Wi-SUN Communication Modules (Specified Low Power Radio Modules)	P. F6
■ Wireless LAN Modules	P. F6
■ Bluetooth® Modules (LAPIS Semiconductor products)	P. F7
■ IEEE802.15.4 Communication Module (LAPIS Semiconductor products)	P. F7
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ROHM Wireless Modules Technology

■ Wireless Communication

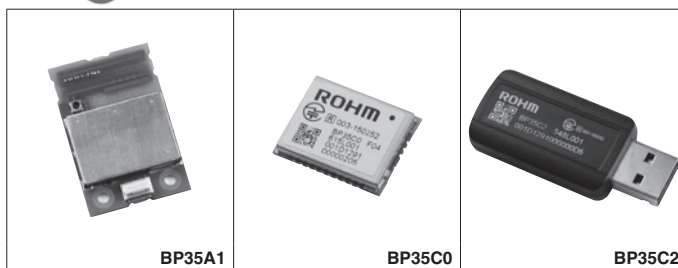
The correspondence of various wireless specifications



• ROHM group is developing Wireless Communication devices in a broad range of fields.

Wi-SUN Communication Modules (Specified Low Power Radio Modules)

- 920MHz specified low-power wireless module
- Excellent receiver sensitivity
- Built-in antenna eliminates the need for high-frequency designs
- Transmitting power pre-adjusted
- MAC address included
- Japan radio law certified

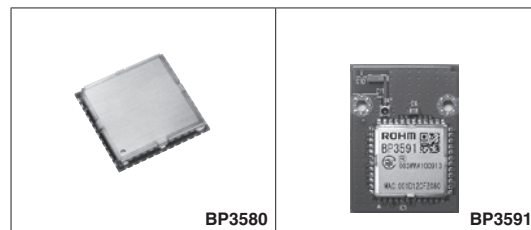


Wi-SUN Communication Modules (Specified Low Power Radio Modules)							
Part No.	Supply Voltage (V)	Operating Temperature (°C)	Host I/F	Terminal Standards	Onboard System LSI	Dimensions (mm)	Package
BP35A1	2.7 to 3.6 (Single power)	-20 to +80	UART	Wi-SUN	ML7396B (LAPIS Semiconductor)	22.0×33.5×4.0	Connector joint type 0.5mm pitch, 20pin
BP35C0	2.6 to 3.6 (Single power)	-30 to +85	UART	Wi-SUN	ML7416N (LAPIS Semiconductor)	15.0×19.0×3.0	SMD 1.27mm pitch, 28pin
BP35C2	5.0 (Single power)	-20 to +50	USB	Wi-SUN	ML7416N (LAPIS Semiconductor)	21.4×49.7×8.5	USB Dongle

Wireless LAN Modules



- IEEE802.11b/g/n compliant Wireless LAN Module
- Built-in baseband IC that made in ROHM
- Transmission power is already adjusted
- Japan radio law certified



Wireless LAN Modules							
Part No.	Supply Voltage (V)	Operating Temperature (°C)	Host I/F	Terminal Standards	Onboard IC	Dimensions (mm)	Package*
BP3580	3.1 to 3.5 (Single power)	-40 to +85	USB/SDIO/UART	• IEEE802.11b/g/n	BU1805GU	17.0×17.0×2.3	Surface mount type End face through hole 1.27mm pitch, 48pin
BP3591	3.1 to 3.5 (Single power)	-40 to +85	USB/SDIO/UART	• IEEE802.11b/g/n • BP3580 and chip-antenna into 1 module	BU1805GU	24.0×33.1×4.7	Connector joint type 0.5mm pitch, 34pin
BP3595	3.1 to 3.5 (Single power)	-40 to +85	USB/SDIO/UART	• IEEE802.11b/g/n • The small size type of BP3591	BU1805GU	15.3×27.6×2.6	Connector joint type 0.4mm pitch, 30pin
BP3599	3.1 to 3.5 (Single power)	-40 to +85	USB/SDIO/UART	• IEEE802.11b/g/n • Type with flash memory mounted on BP3591 • Firmware is written in a flash memory	BU1805GU	24.0×33.1×4.7	Connector joint type 0.5mm pitch, 34pin
BP359B	3.1 to 3.5 (Single power)	-40 to +70	USB/UART/SPI	• IEEE802.11b/g/n • Type with MCU and flash memory mounted on BP3591 • Firmware is written in a flash memory	BU1805GU	24.0×33.1×4.7	Connector joint type 0.5mm pitch, 34pin

*Original ROHM package used.

Bluetooth® Modules Bluetooth®

- Bluetooth Low Energy single mode module
- Low power consumption and the best solution for the instruments using coin type/button battery

TX : 6.7mA, RX : 6.2mA (MK71251 series)

- Built-in pattern antenna and RF characteristic adjusted before shipment
- Certified radio regulation: TELEC, FCC, ISCED(IC), CE



MK71251-01/-02

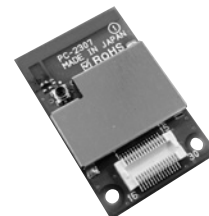
Bluetooth® Low Energy Modules (LAPIS Semiconductor products)									
Part No.	Supply Voltage(V)	Operating Temperature(°C)	Host I/F	Supported Standard	Certification	Module Specification	Flash/RAM	Dimension (mm)	Package
MK71251-01	2.0 to 3.6	−20 to +75	(BACI ^{*1})SPI (HCI ^{*2})UART	Bluetooth® core spec v4.1 (Single mode)	Bluetooth® certification QDID:77987 (End Product) Radio law certification TELEC/FCC/IC/CE	Role: Master/Slave	Flash : — RAM : 28KB	8.0×11.0×2.00	M-FLGA33-8.0X11.0-0.65-9Y
MK71251-02	2.0 to 3.6	−20 to +75	UART	Bluetooth® core spec v4.1 (Single mode)	Bluetooth® certification QDID:77987 (End Product) Radio law certification TELEC/FCC/IC/CE	Role: Slave only Application: Blank	Flash : — RAM : 28KB	8.0×11.0×2.00	M-FLGA33-8.0X11.0-0.65-9Y
MK71251-02A						Role: Slave only Application: Serial communication			
MK71251-02B						Role: Slave only Application: Beacon			
☆MK71351-01	2.0 to 3.6	−40 to +85	UART	Bluetooth® core spec v4.2 (Single mode)	Bluetooth® certification Radio law certification TELEC/FCC/ISED/CE	Role: Master/Slave Application: Blank	Flash : 128KB RAM : 128KB	9.7×11.95×2.00	TBD

*1:BACI(Bluetooth Application Controller Interface):Lapis Semiconductor proprietary host interface *2:HCI(Host Control Interface):Bluetooth standard interface
Note: User need a confirmation and an agreement on an application and usage environment before using Bluetooth modules.
Note: Bluetooth® is a registered trademark of Bluetooth®SIG.

☆: Under Development(Provisional Specification)

IEEE802.15.4 Communication Module

- IEEE802.15.4 compliant wireless communication module
- IEEE802.15.4-2003PHY/MAC integrated (MAC is not full function)
- LAPIS Semiconductor's RF LSI mounted
- RF characteristic adjusted before shipment
- Built-in antenna and certified TELEC



MK72750A-01

IEEE802.15.4 Communication Modules (LAPIS Semiconductor products)									
Part No.	Supply Voltage(V)	Operating Temperature(°C)	Host I/F	Supported Standard	Certification	Module Specification	LSI	Dimension (mm)	Package
MK72750A-01	1.8 to 3.6	−40 to +85	UART	IEEE802.15.4	Radio law certification: TELEC	IEEE802.15.4-2003 PHY/MAC (Not full MAC function)	ML7275 (LAPIS Semiconductor)	20.0×31.0×2.7	30pin Connector

EnOcean® Communication Modules

EnOcean® products are based on energy harvesting battery-less/wireless telecommunication technology.

ROHM has become a member of EnOcean alliance which promote next generation radio telecommunication standard since 2012, and we contribute to the expansion of EnOcean® communication method.

*EnOcean® is a registered trademark of EnOcean GmbH.

■ Feature

- EnOcean® Wireless Standard(ISO/IEC 14543-3-10/11)
- Built-in antenna eliminates the need for high-frequency designs
- Japan radio law certified

*This product(928MHz frequency band) is permitted as "specified low-power radio station" in Japanese radio law.

EnOcean® Communication Modules/Devices											
Frequency Band	Use Target Area	Products									
											
		Energy converter for motion energy harvesting (for the switch module)	Transmitter module (for switch module)	Push button multi-channel switch module	Energy harvesting wireless transceiver module	Programmable transceiver module	Energy harvesting magnet contact module	Energy harvesting temperature sensor module	Humidity sensor module	Receiver USB module	Development kit
928MHz	Japan	ECO 200	PTM 430J	PTM 210J	STM 400J	TCM 410J	STM 429J	STM 431J	HSM 100	USB 400J	EDK 400J*
868MHz	Europe・China	ECO 200	PTM 330	PTM 210	STM 300	TCM 310	STM 320	STM 331	HSM 100	USB 300	EDK 350

*Contents: PTM 210J (Switch Module) / USB 400J (USB Dongle) / PTM 430J (Circuit Board for Switch Module) / ECO 200 (Electromagnetic Induction Generator for Switch Module) / STM 431J (Temperature Sensor Module) / STM 400J (Energy Harvesting Wireless Module) / EOP 350 (Programming Board : it's for rewriting of STM 431J, STM 400J) / USB Cable ... Connection cable of EOP 350 and PC
 ●STM 400J in EDK 400J is mounted on the exclusive Substrate to connect to EOP 350

- Please choose your region products by frequency band.
- Please contact a ROHM sales representative for purchase and inquiry.
- Please refer to our EnOcean® introduction page(<https://www.rohm.com/enOcean>) for detail.



Modules

Thermal Printheads

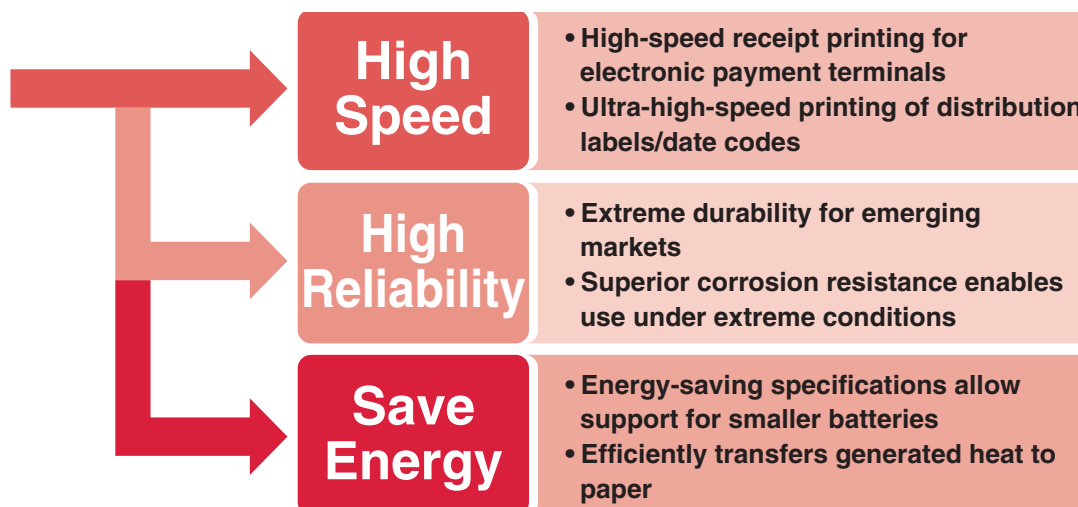
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■ For Receipt Printers, Label Printers : CF/CA, CG/LE series	 P. F13
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Introduction of ROHM Thermal Printheads

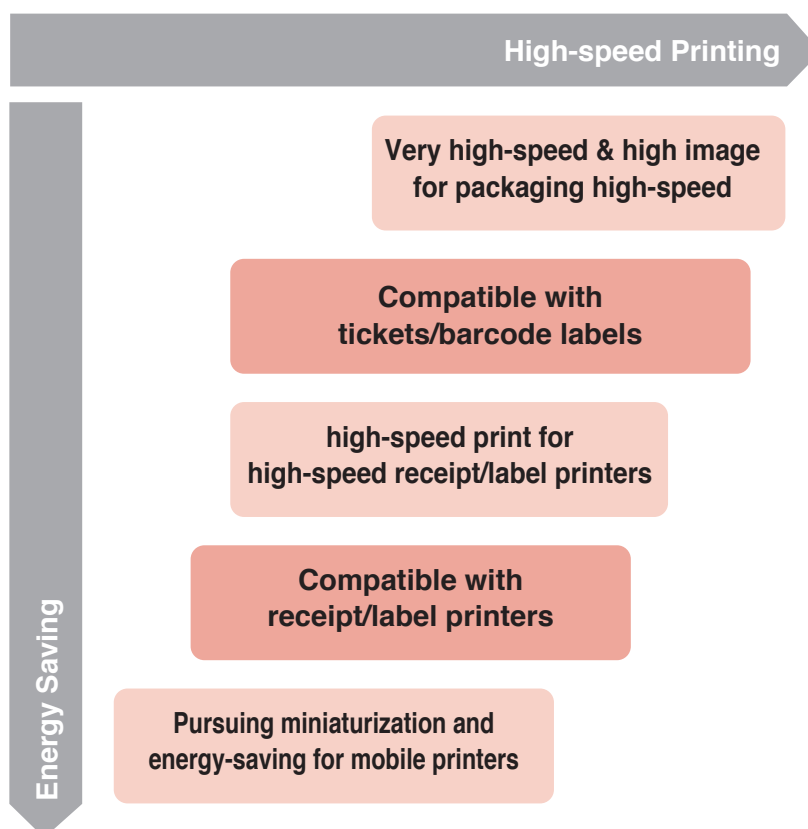
Propose various applications from ROHM wide lineup

1. Features of thermal printhead



2. ROHM wide lineup

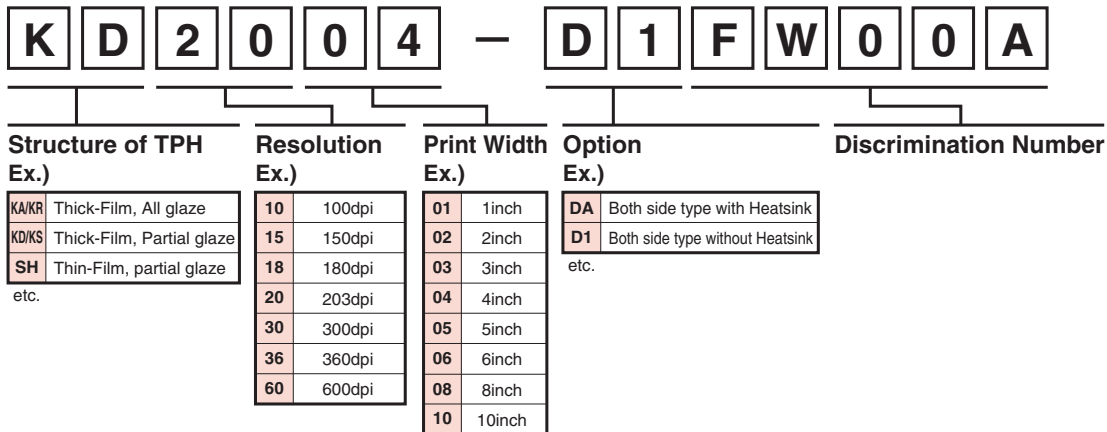
ROHM's TPH Lineup



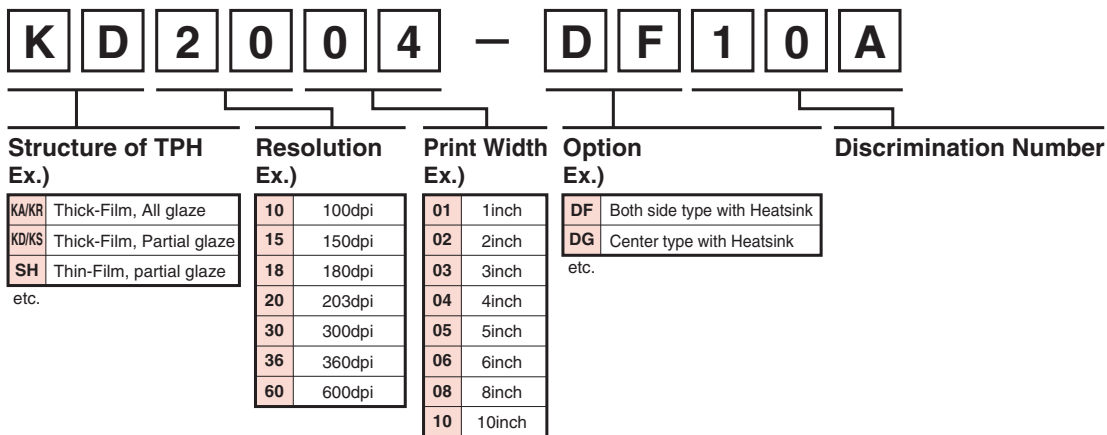
We have various line-up to response the customer requests.
Please contact a ROHM sales representative for further details when there is no product on our lineup.

Part No. Configuration

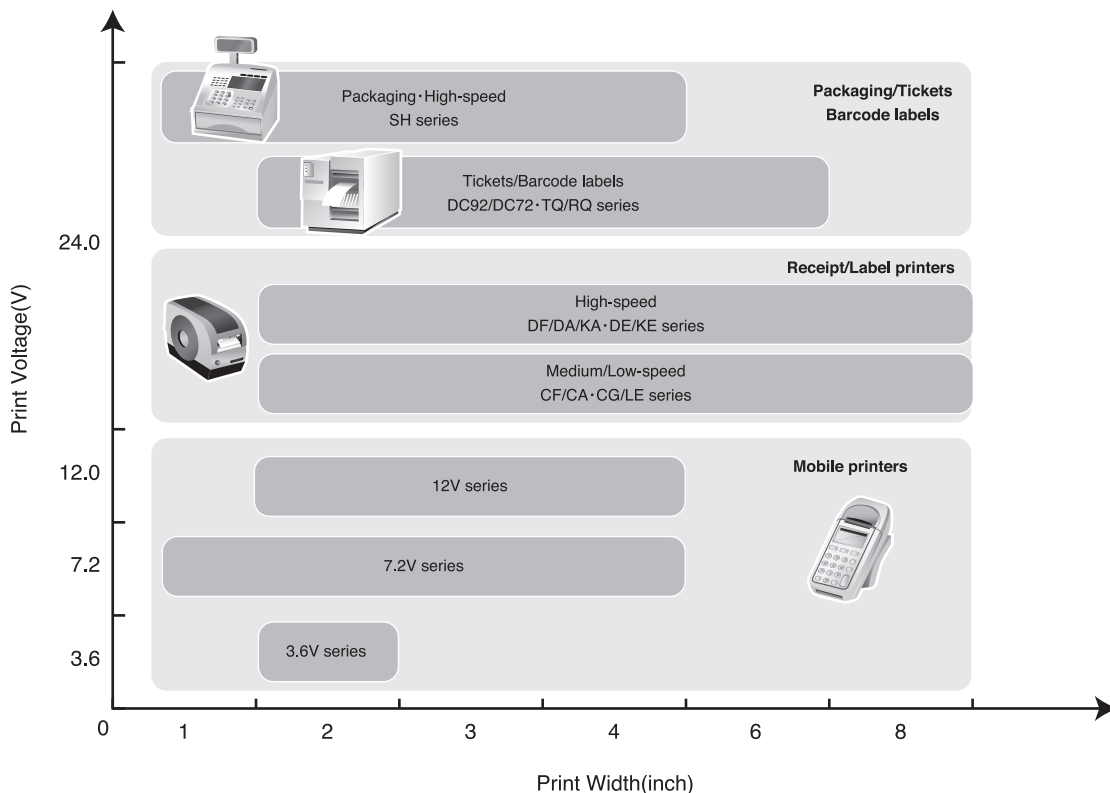
Totally 13 digit



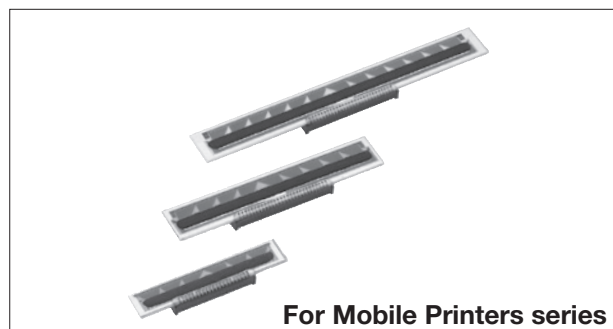
Totally 11 digit



Selection guide



For Mobile Printers series



■Features

3.6V Li-ion battery driving model and 12.0V driving model are added to lineup.

the customer need diversification of applications. ROHM is developing in order to response these requests.

■Applications

Ideal for mobile printers, with low voltage and current capacity limitations, and EFT-POS terminals, receipt printers and compact label printers, where small size and low energy consumption are important requirements.

For Mobile Printers series											
Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltage (Vcc)	Heat Sink	Interface	
KR2002-D06N10A	203	48	384	80	8.0	100	3.6	2.70 to 5.25	—	21pin Non connector (Pre-soldering)	
KA2002-B35N00A		176	576	14.0			7.2			21pin Center type (Flat cable)	
KA2003-B35N00A					28pin Center type (Flat cable)						
KA2002-BE13A			48	384							
KA2003-BE51A			72	576							
KA2004-BE51A			104	832							
KA2004-D35N90A		104	832								
KA3002-B05N00A	300	48.8	576	210	8.0	75	12.0	2.70 to 5.25	—	21pin Non connector (Pre-soldering)	
KD2002-D3JX20A	203	48	384		14.0	150				12.0	21pin Center type (Flat cable)
KD2003-D3JX20A		72	576								20.0
KD2002-D5JX20A		56	448								
KD2003-D5JX20A		80	640								
KD2004-D5JX20A		104	832								

We can also develop a thermal printhead per customized specifications. Please contact a ROHM sales representative for further details.

For Receipt Printers, Label Printers : CF/CA, CG/LE series



■Features

Adopting the most suitable structures of the heat elements such as CF/CA · CG/LE series for 100mm/s high speed printing, CG series for 150mm/s make the high quality printings and energy-savings possible. Plus, those thermal print heads are able to cover various controls by adopting the high-frequency clock.

■Applications

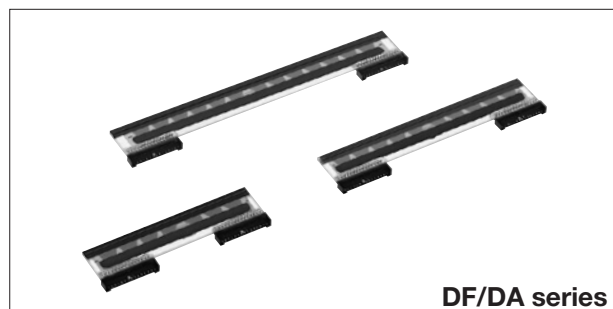
High versatility makes these products ideal for POS terminals, ATMs, gaming, lottery printers, and the like.



CF/CA series										
Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltageae (Vcc)	Heat Sink	Interface
KD2002-CAFW00A	203	54	432	800	14.0	150	24	3.13 to 5.25	YES	7pin × 2, Both-side type (Wire cable)
KD2003-CAFW00A		72	576						YES	9pin × 2, Both-side type (Wire cable)
KD2004-CAFW00A		108	864						YES	
KD2004-C1GW00A		108	864						—	
KD2004-CAGW00A		108	864						YES	
KD2008-CF10A		216	1,728	1,000	20.0	100			YES	15pin × 2, Both-side type (Wire cable)
KD2008-CF16A		216	1,728	800		125			YES	
KD3008-CF10A		300	219.5	2,592		1,250			100	
CG/LE series										
Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltageae (Vcc)	Heat Sink	Interface
KD2002-CG11A	203	54	432	800	20.0	150	24	3.13 to 5.25	YES	28pin Center type (Flat cable)
KD2003-CG11A		72	576		YES					
KD2003-CG22A		72	576		YES					
KD2003-CE22A		72	576		—					
KD2004-CG11A		108	864		3.13 to 5.25				YES	
KD2008-CG50A		216	1,728		4.75 to 5.25				YES	
KD3003-LEGW00A		300	73.2	864	1,000	125		YES		

We can also develop a thermal printhead per customized specifications. Please contact a ROHM sales representative for further details.

For High-speed Receipt Printers, Label Printers : DF/DA, DE/KE series

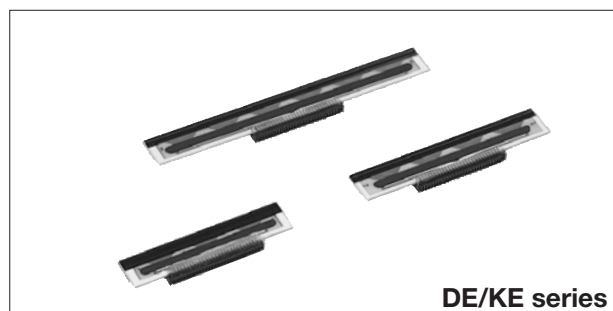

DF/DA series

■Features

The original heat element structure enables dark printing from the get go with minimal smearing at the end for optimum print quality, even at high 100 to 250mm/s printing speeds.

■Applications

Ideal for POS and ECR printers that support high-speed printing and compact label printers.


DE/KE series

DF/DA series

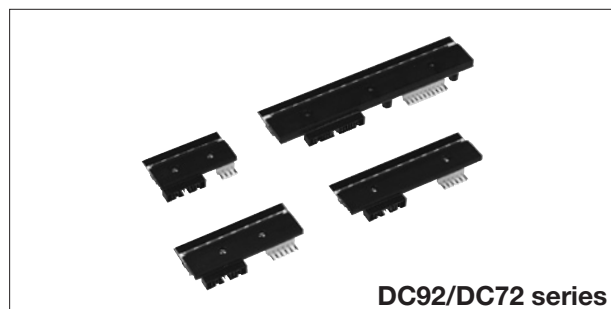
Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltage (V _{cc})	Heat Sink	Interface			
KD2002-DAFW00A	203	56	448	650	20.0	250	24	3.13 to 5.25	YES	15pin × 2, Both-side type (Wire cable)			
KD2003-DAFW00A		80	640						YES				
KD2003-DAGW00A									YES				
KD2004-DAFW00A									YES				
KD2004-D1GW00A									—				
KD2004-DAGW00A		104	832						YES				
KD3002-DF11A	300			54.2	640	1,000			18.0		100	YES	
KD3003-DF11A		81.3	960	YES									
KD3004-DF11A		108.4	1,280	YES									
KD3004-K1GW00A				—									
KD3008-DF54A		216.8	2,560	660	25.0							4.75 to 5.25	YES

DE/KE series

Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltage (V _{cc})	Heat Sink	Interface	
KD2002-DB32A	203	48	384	650	8.0	150	24	3.13 to 5.25	—	21pin Non connector (Pre-soldering)	
KD2002-DEFW00A		56	448		20.0	250			YES	28pin Center type (Flat cable)	
KD2003-D0FW00A		80	640						—	28pin Non connector (Pre-soldering)	
KD2003-D5FW00A									—		28pin Center type (Flat cable)
KD2003-D5GW00A									—		
KD2003-DEFW00A									YES		
KD2003-DEGW00A									YES	—	28pin Center type (Flat cable)
KD2003-F5FW00A		104	832		14.0	—			28pin Center type (Flat cable)		
KD2003-F5GW00A					20.0	—			28pin Center type (Flat cable)		
KD2004-DEFW00A						YES					
KD2004-D0GW00A						—			28pin Non connector (Pre-soldering)		
KD3003-KEFW00A	300	81.3	960	1,000	18.0	200			YES	28pin Center type (Flat cable)	

We can also develop a thermal printhead per customized specifications. Please contact a ROHM sales representative for further details.

For Ticket, Barcode label Printers : DC92/DC72, TQ/RQ series



■Features

ROHM's high-current thermal printheads, featuring a heat element structure compatible with high-speed printing along with a durable protective coating, enable high-speed printing with superior energy savings, providing superior reliability in industrial equipment. The heat history controls are equipped with DC72 series which is ROHM's original and covers high speed printings of 12ips.

■Applications

Ideal for bar-code printers or label printers at factory lines or distribution centers where 24-hour operation or continuous printing are required.

DC92 series

Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltage (V _{cc})	Heat Sink	Interface	Historical Control
KD2002-DC92A	203	56	448	550	20.0	100 to 150	24	4.75 to 5.25	YES	20pin connector, 4pin power connector (Wire cable)	—
KD2003-DC92A		80	640							20pin connector, 6pin power connector (Wire cable)	
KD2004-DC92A		104	832							34pin connector, 10pin power connector (Wire cable)	
KD2006-DC92A		168	1,344							650	
KD3002-DC92A	300	54.2	640	1,250		50 to 100				20pin connector, 6pin power connector (Wire cable)	
KD3003-DC92A		81.3	960							20pin connector, 6pin power connector (Wire cable)	
KD3004-DC92A		108.4	1,280							34pin connector, 10pin power connector (Wire cable)	
KD3006-DC92A		162.6	1,920							34pin connector, 10pin power connector (Wire cable)	

DC72 series

Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltage (V _{cc})	Heat Sink	Interface	Historical Control	
KD2002-DC72A	203	56	448	550	20.0	100 to 250	24	4.75 to 5.25	YES	20pin connector, 4pin power connector (Wire cable)	YES	
KD2003-DC72A		80	640							20pin connector, 6pin power connector (Wire cable)		
KD2004-DC72A		104	832							34pin connector, 10pin power connector (Wire cable)		
KD2006-DC72A		168	1,344							20pin connector, 4pin power connector (Wire cable)		
KD3002-DC72A	300	54.2	640	1,250		100 to 200				20pin connector, 6pin power connector (Wire cable)		
KD3003-DC72A		81.3	960									34pin connector, 10pin power connector (Wire cable)
KD3004-DC72A		108.4	1,280									34pin connector, 10pin power connector (Wire cable)
KD3006-DC72A		162.6	1,920									34pin connector, 10pin power connector (Wire cable)

TQ series

	Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltage (V _{cc})	Heat Sink	Interface	Historical Control
New	KD2002-TQFW00A	203	56	448	550	20.0	100 to 150	24	3.13 to 5.25	YES	20pin connector, 4pin power connector (Wire cable)	—
New	KD2003-TQFW00A		80	640							20pin connector, 6pin power connector (Wire cable)	
New	KD2004-TQFW00A		104	832							26pin connector, 10pin power connector (Wire cable)	
New	KD2006-TQFW00A		168	1,344							20pin connector, 4pin power connector (Wire cable)	
New	KD3002-TQFW00A	300	54.2	640	850		50 to 100				20pin connector, 6pin power connector (Wire cable)	
New	KD3003-TQFW00A		81.3	960							20pin connector, 6pin power connector (Wire cable)	
New	KD3004-TQFW00A		108.4	1,280							26pin connector, 10pin power connector (Wire cable)	
New	KD3006-TQFW00A		162.6	1,920							26pin connector, 10pin power connector (Wire cable)	

RQ series

	Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltage (V _{cc})	Heat Sink	Interface	Historical Control
New	KD2002-RQFW00A	203	56	448	550	20.0	100 to 250	24	3.13 to 5.25	YES	20pin connector, 4pin power connector (Wire cable)	YES
New	KD2003-RQFW00A		80	640							20pin connector, 6pin power connector (Wire cable)	
New	KD2004-RQFW00A		104	832							26pin connector, 10pin power connector (Wire cable)	
New	KD2006-RQFW00A		168	1,344							20pin connector, 4pin power connector (Wire cable)	
New	KD3002-RQFW00A	300	54.2	640	850		100 to 200				20pin connector, 6pin power connector (Wire cable)	
New	KD3003-RQFW00A		81.3	960							20pin connector, 6pin power connector (Wire cable)	
New	KD3004-RQFW00A		108.4	1,280							26pin connector, 10pin power connector (Wire cable)	
New	KD3006-RQFW00A		162.6	1,920							26pin connector, 10pin power connector (Wire cable)	

We can also develop a thermal printhead per customized specifications. Please contact a ROHM sales representative for further details.

For Packaging High-speed Printers : SH series


SH series

■Features

These thermal heads feature a near-edge structure based on the high-speed, high-quality, reliable step-free SH series, enabling straight path for hard media or high speed printing.

■Applications

Ideal for packaging printers requiring high reliability.

For Packaging High-speed Printers : SH series

	Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltage (V _{cc})	Heat Sink	Interface	Historical Control
New	SH3001-PPFW00A	300	32.52	384	550	50.0	600	24	4.75 to 5.25	YES	16pin connector, 4pin power connector (Wire cable)	YES
New	SH3002-PPFW00A		54.2	640							20pin connector, 6pin power connector (Wire cable)	
New	SH3004-PPFW00A		108.4	1,280							26pin connector, 10pin power connector (Wire cable)	

We can also develop a thermal printhead per customized specifications. Please contact a ROHM sales representative for further details.

For Facsimiles : A series


A series

■Features

In-house IC is mounted on ROHM printheads for A4 facsimiles, contributing to a reduction in the size and weight of printers. It enjoys wide use due to their high productivity, basic structure and reliable performance.

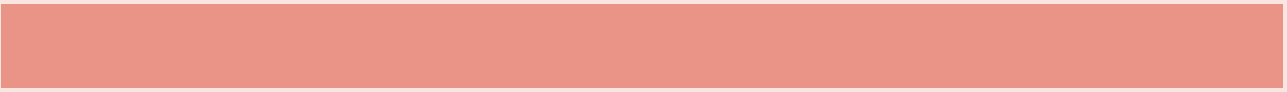
■Applications

Facsimiles of all types, from personal to business. Also ideal for ECGs and other medical imaging equipment due to particle-free printing.

For Facsimiles : A series

	Part No.	Resolutions (dpi)	Print Width (mm)	Number of dot (dots)	Resistance Tolerance (Ω)	Platen Diameter Max. (mm)	Print Speed (mm/s)	Supply Voltage (VH)	Logic Voltage (V _{cc})	Heat Sink	Interface
	KA2008-AF10A	203	216	1,728	3,000	20.0	6.25 to 12.5	24	3.13 to 5.25	YES	9pin × 2, Both-side type (Wire cable)

We can also develop a thermal printhead per customized specifications. Please contact a ROHM sales representative for further details.



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1SS355VM	C84	2SB1694	C25	2SCR553P	C31	BA15BC0	A36	BA3474FV	A12
1SS380VM	C84	2SB1695	C29	2SCR553P5	C31	BA15BC0W	A36	BA3474FVJ	A12
1SS390SM	C85	2SB1695K	C25	2SCR553R	C29	BA15DD0T	A34	BA3474RFV	A12
1SS400CM	C84	2SB1697	C31	2SCR554P	C31	BA15DD0W	A34	BA3474WV-C	A13
1SS400SM	C84	2SB1705	C29	2SCR554P5	C31	BA15JC5T	A36	BA3474YFV-C	A13
2SA1036K	C25	2SB1706	C29	2SCR554R	C29	BA18BC0	A36	BA3662CP-V5	A35
2SA1037AK	C25	2SB1707	C29	2SCR562F3	C31	BA18BC0W	A36	BA3834F	A104
2SA1514K	C25	2SB1708	C29	2SCR572D3	C32	BA18DD0T	A34	BA3835F	A104
2SA1576A	C25	2SB1709	C29	2SCR573D3	C32	BA18DD0W	A34	BA4510F	A15
2SA1576U3	C25	2SB1710	C29	2SCR574D3	C32	BA18JC5T	A36	BA4510FV	A15
2SA1576UB	C24	2SB1730	C29	2SCR582D3	C32	BA2107G	A15	BA4510FVM	A15
2SA1577	C25	2SB1731	C29	2SCR583D3	C32	BA2115F	A15	BA4510FVT	A15
2SA1579	C25	2SB1732	C29	2SCR586D3	C32	BA2115FJ	A15	BA4558F	A15
2SA1579U3	C25	2SB1733	C29	2SCR586J	C32	BA2115FVM	A15	BA4558FJ	A15
2SA1774	C25	2SB852K	C27	2SCR587D3	C32	BA25BC0	A36	BA4558FV	A15
2SA1774EB	C24	2SC2411K	C25	2SCRC41C	C25	BA25BC0W	A36	BA4558FVM	A15
2SA2018	C25	2SC2412K	C25	2SD1383K	C27	BA25DD0T	A34	BA4558FVT	A15
2SA2029	C24	2SC3837K	C28	2SD1484K	C25	BA25DD0W	A34	BA4558RF	A15
2SA2030	C24	2SC3838K	C28	2SD1757K	C25	BA25JC5T	A36	BA4558RFJ	A15
2SA2071P5	C31	2SC3906K	C25	2SD1781K	C25	BA2901F	A16	BA4558RFV	A15
2SA2088	C25	2SC4061K	C25	2SD1782K	C25	BA2901FV	A16	BA4558RFVM	A15
2SA2088U3	C25	2SC4081	C25	2SD1834	C31	BA2901SF	A16	BA4558RFVT	A15
2SA2094	C29	2SC4081U3	C25	2SD1918	C31	BA2901SFV	A16	BA4558YF-M	A15
2SA2119K	C25	2SC4081UB	C24	2SD1949	C25	BA2901YF-C	A16	BA4558YFV-M	A15
2SAR293P	C31	2SC4082	C28	2SD1980	C31	BA2901YF-LB	A16	BA4558YFVM-M	A15
2SAR293P5	C31	2SC4083	C28	2SD2114K	C27	BA2901YF-M	A16	BA4560F	A15
2SAR340P	C31	2SC4097	C25	2SD2142K	C27	BA2901YFV-C	A16	BA4560FJ	A15
2SAR340Q	C29	2SC4098	C28	2SD2143	C31	BA2901YFV-M	A16	BA4560FV	A15
2SAR372P5	C31	2SC4102	C25	2SD2153	C31	BA2902YF-C	A11	BA4560FVM	A15
2SAR375P5	C31	2SC4102U3	C25	2SD2226K	C27	BA2902YF-M	A11	BA4560FVT	A15
2SAR502EB	C24	2SC4617	C25	2SD2351	C27	BA2902YFV-C	A11	BA4560RF	A15
2SAR502U3	C25	2SC4617EB	C24	2SD2444K	C25	BA2902YFV-M	A11	BA4560RFJ	A15
2SAR502UB	C24	2SC4618	C28	2SD2537	C31	BA2903F	A16	BA4560RFV	A15
2SAR512P	C31	2SC4713K	C28	2SD2652	C25	BA2903FV	A16	BA4560RFVM	A15
2SAR512P5	C31	2SC4725	C28	2SD2653	C29	BA2903FVM	A16	BA4560RFVT	A15
2SAR512R	C29	2SC4726	C28	2SD2653K	C25	BA2903SF	A16	BA4560YF-M	A15
2SAR513P	C31	2SC4774	C28	2SD2654	C27	BA2903SFV	A16	BA4560YFV-M	A15
2SAR513P5	C31	2SC5585	C25	2SD2656	C25	BA2903SFVM	A16	BA4560YFVM-M	A15
2SAR513R	C29	2SC5658	C24	2SD2657	C29	BA2903YF-C	A16	BA4564RFV	A15
2SAR514P	C31	2SC5661	C28	2SD2657K	C25	BA2903YF-LB	A16	BA4564WV	A16
2SAR514P5	C31	2SC5662	C28	2SD2661	C31	BA2903YF-M	A16	BA4580RF	A15
2SAR514R	C29	2SC5663	C24	2SD2670	C29	BA2903YFV-C	A16	BA4580RFJ	A15
2SAR522EB	C24	2SC5824	C31	2SD2671	C29	BA2903YFV-M	A16	BA4580RFVM	A15
2SAR522M	C24	2SC5866	C29	2SD2672	C29	BA2903YFVM-C	A16	BA4580RFVT	A15
2SAR522UB	C24	2SC5876	C25	2SD2673	C29	BA2903YFVM-M	A16	BA4580YF-M	A15
2SAR523EB	C24	2SC5876U3	C25	2SD2674	C29	BA2904YF-C	A11	BA4580YFVM-M	A15
2SAR523M	C24	2SCR293P	C31	2SD2675	C29	BA2904YF-M	A11	BA4584FV	A15
2SAR523UB	C24	2SCR293P5	C31	2SD2696	C24	BA2904YFV-C	A11	BA4584RF	A15
2SAR533P	C31	2SCR341Q	C29	2SD2700	C29	BA2904YFV-M	A11	BA4584RFV	A15
2SAR533P5	C31	2SCR346P	C31	2SD2701	C29	BA2904YFVM-C	A11	BA4584YFV-M	A15
2SAR542F3	C31	2SCR372P	C31	2SD2702	C29	BA2904YFVM-M	A11	BA50BC0	A36
2SAR542P	C31	2SCR372P5	C31	2SD2703	C29	BA30BC0	A36	BA50BC0W	A36
2SAR543R	C29	2SCR375P	C31	2SD2704K	C27	BA30BC0W	A36	BA50DD0T	A34
2SAR544P	C31	2SCR375P5	C31	2SD2707	C27	BA30DD0T	A34	BA50DD0W	A34
2SAR544P5	C31	2SCR502EB	C24	AG009DGG3	C22	BA30DD0W	A34	BA50JC5T	A36
2SAR544R	C29	2SCR502U3	C25	BA00BC0W	A36	BA30E00WHFP	A47	BA60BC0	A36
2SAR552P	C31	2SCR502UB	C24	BA00CC0W	A35	BA30JC5T	A36	BA60BC0W	A36
2SAR552P5	C31	2SCR512P	C31	BA00DD0W	A34	BA3121F	A102	BA60JC5T	A36
2SAR553P	C31	2SCR512P5	C31	BA00JC5WT	A36	BA3123F	A102	BA6219BFP-Y	A69
2SAR553P5	C31	2SCR512R	C29	BA033CC0	A34	BA3131FS	A102	BA6247FP-Y	A69
2SAR553R	C29	2SCR513P	C31	BA033CC0W	A35	BA3259HFP	A47	BA6285AFP-Y	A69
2SAR554P	C31	2SCR513P5	C31	BA03CC0	A34	BA3308F	A102	BA6285FS	A69
2SAR554P5	C31	2SCR513R	C29	BA03CC0W	A35	BA3308FV	A102	BA6287F	A69
2SAR554R	C29	2SCR514P	C31	BA05CC0	A34	BA33BC0	A36	BA6406F	A75
2SAR562F3	C31	2SCR514P5	C31	BA05CC0W	A35	BA33BC0W	A36	BA6506F	A75
2SAR572D3	C32	2SCR514R	C29	BA06CC0	A34	BA33D15HFP	A47	BA6920FP-Y	A69
2SAR573D3	C32	2SCR522EB	C24	BA06CC0W	A35	BA33D18HFP	A47	BA70BC0	A36
2SAR574D3	C32	2SCR522M	C24	BA07CC0	A34	BA33DD0T	A34	BA70BC0W	A36
2SAR582D3	C32	2SCR522UB	C24	BA07CC0W	A35	BA33DD0W	A34	BA7805	A33
2SAR583D3	C32	2SCR523EB	C24	BA08CC0	A34	BA33JC5T	A36	BA7806	A33
2SAR586D3	C32	2SCR523M	C24	BA08CC0W	A35	BA3472F	A12	BA7807	A33
2SAR587D3	C32	2SCR523UB	C24	BA09CC0	A34	BA3472FJ	A12	BA7808	A33
2SARA41C	C25	2SCR533P	C31	BA09CC0W	A35	BA3472FV	A12	BA7809	A33
2SB1197K	C25	2SCR533P5	C31	BA1117FP	A33	BA3472FVM	A12	BA7810	A33
2SB1198K	C25	2SCR542F3	C31	BA12003B	A18	BA3472FVT	A12	BA7812	A33
2SB1275	C31	2SCR542P	C31	BA12003DF-Z	A18, C53	BA3472RFVM	A12	BA7815	A33
2SB1316	C31	2SCR543R	C29	BA12004B	A18	BA3472WV-C	A13	BA7818	A33
2SB1427	C31	2SCR544P	C31	BA12004DF-Z	A18, C53	BA3472YF-C	A13	BA7820	A33
2SB1590K	C25	2SCR544P5	C31	BA14741F	A15	BA3472YF-LB	A12	BA7824	A33
2SB1689	C25	2SCR544R	C29	BA14741FJ	A15	BA3472YFV-C	A13	BA78M05	A33
2SB1690	C29	2SCR552P	C31	BA15218F	A15	BA3472YFVM-	A13	BA78M06	A33
2SB1690K	C25	2SCR552P5	C31	BA15532F	A15	BA3474F	A12	BA78M07	A33

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BA78M09	A33	BD00GCOMEFJ/BD00GCOMEFJ-M	A37	BD18GA3W	A38	BD25GA3W	A38	BD33HC5MEFJ-LB	A39
BA78M10	A33	BD00HA3MEFJ-LB	A40	BD18GA5MEFJ-LB	A38	BD25GA5MEFJ-LB	A38	BD33HC5WEFJ/BD33HC5MEFJ-M	A39
BA78M12	A33	BD00HA3WEFJ/BD00HA3MEFJ-M	A40	BD18GA5WEFJ/BD18GA5MEFJ-M	A37	BD25GA5WEFJ/BD25GA5MEFJ-M	A37	BD33IA5MEFJ-LB	A42
BA78M15	A33	BD00HA5MEFJ-LB	A40	BD18GCOWEFJ-LB	A37	BD25GCOWEFJ-LB	A37	BD33IA5WEFJ/BD33IA5MEFJ-M	A41
BA78M18	A33	BD00HA5WEFJ/BD00HA5MEFJ-M	A39	BD18GCOWEFJ/BD18GCOWEFJ-M	A37	BD25GCOWEFJ/BD25GCOWEFJ-M	A37	BD33ICOWEFJ-LB	A41
BA78M20	A33	BD00HCOMEFJ-LB	A39	BD18HA3MEFJ-LB	A40	BD25HA3MEFJ-LB	A40	BD33ICOWEFJ-M	A40
BA78M24	A33	BD00HCOWEFJ/BD00HCOWEFJ-M	A39	BD18HA3WEFJ/BD18HA3MEFJ-M	A40	BD25HA3WEFJ/BD25HA3MEFJ-M	A40	BD33ICOW	A40
BA80BC0	A36	BD00HC5MEFJ-LB	A39	BD18HA5MEFJ-LB	A40	BD25HA5MEFJ-LB	A40	BD33KA5FP	A41
BA80BC0W	A36	BD00HC5WEFJ/BD00HC5MEFJ-M	A39	BD18HA5WEFJ/BD18HA5MEFJ-M	A39	BD25HA5WEFJ/BD25HA5MEFJ-M	A39	BD33KA5W	A41
BA80JC5T	A36	BD00IA5MEFJ-LB	A42	BD18HCOWEFJ-LB	A39	BD25HCOWEFJ-LB	A39	BD3401KS2	A104
BA82901YF-C	A11	BD00IA5MHFV-M	A41	BD18HCOWEFJ/BD18HCOWEFJ-M	A39	BD25HCOWEFJ/BD25HCOWEFJ-M	A39	BD3402KS2	A104
BA82901YFV-C	A11	BD00IA5WEFJ/BD00IA5MEFJ-M	A41	BD18HC5MEFJ-LB	A39	BD25HC5MEFJ-LB	A39	BD3433K	A104
BA82902YF-C	A11	BD00ICOWEFJ-LB	A41	BD18HC5WEFJ/BD18HC5MEFJ-M	A39	BD25HC5WEFJ/BD25HC5MEFJ-M	A39	BD34602FS-M	A104
BA82902YFJ-C	A11	BD00ICOWEFJ-M	A40	BD18IA5MEFJ-LB	A42	BD25IA5MEFJ-LB	A42	BD3460FS	A104
BA82902YFV-C	A11	BD00ICOW	A40	BD18IA5WEFJ/BD18IA5MEFJ-M	A41	BD25IA5WEFJ/BD25IA5MEFJ-M	A41	BD3461FS	A104
BA82902YFVJ-C	A11	BD00KA5W	A41	BD18ICOWEFJ-LB	A41	BD25ICOWEFJ-LB	A41	BD3464FV	A104
BA82903YF-C	A11	BD1020HFV	A91	BD18ICOWEFJ-M	A40	BD25ICOWEFJ-M	A40	BD3465FV	A104
BA82903YFVM-C	A11	BD10IA5MEFJ-LB	A42	BD18ICOW	A40	BD25ICOW	A40	BD34700FV	A102
BA82904YF-C	A11	BD10IA5WEFJ/BD10IA5MEFJ-M	A41	BD18KA5FP	A41	BD25KA5FP	A41	BD34701KS2	A102
BA82904YFVM-C	A11	BD10ICOWEFJ-LB	A41	BD18KA5W	A41	BD25KA5W	A41	BD34704KS2	A102
BA8391G	A16	BD10ICOWEFJ-M	A40	BD1CICOW	A40	BD2606MVV	A83	BD34705KS2	A102
BA90BC0	A36	BD10ICOW	A40	BD2041AFJ	A61	BD26503GUL	A84	BD34710FV	A102
BA90BC0W	A36	BD10KA5FP	A41	BD2042AFJ	A61	BD26503KS2	A84	BD3471KS2	A102
BA90DD0T	A34	BD10KA5W	A41	BD2045AFJ	A61	BD26ICOW	A40	BD3473KS2	A102
BA90DD0W	A34	BD12730G	A13	BD2046AFJ	A61	BD27400GUL	A100	BD3474KS2	A102
BA90JC5T	A36	BD12732F	A13	BD2051AFJ	A61	BD2802GU	A84	BD3490FV	A103
BA9741F	A51	BD12732FJ	A13	BD2052AFJ	A61	BD2808MUV-M	A84	BD3491FS	A103
BA9741FS	A51	BD12732FV	A13	BD2055AFJ	A61	BD2812GU	A84	BD3504FVM	A45
BA9743AFV	A51	BD12732FVJ	A13	BD2056AFJ	A61	BD28412MUV	A100	BD3506F	A45
BA9744FV	A51	BD12732FVM	A13	BD2061AFJ	A61	BD28623MUV	A101	BD3507HFV	A45
BAJ0BC0	A36	BD12732FVT	A13	BD2062FJ	A61	BD3020HFP	A46	BD3508MUV	A45
BAJ0BC0W	A36	BD12734F	A13	BD2062FJ-LB	A61	BD3021HFP	A46	BD3509MUV	A45
BAJ0CC0	A34	BD12734FJ	A13	BD2065AFJ	A61	BD30FCOW	A35	BD3512MUV	A45
BAJ0CC0W	A35	BD12734FV	A13	BD2066FJ	A61	BD30FDOW	A34	BD3521FVM	A45
BAJ2CC0	A34	BD12734FVJ	A13	BD2066FJ-LB	A61	BD30GA3MEFJ-LB	A38	BD3533F	A47
BAJ2CC0W	A35	BD12IA5MEFJ-LB	A42	BD2068FJ-M	A61	BD30GA3MEFJ-M	A38	BD3533FVM	A47
BAJ2DD0T	A34	BD12IA5WEFJ/BD12IA5MEFJ-M	A41	BD2069FJ-M	A61	BD30GA3W	A38	BD3533HFN	A47
BAJ2DD0W	A34	BD12ICOWEFJ-LB	A41	BD2200GUL	A62	BD30GA5MEFJ-LB	A38	BD35390FJ	A47
BAJ5CC0	A34	BD12ICOWEFJ-M	A40	BD2201GUL	A62	BD30GA5WEFJ/BD30GA5MEFJ-M	A37	BD35395FJ-M	A47
BAJ6DD0T	A34	BD12ICOW	A40	BD2202G	A62	BD30GCOWEFJ-LB	A37	BD3539FVM	A47
BAJ6DD0W	A34	BD12KA5FP	A41	BD2202G-LB	A62	BD30GCOWEFJ/BD30GCOWEFJ-M	A37	BD3539NUX	A47
BAS116HM	C84	BD12KA5W	A41	BD2204GUL	A62	BD30HA3MEFJ-LB	A40	BD3540NUV	A45
BAS16HM	C84	BD1321G	A14	BD2206G	A62	BD30HA3WEFJ/BD30HA3MEFJ-M	A40	BD3541NUV	A45
BAS21HM	C84	BD14000EFV-C	A63	BD2206G-LB	A62	BD30HA5MEFJ-LB	A40	BD3550HFN	A45
BAS21VM	C84	BD15FDOW	A34	BD2220G	A60	BD30HA5WEFJ/BD30HA5MEFJ-M	A39	BD3551HFN	A45
BAS40-04HM	C64	BD15GA3MEFJ-LB	A38	BD2220G-LB	A60	BD30HCOWEFJ-LB	A39	BD3552HFN	A45
BAS40-05HM	C64	BD15GA3MEFJ-M	A38	BD2221G	A60	BD30HCOWEFJ/BD30HCOWEFJ-M	A39	BD3570YFP-M	A33
BAS40-06HM	C64	BD15GA3W	A38	BD2221G-LB	A60	BD30HC5MEFJ-LB	A39	BD3570YHFP-M	A33
BAS40HM	C64	BD15GA5MEFJ-LB	A38	BD2222G	A60	BD30HC5WEFJ/BD30HC5MEFJ-M	A39	BD3571YFP-M	A33
BAT54AHM	C64	BD15GA5WEFJ/BD15GA5MEFJ-M	A37	BD2224G	A60	BD30IA5MEFJ-LB	A42	BD3571YHFP-M	A33
BAT54CHM	C64	BD15GCOWEFJ-LB	A37	BD2224G-LB	A60	BD30IA5WEFJ/BD30IA5MEFJ-M	A41	BD3572YFP-M	A33
BAT54HM	C64	BD15GCOWEFJ/BD15GCOWEFJ-M	A37	BD2225G	A60	BD30ICOWEFJ-LB	A41	BD3572YHFP-M	A33
BAT54SHM	C64	BD15HA3MEFJ-LB	A40	BD2225G-LB	A60	BD30ICOWEFJ-M	A40	BD3573YFP-M	A33
BAV170HM	C84	BD15HA3WEFJ/BD15HA3MEFJ-M	A40	BD2226G	A60	BD30ICOW	A40	BD3573YHFP-M	A33
BAV199HM	C84	BD15HA5MEFJ-LB	A40	BD2226G-LB	A60	BD30KA5FP	A41	BD3574YFP-M	A33
BAV199UM	C84	BD15HA5WEFJ/BD15HA5MEFJ-M	A39	BD2227G	A60	BD30KA5W	A41	BD3574YHFP-M	A33
BAV70HM	C84	BD15HCOWEFJ-LB	A39	BD2227G-LB	A60	BD3375KV-C	A29	BD3575YFP-M	A33
BAV99HM	C84	BD15HCOWEFJ/BD15HCOWEFJ-M	A39	BD2232G	A60	BD3375MUV-M	A29	BD3575YHFP-M	A33
BAW156HM	C84	BD15HC5MEFJ-LB	A39	BD2233G	A60	BD3376EFV-C	A29	BD3650FP-M	A34
BAW156UM	C84	BD15HC5WEFJ/BD15HC5MEFJ-M	A39	BD2240G	A60	BD3376MUV-M	A29	BD37067FV-M	A104
BAW56HM	C84	BD15IA5MEFJ-LB	A42	BD2241G	A60	BD3378MUV-M	A29	BD37068FV-M	A104
BC847B	C26	BD15IA5WEFJ/BD15IA5MEFJ-M	A41	BD2242G	A60	BD3380MUV-M	A29	BD37069FV-M	A104
BC847BU3	C26	BD15ICOWEFJ-LB	A41	BD2243G	A60	BD3381EKV-C	A29	BD37201NUX	A45, A102
BC848B	C26	BD15ICOWEFJ-M	A40	BD2244G-M	A60	BD33C0A	A34	BD37210AMUV	A45, A102
BC848BW	C26	BD15ICOW	A40	BD2245G-M	A60	BD33C0AW	A35	BD37215AMUV	A45, A102
BC857B	C26	BD15KA5FP	A41	BD2246G	A60	BD33FA1FP3	A35	BD37503FV	A103
BC857BU3	C26	BD15KA5W	A41	BD2247G	A60	BD33FC0FP	A34	BD37511FS	A103
BC858B	C26	BD1604MUV	A83	BD2248G	A60	BD33FCOW	A35	BD37512FS	A103
BC858BW	C26	BD16805FV-M	A73	BD22621G-M	A60	BD33FDOW	A34	BD37513FS	A103
BCX17	C26	BD16912EFV-C	A68	BD2262G-M	A60	BD33GA3MEFJ-LB	A38	BD37514FS	A103
BCX19	C26	BD16922EFV-M	A68	BD22641G-M	A60	BD33GA3MEFJ-M	A38	BD37515FS	A103
BD00C0AW	A35	BD16933EFV-C	A68	BD2264G-M	A60	BD33GA3W	A38	BD37521FS	A103
BD00C0AWFPS-M	A35	BD16938EFV-C	A68	BD2265G-M	A60	BD33GA5MEFJ-LB	A38	BD37522FS	A103
BD00FA1WEFJ	A35	BD16939EFV-C	A68	BD2266G-M	A60	BD33GA5WEFJ/BD33GA5MEFJ-M	A37	BD37523FS	A103
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BD87A29FVM	A66	BD9328EFJ-LB	A50	BD9B304QWZ	A49	BH1792GLC	A91	BH76906GU	A106
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BD87A41FVM	A66	BD9329AEFJ-LB	A50	BD9B333GWZ	A49	BH18PB1WHFV	A45	BH76912GU	A106
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SCS210AM	B3	SFR03	D11	SLI-343Y8C	E16	SMF24V	C81	SML-D15YW	E6
SCS210KE2	B3	SFR10	D11	SLI-343Y8Y	E16	SMF26V	C81	SML-D22MUW	E9
SCS210KE2HR	B3	SFR18	D11	SLI-343YC	E16	SMF28V	C81	SML-D22YVW	E9
SCS210KG	B3	SFR25	D11	SLI-343YC(W)	E16	SMF30V	C81	SML-E12D8W	E6
SCS210KGHR	B3	SH3001-PPFW00A	F16	SLI-343YY	E16	SMF33V	C81	SML-E12DW	E6
SCS212AG	B3	SH3002-PPFW00A	F16	SLI-343YY(W)	E16	SMF5V0	C81	SML-E12M8W	E6
SCS212AGHR	B3	SH3004-PPFW00A	F16	SLI-430DU	E17	SMF6V0	C81	SML-E12P8W	E6
SCS212AJ	B2	SH8J31	C13	SLI-430MG	E17	SMF6V5	C81	SML-E12U8W	E6
SCS212AJHR	B2	SH8J62	C13	SLI-430U2R	E17	SMF7V0	C81	SML-E12UW	E6
SCS212AM	B3	SH8J65	C13	SLI-430Y2U	E17	SMF7V5	C81	SML-E12V8W	E6
SCS215AE	B3	SH8J66	C13	SLI-560DT	E16	SMF8V0	C81	SML-E12Y8W	E6
SCS215AG	B3	SH8K10S	C13	SLI-560UT	E16	SMF9V0	C81	SML-E13EC8T	E6
SCS215AGHR	B3	SH8K11	C13	SLI-560YT	E16	SML522BU1W	E9	SML-EN3BC8T	E6
SCS215AJ	B2	SH8K12	C13	SLI-570DT	E16	SML-522MD8W	E9	SML-EN3WBC8W	E6
SCS215AJHR	B2	SH8K25	C13	SLI-570U2T	E16	SML-522MU8W	E9	SML-H10TB	E10, E35
SCS215AM	B3	SH8K26	C13	SLI-570UT	E16	SML-522MUW	E9	SML-H12D8T	E7
SCS215KG	B3	SH8K32	C13	SLI-570Y2T	E16	SML-522MY8W	E9	SML-H12M8T	E7
SCS215KGHR	B3	SH8K37	C13	SLI-570YT	E16	SML-810TB	E10, E35	SML-H12P8T	E7
SCS220AE	B3	SH8K39	C13	SLI-580DT	E16	SML-811DT(A)	E8	SML-H12U8T	E7
SCS220AE2	B3	SH8K41	C13	SLI-580UT	E16	SML-811UT(A)	E8	SML-H12V8T	E7
SCS220AE2HR	B3	SH8K52	C13	SLI-580YT	E16	SML-811VT(A)	E8	SML-H12Y8T	E7
SCS220AG	B3	SH8KA1	C13	SLR-322DC	E17	SML-811WT(A)	E8	SMLK18WBJCW	E8
SCS220AGHR	B3	SH8KA2	C13	SLR-322DU	E17	SML812BCT	E8	SMLK18WBJDW	E8
SCS220AJ	B2	SH8KA4	C13	SLR-322MC	E17	SML-812MT	E8	SMLK28WBJCW	E8
SCS220AJHR	B2	SH8KA7	C13	SLR-322MG	E17	SML813WBC8W	E8	SML-M13DT	E7
SCS220AM	B3	SH8M24	C13	SLR-322VC	E17	SML-822MV8W	E8, E9	SML-M13MT	E7
SCS220KE2	B3	SH8M31	C13	SLR-322VR	E17	SML-825MVW	E8, E9	SML-M13PT	E7
SCS220KE2HR	B3	SH8M41	C13	SLR-322YC	E17	SML-A12D8T	E8	SML-M13RT	E10, E34
SCS220KG	B3	SH8M51	C13	SLR-322YY	E17	SML-A12DT(J)	E8	SML-M13UT	E7
SCS220KGHR	B3	SH8MA2	C13	SLR-325DC	E17	SMLA12EC6T	E8	SML-M13VT	E7
SCS230AE2	B3	SH8MA3	C13	SLR-325DU	E17	SML-A12M8T	E8	SML-M13YT	E7
SCS230AE2HR	B3	SH8MA4	C13	SLR-325MC	E17	SML-A12MT(J)	E8	SML-M15R2T	E10
SCS230KE2	B3	SIM-030ST	E34	SLR-325MG	E17	SML-A12P8T	E8	SMLM22BN1T(C)	E7
SCS240AE2	B3	SIM-040ST	E34	SLR-325VC	E17	SML-A12U8T	E8	SMLM22EN1T(C)	E7
SCS240AE2HR	B3	SIM-20ST	E34	SLR-325VR	E17	SML-A12UT(J)	E8	SMLM22WBN1CW1T(C)	E7
SCS240KE2	B3	SIM-22ST	E34	SLR-325YC	E17	SML-A12V8T	E8	SMLMN2BCT(C)	E7
SCS302AHG	B3	SIR-341ST3F	E34	SLR-325YY	E17	SMLA12WBC7W	E8	SMLMN2ECT(C)	E7
SCS302AJ	B2	SIR-34ST3F	E34	SLR-332DC	E16	SML-A12WT(J)	E8	SMLMN2PB1CW(C)	E7
SCS304AHG	B3	SIR-563ST3F	E34	SLR-332DU	E16	SML-A12Y8T	E8	SMLMN2SB1CW(C)	E7
SCS304AJ	B2	SIR-568ST3F	E34	SLR-332MC	E16	SMLA13BC8T	E8	SMLMN2WB1CW(C)	E7
SCS304AM	B3	SIR-56ST3F	E34	SLR-332MG	E16	SML-A15YT	E8	SMLMN3WB2ZW(C)	E7
SCS306AHG	B3	SLA560BC4T	E16	SLR-332VC	E16	SML-D11YW	E6	SML-P11DT(R)	E6
SCS306AJ	B2	SLA560BCT	E16	SLR-332VR	E16	SMLD12BN1W	E6	SML-P11MT(R)	E6
SCS306AM	B3	SLA560BD2T	E16	SLR-332YC	E16	SML-D12D1W	E6	SML-P11UT(R)	E6
SCS308AHG	B3	SLA560EC4T	E16	SLR-332YY	E16	SML-D12D8W	E6	SML-P11VT(R)	E6
SCS308AJ	B2	SLA560ECT	E16	SLR343BC4T	E16	SMLD12E2N1W	E6	SML-P11YT(R)	E6
SCS308AM	B3	SLA-560MT	E16	SLR343BC7T	E16	SMLD12E3N1W	E6	SML-P12DT(R)	E6
SCS310AHG	B3	SLA560WBD2PT	E16	SLR343BCT	E16	SMLD12EN1W	E6	SML-P12M2T(R)	E6
SCS310AJ	B2	SLA-570MT	E16	SLR343BD2T	E16	SML-D12FW	E6	SML-P12MT(R)	E6
SCS310AM	B3	SLA580BC4T	E16	SLR-343DC	E16	SML-D12M1W	E6	SML-P12U2T(R)	E6
SCS312AHG	B3	SLA580BCT	E16	SLR-343DU	E16	SML-D12M8W	E6	SML-P12UT(R)	E6
SCS312AJ	B2	SLA580EC4T	E16	SLR343EC4T	E16	SML-D12P8W	E6	SML-P12VT(R)	E6
SCS312AM	B3	SLA580ECT	E16	SLR343ECT	E16	SML-D12U1W	E6	SML-P12WT(R)	E6
SCS315AHG	B3	SLA-580MT	E16	SLR-343MC	E16	SML-D12U8W	E6	SML-P12Y2T(R)	E6
SCS315AJ	B2	SLD430BD2W	E17	SLR-343MG	E16	SML-D12V1W	E6	SML-P12Y3T(R)	E6
SCS315AM	B3	SLD430WBD2PT	E17	SLR-343PC	E16	SML-D12V8W	E6	SML-P12YT(R)	E6
SCS320AHG	B3	SLI-325DC(W)	E17	SLR-343PG	E16	SML-D12W8W(A)	E6	SMLP13BC8T	E6
SCS320AJ	B2	SLI-325DU(W)	E17	SLR-343VC	E16	SMLD12WBN1W	E6	SMLP13EC8T	E6
SCS320AM	B3	SLI-325UR(W)	E17	SLR-343VR	E16	SML-D12Y1W	E6	SML-P13FT(R)	E6
SCT2080KE	B6	SLI-325URC(W)	E17	SLR343WBC7T	E16	SML-D12Y3W	E6	SML-P13PT(R)	E6
SCT2120AF	B6	SLI-325YC(W)	E17	SLR343WBD2PT	E16	SML-D12Y8W	E6	SMLP13WBC9W	E6
SCT2160KE	B6	SLI-325YY(W)	E17	SLR-343YC	E16	SML-D13DW(A)	E6	SML-P15DT(A)	E6
SCT2280KE	B6	SLI-343D8C	E16	SLR-343YY	E16	SML-D13FW	E6	SML-P15R2T	E10, E34
SCT2450KE	B6	SLI-343D8U	E16	SLR-56DC	E16	SML-D13M8W	E6	SML-P15UT(A)	E6
SCT2750NY	B6	SLI-343DC	E16	SLR-56DU	E16	SML-D13MW(A)	E6	SML-P24MUW(R)	E9
SCT2H12NY	B6	SLI-343DC(W)	E16	SLR-56MC	E16	SML-D13U8W	E6	SMLP34RGB2W	E9
SCT2H12NZ	B6	SLI-343DU	E16	SLR-56MG	E16	SML-D13UW(A)	E6	SMLP36RGB2W(R)	E9
SCT3017AL	B6	SLI-343DU(W)	E16	SLR-56VC	E16	SML-D13VW(A)	E6	SML-S13DT	E8, E9
SCT3022AL	B6	SLI-343M8C	E16	SLR-56VR	E16	SML-D13WW(A)	E6	SML-S13MT	E8, E9
SCT3022KL	B6	SLI-343M8G	E16	SLR-56YC	E16	SML-D13Y2W	E6	SML-S13PT	E8, E9
SCT3030AL	B6	SLI-343MC	E16	SLR-56YY	E16	SML-D13Y8W	E6	SML-S13RT	E10, E34
SCT3030KL	B6	SLI-343MG	E16	SMF10V	C81	SML-D14DW(A)	E6	SML-S13UT	E8, E9
SCT3040KL	B6	SLI-343P8C	E16	SMF11V	C81	SML-D14MW(A)	E6	SML-S13VT	E8, E9
SCT3060AL	B6	SLI-343P8G	E16	SMF12V	C81	SML-D14U2W(A)	E6	SML-S13YT	E8, E9
SCT3080AL	B6	SLI-343U8R	E16	SMF13V	C81	SML-D14VW(A)	E6	SMLS14BET	E8, E9
SCT3080KL	B6	SLI-343U8RC	E16	SMF14V	C81	SML-D14WW(A)	E6	SMLS14EET	E8, E9
SCT3105KL	B6	SLI-343UR	E16	SMF15V	C81	SML-D14YW(A)	E6	SML-S15R2T	E10, E34
SCT3120AL	B6	SLI-343UR(W)	E16	SMF16V	C81	SML-D15DW	E6	SMLVN6RGB1H	E9
SCT3160KL	B6	SLI-343URC	E16	SMF17V	C81	SML-D15MW	E6	SMLVN6RGB1U	E9
SDR03	D8	SLI-343URC(W)	E16	SMF18V	C81	SML-D15U2W	E6	SMLVN6RGB1W	E9

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SMLZ14BGT(A)	E7	TT8M3	C6	US6M1	C6				
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SML-Z14DT(A)	E7	TT8U2	C9	US6M2	C6				
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TT8K11	C6	US6J11	C6						
TT8K2	C6	US6J12	C6						
TT8M1	C6	US6K1	C6						

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Notes

- 1) The information contained in this document is provided as of 1st. October, 2018.
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