

Power MOSFETs for DC/DC Converter – 1

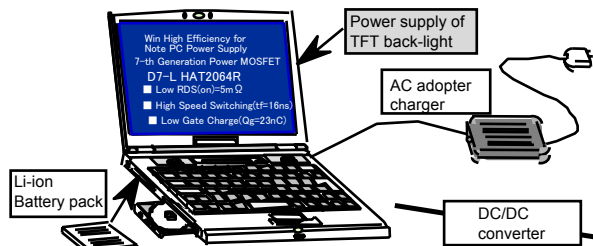
Improving Supply Efficiency by Low Loss

Features	Merits
Low ON resistance, High-speed switching, Low Qg.	Improve power supply efficiency (for energy saving), Fast response
Low voltage drive (4.5V)	Available a direct drive from application specific control IC.
Small & low profile package (SOP-8, TSSOP-8)	Achieve smaller & lower profile equipment
2 chips built-in SOP-8	

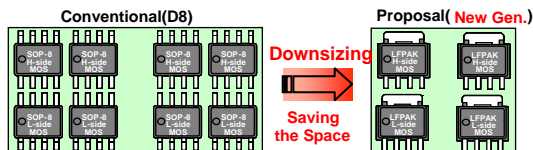
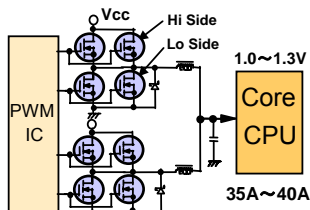
Applications

- Note PC, VTR Camera
- Mobile Phones
- Secondary side of onboard power supply
- For over charge protection of Li-ion battery pack

Application Example (DC/DC converter for note PC)



Recommendation Ex.; Next Gen. Note Book PC CPU Power Supply



SOP-8 x 4/ph = Total 8pcs LPAK x 2/ph = Total 4 pcs

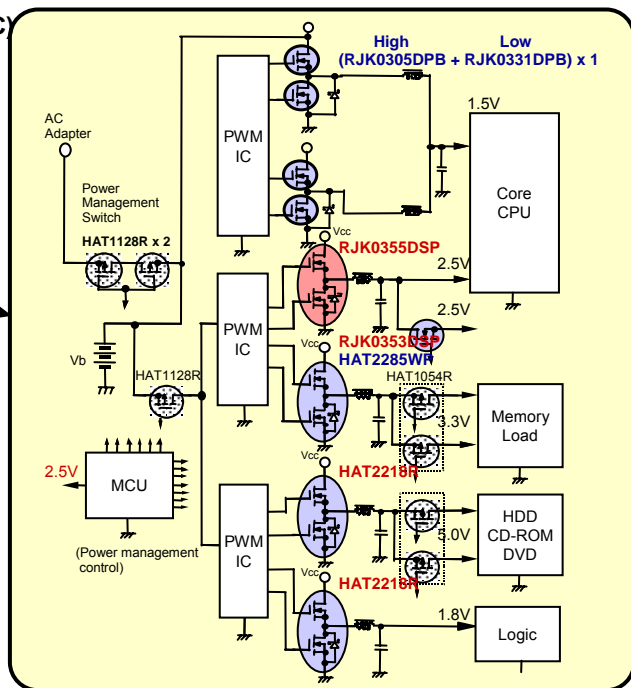
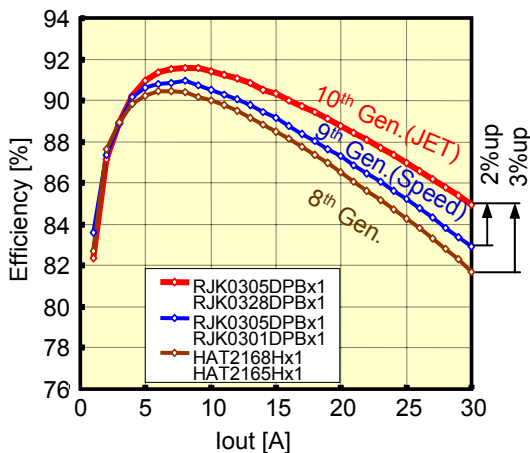
Hi Side HAT2198R x 4
Lo Side HAT2195R x 4

Light load → Hi Side RJK0305DPB x 2
Lo Side RJK0332DPB x 2

Heavy load → Hi Side RJK0305DPB x 2
Lo Side RJK0329DPB x 2

The number of MOSFET (pcs)	DC/DC converter				Total
	Li Ion	DC/DC	PW management SW	TFT back-light power supply	
	2~4	8~10	4~6	1~2	15~22

Mount result of power supply of synchro. rectification converter



Major Product Lineup

*: Low Side MOSFET+SBD

Application	Part No.	PKG	VDSS (V)	ID (A)	10V RDS(on)(mΩ)		Qg(nC) (Note1)	
					Typ	max		
Synchronous Rectifier DC/DC	CPU Drive	SOP-8	RJK0348DSP	30	22	2.6	3.4	34
			RJK0349DSP	30	20	2.9	3.8	25
			RJK0352DSP	30	18	4.3	5.6	16
			RJK0353DSP	30	18	4.5	5.9	15
			RJK0354DSP	30	16	5.4	7.0	12
			RJK0355DSP	30	12	8.5	11.1	6.0
			RJK0305DPS	30	45	6.7	8.0	8
			RJK0328DPB	30	60	1.6	2.1	42
			RJK0329DPB	30	55	1.8	2.3	35
			RJK0330DPB	30	45	2.1	2.7	27
			RJK0331DPB	30	40	2.6	3.4	21
			RJK0332DPB	30	35	3.6	4.7	14
			RJK03C0DPA	30	70	1.5	2.0	66
			RJK0390DPA	30	65	1.7	2.2	54
			RJK0391DPA	30	50	2.2	2.9	34
	RJK0392DPA	30	45	2.7	3.5	26		
	RJK0393DPA	30	40	3.3	4.3	21		
	RJK0394DPA	30	35	4.1	5.3	15.5		
	RJK0395DPA	30	30	5.9	7.7	11.0		
	RJK0396DPA	30	30	6.9	9.0	9		
	RJK0397DPA	30	30	7.8	10.1	7.4		
	RJK03B7DPA	30	30	6.0	7.8	11.0		
	RJK03B8DPA	30	30	7.2	9.3	9		
	RJK03B9DPA	30	30	8.3	10.6	7.4		
	RJK0379DPA *	WPAK	30	50	1.8	2.3	37.0	
	RJK0380DPA *	(Single)	30	45	2.4	3.2	24.0	
	RJK03A4DPA *	+SBD	30	42	2.9	3.8	17.0	
	RJK0381DPA *		30	40	3.4	4.5	15.0	
	RJK0383DPA *	WPAK	30	15/45	8.5/2.5	11.1/3.3	6.8/20	
	RJK0384DPA *	(Dual)	30	15/42	8.5/2.9	11.1/3.8	6.8/17	
RJK0389DPA *	+SBD	30	15/20	8.2/6.8	10.7/8.9	6.0/7.2		
Power Management SW	HAT1054R[D]	SOP-8	-20	-6	(24)	(30)	—	
	RJ0315DSP		-30	-16	5.2	6.5	48	
LED Backlight	HAT1125H	LPAK	-30	-45	2.7	3.6	165	
	HAT2114R[D]	SOP-8	60	6	28	32	15	
	HAT2215R[D]		80	3.4	88	115	7.3	

(): LGS=4.5V, Note1)VDD=10V,VGS=5V

Power MOSFETs for DC/DC Converter - 2

Features	Merits
Low ON resistance, High-speed switching, Low Qg.	Improve power supply efficiency (for energy saving), Fast response
Low voltage drive (4.5V)	Available a direct drive from application specific control IC.
Complex small package (SOP-8 + SBD)	To be 1 package (SOP-8)
2 chips built-in SOP-8	Available smaller equipment

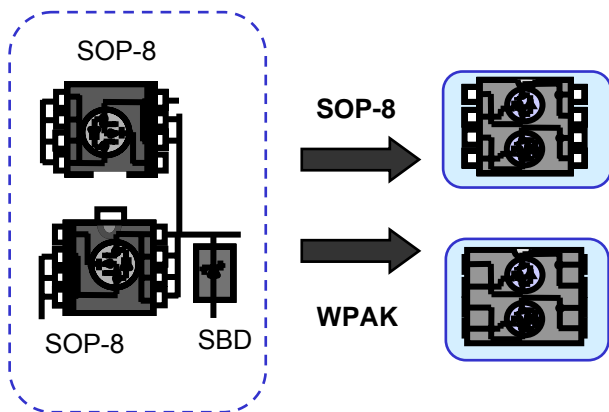
Applications

- Power supply of Note PC
- Network, Datacom
- Various DC/DC power supply of printer and PPC and so on

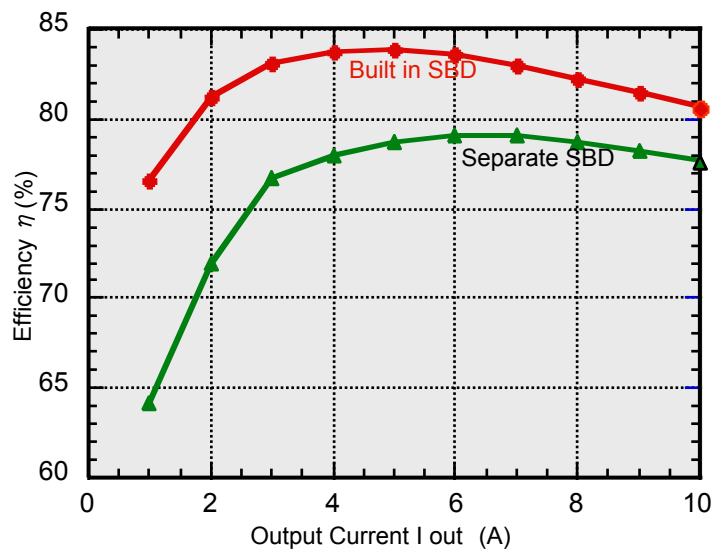
Product Lineup

Part No.	PKG	Max Rating					RDS(on)(mΩ)				Qg (nc)	Qgd (nc)	SBD	
		VDSS (V)	VGSS (V)	ID (A)	Pch (W)	VGS=4.5V		VGS=10V		VF 3.5A(V)			trr (ns)	
						typ	max	typ	max					
HAT2218R	Q1	SOP-8	30	±20	7.5	1.5	27	40	19	24	4.6	1.2	-	-
	Q2		30	±12	8	1.5	21	29	17	22	11	3.2	0.5	15
HAT2219R	Q1		30	±20	7.5	1.5	27	40	19	24	4.6	1.2	-	-
	Q2		30	±12	8	1.5	21	29	17	22	11	3.2	0.5	15
RJK0383DPA	Q1	WPAK	30	±20	15	10	12	16.8	8.5	11.1	6.8	1.5	0.84	20
	Q2		30	±20	45	30	3.7	5.2	2.5	3.3	20	6.5	0.36	30
RJK0384DPA	Q1		30	±20	15	10	12	16.8	8.5	11.1	6.8	1.5	0.84	20
	Q2		30	±20	42	25	4.3	6.0	2.9	3.8	17	5.2	0.39	23
RJK0389DPA	Q1	WPAK	30	±20	15	10	11.8	16.5	8.2	10.7	6.3	1.4	0.84	20
	Q2		30	±20	20	10	10.5	14.7	6.8	8.9	7.2	2.2	0.44	12

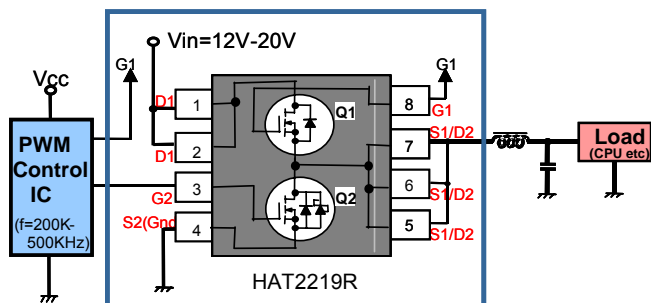
Built-in 1 Package



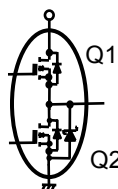
Mounting Scale of Supply Efficiency



Application Example



	HAT2285WP	HAT2210R HAT2218R HAT2219R
V _{out}	1.5V-5.0V	1.5V-5.0V
I _{out}	4A-6A	2A-3A



Q1: High Side MOS FET
Q2: Low Side MOS FET
+SBD(1chip)

Ultra-slim and Low Thermal Resistance New Package WPAK

Features	Merits
Low profile package (0.8mm max)	Achieve low thermal resistance by equivalent mountine area to SOP-8
Low thermal resistance (5degC/W)	
Low on resistance	Achieve smaller and higher efficiency

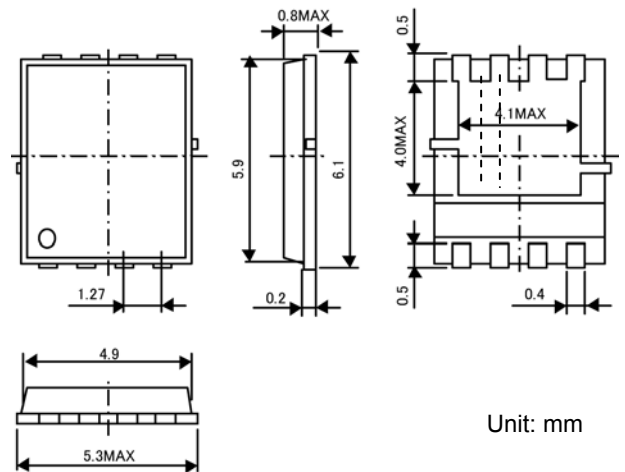
Major Application

- Pch: Li-ion battery (Note PC)
- Nch: For synchronous rectification of DC/DC converter (Note PC, Telecommunication equipment, POL (Point of Load), Brick battery)

Height Comparison

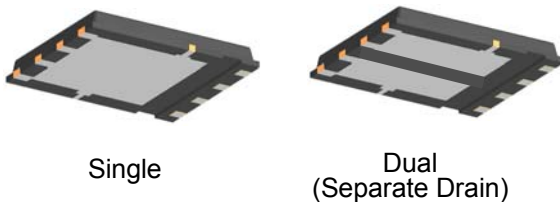
Package	Height (mm)	Ratio (%)
SOP-8	1.75Max.	100
LFPAK	1.1Max.	63
WPAK	0.8Max.	46

Package Size



Unit: mm

Package Overview



Product Lineup

Part No.	PKG	Drive Voltage (V)	Max. Ratings				Main Characteristics		
			VDSS (V)	VGSS (V)	ID (A)	Pch (W)	RDS(on) typ(mΩ)	Qg(nC) typ	Qgd(nC) typ
RJK0346DPA	Single	4.5	30	±20	65	65	1.9(4.5V)	49	10.5
RJK0348DPA	Single	4.5	30	±20	50	55	2.5(4.5V)	34	7.0
RJK0349DPA	Single	4.5	30	±20	45	50	3.1(4.5V)	25	5.3
RJK0351DPA	Single	4.5	30	±20	40	45	4.2(4.5V)	17	3.8
RJK0353DPA	Single	4.5	30	±20	35	40	5.4(4.5V)	14	3.0
RJK0355DPA	Single	4.5	30	±20	30	25	11.8(4.5V)	6	1.2
RJK0379DPA	Single	4.5	30	±20	50	55	2.4(4.5V)	37	10.7
RJK0380DPA	Single	4.5	30	±20	45	50	3.3(4.5V)	24	6.7
RJK03A4DPA	Single	4.5	30	±20	42	45	4.3(4.5V)	17	5.2
RJK0381DPA	Single	4.5	30	±20	40	45	4.7(4.5V)	15	4.3
RJK0383DPA	Dual +SBD	4.5	30	±20	15	10	12(4.5V)	6.8	1.5
					45	30	3.7(4.5V)	20	6.5
RJK0384DPA	Dual +SBD	4.5	30	±20	15	10	12(4.5V)	6.8	1.5
					42	25	4.3(4.5V)	17	5.2
RJK0389DPA	Dual +SBD	4.5	30	±20	15	10	11.8(4.5V)	6.3	1.4
					20	10	10.5(4.5V)	7.2	2.2
HAT2244WP	Single	4.5	80	±20	30	25	11.5(4.5V)	60	9
HAT2200WP	Single	8	100	±20	20	20	23(8V)	32	8.0
HAT2201WP	Single	8	100	±20	15	15	34(8V)	21	5.2
HAT2183WP	Single	10	150	±30	20	30	57(10V)	27	10
HAT2184WP	Single	10	150	±30	14	25	97(10V)	15	5.6
RJK1555DPA	Single	10	150	±30	(25)	(30)	(38)(10V)	(42)	(13)
RJK1557DPA	Single	10	150	±30	(25)	(30)	(46)(10V)	(20.5)	(6)
HAT2187WP	Single	10	200	±30	17	30	84(10V)	26	10
HAT2188WP	Single	10	200	±30	12	25	135(10V)	15	6
RJK2055DPA	Single	10	200	±30	(20)	(30)	(54)(10V)	(42)	(13)
RJK2057DPA	Single	10	200	±30	(20)	(30)	(68)(10V)	(20.5)	(7)
HAT2191WP	Single	10	250	±30	14	30	120(10V)	27	10
HAT2192WP	Single	10	250	±30	10	25	200(10V)	15	6
HAT2193WP	Single	10	250	±30	7	20	350(10V)	10	4
RJK2555DPA	Single	10	250	±30	(17)	(30)	(83)(10V)	(42)	(13)
RJK2557DPA	Single	10	250	±30	(17)	(30)	(102)(10V)	(20.5)	(6)