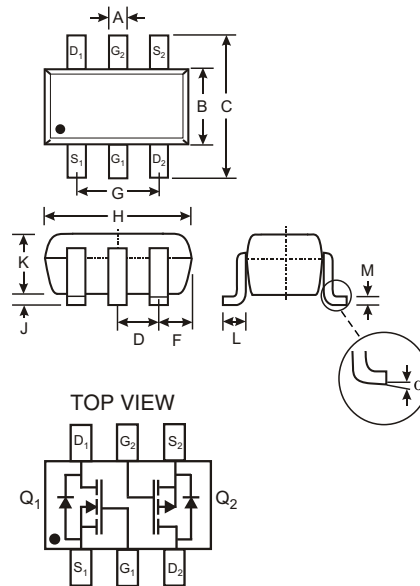


**COMPLEMENTARY PAIR ENHANCEMENT MODE FIELD
EFFECT TRANSISTOR**
NEW PRODUCT
Features

Low On-Resistance: $R_{DS(ON)}$
 Low Gate Threshold Voltage
 Low Input Capacitance
 Fast Switching Speed
 Low Input/Output Leakage
 Complementary Pair
Lead Free/RoHS Compliant (Note 2)

Mechanical Data

Case: SOT-363
 Case Material: Molded Plastic. UL Flammability
 Classification Rating 94V-0
 Moisture Sensitivity: Level 1 per J-STD-020C
 Terminals: Solderable per MIL-STD-202, Method 208
 Lead Free Plating (Matte Tin Finish annealed over Alloy 42
 leadframe). Please see Ordering Information, Note 5, on
 Page 5
 Terminal Connections: See Diagram
 Marking: KNP (See Page 5)
 Weight: 0.008 grams (approx.)



SOT-363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
F	0.30	0.40
H	1.80	2.20
J		0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
	0	8°
All Dimensions in mm		

Maximum Ratings - Total Device @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Units
Power Dissipation (Note 1)	P_d	200	mW
Thermal Resistance, Junction to Ambient	R_{JA}	625	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Maximum Ratings N-CHANNEL - Q_1 , 2N7002 Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Drain-Gate Voltage $R_{GS} = 1.0\text{M}$	V_{DGR}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Pulsed		± 40	
Drain Current (Note 1)	I_D	115	mA
Continuous @ 100°C		73	
Pulsed		800	

Maximum Ratings P-CHANNEL - Q_2 , BSS84 Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	-50	V
Drain-Gate Voltage $R_{GS} = 20\text{K}$	V_{DGR}	-50	V
Gate-Source Voltage	V_{GSS}	20	V
Drain Current (Note 1)	I_D	-130	mA

Note: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 2. No purposefully added lead.

Electrical Characteristics N-CHANNEL - Q₁, 2N7002 Section @ T_A = 25 °C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 3)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	70		V	V _{GS} = 0V, I _D = 10 A
Zero Gate Voltage Drain Current @ T _C = 25°C @ T _C = 125°C	I _{DSS}			1.0 500	μA	V _{DS} = 60V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}			±10	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	1.0		2.5	V	V _{DS} = V _{GS} , I _D = 250 A
Static Drain-Source On-Resistance @ T _J = 25°C @ T _J = 125°C	R _{DS (ON)}		3.2 4.4	7.5 13.5		V _{GS} = 5.0V, I _D = 0.05A V _{GS} = 10V, I _D = 0.5A
On-State Drain Current	I _{D(ON)}	0.5	1.0		A	V _{GS} = 10V, V _{DS} = 7.5V
Forward Transconductance	g _{FS}	80			mS	V _{DS} =10V, I _D = 0.2A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}		22	50	pF	V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}		11	25	pF	
Reverse Transfer Capacitance	C _{rss}		2.0	5.0	pF	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}		7.0	20	ns	V _{DD} = 30V, I _D = 0.2A, R _L = 150 Ω, V _{GEN} = 10V, R _{GEN} = 25 Ω
Turn-Off Delay Time	t _{D(OFF)}		11	20	ns	

Electrical Characteristics P-CHANNEL - Q₂, BSS84 Section @ T_A = 25 °C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 3)						
Drain-Source Breakdown Voltage	BV _{DSS}	-50			V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}			-15 -60 -100	μA μA nA	V _{DS} = -50V, V _{GS} = 0V, T _J = 25 C V _{DS} = -50V, V _{GS} = 0V, T _J = 125 C V _{DS} = -25V, V _{GS} = 0V, T _J = 25 C
Gate-Body Leakage	I _{GSS}			10	nA	V _{GS} = 20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	-0.8		-2.0	V	V _{DS} = V _{GS} , I _D = -1mA
Static Drain-Source On-Resistance	R _{DS (ON)}			10		V _{GS} = -5V, I _D = -0.100A
Forward Transconductance	g _{FS}	.05			S	V _{DS} = -25V, I _D = -0.1A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}			45	pF	V _{DS} = -25V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{OSS}			25	pF	
Reverse Transfer Capacitance	C _{rss}			12	pF	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}		10		ns	V _{DD} = -30V, I _D = -0.27A, R _{GEN} = 50 , V _{GS} = -10V
Turn-Off Delay Time	t _{D(OFF)}		18		ns	

Note: 3. Short duration test pulse used to minimize self-heating effect.

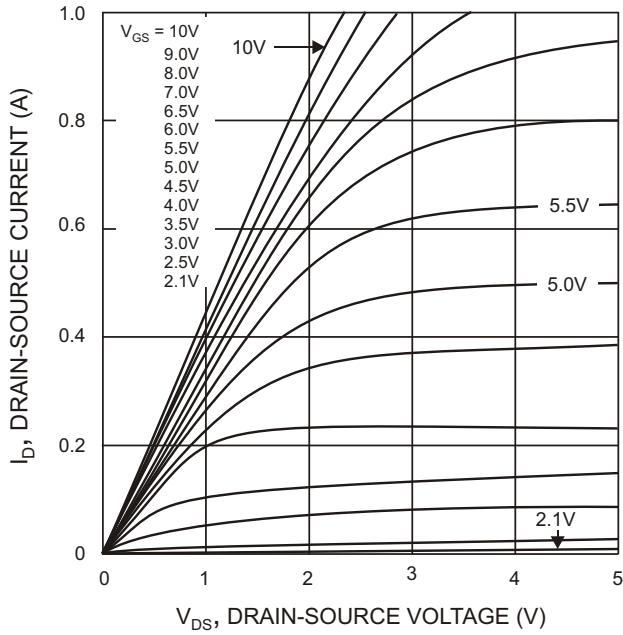


Fig. 1 On-Region Characteristics

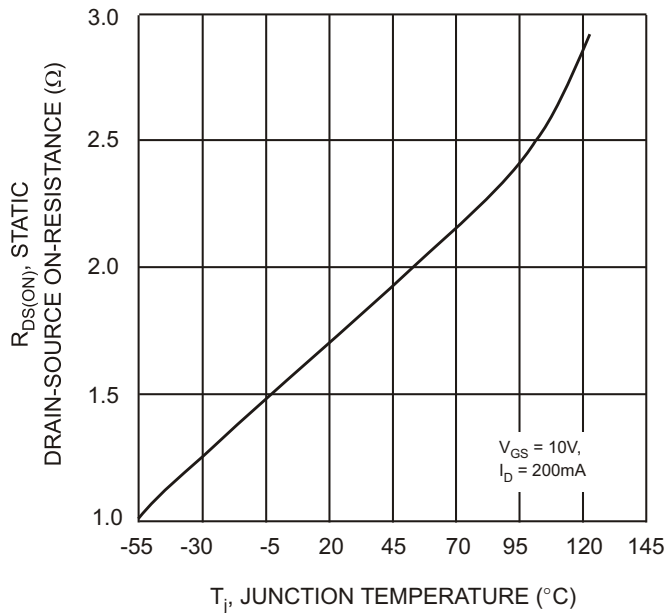


Fig. 3 On-Resistance vs Junction Temperature

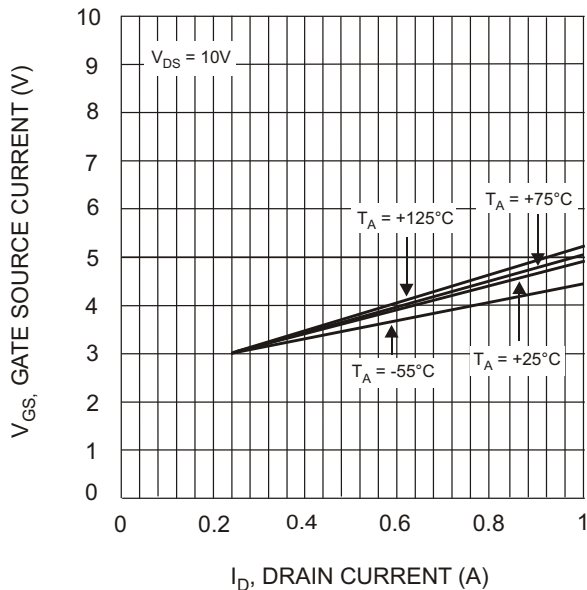


Fig. 5 Typical Transfer Characteristics

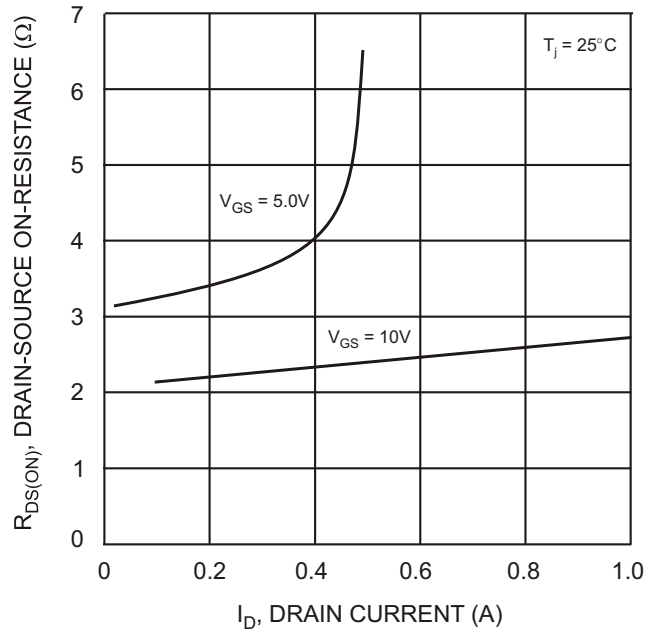


Fig. 2 On-Resistance vs Drain Current

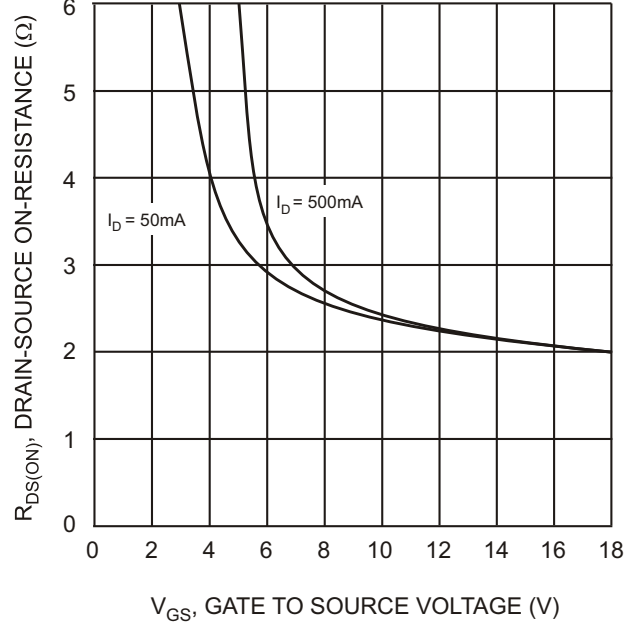


Fig. 4 On-Resistance vs. Gate-Source Voltage

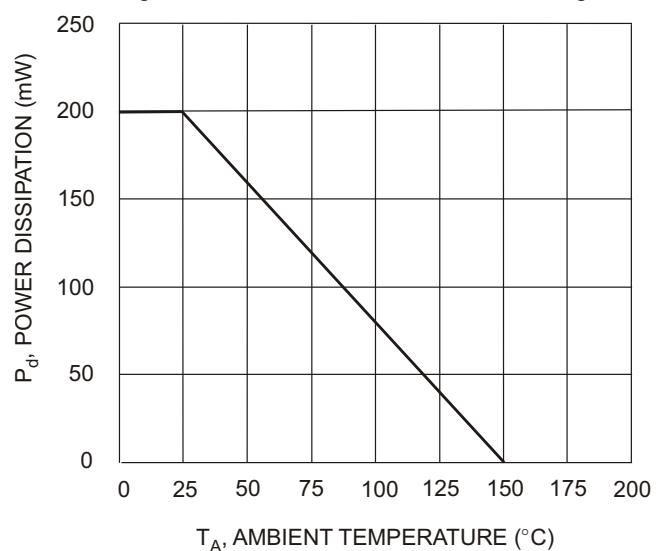


Fig. 6 Max Power Dissipation vs. Ambient Temperature

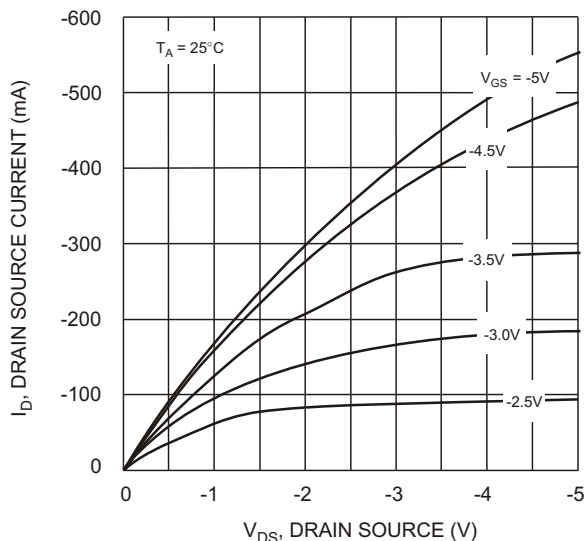


Fig. 7, Drain Source Current vs. Drain Source Voltage

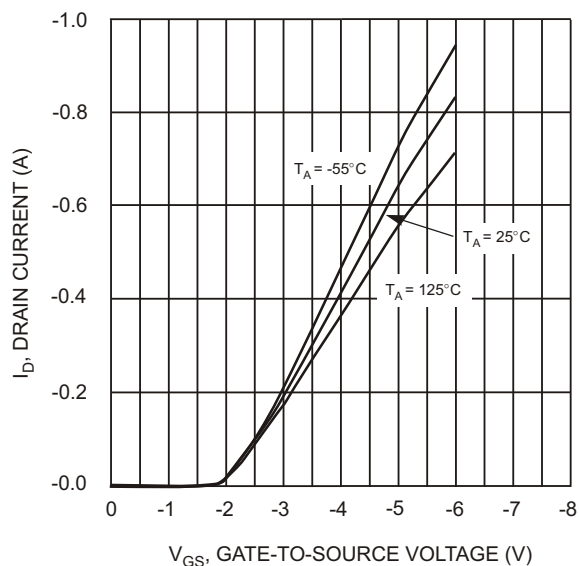


Fig. 8, Drain Current vs. Gate Source Voltage

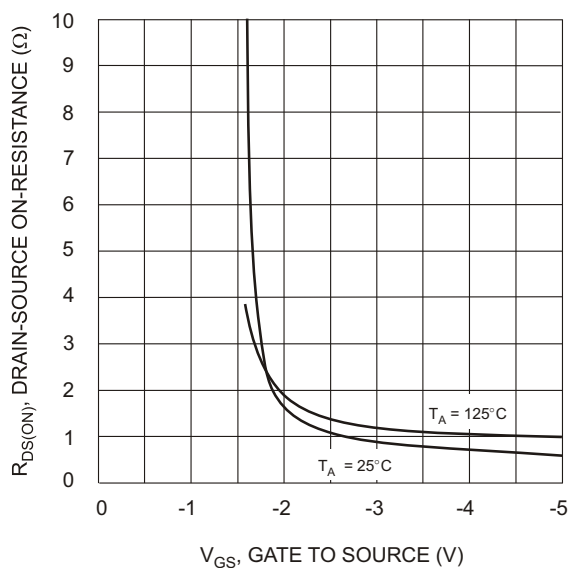


Fig. 9, On Resistance vs. Gate Source Voltage

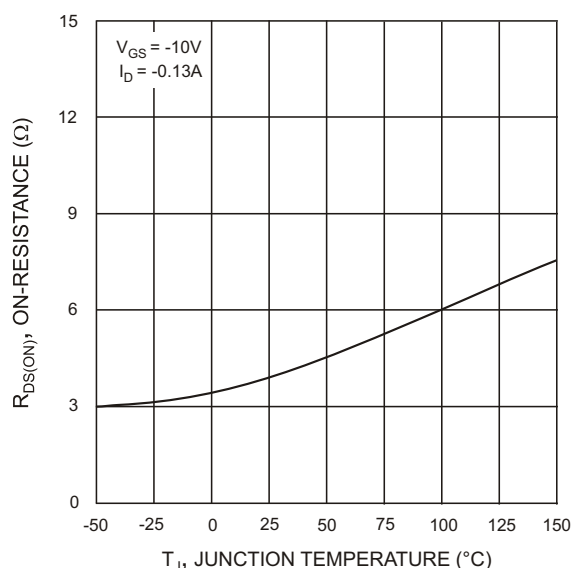


Fig. 10, On-Resistance vs. Junction Temperature

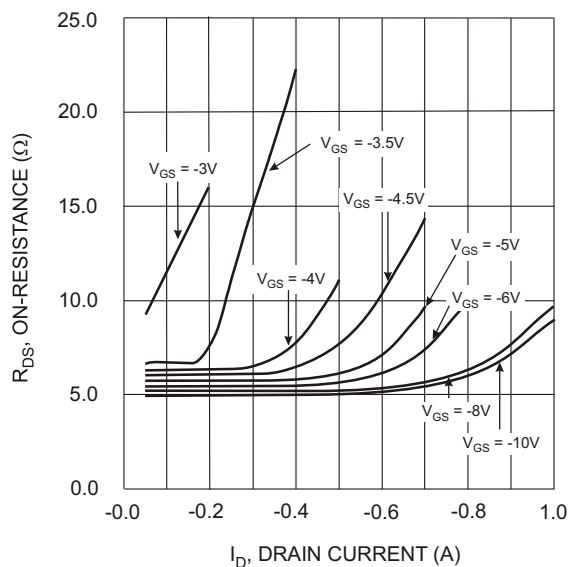


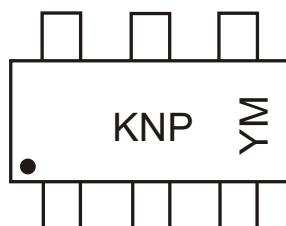
Fig. 11, On-Resistance vs. Drain Current

Ordering Information (Note 4)

Device	Packaging	Shipping
BSS8402DW-7-F	SOT-363	3000/Tape & Reel

Notes: 4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



KNP = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: R = 2004
M = Month ex: 9 = September

Date Code Key

Year	2003	2004	2005	2006	2007	2008	2009
Code	P	R	S	T	U	V	W

Month	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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