BSS8402DW

COMPLEMENTARY PAIR ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

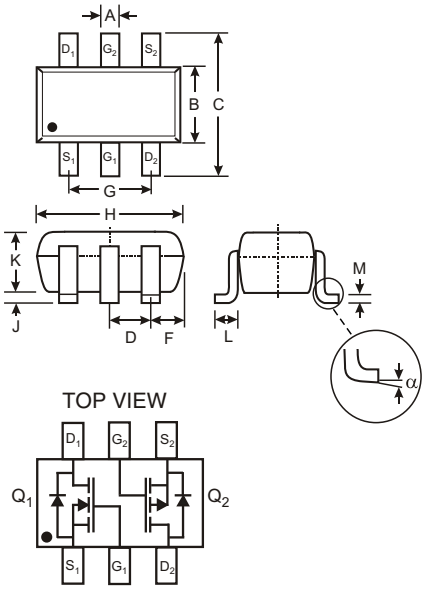
NEW PRODUCT

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 C unless otherwise specified

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

Maximum Ratings N-CHANNEL - Q_1, 2N7002 Section @ T_A = 25 C unless otherwise specified

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

Maximum Ratings P-CHANNEL - Q_2, BSS84 Section @ T_A = 25 C unless otherwise specified

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	-50	V
Drain-Gate Voltage R_{GS} 20K		V_{DGR}	-50	V
Gate-Source Voltage	Continuous	V_{GSS}	20	V
Drain Current (Note 1)	Continuous	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.

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Electrical Characteristics N-CHANNEL - Q_1, 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	$R_{DS\ (ON)}$		3.2	7.5		V_{GS} = 5.0V, I_D = 0.05A
@ T_j = 125°C			4.4	13.5		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 , V_{GEN} = 10V, R_{GEN} = 25
Turn-Off Delay Time	$t_{D(OFF)}$		11	20	ns	

Electrical Characteristics P-CHANNEL - Q_2, 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.

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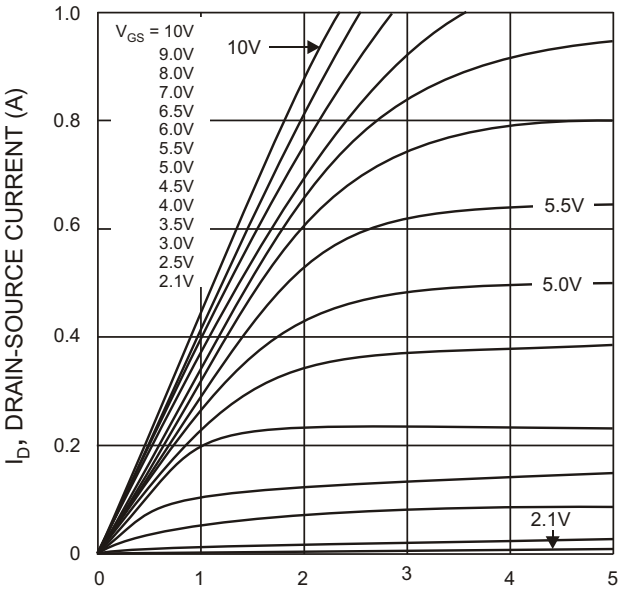

Fig. 1 On-Region Characteristics

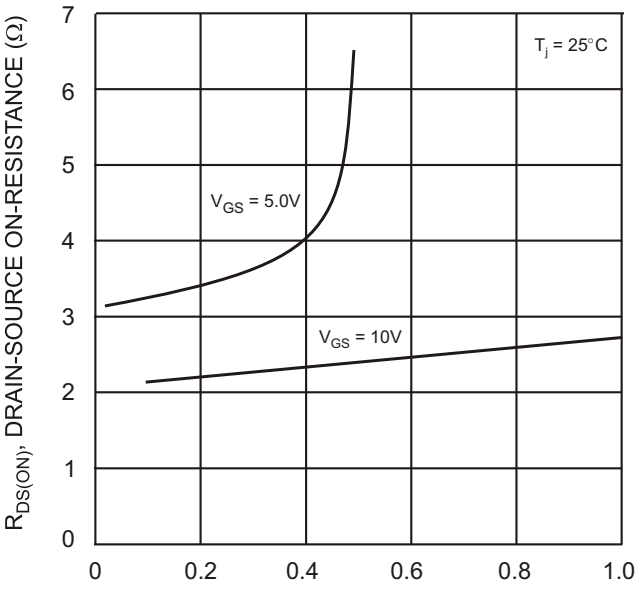

Fig. 2 On-Resistance vs Drain Current

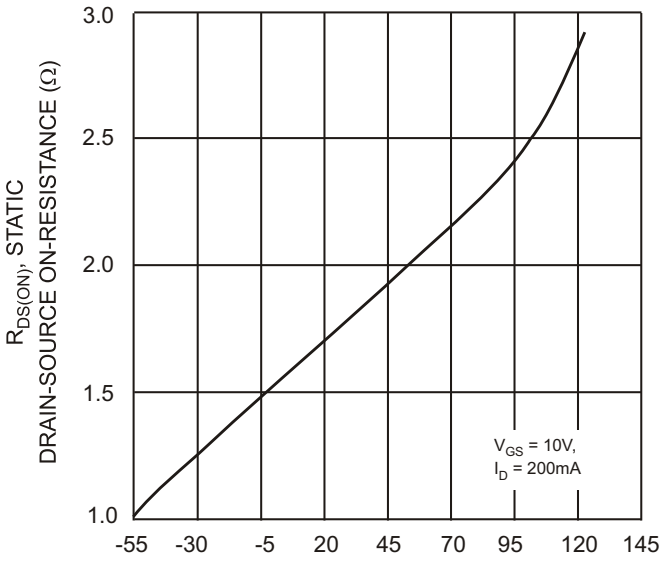

Fig. 3 On-Resistance vs Junction Temperature

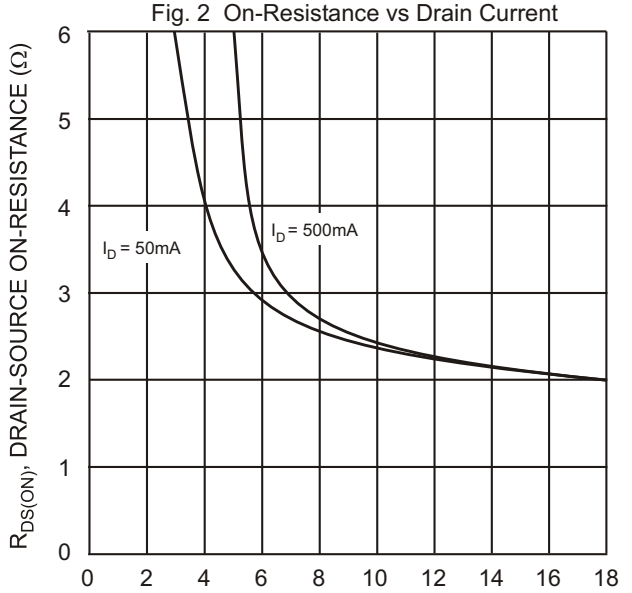

Fig. 4 On-Resistance vs. Gate-Source Voltage

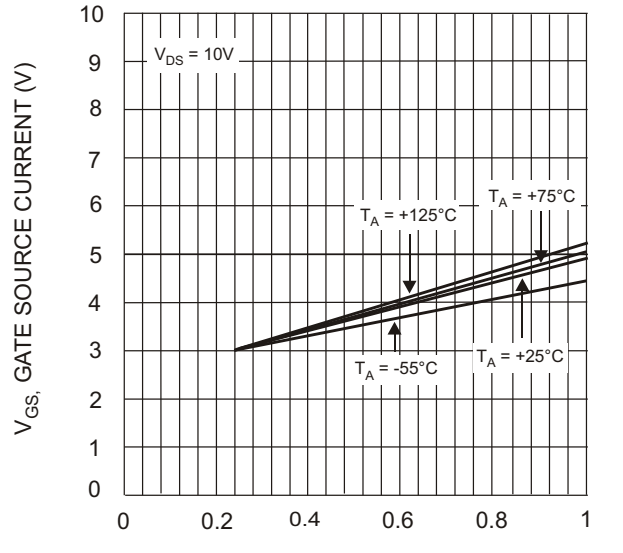

Fig. 5 Typical Transfer Characteristics

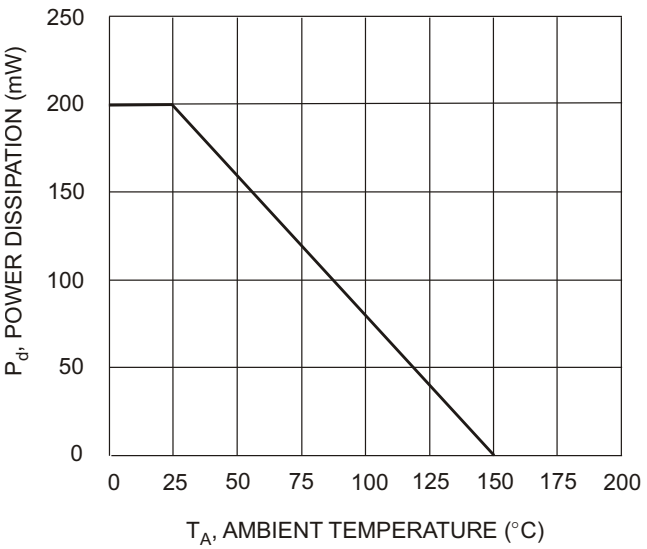

Fig. 6 Max Power Dissipation vs. Ambient Temperature

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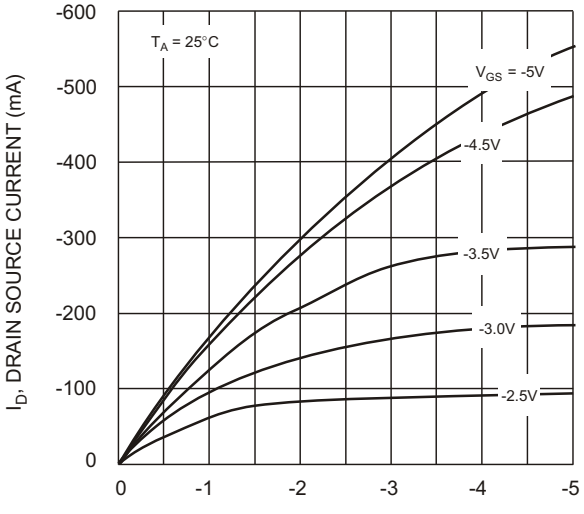

Fig. 7, Drain Source Current vs. Drain Source Voltage

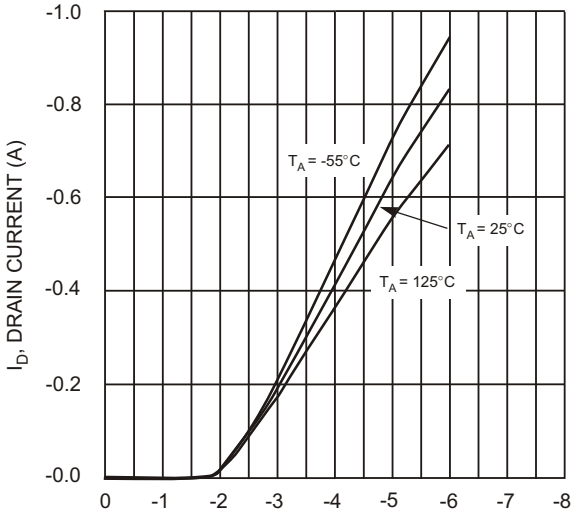

Fig. 8, Drain Current vs. Gate Source Voltage

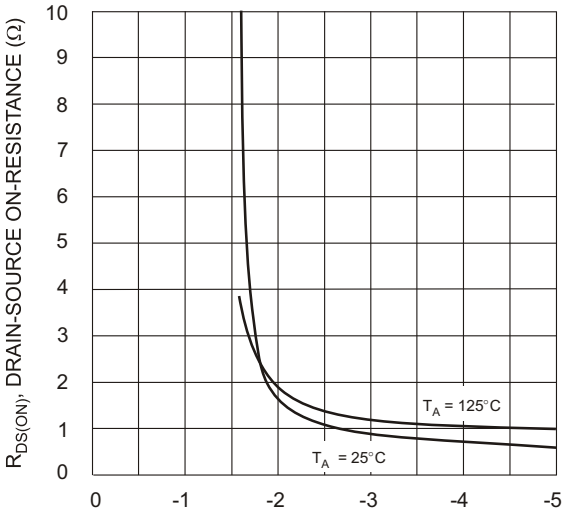

Fig. 9, On Resistance vs. Gate Source Voltage

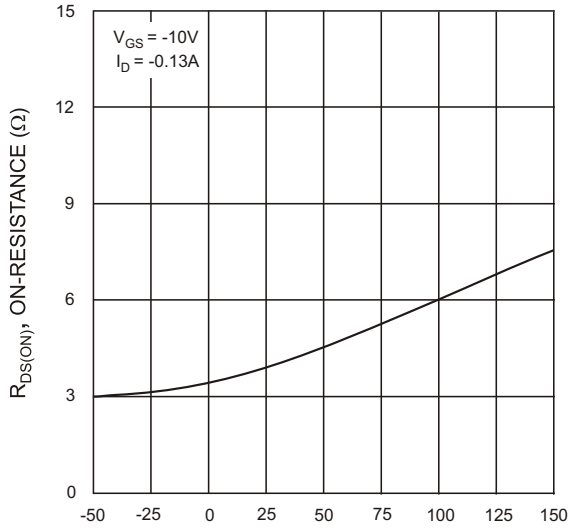

Fig. 10, On-Resistance vs. Junction Temperature

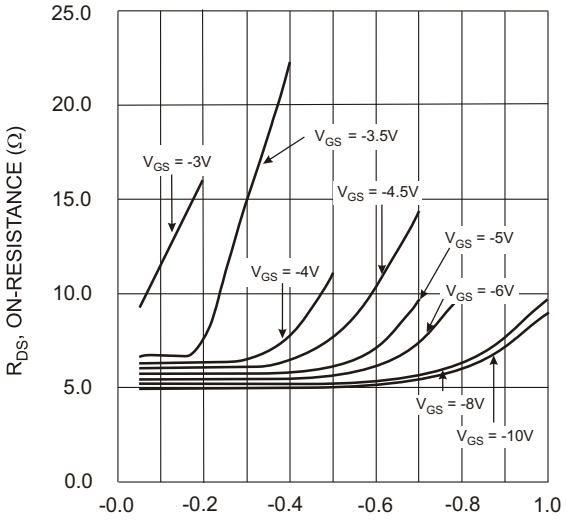

Fig. 11, On-Resistance vs. Drain Current

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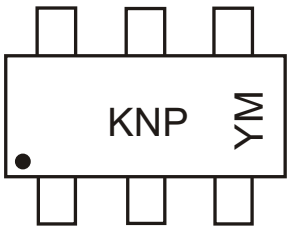
Ordering Information (Note 4)

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