BSS123W

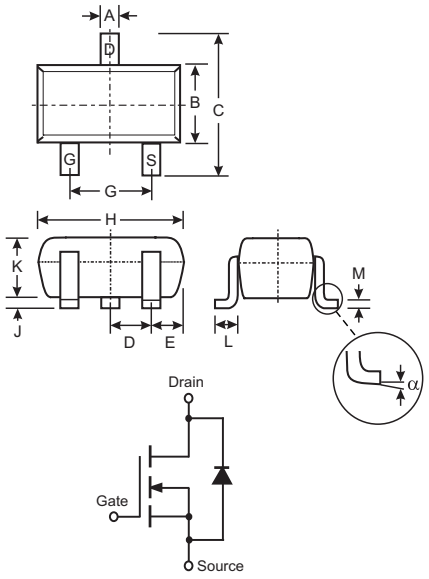
Lead-free Green

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

NEW PRODUCT

Features

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- High Drain-Source Voltage Rating
- **Lead Free/RoHS Compliant (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **"Green" Device, Note 3 and 4**



SOT-323		
Dim	**Min**	**Max**
A	0.25	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.18
α	0°	8°
All Dimensions in mm		

Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking: Date Code and Type Code, See Page 3
- Type Code: K23
- Weight: 0.006 grams (approximate)

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	100	V
Drain-Gate Voltage $R_{GS} \leq 20K\Omega$		V_{DGR}	100	V
Gate-Source Voltage	Continuous	V_{GSS}	±20	V
Drain Current (Note 1)	Continuous Pulsed	I_D I_{DM}	170 680	mA
Total Power Dissipation (Note 1)		P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 1)		$R_{\theta JA}$	625	°C/W
Operating and Storage Temperature Range		T_j, T_{STG}	-55 to +150	°C

Notes:
1. Device mounted on FR-4 PC board with recommended pad layout, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
2. No purposefully added lead.
3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
4. Product manufactured with Date Code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

NEW PRODUCT

Electrical Characteristics @ $T_A = 25°C$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	$V_{GS} = 0V$, $I_D = 250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0 10	μA nA	$V_{DS} = 100V$, $V_{GS} = 0V$ $V_{DS} = 20V$, $V_{GS} = 0V$
Gate-Body Leakage, Forward	I_{GSSF}	—	—	50	nA	$V_{GS} = 20V$, $V_{DS} = 0V$
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	0.8	1.4	2.0	V	$V_{DS} = V_{GS}$, $I_D = 1mA$
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	— —	— —	6.0 10	Ω	$V_{GS} = 10V$, $I_D = 0.17A$ $V_{GS} = 4.5V$, $I_D = 0.17A$
Forward Transconductance	g_{FS}	80	370	—	mS	$V_{DS} = 10V$, $I_D = 0.17A$, f = 1.0KHz
Drain-Source Diode Forward Voltage	V_{SD}	—	0.84	1.3	V	$V_{GS} = 0V$, $I_S = 0.34A$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	29	60	pF	$V_{DS} = 25V$, $V_{GS} = 0V$ f = 1.0MHz
Output Capacitance	C_{oss}	—	10	15	pF	
Reverse Transfer Capacitance	C_{rss}	—	2	6	pF	
SWITCHING CHARACTERISTICS						
Turn-On Rise Time	t_r	—	—	8	ns	$V_{DD} = 30V$, $I_D = 0.28A$, $R_{GEN} = 50\Omega$, $V_{GS} = 10V$
Turn-Off Fall Time	t_f	—	—	16	ns	
Turn-On Delay Time	$t_{D(ON)}$	—	—	8	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	—	13	ns	

Notes: 5. Short duration test pulse used to minimize self-heating effect.

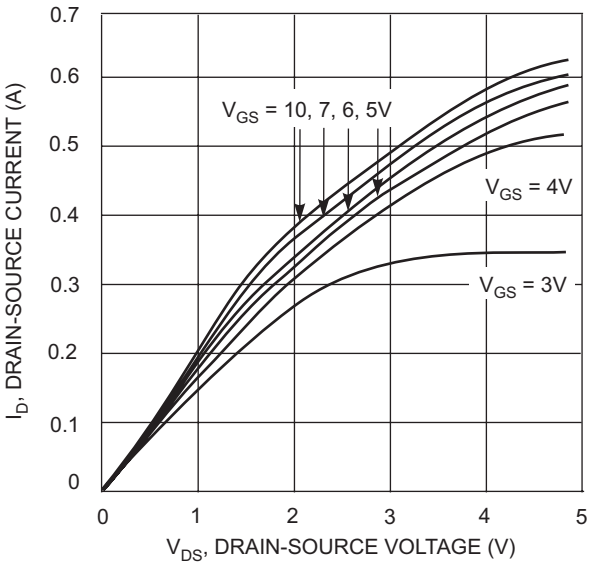


Fig. 1 On-Region Characteristics

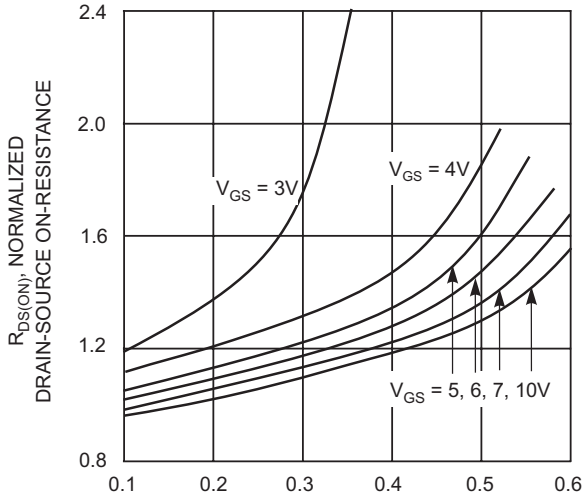


Fig. 2 On-Resistance Variation with Gate Voltage and Drain-Source Current

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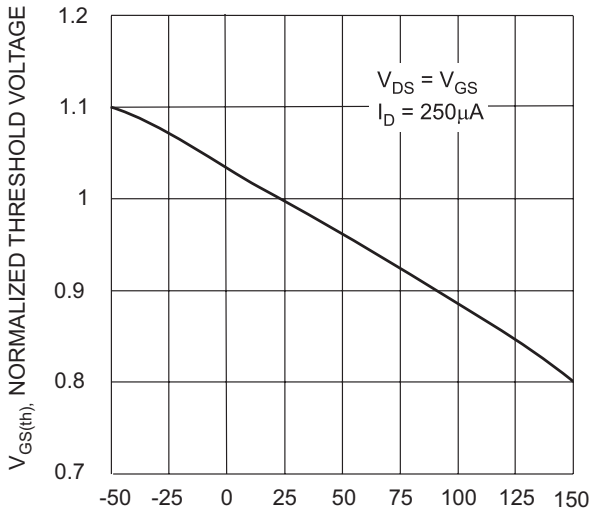


Fig. 3 Gate Threshold Variation with Temperature

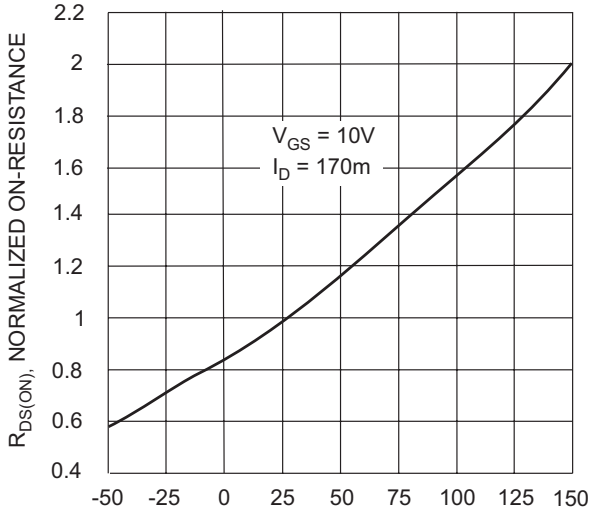


Fig. 4 On-Resistance Variation with Temperature

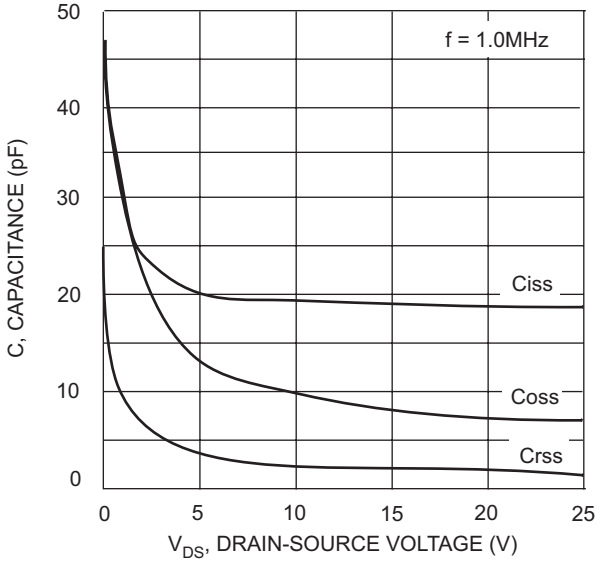


Fig. 5 Typical Capacitance

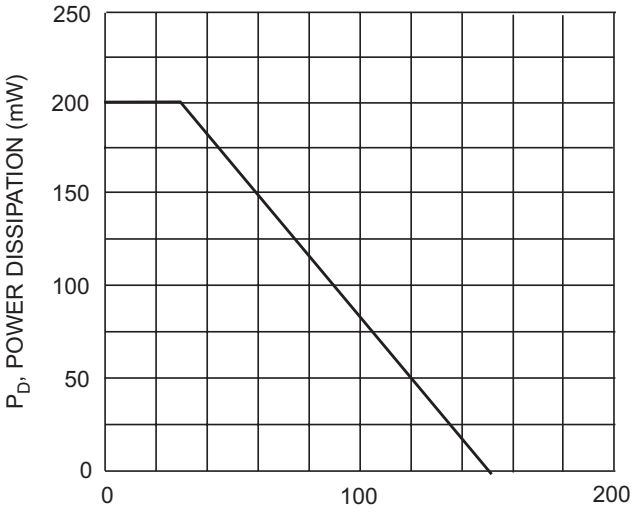


Fig. 6 Power Derating Curve, Total Package

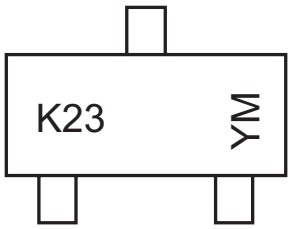
Ordering Information (Note 4 & 6)

Device	Packaging	Shipping
BSS123W-7-F	SOT-323	3000/Tape & Reel

Notes: 4. Product manufactured with Date Code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

6. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



K23 = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: N = 2002
M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009
Code	N	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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