NEW PRODUCT

BSS123

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

Features

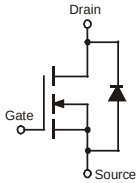
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- High Drain-Source Voltage Rating
- **Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 2 and 4)**

Mechanical Data

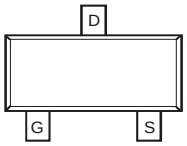
- Case: SOT-23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)

SOT-23

TOP VIEW



Equivalent Circuit



TOP VIEW

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

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 1)	P_d	300	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	°C

Electrical Characteristics @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}	100	—	—	V	V_{GS} = 0V, I_D = 250µA
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 3)						
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} = 50Ω, 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:
1. Part mounted on FR-4 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. Halogen and Antimony Free.
3. Short duration pulse test used to minimize self-heating effect.
4. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb_2O_3 Fire Retardants.

NEW PRODUCT

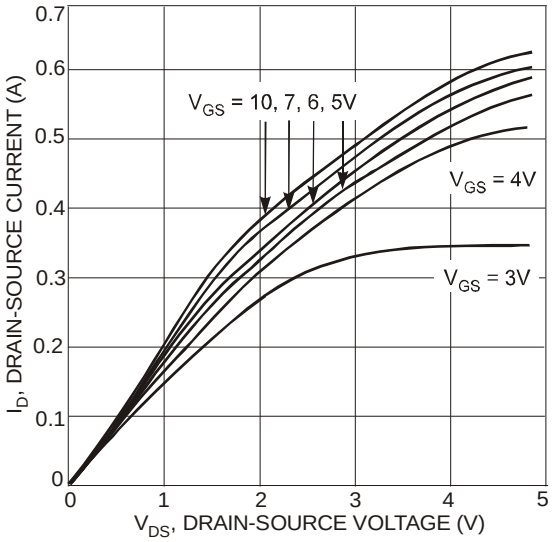


Fig. 1 On-Region Characteristics

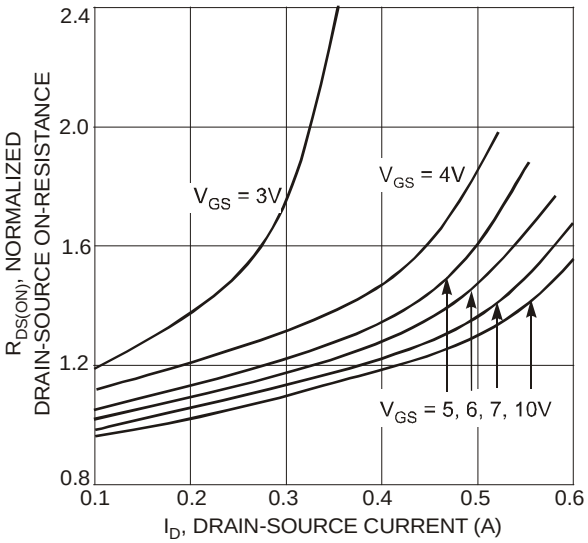


Fig. 2 On-Resistance Variation with Gate Voltage and Drain-Source Current

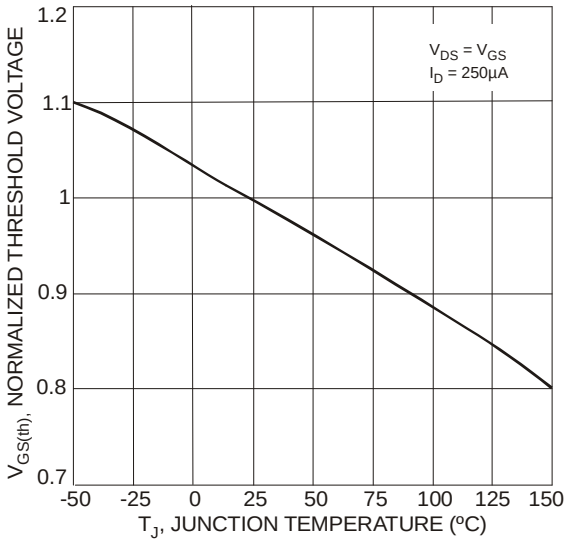


Fig. 3 Gate Threshold Variation with Temperature

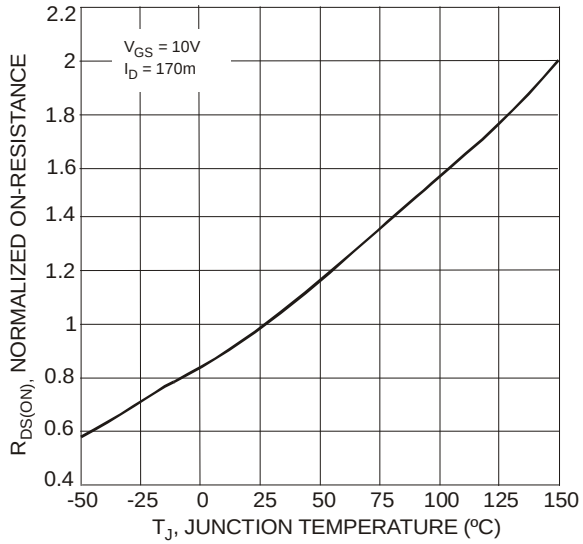


Fig. 4 On-Resistance Variation with Temperature

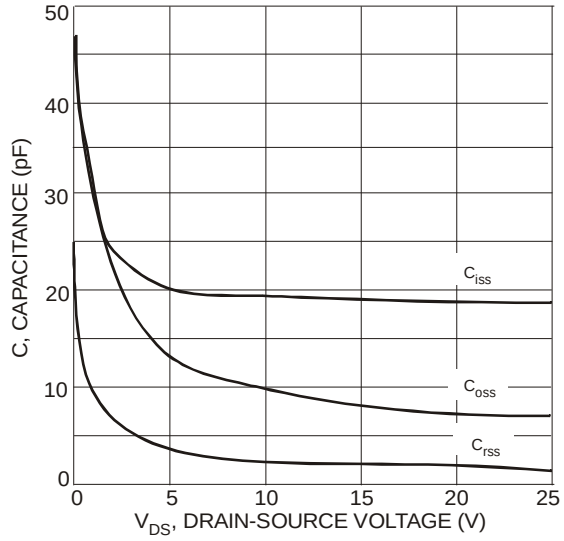


Fig. 5 Typical Capacitance

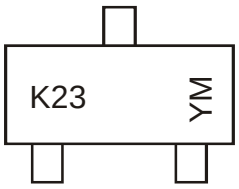
NEW PRODUCT

Ordering Information (Note 5)

Part Number	Case	Packaging
BSS123-7-F	SOT-23	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



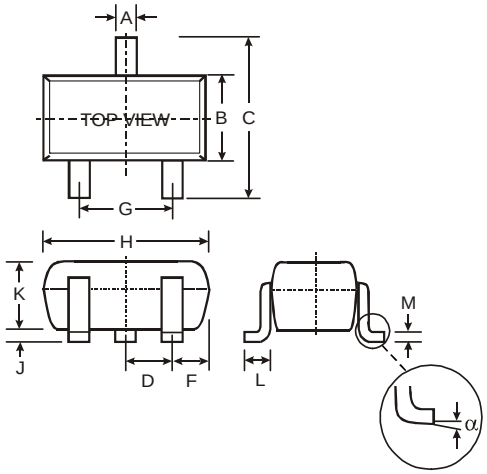
K23 = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: T = 2006
M = Month ex: 9 = September

Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012
Code	T	U	V	W	X	Y	Z

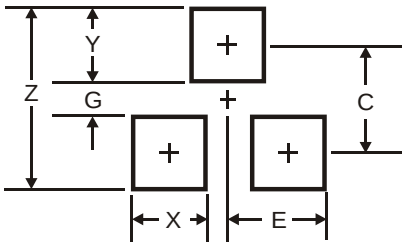
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Package Outline Dimensions



SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
F	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
α	0°	8°
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
Z	3.4
G	0.7
X	0.9
Y	1.4
C	2.0
E	0.9