

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

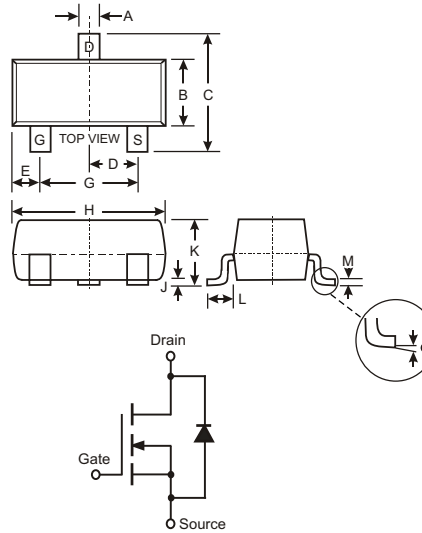
NEW PRODUCT

Features

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- High Drain-Source Voltage Rating

Mechanical Data

- Case: SOT-23, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: K23 (See Page 3)
- Ordering & Date Code Information: See Page 3
- Weight: 0.008 grams (approx.)



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
E	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		

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

Characteristic	Symbol	BSS123	Units
Drain-Source Voltage	V_{DSS}	100	V
Drain-Gate Voltage $R_{GS} \leq 20K\Omega$	V_{DGR}	100	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current (Note 1)	I_D I_{DM}	170 680	mA
Total Power Dissipation (Note 1)	P_d	300	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	$^\circ\text{C}$

Note: 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>.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 2)						
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 2)						
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	

Note: 2. Short duration test pulse used to minimize self-heating effect.

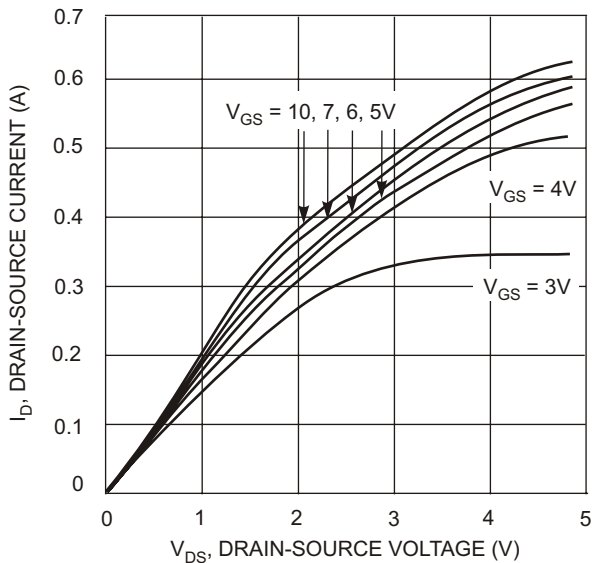


Fig. 1 On-Region Characteristics

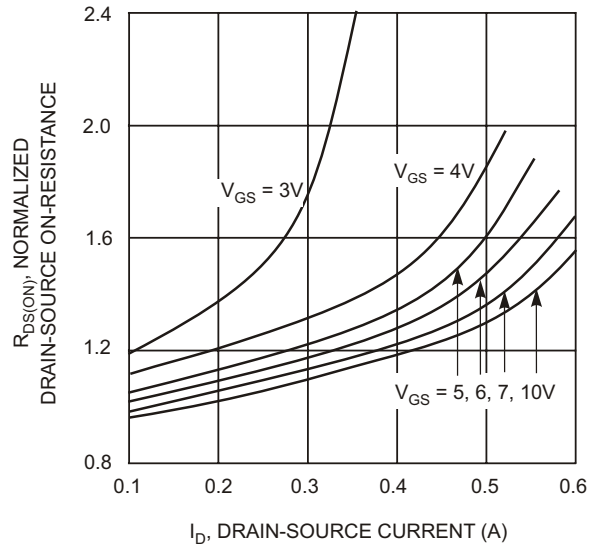


Fig. 2 On-Resistance Variation with Gate Voltage and Drain-Source Current

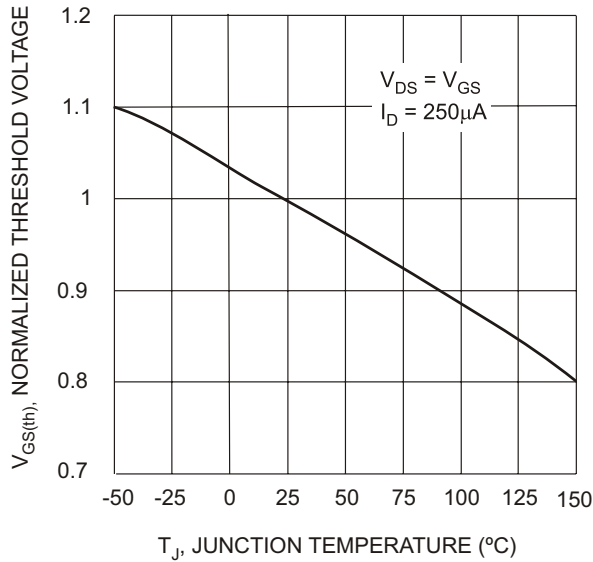


Fig. 3 Gate Threshold Variation with Temperature

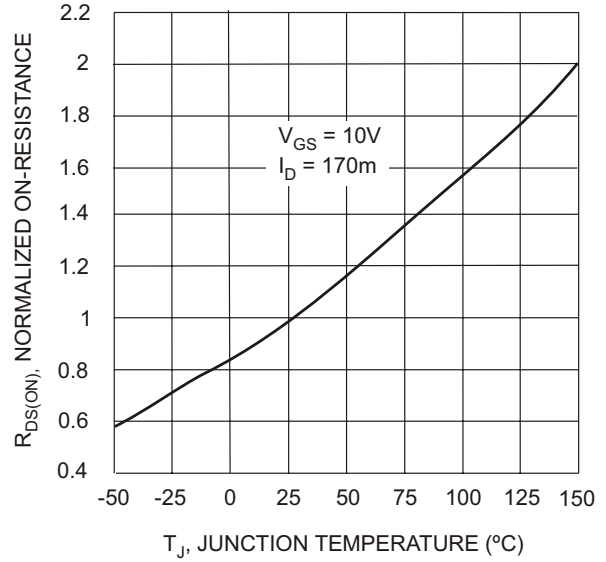


Fig. 4 On-Resistance Variation with Temperature

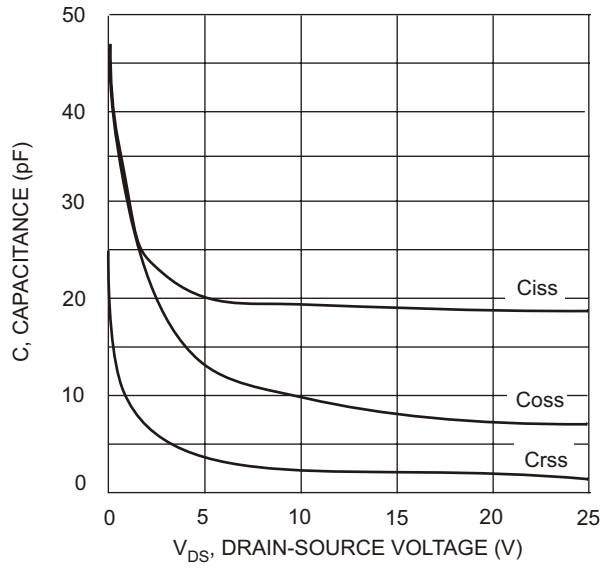


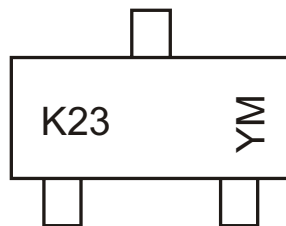
Fig. 5 Typical Capacitance

Ordering Information (Note 3)

Device	Packaging	Shipping
BSS123-7	SOT-23	3000/Tape & Reel

Notes: 3. 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
Code	N	P	R	S	T	U	V

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