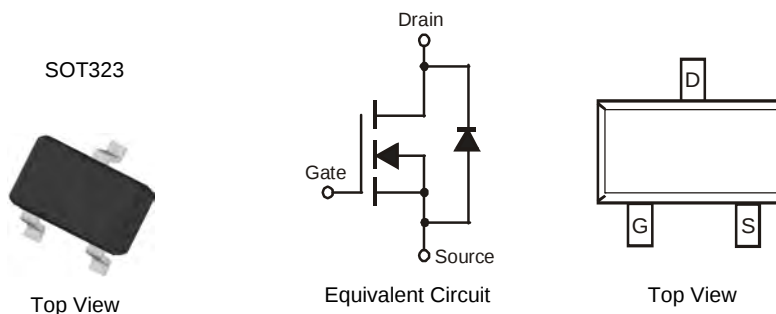


N-CHANNEL ENHANCEMENT MODE MOSFET
Features

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- High Drain-Source Voltage Rating
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green" Device (Notes 2 & 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

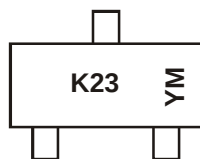
Mechanical Data

- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 3. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Matte Tin Finish annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Weight: 0.006 grams (approximate)


Ordering Information (Notes 3 & 4)

Part Number	Case	Packaging
BSS123W-7-F	SOT323	3000/Tape & Reel

- Notes:
1. No purposefully added lead.
 2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
 3. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.
 4. For packaging details, go to our website at <http://www.diodes.com>.

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	2010	2011	2012	2013	2014	2015	2016	2017
Code	N	P	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E

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

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} ≤ 20KΩ	V _{DGR}	100	V
Gate-Source Voltage Continuous	V _{GSS}	±20	V
Drain Current (Note 5) Continuous	I _D	170	mA
Pulsed	I _{DM}	680	

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P _D	200	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	625	°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 6)						
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 6)						
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: 5. Part mounted on FR-4 board with recommended pad layout, which can be found on our website at <http://www.diodes.com>.
6. Short duration pulse test used to minimize self-heating effect.

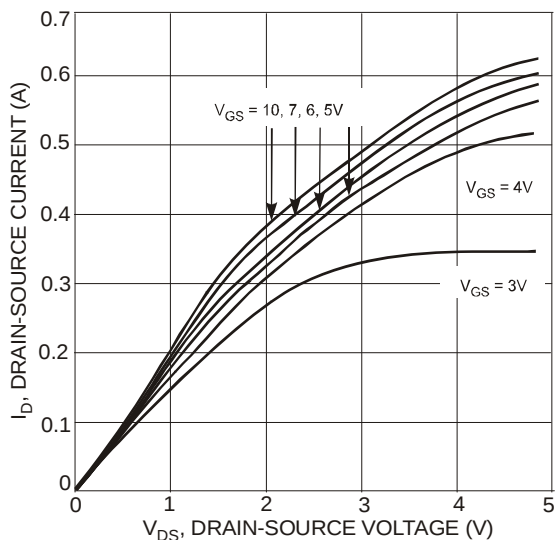


Fig. 1 On-Region Characteristics

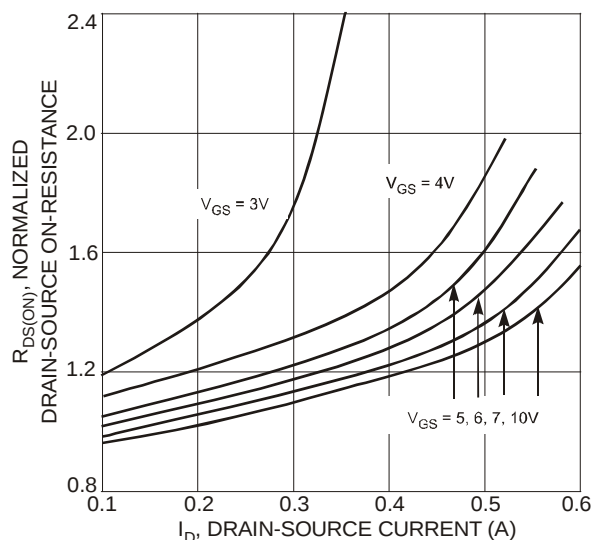


Fig. 2 On-Resistance Variation with Gate Voltage and Drain-Source Current

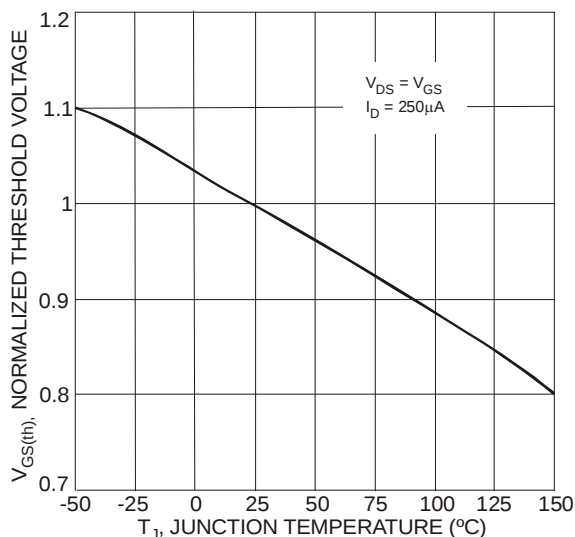


Fig. 3 Gate Threshold Variation with Temperature

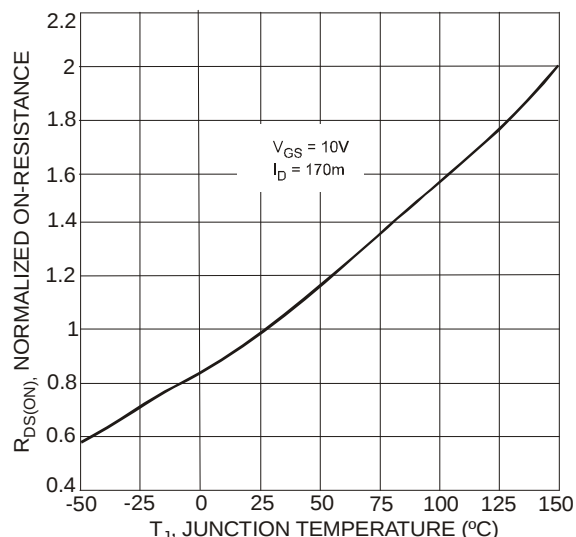


Fig. 4 On-Resistance Variation with Temperature

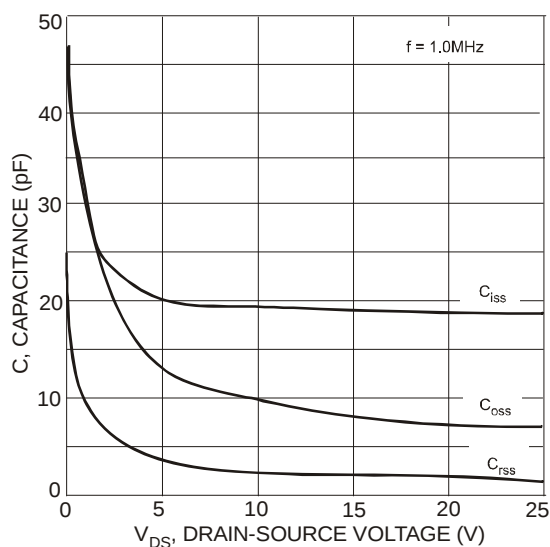


Fig. 5 Typical Capacitance

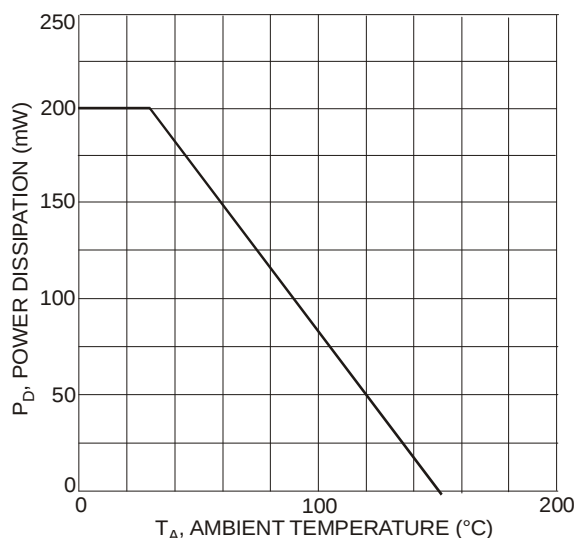
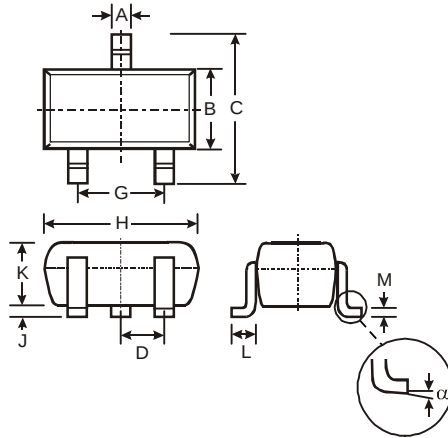


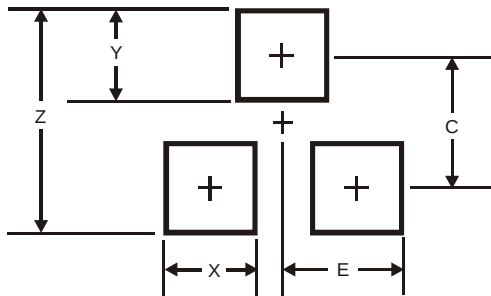
Fig. 6 Power Derating Curve, Total Package

Package Outline Dimensions



SOT323			
Dim	Min	Max	Typ
A	0.25	0.40	0.30
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	-	-	0.65
G	1.20	1.40	1.30
H	1.80	2.20	2.15
J	0.0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.8
X	0.7
Y	0.9
C	1.9
E	1.0

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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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