

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = +25^\circ\text{C}$
100V	6.0Ω @ $V_{GS} = 10\text{V}$	0.17

Description

These N-Channel enhancement mode field effect transistors are produced using DIODES proprietary, high density, uses advanced trench technology. These products have been designed to minimize on-state resistance while provide rugged, reliable, and fast switching performance. These products are particularly suited for low voltage, low current applications such as:

Applications

- Small Servo Motor Control
- Power MOSFET Gate Drivers
- Switching Applications

Features and Benefits

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

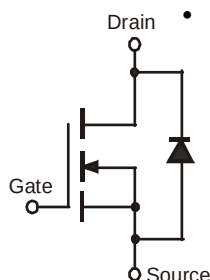
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 **e3**
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

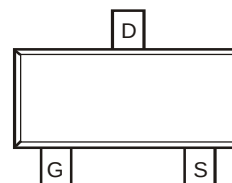
SOT23



Top View



Equivalent Circuit



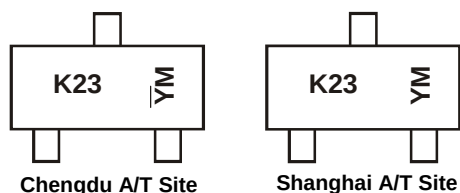
Top View

Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
BSS123-7-F	Commercial	SOT23	3,000 / Tape & Reel
BSS123Q-13	Automotive	SOT23	10,000 / Tape & Reel
BSS123Q-7	Automotive	SOT23	3,000 / Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



Chengdu A/T Site

Shanghai A/T Site

K23 = Product Type Marking Code
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 Y = Date Code Marking for CAT (Chengdu Assembly/ Test site)
 Y or Y = Year (ex: A = 2013)
 M = Month (ex: 9 = September)

Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	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	Unit
Drain-Source Voltage		V _{DSS}	100	V
Gate-Source Voltage	Continuous	V _{GSS}	±20	V
Continuous Drain Current (Note 5) V _{GS} = 10V	Continuous	I _D	170	mA
	Pulsed	I _{DM}	680	

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 5)	P _D	300	mW
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	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 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	100	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.1	μA	V _{DS} = 100V, V _{GS} = 0V
		—	—	10	nA	V _{DS} = 20V, V _{GS} = 0V
Gate-Source 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	Ω	V _{GS} = 10V, I _D = 0.17A
		—	—	10		V _{GS} = 4.5V, I _D = 0.17A
Forward Transfer Admittance	g _{FS}	80	370	—	mS	V _{DS} =10V, I _D = 0.17A, f = 1.0KHz
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		
Reverse Transfer Capacitance	C _{rss}	—	2	6		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(on)}	—	—	8	ns	V _{GS} = 10V, V _{DD} = 30V, I _D = 0.28A, R _{GEN} = 50Ω
Turn-On Rise Time	t _r	—	—	8	ns	
Turn-Off Delay Time	t _{D(off)}	—	—	13	ns	
Turn-Off Fall Time	t _f	—	—	16	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.

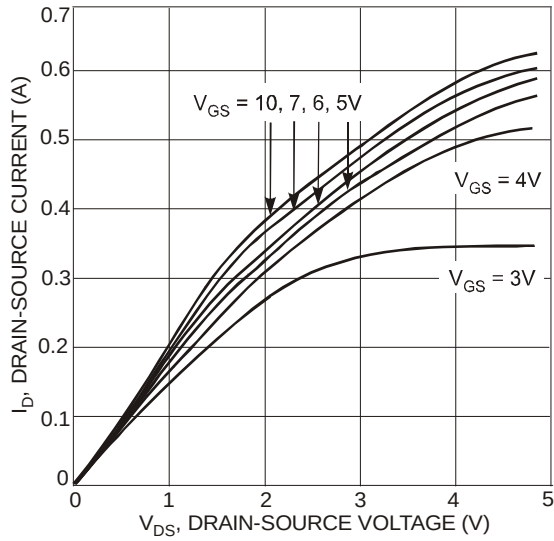


Fig. 1 On-Region Characteristics

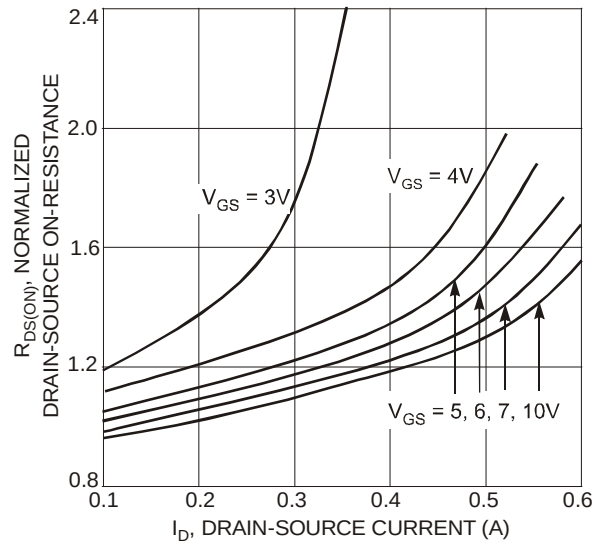


Fig. 2 On-Resistance Variation with Gate Voltage and Drain-Source Current

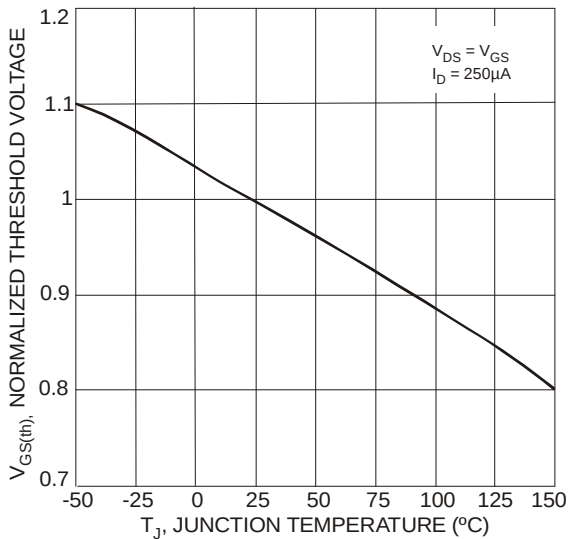


Fig. 3 Gate Threshold Variation with Temperature

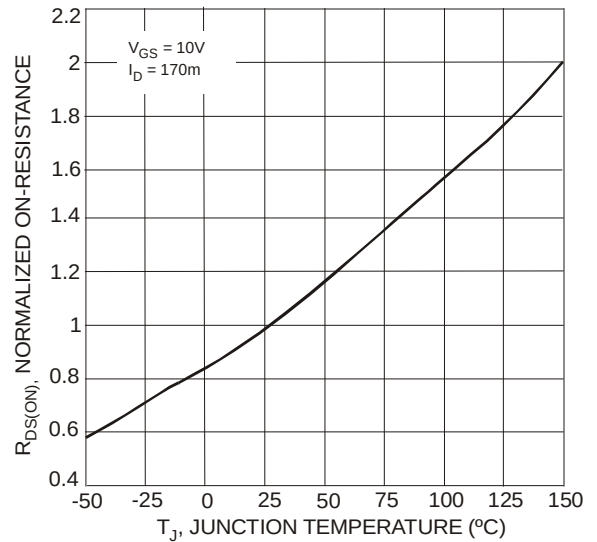


Fig. 4 On-Resistance Variation with Temperature

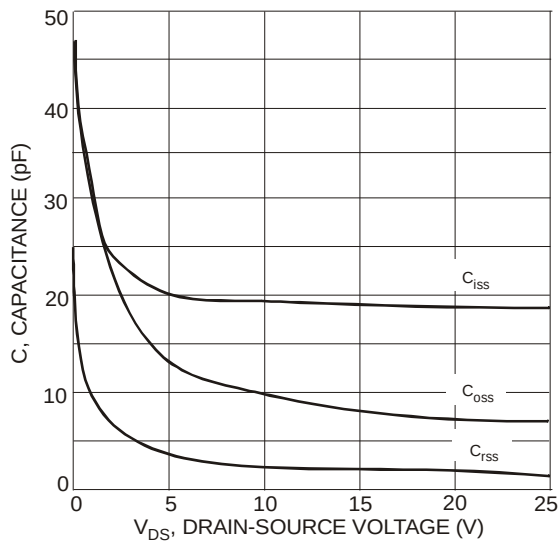
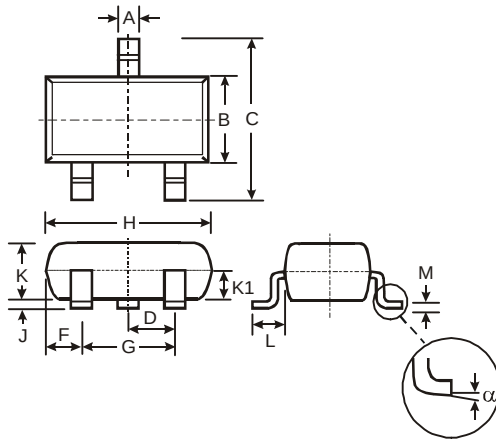


Fig. 5 Typical Capacitance

Package Outline Dimensions

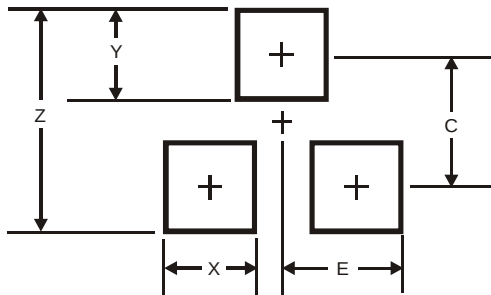
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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