



BSS138

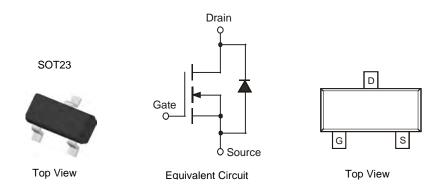
N-CHANNEL ENHANCEMENT MODE MOSFET

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)
- "Green" Device (Note 2)
- 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
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)



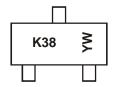
Ordering Information (Note 3)

Part Number	Case	Packaging
BSS138-7-F	SOT23	3000/Tape & Reel

Notes:

- 1. No purposefully added lead. Halogen and Antimony Free.
- 2. 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 Sb₂O₃ Fire Retardants.
- 3. For packaging details, go to our website at http://www.diodes.com.

Marking Information



K38 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: N = 2002) M = Month (ex: 9 = September)

Date Code Key

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	J	K	L	М	N	Р	R	S	Т	U	V	W	Х	Υ	Z
Month	Jan	Fel	b I	Mar	Apr	May	Ju	n	Jul	Aug	Sep	Ос	t I	Nov	Dec
Code	1	2		3	4	5	6		7	8	9	0		N	D

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Maximum Ratings @TA = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	50	V
Drain-Gate Voltage $R_{GS} \le 20K\Omega$		V_{DGR}	50	V
Gate-Source Voltage	Continuous	V_{GSS}	±20	V
Drain Current	Continuous	I _D	200	mA

Thermal Characteristics @TA = 25°C unless otherwise specified

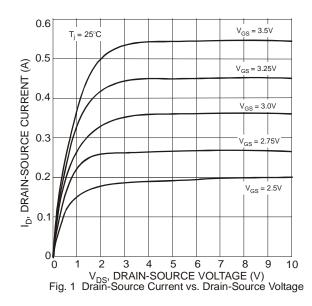
Characteristic	Symbol	Value	Units
Power Dissipation (Note 4)	P_{D}	300	mW
Thermal Resistance, Junction to Ambient (Note 4)	$R_{ heta JA}$	417	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

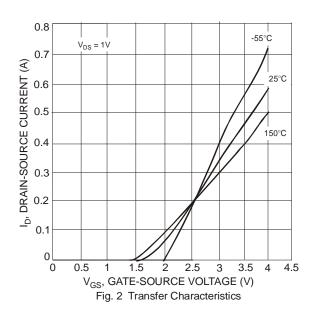
Electrical Characteristics @TA = 25°C unless otherwise specified

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 5)		-	-				
Drain-Source Breakdown Voltage	BV _{DSS}	50	75	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	0.5	μΑ	$V_{DS} = 50V$, $V_{GS} = 0V$	
Gate-Body Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 5)							
Gate Threshold Voltage	V _{GS(th)}	0.5	1.2	1.5	V	$V_{DS} = V_{GS}, I_D = 250 \mu A$	
Static Drain-Source On-Resistance	R _{DS} (ON)	_	1.4	3.5	Ω	$V_{GS} = 10V, I_D = 0.22A$	
Forward Transconductance	g _F s	100	_	_	mS	$V_{DS} = 25V$, $I_D = 0.2A$, $f = 1.0KHz$	
DYNAMIC CHARACTERISTICS							
Input Capacitance	C _{iss}	_	_	50	pF		
Output Capacitance	Coss	_	_	25	pF	$V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz$	
Reverse Transfer Capacitance	C _{rss}	_	_	8.0	pF		
SWITCHING CHARACTERISTICS			_				
Turn-On Delay Time	t _{D(ON)}		_	20	ns	V 20V I 0.24 B 500	
Turn-Off Delay Time	t _{D(OFF)}	_	_	20	ns	$V_{DD} = 30V$, $I_D = 0.2A$, $R_{GEN} = 50\Omega$	

Notes:

- 4. Device mounted on FR-5 PCB 1.0 x 0.75 x 0.062 inch pad layout as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at http://www.diodes.com.
- 5. Short duration pulse test used to minimize self-heating effect.







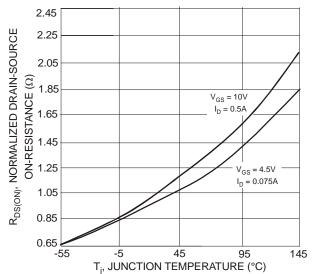


Fig. 3 Drain-Source On-Resistance vs. Junction Temperature

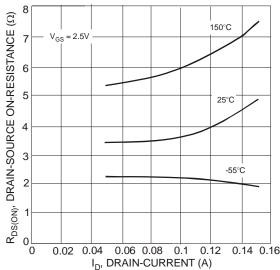


Fig. 5 Drain-Source On-Resistance vs. Drain-Current

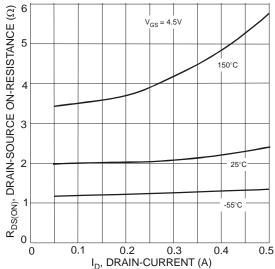
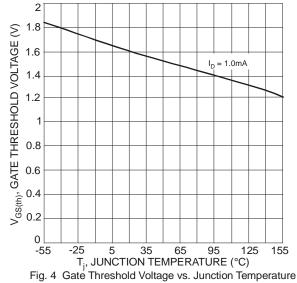


Fig. 7 Drain-Source On-Resistance vs. Drain-Current



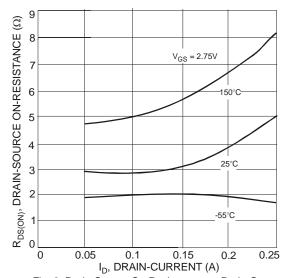


Fig. 6 Drain-Source On-Resistance vs. Drain-Current

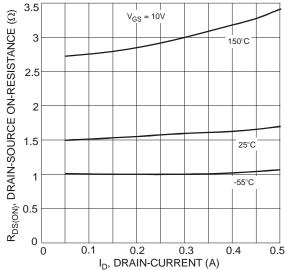
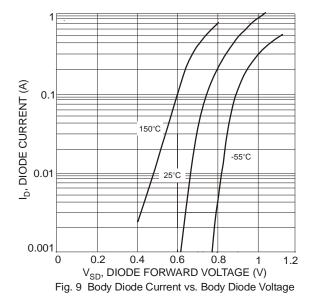
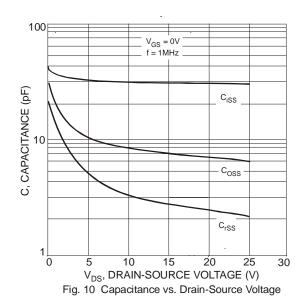


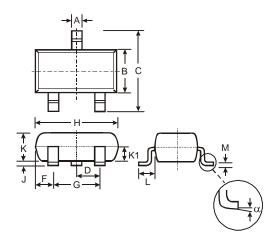
Fig. 8 Drain-Source On Resistance vs. Drain-Current





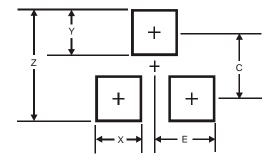


Package Outline Dimensions



SOT23								
Dim	Min	Max	Тур					
Α	0.37	0.51	0.40					
В	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					
Н	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					
М	0.085	0.18	0.11					
α	0°	8°	-					
All	All Dimensions in mm							

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
Х	0.8
Υ	0.9
С	2.0
E	1.35



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