



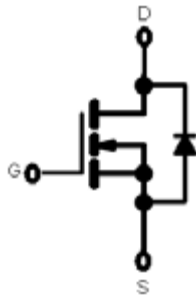
## SOT-23 Plastic-Encapsulate MOSFETS

### BSS138

N-Channel 50-V(D-S) MOSFET

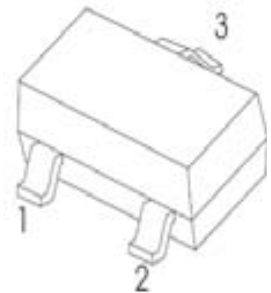
#### FEATURE

- Low On-Resistance
- Low Gate Threshold Voltage
- Fast Switching Speed
- Low Input / Output Leakage



#### SOT-23

1. GATE
2. SOURCE
3. DRAIN



#### Maximum ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	50	V
Continuous Gate-Source Voltage	$V_{GSS}$	$\pm 12$	
Continuous Drain Current	$I_D$	0.22	A
Power Dissipation	$P_D$	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	$^{\circ}\text{C/W}$
Operating Temperature	$T_j$	150	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-55 ~ +150	



## Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Off characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	50			V
Gate-body leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±12V			±1	μA
		V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±10V			±0.5	μA
		V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±5V			±0.05	μA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V			0.1	μA
<b>On characteristics</b>						
Gate-threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 0.25mA	0.60		1.20	V
Static drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 0.05A			2.50	Ω
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 0.05A			2.0	
		V <sub>GS</sub> = 5V, I <sub>D</sub> = 0.05A			1.6	
Forward transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.2A	0.20			S
<b>Dynamic characteristics*</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1MHz		58		pF
Output capacitance	C <sub>oss</sub>			9.75		
Reverse transfer capacitance	C <sub>rss</sub>			5.2		
Gate resistance	R <sub>G</sub>	V <sub>DS</sub> = 5V, V <sub>GS</sub> = 10mV, f = 1MHz		281		Ω
<b>Switching characteristics*</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 30V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.29A, R <sub>GEN</sub> = 6Ω			5	ns
Rise time	t <sub>r</sub>				5	
Turn-off delay time	t <sub>d(off)</sub>				60	
Fall time	t <sub>f</sub>				35	
<b>Drain-source body diode characteristics</b>						
Body diode forward voltage*	V <sub>SD</sub>	I <sub>S</sub> = 0.115A, V <sub>GS</sub> = 0V			1.2	V

\* These parameters have no way to verify.