

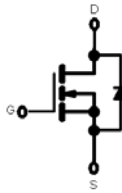
# BSS138

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

## FEATURE

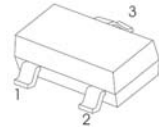
- High density cell design for extremely low  $R_{DS(on)}$
- Rugged and Reliable

## MARKING: SS



## 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	$V_{GSS}$	$\pm 20$	
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	$^{\circ}\text{C}/\text{W}$
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	Units
<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> = ±20V			±100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V			0.5	μA
		V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V			100	nA
<b>On characteristics</b>						
Gate-threshold voltage (note 1)	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1mA	0.80		1.50	V
Static drain-source on-resistance (note 1)	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.22A			3.50	Ω
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.22A			6	
Forward transconductance (note 1)	g <sub>FS</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.22A	0.12			S
<b>Dynamic characteristics (note 2)</b>						
Input capacitance	C <sub>ISS</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1MHz		27		pF
Output capacitance	C <sub>OSS</sub>			13		
Reverse transfer capacitance	C <sub>rss</sub>			6		
<b>Switching characteristics</b>						
Turn-on delay time (note 1,2)	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 (note 1,2)	t <sub>r</sub>				18	
Turn-off delay time (note 1,2)	t <sub>d(off)</sub>				36	
Fall time (note 1,2)	t <sub>f</sub>				14	
<b>Drain-source body diode characteristics</b>						
Body diode forward voltage (note 1)	V <sub>SD</sub>	I <sub>S</sub> = 0.44A, V <sub>GS</sub> = 0V			1.4	V

**Notes:**

1. Pulse Test ; Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. These parameters have no way to verify.

# Typical Characteristics

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