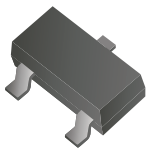
BSS138-G

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



Features

-High density cell design for extremely low $R_{DS(ON)}$.

-Rugged and Reliable.

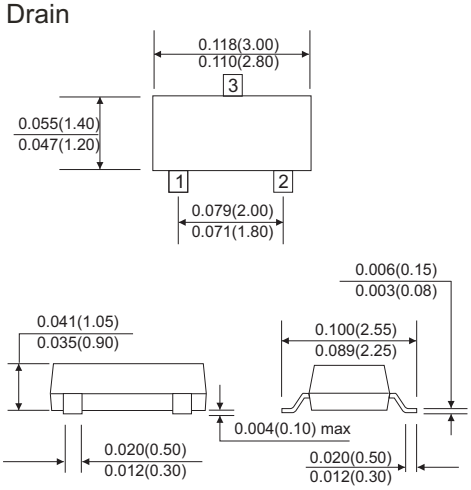
Mechanical data

-Case: SOT-23, molded plastic.

-Terminals: solderable per MIL-STD-750, method 2026.

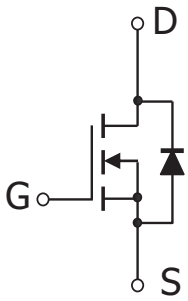
1 : Gate
2 : Source
3 : Drain

SOT-23



Dimensions in inches and (millimeter)

Circuit diagram



Maximum Ratings (at Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Units
Drain-source voltage	V_{DS}	50	V
Continuous gate-source voltage	V_{GS}	±20	V
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	°C/W
Operating temperature	T_J	150	°C
Storage temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Off characteristics						
Drain-Source breakdown voltage	V_{GS}=0V, I_D=250μA	$V_{(BR)DSS}$	50			V
Gate-body leakage	V_{DS}=0V, V_{GS}=±20V	I_{GSS}			±100	nA
Zero gate voltage drain current	V_{DS}=50V, V_{GS}=0V	I_{DSS}			0.5	μA
	V_{DS}=30V, V_{GS}=0V	I_{DSS}			100	nA
On characteristics						
Gate-threshold voltage (note 1)	V_{DS}=V_{GS}, I_D=1mA	$V_{GS(th)}$	0.8		1.5	V
Static drain-source on-resistance (note 1)	V_{GS}=10V, I_D=0.22A	$R_{DS(ON)}$			3.5	Ω
	V_{GS}=4.5V, I_D=0.22A				6	
Forward transconductance (note 1)	V_{DS}=10V, I_D=0.22A	g_{FS}	0.12			S
Dynamic characteristics (note 2)						
Input capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	C_{iss}		27		pF
Output capacitance		C_{oss}		13		
Reverse transfer capacitance		C_{rss}		6		
Switching Characteristics						
Turn-on delay time (note 1,2)	V_{DD}=30V, V_{DS}=10V, I_D=0.29A, R_{GEN}=6Ω	$t_{d(on)}$			5	ns
Rise time (note 1,2)		t_r			18	
Turn-off delay time (note 1,2)		$t_{d(off)}$			36	
Fall time (note 1,2)		t_f			14	
Drain-source body diode characteristics						
Body diode forward voltage (note 1)	I_S=0.44A, V_{GS}=0V	V_{SD}			1.4	V

Note:

1. Pulse test ; Pulse width ≤300μs, Duty cycle ≤ 2%
2. These parameters have no way to verify.

RATING AND CHARACTERISTIC CURVES (BSS138-G)

Fig.1 - Output Characteristics

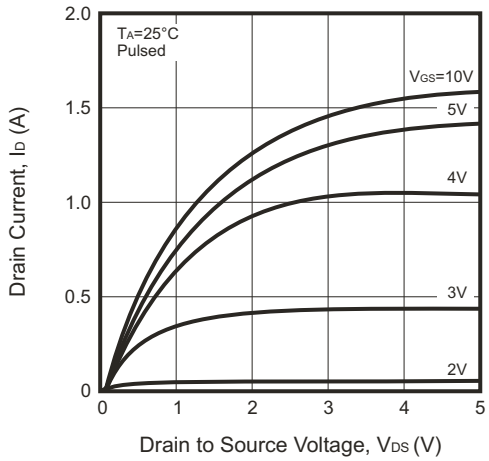


Fig.2 - Transfer Characteristics

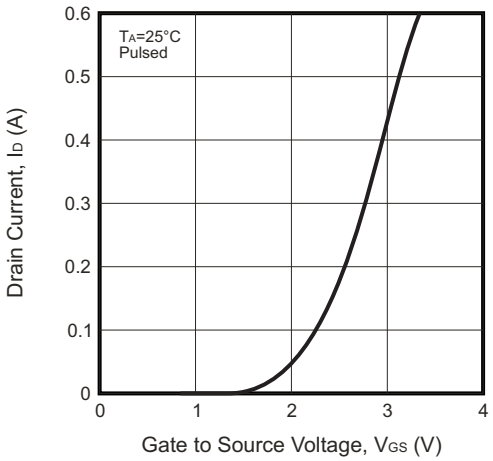


Fig.3 - $R_{DS(ON)}$ — I_D

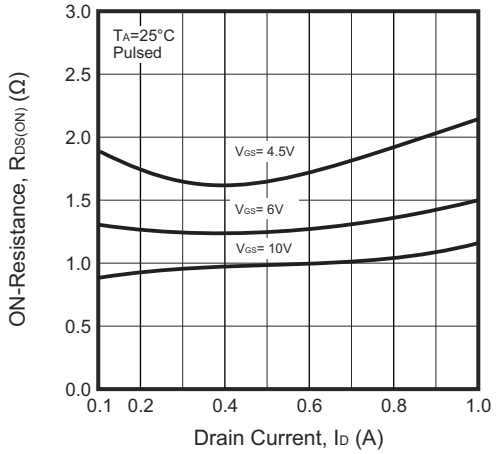


Fig.4 - $R_{DS(ON)}$ — V_{GS}

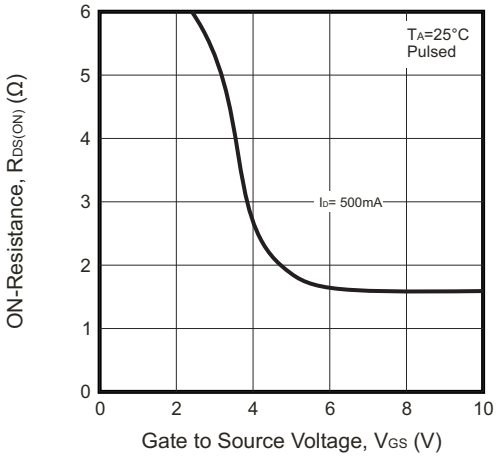
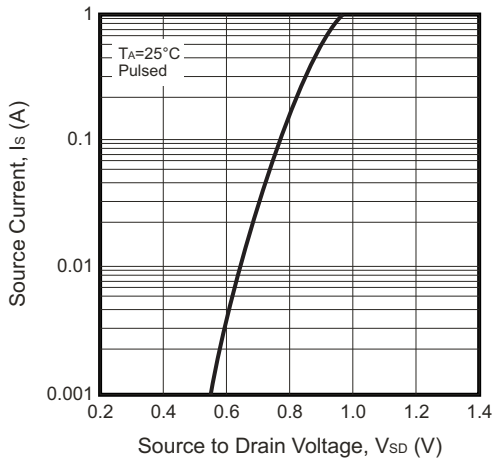
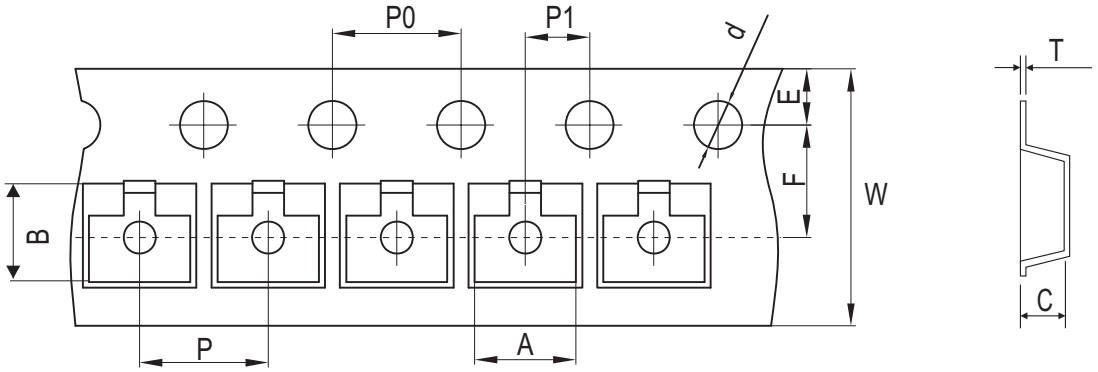
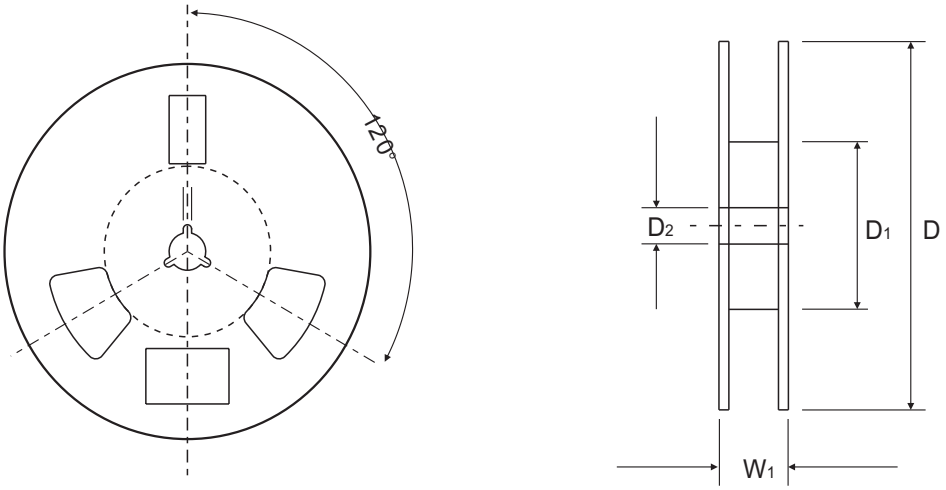


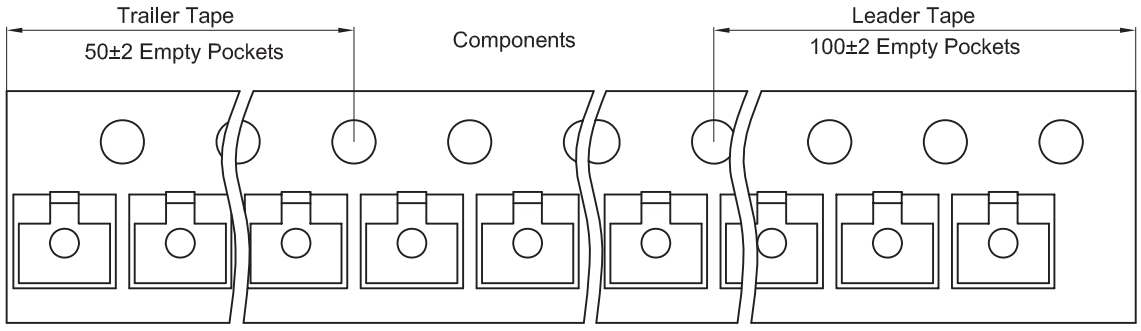
Fig.5 - I_S — V_{SD}



Reel Taping Specification





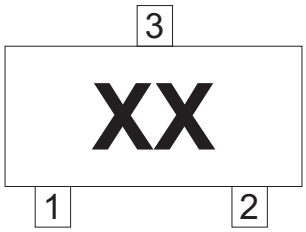


	SYMBOL	A	B	C	d	D	D_1	D_2
SOT-23	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	Φ1.50 ± 0.10	178 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	Φ0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

	SYMBOL	E	F	P	P_0	P_1	W	W_1
SOT-23	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	8.00 + 0.30 / - 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.315 + 0.012 / - 0.004	0.484 ± 0.039

Marking Code

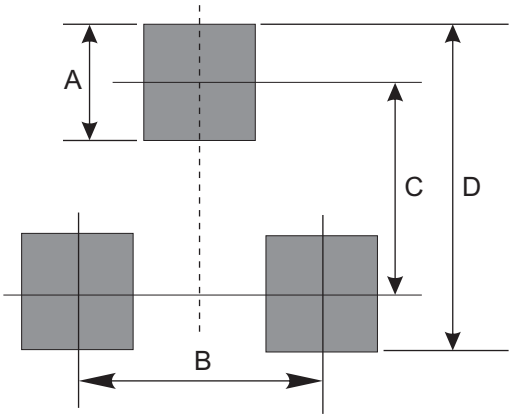
Part Number	Marking Code
BSS138-G	SS



xx = Product type marking code

Suggested PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.80	0.031
B	1.90	0.075
C	2.02	0.080
D	2.82	0.111



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7