



Description

The BSS138 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 50V$ $I_D = 0.22A$

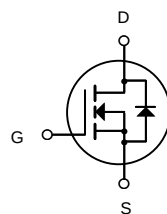
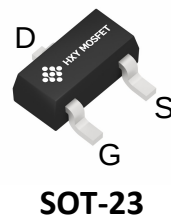
$R_{DS(ON)} < 2.0\Omega @ V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
BSS138	SOT-23	SS	3000

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter		Limit	Unit
V_{DS}	Drain-Source Voltage		50	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current ($T_J = 150^\circ\text{C}$)	$T_A = 25^\circ\text{C}$	0.22	A
		$T_A = 100^\circ\text{C}$	0.13	
I_{DM}	Drain Current-Pulsed (Note 1)		0.88	A
P_D	Maximum Power Dissipation		0.35	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 To 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)		357	$^\circ\text{C/W}$



Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	50			V
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} =50V, V _{GS} =0V			0.5	μA
		V _{DS} =30V, V _{GS} =0V			100	nA
On characteristics						
Gate-threshold voltage (note 1)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =1mA	0.8		1.5	V
Static drain-source on-resistance (note 1)	R _{DS(on)}	V _{GS} =10V, I _D =0.22A		1.1	2.0	Ω
		V _{GS} =4.5V, I _D =0.22A		1.5	3	
Forward transconductance (note 1)	g _{FS}	V _{DS} =10V, I _D =0.22A	0.12			S
Dynamic characteristics (note 2)						
Input capacitance	C _{iss}	V _{DS} =25V,V _{GS} =0V, f=1MHz		27		pF
Output capacitance	C _{oss}			13		
Reverse transfer capacitance	C _{rss}			6		
Switching characteristics						
Turn-on delay time (note 1,2)	t _{d(on)}	V _{DD} =30V, V _{DS} =10V, I _D =0.29A,R _{GEN} =6Ω			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)	V _{SD}	I _S =0.44A, V _{GS} = 0V			1.4	V

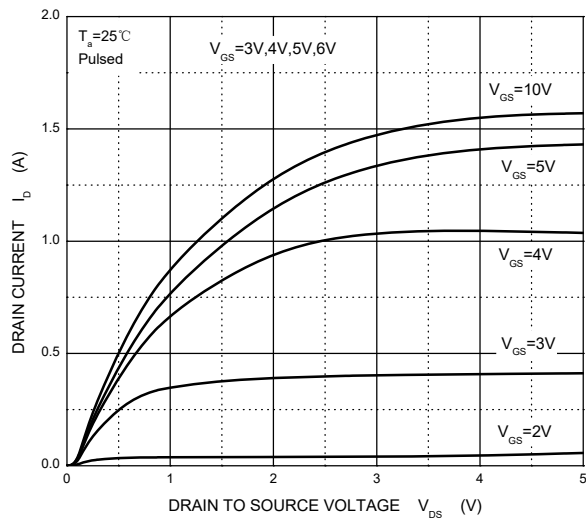
Notes:

1. Pulse Test ; Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
2. These parameters have no way to verify.

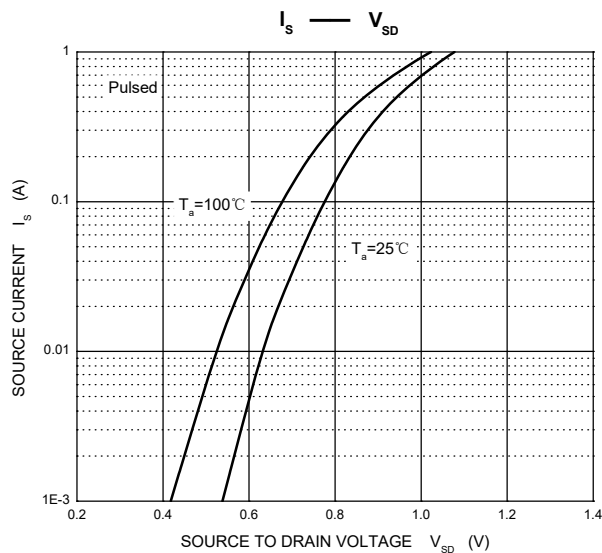
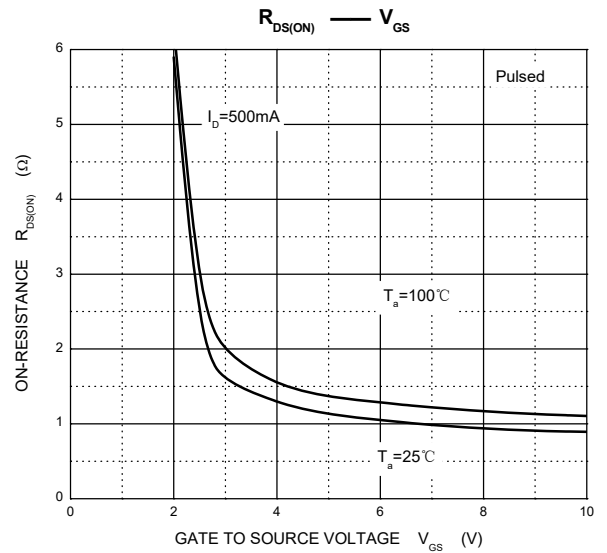
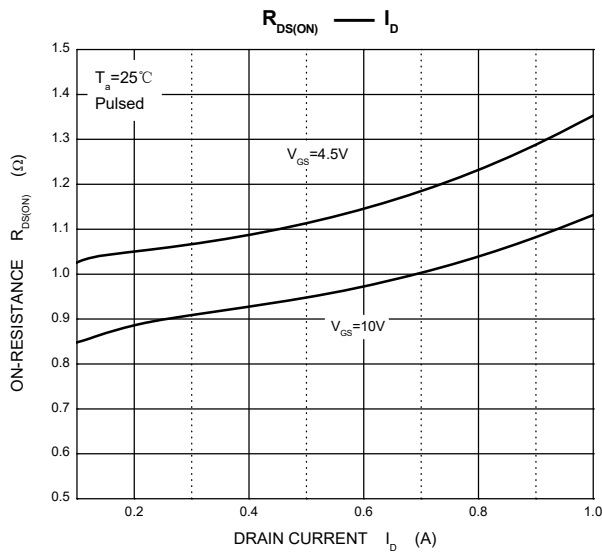
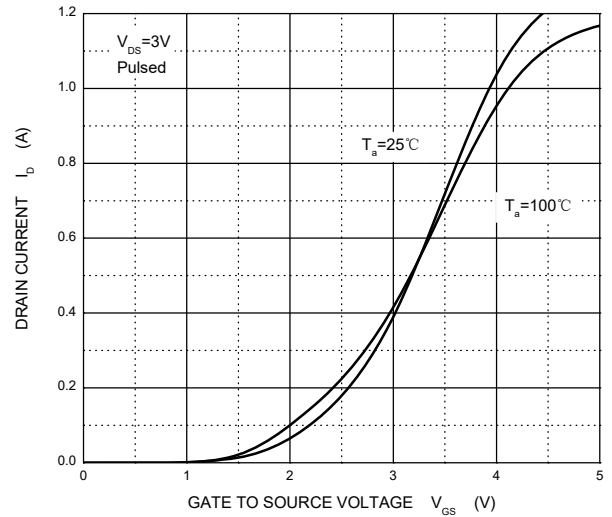


Typical Characteristics

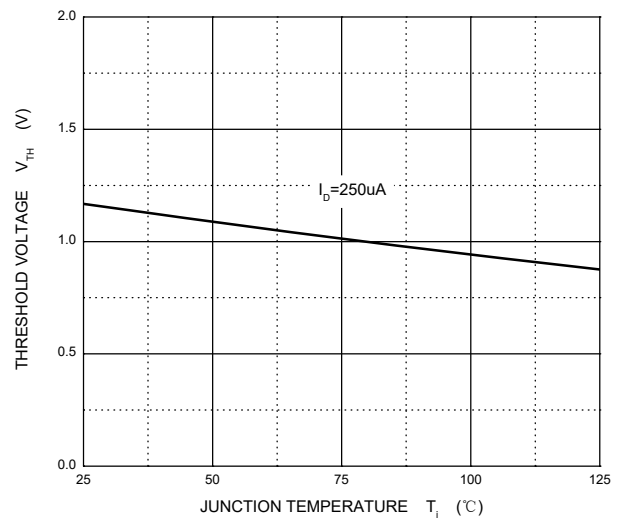
Output Characteristics



Transfer Characteristics

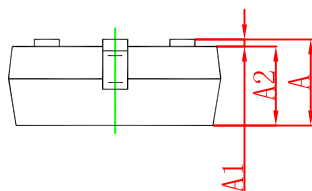
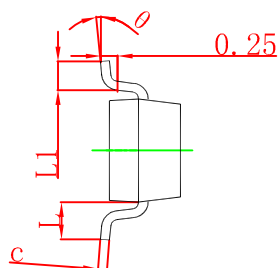
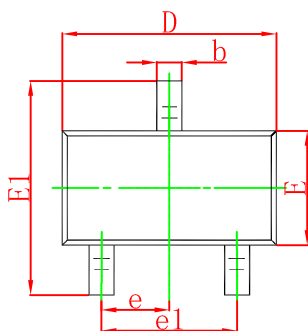


Threshold Voltage



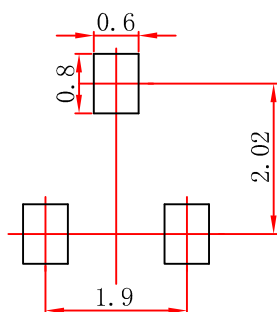


SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.



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