

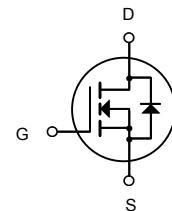


Description

The BSS138LT1G 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.



SOT-23



N-Channel MOSFET

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

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
BSS138LT1G	SOT-23	SS	3000

Absolute Maximum Ratings ($T_c=25^\circ C$ 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 ($T_J = 150^\circ C$)		0.22	A
	$T_A = 100^\circ C$	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	°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ^(Note 2)		357	°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	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_{\text{D}} = 250\mu\text{A}$	50			V
Gate-body leakage	I_{GSS}	$V_{\text{DS}} = 0\text{V}, V_{\text{GS}} = \pm 20\text{V}$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{\text{DS}} = 50\text{V}, V_{\text{GS}} = 0\text{V}$		0.5		μA
		$V_{\text{DS}} = 30\text{V}, V_{\text{GS}} = 0\text{V}$		100		nA
On characteristics						
Gate-threshold voltage (note 1)	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_{\text{D}} = 1\text{mA}$	0.8		1.5	V
Static drain-source on-resistance (note 1)	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10\text{V}, I_{\text{D}} = 0.22\text{A}$		1.1	2.0	Ω
		$V_{\text{GS}} = 4.5\text{V}, I_{\text{D}} = 0.22\text{A}$		1.5	3	
Forward transconductance (note 1)	g_{FS}	$V_{\text{DS}} = 10\text{V}, I_{\text{D}} = 0.22\text{A}$	0.12			S
Dynamic characteristics (note 2)						
Input capacitance	C_{iss}	$V_{\text{DS}} = 25\text{V}, V_{\text{GS}} = 0\text{V}, f = 1\text{MHz}$		27		pF
Output capacitance	C_{oss}			13		
Reverse transfer capacitance	C_{rss}			6		
Switching characteristics						
Turn-on delay time (note 1,2)	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = 30\text{V}, V_{\text{DS}} = 10\text{V}, I_{\text{D}} = 0.29\text{A}, R_{\text{GEN}} = 6\Omega$			5	ns
Rise time (note 1,2)	t_r				18	
Turn-off delay time (note 1,2)	$t_{\text{d}(\text{off})}$				36	
Fall time (note 1,2)	t_f				14	
Drain-source body diode characteristics						
Body diode forward voltage (note 1)	V_{SD}	$I_{\text{S}} = 0.44\text{A}, V_{\text{GS}} = 0\text{V}$			1.4	V

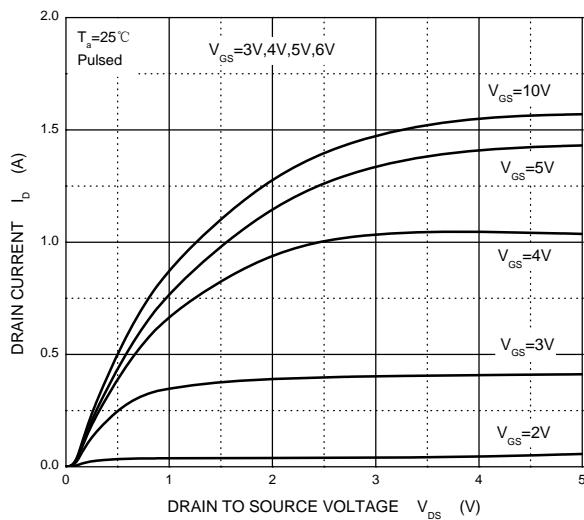
Notes:

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

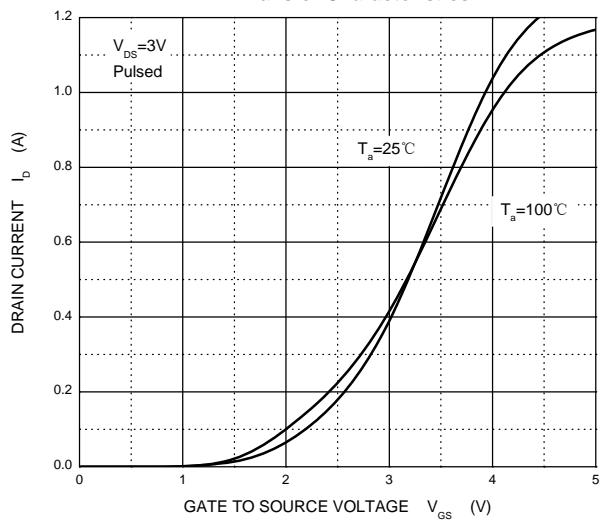


Typical Characteristics

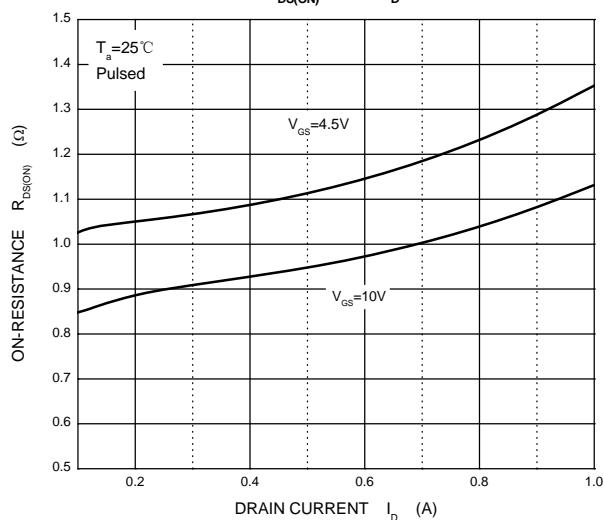
Output Characteristics



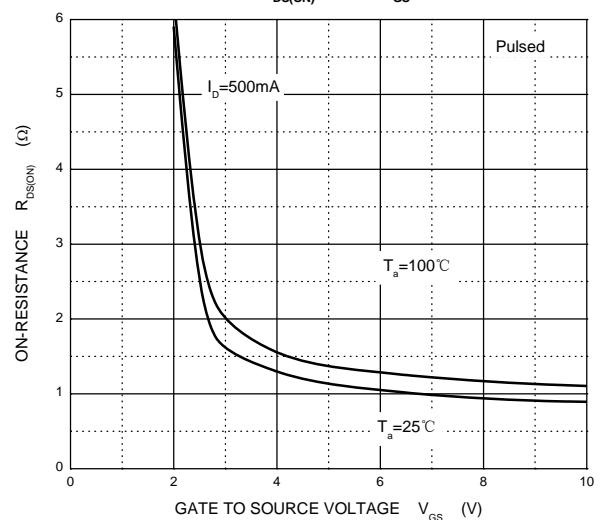
Transfer Characteristics



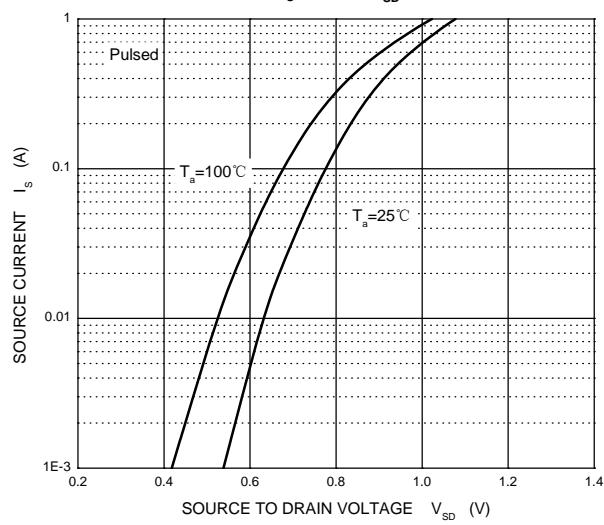
$R_{DS(ON)}$ — I_D



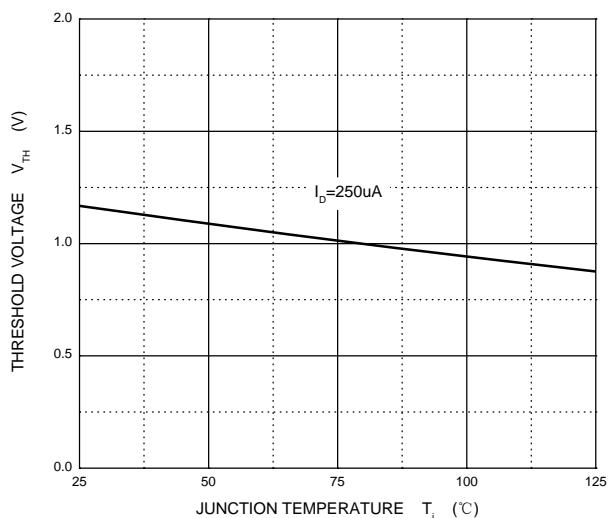
$R_{DS(ON)}$ — V_{GS}



I_s — V_{SD}

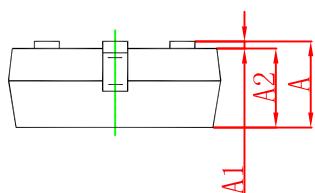
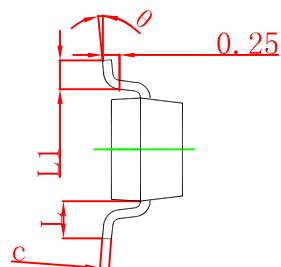
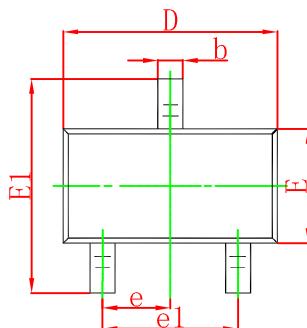


Threshold Voltage



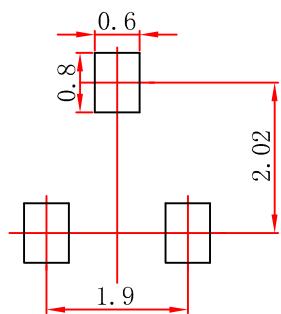


SOT-23 Package Outline Dimensions



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: ± 0.05 mm.
3. The pad layout is for reference purposes only.



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