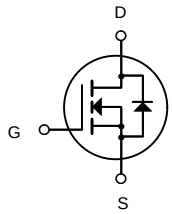
Description

The BSS138K 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

$R_{DS(ON)}$ < 2.0Ω@ V_{GS}=10V

Application

Battery protection

Load switch

Uninterruptible power supply

Ordering Information

Product ID	Pack	Marking	Qty(PCS)
BSS138K	SOT-23	SS	3000

Absolute Maximum Ratings (T_C=25℃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℃)	T_A =25℃	0.22	A
		T_A =100℃	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	℃
$R_{\theta JA}$	Thermal Resistance,Junction-to-Ambient (Note 2)		357	℃/W

Electrical Characteristics (T_A=25℃unless otherwise noted)

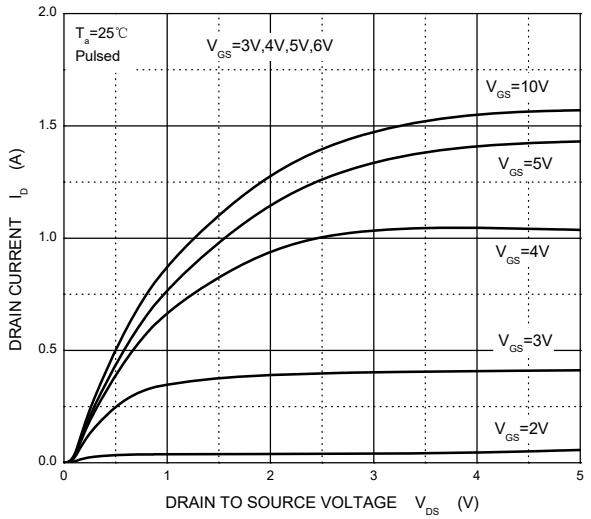
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	50			V
Gate-body leakage	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} =50V, V_{GS} =0V			0.5	μA
		V_{DS} =30V, 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:

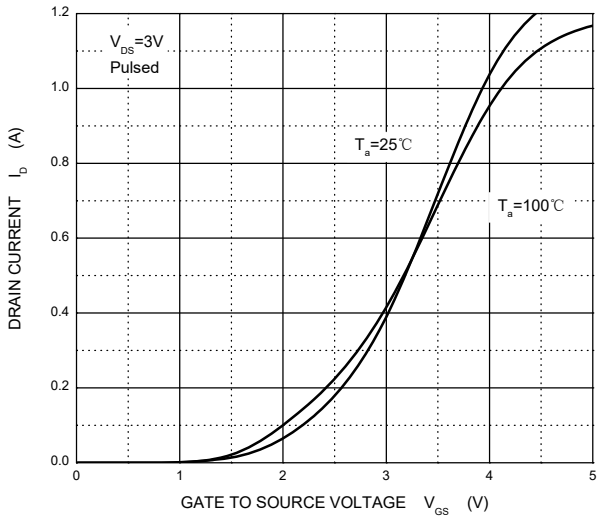
1. Pulse Test ; Pulse Width ≤300μs, Duty Cycle ≤2%.
2. These parameters have no way to verify.

Typical Characteristics

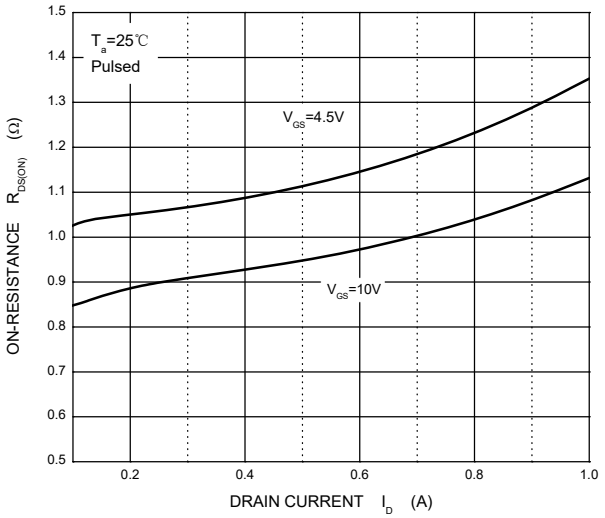
Output Characteristics



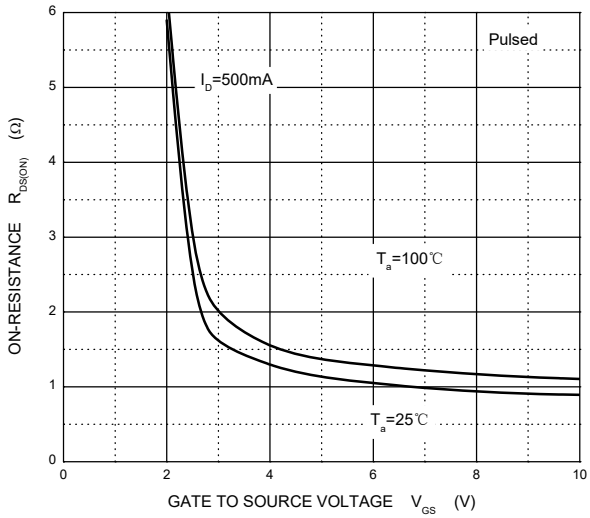
Transfer Characteristics



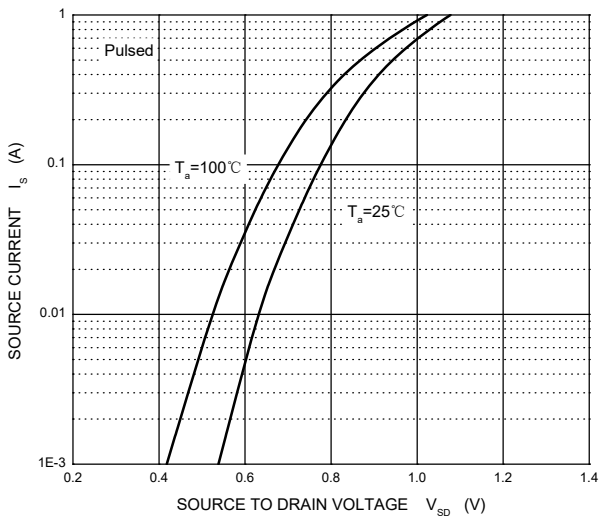
$R_{DS(ON)}$ —— I_D



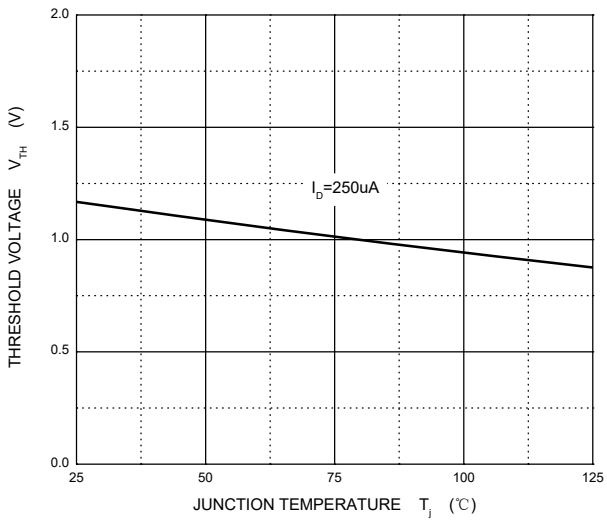
$R_{DS(ON)}$ —— V_{GS}



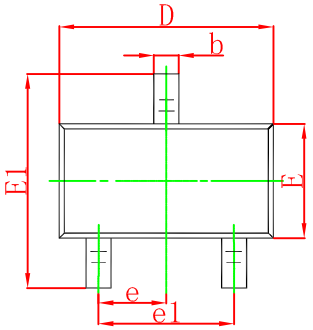
I_S —— V_{SD}

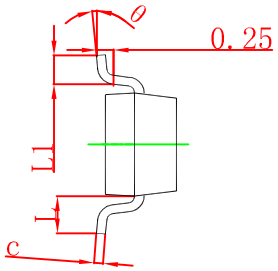


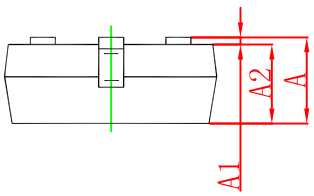
Threshold Voltage



SOT-23 Package Outline Dimensions

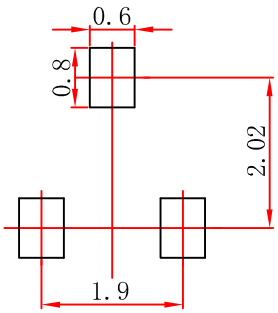






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 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:± 0.05mm.
3.The pad layout is for reference purposes only.

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