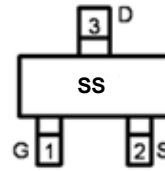


Main Product Characteristics

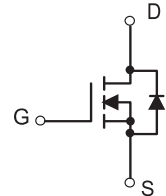
$V_{(BR)DSS}$	50V
$R_{DS(on)MAX}$	3.5Ω@10V
	6Ω@ 4.5V
I_D	0.22A



SOT-323



Marking and Pin Assignment



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The BSS138W utilizes the latest processing techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in power switching applications and a wide variety of other applications.

Absolute Max Ratings ($T_A=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	50	V
Continuous Gate-Source Voltage	V_{GSS}	±20	
Continuous Drain Current	I_D	0.22	A
Power Dissipation	P_D	0.3	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	417	$^{\circ}C/W$
Operating Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55 to +150	

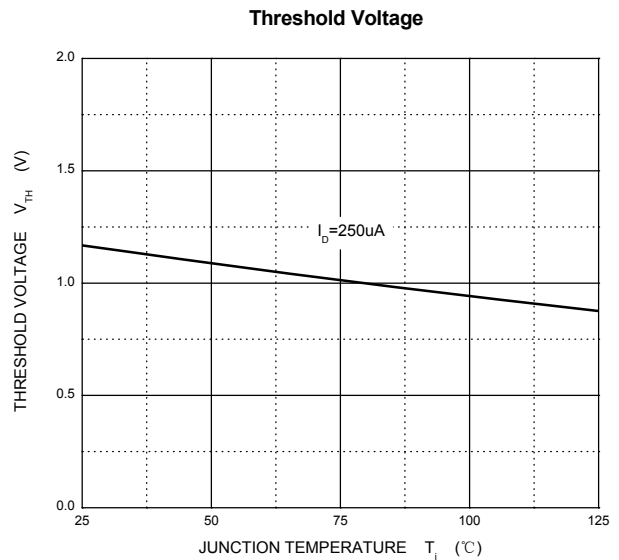
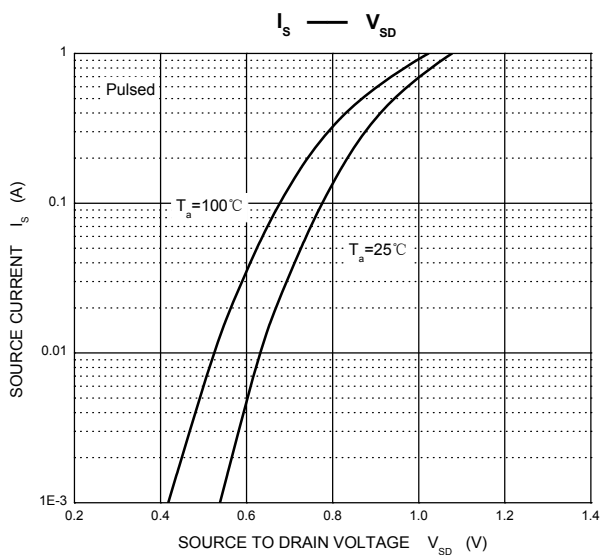
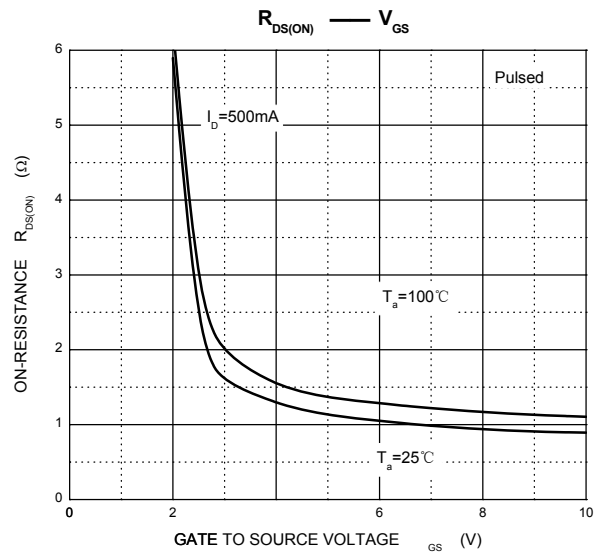
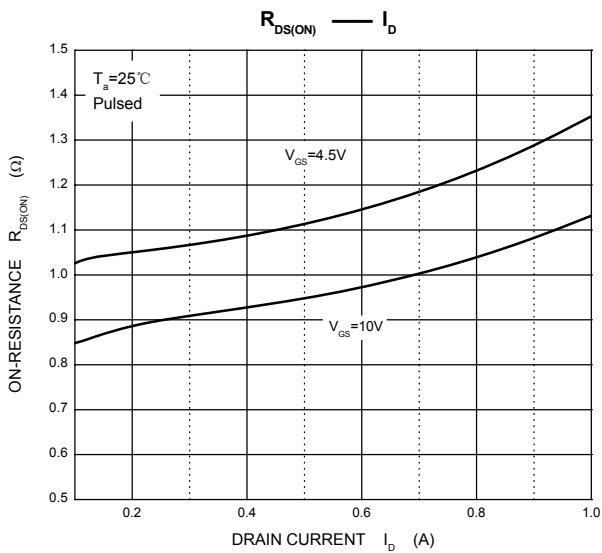
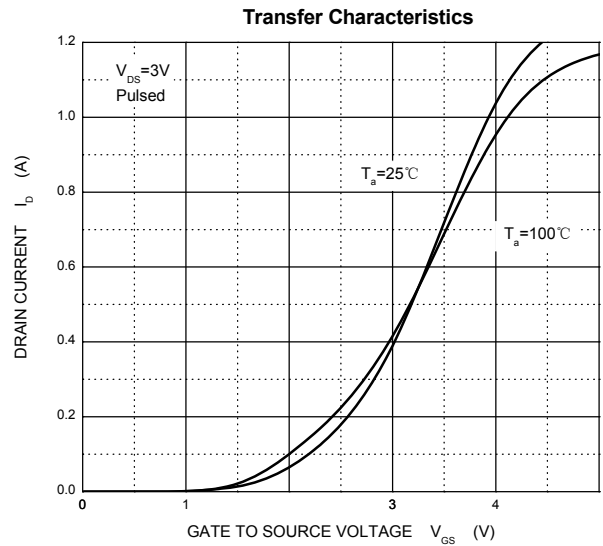
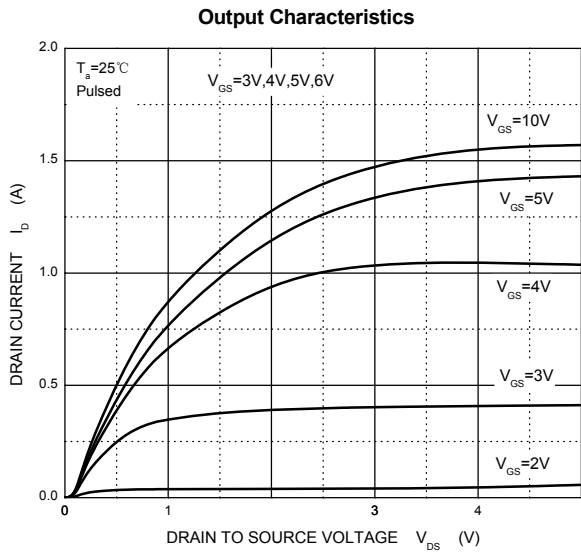
Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	50	-	-	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 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)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1mA$	0.80	-	1.50	V
Static Drain-Source On-Resistance (note 1)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 0.22A$	-	-	3.50	Ω
		$V_{GS} = 4.5V, I_D = 0.22A$	-	-	6	
Forward Transconductance (note 1)	g_{FS}	$V_{DS} = 10V, I_D = 0.22A$	0.12	-	-	S
Dynamic Characteristics						
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)	$t_{d(on)}$	$V_{DD} = 30V, V_{DS} = 10V, I_D = 0.29A, R_{GEN} = 6\Omega$	-	-	5	ns
Rise Time (note 1)	t_r		-	-	18	
Turn-off Delay Time (note 1)	$t_{d(off)}$		-	-	36	
Fall Time (note 1)	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:

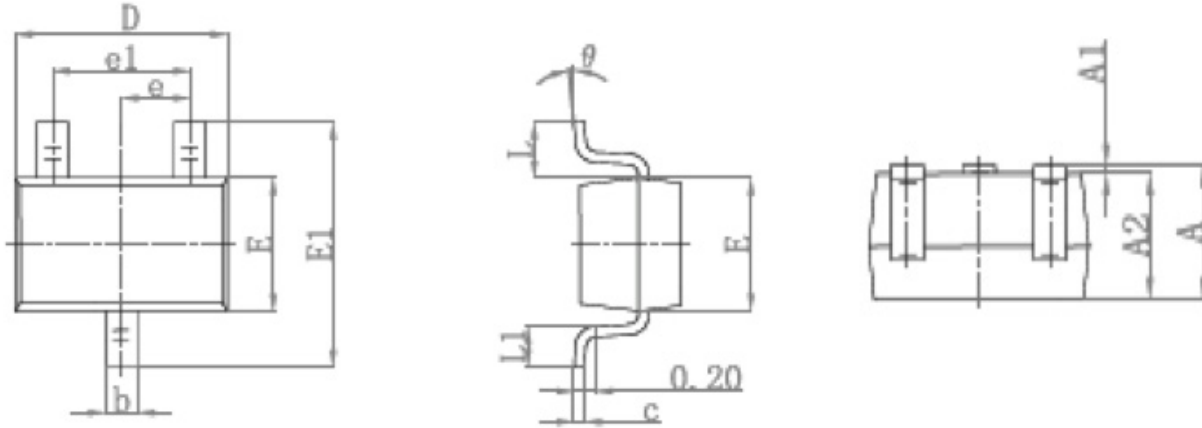
1. Pulse Test ; Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Typical Electrical and Thermal Characteristic Curves



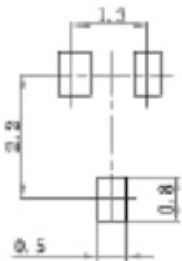
Package Outline Dimensions

SOT-323



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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.