SEMICONDUCTOR

BSS138W

N-Channel Enhancement MOSFET

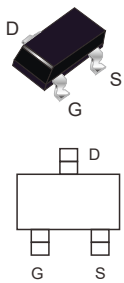
Features

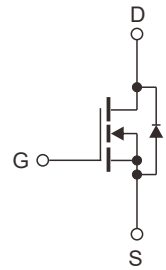
- $R_{DS(ON)}$ <3.0Ω @V_{GS}=4.5V
- $R_{DS(ON)}$ <2.5Ω @V_{GS}=10V
- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- Low input Capacitance
- Fast Switching Speed

RoHS COMPLIANT

Product Summary		
V_{DS}	$R_{DS(on)}$ (Ω) Typ	I_D (mA)
50V	1.2@ 4.5V 0. 2A	340
	1.1@ 10V 0. 3A	

SOT-323





N-channel MOSFET

Mechanical Data

- Case:SOT-323
- Terminals:Plated solderable per MIL-STD-750,method 2026
- Mounting Position: Any

Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameters		Symbol	Value	Unit
Drain-Source voltage		V_{DS}	50	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25℃	I_D	340	mA
	T_A=70℃		272	
Pulsed Drain Current [1]		I_{DM}	1.5	A
Maximum Power Dissipation @T_A=25℃		P_D	150	mW
Junction and Storge Temperature Range		T_J,T_{STG}	-55 to +150	℃

Thermal Resistance Ratings

Parameters	Symbol	Typ	Max	Unit
Junction to Ambient，Steady State [2]	$R_{\theta JA}$	-	833	℃/W

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameters	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	50	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=50V,V_{GS}=0V,T_C=25℃	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.8	1.2	1.6	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=300mA	-	1.1	2.5	Ω
		V_{GS}= 4.5V, I_D=200mA	-	1.2	3.0	
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1MHz	-	28.5	-	pF
Output Capacitance	C_{oss}		-	2.7	-	
Reverse Transfer Capacitance	C_{rss}		-	1.78	-	
Total Gate Charge	Q_g	V_{DS}=25V,V_{GS}=10V,I_D=0.3A	-	1.7	-	nc
Gate-Source Charge	Q_{GS}		-	0.4	-	
Gate-Drain Charge	Q_{GD}		-	0.24	-	
Reverse Recovery Charge	Q_{rr}	I_F=0.3A,di/dt=100A/us	-	2.65	-	
Reverse Recovery Time	t_{rr}		-	12.2	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=25V, R_{GEN}=6Ω, I_D=0.3A	-	2.6	-	
Turn-on Rise Time	t_r		-	18.8	-	
Turn-off Delay Time	$t_{D(off)}$		-	9.7	-	
Turn-off Fall Time	t_f		-	47	-	
Drain-Source Body Diode Characteristics						
Maximum Body-Diode Continuous Current	I_S		-	-	340	mA
Diode Forward Voltage	V_{SD}	I_S=0.3mA,V_{GS}=0V	-	-	1.2	V

Notes: 1. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
2.Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Characteristics Diagrams

Figure 1.Output Characteristics

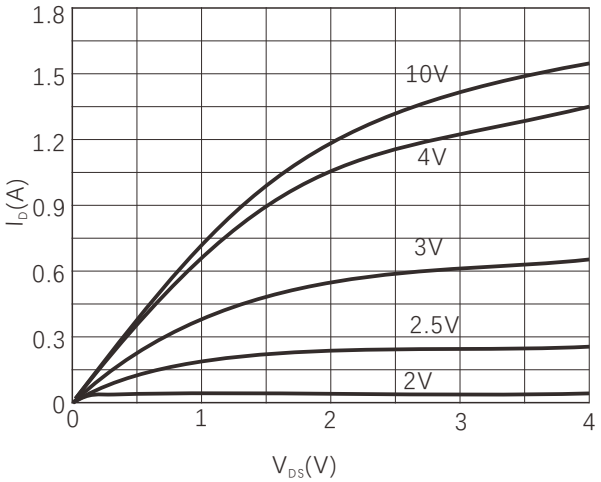


Figure 2. Transfer Characteristics

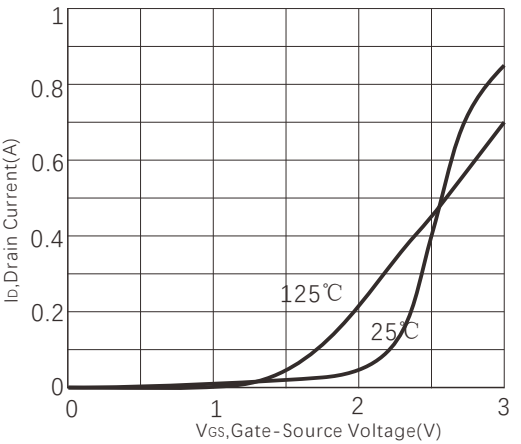


Figure 3.On-Resistance vs.Drain Current

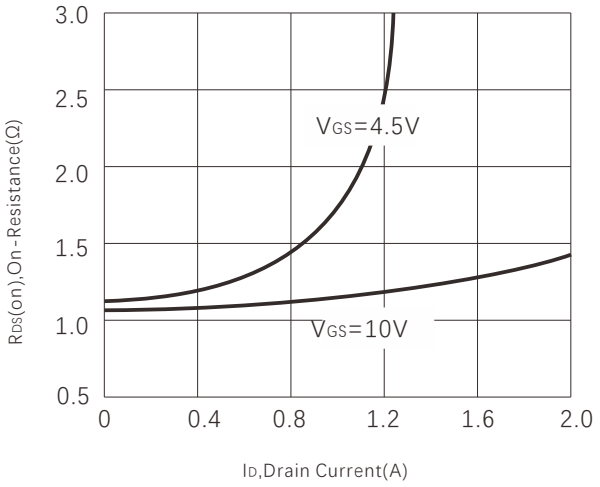
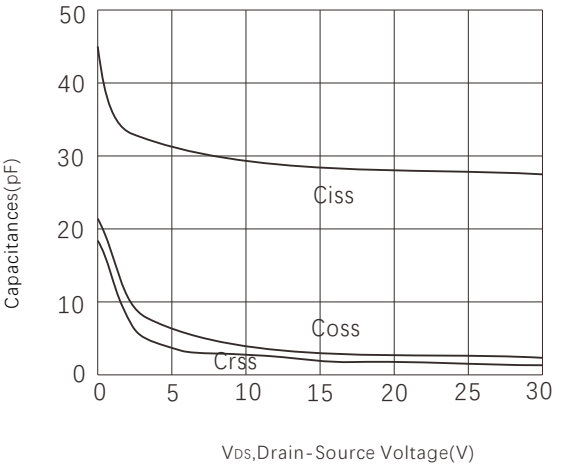


Figure 4. Capacitance



Typical Characteristics Diagrams

Figure 5.Gate charge

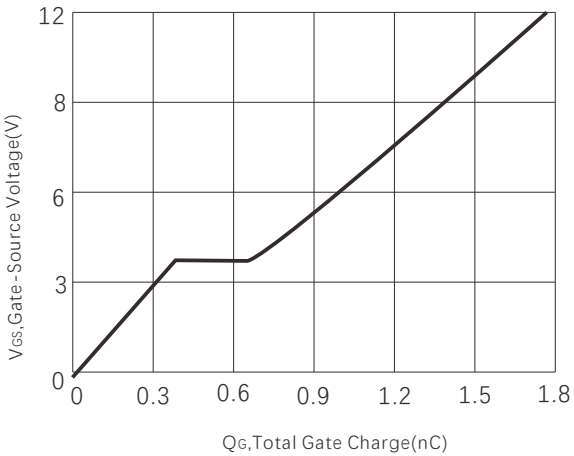


Figure6.Normalized $R_{DS(ON)}$ vs Junction Temperature

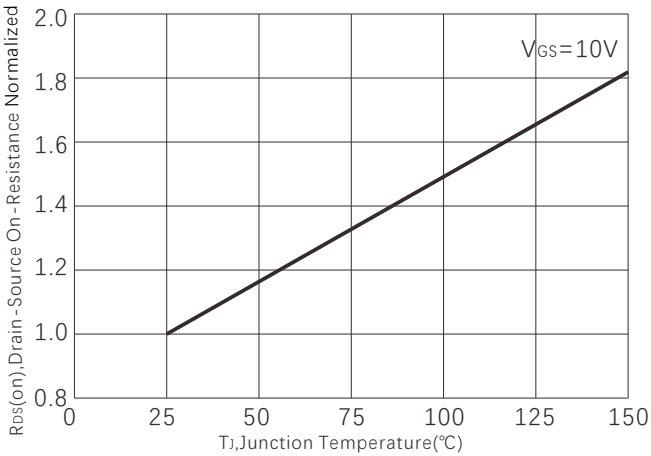


Figure 7. Safe operating area

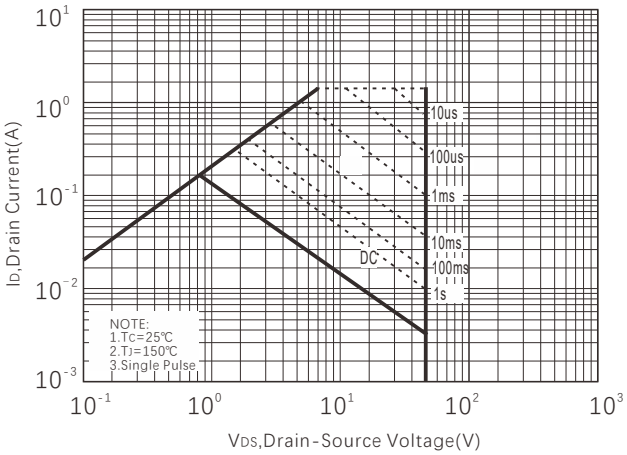
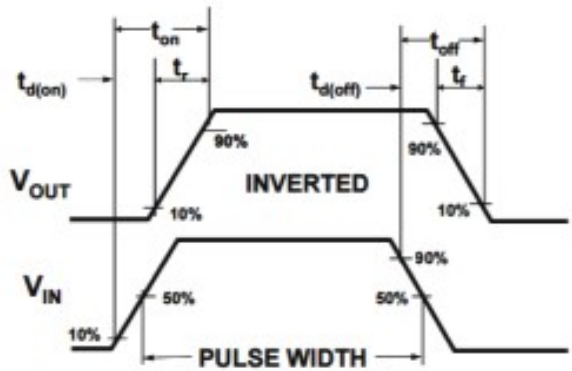
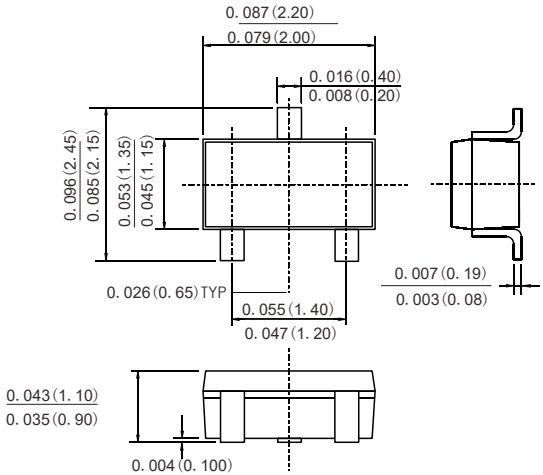


Figure8.Switching wave



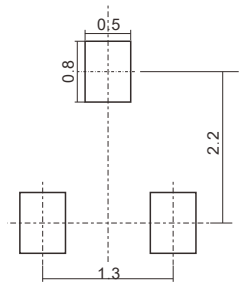
PACKAGE OUTLINE DIMENSIONS

SOT-323



Dimensions in inches and (millimetrers)

Suggested Pad Layout



Dimensions in millimetrers

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