



N-Channel Enhancement Mode Field Effect Transistor

Product Summary

V_{DS}	60V
I_D	0.35A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	1.5
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	1.8
$R_{DS(ON)}$ (at $V_{GS}=2.5V$)	3.7
Gate-Source ESD Rating Up to 2KV (HBM)	

General Description

Trench Power MV MOSFET technology
Voltage controlled small signal switch
Low input Capacitance
Fast Switching Speed
Moisture Sensitivity Level 1
Epoxy Meets UL 94 V-0 Flammability Rating
Halogen Free

Applications



BSS138KEJ

Electrical Characteristics ($T_J=25$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=60V, V_{GS}=0V, T_J=150^\circ C$	-	-	100	
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	1.1	1.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=0.35A$	-	1.05	1.5	
		$V_{GS}=4.5V, I_D=0.2A$		1.2	1.8	
		$V_{GS}=2.5V, I_D=0.1A$	-	2.6	3.7	
Diode Forward Voltage	V_{SD}	$I_S=0.35A, V_{GS}=0V$	-	0.9	1.3	V
Gate resistance	R_G	$f=1MHz, \text{Open drain}$	-	70	-	
Maximum Body-Diode Continuous Current	I_S		-	-	0.35	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, f=1MHz$	-	25	-	μF
Output Capacitance	C_{oss}		-	7	-	
Reverse Transfer Capacitance	C_{rss}		-	3	-	
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}$				

Typical Electrical and Thermal Characteristics Diagrams

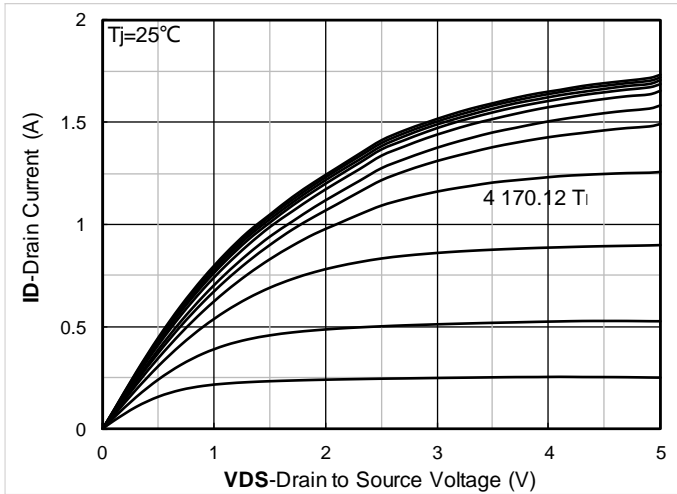


Figure 1. Output Characteristics

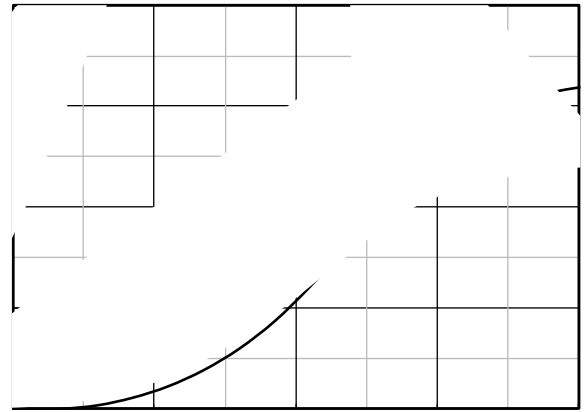


Figure 2. Transfer Characteristics

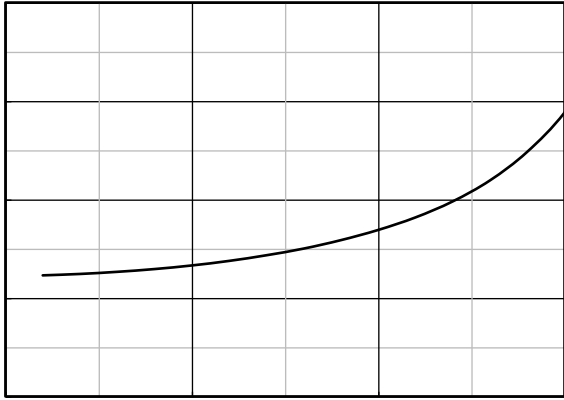


Figure 7. $R_{DS(on)}$ VS Drain Current

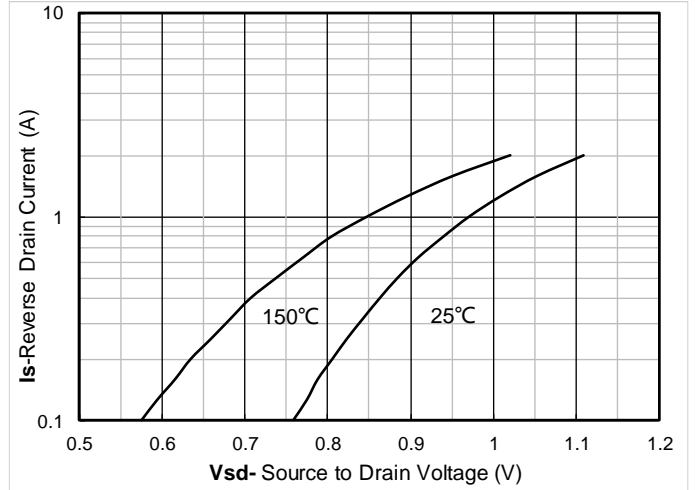


Figure 8. Forward characteristics of reverse diode

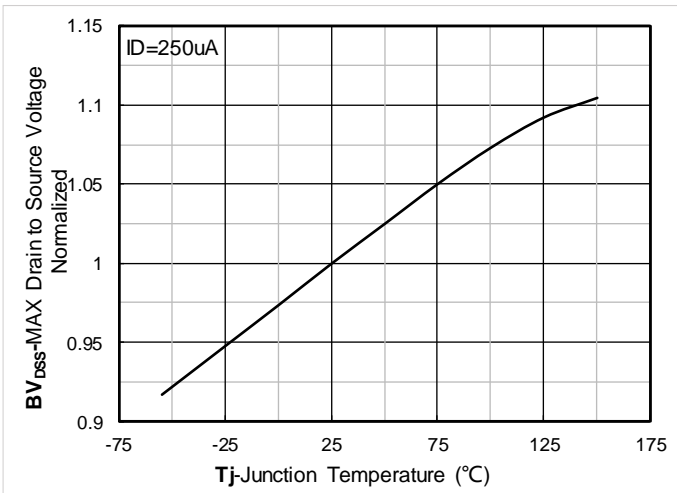


Figure 9. Normalized breakdown voltage



Figure 10. Normalized Threshold voltage

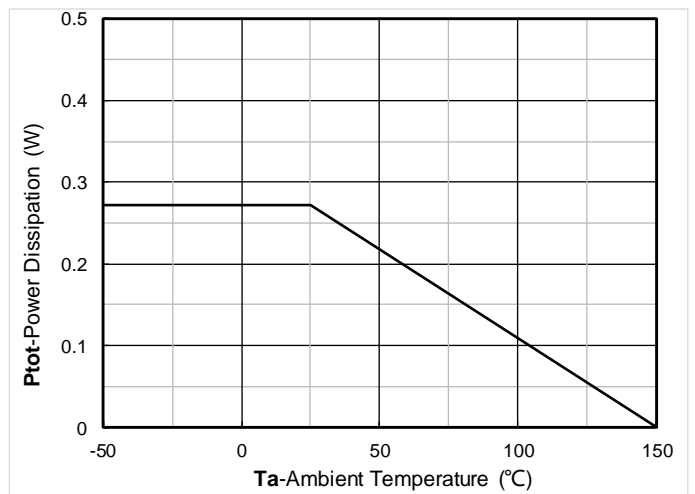


Figure 11. Current dissipation

Figure 12. Power dissipation

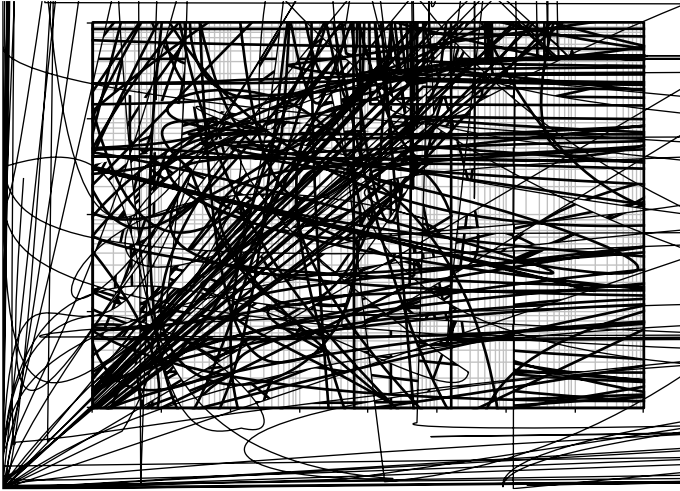


Figure 13. Maximum Transient Thermal Impedance

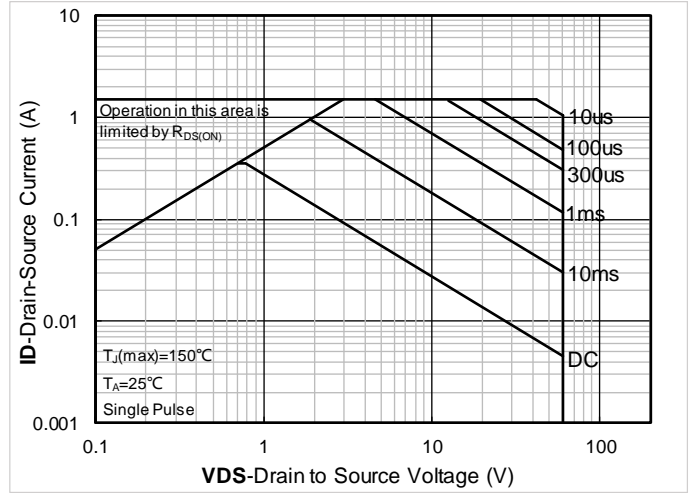


Figure 14. Safe Operation Area

Test Circuits & Waveforms

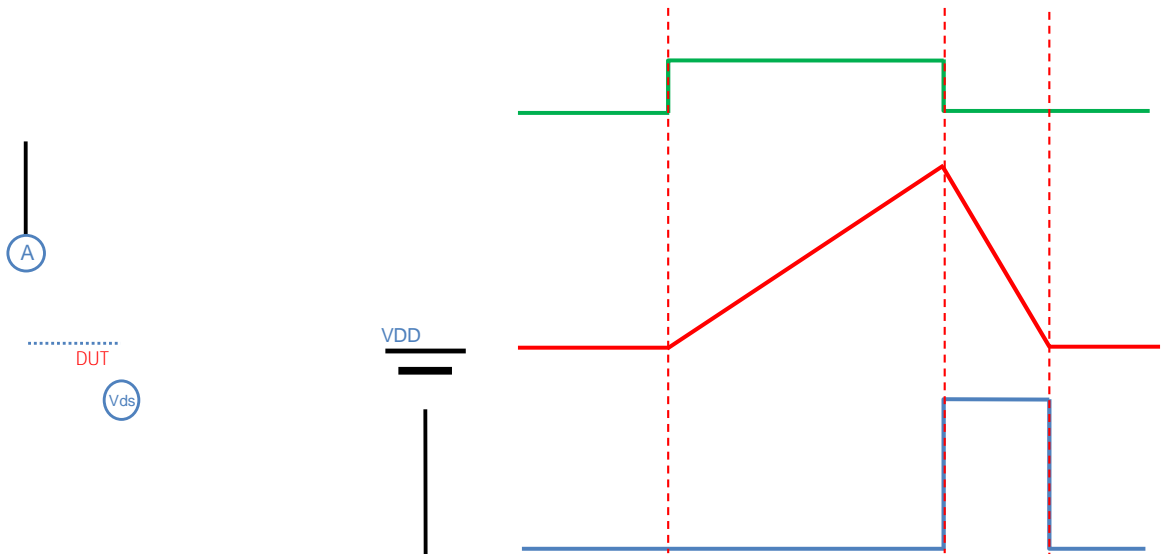


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

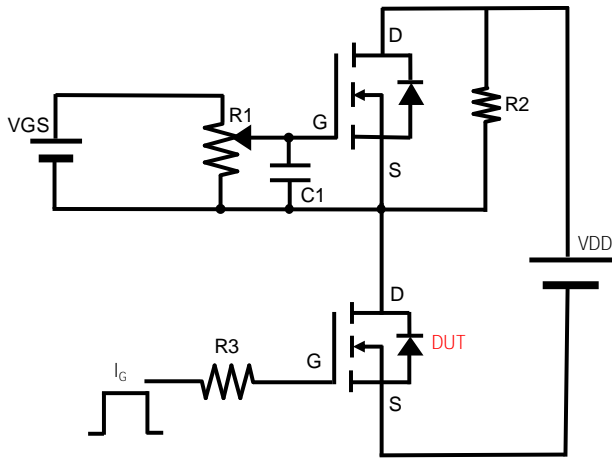


Figure B. Gate Charge Test Circuit & Waveform

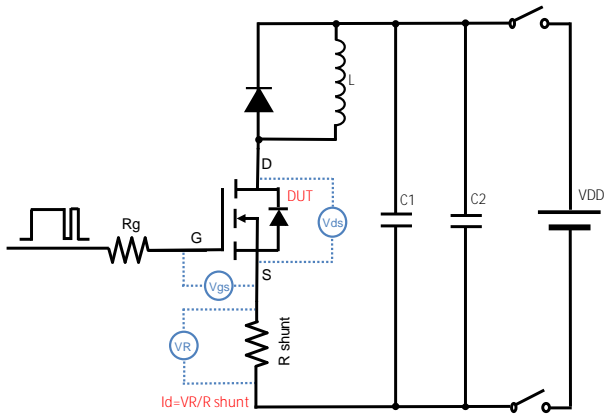


Figure C. Resistive Switching Test Circuit & Waveform

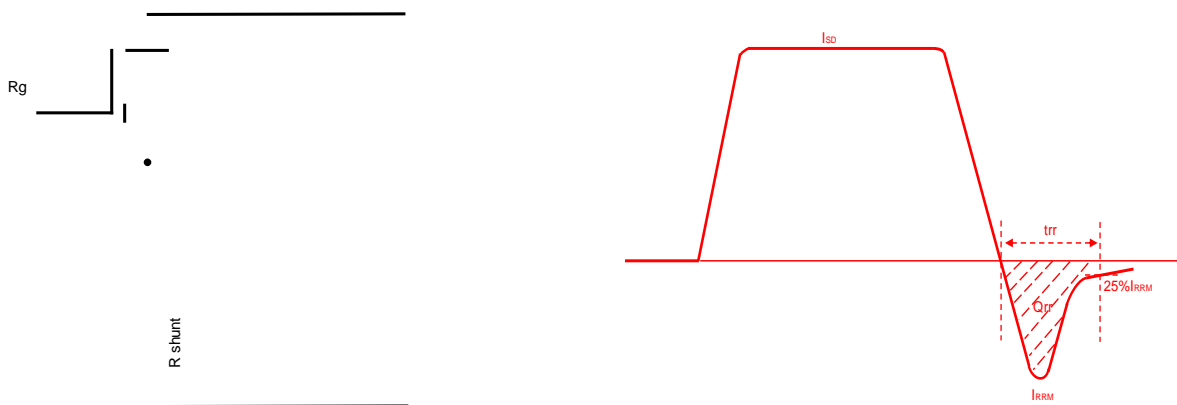
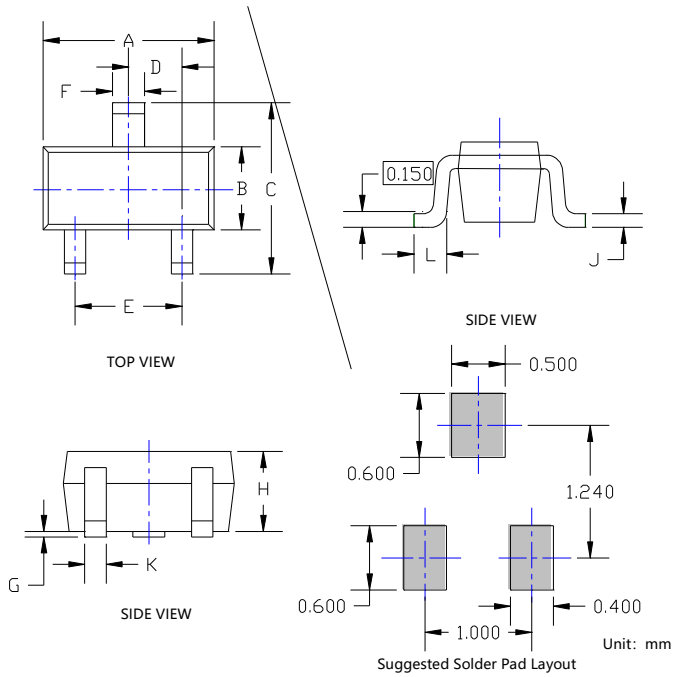


Figure D. Diode Recovery Test Circuit & Waveform



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SOT-523 Package information



SYMBOL	DIMENSIONS	
	INCHES	Millimeter
	MIN.	MIN. MAX.
A	0.059	1.700
B	0.030	0.850
C	0.057	1.750
D	0.020 TYP	
E	0.035	1.100
F	0.010	0.450
G		
H	0.024	0.800
J	0.004	0.200
K	0.006	0.350

- NOTE:
1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
 2. TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
 3. THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



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