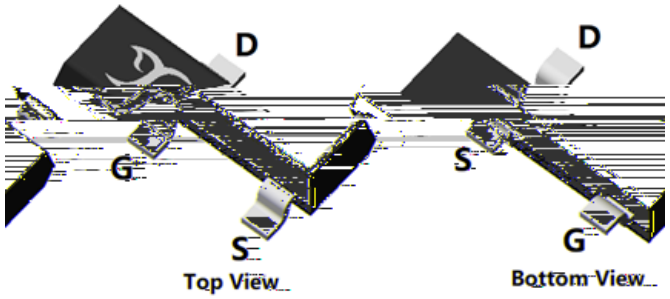
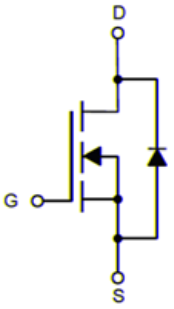
N-Channel Enhancement Mode Field Effect Transistor



SOT-23



Product Summary

- V_{DS} 50V
- I_D 600mA
- $R_{DS(ON)}$(at V_{GS}=10V) 1100mΩ
- $R_{DS(ON)}$(at V_{GS}=4.5V) 1200mΩ

General Description

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

Applications

- Battery operated systems
- Solid-state relays
- Direct logic-level interface TTL/CMOS

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	50	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_A=25	I_D	600	mA
	T_A=100		380	
Pulsed Drain Current [A]		I_{DM}	2	A
Total Power Dissipation [B]	T_A=25	P_D	830	mW
	T_A=100		330	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55 +150	

■Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [C]	Steady-State	$R_{\theta JA}$	120	150	/W

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
BSS138B	F2	138B.	3000	30000	120000	7“ reel

■ 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=250μA	50	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=50V, V_{GS}=0V	-	-	1	μA
		V_{DS}=50V, V_{GS}=0V, Tj=150	-	-	100	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.8	1.2	1.6	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=300mA	-	680	1100	mΩ
		V_{GS}=4.5V, I_D=200mA	-	750	1200	
Diode Forward Voltage	V_{SD}	I_S=300mA, V_{GS}=0V	-	-	1.2	V
Gate resistance	R					

Typical Electrical and Thermal Characteristics Diagrams

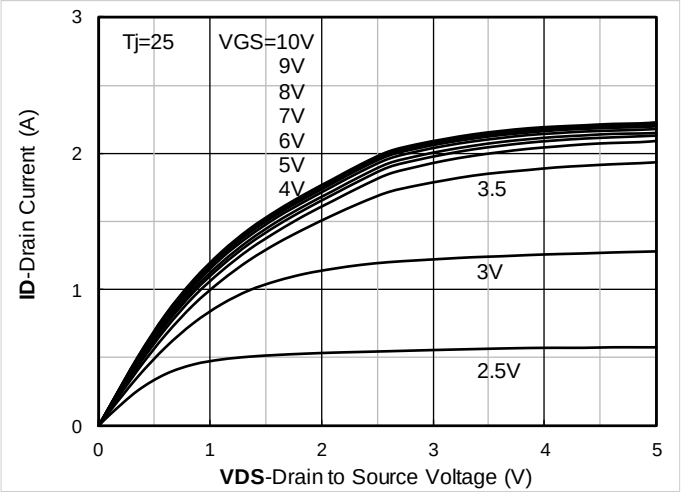


Figure 1. Output Characteristics

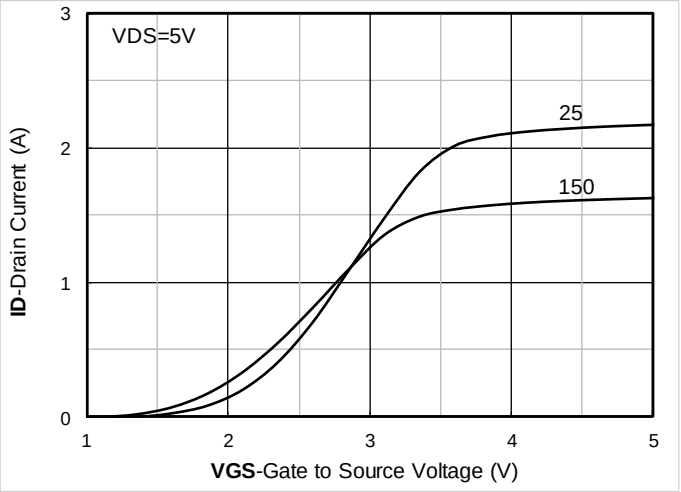


Figure 2. Transfer Characteristics

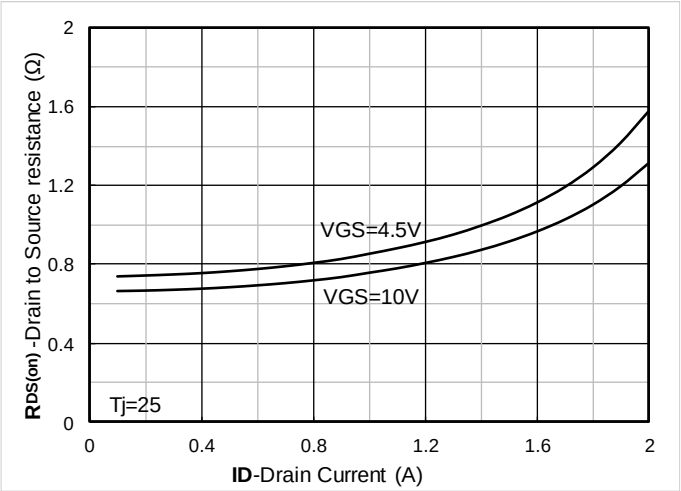


Figure 7. $R_{DS(on)}$ VS Drain Current

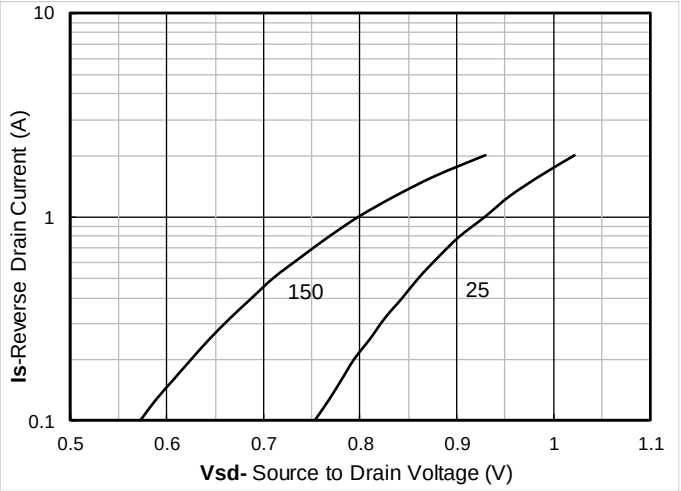


Figure 8. Forward characteristics of reverse diode

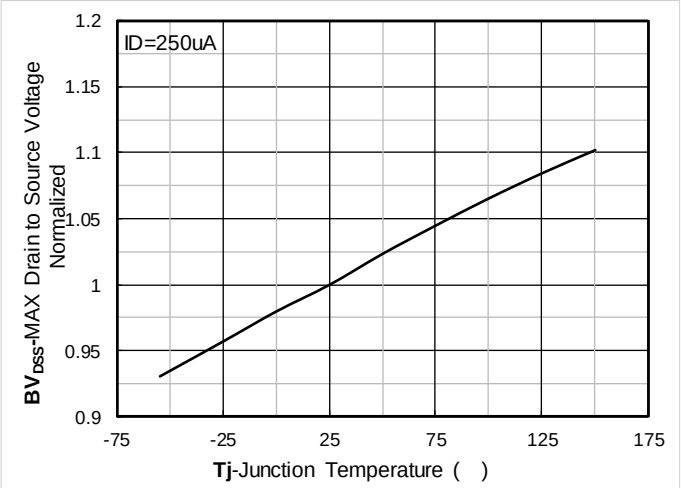


Figure 9. Normalized breakdown voltage

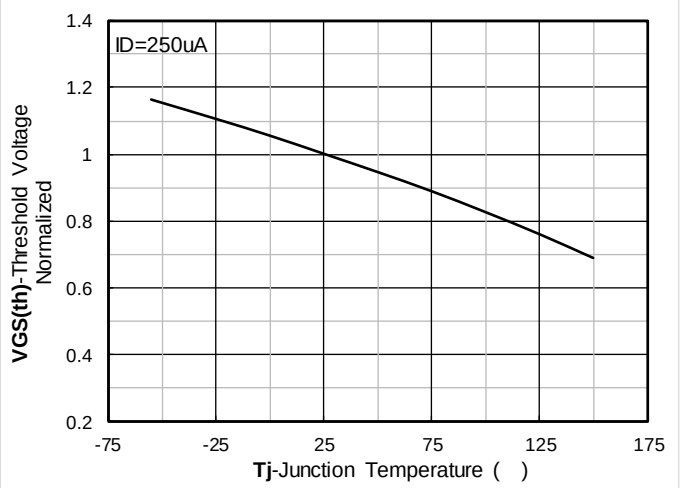


Figure 10. Normalized Threshold voltage

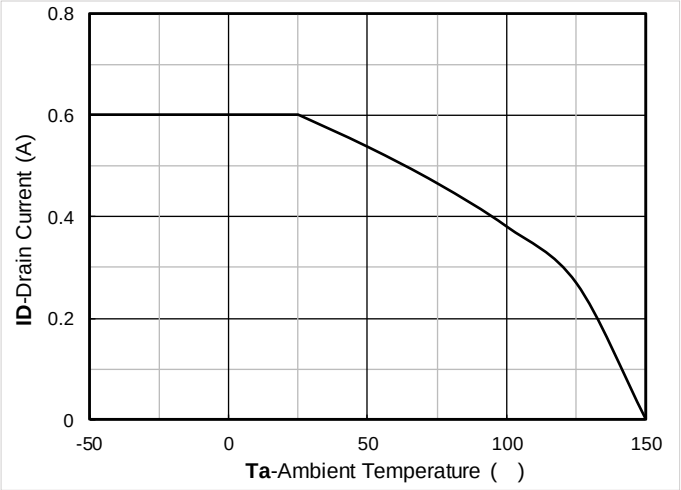


Figure 11. Current dissipation

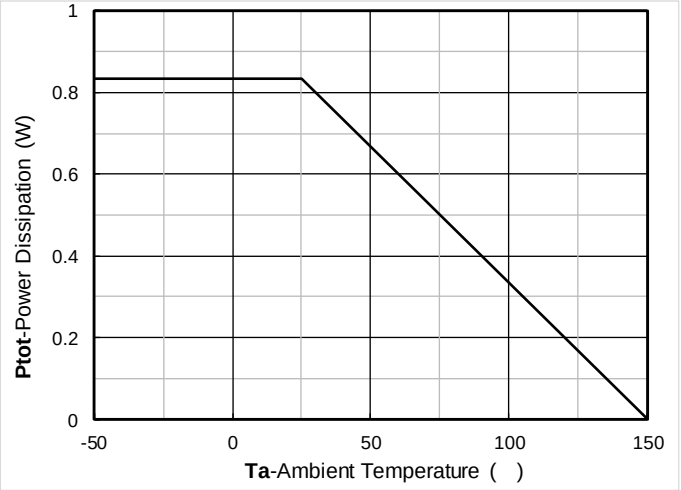


Figure 12. Power dissipation

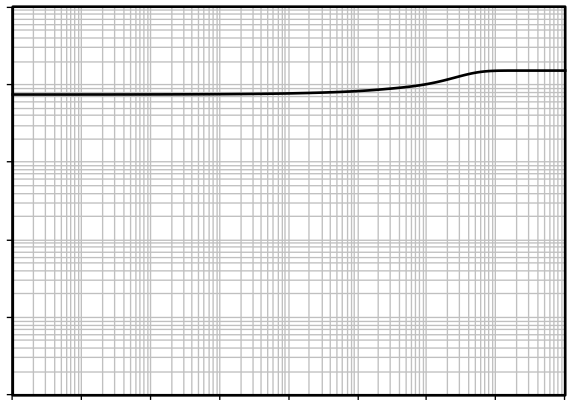


Figure 13. Maximum Transient Thermal Impedance

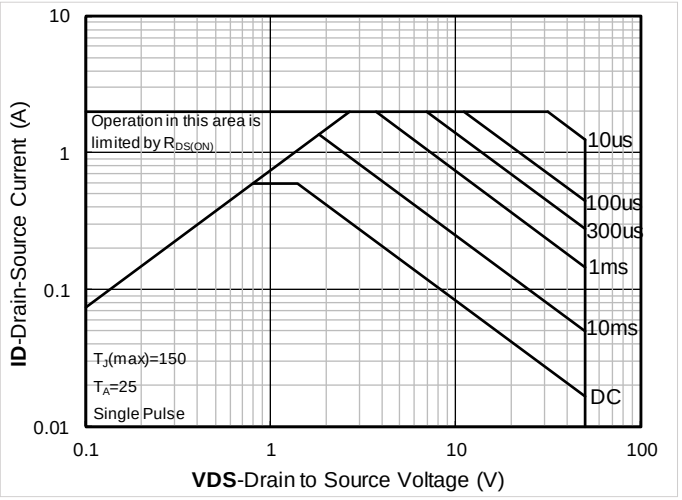


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

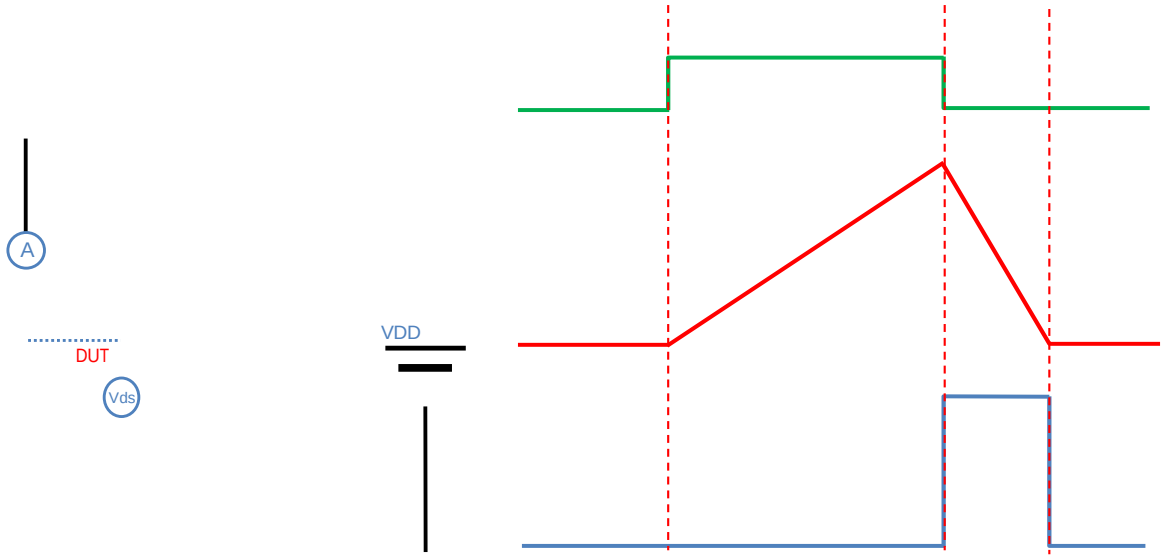


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

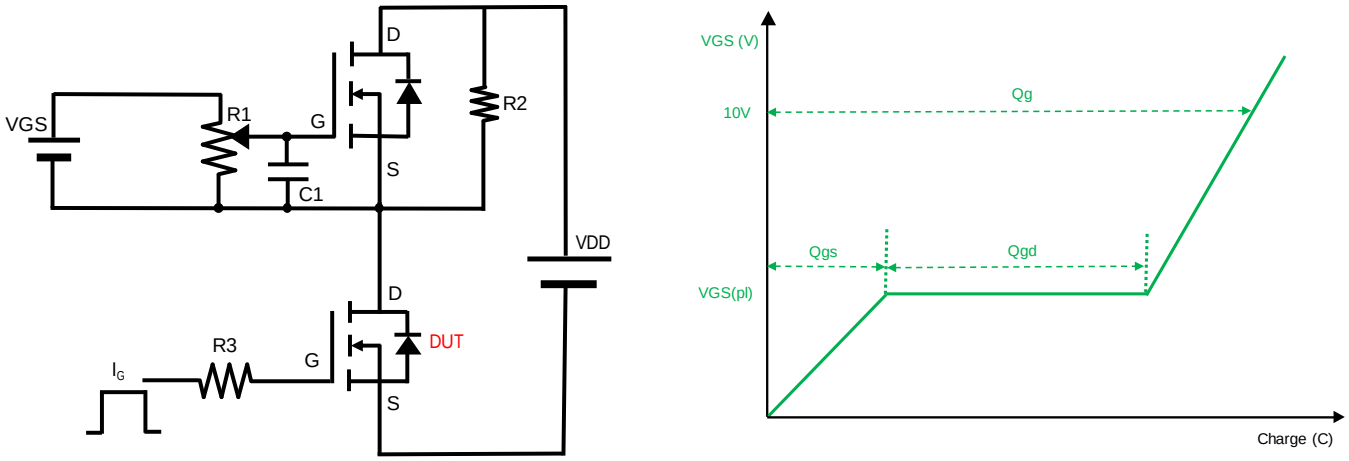


Figure B. Gate Charge Test Circuit & Waveform

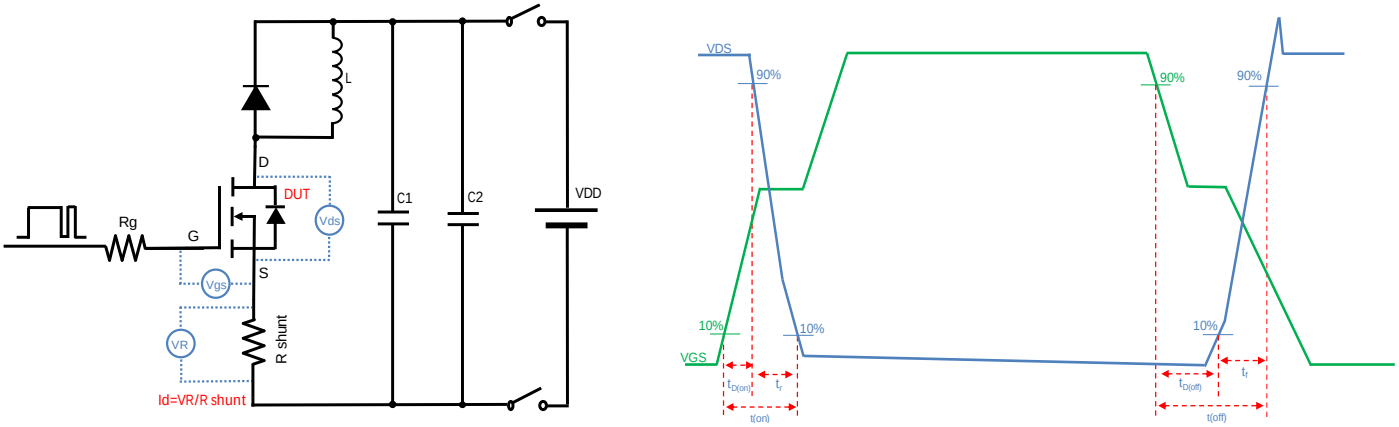


Figure C. Resistive Switching Test Circuit & Waveform

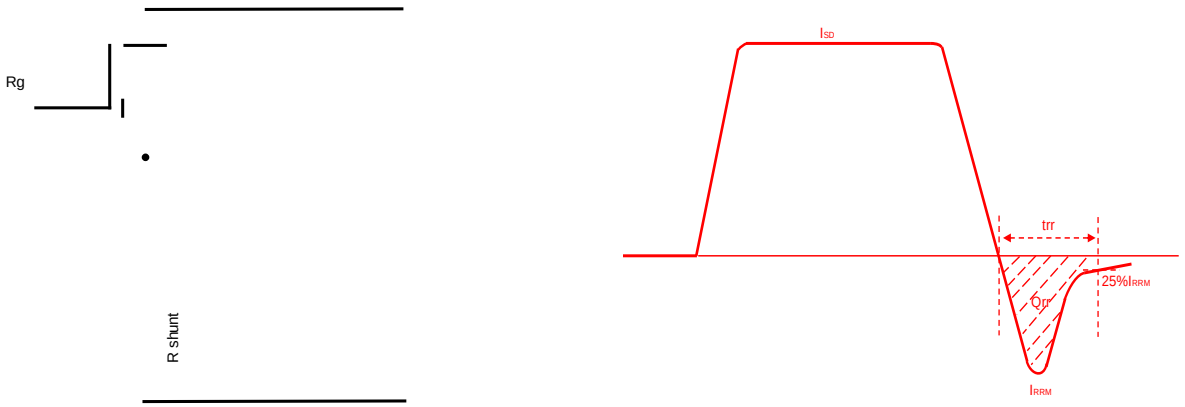
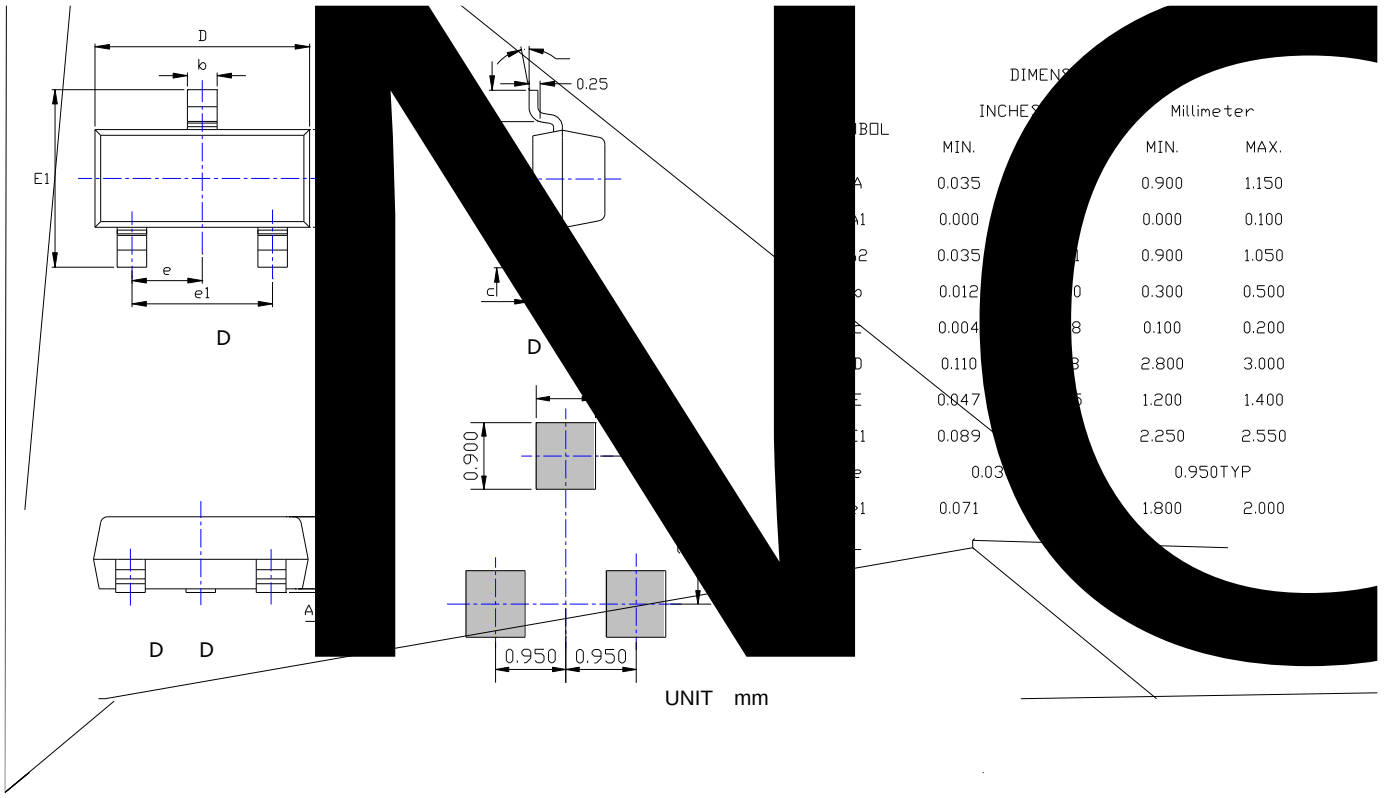


Figure D. Diode Recovery Test Circuit & Waveform

■ SOT-23 Package information



SYMBOL	Millimeter			INCHES		
	MIN.		MAX.	MIN.		MAX.
A	0.900		1.150	0.035		
A1	0.000		0.100	0.000		
A2	0.900		1.050	0.035		
b	0.300		0.500	0.012		
c	0.100		0.200	0.004		
D	2.800		3.000	0.110		
E	1.200		1.400	0.047		
E1	2.250		2.550	0.089		
e	0.950TYP			0.03		
e1	1.800		2.000	0.071		

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