100V N-Channel Mosfet

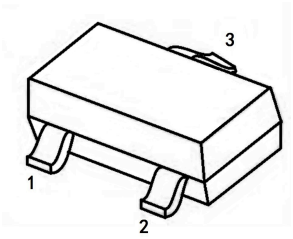
FEATURES

- $R_{DS(ON)}$ ≤ 310mΩ (230 mΩ Typ.) @V_{GS}=10V
- $R_{DS(ON)}$ ≤ 350mΩ (250mΩ Typ.) @V_{GS}=4.5V

APPLICATIONS

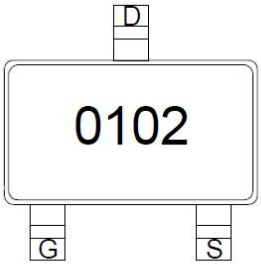
- UPS
- Hard Switched and High Frequency
- Circuits Power Switching application

SOT-23



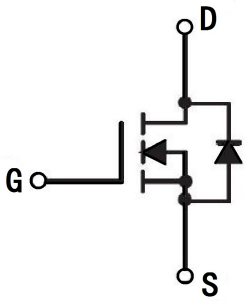
1. GATE
2. SOURCE
3. DRAIN

MARKING



0102: Device code

N-CHANNEL MOSFET



Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	3	A
		T_C = 100℃	2	A
I_{DM}	Pulsed Drain Current note1		12	A
P_D	Power Dissipation	T_A = 25℃	1.1	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		120	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250μA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =100V, V_{GS} = 0V,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V,V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	1.0	-	3.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	V_{GS} =10V, I_D =1A	-	230	310	mΩ
		V_{GS} =4.5V, I_D =1A	-	250	350	
g_{FS}	Forward Transconductance	V_{DS} =10V, I_D =3A	-	1.1	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =25V, V_{GS} = 0V, f = 1.0MHz	-	300	-	pF
C_{oss}	Output Capacitance		-	25.6	-	pF
C_{rss}	Reverse Transfer Capacitance			15.6	-	pF
Q_g	Total Gate Charge	V_{DD} =80V, I_D =1.5A, V_{GS} = 10V	-	7.5	-	nC
Q_{gs}	Gate-Source Charge		-	1.1	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge			2.1	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V,R_L=50Ω, R_G=3.3Ω, V_{GS} =10V	-	11.8	-	ns
t_r	Turn-on Rise Time		-	13.2	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	32.8	-	ns
t_f	Turn-off Fall Time		-	4.8	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	3	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	12	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S=1A	-	0.8	1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

Figure1: Output Characteristics

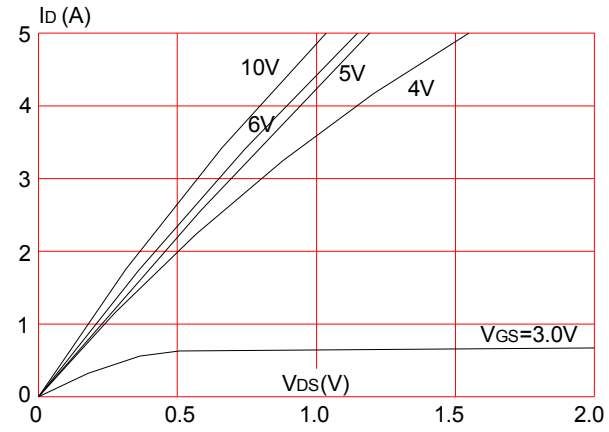


Figure 2: Typical Transfer Characteristics

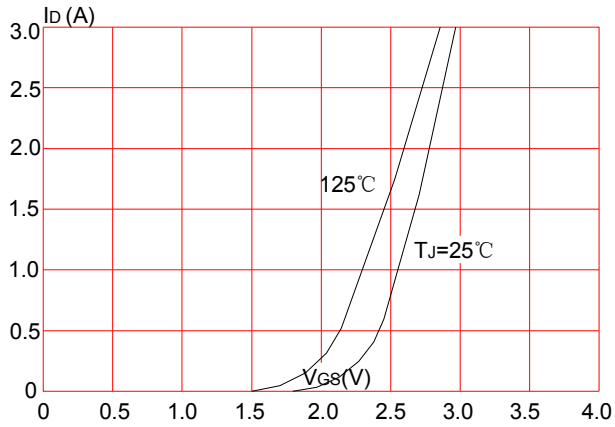


Figure 3: On-resistance vs. Drain Current

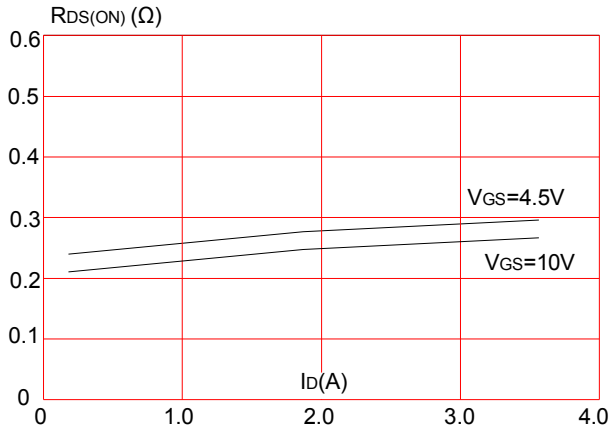


Figure 4: Body Diode Characteristics

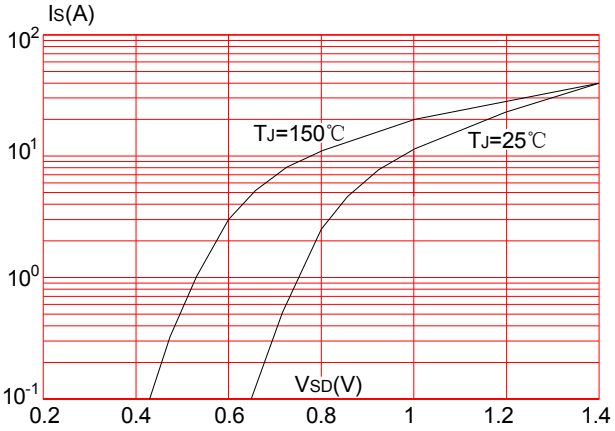


Figure 5: Gate Charge Characteristics

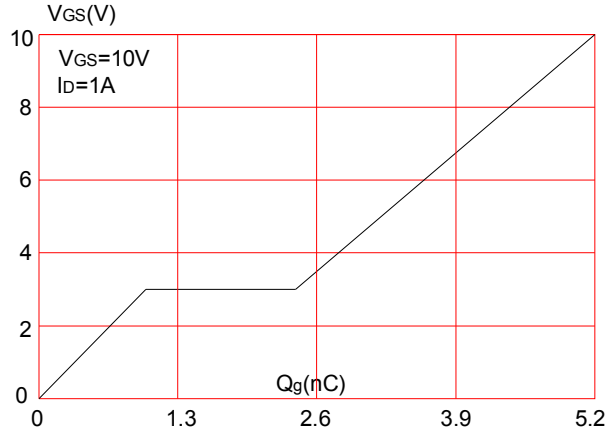


Figure 6: Capacitance Characteristics

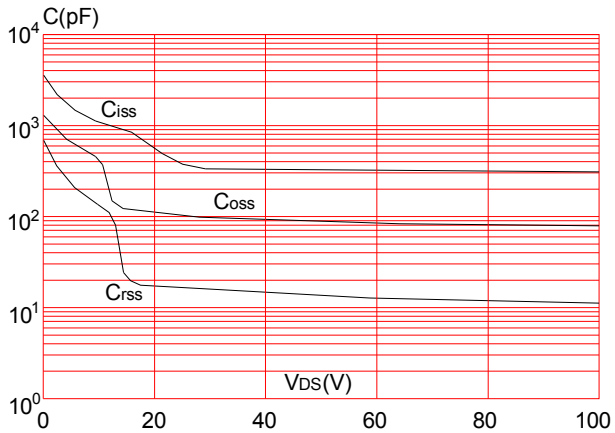


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

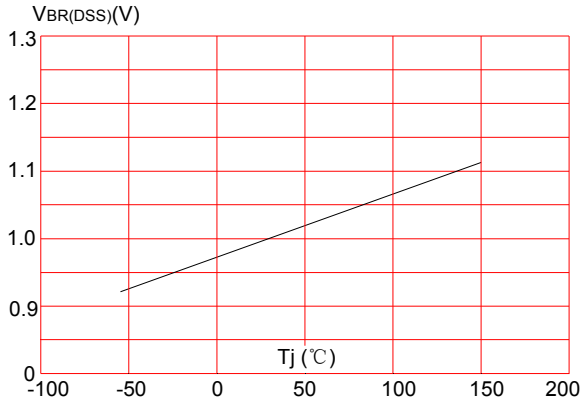


Figure 8: Normalized on Resistance vs. Junction Temperature

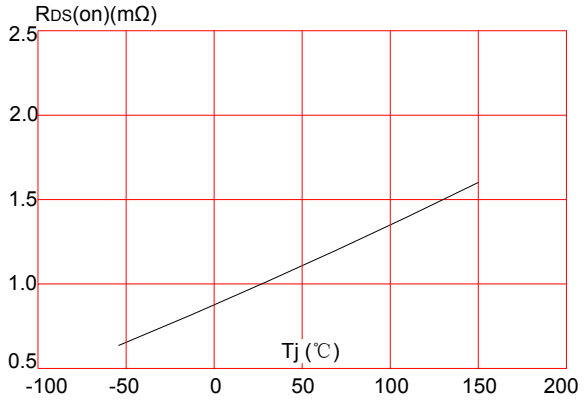


Figure 9: Maximum Safe Operating Area

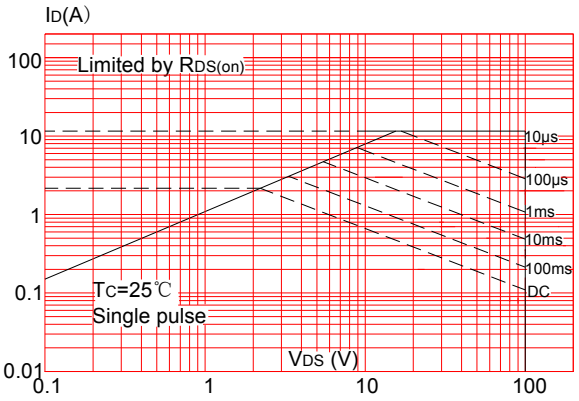


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

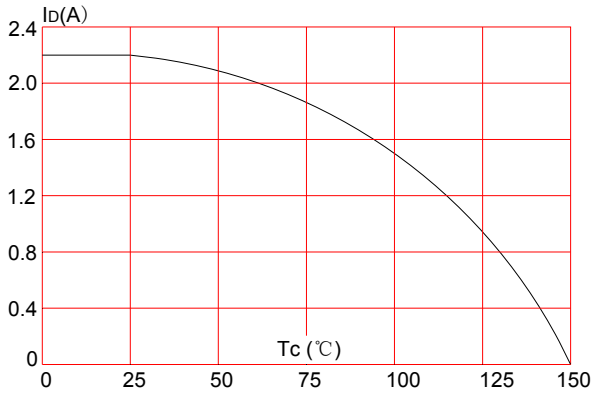


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOT-23)

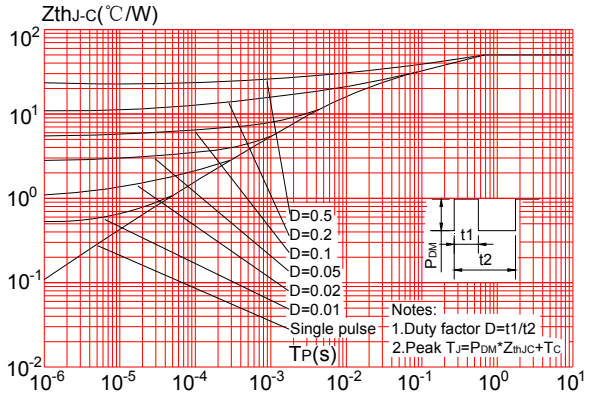


Figure.12: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOT89-3)

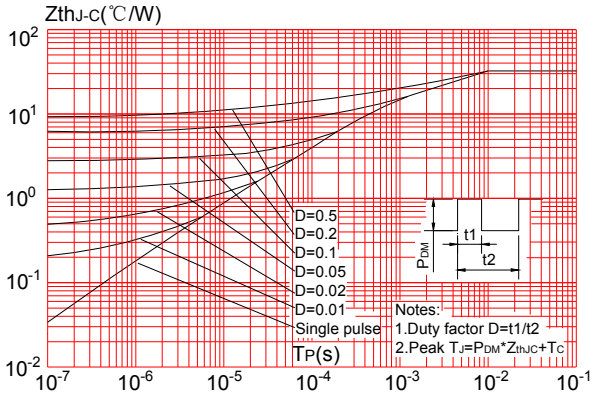
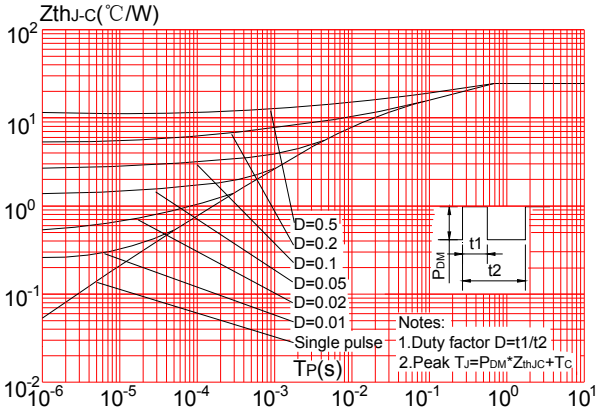


Figure.13: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOT-223)



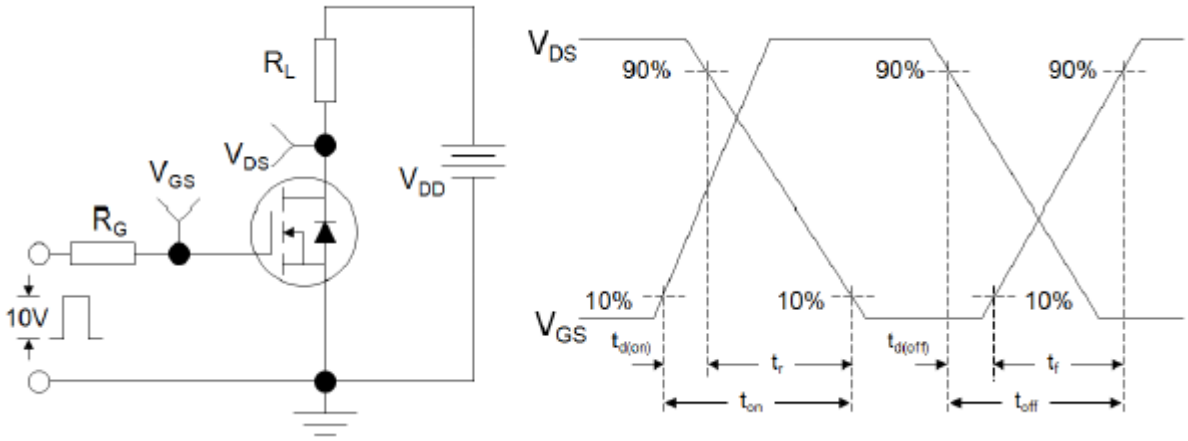


Figure 2: Resistive Switching Test Circuit & Waveforms

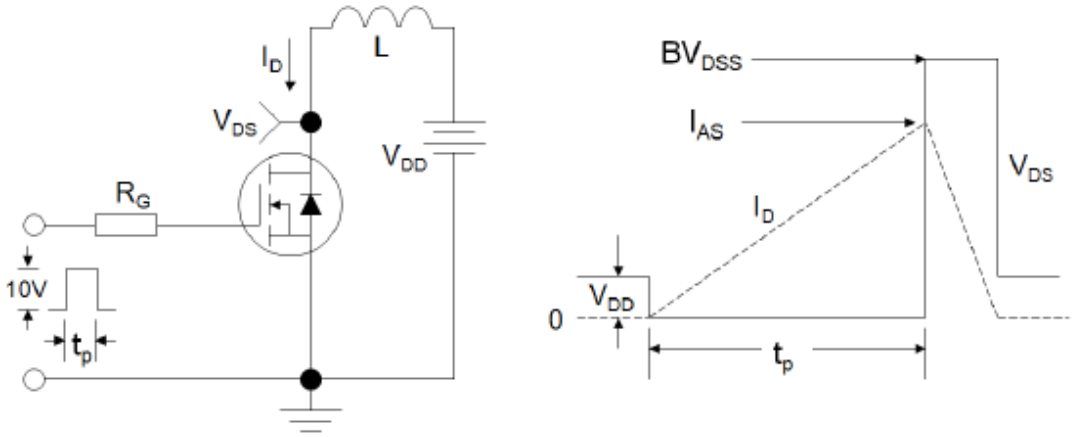


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

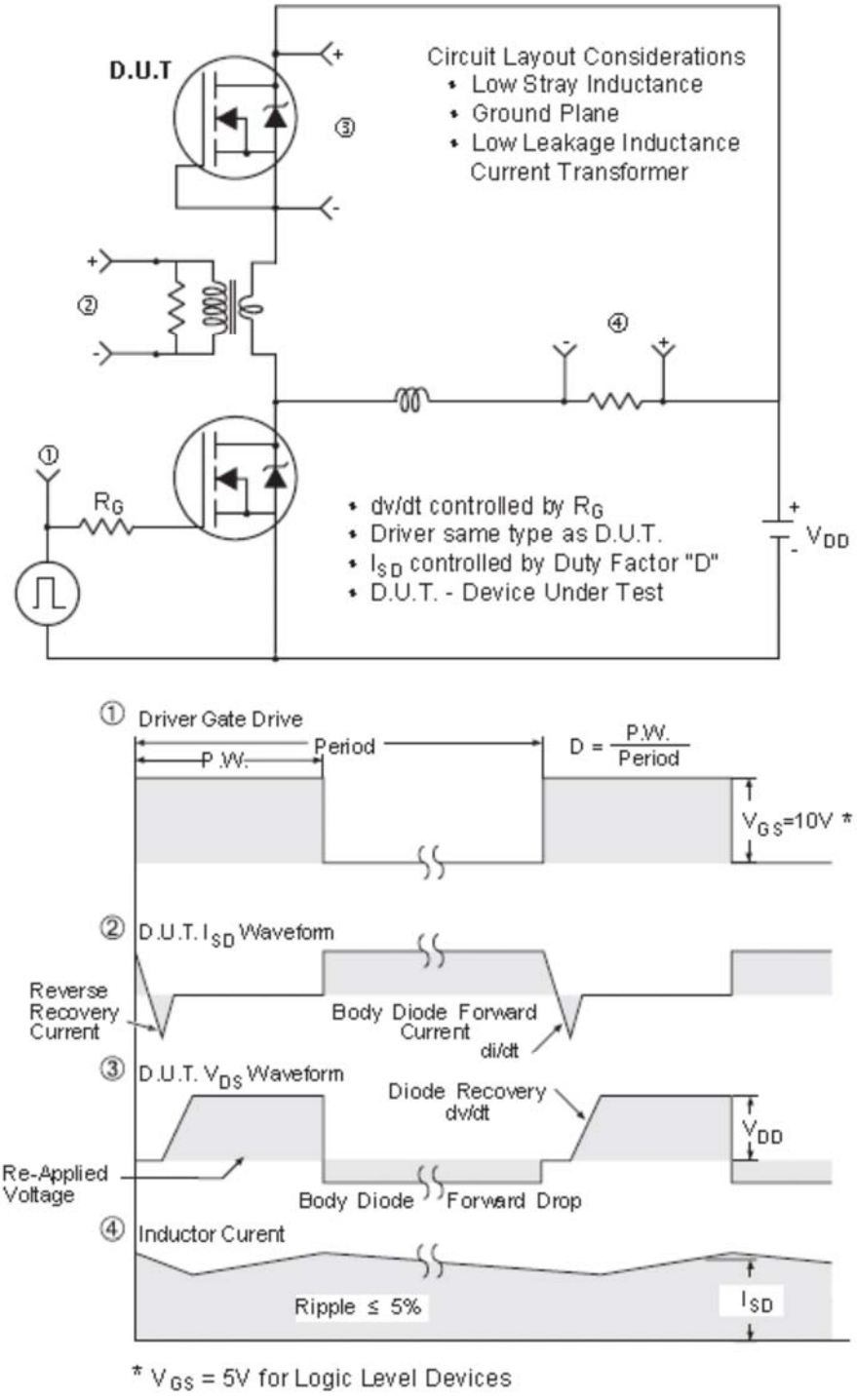
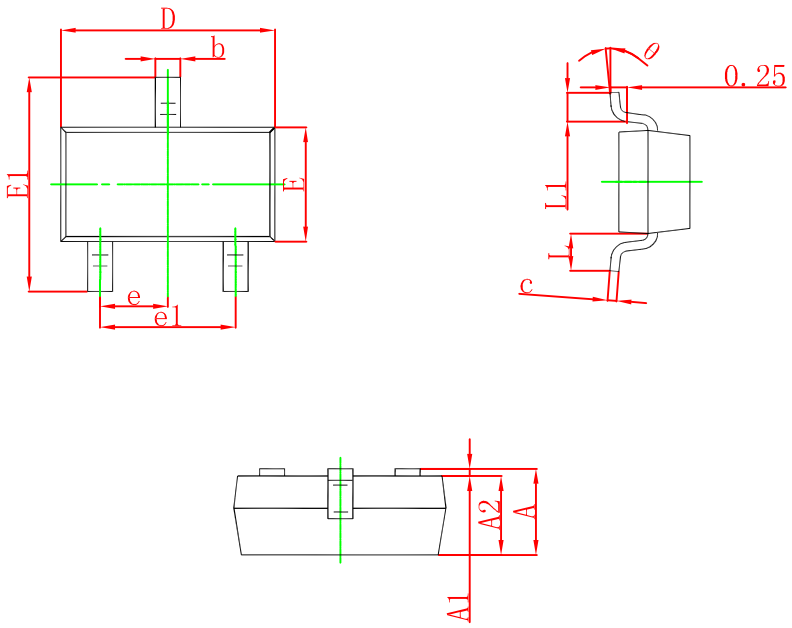


Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

SOT-23 PACKAGE OUTLINE DRAWING



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°