Description

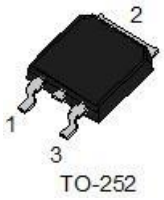
Features

- 40V,120A
- $R_{DS(ON)}$=3.2mΩ (Typ.) @ V_{GS}=10V
- $R_{DS(ON)}$=3.9mΩ (Typ.) @ V_{GS}=4.5V
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge

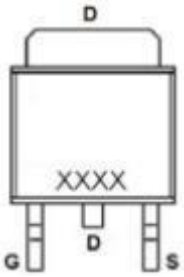
Application

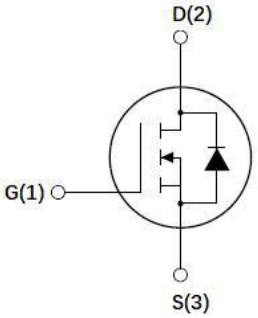
- Load Switch
- PWM Application

Package



TO-252





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

Symbol	Parameter		Value	Units
V_{DSS}	Drain-Source Voltage		40	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	120	A
		T_C = 100℃	70	A
I_{DM}	Pulsed Drain Current note1		360	A
E_{AS}	Single Pulsed Avalanche Energy note2		463	mJ
P_D	Power Dissipation	T_C = 25℃	55	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		2.3	℃/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	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=32V, 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	1.6	2	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D =30A	-	3.2	3.9	mΩ
		V_{GS}=4.5V, I_D =20A	-	3.9	4.7	
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D =20A	-	31	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f = 1.0MHz	-	4792	-	pF
C_{oss}	Output Capacitance		-	409	-	pF
C_{rss}	Reverse Transfer Capacitance		-	374	-	pF
R_g	Gate resistance	-	-	2.4	-	Ω
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=20V, I_D =20A, V_{GS}=10V	-	98	-	nC
Q_{gs}	Gate-Source Charge		-	11	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	25	-	nC
$V_{plateau}$	Gate plateau voltage		-	2.6	-	V
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=20V, V_{GS}=10V RL=1Ω,R_{GEN}=3Ω,	-	16	-	ns
t_r	Turn-on Rise Time		-	103	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	89	-	ns
t_f	Turn-off Fall Time		-	107	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	120	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	360	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S=10A	-	-	1.2	V

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

2. EAS condition: T_J=25℃,VDD=30V,VG=10V, RG=25Ω， L=0.5mH

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

Figure1: On-Region Characteristics

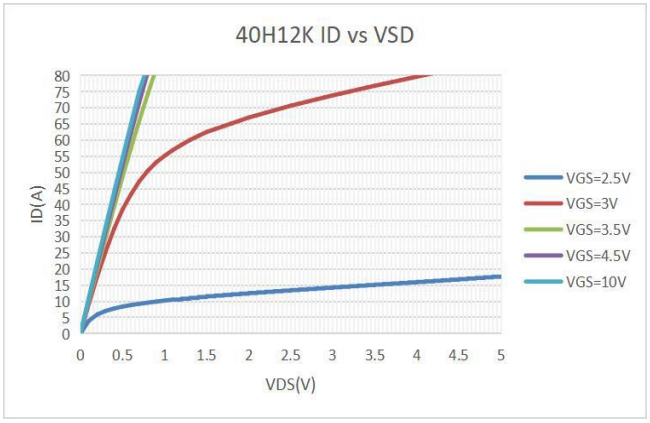


Figure 2: Transfer Characteristics

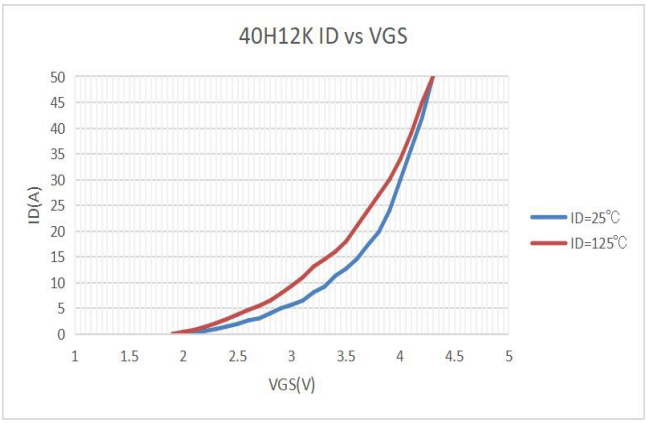


Figure 3: On-resistance vs. Drain Current and Gate Voltage

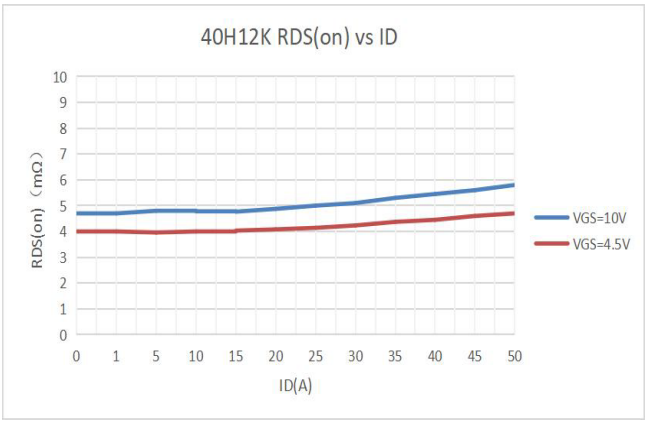


Figure 4: On-Resistance vs. Gate-Source Voltage

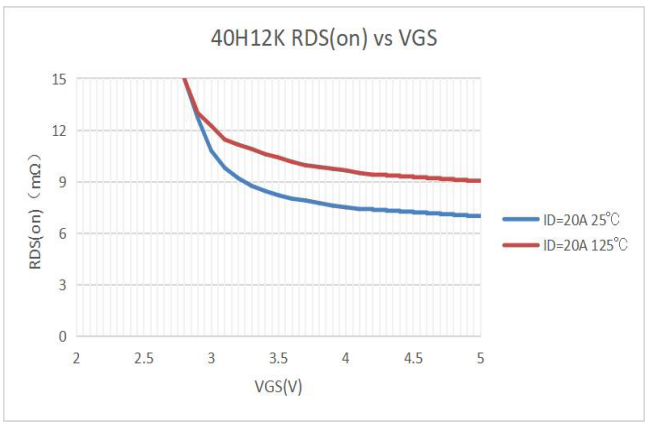


Figure 5: On-Resistance vs. Junction Temperature

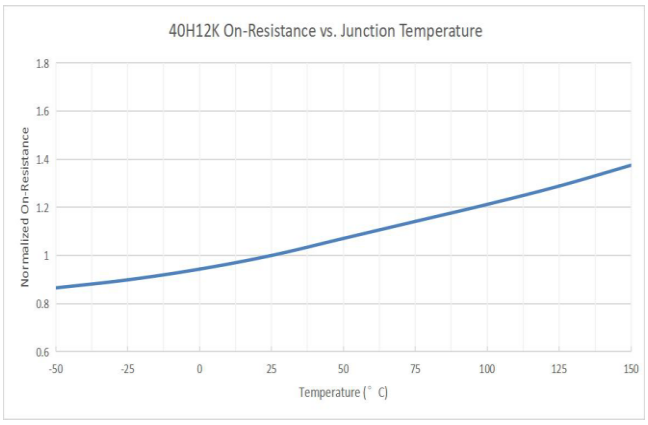
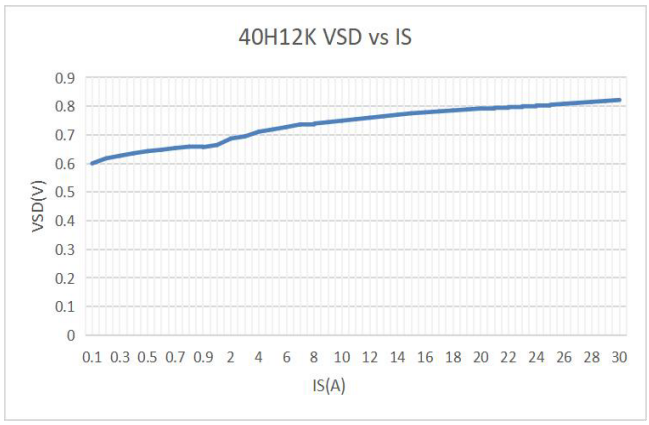


Figure 6: Body-Diode Characteristics



Typical Performance Characteristics

Figure7: Capacitance Characteristics C(pF)

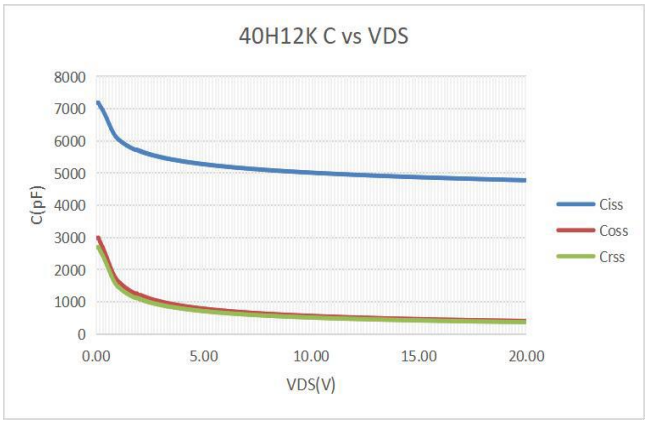


Figure 8: Gate-Charge Characteristics

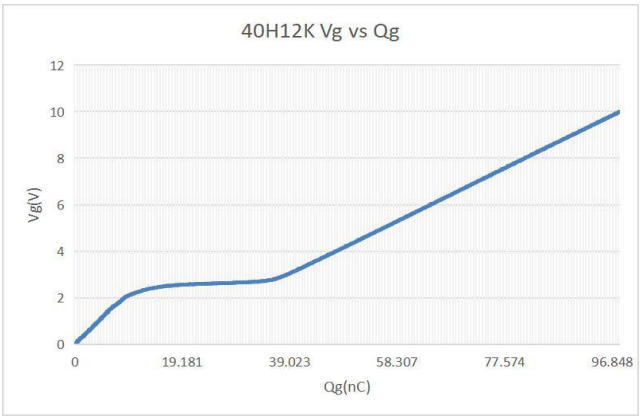


Figure9: Maximum Forward Biased Safe Operating Area

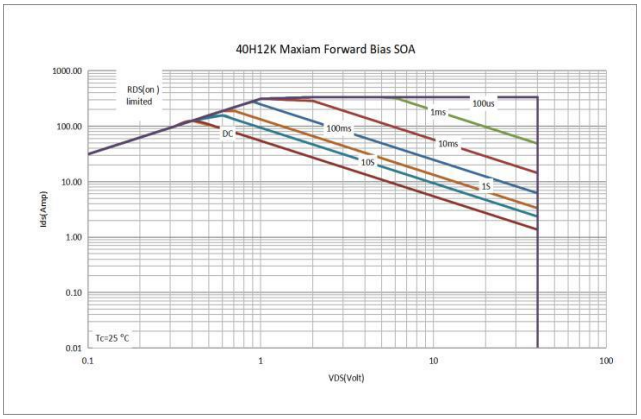
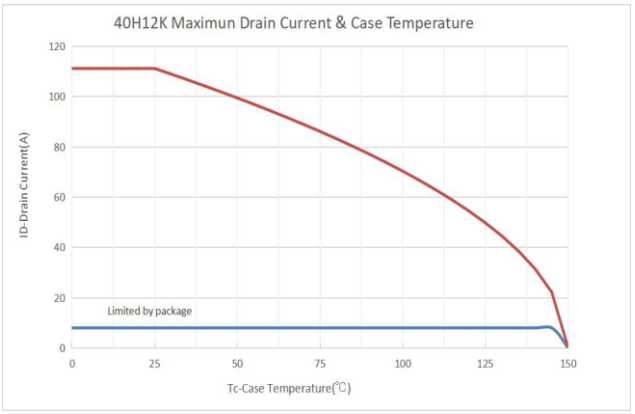


Figure 10: Current De-rating



Test Circuit

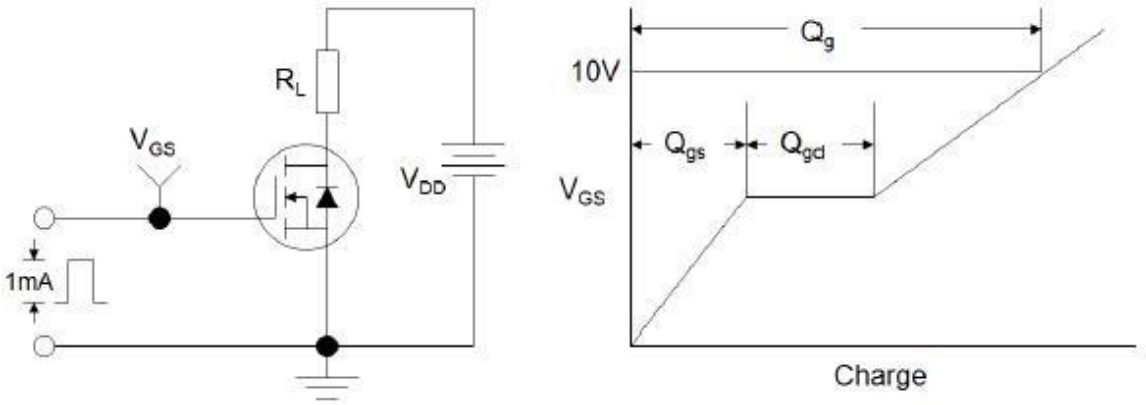


Figure1:Gate Charge Test Circuit & Waveform

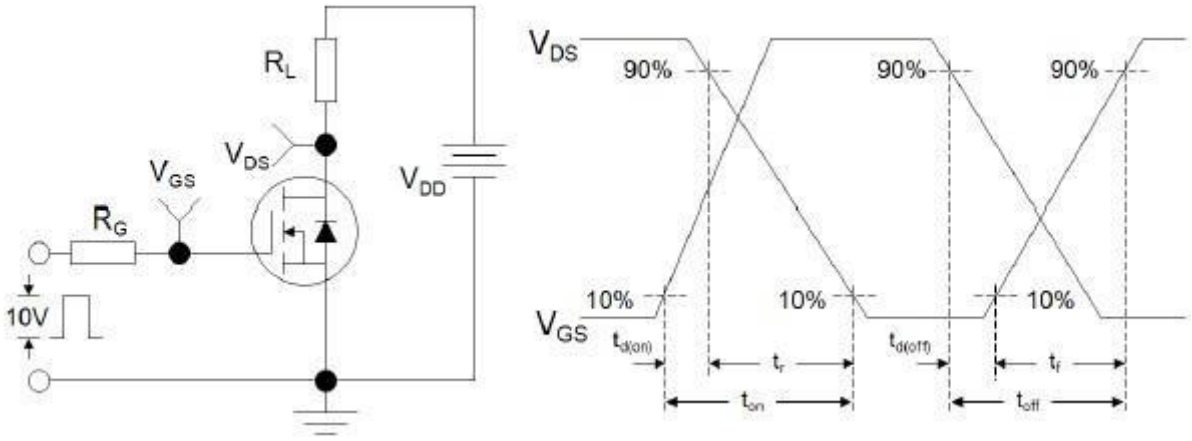


Figure 2: Resistive Switching Test Circuit & Waveforms

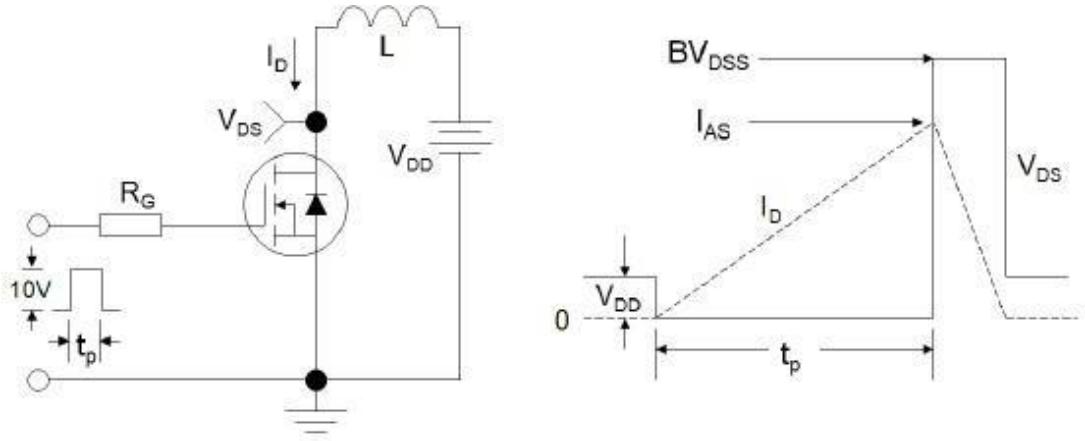


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

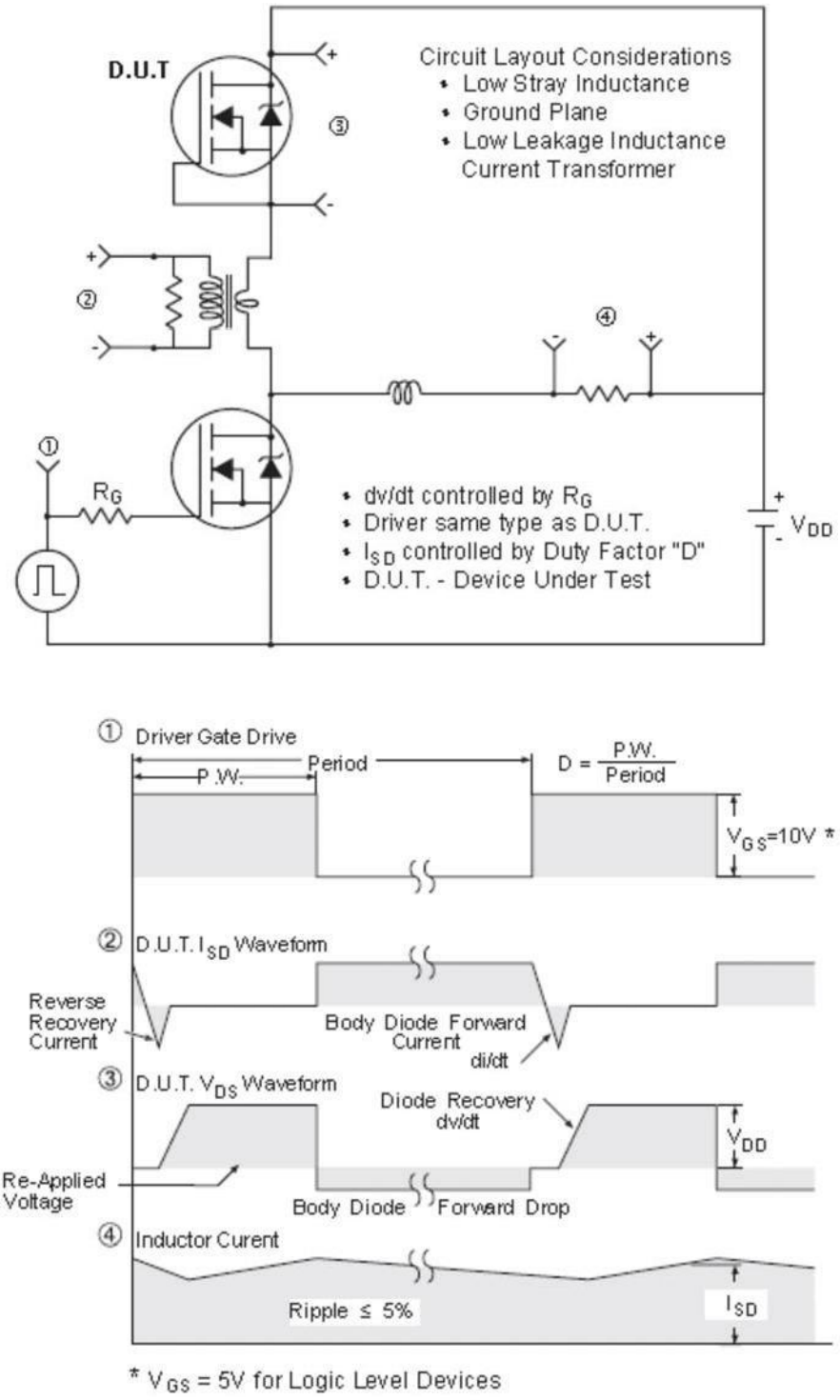
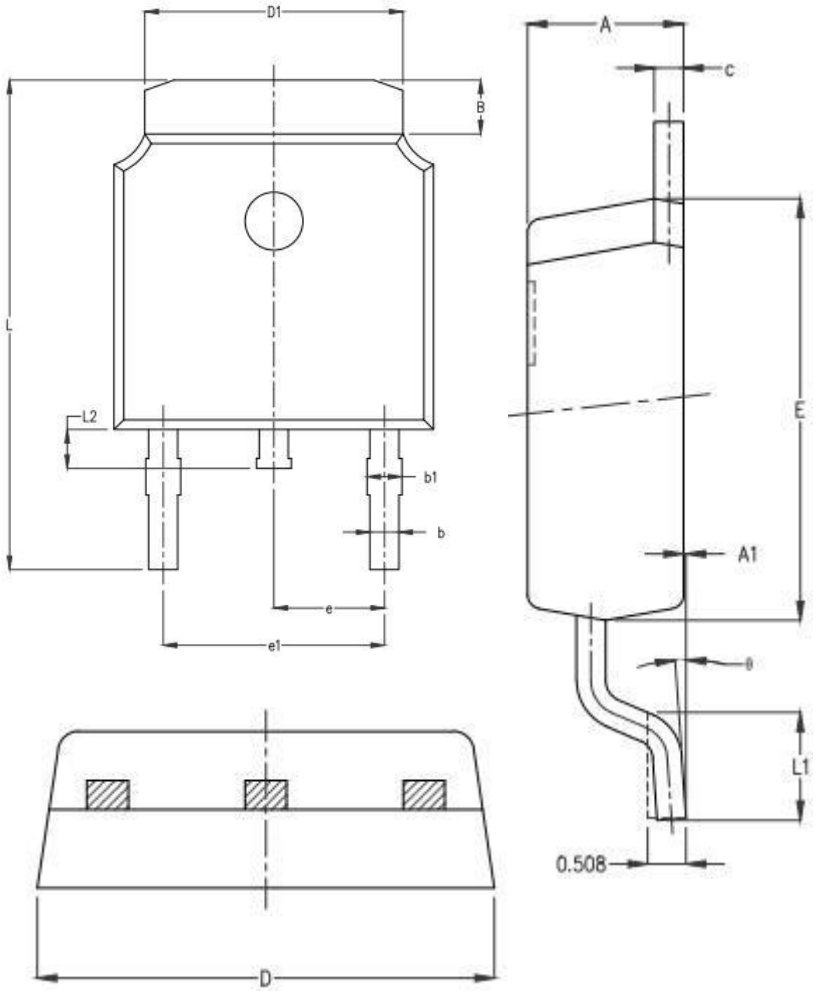


Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.15	2.25	2.35
A1	0.00	0.06	0.12
B	0.96	1.11	1.26
b	0.59	0.69	0.79
b1	0.69	0.81	0.93
c	0.34	0.42	0.50
D	6.45	6.60	6.75
D1	5.23	5.33	5.43
E	5.95	6.10	6.25
e	2.286TYP.		
e1	4.47	4.57	4.67
L	9.90	10.10	10.30
L1	1.40	1.55	1.70
L2	0.60	0.80	1.00
θ	0°	4°	8°