



UNI-SEMICONDUCTOR CO., LTD

宇力半导体有限公司



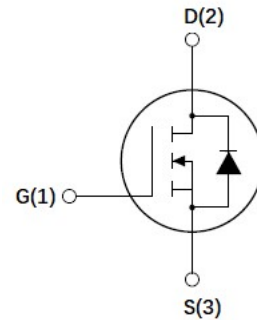
AP30H150KA Data Sheet

V 1.1

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Features

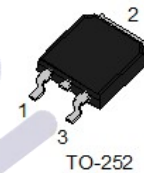
- 30V,150A
 $R_{DS(ON)} < 3m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 6m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge



Application

- Load Switch
- PWM Application

Package



Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V _{DSS}	Drain-Source Voltage	30	V
V _{GSS}	Gate-Source Voltage	±20	V
I _D	Continuous Drain Current	T _C = 25°C	150
		T _C = 100°C	100
I _{DM}	Pulsed Drain Current ^{note1}	400	A
E _{AS}	Single Pulsed Avalanche Energy ^{note2}	650	mJ
P _D	Power Dissipation	T _C = 25°C	110
R _{θJC}	Thermal Resistance, Junction to Case	1.36	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +175	°C

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V,$	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	3.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	$V_{GS}=10V, I_D=30A$	-	2.3	3.0	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	4.2	6.0	m Ω
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=10A$	-	28	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0MHz$	-	3400	-	pF
C_{oss}	Output Capacitance		-	356	-	pF
C_{rss}	Reverse Transfer Capacitance		-	308	-	pF
Q_g	Total Gate Charge	$V_{DS}=15V, I_D=30A,$ $V_{GS}=10V$	-	70	-	nC
Q_{gs}	Gate-Source Charge		-	12	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	16.3	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15V,$ $I_D=60A, R_{GEN}=1.8\Omega,$ $V_{GS}=4.5V$	-	11	-	ns
t_r	Turn-on Rise Time		-	120	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	25	-	ns
t_f	Turn-off Fall Time		-	60	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	150	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	400	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F=60A, di/dt=100A/\mu s$	-	56	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	110	-	nC

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

2. EAS condition: $T_j=25^\circ\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

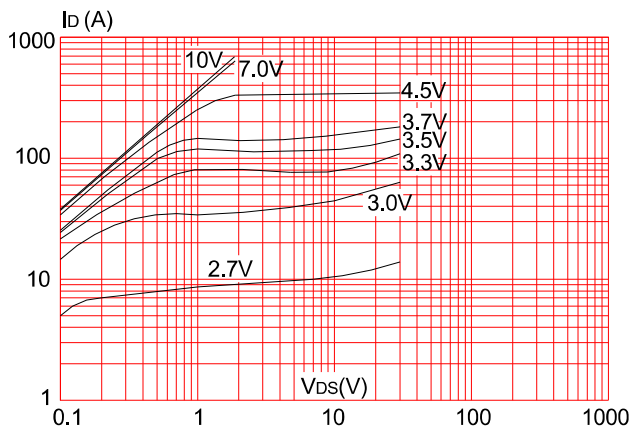


Figure 2: Typical Transfer Characteristics

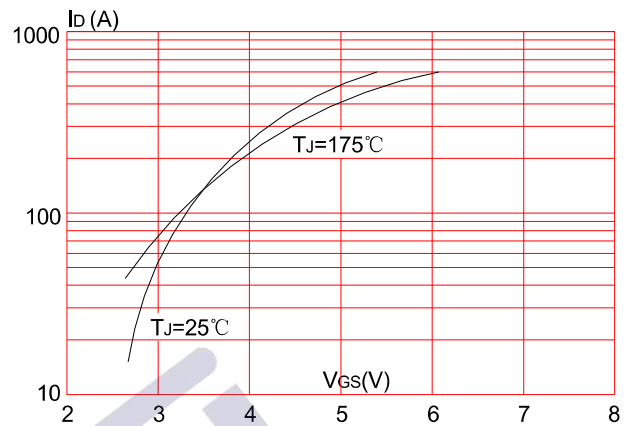


Figure 3: On-resistance vs. Drain Current

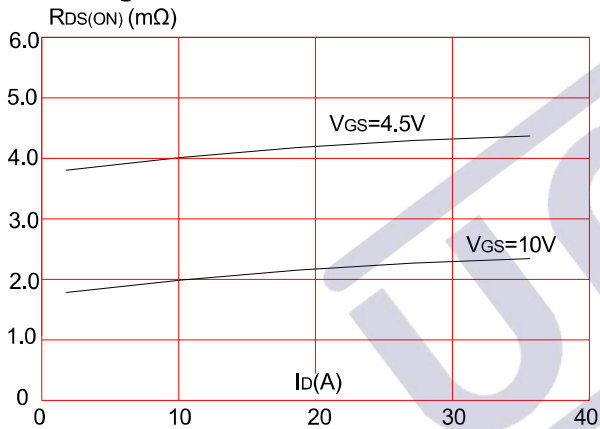


Figure 4: Body Diode Characteristics

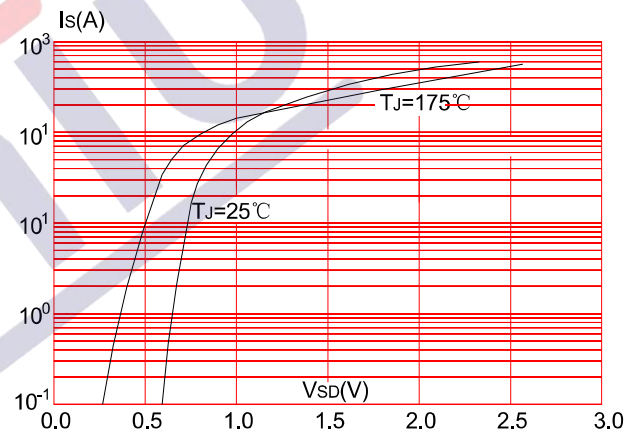


Figure 5: Gate Charge Characteristics

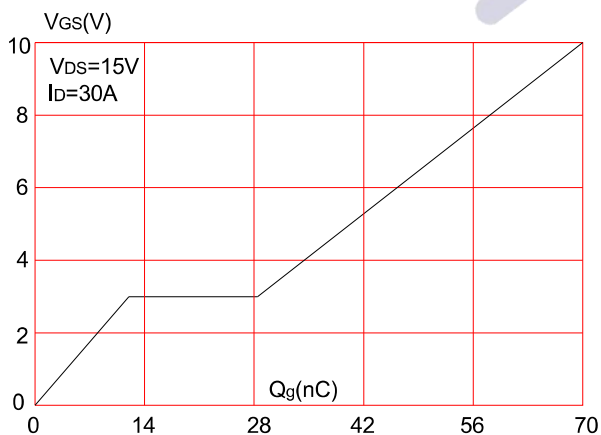


Figure 6: Capacitance Characteristics

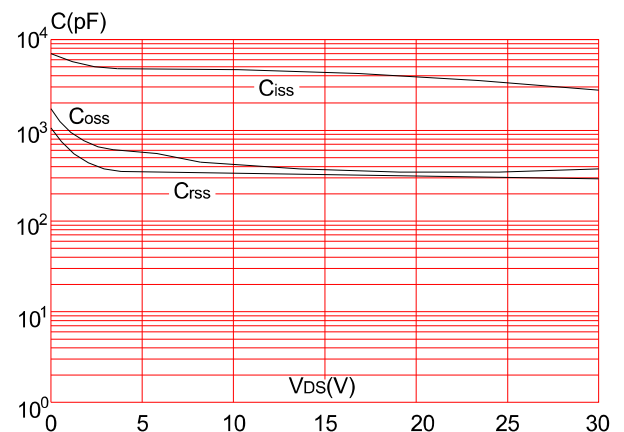


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

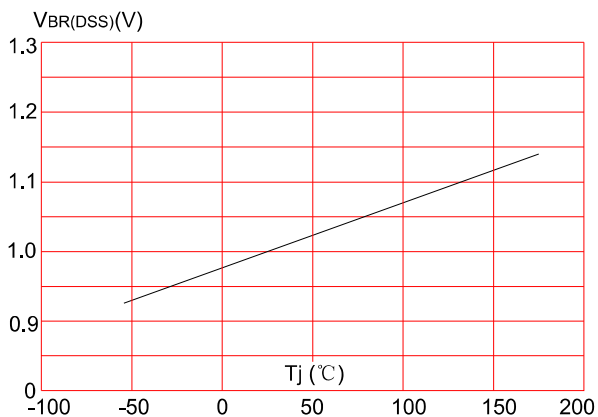


Figure 8: Normalized on Resistance vs. Junction Temperature

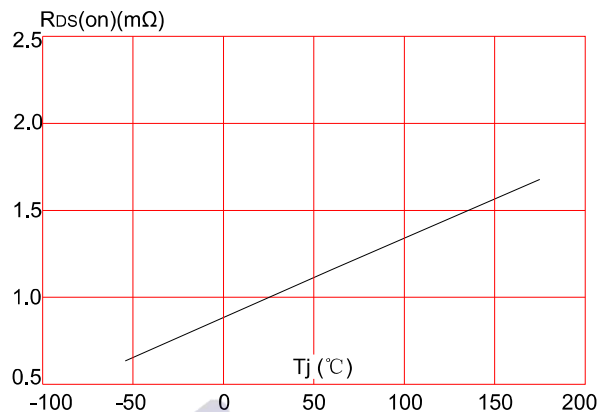


Figure 9: Maximum Safe Operating Area

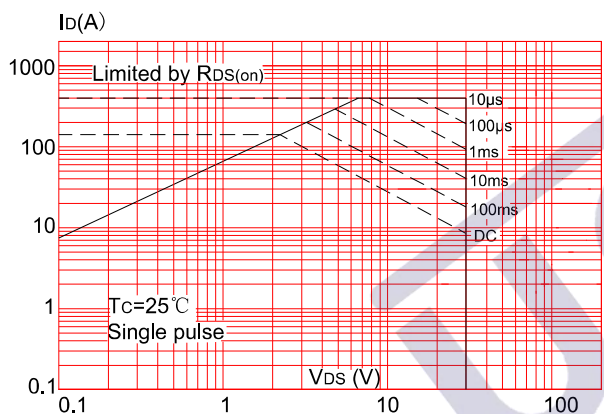


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

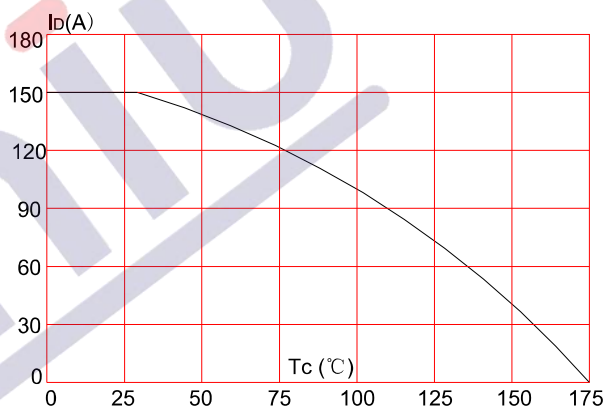


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-252)

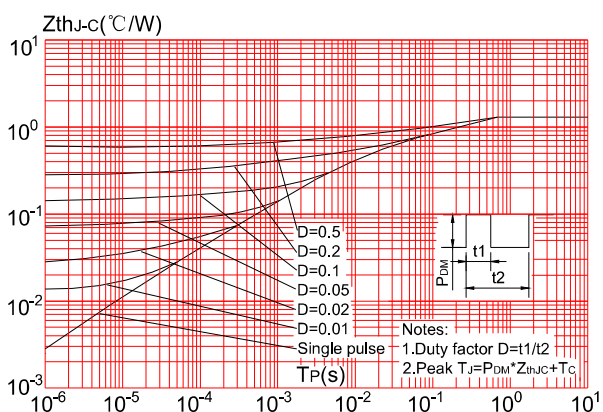
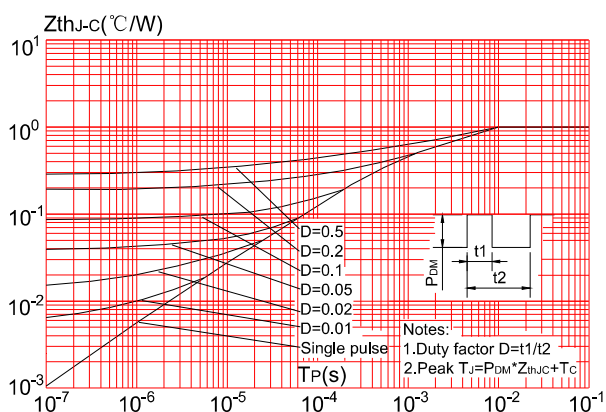


Figure.12: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-263)



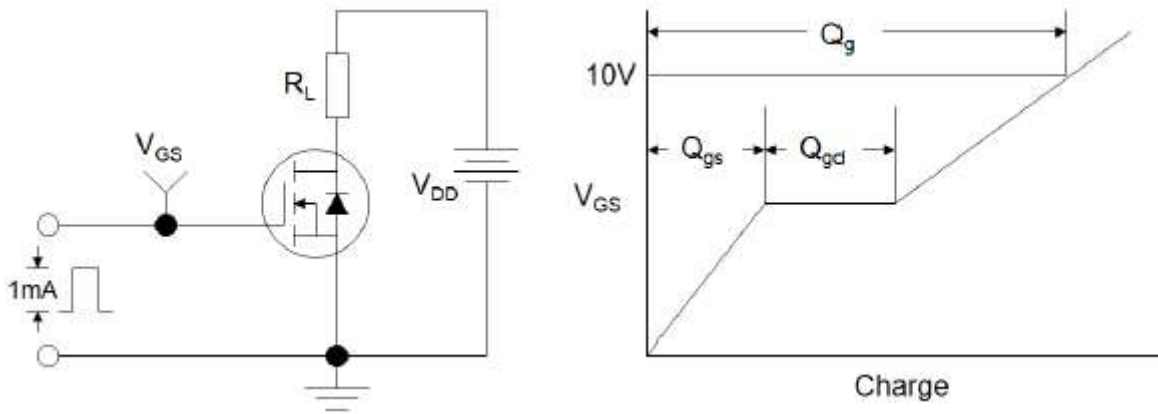


Figure1:Gate Charge Test Circuit & Waveform

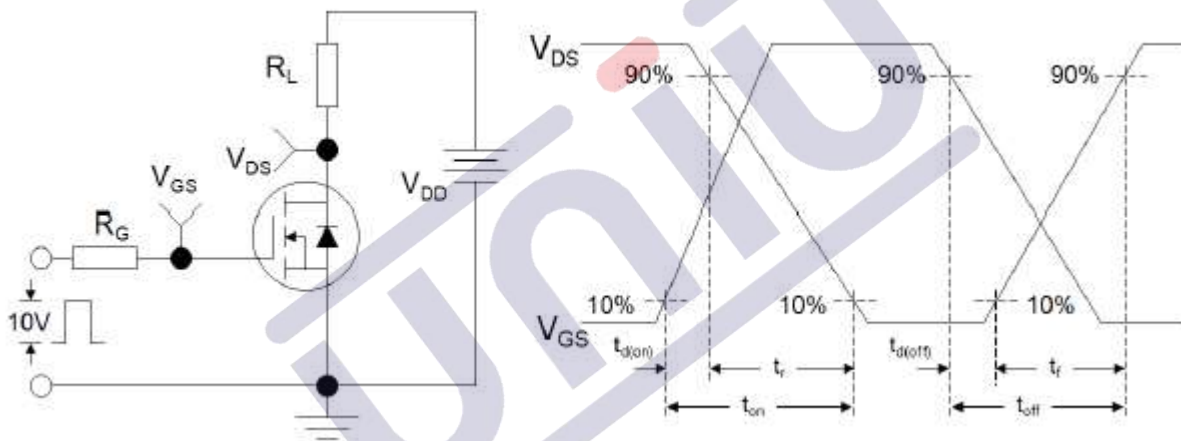


Figure 2: Resistive Switching Test Circuit & Waveforms

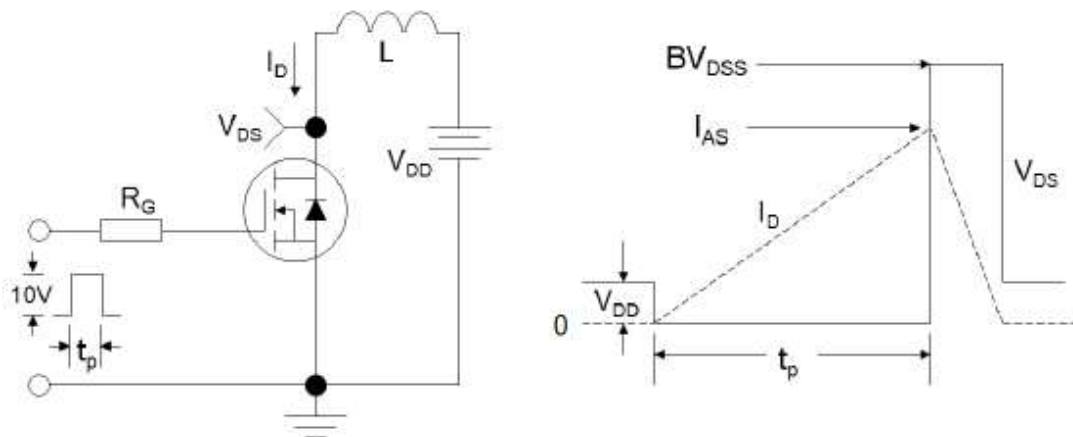


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

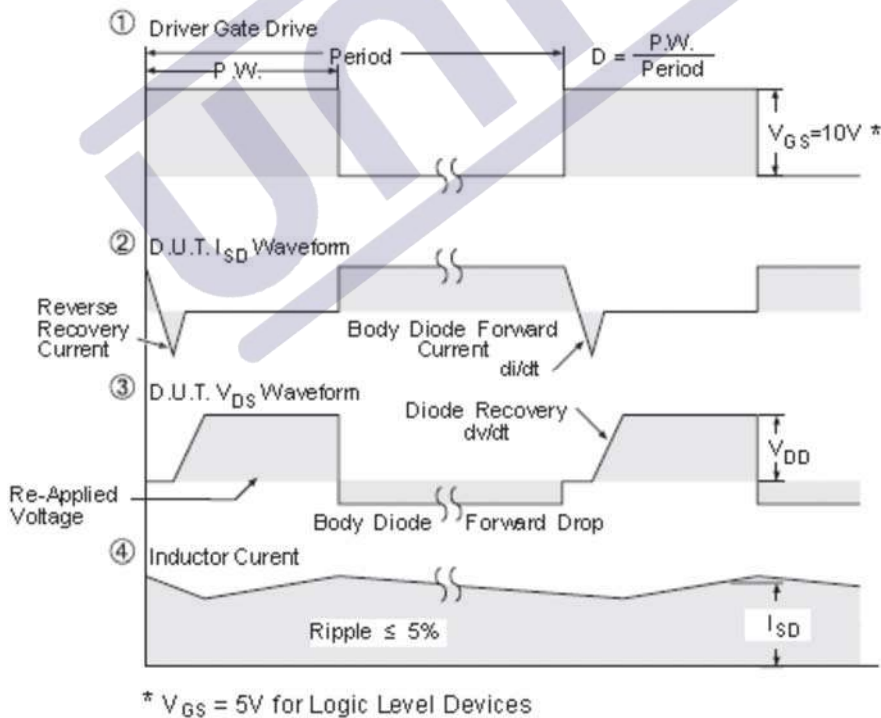
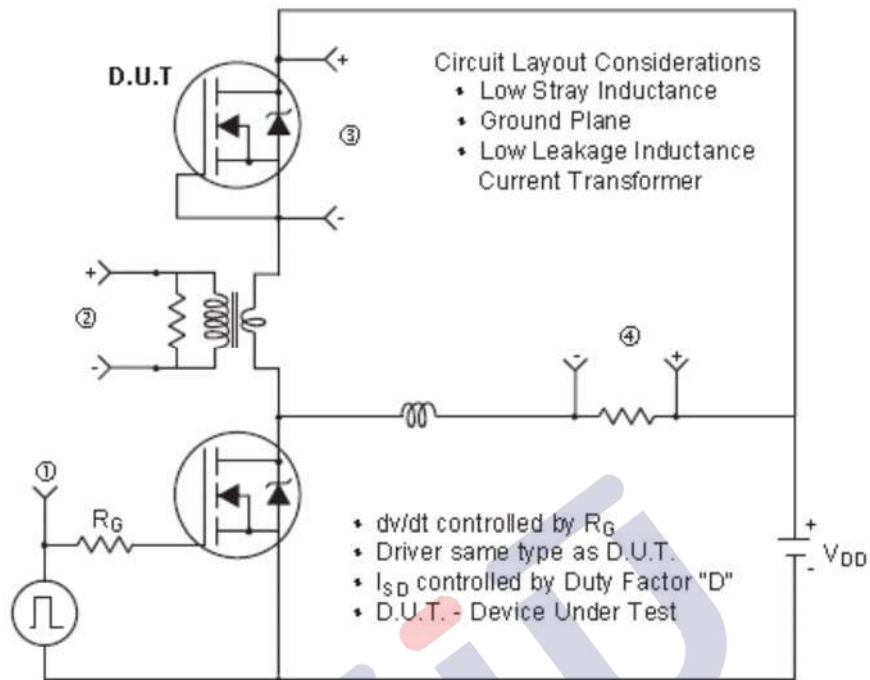
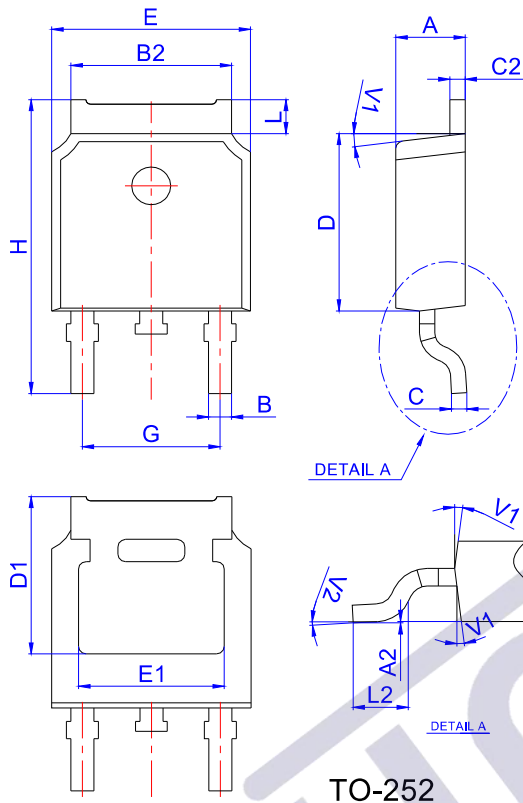


Figure 4: Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

1.版本记录

DATE	REV.	DESCRIPTION
2018/04/19	1.0	First Release
2021/12/11	1.1	Layout adjustment

2.免责声明

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