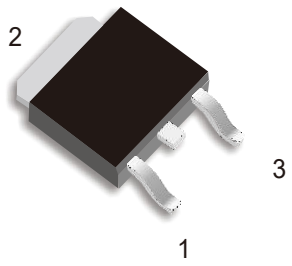
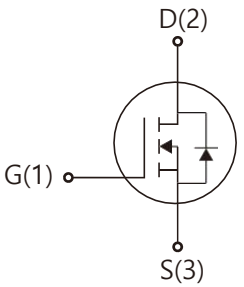
CTKD10N65SE

Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg=35nC (Typ.).
- ☐ V_{DSS}= 650V,I_D=10A
- ☐ R_{DS}(on) : 0 . 9 Ω (Max) @V_G=10V
- ☐ 100% Avalanche Tested

TO-252





1.Gate (G)
2.Drain (D)
3.Source (S)

Absolute Maximum Ratings (Ta=25℃ unless otherwise noted)

Sy mbol	Parameter		Value	Unit
V_{DSS}	Drain-Source Voltage		650	V
I_D	Drain Current	T_j=25℃	10	A
		T_j=100℃	6.7	
V_{GSS}	Gate-Source Voltage		±30	V
E_{AS}	Single Pulse Avalanche Energy (note1)		380	mJ
I_{AR}	Avalanche Current (note2)		10	A
P_D	Power Dissipation (Tj=25℃)		45	W
T_j	Junction Temperature(Max)		150	℃
T_{stg}	Storage Temperature		-55~+150	℃
TL	Maximum lead temperature for soldering purpose,1/8’ from case for 5 seconds		300	℃

Thermal Characteristics

Sy mbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance,Junction to Case	-	2.4	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	-	62.5	℃/W

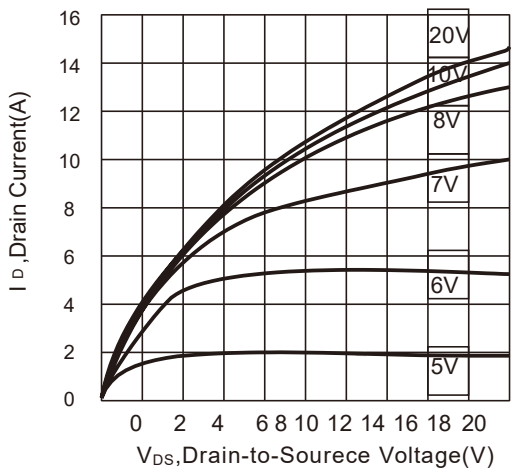
Electrical Characteristics (Ta=25℃ unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA , V_{GS} =0	650	-	-	V
△BVDSS/ △TJ	Breakdown Voltage Temperature Coefficient	I_D=250μA ,Reference to 25℃	-	0.67	-	V/℃
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V, V_{GS} =0V	-	-	10	μA
		V_{DS}=520V, Tj=125℃			100	
I_{GSSF}	Gate-body leakage Current, Forward	V_{GS} =+30V, V_{DS}=0V	-	-	100	nA
I_{GSSR}	Gate-body leakage Current, Reverse	V_{GS} =-30V, V_{DS}=0V	-	-	-100	
On Characteristics						
$V_{GS(TH)}$	Date Threshold Voltage	I_D=250μA,V_{DS}=V_{GS}	2	-	4	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	I_D=5.0A,V_{GS} =10V	-	0.8	0.9	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	V_{DS}=25V , V_{GS} =0 , f=1.0MHz	-	1500	-	pF
Coss	Output Capacitance		-	194	-	
Crss	Reverse Transfer Capacitance		-	18	-	
Sw itching Characteristics						
Td(on)	Turn-On Delay Time	V_{DD}=325V , I_D=10A R_G =25Ω (Note 3,4)	-	23		nS
Tr	Turn-On Rise Time			15		
Td(of f)	Turn-Off Delay Time		-	90		
Tf	Turn-Off Rise Time		-	30		
Qg	Total Gate Charge	V_{DS}=520V,V_{GS} =10V , I_D=10A (Note3,4)	-	35		nC
Qgs	Gate-Source Charge			7	-	
Qgd	Gate-Drain Charge			18	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Is	Max. Diode Forward Current	-		- -	10	A
I_{SM}	Max. Pulsed Forward Current	-		- -	40	
V_{SD}	Diode Forward Voltage	I_D=10A	-	-	1.4	V
Trr	Reverse Recovery Time	Is=10A,V_{GS} =0V diF/dt=100A/ μs (Note3)	-	320	-	nS
Qrr	Reverse Recovery Charge		-	4. 2	-	μC

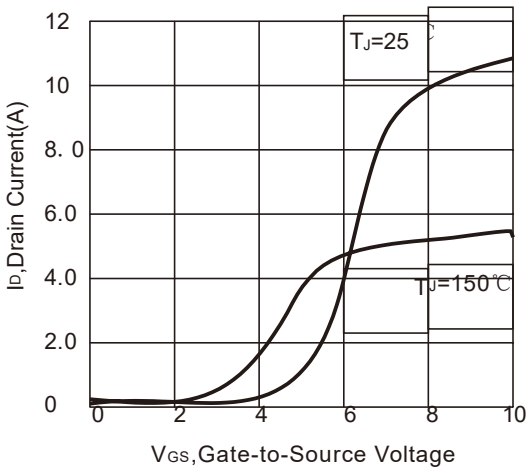
Notes : 1, L=0.5mH, IAS= 10A, VDD=50V, RG=25Ω , Starting TJ =25℃
2, Repetitive Rating : Pulse width limited by maximum junction temperature
3, Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
4, Essentially Independent of Operating Temperature

Typical Characteristics

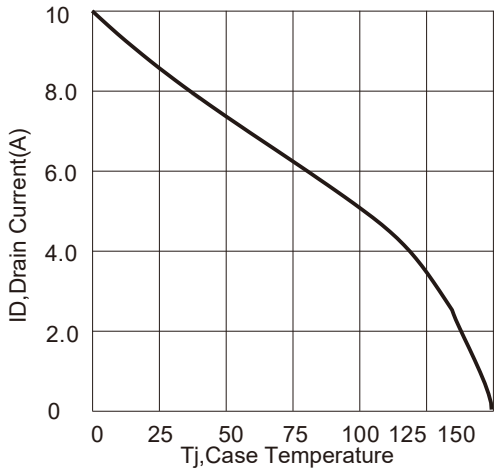
Output Characteristics



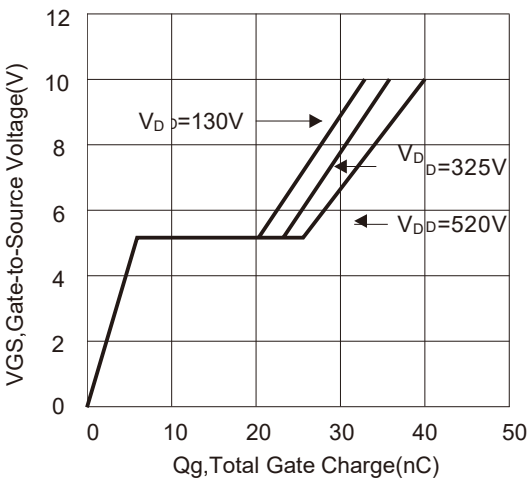
Transfer Characteristics



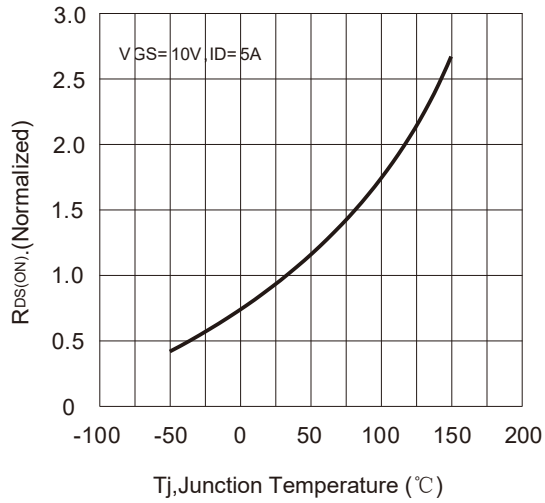
Drain Current VS.Temperature



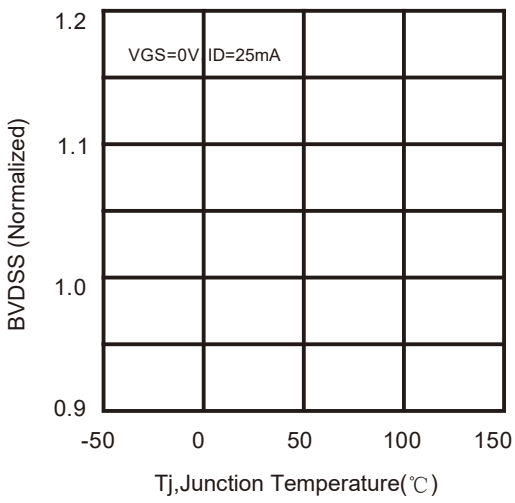
Gate Charge



On-Resistance vs. Junction Temperature

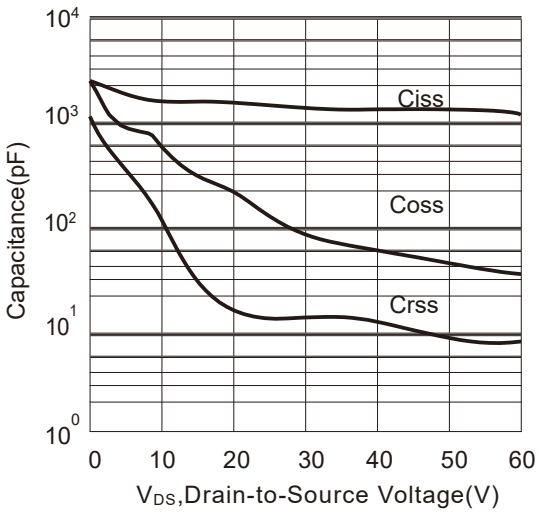


BV_{DSS} Variation VS.Temperature

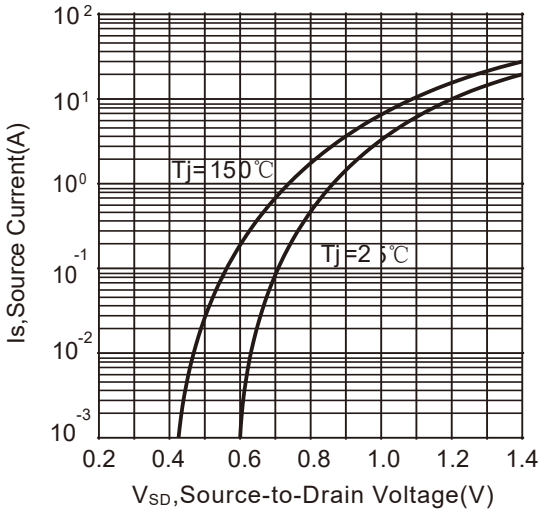


Typical Characteristics (Continued)

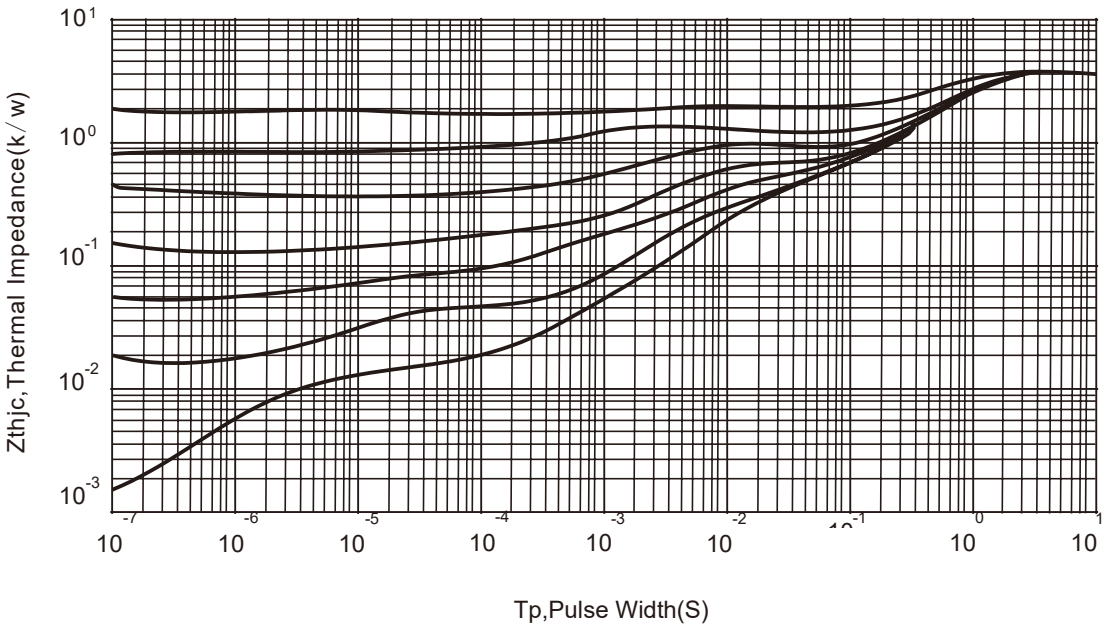
Capacitance



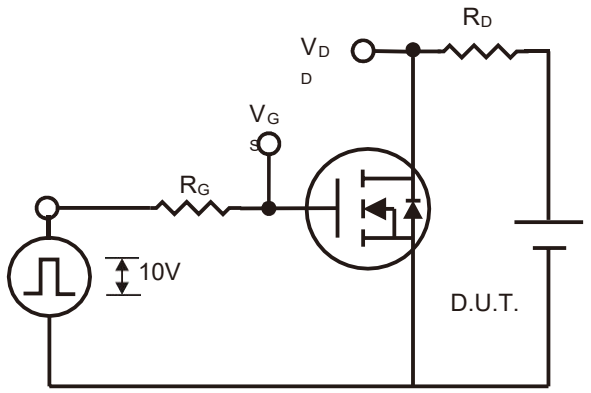
Body Diode Forward Voltage



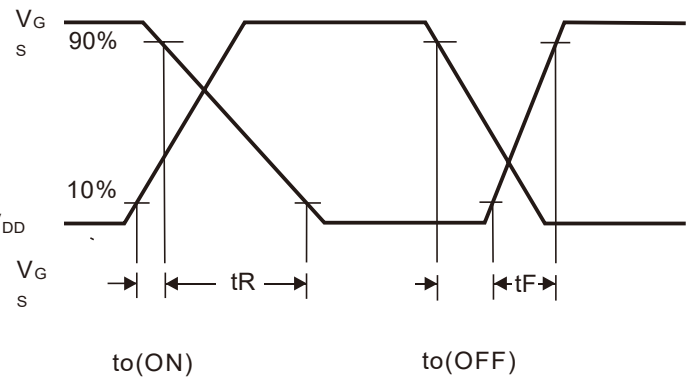
Transisent Thermal Impedance



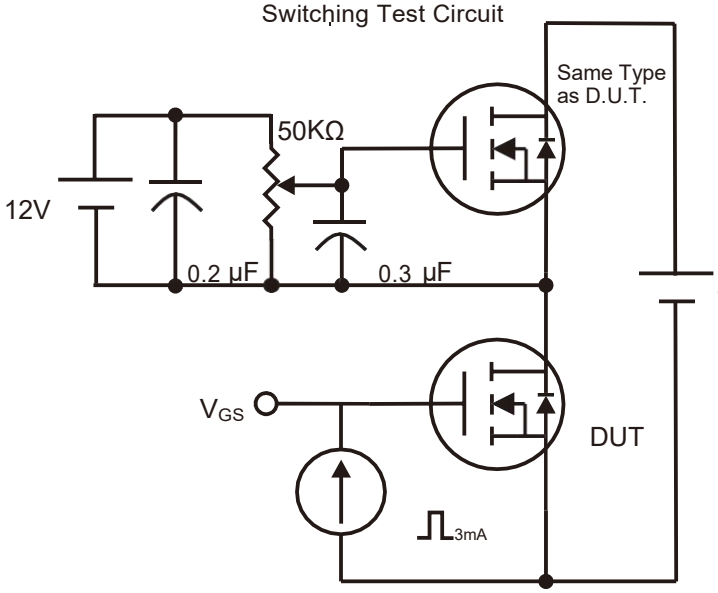
Gate Charge Test Circuit & Waveform



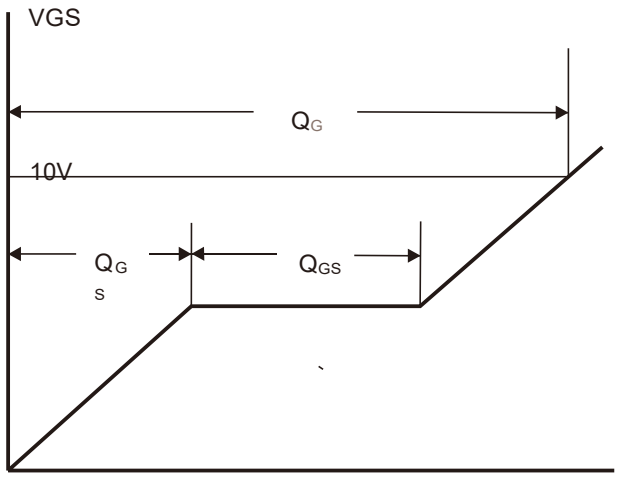
Switching Test Circuit



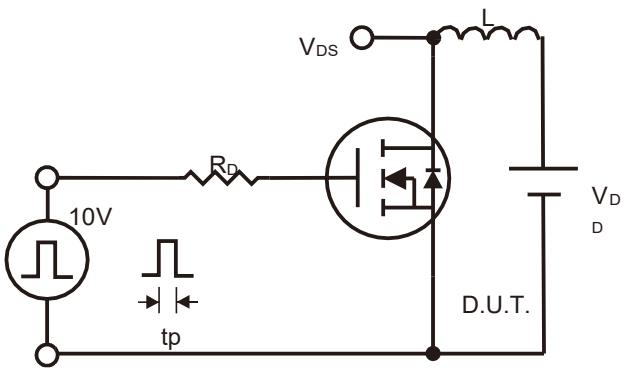
Switching Waveforms



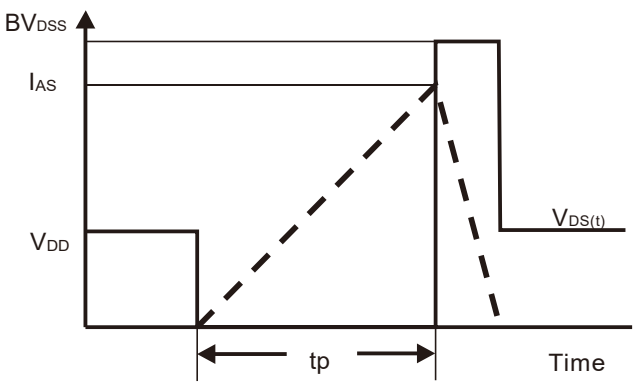
Gate Charge Test Circuit



Gate Charge Waveform

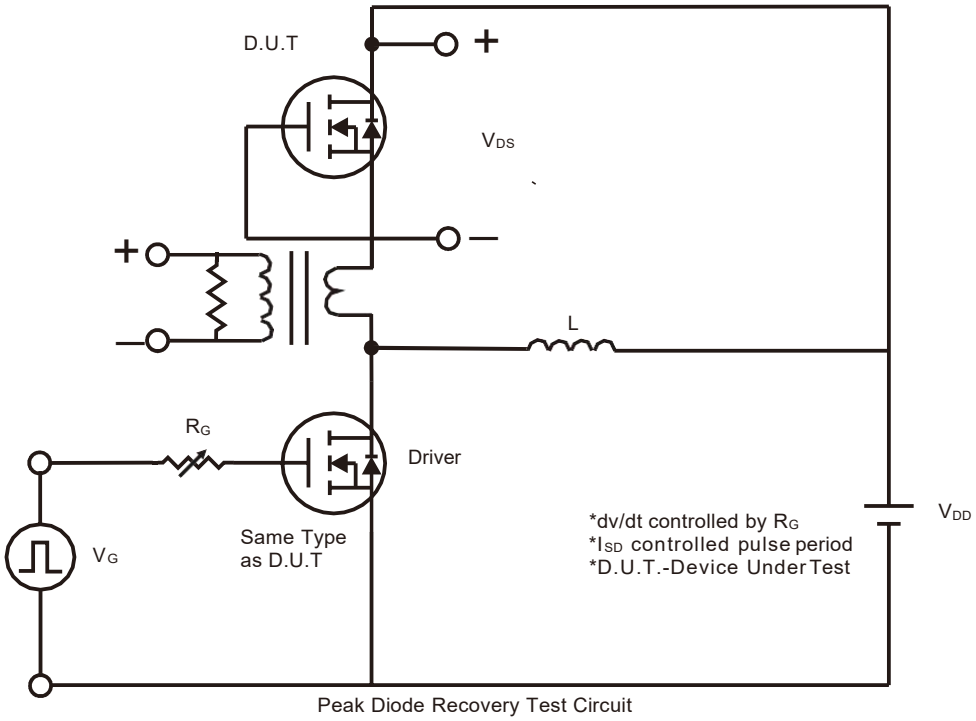


Unclamped Inductive Switching Test Circuit

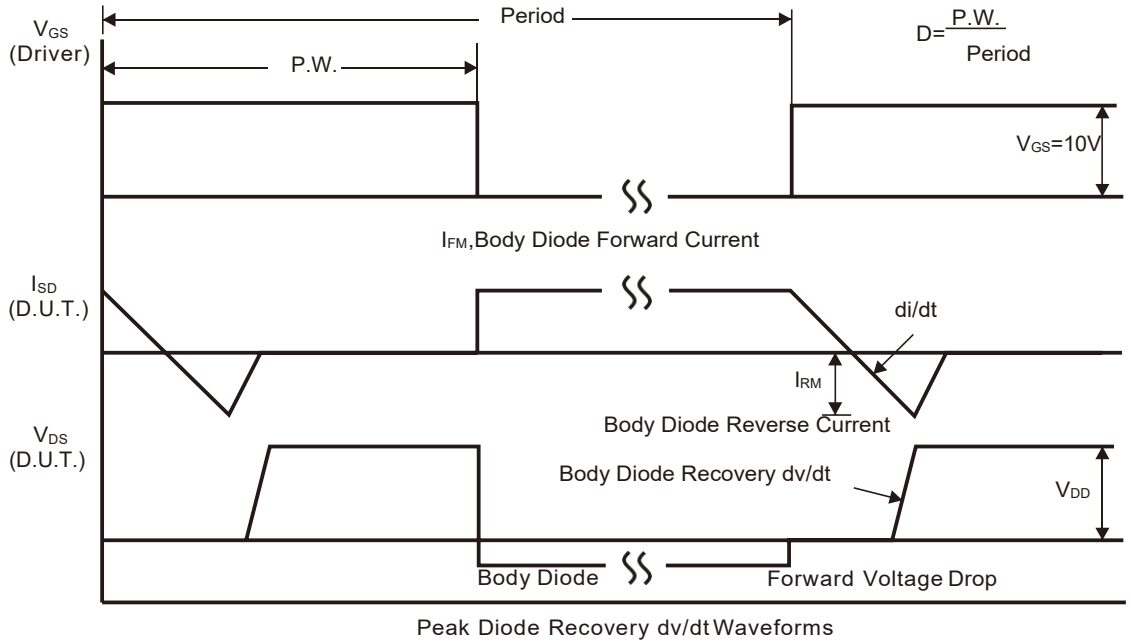


Unclamped Inductive Switching Waveforms

Peak Diode Recovery **dv/dt** Test Circuit & W**aveform**

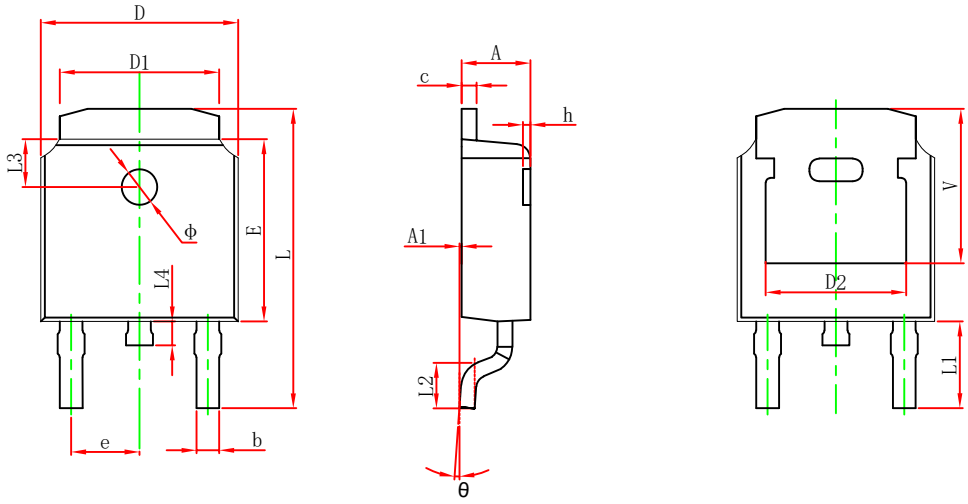


Peak Diode Recovery Test Circuit



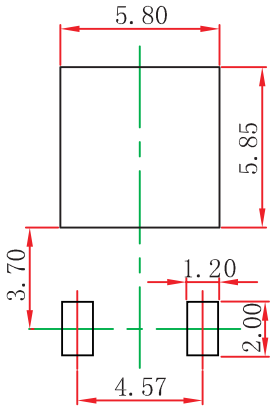
Peak Diode Recovery dv/dt Waveforms

Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.700	0.860	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.300	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

TO-252-2L Suggest Pad Layout



NOTE:

1. Controlling dimension: in millimeters.
2. General tolerance: ±0.05mm.
3. The pad layout is for reference purposes only.