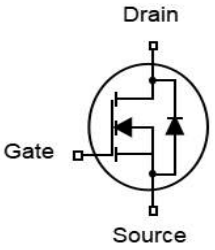
Features

- Super-Junction MOSFET
- Low ON Resistance
- Improved dv/dt Capability
- 100% Avalanche Tested
- RoHS compliant
- 100% EAS Tested

V_{DS}	650	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	520	mΩ
I_D	8	A

TO-252



Part ID	Package Type	Marking	Packing
ZT65T520D	TO-252	ZT65T520D	2500pcs/Reel

Absolute Maximum Ratings T_A =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±30	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		650	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_{DM}	Drain Current-Continuous@ Current-Pulsed (Note 2)	T_C =25°C	24	A
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous (Note 1)	T_C =25°C	8	A
		T_C =100°C	4.8	A
P_D	Maximum Power Dissipation		104	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.2	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		98	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 3)		122	mJ
dv/dt	MOSFET dv/dt Ruggedness(V_{DS}=0~400V)		50	mJ
dv/dt	Reverse Diode dv/dt (Note 4)		15	V/ns

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	650	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±30V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.8	3.3	3.8	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=4A	--	520	580	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
Ciss	Input Capacitance	V_{DS}=100V,V_{GS}=0V, f=1MHz	--	465	--	pF
Coss	OutputCapacitance		--	22	--	pF
Crss	ReverseTransferCapacitance		--	0.9	--	pF
Rg	Gate Resistance	f=1MHz	--	14	--	Ω
Qg	Total Gate Charge	V_{DS}=325V,I_D=8A, V_{GS}=10V	--	11.2	--	nC
Qgs	Gate-SourceCharge		--	2.46	--	nC
Qgd	Gate-DrainCharge		--	4.66	--	nC
Switching Characteristics						
Td(on)	Turn-on Delay Time	V_{DS}=325V, I_D =8A, R_G=25Ω, V_{GS}=10V	--	15.2	--	ns
Tr	Turn-on Rise Time		--	18	--	ns
Td(off)	Turn-Off Delay Time		--	60.3	--	ns
Tf	Turn-Off Fall Time		--	16.8	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_S=8A,V_{GS}=0V	--	--	1.3	V
Trr	Reverse Recovery Time	T_j=25℃,I_S =8A, V_{GS}=0V di/dt=100A/μs	--	211	--	ns
Qrr	Reverse Recovery Charge		--	1.75	--	uC

Notes:

1. Drain current is limited by maximum junction temperature.
2. Repetitive rating : pulse width limited by junction temperature.
3. L = 60mH, I_{AS} = 2A, V_{DD} = 50V, R_G=25Ω, Starting at T_J = 25°C
4. I_{SD} ≤ I_D, di/dt = 100A/us, V_{DD} ≤ 400V, Starting at T_J =25°C

Typical Characteristics T_J = 25ºC, unless otherwise noted

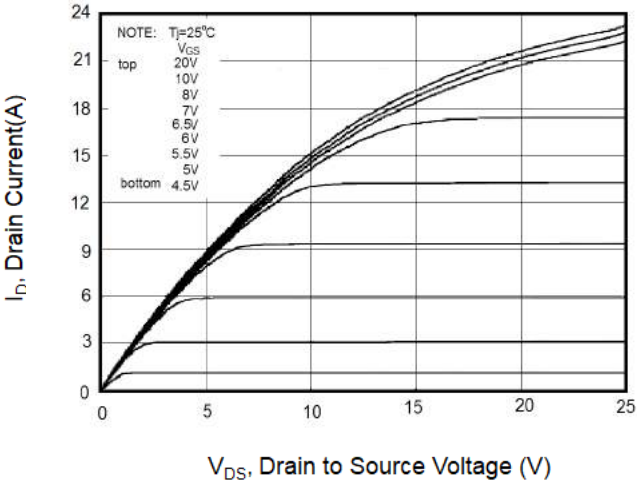


Fig1. Output characteristics

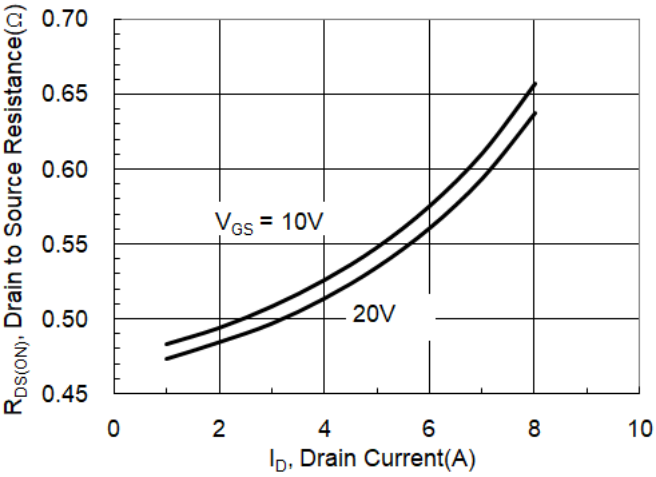


Fig4. Drain-source on-state resistance

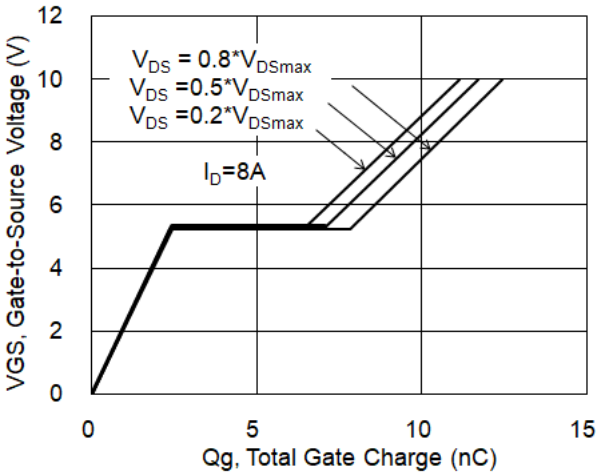


Fig2. Gate charge characteristics

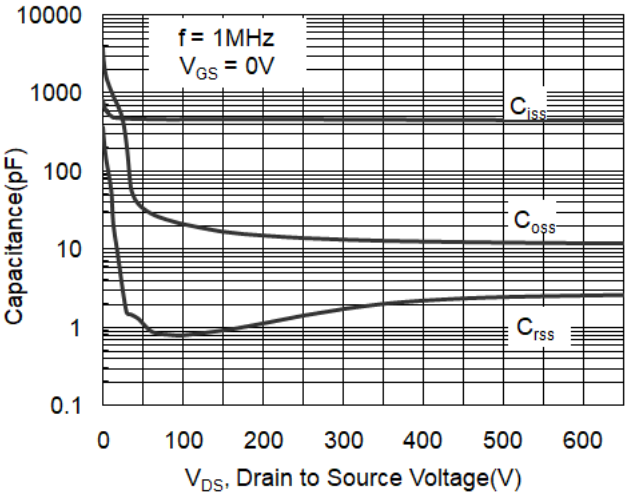


Fig 5. Capacitance Characteristics

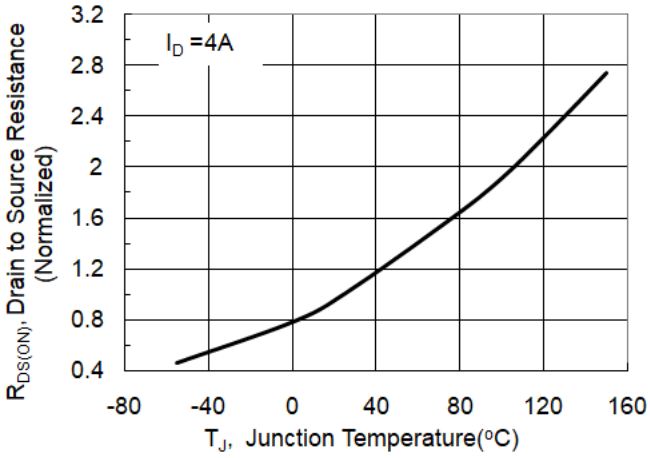


Fig 3. $R_{DS(ON)}$ vs junction temperature

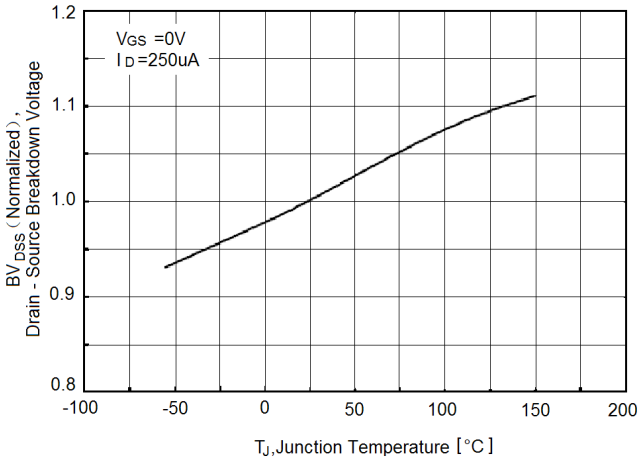


Fig 6. BV_{DSS} vs junction temperature

Typical Characteristics T_J = 25ºC, unless otherwise noted

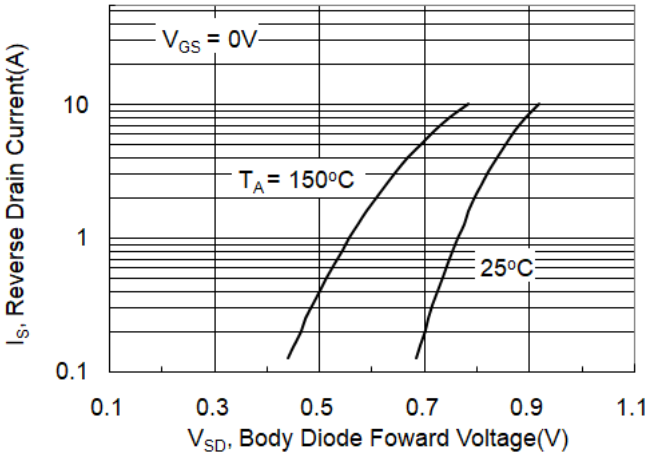


Fig 7 . Forward characteristics of reverse diode

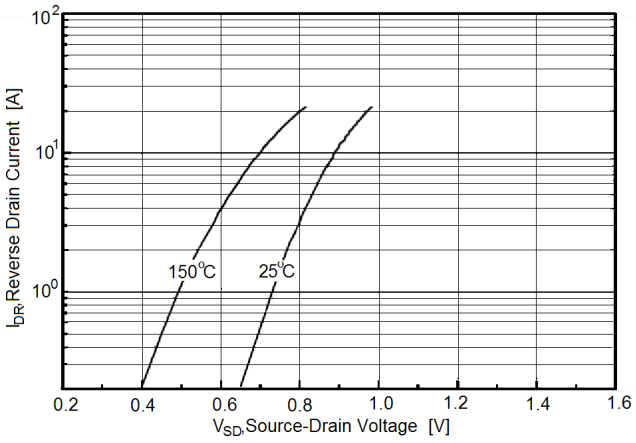


Fig 9 . Transfer characteristics

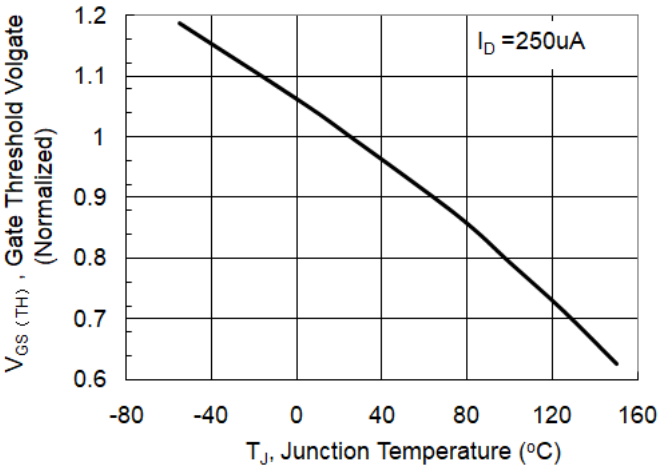


Fig 8 . $V_{GS(TH)}$ vs junction temperature

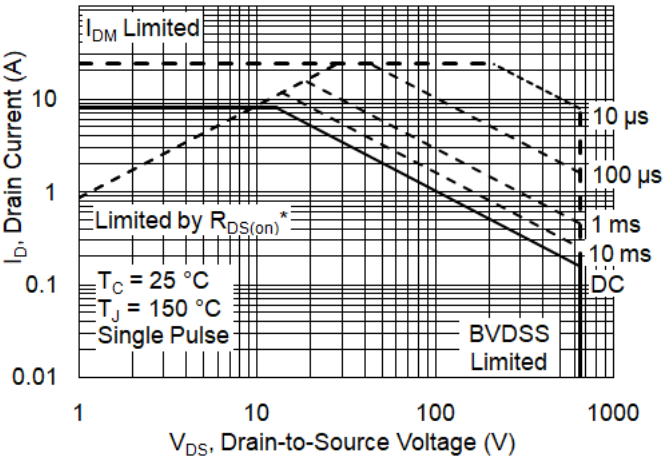


Fig 10. Safe operating area(TO-252)

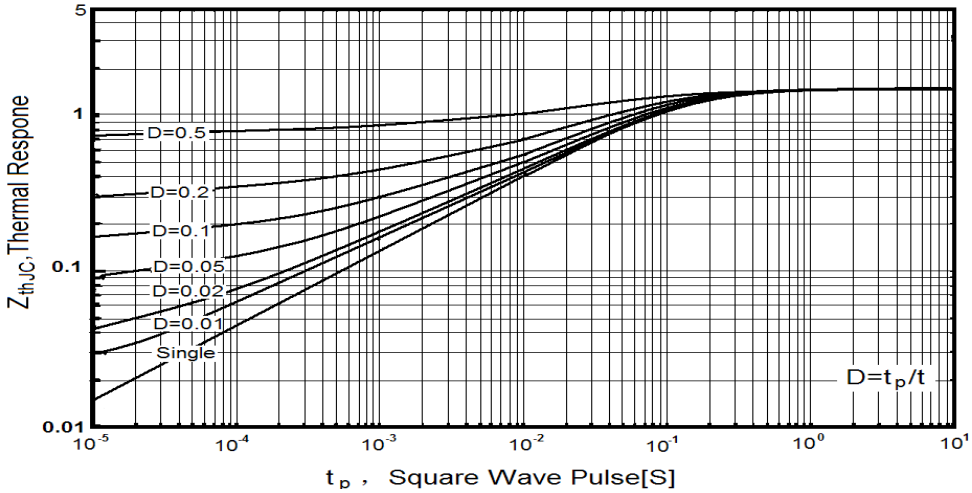


Fig 11. Transient thermal impedance (TO-252)

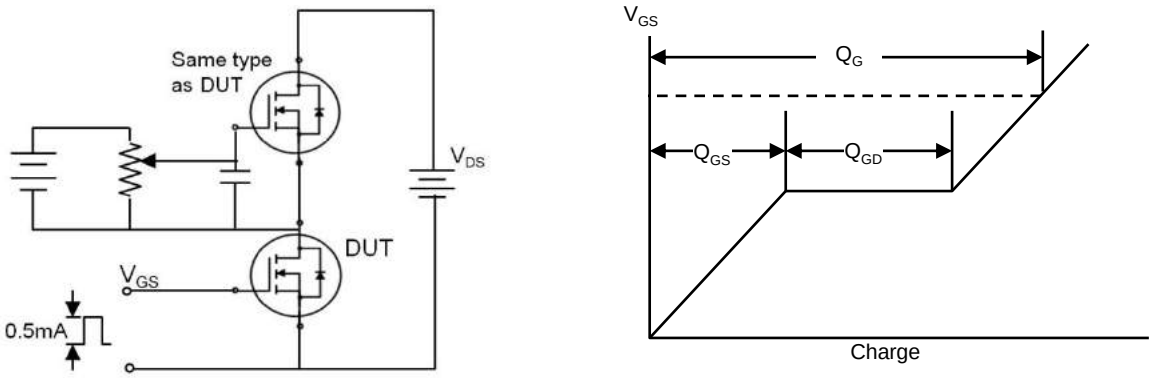


Fig A. Gate charge test circuit & waveform

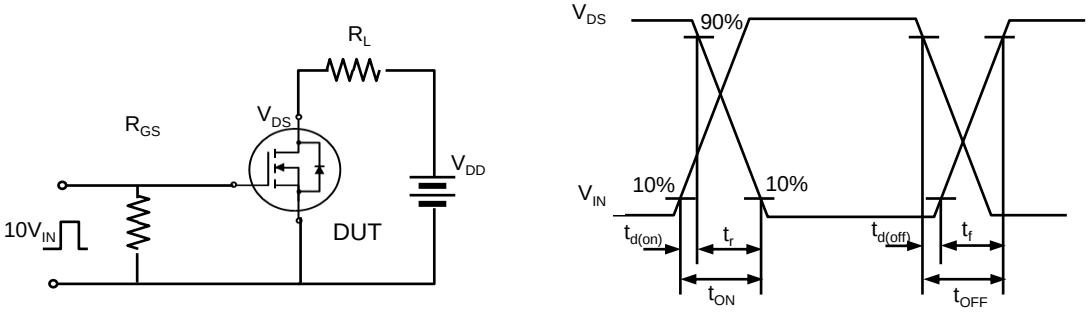


Fig B. Switching time test circuit & waveform

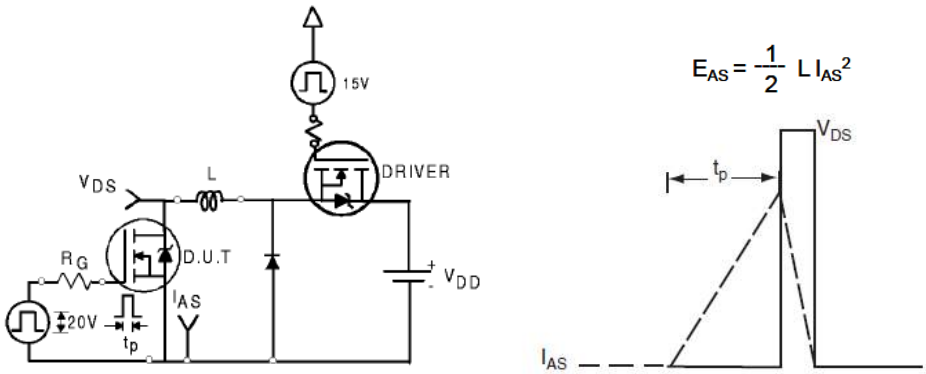


Fig C. Unclamped Inductive switching test circuit & waveform

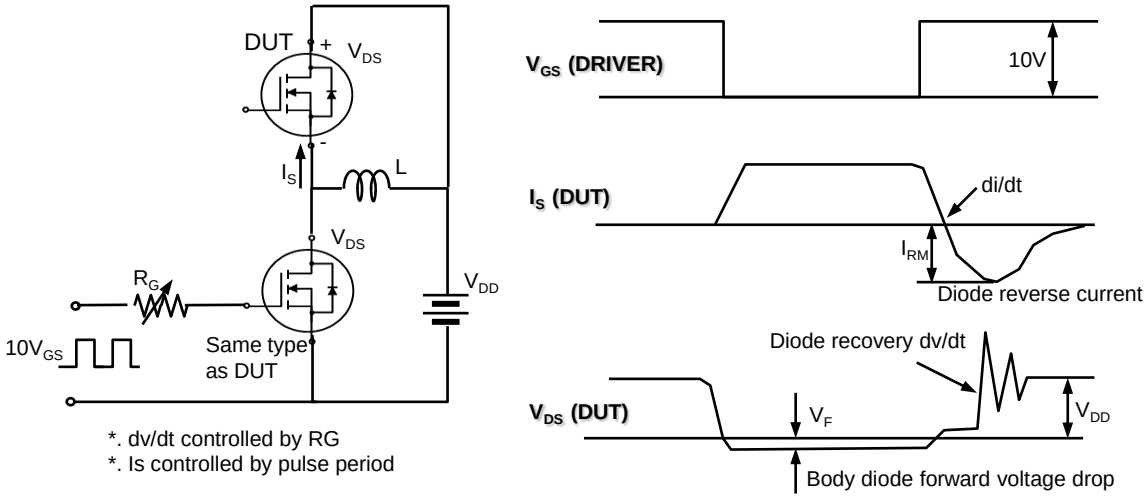
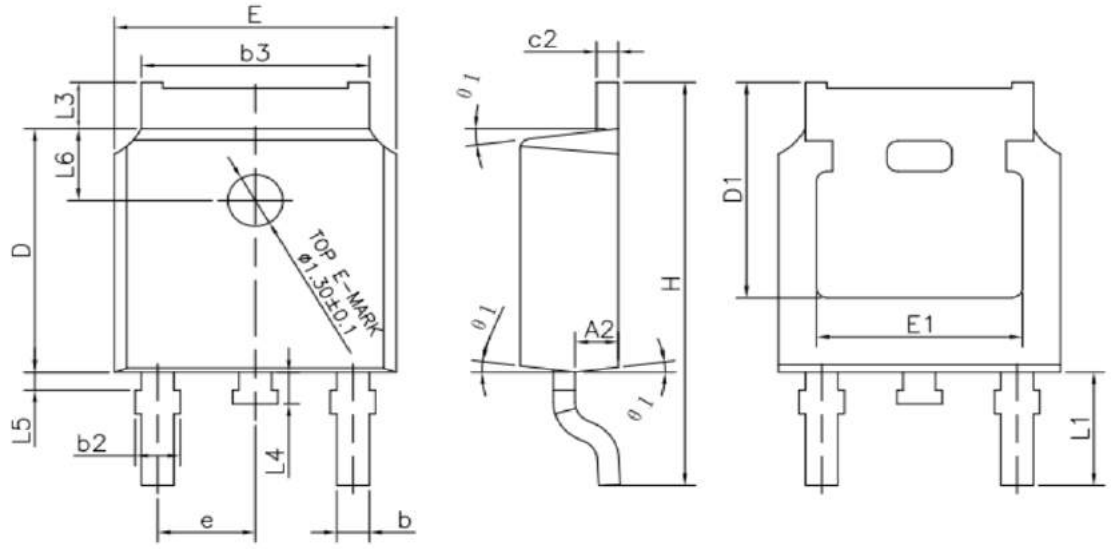
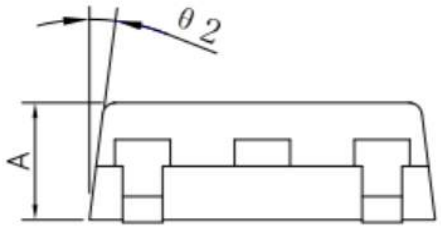
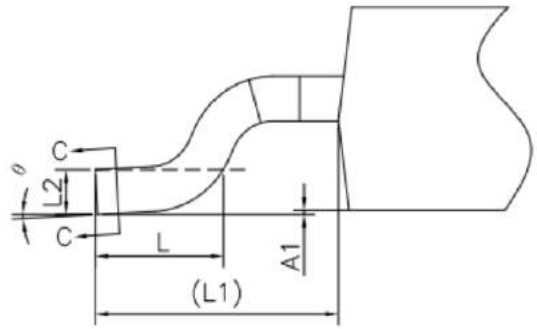


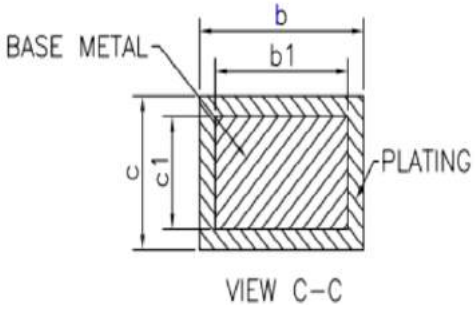
Fig D. Peak diode recovery dv/dt test circuit & waveform

TO-252 Package Information









SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0	---	0.10
A2	0.90	1.01	1.10
b	0.72	---	0.85
b1	0.71	0.76	0.81
b2	0.72	---	0.90
b3	5.13	5.33	5.46
c	0.47	---	0.60
c1	0.46	0.51	0.56
c2	0.47	---	0.60
D	6.00	6.10	6.20
D1	5.25	---	---
E	6.50	6.60	6.70
E1	4.70	---	---
e	2.186	2.286	2.386
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90 REF		
L2	0.508 BSC		
L3	0.90	---	1.25
L4	0.60	0.80	1.00
L5	0.15	---	0.75
L6	1.80 REF		
θ	0°	---	8°
θ1	5°	7°	9°
θ2	5°	7°	9°

Customer Service

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