

Description

Features

- Ultra-low $R_{DS(on)}$
- Low Gate Charge
- Halogen-free and RoHS-compliant

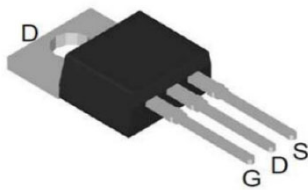
Application

- Load Switching, e-Fuse Switching
- Current Switching in DC/DC
- Power Management in Computing

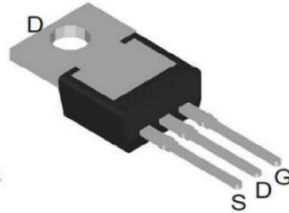
V_{DS}	60	V
$R_{ds(on)typ}@V_{gs}=10V$	1.8	m Ω
I_D	220	A



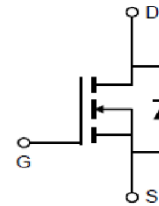
Top View



Bottom View



Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMS60H22P	S60H22P	TO220	Tube	NA	NA	50pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_{D@Tc=25^{\circ}C}$	Continuous Drain Current, $V_{GS}=10V$	220	A
$I_{D@Tc=100^{\circ}C}$	Continuous Drain Current, $V_{GS}=10V$	120	A
I_{DM}	Pulsed Drain Current ¹	800	A
EAS	Single Pulse Avalanche Energy	930	mJ
$PD@Tc=25^{\circ}C$	Total Power Dissipation	156	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_j	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Typ	Max	Units
R _{θJA}	Thermal Resistance Junction-Ambient	50	55	°C/W
R _{θJC}	Thermal Resistance Junction-Case	0.6	0.8	°C/W

Electrical Characteristics (T_J=25 °C, Unless otherwise noted)

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	60	--	--	V	V _{GS} =0V, I _D =250uA
R _{DS(ON)}	Static Drain-Source On-Resistance	--	1.8	3	mΩ	V _{GS} =10V, I _D =80A
V _{GS(th)}	Gate Threshold Voltage	2	3	4	V	V _{GS} =V _{DS} , I _D =250uA
IDSS	Drain-Source Leakage Current	--	--	1	uA	V _{DS} =60V, V _{GS} =0V, T _J =25°C
		--	--	10	uA	V _{DS} =48V, V _{GS} =0V, T _J =125°C
IGSS	Gate-Source Leakage Current	--	--	±100	nA	V _{GS} =±20V, V _{DS} =0V
g _{fs}	Forward Transconductance	--	198	--	S	V _{DS} =10V, I _D =80A
R _g	Gate Resistance	--	0.7	--	Ω	V _{DS} =0V, V _{GS} =0V, f=1MHz
Q _g	Total Gate Charge ^{2,3}	--	114	--	nC	V _{DS} =30V, V _{GS} =10V, I _D =80A
Q _{gs}	Gate-Source Charge ^{2,3}	--	34	--		
Q _{gd}	Gate-Drain Charge ^{2,3}	--	32	--		
T _{d(on)}	Turn-On Delay Time ^{2,3}	--	13	--	ns	V _{DD} =30V, V _{GS} =10V, R _G =1.5Ω I _D =20A
T _r	Rise Time ^{2,3}	--	21	--		
T _{d(off)}	Turn-Off Delay Time ^{2,3}	--	57	--		
T _f	Fall Time ^{2,3}	--	25	--	pF	V _{DS} =30V, V _{GS} =0V, f=1MHz
C _{iss}	Input Capacitance	--	7050	--		
C _{oss}	Output Capacitance	--	2730	--		
C _{rss}	Reverse Transfer Capacitance	--	104	--		

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
T _{rr}	Body Diode Reverse Recovery Time	IF=20A, di/dt=100A/us	--	56	--	ns
Q _{rr}	Body Diode Reverse Recovery Charge		--	65	--	nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =30A, T _J =25°C	--	--	1.3	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.
4. The EAS data shows Max. rating. The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH.

Typical Performance Characteristics

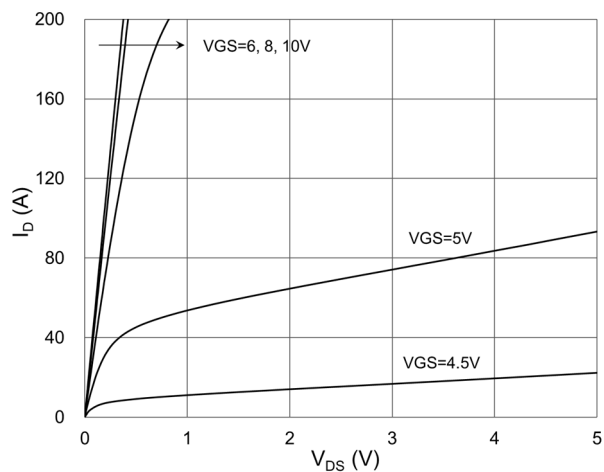
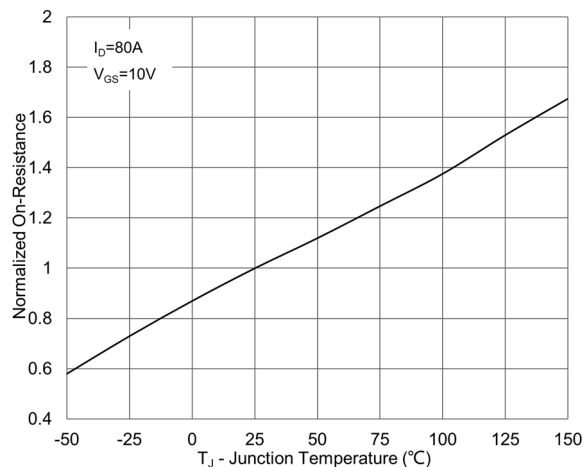
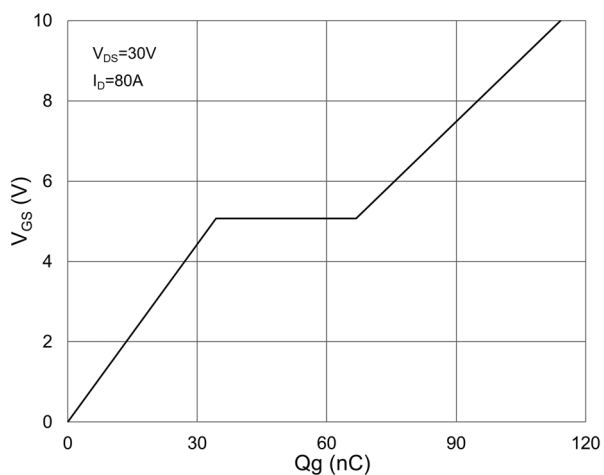
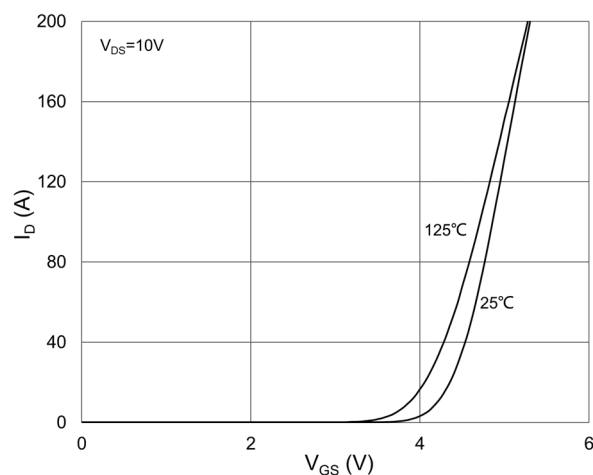
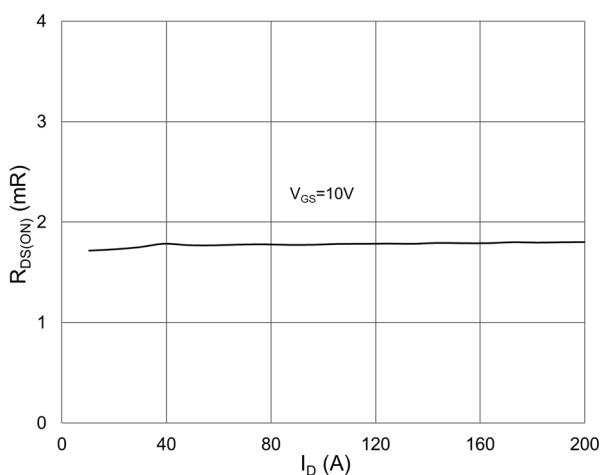
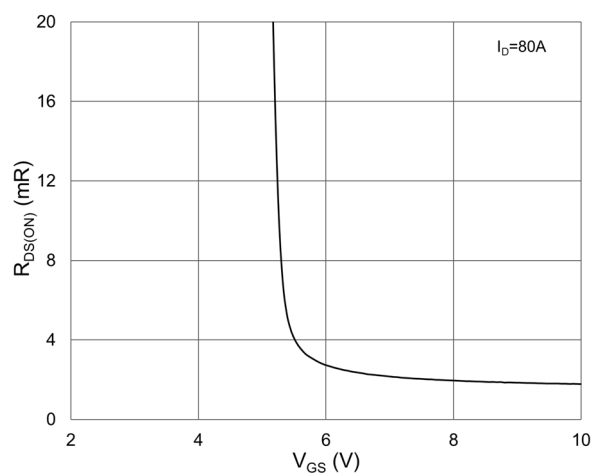
Fig1 Output Characteristics

Fig2 Normalized $R_{DS(on)}$ vs. T_J

Fig3 Gate Charge Waveform

Fig4 Transfer Characteristics

Fig5 $R_{ds(on)}$ vs. Drain Current and Gate Voltage

Fig6 $R_{ds(on)}$ vs. Gate Voltage


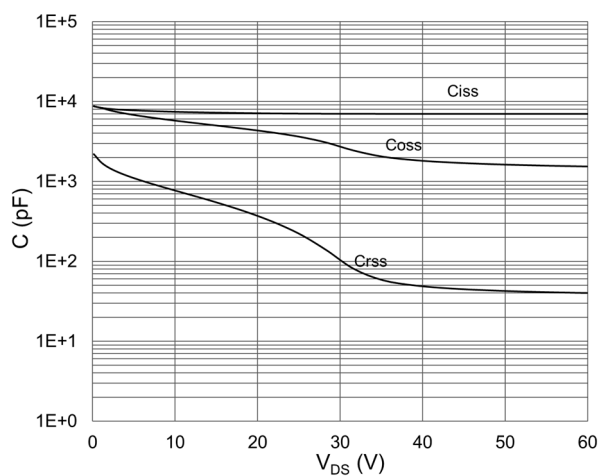
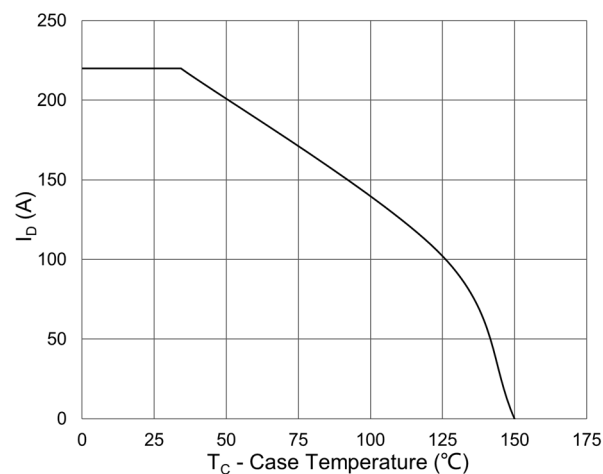
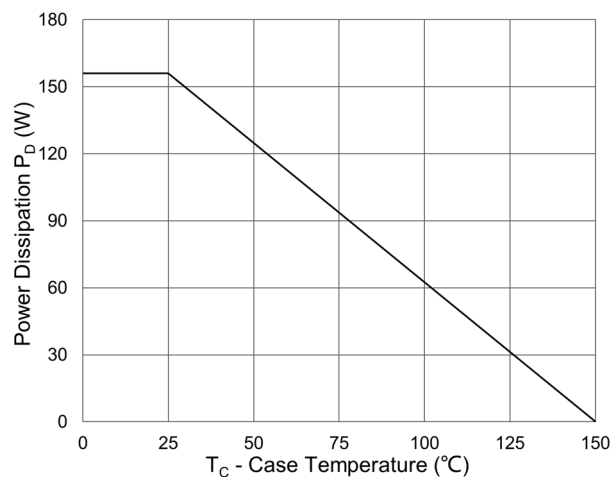
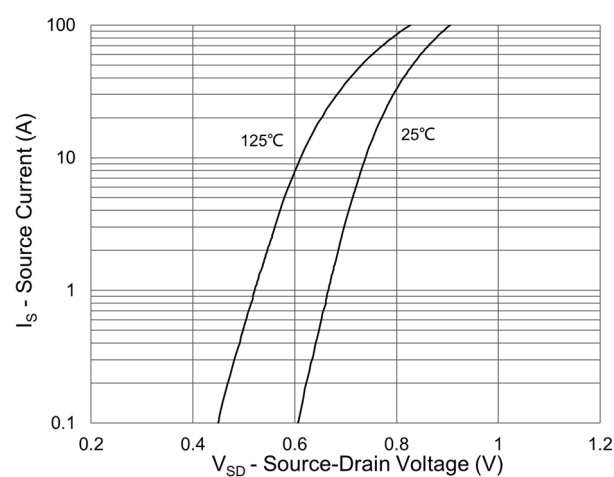
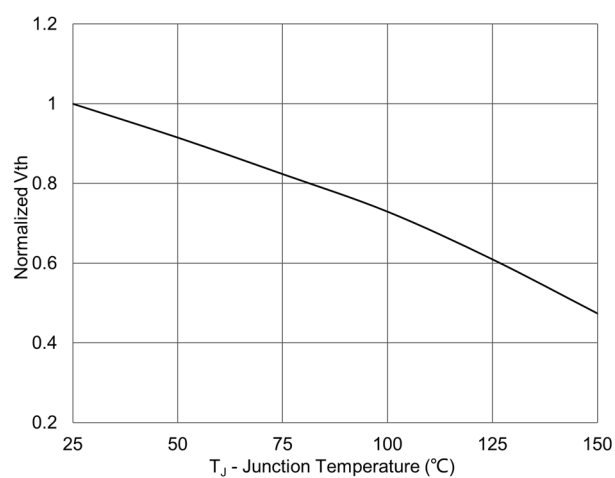
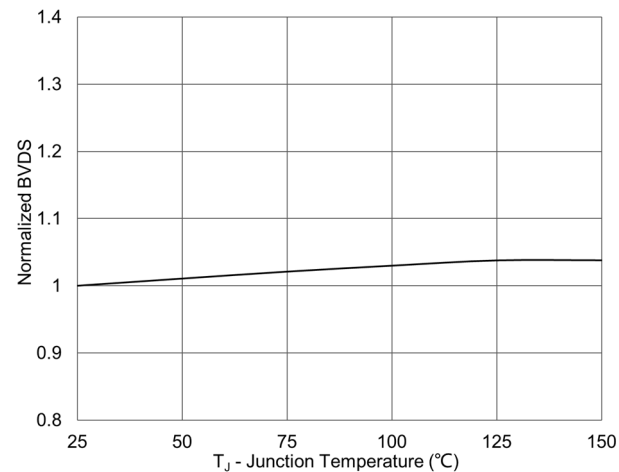
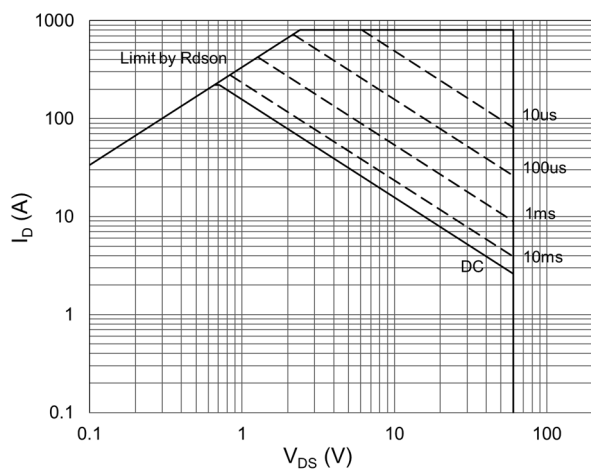
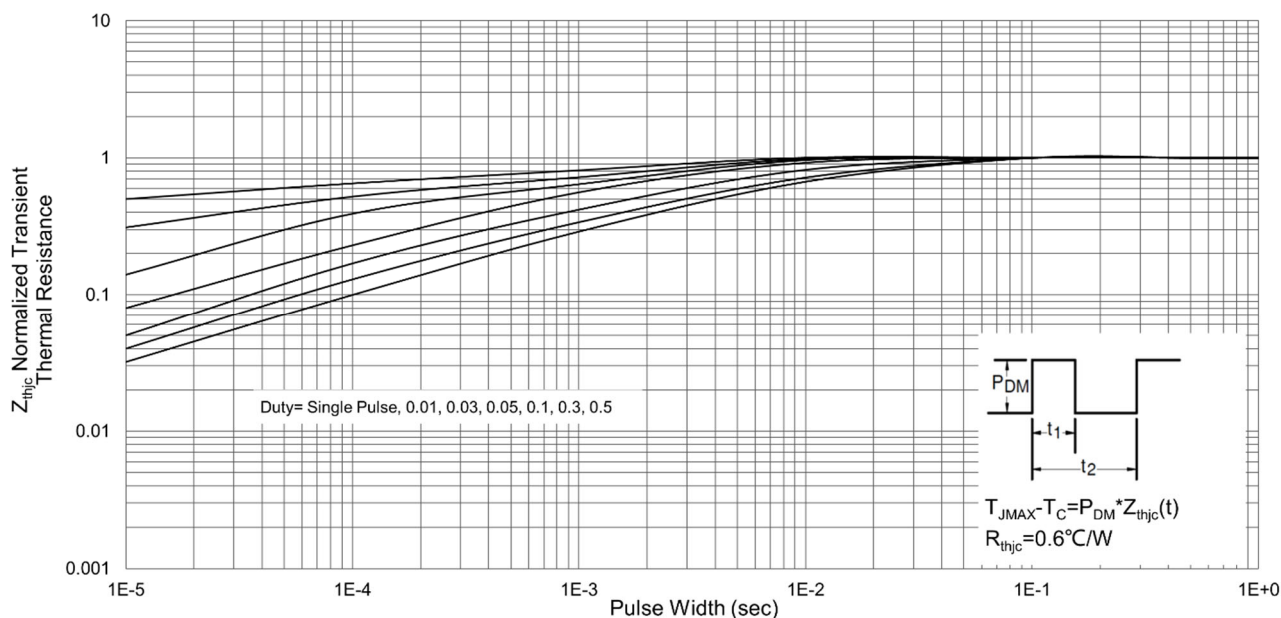
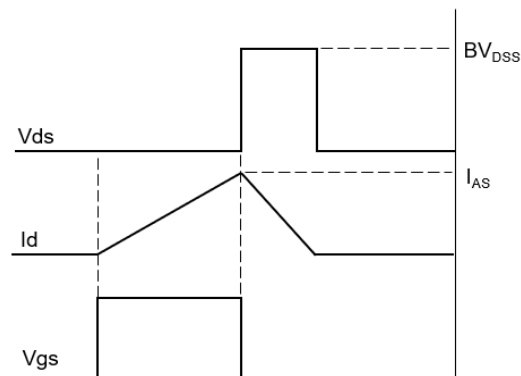
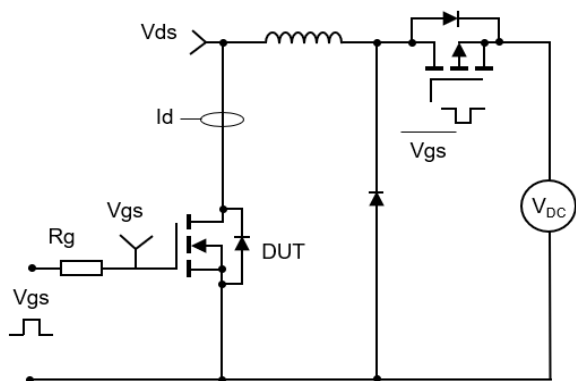
Fig7 Capacitance Characteristics

Fig8 Drain Current Derating

Fig9 Power Dissipation

Fig10 Source-Drain Diode Forward Characteristics

Fig11 Normalized Threshold Voltage vs. T_J

Fig12 Normalized Breakdown Voltage vs. T_J


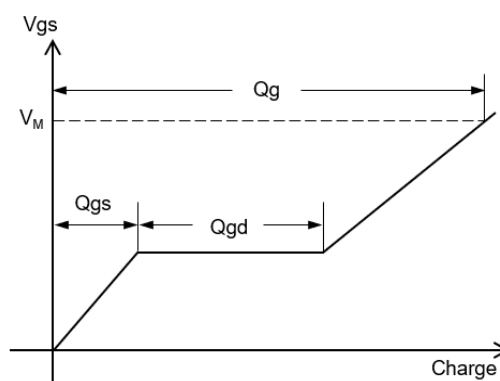
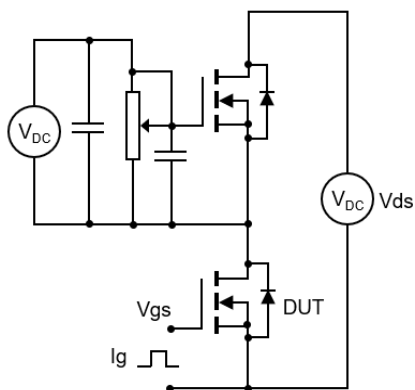
Fig13 Maximum Safe Operation Area

Fig14 Normalized Transient Impedance


Test Circuit & Waveform

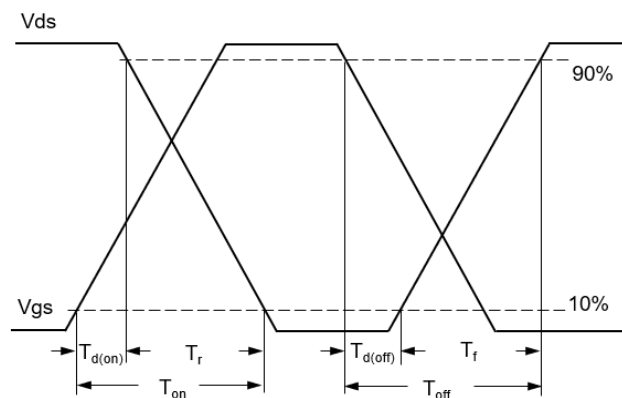
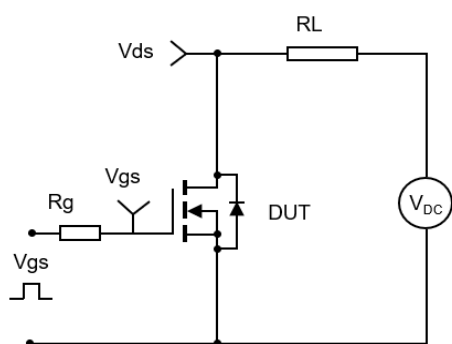
1. Unclamped Inductive Switching Test Circuit & Waveform



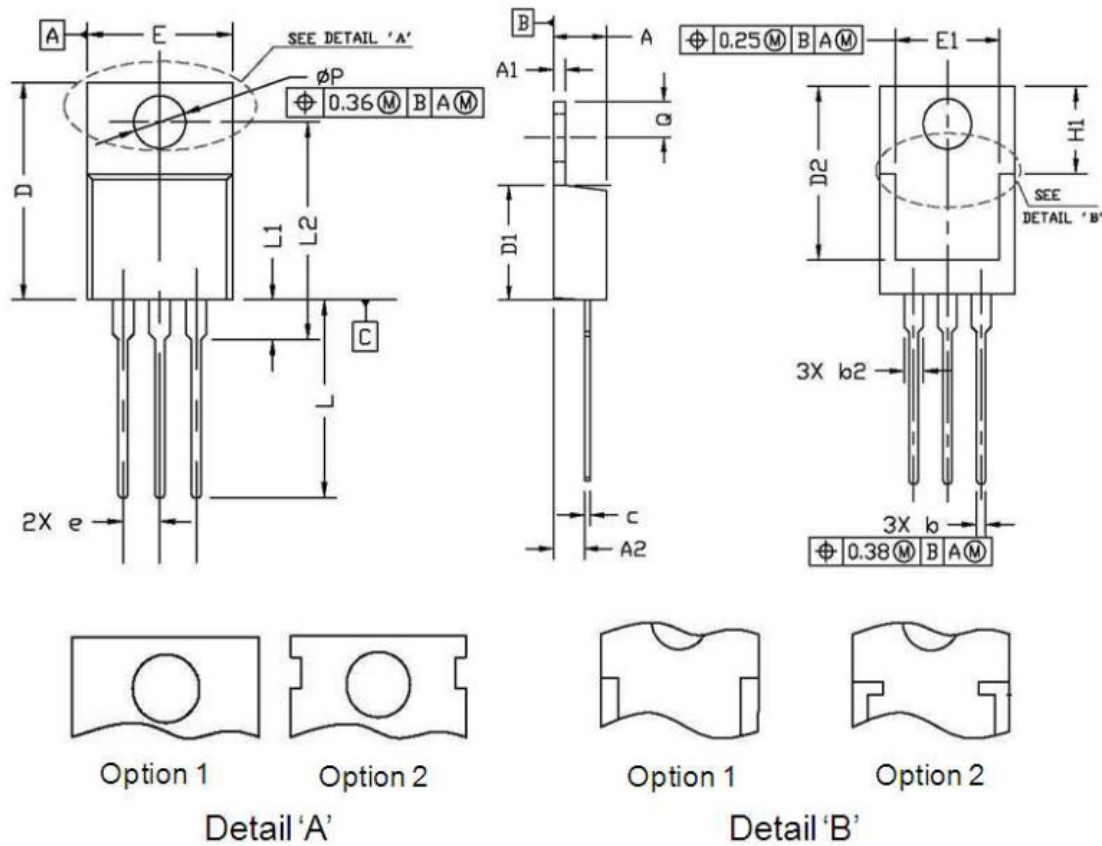
2. Gate Charge Test Circuit & Waveform



3. Resistive Switching Test Circuit & Waveform



TO220 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.80	0.169	0.189
A1	1.20	1.45	0.047	0.057
A2	2.20	2.90	0.087	0.114
b	0.69	0.95	0.027	0.037
b2	1.00	1.60	0.039	0.063
c	0.33	0.65	0.013	0.026
D	14.70	16.20	0.579	0.638
D1	8.59	9.65	0.338	0.380
D2	11.75	13.60	0.463	0.535
e	2.54 BSC.		0.100 BSC.	
E	9.60	10.60	0.378	0.417
E1	7.00	8.46	0.276	0.333
H1	6.20	7.00	0.244	0.276
L	12.60	14.80	0.496	0.583
L1	2.70	3.80	0.106	0.150
L2	12.13	16.50	0.478	0.650
Q	2.40	3.10	0.094	0.122
P	3.50	3.90	0.138	0.154