

Description

Features

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

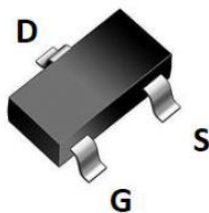
Application

- High current load application
- Load switching
- Quick Charge

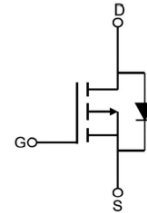
V_{DS}	-16	V
$R_{ds(on),typ}@V_{gs}=-4.5V$	17.5	mΩ
$R_{ds(on),typ}@V_{gs}=-2.5V$	22	mΩ
I_D	-12	A



Top View



Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMT10P12R1	1012D	SOT23-3L	Reel	NA	NA	3000pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-16	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_c=25^\circ C$	Continuous Drain Current, $V_{GS}=-4.5V$	-12	A
$I_D@T_c=100^\circ C$	Continuous Drain Current, $V_{GS}=-4.5V$	-7.5	A
IDM	Pulsed Drain Current ¹	-48	A
$PD@T_c=25^\circ C$	Total Power Dissipation	3.9	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 _{θJC}	Thermal Resistance Junction-Case	30	36	°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	--	--	-16	V	V _{GS} =0V, I _D = -250uA
R _{DS(ON)}	Static Drain-Source On-Resistance	--	17.5	22	mΩ	V _{GS} = -4.5V, I _D = -2A
		--	22	27		V _{GS} = -2.5V, I _D = -1A
V _{GS(th)}	Gate Threshold Voltage	-0.4	-0.6	-1.2	V	V _{GS} =V _{DS} , I _D = -250uA
IDSS	Drain-Source Leakage Current	--	--	-1	uA	V _{DS} = -16V, V _{GS} =0V, T _J =25°C
		--	--	-10	uA	V _{DS} = -12.8V, V _{GS} =0V, T _J =125°C
IGSS	Gate-Source Leakage Current	--	--	±100	nA	V _{GS} =±10V, V _{DS} =0V
R _g	Gate Resistance	--	16.6	--	Ω	V _{DS} =0V, V _{GS} =0V, f=1MHz
Q _g	Total Gate Charge ^{2,3}	--	11	--	nC	V _{DS} = -8V, V _{GS} = -4.5V, I _D = -2A
Q _{gs}	Gate-Source Charge ^{2,3}	--	1.8	--		
Q _{gd}	Gate-Drain Charge ^{2,3}	--	3.2	--		
T _{d(on)}	Turn-On Delay Time ^{2,3}	--	13	--	ns	V _{DD} = -8V, V _{GS} = -4.5V, R _G =3Ω I _D = -2A
T _r	Rise Time ^{2,3}	--	35	--		
T _{d(off)}	Turn-Off Delay Time ^{2,3}	--	33	--		
T _f	Fall Time ^{2,3}	--	11	--	pF	V _{DS} = -8V, V _{GS} =0V, f=1MHz
C _{iss}	Input Capacitance	--	970	--		
C _{oss}	Output Capacitance	--	196	--		
C _{rss}	Reverse Transfer Capacitance	--	132	--		

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
I _S	Continuous Source Current	VG=VD=0V, Force Current	--	--	-12	A
I _{sm}	Pulsed Source Current		--	--	-48	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S = -2A, T _J =25°C	--	--	-1.1	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.

Typical Performance Characteristics

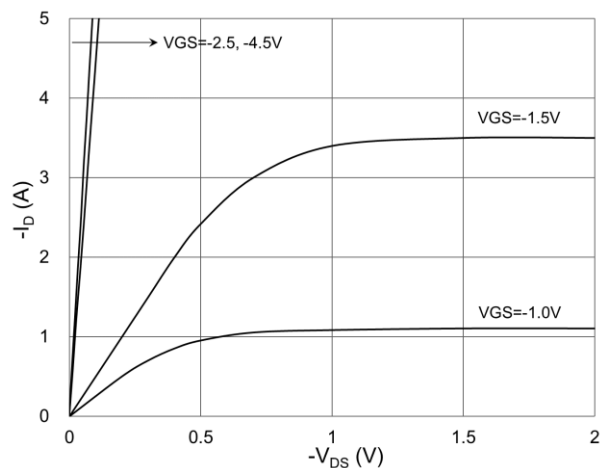
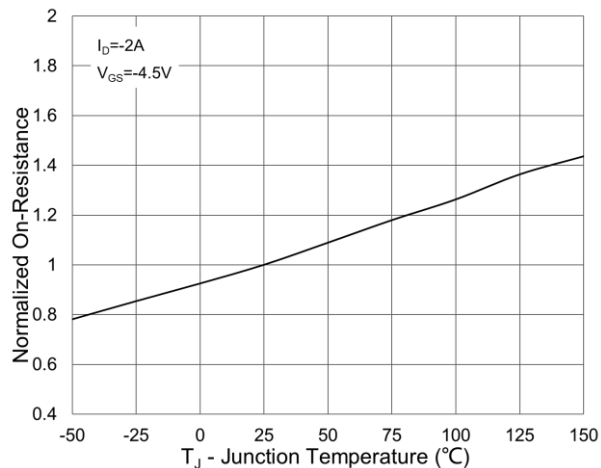
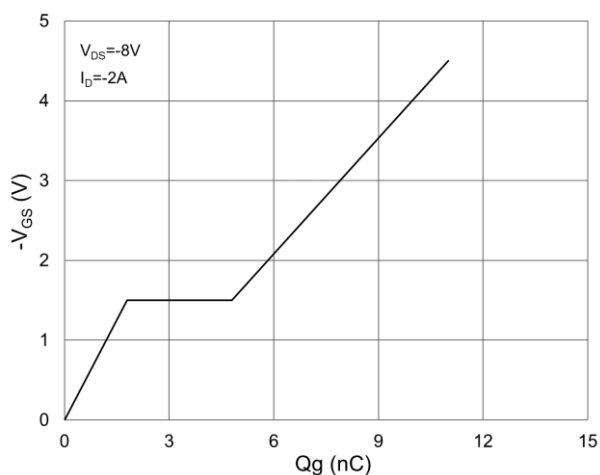
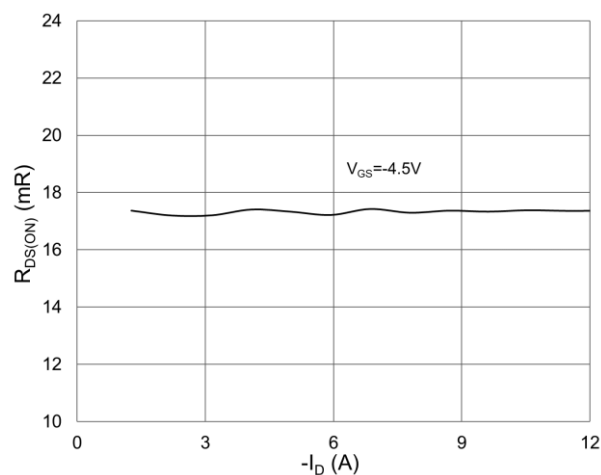
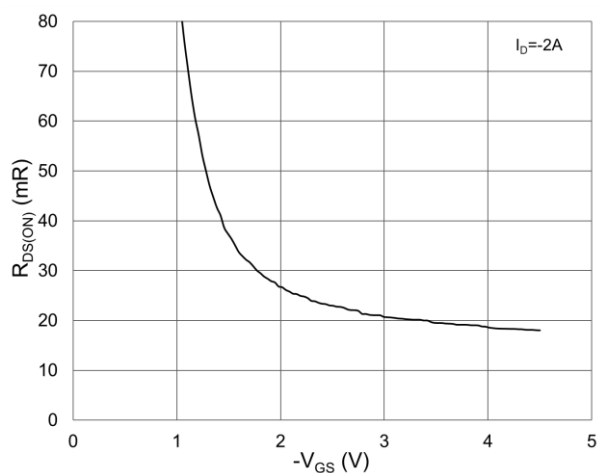
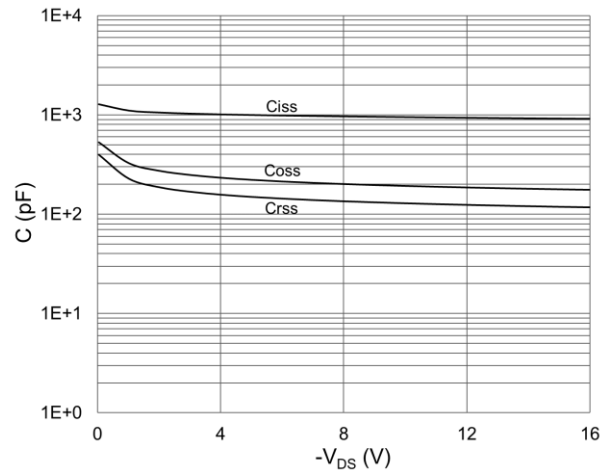
Fig1 Output Characteristics

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

Fig3 Gate Charge Waveform

Fig4 $R_{DS(on)}$ vs. Drain Current and Gate Voltage

Fig5 $R_{DS(on)}$ vs. Gate Voltage

Fig6 Capacitance Characteristics


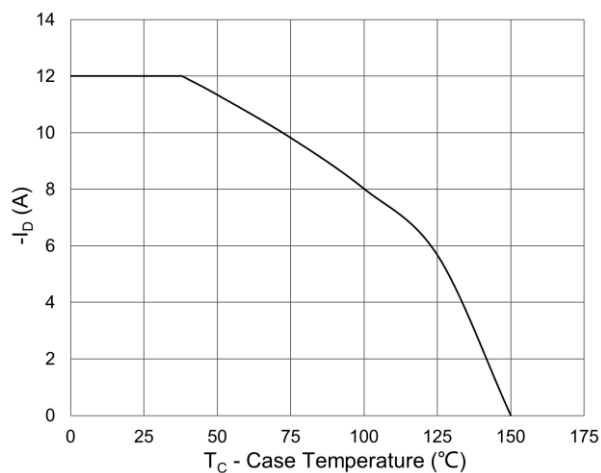
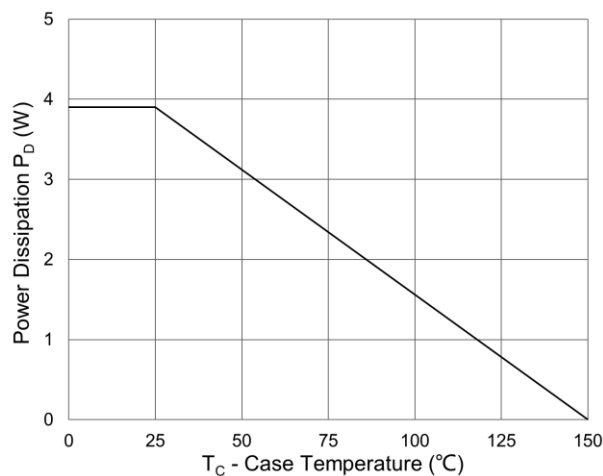
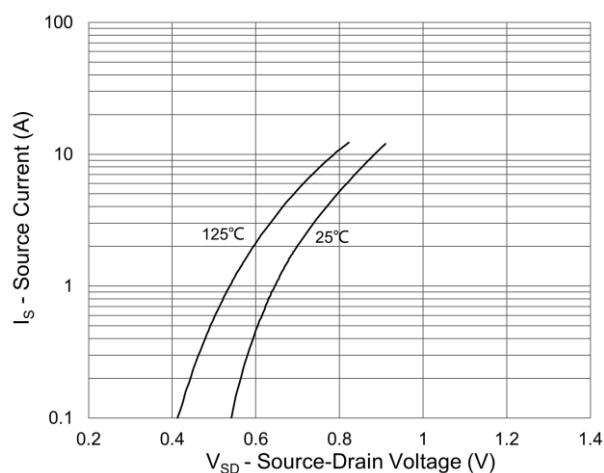
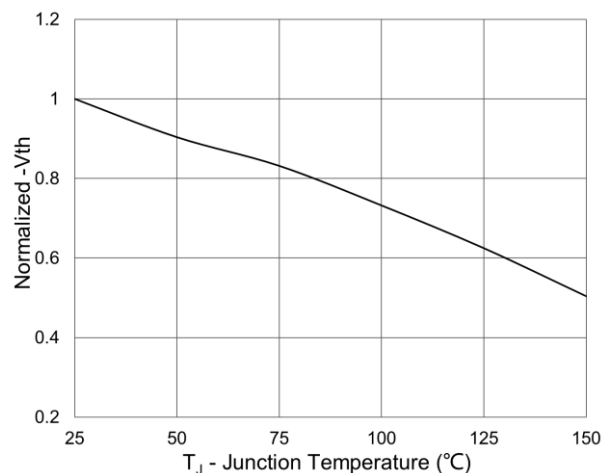
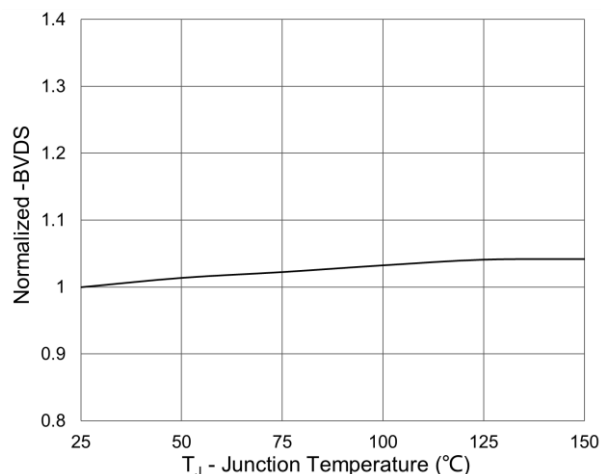
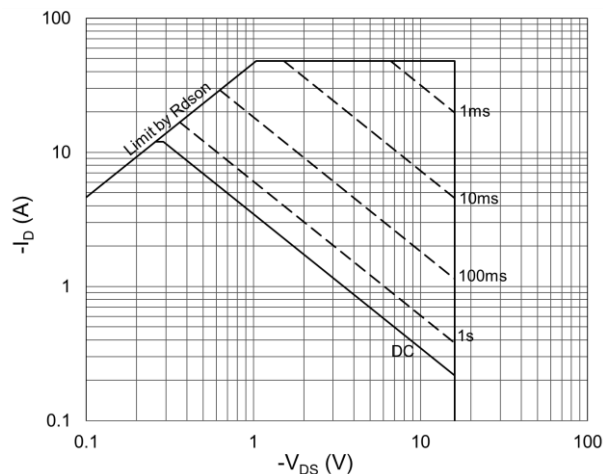
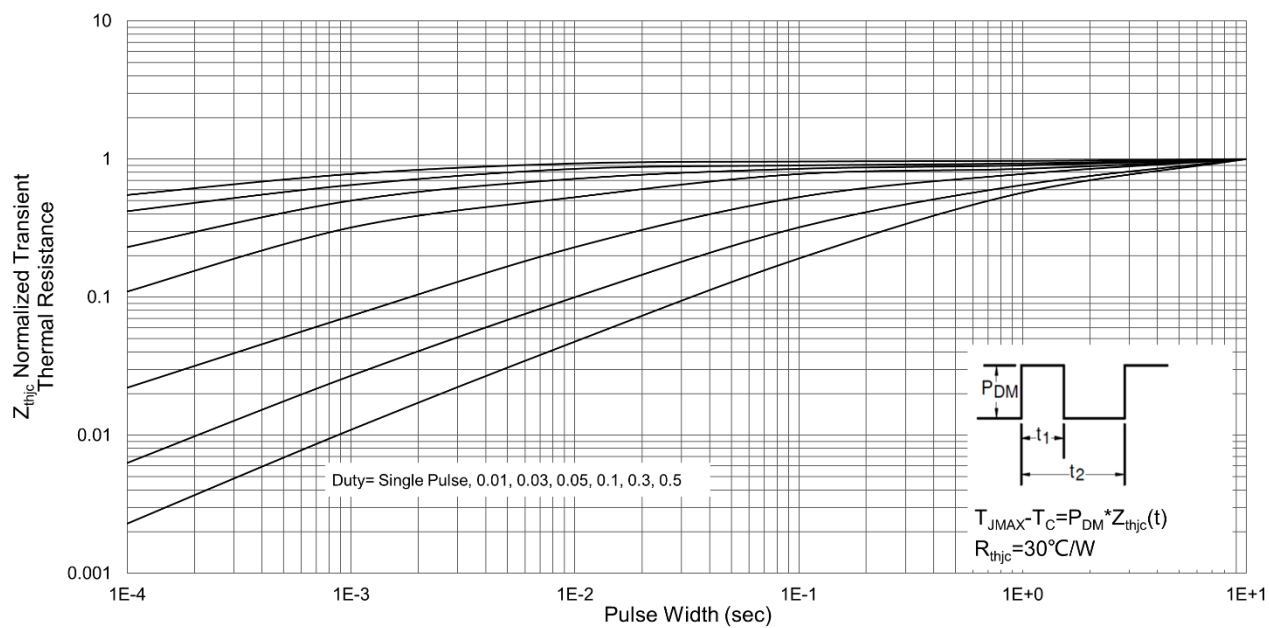
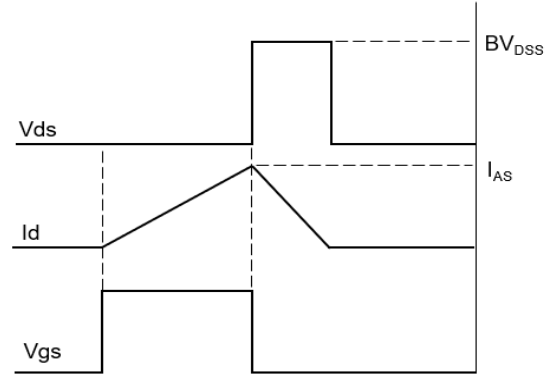
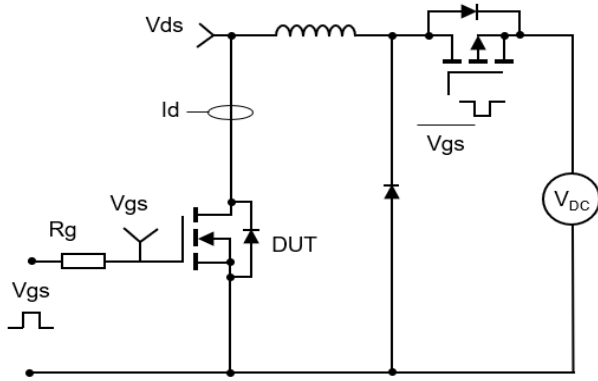
Fig7 Drain Current Derating

Fig8 Power Dissipation

Fig9 Source-Drain Diode Forward Characteristics

Fig10 Normalized Threshold Voltage vs. T_J

Fig11 Normalized Breakdown Voltage vs. T_J

Fig12 Maximum Safe Operation Area


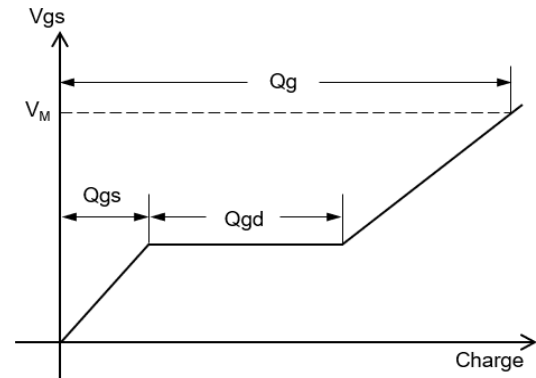
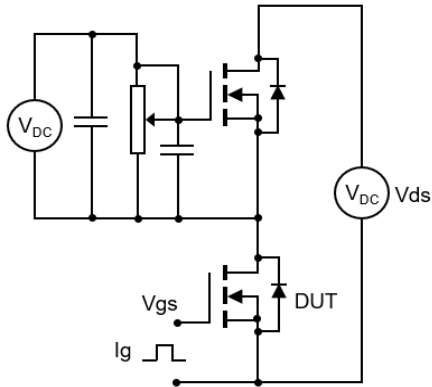
Fig13 Normalized Transient Impedance


Test Circuit & Waveform

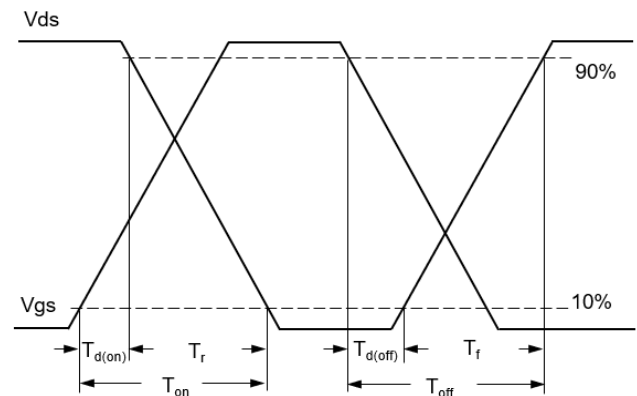
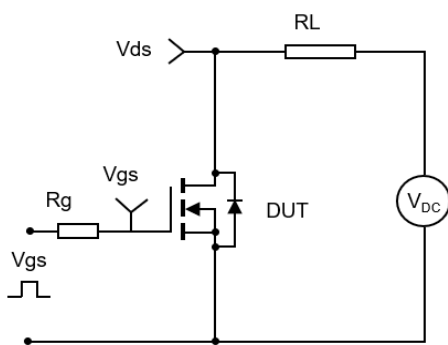
1. Unclamped Inductive Switching Test Circuit & Waveform



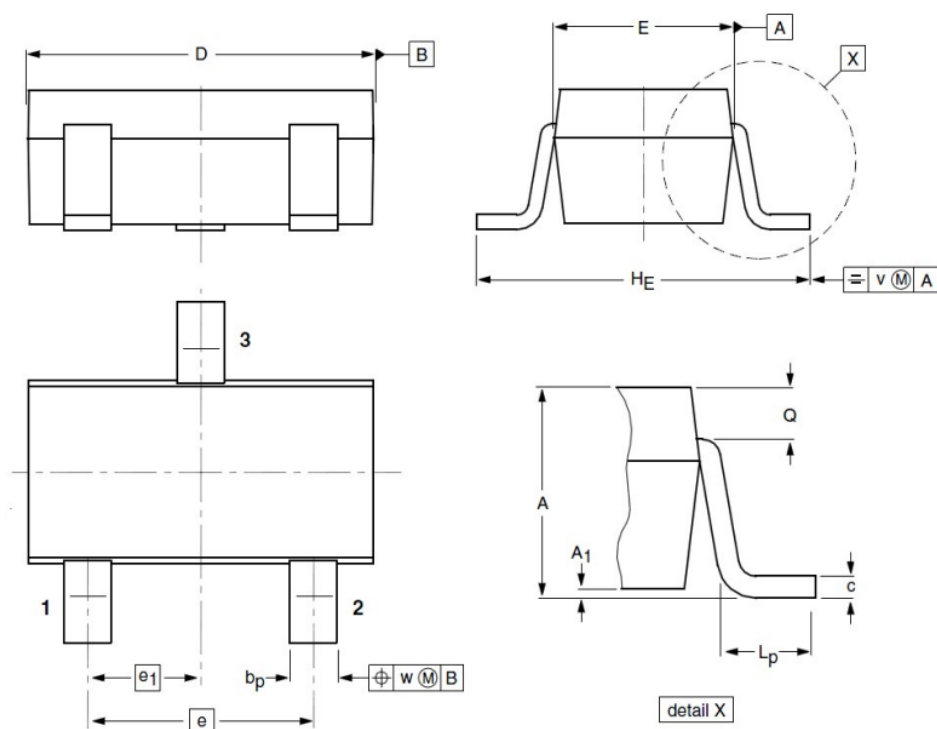
2. Gate Charge Test Circuit & Waveform



3. Resistive Switching Test Circuit & Waveform



SOT23-3L Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

DIM	MILIMETER		
	MIN	MOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.82	2.90	3.02
E	1.52	1.60	1.72
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55REF		
e	0.95BSC		
e1	1.90REF		