

Description

Features

- Advanced SGT technology
- Excellent $Q_g \cdot R_{on}$ product(FOM)
- Extremely low on-resistance(R_{on})

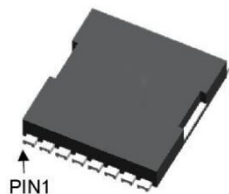
V_{DS}	60	V
$R_{ds(on),typ}@V_{gs}=10V$	1.2	mΩ
I_D	330	A

Application

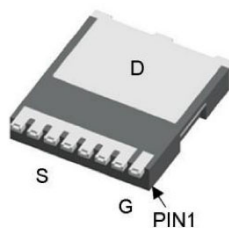
- Battery management
- High current switching application
- Power management



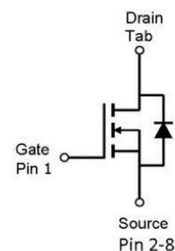
Top View



Bottom View



Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMS60H33T	S60H33T	Toll-8	Reel	330*28.5mm	24mm	2000pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
$I_D@T_c=25^{\circ}C$	Continuous Drain Current, $V_{GS}=10V$	330	A
$I_D@T_c=100^{\circ}C$	Continuous Drain Current, $V_{GS}=10V$	210	A
I_{DM}	Pulsed Drain Current ¹	1300	A
EAS	Single Pulse Avalanche Energy ⁴	1092	mJ
$PD@T_c=25^{\circ}C$	Total Power Dissipation	250	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_j	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ	Max	Units
R _{θJA}	Thermal Resistance Junction-Ambient	50	55	°C/W
R _{θJC}	Thermal Resistance Junction-Case	0.45	0.5	°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
RDS(ON)	Static Drain-Source On-Resistance	--	1.2	1.6	mΩ	V _{GS} =10V, I _D =80A
VGS(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
R _g	Gate Resistance	--	0.8	--	Ω	V _{DS} =0V, V _{GS} =0V, f=1MHz
Q _g	Total Gate Charge (10V) ^{2,3}	--	113	--	nC	V _{DS} =30V, V _{GS} =10V, I _D =80A
Q _{gs}	Gate-Source Charge ^{2,3}	--	36	--		
Q _{gd}	Gate-Drain Charge ^{2,3}	--	34.6	--		
Td(on)	Turn-On Delay Time ^{2,3}	--	24	--	ns	V _{DD} =30V, V _{GS} =10V, R _G =6Ω I _D =80A
Tr	Rise Time ^{2,3}	--	70	--		
Td(off)	Turn-Off Delay Time ^{2,3}	--	130	--		
Tf	Fall Time ^{2,3}	--	87	--		
Ciss	Input Capacitance	--	7107	--	pF	V _{DS} =30V, V _{GS} =0V, f=1MHz
Coss	Output Capacitance	--	2888	--		
Crss	Reverse Transfer Capacitance	--	98	--		

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
T _{rr}	Body Diode Reverse Recovery Time	I _F =15A, di/dt=100A/us	--	88	--	ns
Q _{rr}	Body Diode Reverse Recovery Charge		--	60	--	nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =50A, T _J =25°C		--	1.2	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

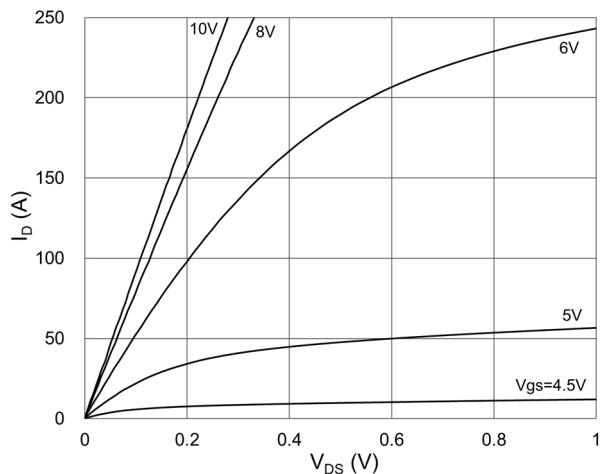
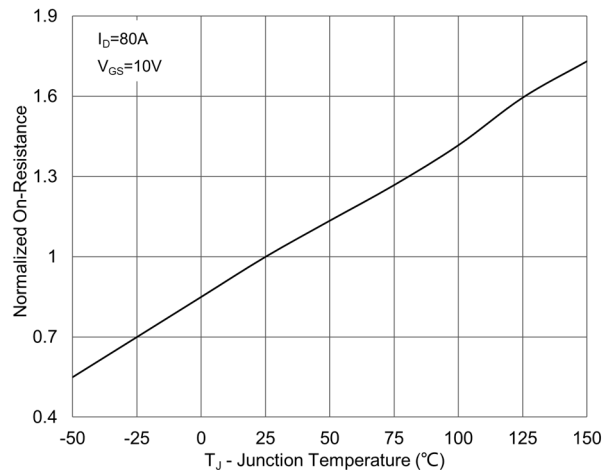
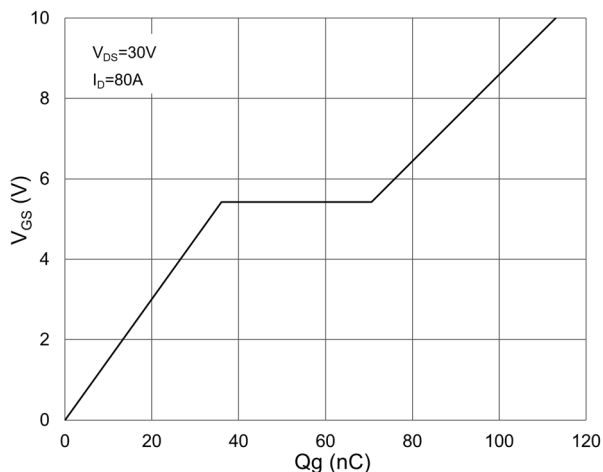
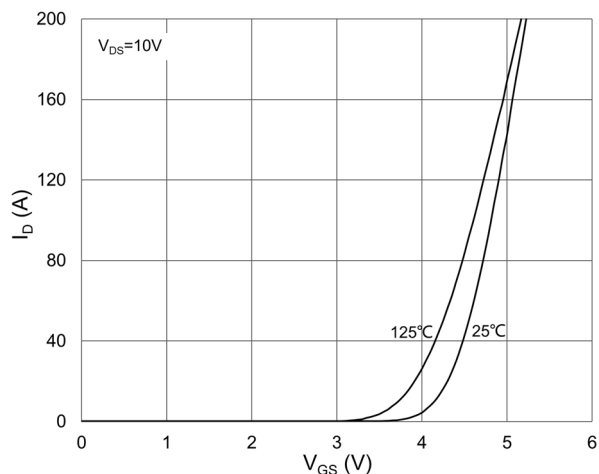
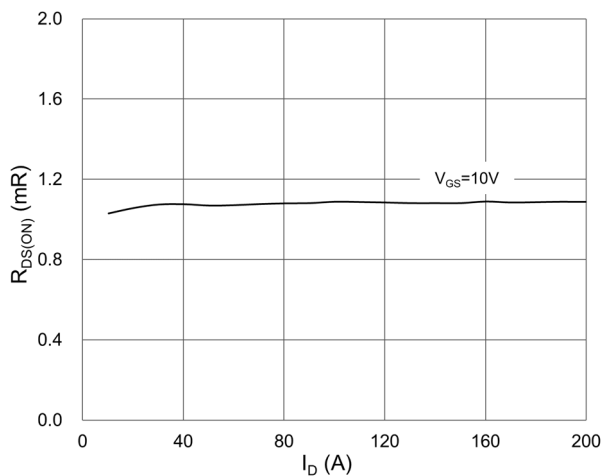
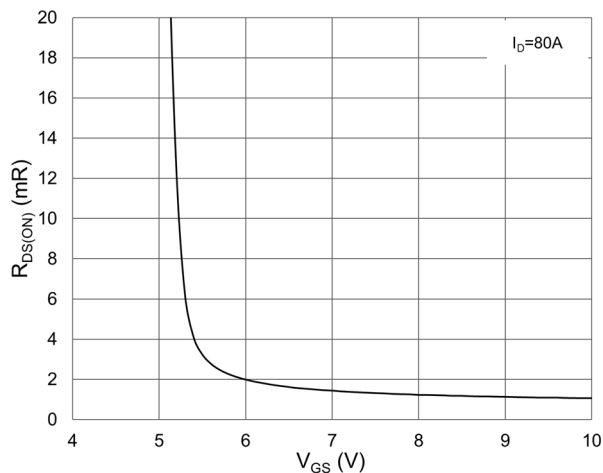
Fig1 Output Characteristics

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


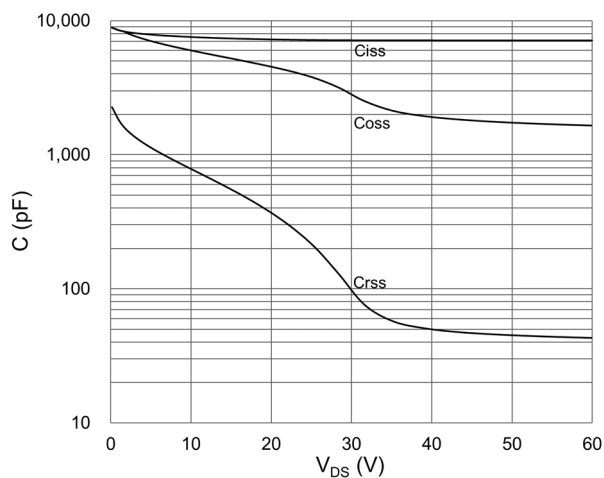
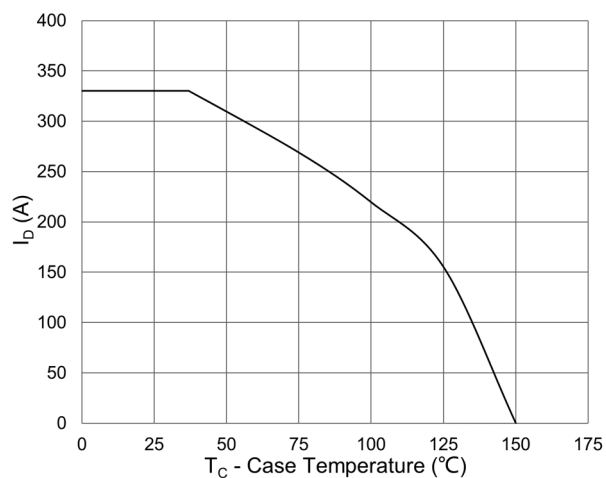
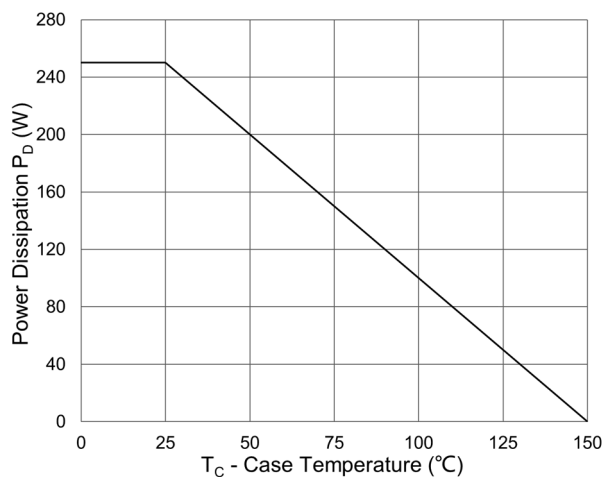
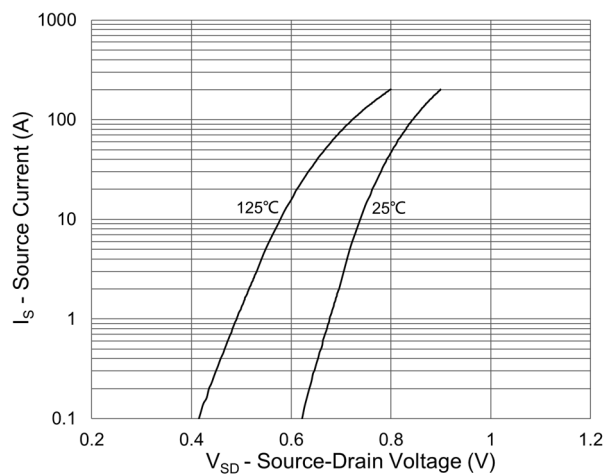
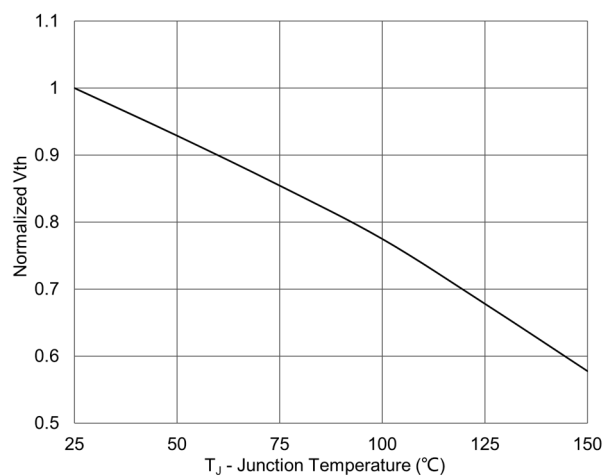
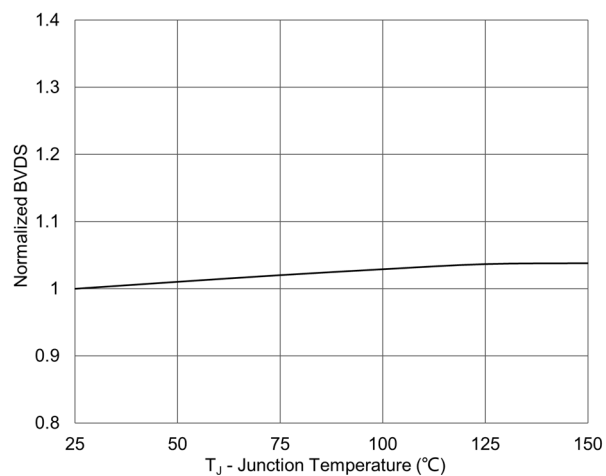
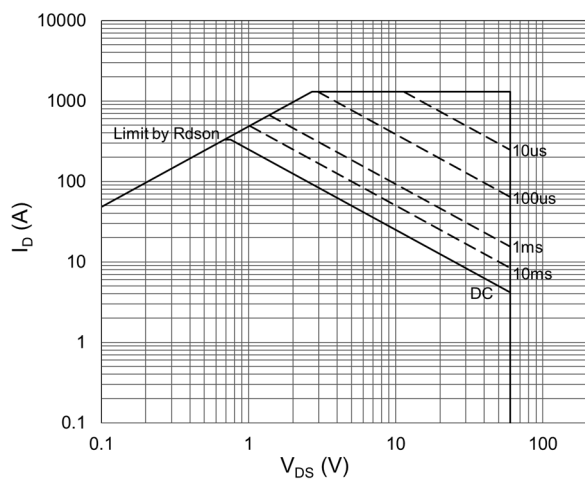
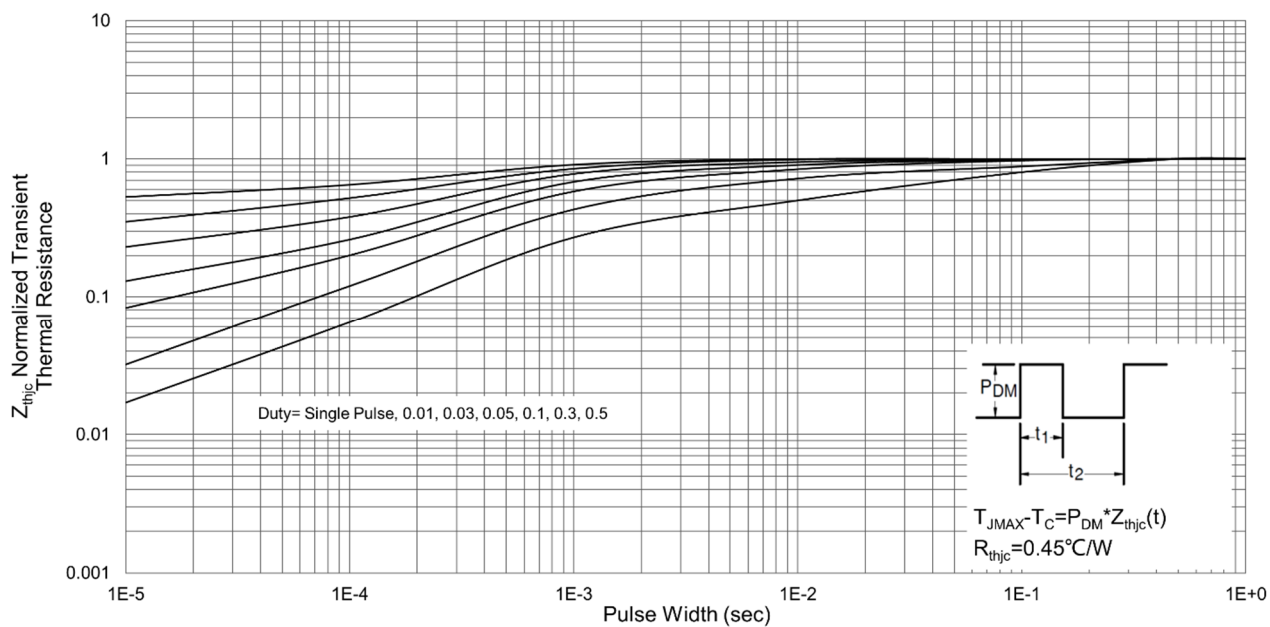
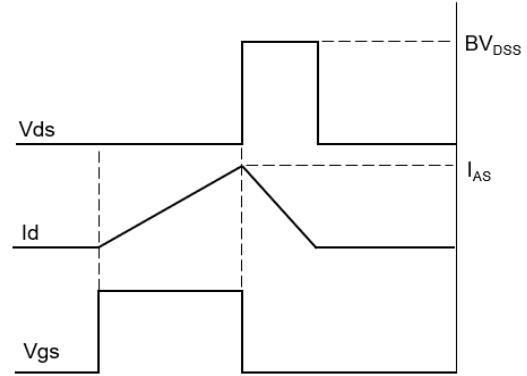
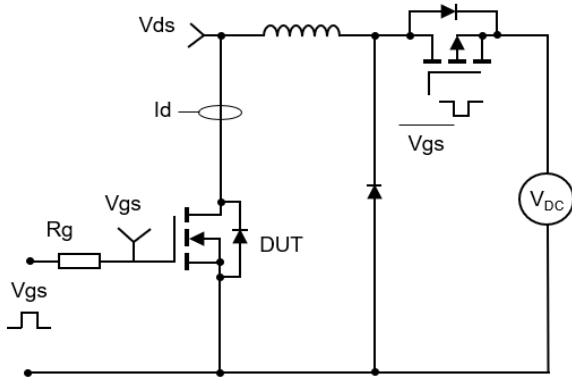
Fig7 Capacitance Characteristics

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


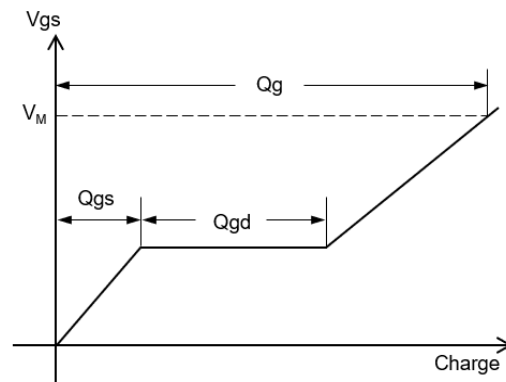
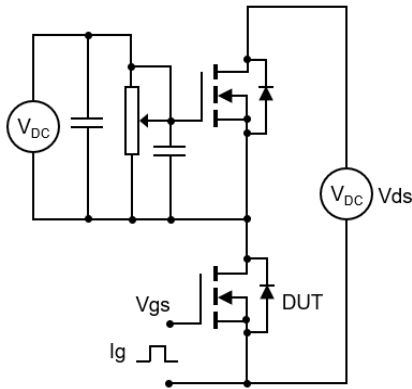
Fig13 Maximum Safe Operation Area

Fig14 Normalized Transient Impedance


Test Circuit & Waveform

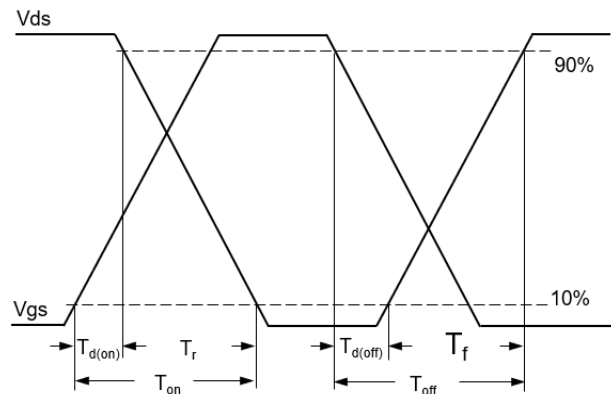
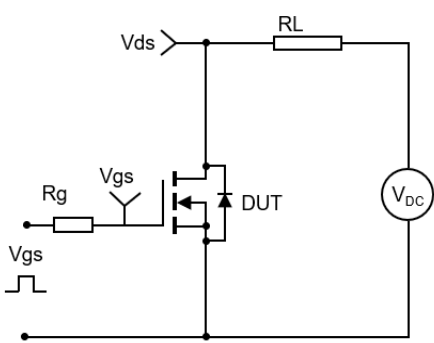
1. Unclamped Inductive Switching Test Circuit & Waveforms



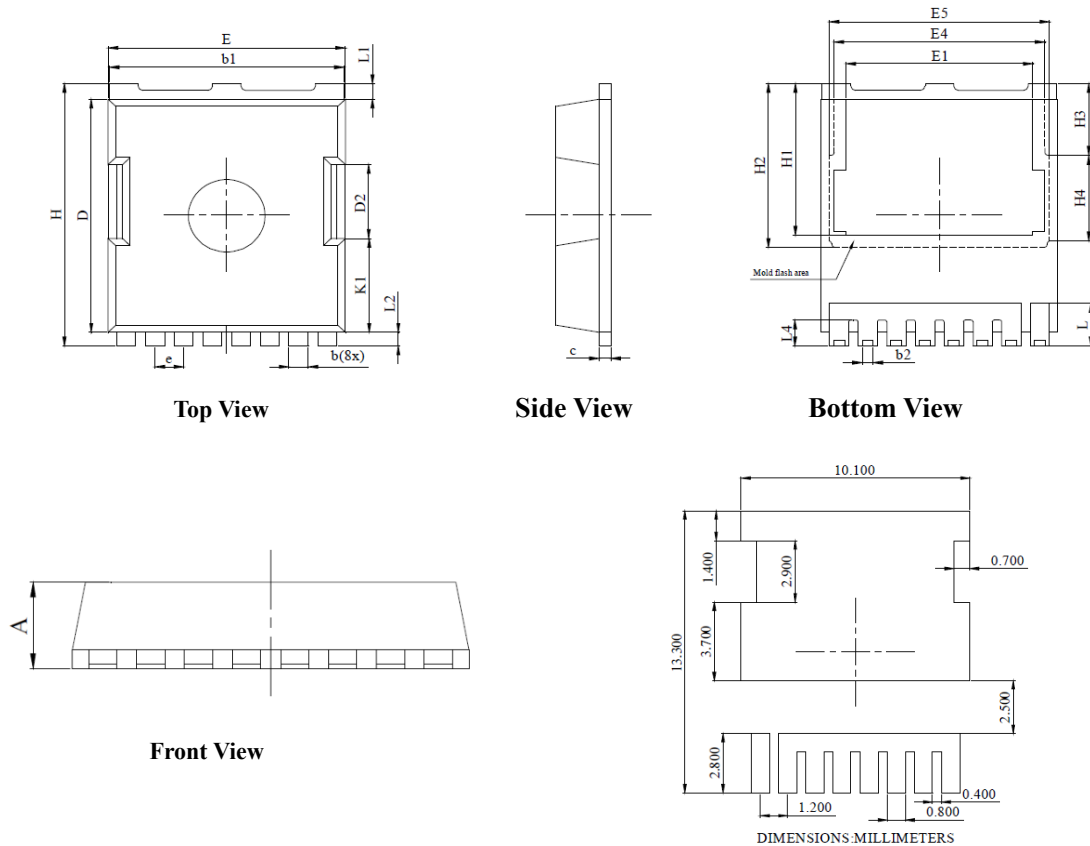
2. Gate Charge Test Circuit & Waveform



3. Resistive Switching Test Circuit & Waveform



Toll-8L Package Information



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b2	0.42	0.46	0.50
c	0.40	0.50	0.60
D	10.28	10.38	10.58
D2	3.30		
E	9.70	9.90	10.10
E1	7.80		
E4	8.80		
E5	9.20		
e	1.20 (BSC)		
H	11.48	11.68	11.88
H1	6.55	6.75	6.85
H2	7.30		
H3	3.20		
H4	3.80		
K1	4.18		
L	1.70	1.90	2.10
L1	0.70		
L2	0.60		
L4	1.00	1.15	1.30