

Description

Features

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

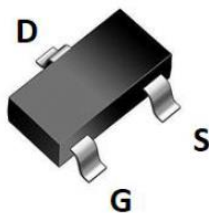
Application

- High current load application
- Load switching
- Quick Charge

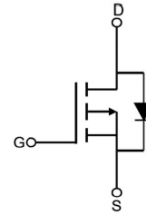
V_{DS}	-16	V
$R_{ds(on),typ}@V_{gs}=-4.5V$	18	mΩ
$R_{ds(on),typ}@V_{gs}=-2.5V$	23	mΩ
I_D	-12	A



Top View



Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMT10P12R	1012	SOT-23	Reel	NA	NA	3000pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-16	V
V_{GS}	Gate-Source Voltage	± 10	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@Tc=25°C	Total Power Dissipation	3.9	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _j	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance Junction-Case	30	36	$^{\circ}\text{C/W}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless otherwise noted)

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	--	--	-16	V	$V_{GS}=0V, I_D=-250\mu A$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	--	18	30	$m\Omega$	$V_{GS}=-4.5V, I_D=-2A$
		--	23	42		$V_{GS}=-2.5V, I_D=-1A$
$V_{GS(th)}$	Gate Threshold Voltage	-1.2	-0.6	-0.4	V	$V_{GS}=V_{DS}, I_D=-250\mu A$
IDSS	Drain-Source Leakage Current	-1	--	--	μA	$V_{DS}=-16V, V_{GS}=0V, T_J=25^{\circ}\text{C}$
		-10	--	--	μA	$V_{DS}=-12.8V, V_{GS}=0V, T_J=125^{\circ}\text{C}$
IGSS	Gate-Source Leakage Current	--	--	± 100	nA	$V_{GS}=\pm 10V, V_{DS}=0V$
R_g	Gate Resistance	--	16.6	--	Ω	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$
Q_g	Total Gate Charge	--	11	--	nC	$V_{DS}=-8V, V_{GS}=-4.5V, I_D=-2A$
Q_{gs}	Gate-Source Charge	--	1.8	--		
Q_{gd}	Gate-Drain Charge	--	3.2	--		
$T_{d(on)}$	Turn-On Delay Time	--	13	--	ns	$V_{DD}=-8V, V_{GS}=-4.5V, R_G=3\Omega, I_D=-2A$
T_r	Rise Time	--	35	--		
$T_{d(off)}$	Turn-Off Delay Time	--	33	--		
T_f	Fall Time	--	11	--		
C_{iss}	Input Capacitance	--	926	--	pF	$V_{DS}=-8V, V_{GS}=0V, f=1\text{MHz}$
C_{oss}	Output Capacitance	--	167	--		
C_{rss}	Reverse Transfer Capacitance	--	118	--		

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	--	--	-12	A
I_{sm}	Pulsed Source Current		--	--	-48	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-2A, T_J=25^{\circ}\text{C}$	--	--	-1.1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

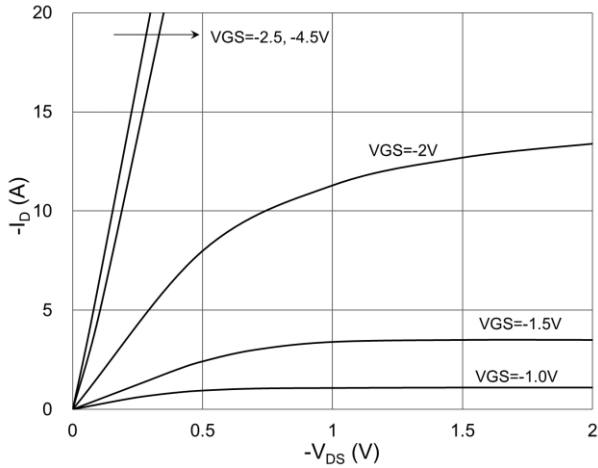
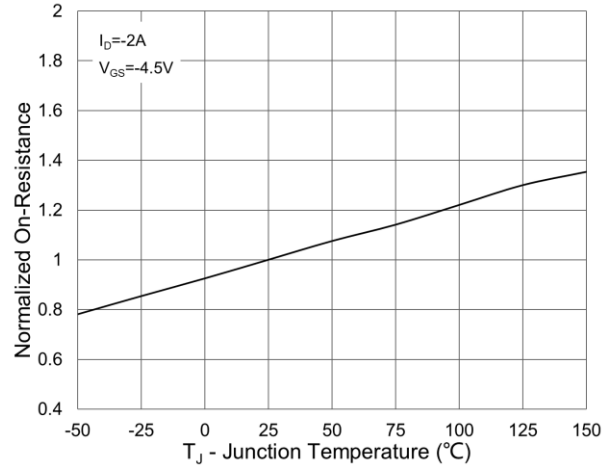
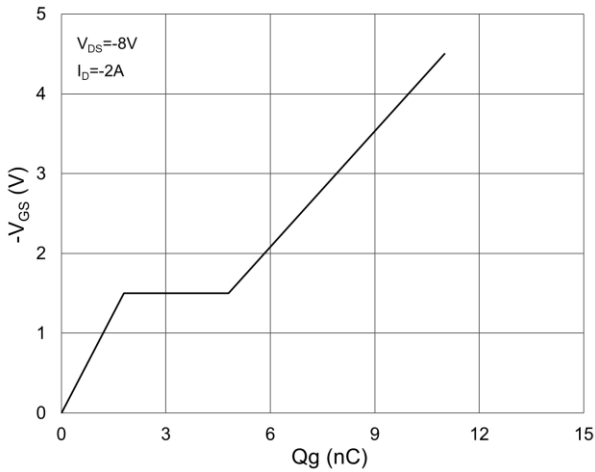
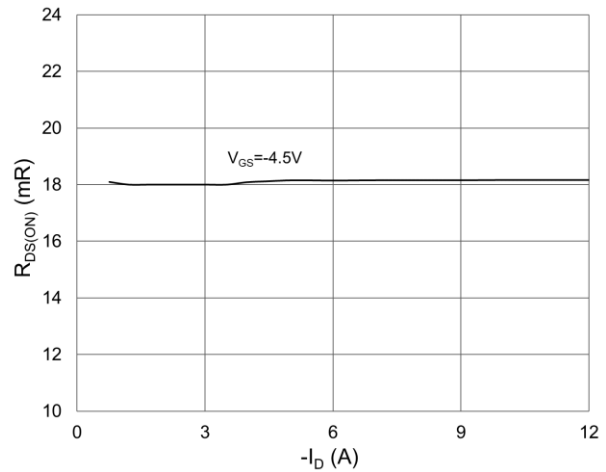
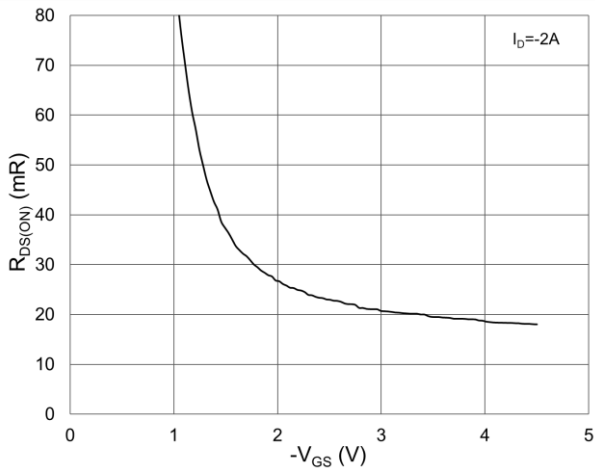
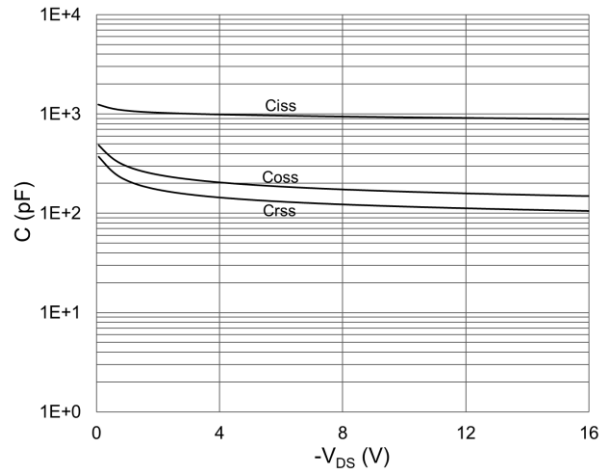
Fig1 Output Characteristics

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


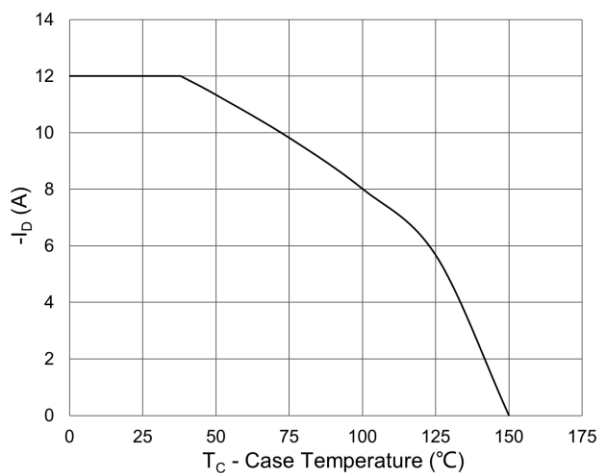
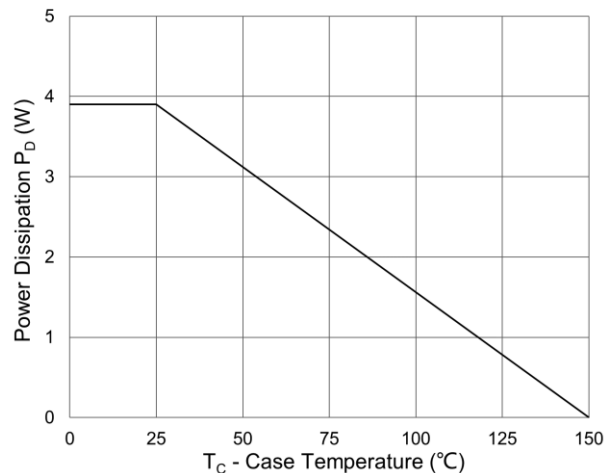
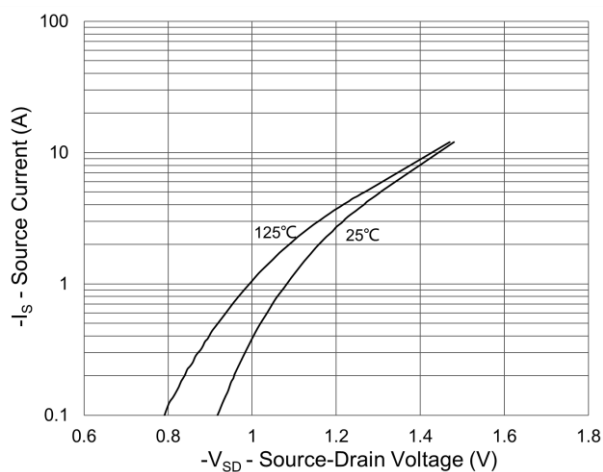
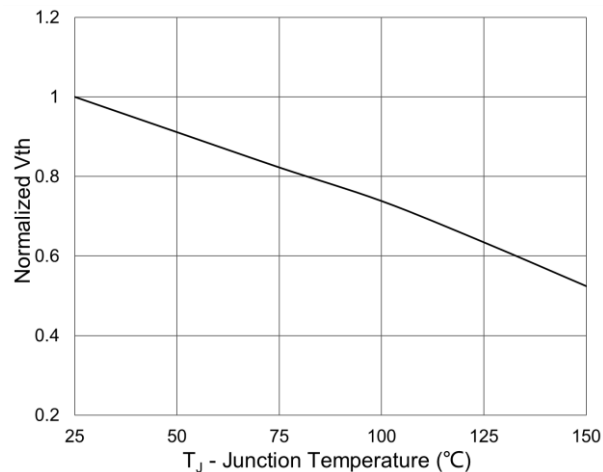
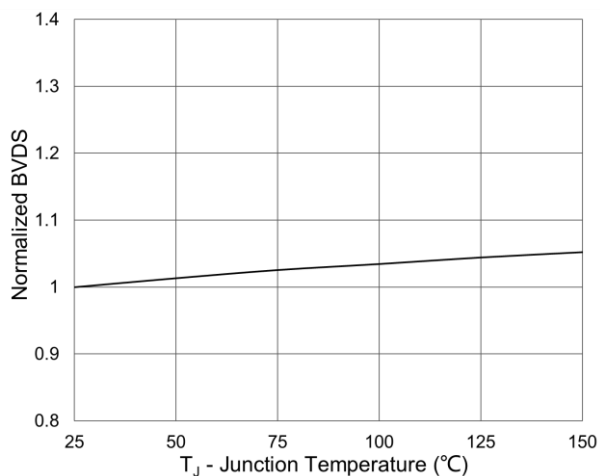
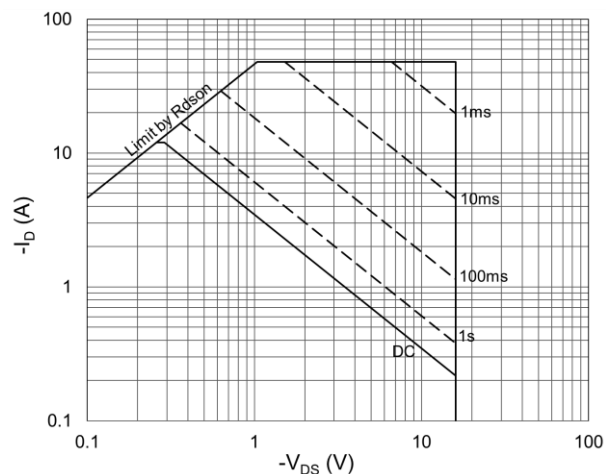
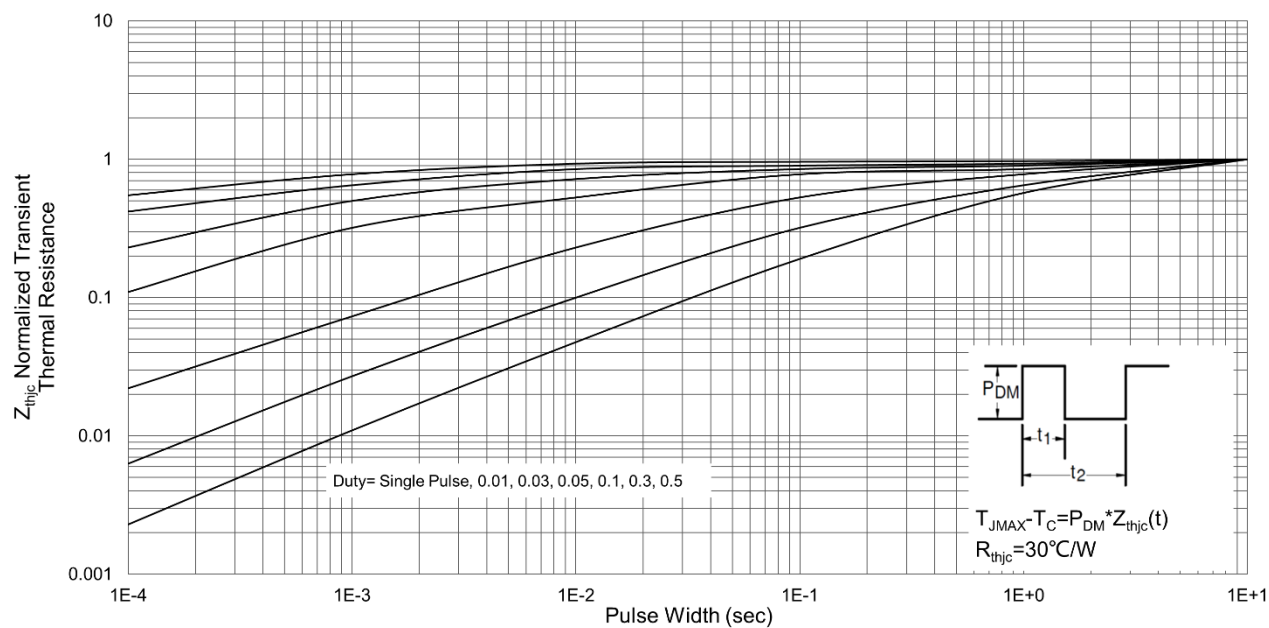
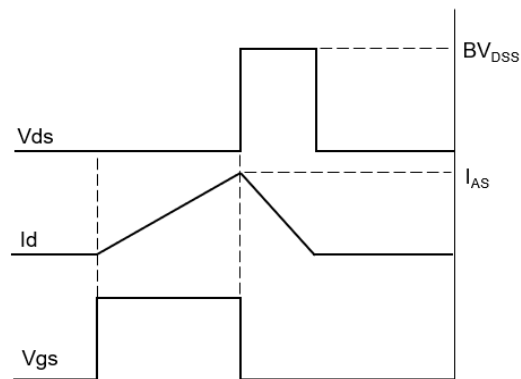
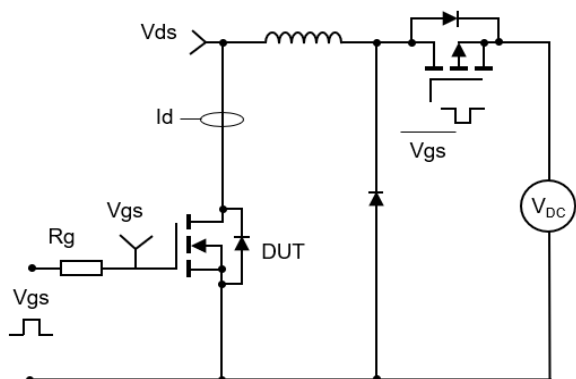
Fig7 Drain Current Derating

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


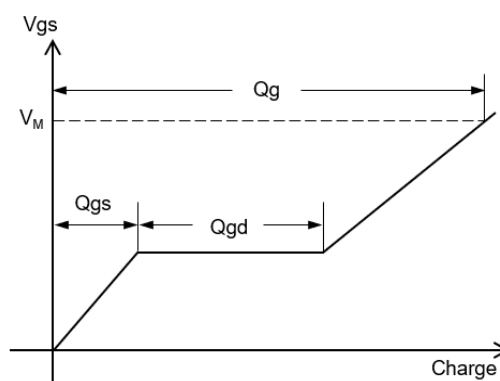
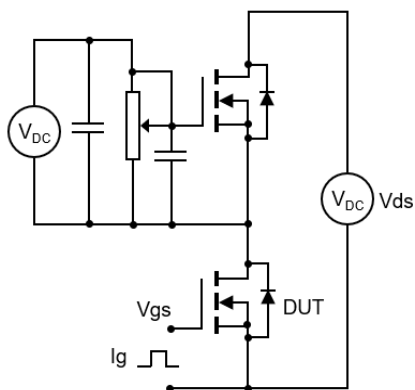
Fig13 Normalized Transient Impedance


Test Circuit & Waveform

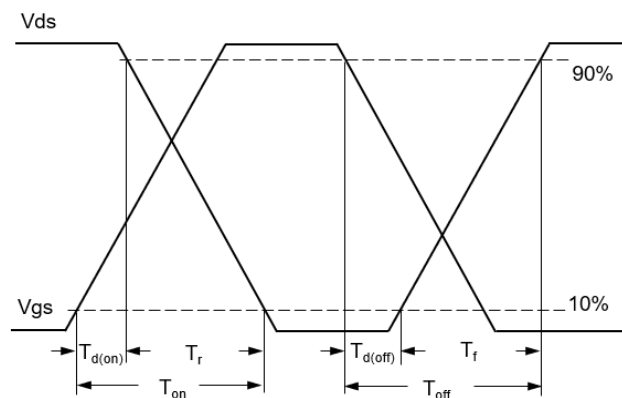
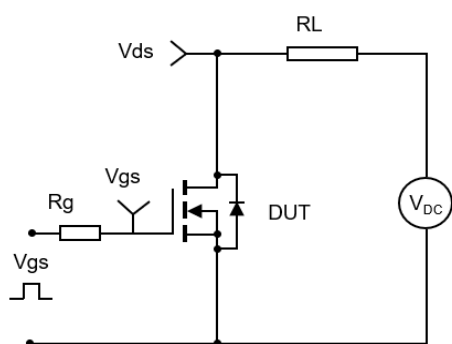
1. Unclamped Inductive Switching Test Circuit & Waveform



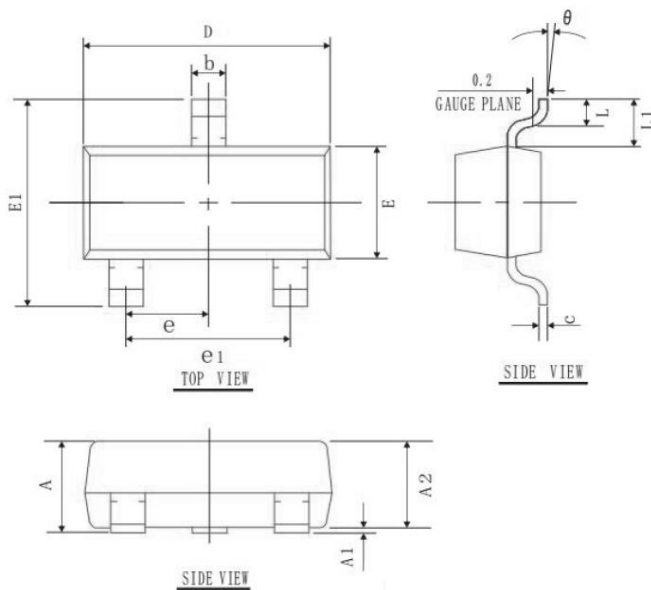
2. Gate Charge Test Circuit & Waveform



3. Resistive Switching Test Circuit & Waveform



SOT-23 Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	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	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		