

Description

Features

- Advanced Trench Technology
- Low Gate Charge
- ESD Protected: 2KV

Application

- Load Switch
- PWM Application
- Power management

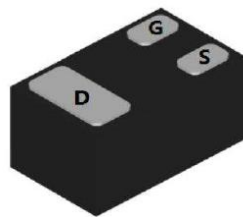
V_{DS}	20	V
$R_{ds(on),typ}@V_{gs}=4.5V$	190	mΩ
$R_{ds(on),typ}@V_{gs}=2.5V$	280	mΩ
I_D	1	A



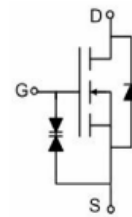
Top View



Bottom View



Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMT2001EY	21X	DFN1.0*0.6	Reel	NA	NA	10000

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	10	V
$I_D@T_c=25^{\circ}C$	Continuous Drain Current, $V_{GS}=4.5V$	1	A
$I_D@T_c=100^{\circ}C$	Continuous Drain Current, $V_{GS}=4.5V$	0.7	A
I_{DM}	Pulsed Drain Current	4	A
$PD@T_c=25^{\circ}C$	Total Power Dissipation	0.12	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
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	750	900	°C/W

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

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	20	--	--	V	$V_{GS}=0V, I_D=250\mu A$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	--	190	320	$m\Omega$	$V_{GS}=4.5V, I_D=0.5A$
		--	280	400		$V_{GS}=2.5V, I_D=0.3A$
$V_{GS(th)}$	Gate Threshold Voltage	0.5	1	1.5	V	$V_{GS}=V_{DS}, I_D=250\mu A$
IDSS	Drain-Source Leakage Current	--	--	1	μA	$V_{DS}=20V, V_{GS}=0V, T_J=25^{\circ}\text{C}$
		--	--	10	μA	$V_{DS}=16V, V_{GS}=0V, T_J=125^{\circ}\text{C}$
IGSS	Gate-Source Leakage Current	--	--	± 100	nA	$V_{GS}=\pm 10V, V_{DS}=0V$
Qg	Total Gate Charge	--	1	--	nC	$V_{DS}=10V, V_{GS}=4.5V, I_D=0.5A$
Qgs	Gate-Source Charge	--	0.21	--		
Qgd	Gate-Drain Charge	--	0.18	--		
$T_{d(on)}$	Turn-On Delay Time	--	2	--	ns	$V_{DD}=10V, V_{GS}=4.5V, R_G=10\Omega, I_D=0.5A$
T_r	Rise Time	--	18	--		
$T_{d(off)}$	Turn-Off Delay Time	--	9	--		
T_f	Fall Time	--	24	--		
Ciss	Input Capacitance	--	18	--	pF	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$
Coss	Output Capacitance	--	11	--		
Crss	Reverse Transfer Capacitance	--	22	--		

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	--	--	1	A
I_{sm}	Pulsed Source Current		--	--	4	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=0.5A, T_J=25^{\circ}\text{C}$	--	--	1.0	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

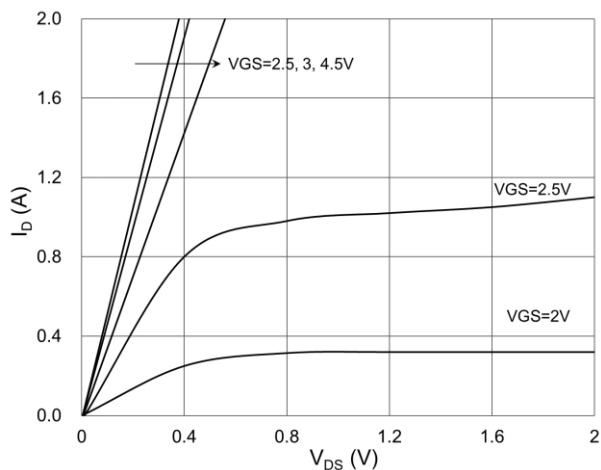


Fig2 Normalized $R_{DS(on)}$ vs. T_J

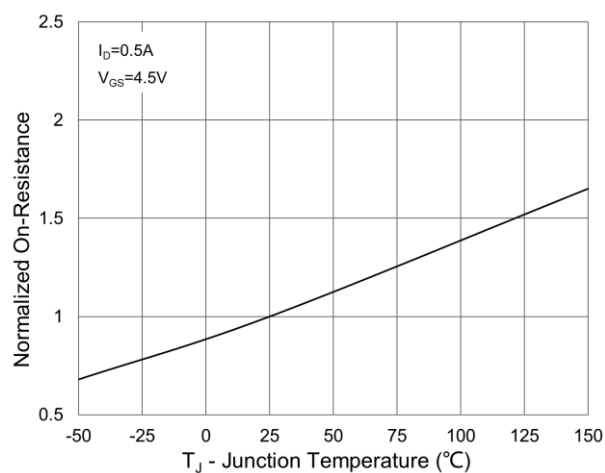


Fig3 Gate Charge Waveform

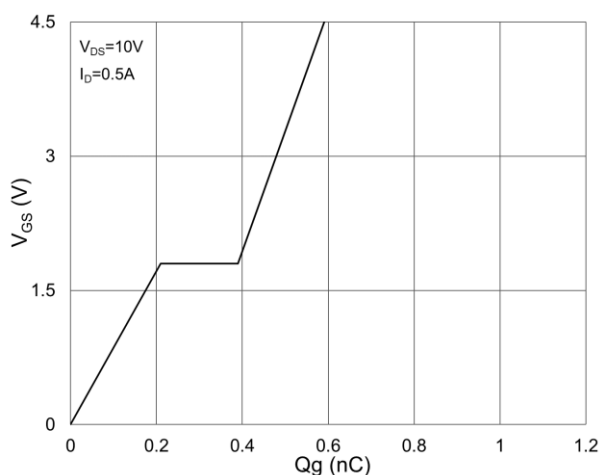


Fig4 Transfer Characteristics

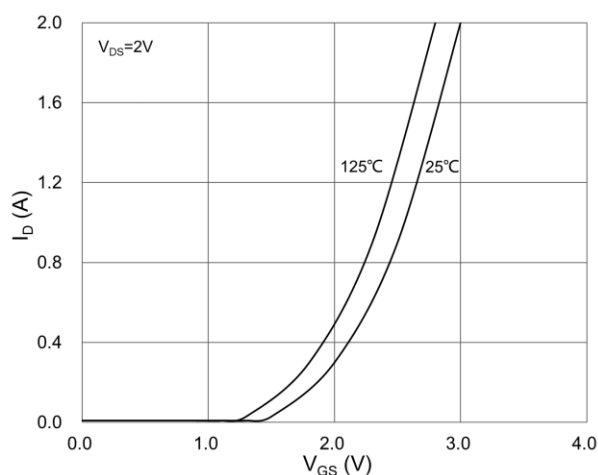


Fig5 $R_{DS(on)}$ vs. Drain Current and Gate Voltage

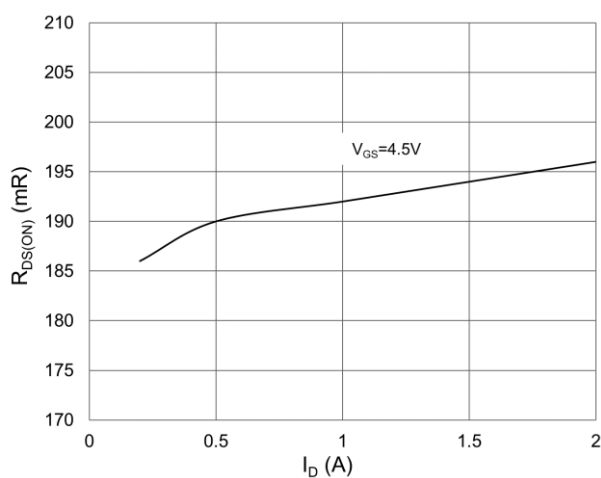


Fig6 $R_{DS(on)}$ vs. Gate Voltage

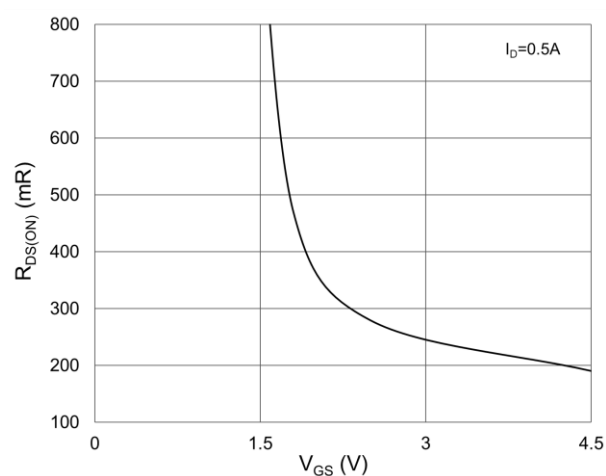
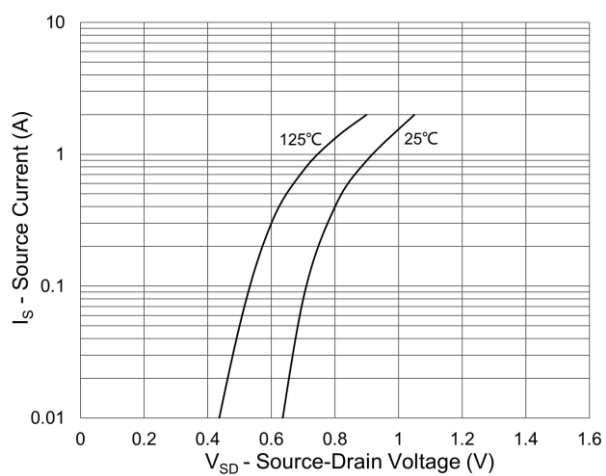
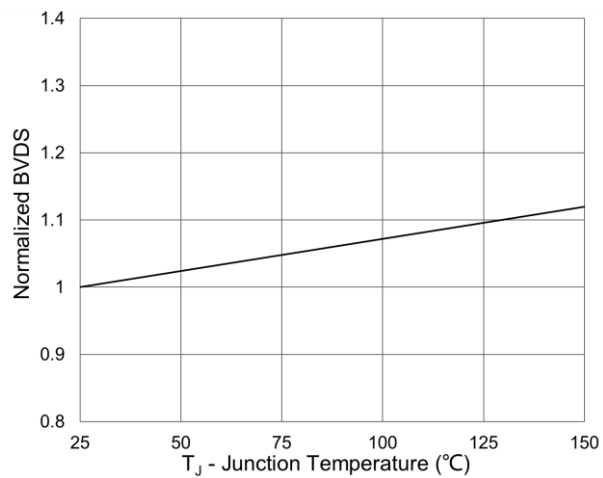
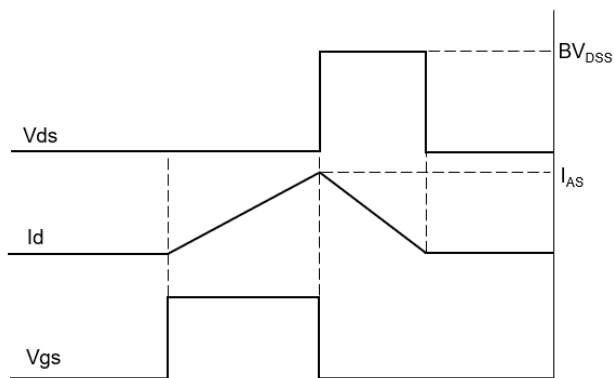
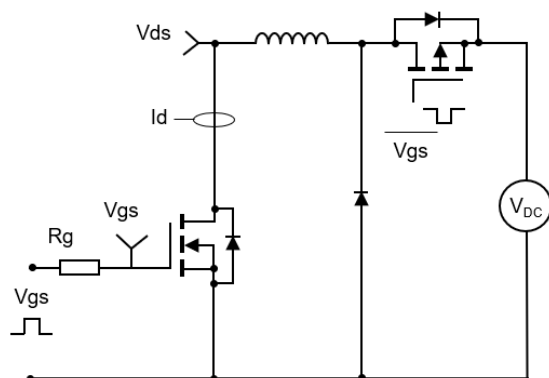


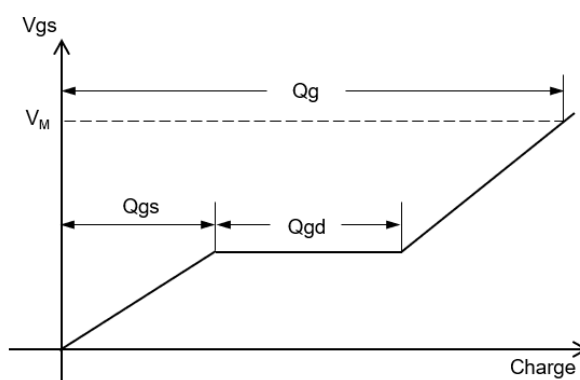
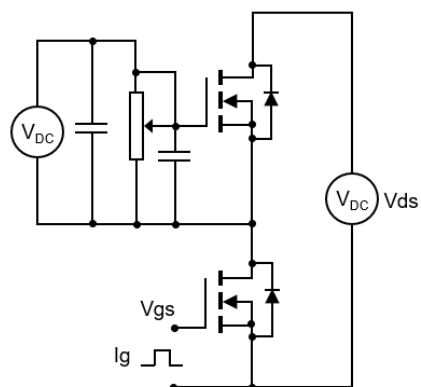
Fig7 Source-Drain Diode Forward Characteristics

Fig8 Normalized Breakdown Voltage vs. T_J


Test Circuit & Waveform

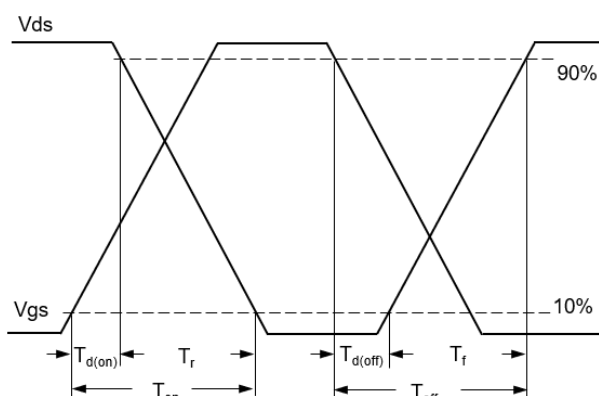
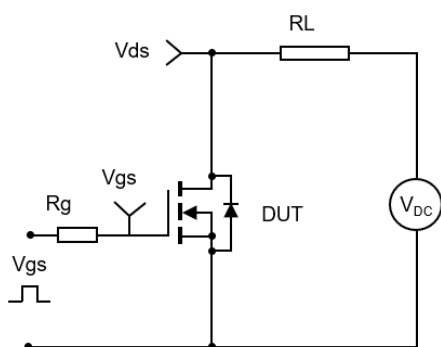
1. Unclamped Inductive Switching Test Circuit & Waveform



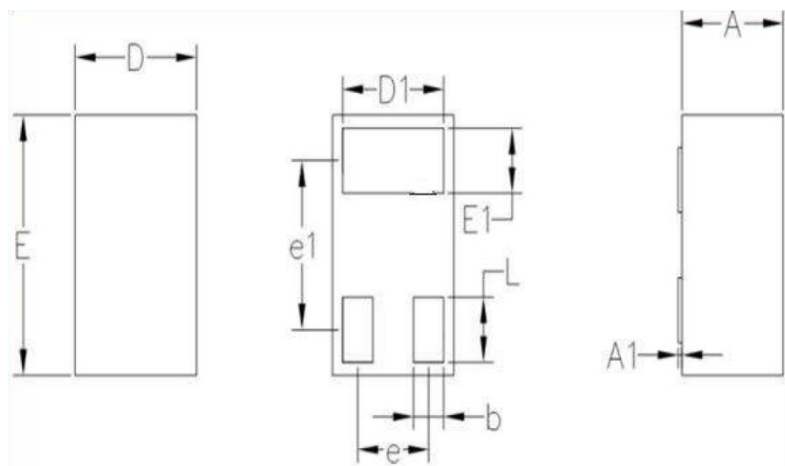
2. Gate Charge Test Circuit & Waveform



3. Resistive Switching Test Circuit & Waveform



DFN1.0*0.6 Package Information



SYMBOL	DIMENSIONS IN MM		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	0.00	—	0.05
D	0.55	0.60	0.65
E	0.95	1.00	1.05
D1	0.45	0.50	0.55
E1	0.20	0.25	0.30
L	0.20	0.25	0.30
b	0.10	0.15	0.20
e	0.35BSC		
e1	0.65BSC		