CMT30P47K

30V P-Channel MOSFET

Description

Features

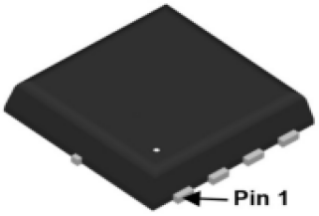
- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)

Application

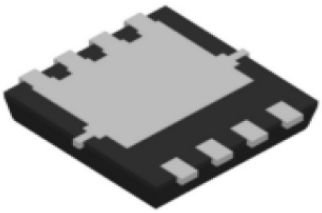
- High current load application
- Load switching
- Quick Charge

V_{DS}	-30	V
$R_{ds(on),typ}$@V_{gs}=-10V	7.3	mΩ
$R_{ds(on),typ}$@V_{gs}=-4.5V	11	mΩ
I_D	-47	A

Top View

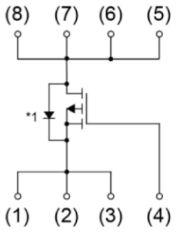


Bottom View



PDFN3.3*3.3 Pin Configuration

(1) Source
(2) Source
(3) Source
(4) Gate
(5) Drain
(6) Drain
(7) Drain
(8) Drain
*1 Body Diode



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMT30P47K	T30P47K	PDFN3.3*3.3	Reel	NA	NA	5000pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±20	V
ID@Tc=25℃	Continuous Drain Current, VGS=-10V[1]	-47	A
ID@Tc=100℃	Continuous Drain Current, VGS=-10V[1]	-35	A
IDM	Pulsed Drain Current[2]	-160	A
EAS	Single Pulse Avalanche Energy[5]	160	mJ
PD@Tc=25℃	Total Power Dissipation[3]	43	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_j	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction-Ambient[1]	68	75	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	2.6	2.9	°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	-30	--	--	V	VGS=0V, ID=-250uA
RDS(ON)	Static Drain-Source On-Resistance[2]	--	7.3	9	mΩ	VGS=-10V, ID=-20A
		--	11	13		VGS=-4.5V, ID=-10A
VGS(th)	Gate Threshold Voltage	-2	-1.6	-1.2	V	VGS=VDS, ID=-250uA
IDSS	Drain-Source Leakage Current	--	--	-1	uA	VDS=-30V, VGS=0V, TJ=25°C
		--	--	-30	uA	VDS=-24V, VGS=0V, TJ=125°C
IGSS	Gate-Source Leakage Current	--	--	±100	nA	VGS=±20V, VDS=0V
gfs	Forward Transconductance	--	13.8	--	Ns	VDS=-10V, ID=-10A
Rg	Gate Resistance	--	15	--	Ω	VDS=0V, VGS=0V, f=1MHz
Qg	Total Gate Charge (10V)	--	45	--	nC	VDS=-15V, VGS=-4.5V, ID=-20A
Qgs	Gate-Source Charge	--	13	--		
Qgd	Gate-Drain Charge	--	15	--		
Td(on)	Turn-On Delay Time	--	24.1	--	ns	VDD=-15V, VGS=-10V, RG=6Ω ID=-20A
Tr	Rise Time	--	10	--		
Td(off)	Turn-Off Delay Time	--	152	--		
Tf	Fall Time	--	48	--		
Ciss	Input Capacitance	--	2659	--	pF	VDS=-15V, VGS=0V, f=1MHz
Coss	Output Capacitance	--	407	--		
Crss	Reverse Transfer Capacitance	--	301	--		

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Units
Is	Continuous Source Current[1,4]	VG=VD=0V, Force Current	-47	--	A
Ism	Pulsed Source Current[2,4]		-160	--	A
V_{SD}	Diode Forward Voltage[2]	VGS=0V, IS=-10A, TJ=25°C	-1.2	--	V

Note:

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed, pulse width ≦ 300us, duty cycle ≦ 2%.
3.The power dissipation is limited by 150°C junction temperature.
4.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.
5.The EAS data shows Max. rating. The test condition is VDD=-20V, VGS=-10V, L=0.5mH.

Typical Performance Characteristics

Fig1 Output Characteristics

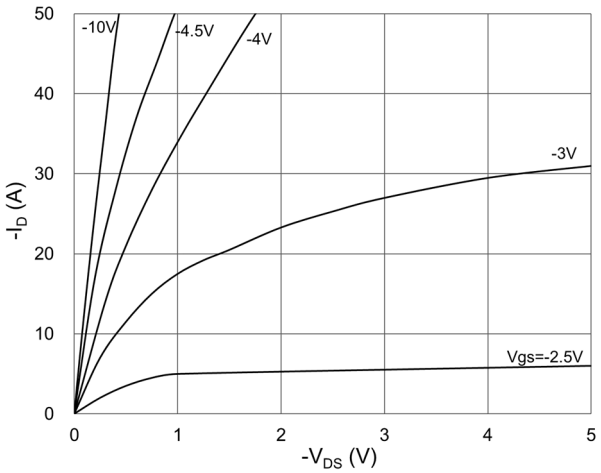


Fig2 Normalized R_{DSON} vs. T_J

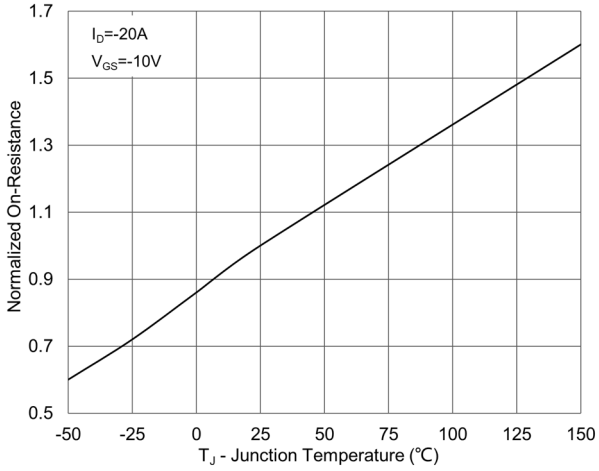


Fig3 Gate Charge Waveform

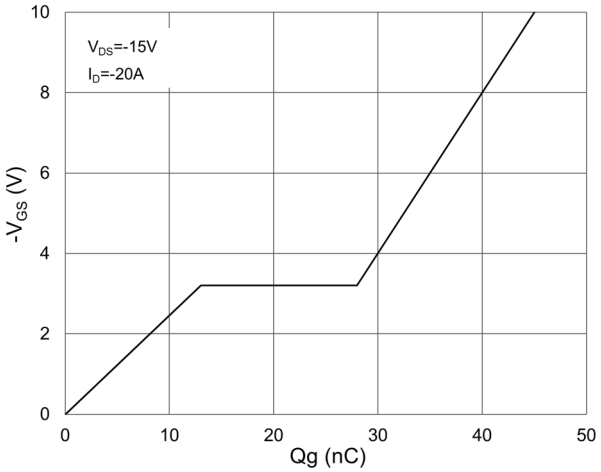


Fig4 Transfer Characteristics

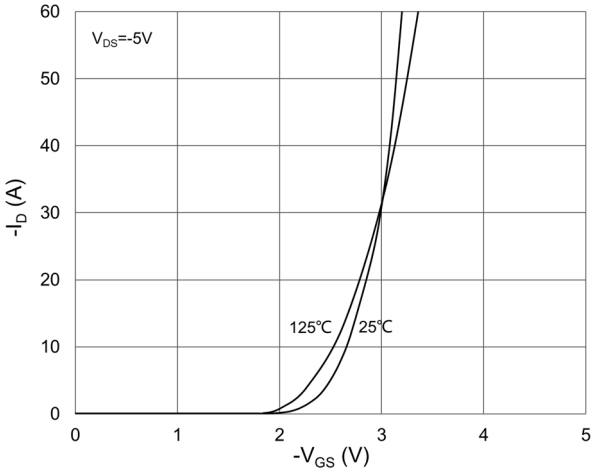


Fig5 Rds(on) vs. Drain Current and Gate Voltage

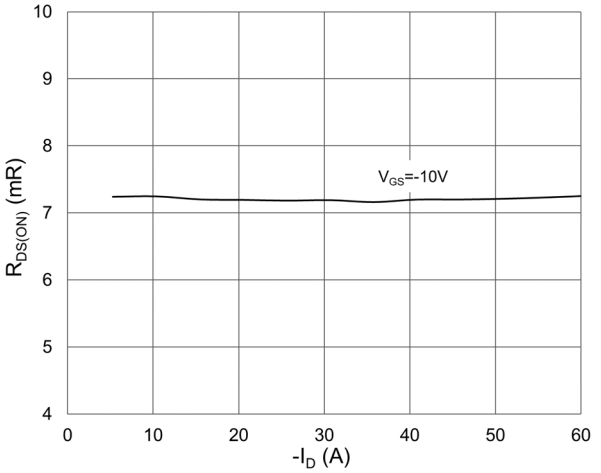


Fig6 Source-Drain Diode Forward Characteristics

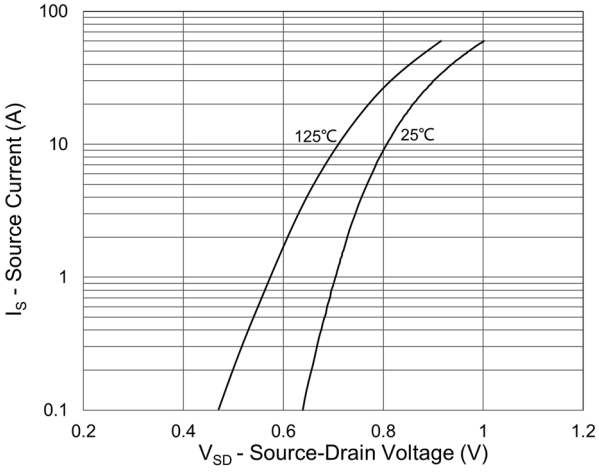


Fig7 Capacitance Characteristics

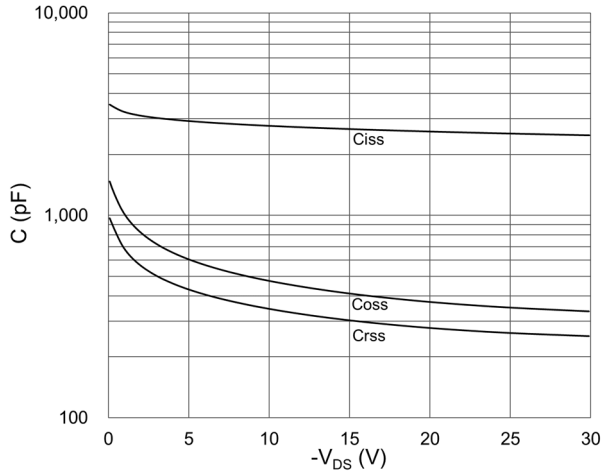


Fig8 Drain Current Derating

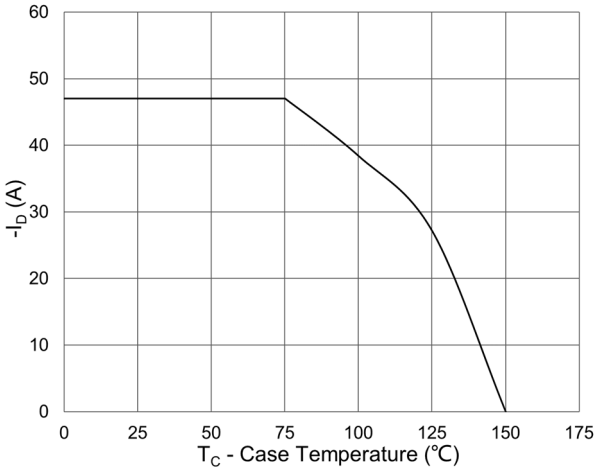


Fig9 Power Dissipation

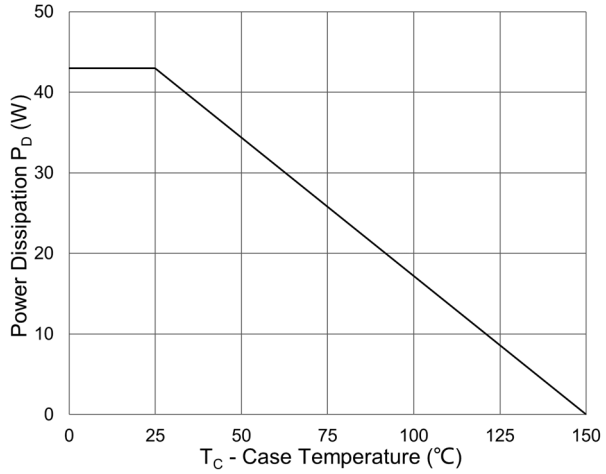


Fig10 Maximum Safe Operation Area

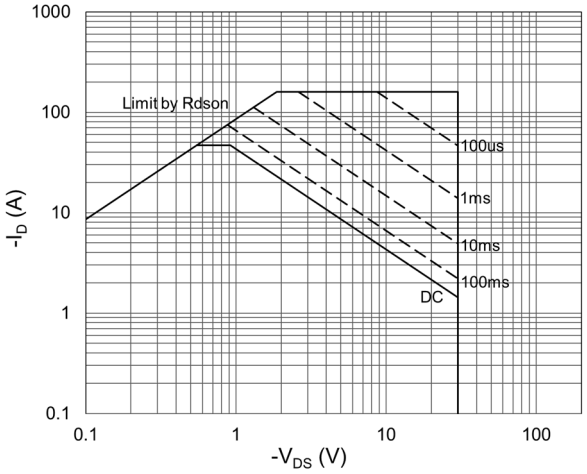
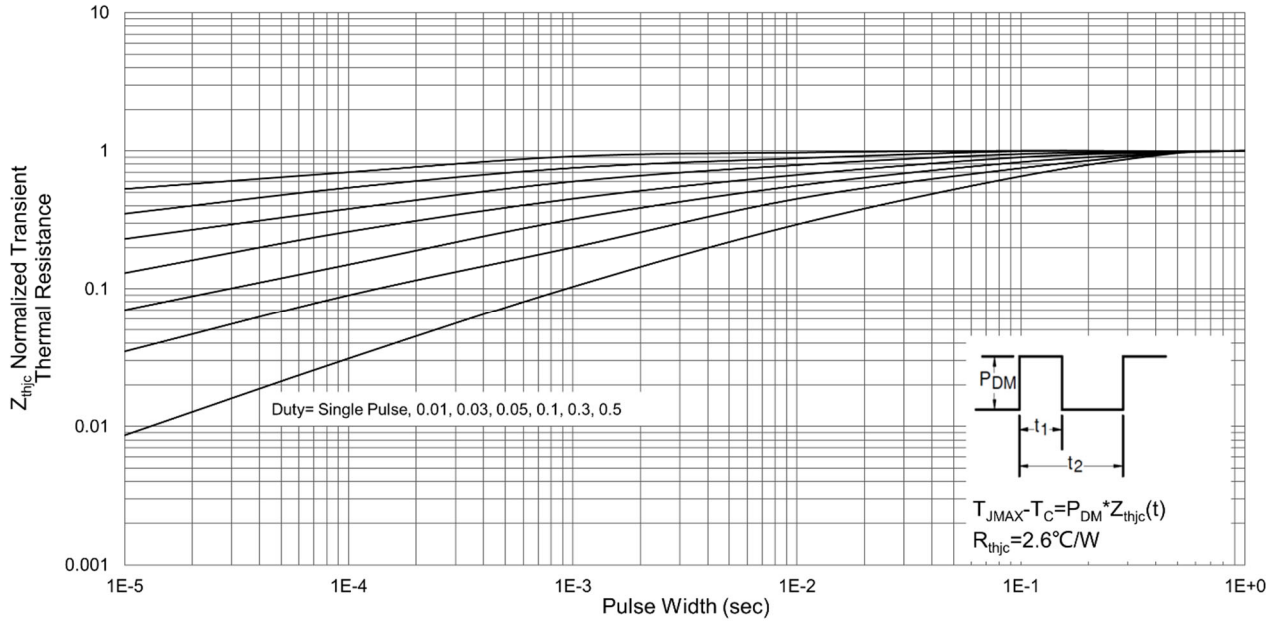
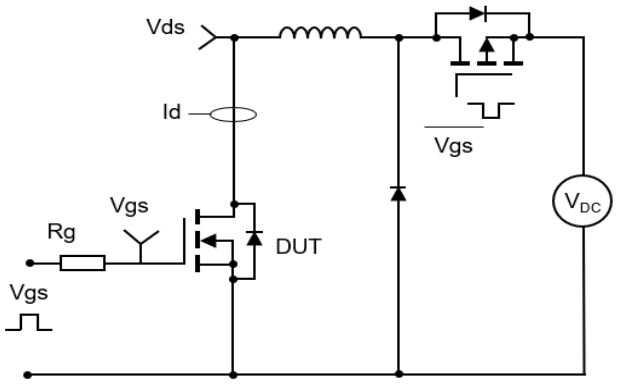


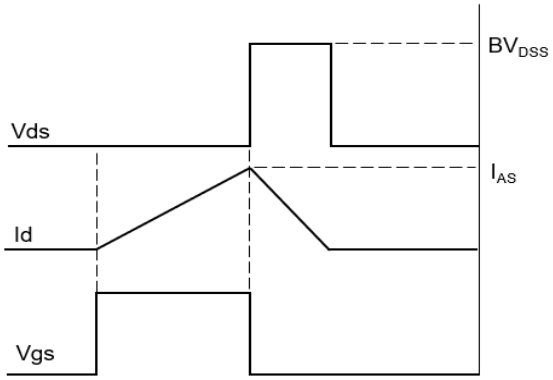
Fig11 Normalized Transient Impedance



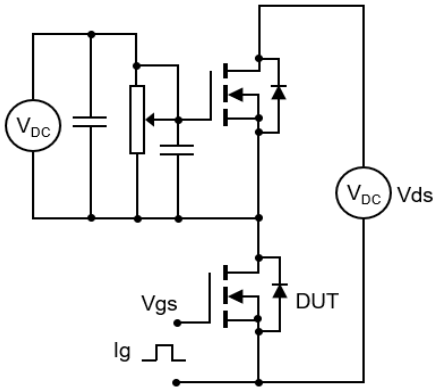
Test Circuit & Waveform

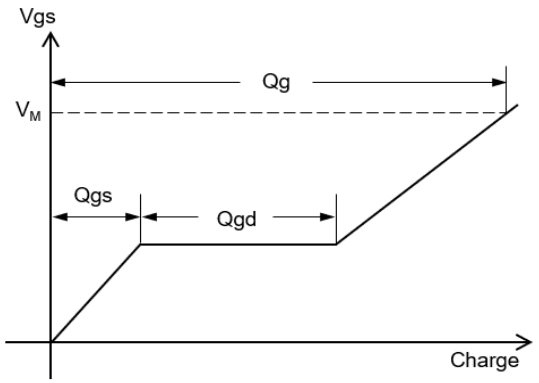
1. Unclamped Inductive Switching Test Circuit & Waveforms



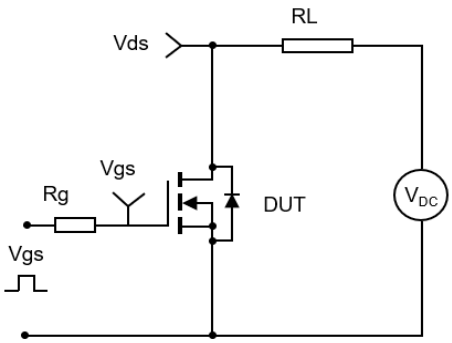


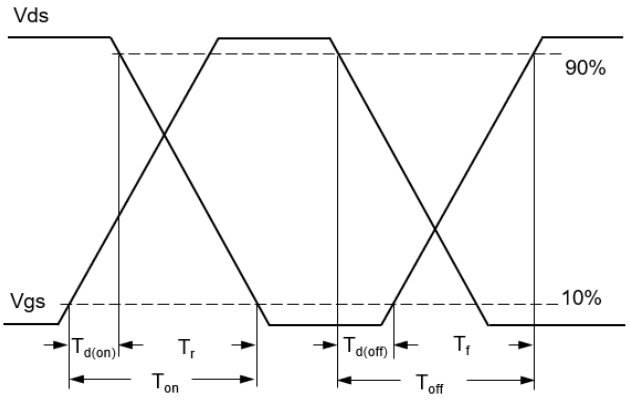
2. Gate Charge Test Circuit & Waveform



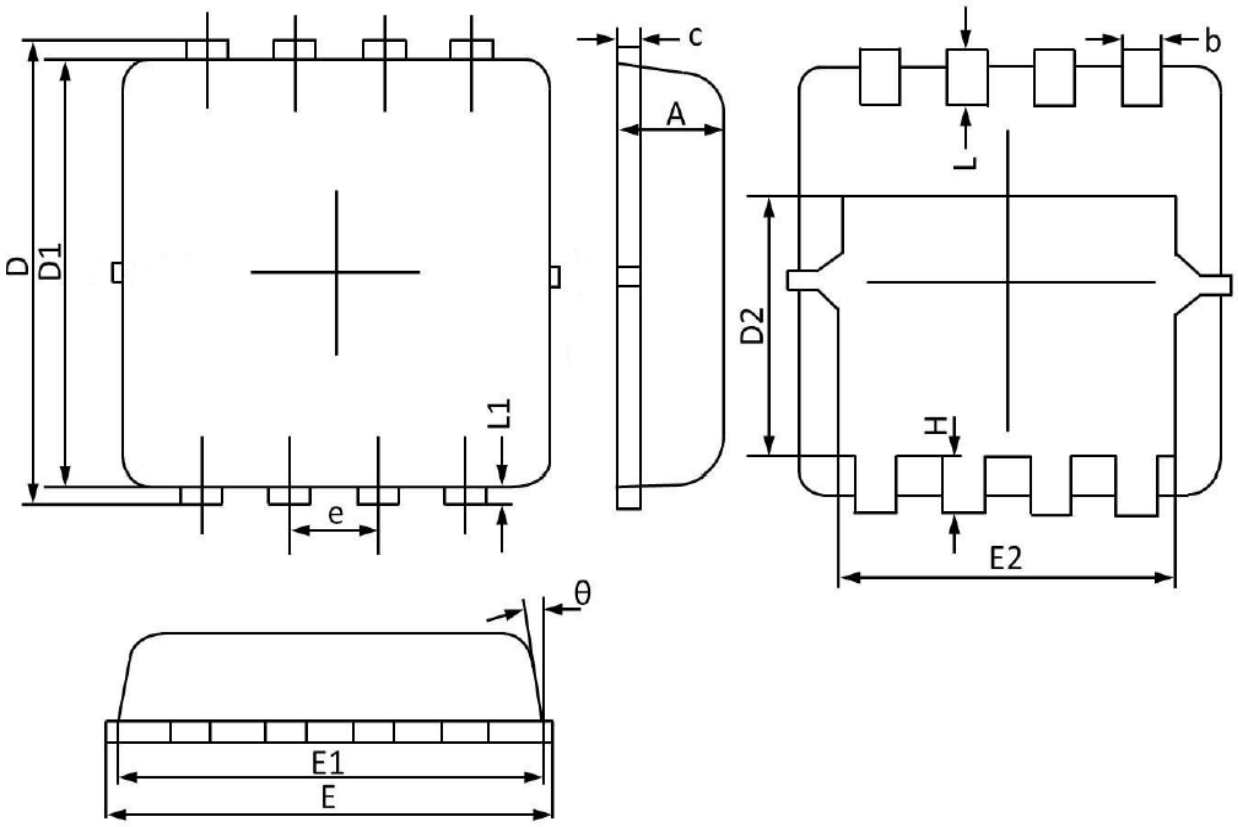


3. Resistive Switching Test Circuit & Waveform





PDFN3.3*3.3 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.900	0.700	0.035	0.028
b	0.350	0.240	0.014	0.009
c	0.250	0.100	0.010	0.004
D	3.450	3.050	0.136	0.120
D1	3.200	2.900	0.126	0.114
D2	1.850	1.350	0.073	0.053
E	3.400	3.000	0.134	0.118
E1	3.250	2.900	0.128	0.114
E2	2.600	2.350	0.102	0.093
e	0.65BSC		0.026BSC	
H	0.500	0.300	0.020	0.012
L	0.500	0.300	0.020	0.012
L1	0.200	0.070	0.008	0.003
θ	12°	0°	12°	0°