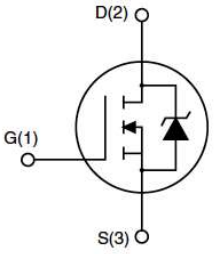
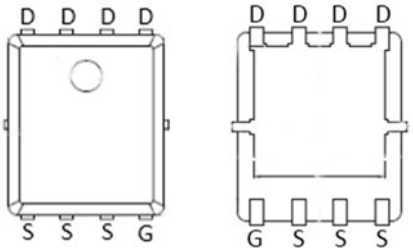
Feature

- 60V,150A
  $R_{DS(ON)}$ <2.3mΩ @V_{GS}=10V (TYP:1.9mΩ)
  $R_{DS(ON)}$ <3.5mΩ @V_{GS}=4.5V (TYP:3.0mΩ)
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Application

- PWM applications
- Load Switch
- Power management



PDFN5X6

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G022N06G	APG022N06G	PDFN5X6	-	-	5000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_a =25℃)	I_D	150	A
Continuous Drain Current (T_a =100℃)	I_D	100	A
Pulsed Drain Current (1)	I_{DM}	450	A
Single Pulsed Avalanche Energy (2)	E_{AS}	520	mJ
Power Dissipation	P_D	140	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.89	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	45	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

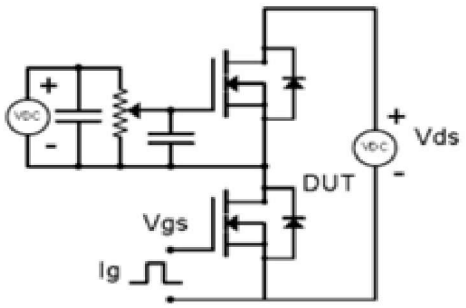
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	60	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =60V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.5	2.0	3.0	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =20A	-	1.9	2.3	mΩ
		V_{GS} =4.5V, I_D =10A	-	3.0	3.5	mΩ
Forward Threshold Voltage	g_{fs}	V_{DS} =5V, I_D =20A	-	75	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =100KHz	-	6052	-	pF
Output Capacitance	C_{oss}		-	1470	-	
Reverse Transfer Capacitance	C_{rss}		-	185	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V, I_D=25A, V_{GS}=10V, R_G=2Ω	-	8	-	ns
Turn-on rise time	t_r		-	15	-	
Turn-off delay time	$t_{d(off)}$		-	55	-	
Turn-off fall time	t_f		-	25	-	
Total Gate Charge	Qg	VDS=30V, ID=25A, VGS=10V	-	110	-	nC
Gate-Source Charge	Qgs		-	20	-	
Gate-Drain Charge	Qgd		-	21	-	
Reverse Recovery Chrage	Qrr	I_F=20A,di/dt=100A/us		100		nC
Reverse Recovery Time	Trr	I_F=20A,di/dt=100A/us		72		ns
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{SD}	V_{GS} =0V, I_S=10A	-	-	1.2	V
Diode Forward current(4)	I_S		-	-	150	A

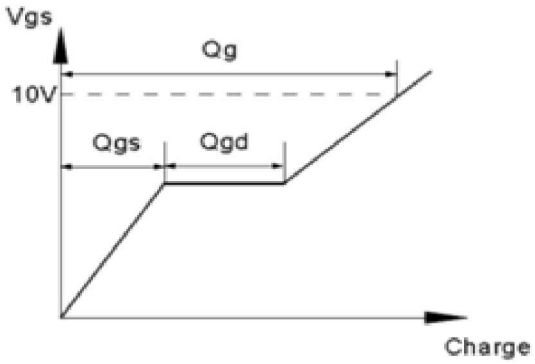
Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=48V,R_G=25Ω,L=0.5Mh
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

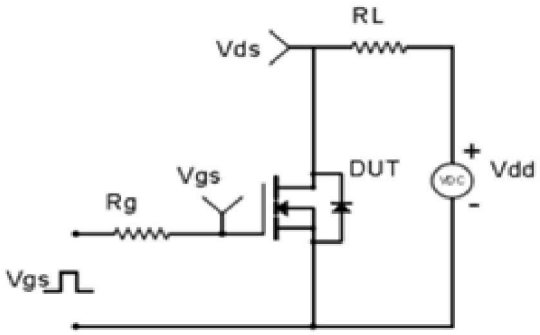
Test Circuit & Waveform

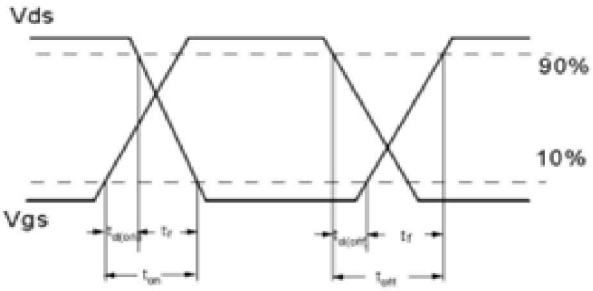
Gate Charge Test Circuit & Waveform



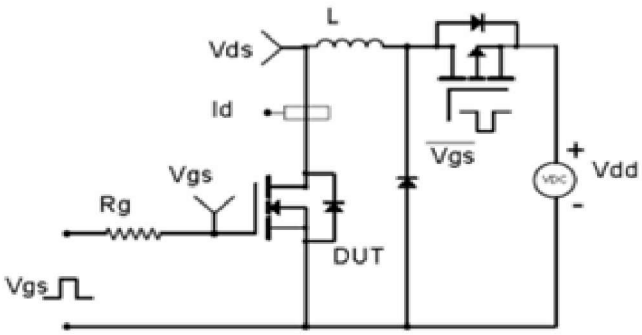


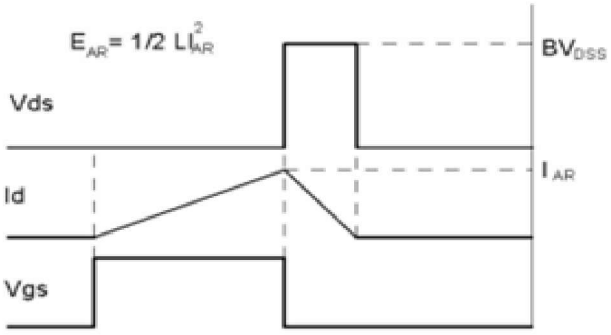
Resistive Switching Test Circuit & Waveforms



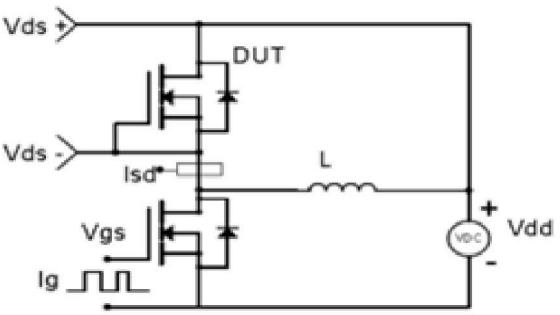


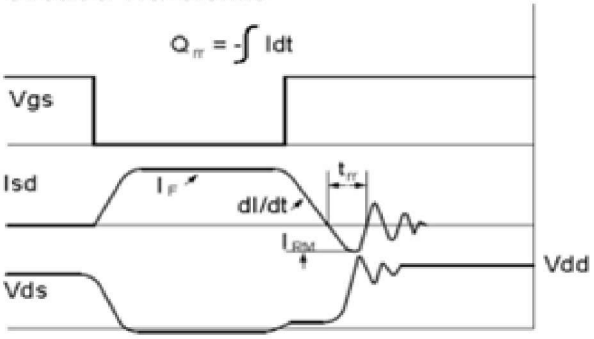
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms





Typical Performance Characteristics

Fig.1 Power Dissipation Derating Curve

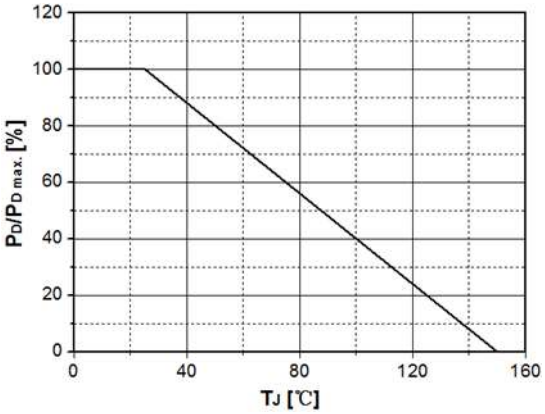


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

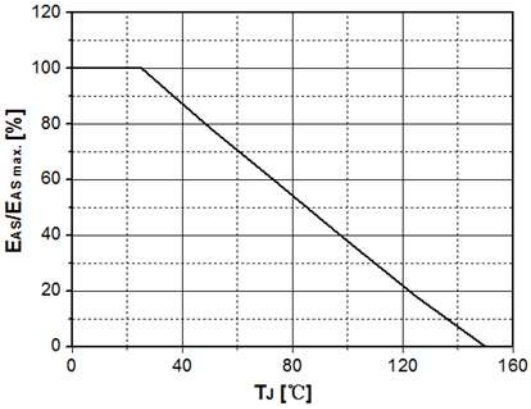


Fig.3 Typical Output Characteristics

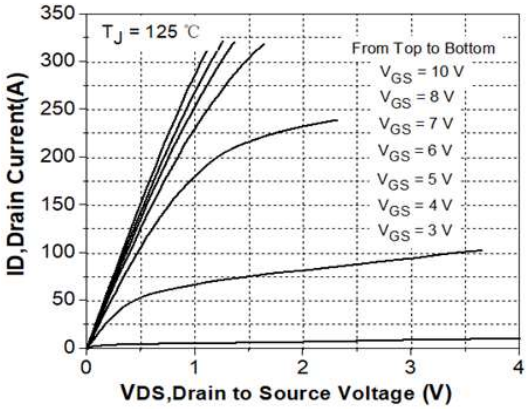


Fig. 4 Transconductance vs. Drain Current

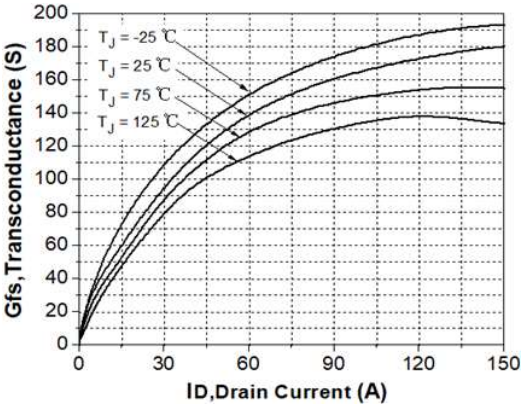


Fig.5 Typical Transfer Characteristics

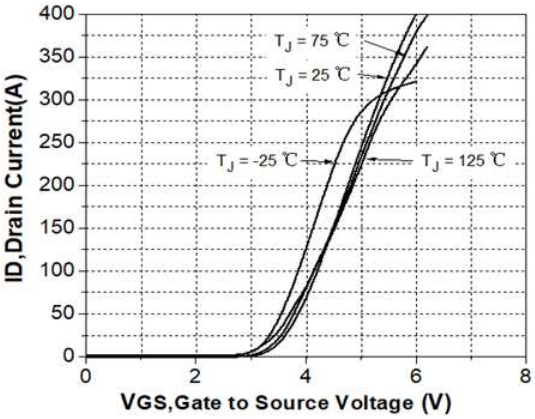


Fig. 6 State Resistance vs. Drain Current @-25℃

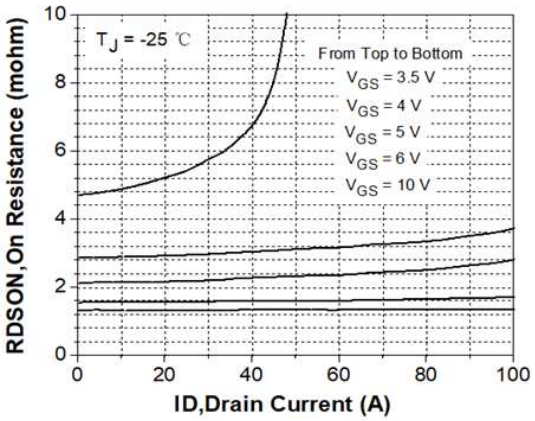


Fig.7 State Resistance vs. Drain Current @25℃

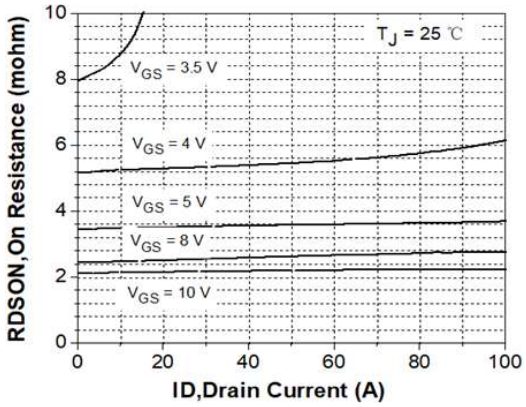


Fig. 8 State Resistance vs. Drain Current @125℃

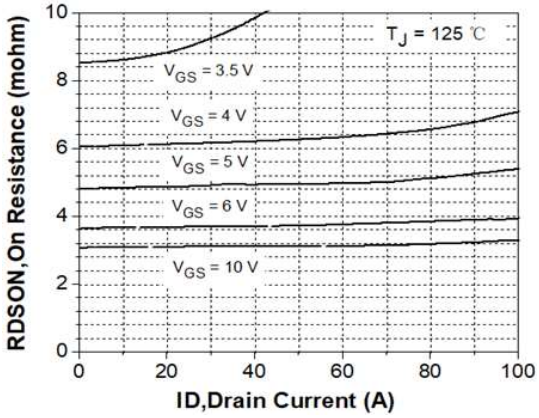


Fig.9 Typical Capacitance vs. Drain Source Voltage

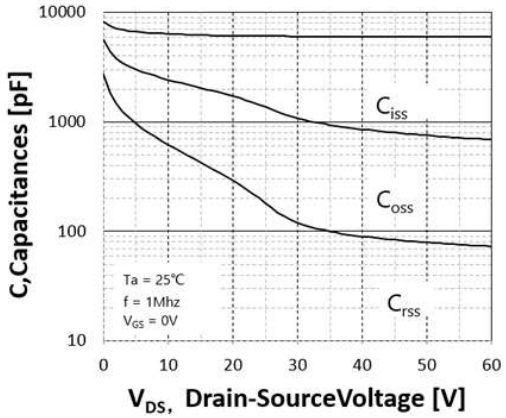


Fig.10 Dynamic Input Characteristics

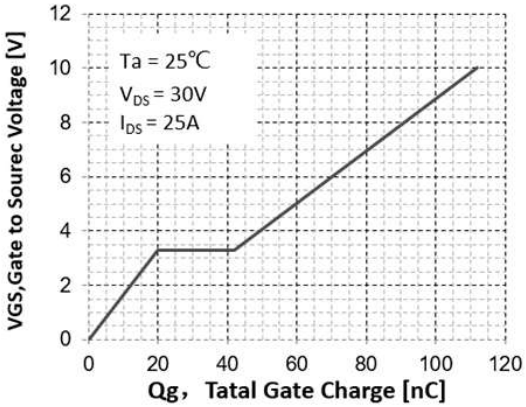


Fig.11 Breakdown Voltage vs. Junction Temperature

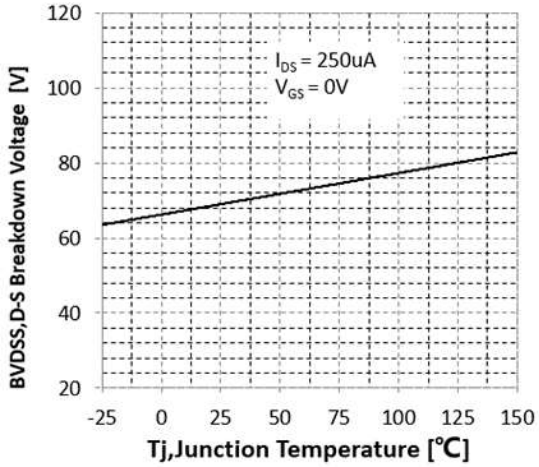


Fig. 12 Gate Threshold Voltage vs. Junction Temperature

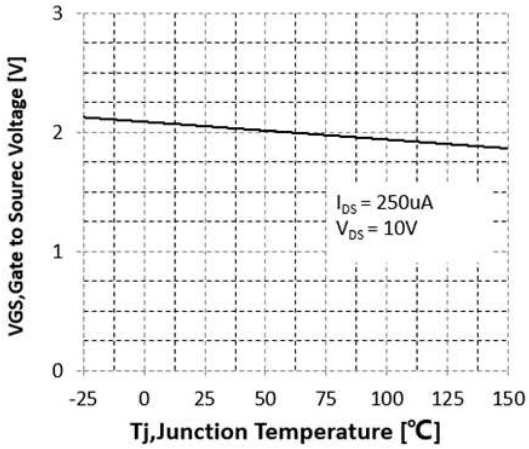


Fig.13 On-Resistance Variation vs. Junction Temperature

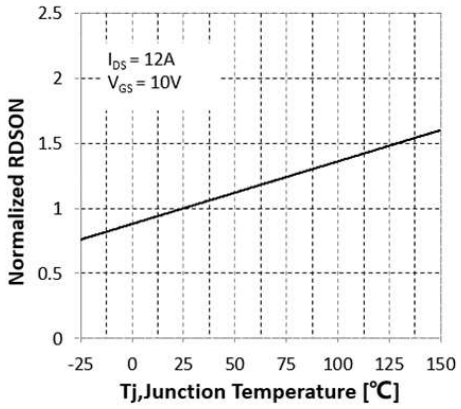


Fig.14 Maximum Drain Current vs.Case Temperature

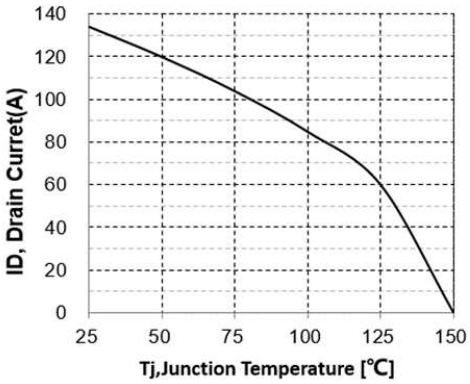


Fig.15 Body Diode Forward Voltage vs. Reverse Drain Current

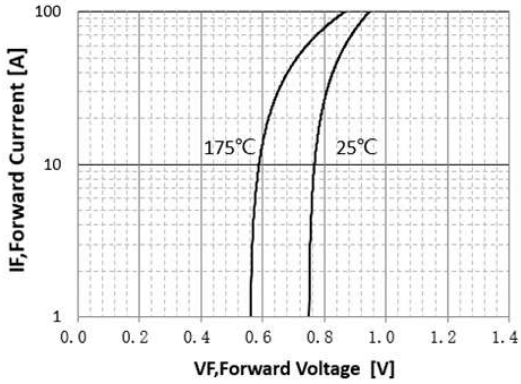


Fig.16 Safe Operating Area

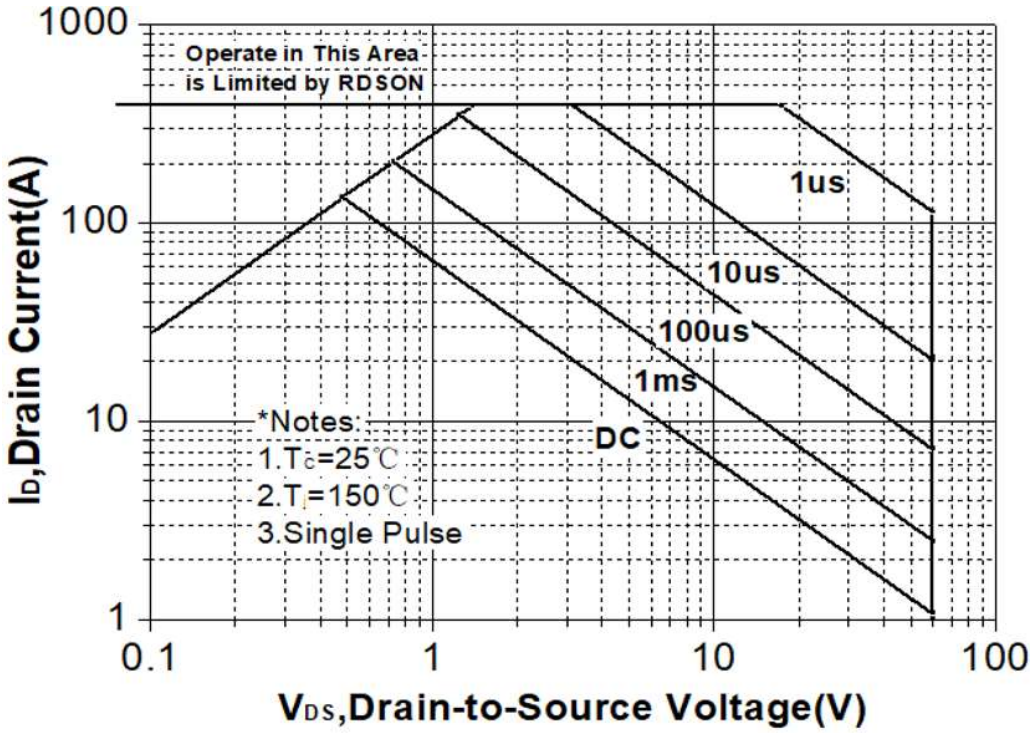
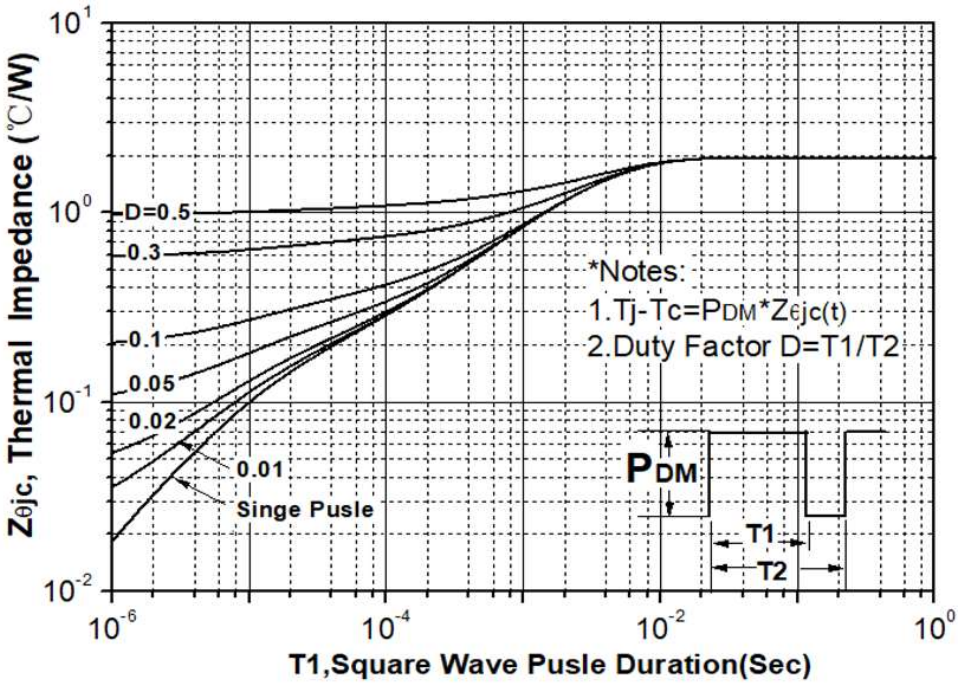
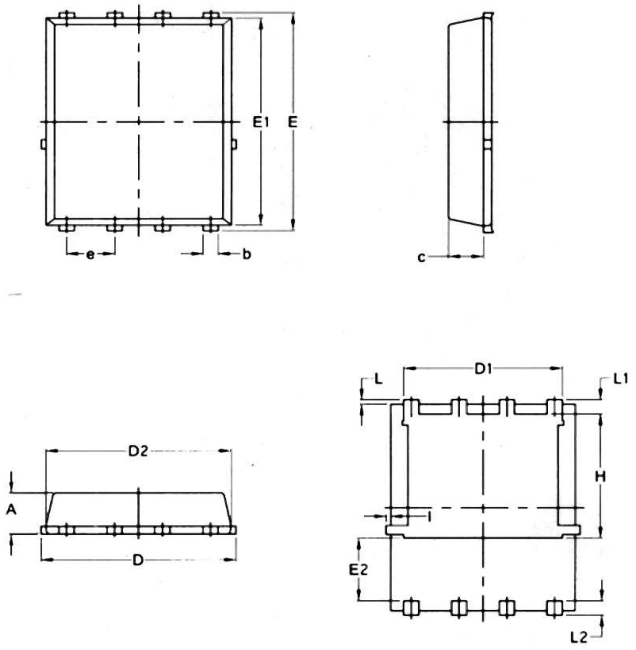


Fig. 17 Transient Thermal Response Curve



PDFN5X6 Package Information



PDFN5X6

SYMBOL	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	—	0.0630	—
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	—	0.18	—	0.0070

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