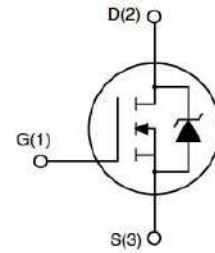


TPG070N12G

N-Channel Enhancement Mosfet

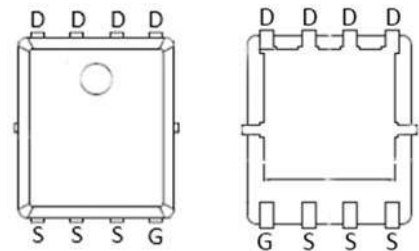
Feature

- 120V, 90A
 $R_{DS(ON)} < 7.0m\Omega @ V_{GS}=10V$ (TYP: 6.0m Ω)
 $R_{DS(ON)} < 9.4m\Omega @ V_{GS}=4.5V$ (TYP: 7.8m Ω)
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Application

- PWM applications
- Load Switch
- Power management



PDFN5X6-8L

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G070N12G	TPG070N12G	PDFN5*6-8L	-	-	5000

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_a=25^\circ\text{C}$)	I_D	90	A
Continuous Drain Current ($T_a=100^\circ\text{C}$)	I_D	60	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	360	A
Singel Pulsed Avalanche Energy ⁽²⁾	E_{AS}	350	mJ
Power Dissipation	P_D	102	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.2	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

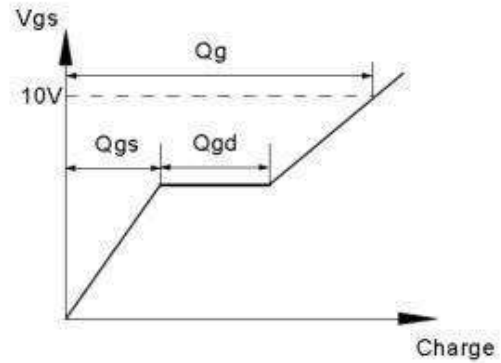
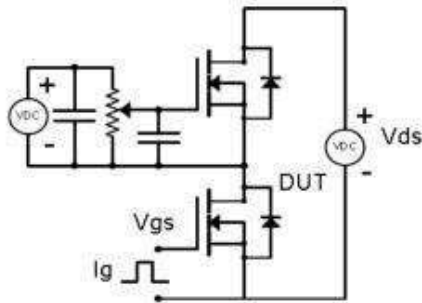
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	120	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =120V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage ⁽³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	2.0	3.0	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} =10V, I _D =40A	-	6.0	7.0	mΩ
		V _{GS} =4.5V, I _D =20A	-	6.8	9.4	mΩ
Forward Threshold Voltage	g _{fs}	V _{DS} =5V, I _D =20A	-	80	-	S
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =60V, V _{GS} =0V, f =1MHz	-	4913	-	pF
Output Capacitance	C _{oss}		-	404	-	
Reverse Transfer Capacitance	C _{rss}		-	14	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =60V, I _D =20A, V _{GS} =10V, R _G =10Ω	-	23	-	ns
Turn-on rise time	t _r		-	42	-	
Turn-off delay time	t _{d(off)}		-	110	-	
Turn-off fall time	t _f		-	51	-	
Total Gate Charge	Q _g	V _D S=60V, I _D =20A, V _G S=10V	-	67	-	nC
Gate-Source Charge	Q _{gs}		-	13	-	
Gate-Drain Charge	Q _{gd}		-	10	-	
Reverse Recovery Chrage	Q _{rr}	I _F =20A,di/dt=100A/us		393		nC
Reverse Recovery Time	T _{rr}	I _F =20A,di/dt=100A/us		60		ns
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V _{SD}	V _{GS} =0V, I _S =40A	-	-	1.3	V
Diode Forward current ⁽⁴⁾	I _S		-	-	90	A

Notes:

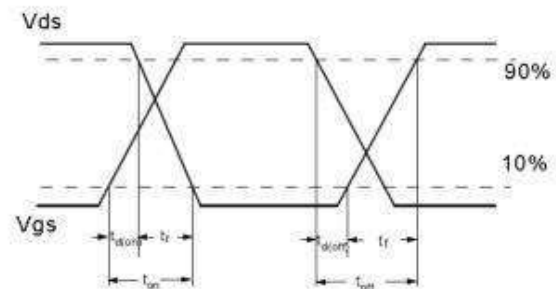
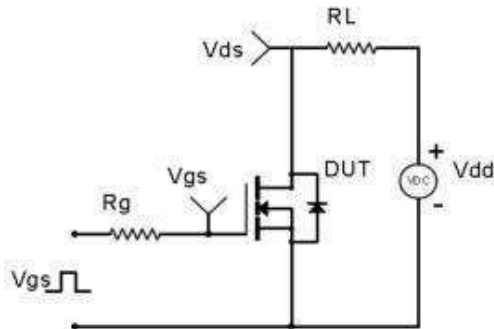
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: $T_J = 25^{\circ}\text{C}, V_{DD} = 50V, R_G = 25\Omega, L = 0.4Mh$
3. Pulse Test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
4. Surface Mounted on FR4 Board, $t \leq 10$ sec

Test Circuit & Waveform

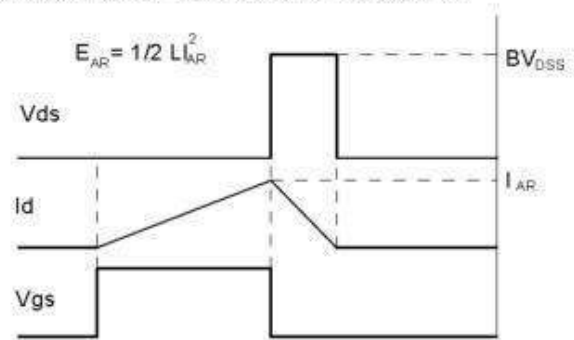
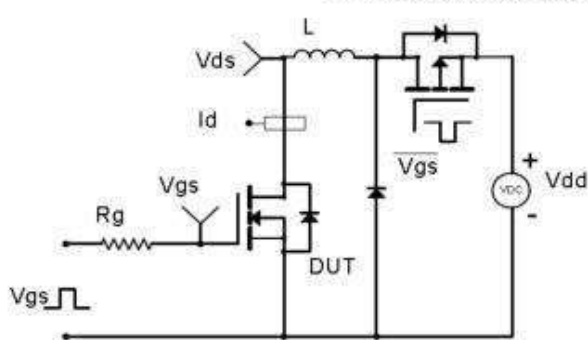
Gate Charge Test Circuit & Waveform



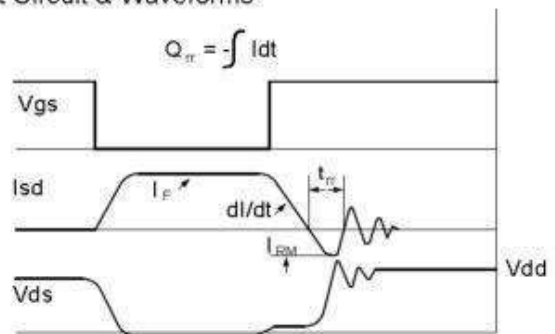
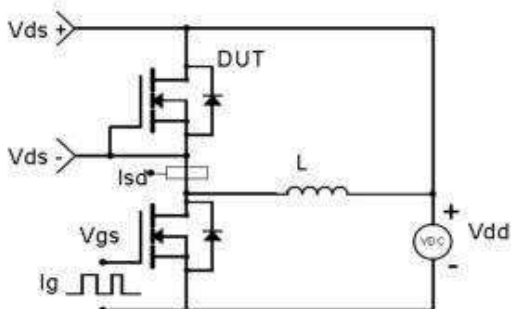
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Performance Characteristics

Fig.1 Power Dissipation Derating Curve

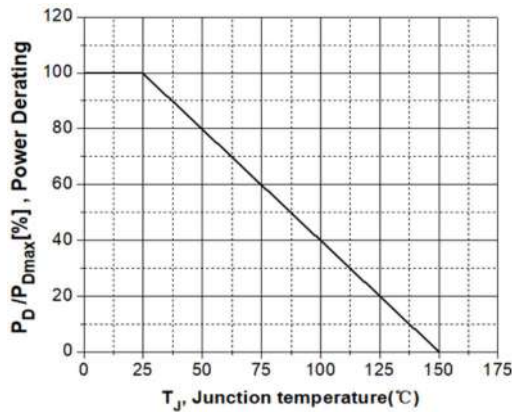


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

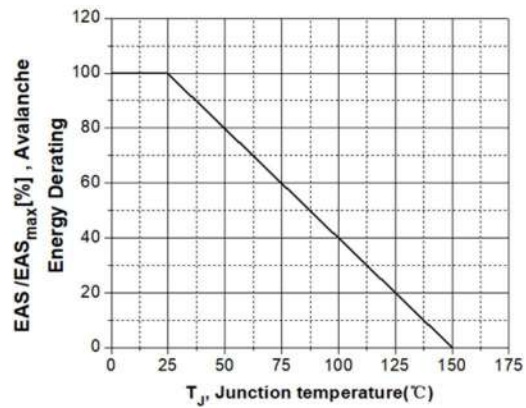


Fig.3 Typical Output Characteristics

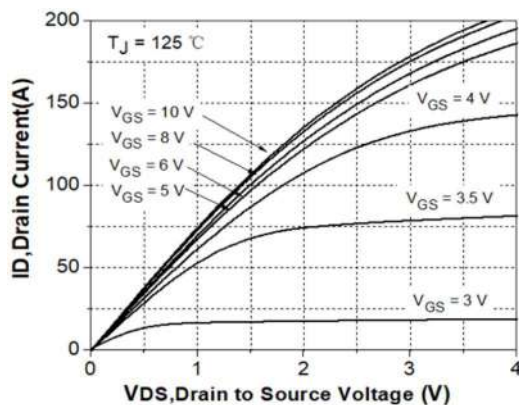


Fig. 4 Transconductance vs. Drain Current

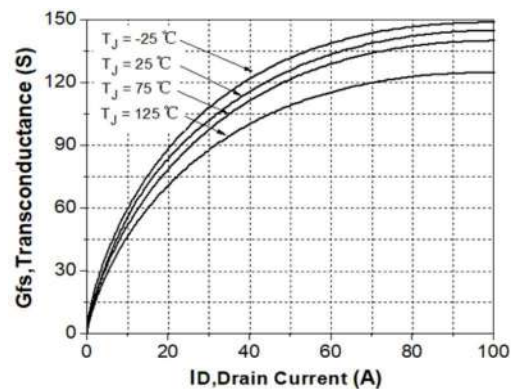


Fig.5 Typical Transfer Characteristics

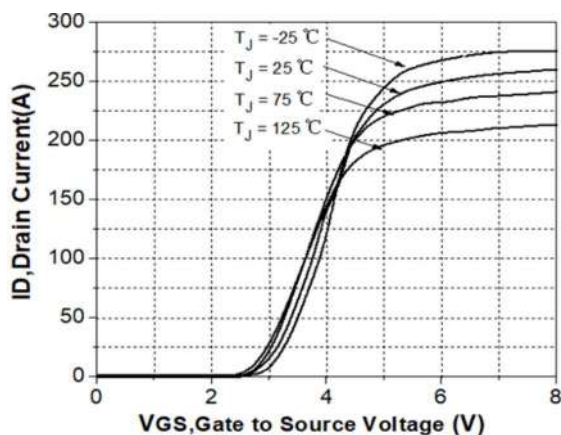
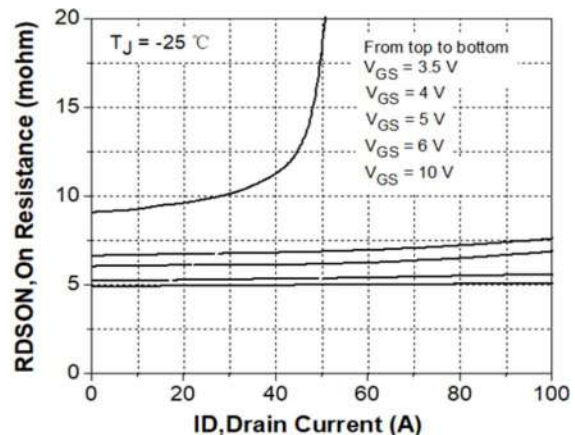


Fig. 6 State Resistance vs. Drain Current @-25°C



Typical Performance Characteristics

Fig.7 State Resistance vs. Drain Current @25°C

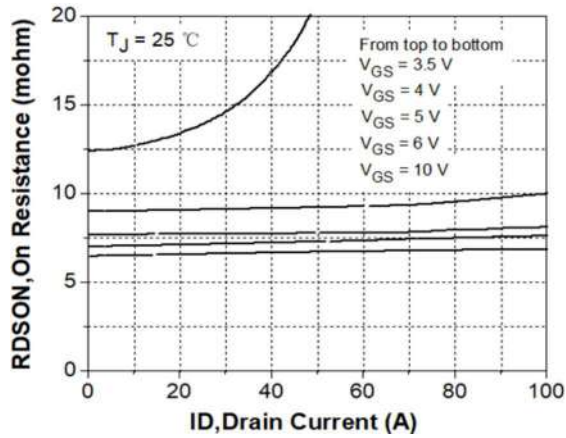


Fig. 8 State Resistance vs. Drain Current @125°C

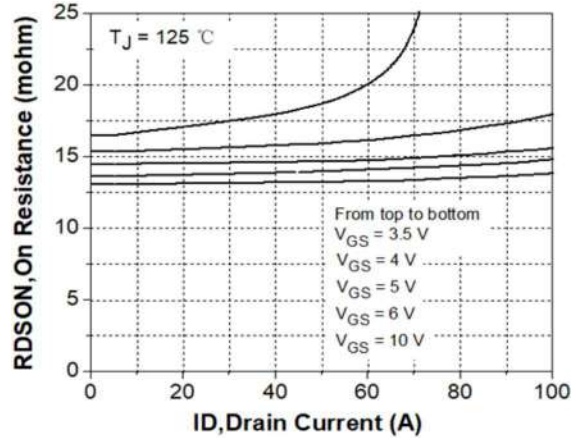


Fig.9 Typical Capacitance vs. Drain Source Voltage

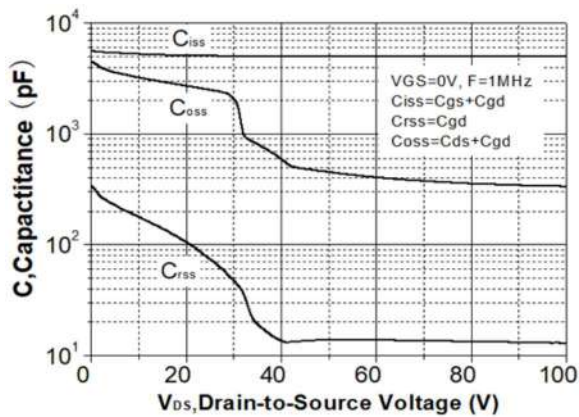


Fig.10 Dynamic Input Characteristics

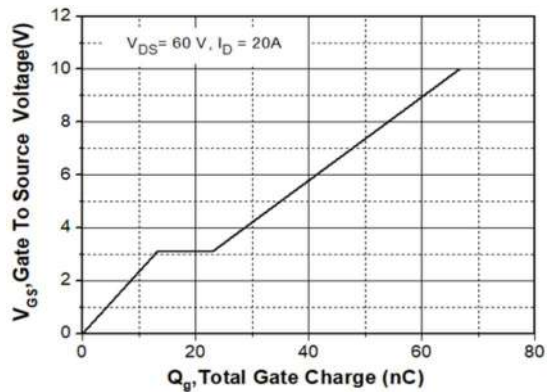


Fig.11 Breakdown Voltage vs. Junction Temperature

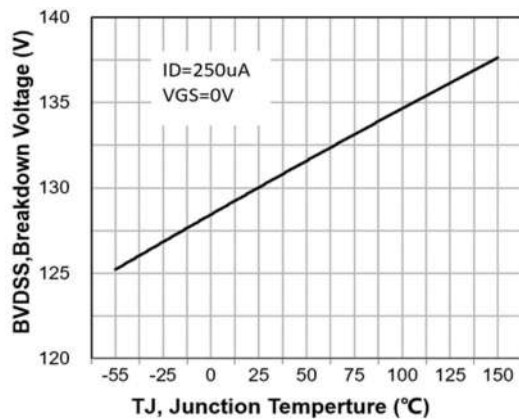
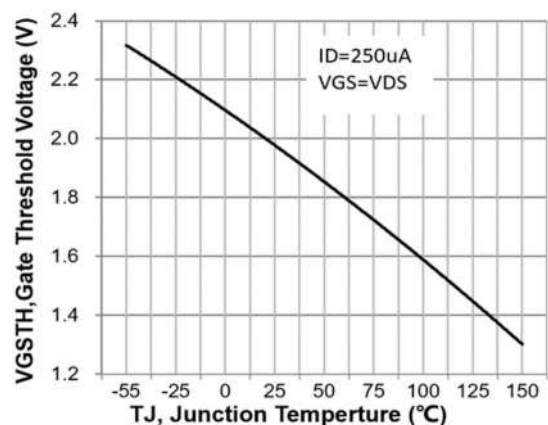


Fig. 12 Gate Threshold Voltage vs. Junction Temperature



Typical Performance Characteristics

Fig.13 On-Resistance Variation vs. Junction

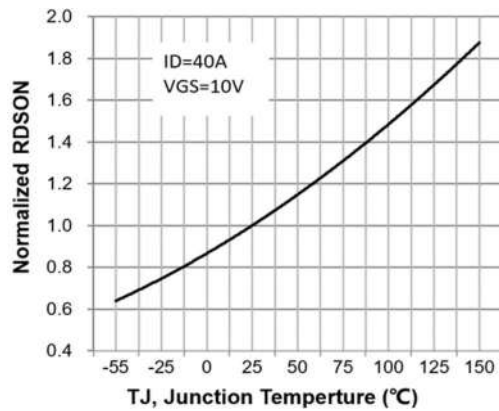


Fig.14 Maximum Drain Current vs. Case Temperature

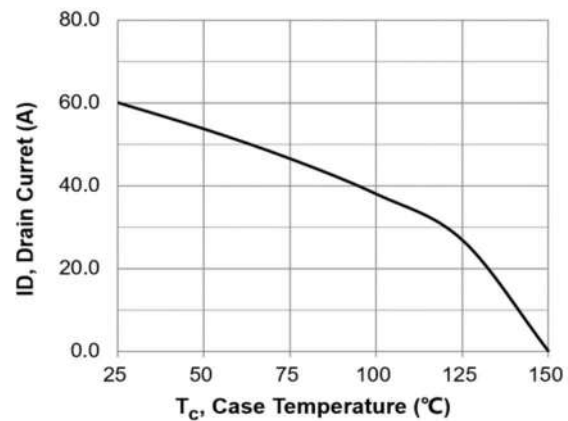
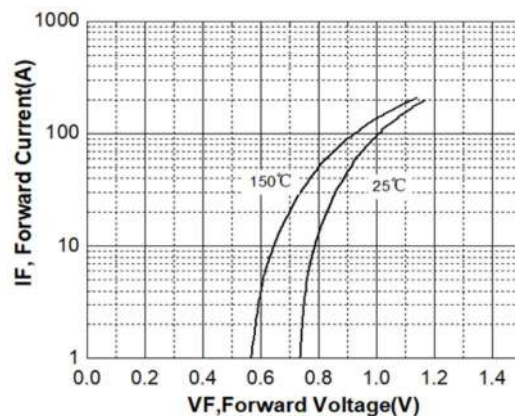


Fig.15 Body Diode Forward Voltage vs. Reverse Drain Current



Typical Performance Characteristics

Fig.16 Safe Operating Area

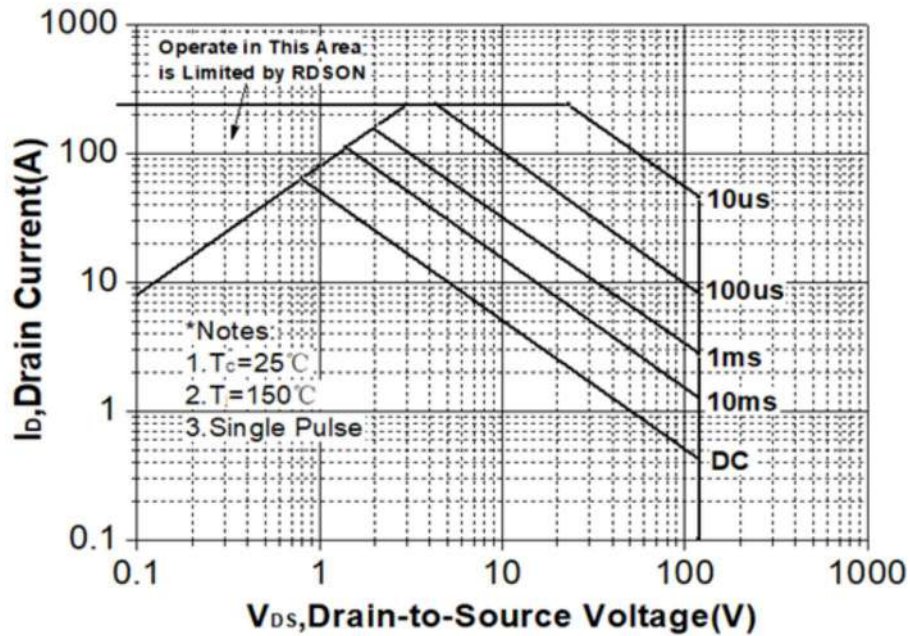
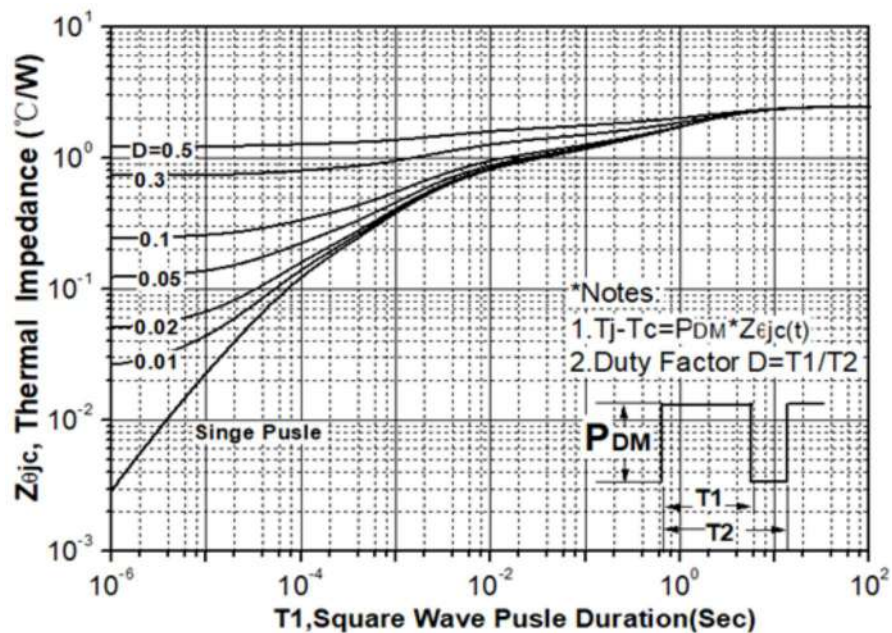
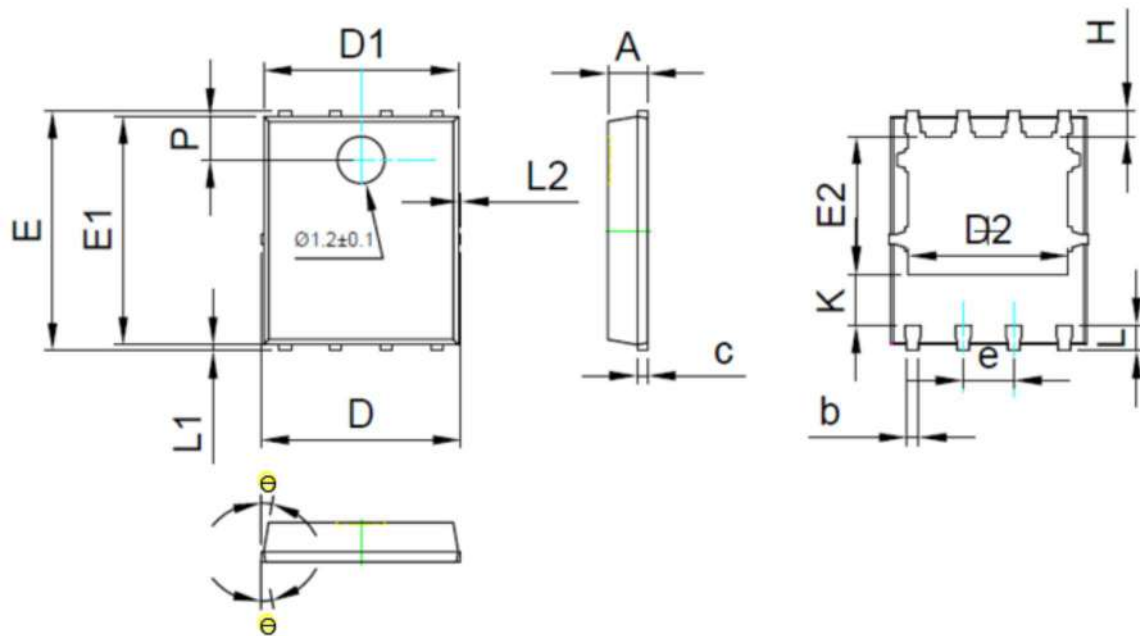


Fig. 17 Transient Thermal Response Curve



PDFN5*6-8L Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE = MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.35	0.40	0.45
c	0.21	0.25	0.34
D	-	-	5.1
D1	4.85	4.90	4.95
D2	3.96	4.01	4.06
e	1.27 BSC		
E	5.95	6.00	6.05
E1	5.70	5.75	5.80
E2	3.425	3.475	3.525
H	0.60	0.65	0.70
K	1.29	-	-
L	0.60	0.65	0.70
L1	0.05	0.15	0.25
L2	-	-	0.12
θ	8°	10°	12°
P	1.05	1.10	1.15