

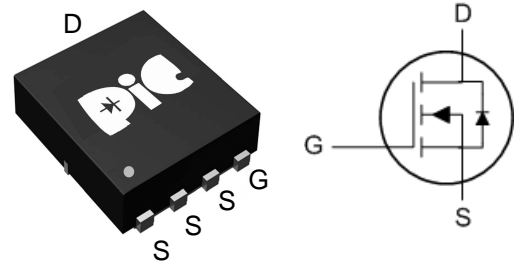
➤ General Description

This PAN00SY48Y N-Channel enhancement mode power field effect transistor is the high density trench technology and this advanced technology can provide excellent $R_{ds(On)}$ performance and efficiency for power switching and load switching application., this device also comply with the RoHS and Green Product requirement with full function reliability approved.

➤ Feature

- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

➤ DFN5X6A-EP1



➤ Application

- DC/DC Primary Side Switch
- Industrial Synchronous
- Rectification Load Switch
- DC/DC Converters

➤ Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^{1,6}	$I_D@T_C=25^\circ C$	78	A
Continuous Drain Current ^{1,6}	$I_D@T_C=70^\circ C$	62	A
Pulsed Drain Current ²	I_{DM}	280	A
Single Pulse Avalanche Energy ³	EAS	26.5	mJ
Avalanche Current	I_{AS}	23	A
Total Power Dissipation ⁴	$P_D@T_C=25^\circ C$	108	W
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ C$
Thermal Resistance Junction-Ambient ¹ ($t \leq 10s$)	$R_{\theta JA}$	25	$^\circ C/W$
Thermal Resistance Junction-Ambient ¹		55	$^\circ C/W$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	1.3	$^\circ C/W$

➤ Electrical Characteristics ($T_J=25^\circ C$ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=10V, I_D=13.5A$	---	6.6	8	m Ω
Static Drain-Source On-Resistance ²		$V_{GS}=4.5V, I_D=11.5A$	---	8.7	10.5	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	---	2.3	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	uA
		$V_{DS}=80V, V_{GS}=0V, T_J=55^\circ C$	---	---	5	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$	---	85	---	S
Total Gate Charge (10V)	Q_g	$V_{DS}=50V, V_{GS}=10V, I_D=13.5A$	---	45	---	nC
Total Gate Charge (4.5V)	Q_g		---	19.3	---	
Gate-Source Charge	Q_{gs}		---	9.5	---	
Gate-Drain Charge	Q_{gd}		---	4.8	---	
Turn-On Delay Time	$T_d(on)$	$V_{DD}=50V, V_{GS}=10V, R_G=3\Omega, I_D=13.5A$	---	10	---	ns
Rise Time	T_r		---	6.5	---	
Turn-Off Delay Time	$T_d(off)$		---	45	---	
Fall Time	T_f		---	7.5	---	
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	---	3320	---	pF
Output Capacitance	C_{oss}		---	605	---	
Reverse Transfer Capacitance	C_{rss}		---	20	---	

➤ Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current ^{1,5,6}	I_S	$V_G=V_D=0V, \text{Force Current}$	---	---	45	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1.1	V
Reverse Recovery Time	t_{rr}	$I_F=13.5A, di/dt=100A/\mu s, T_J=25^\circ C$	---	33	---	nS
Reverse Recovery Charge	Q_{rr}		---	150	---	nC

Note :

1.Pulse width limited by maximum junction temperature.

2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

3.The EAS data shows Max. rating . The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=23A$

4.The power dissipation is limited by $150^\circ C$ junction temperature

5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

6.The maximum current rating is package limited.

➤ Typical Characteristics

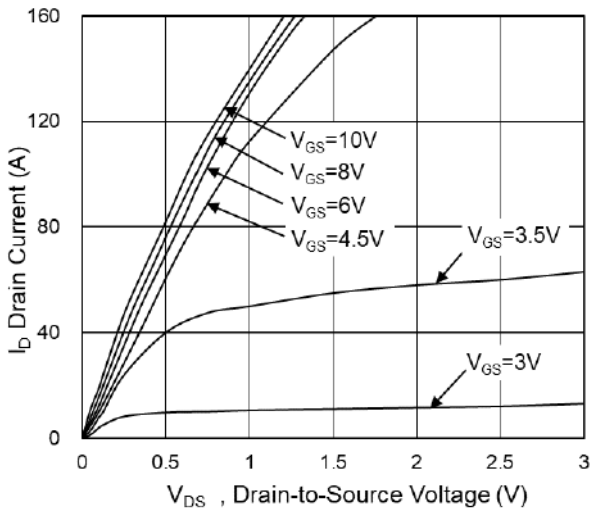


Fig.1 Typical Output Characteristics

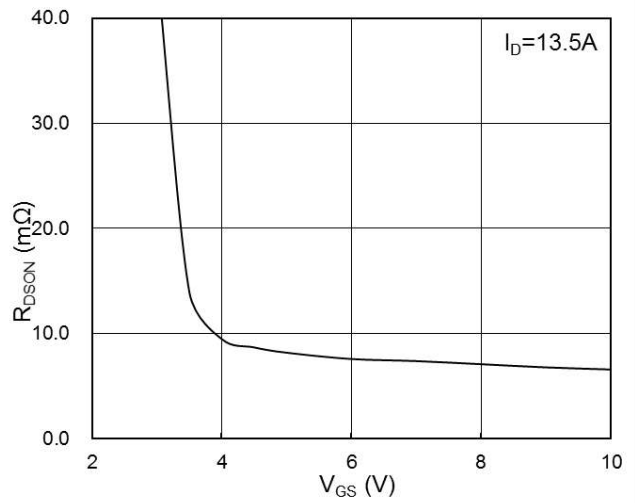


Fig.2 On-Resistance vs G-S Voltage

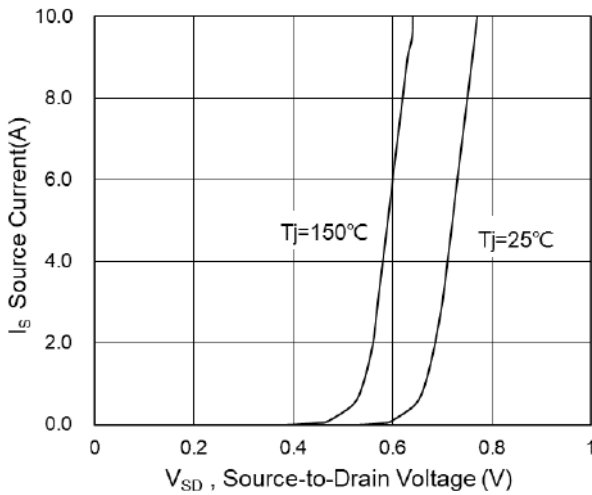


Fig.3 Source-Drain Forward Characteristics

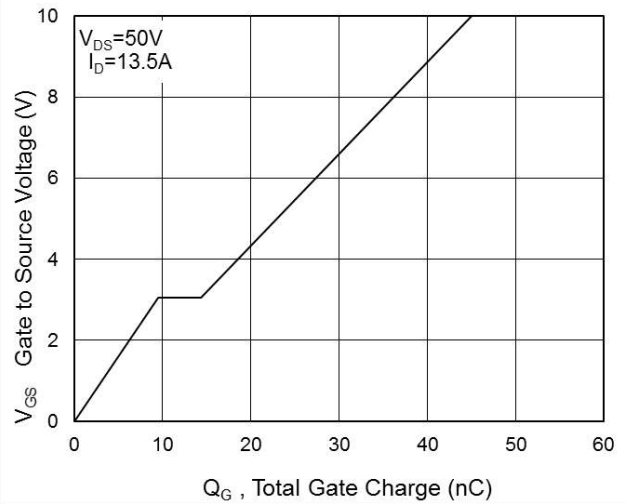


Fig.4 Gate-Charge Characteristics

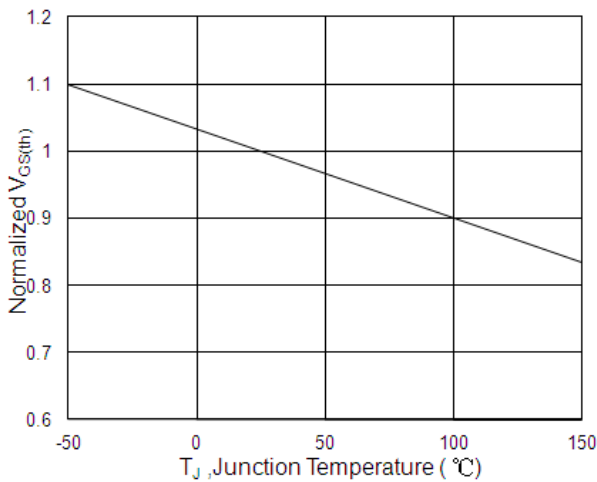


Fig.5 Normalized $V_{GS(th)}$ vs T_J

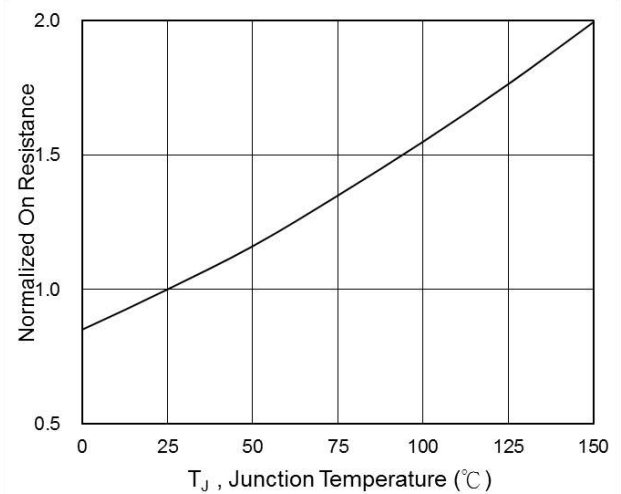


Fig.6 Normalized $R_{DS(ON)}$ vs T_J

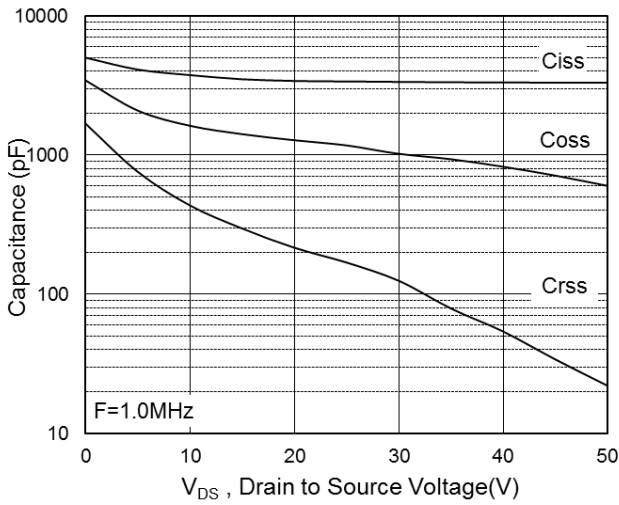


Fig.7 Capacitance

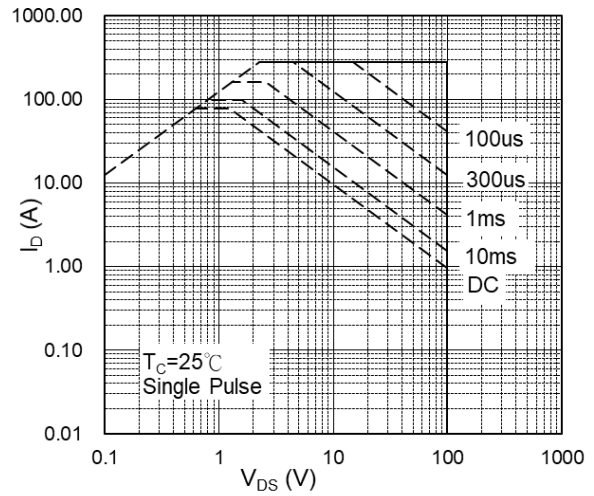


Fig.8 Safe Operating Area

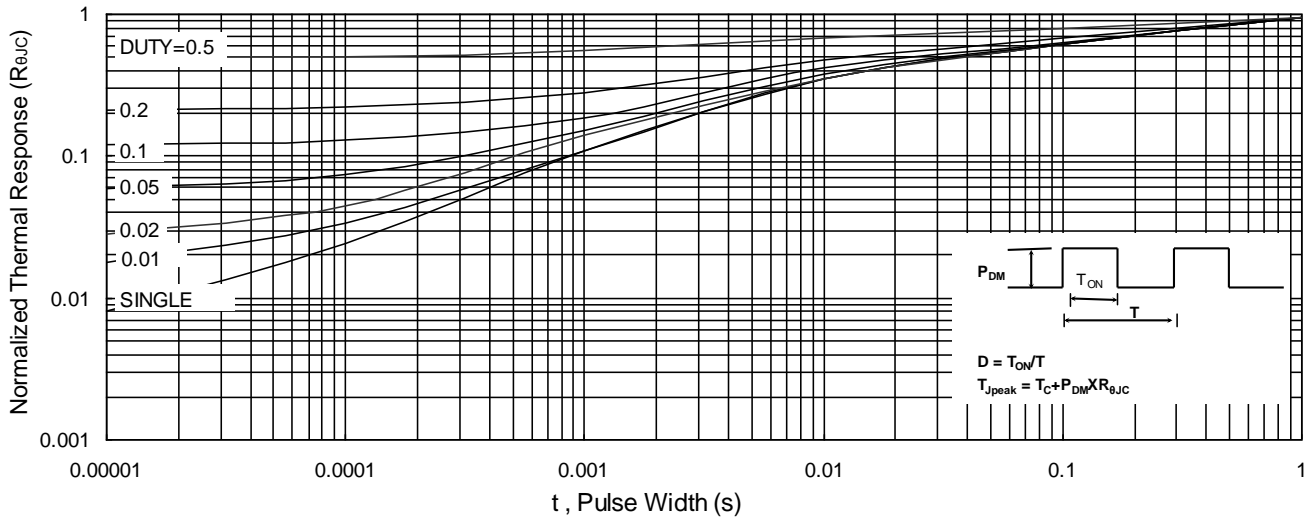


Fig.9 Normalized Maximum Transient Thermal Impedance

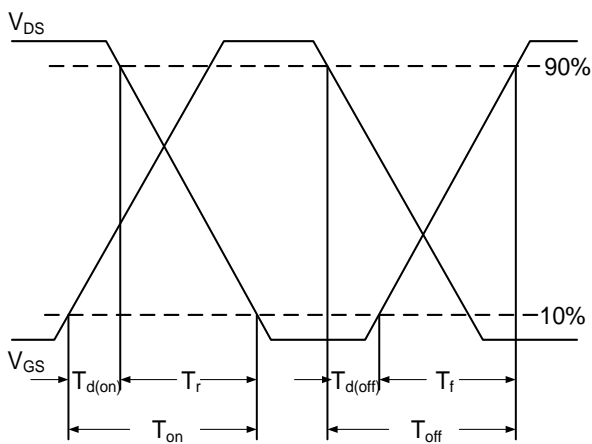


Fig.10 Switching Time Waveform

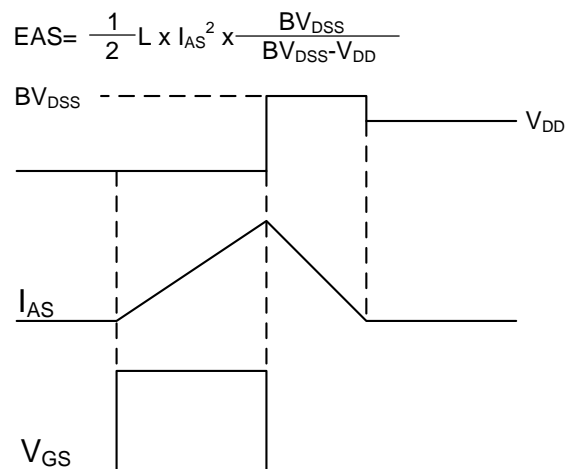
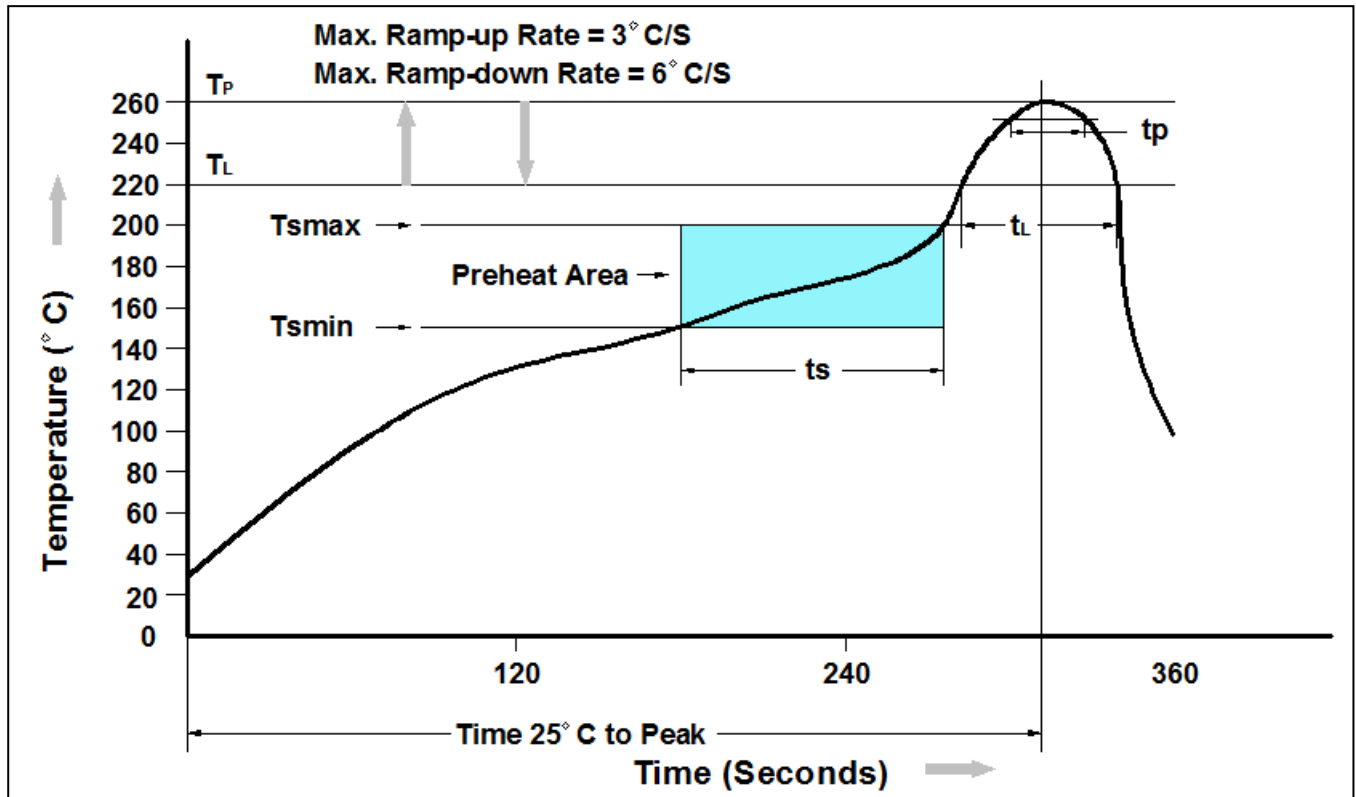


Fig.11 Unclamped Inductive Switching Waveform

➤ Recommend IR Reflow Soldering Thermal Profile

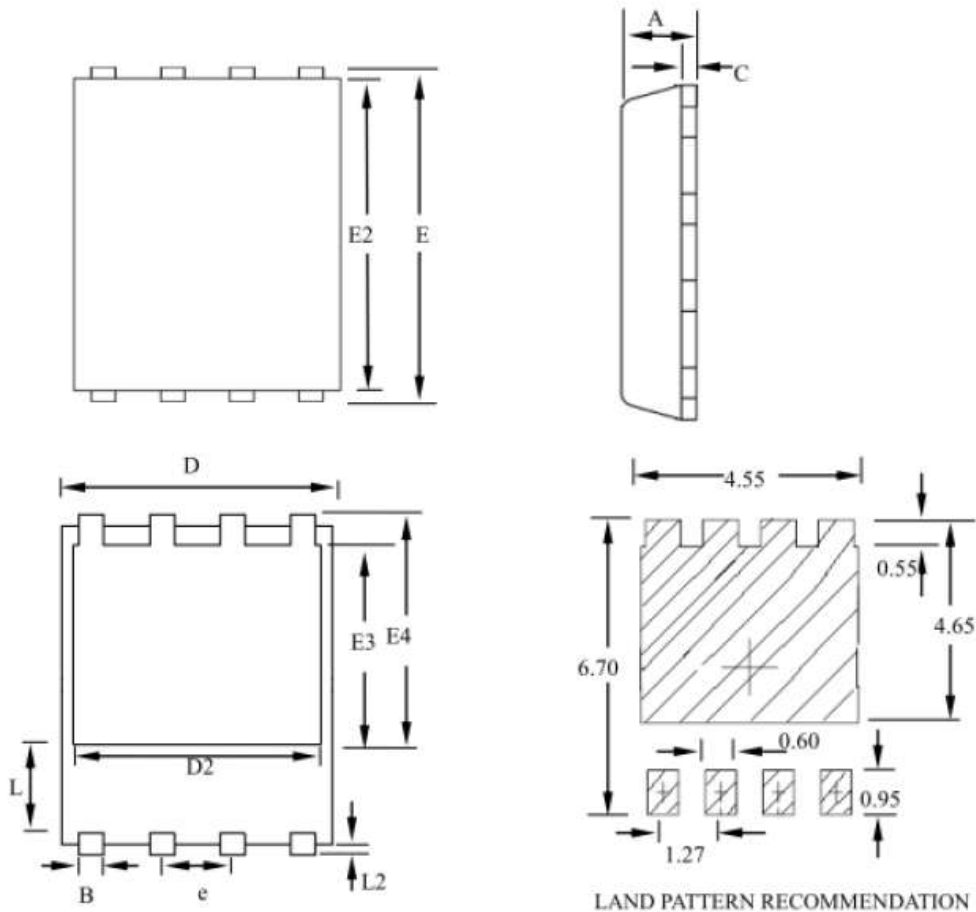


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	150°C
Temperature Max. (T_{smax})	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Average Ramp-up Rate (t_L to t_P)	3°C/second max.
Liquidous Temperature (T_L)	217°C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time (t_P) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

➤ Ordering Information

Part Number	Description	Quantity
PAN00SY48Y	DFN5X6A-EP1 Reel	3000 pcs

➤ Package Information (DFN5X6A-EP1)



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.30	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.30	0.189	--	0.209
D2	3.61	--	4.35	0.142	--	0.171
E	5.90	--	6.35	0.232	--	0.250
E2	5.42	--	5.90	0.213	--	0.232
E3	3.23	--	3.90	0.127	--	0.154
E4	3.69	--	4.55	0.145	--	0.179
L	0.61	--	1.80	0.024	--	0.071
L2	0.05	--	0.36	0.002	--	0.014
e	--	1.27	--	--	0.050	--

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