

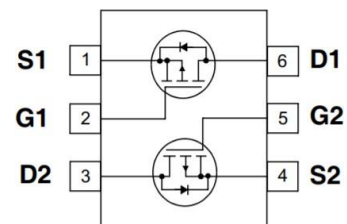
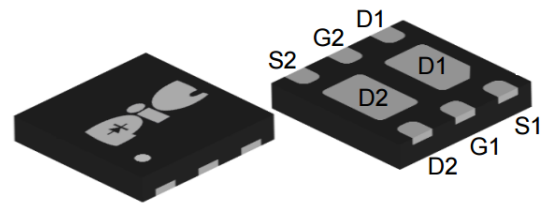
➤ General Description

This PAP2801S Dual P-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
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology
- DFN2X2A-EP2 package design

➤ DFN2X2A-EP2



➤ Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ¹	$I_D@T_A=25^\circ C$	-3.0	A
Continuous Drain Current ¹	$I_D@T_A=70^\circ C$	-2.3	A
Pulsed Drain Current ²	I_{DM}	-12	A
Total Power Dissipation ³	$P_D@T_A=25^\circ C$	1.8	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	$R_{\theta JA}$	150	$^\circ C/W$
Thermal Resistance Junction-ambient ¹ ($t \leq 10s$)	$R_{\theta JA}$	69	$^\circ C/W$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$, $I_D=-250\mu A$	-20	---	---	V
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=-4.5V$, $I_D=-3A$	---	86	110	m Ω
		$V_{GS}=-2.5V$, $I_D=-2A$	---	120	150	
		$V_{GS}=-1.8V$, $I_D=-0.9A$	---	170	240	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-0.45	-0.6	-1.0	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-16V$, $V_{GS}=0V$, $T_J=25^\circ C$	---	---	-1	uA
		$V_{DS}=-16V$, $V_{GS}=0V$, $T_J=55^\circ C$	---	---	-5	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA
Forward Transconductance	g_{fs}	$V_{DS}=-5V$, $I_D=-3A$	---	12.2	---	S
Total Gate Charge (-4.5V)	Q_g	$V_{DS}=-15V$, $V_{GS}=-4.5V$, $I_D=-3A$	---	10.1	---	nC
Gate-Source Charge	Q_{gs}		---	1.21	---	
Gate-Drain Charge	Q_{gd}		---	2.46	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=-10V$, $V_{GS}=-4.5V$, $R_G=3.3\Omega$ $I_D=-3A$	---	5.6	---	ns
Rise Time	T_r		---	32.2	---	
Turn-Off Delay Time	$T_{d(off)}$		---	45.6	---	
Fall Time	T_f		---	29.2	---	
Input Capacitance	C_{iss}	$V_{DS}=-15V$, $V_{GS}=0V$, $f=1MHz$	---	677	---	pF
Output Capacitance	C_{oss}		---	82	---	
Reverse Transfer Capacitance	C_{rss}		---	73	---	

➤ Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current ^{1,4}	I_S	$V_G=V_D=0V$, Force Current	---	---	-3	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^\circ C$	---	---	-1	V

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.Ensure that the channel temperature does not exceed $150^\circ C$.

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

➤ Typical Characteristics

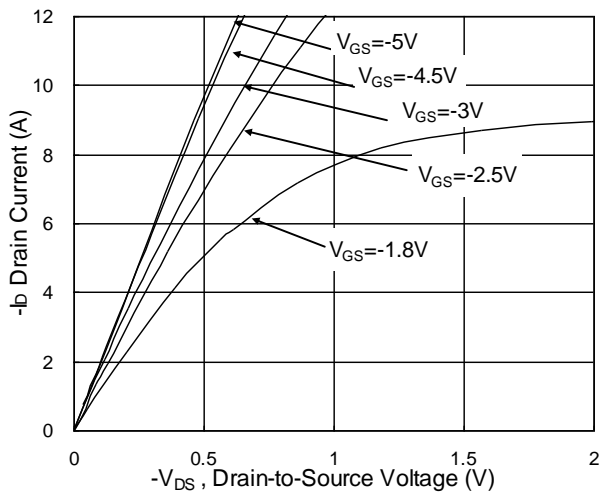


Fig.1 Typical Output Characteristics

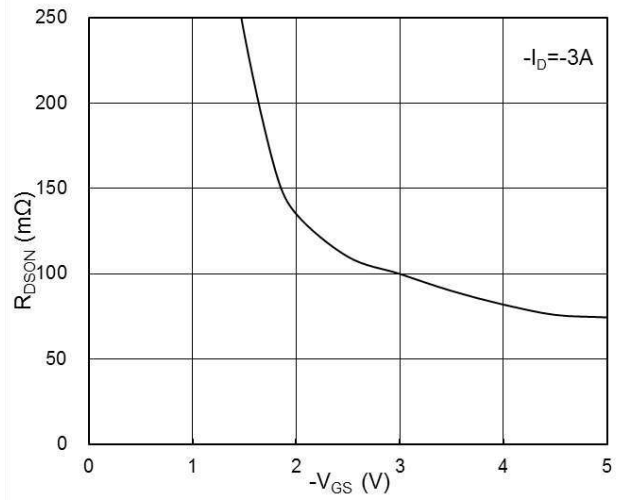


Fig.2 On-Resistance vs. G-S Voltage

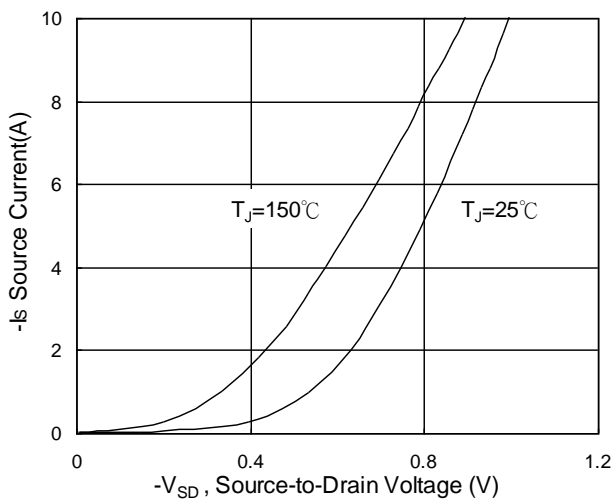


Fig.3 Source Drain Forward Characteristics

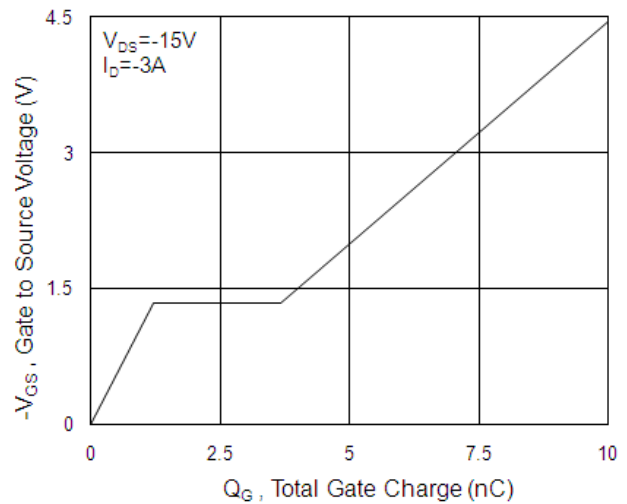


Fig.4 Gate-Charge Characteristics

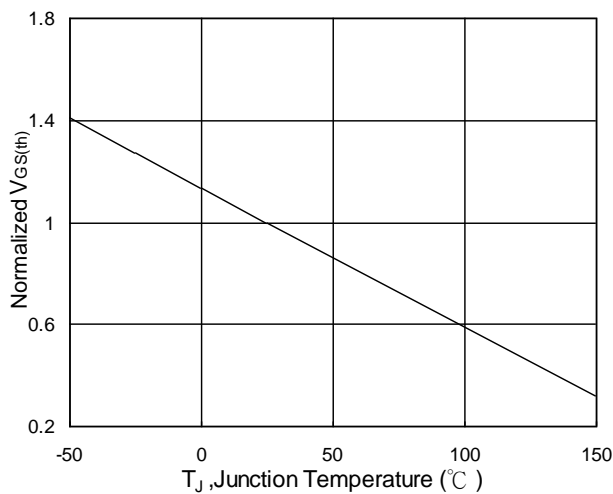


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

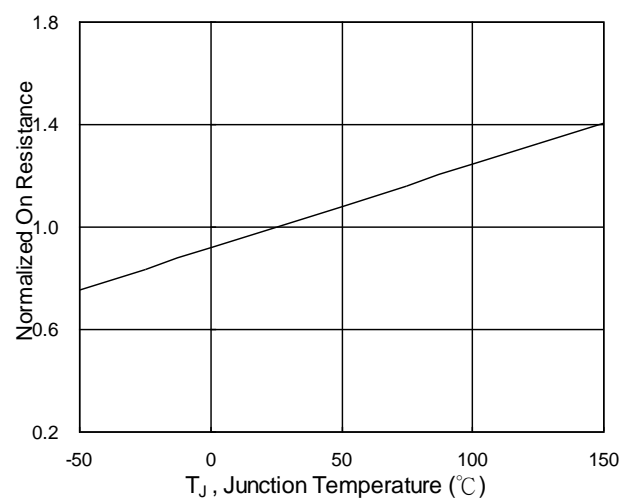


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

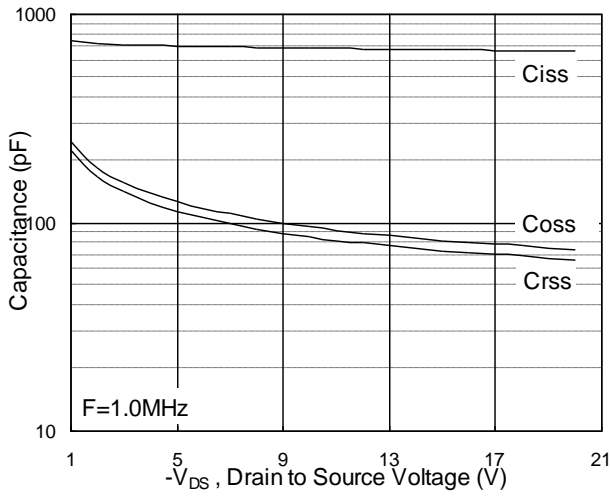


Fig.7 Capacitance

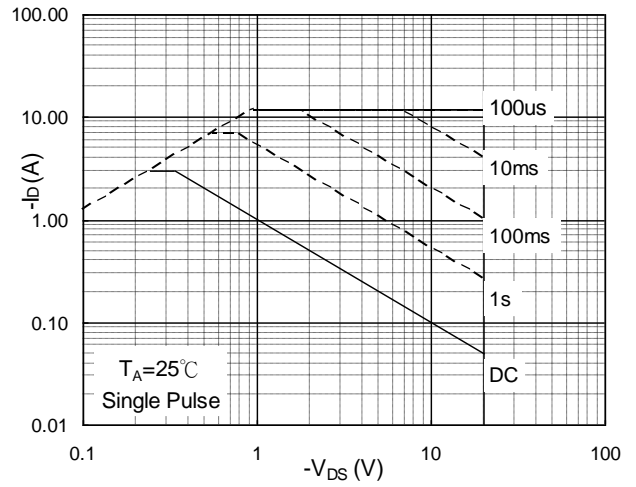


Fig.8 Safe Operating Area

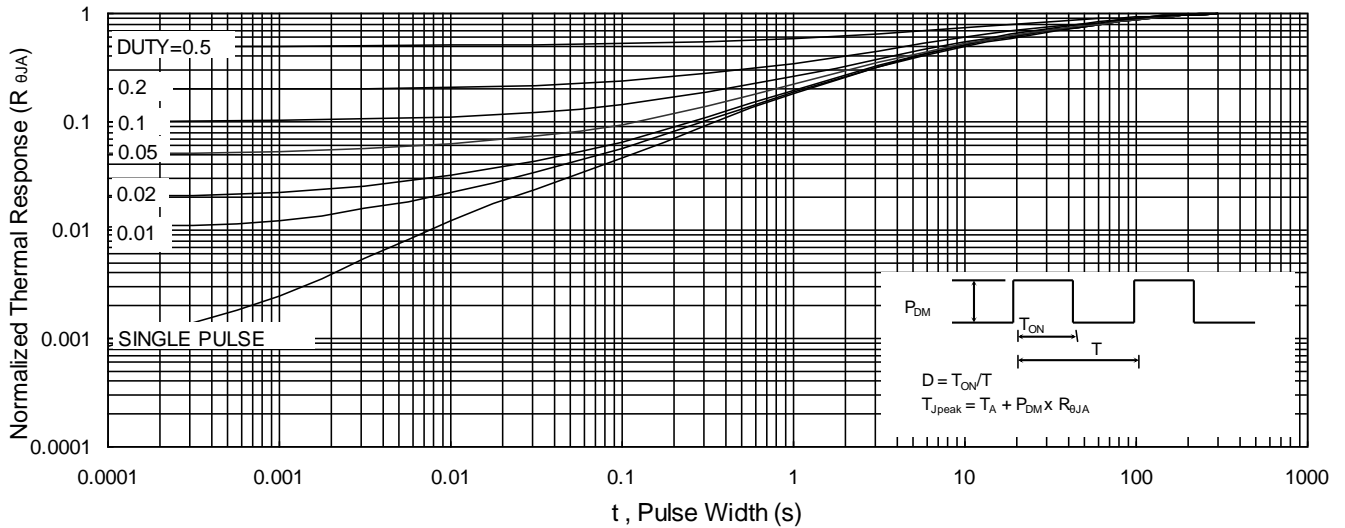


Fig.9 Normalized Maximum Transient Thermal Impedance

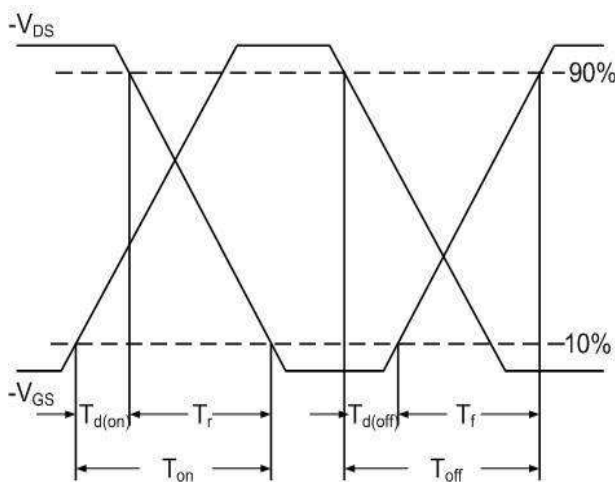


Fig.10 Switching Time Waveform

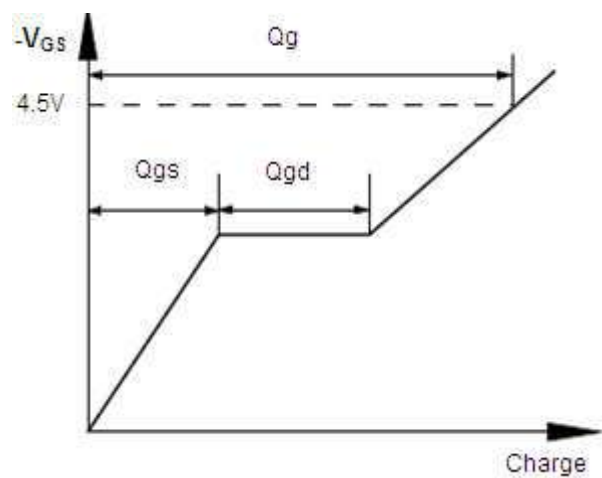
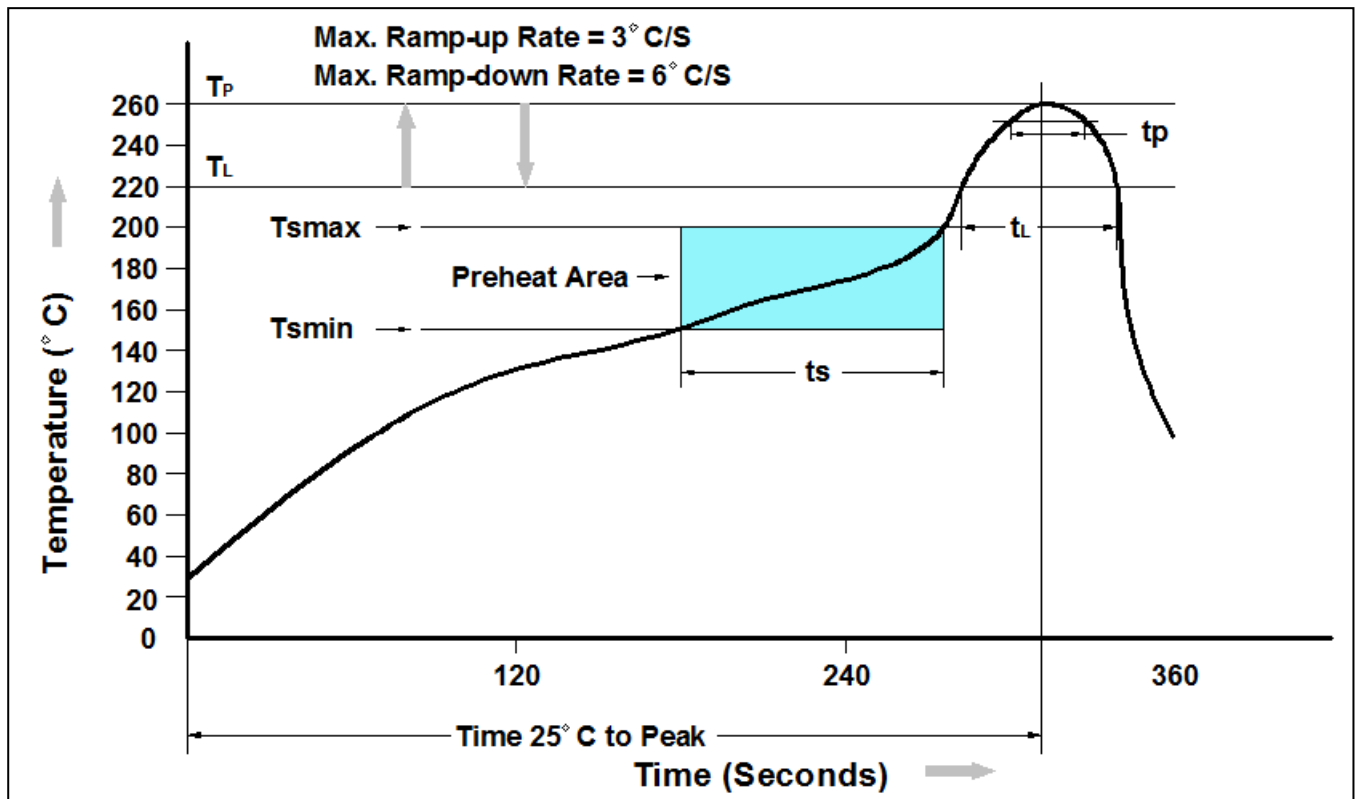


Fig.11 Gate Charge Waveform

➤ Recommand IR Reflow Soldering Thermal Profile

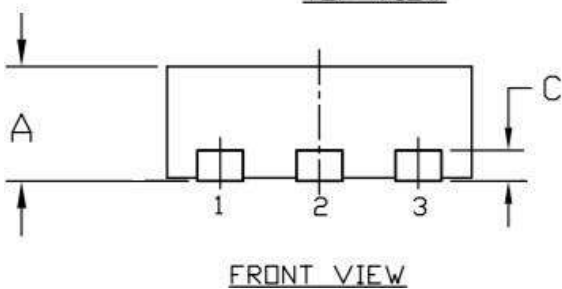
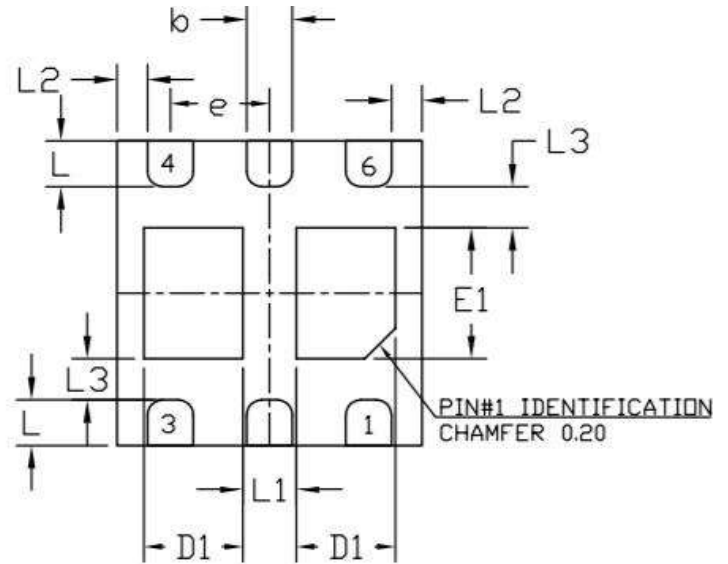
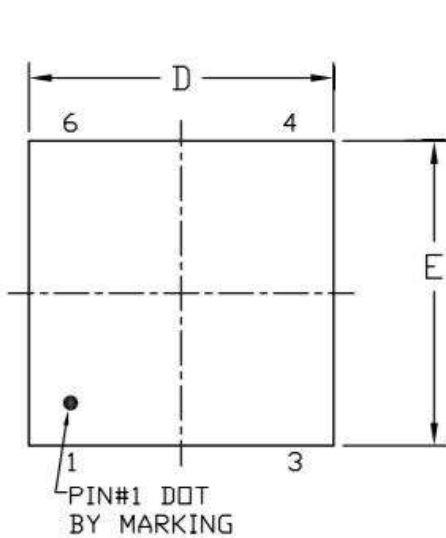


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	150°C
Temperature Max. (T _{smax})	200°C
Time (t _s) from (T _{smin} to T _{smax})	60-120 seconds
Average Ramp-up Rate (t _L to t _P)	3°C/second max.
Liquidous Temperature (T _L)	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds
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.

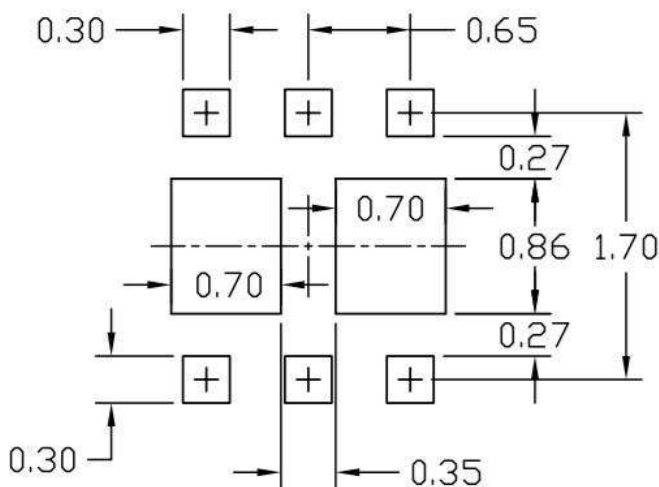
➤ Ordering Information

Part Number	Description	Quantity
PAP2801S	DFN2X2A-EP2 Reel	3000 pcs

➤ Package Information (DFN2X2A-EP2)



RECOMMENDED LAND PATTERN



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
b	0.25	0.30	0.35	0.010	0.012	0.014
c	0.20 Ref.			0.008 Ref.		
D	1.90	2.00	2.10	0.075	0.079	0.083
D1	0.620	0.650	0.680	0.024	0.026	0.027
E	1.90	2.00	2.10	0.075	0.079	0.083
E1	0.76	0.86	0.96	0.030	0.034	0.038
e	0.65 BSC			0.026 BSC		
L	0.25	0.30	0.35	0.010	0.012	0.014
L1	0.320	0.350	0.380	0.013	0.014	0.015
L2	0.170	0.200	0.230	0.007	0.008	0.009
L3	0.240	0.270	0.300	0.009	0.011	0.012

DISCLAIMER

- The information in this document and any product described herein are subject to change without notice and should not be construed as a commitment by Paceleader, Paceleader reserve the right to make changes to the information in this document.
- Though Paceleader make effort to improve product quality and reliability, Product can malfunction and fail due to their inherent electrical sensitivity and vulnerability to physical stress, it is the responsibility of the customer, when utilizing Paceleader products, to comply with the standards of safety in making a safe design for entire system and to avoid situation in which a malfunction or failure., In developing a new designs, customer should ensure that the device which shown in this documents are used within specified operating ranges.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by Paceleader for any infringements of patents or other rights of the third parties which may result from its use.