PAN82TE33F

Dual N-Ch 20V Fast Switching MOSFET

V_{DS}=20V, I_D=11A ,$RDS_{(ON)}$=7.2mΩ

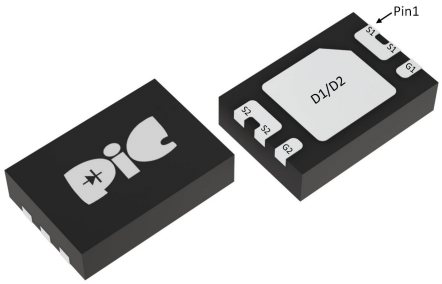
➢ General Description

The PAN82TE33F the low RDSON trenched N-CH MOSFETs with robust ESD protection. This product is suitable for Lithium-ion battery pack applications.The 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

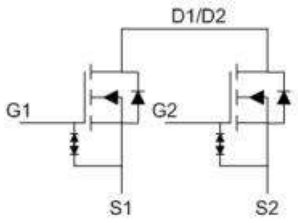
- ●Low drain-source ON resistance
- ●Green Device Available
- ●ESD Protected Embedded
- ●DFN2X3-6L package design

➢ DFN2X3-6L



➢ Application

- ●Load Switch
- ●Portable Equipment
- ●Battery Powered System



➢ Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current, V_{GS} @ 4.5V[1]	I_D@T_A=25°C	11	A
Continuous Drain Current, V_{GS} @ 4.5V[1]	I_D@T_A=70°C	8.8	A
Pulsed Drain Current[2]	I_{DM}	70	A
Total Power Dissipation[1]	P_D@T_A=25°C	1.56	W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C
Thermal Resistance Junction-Ambient [1] (t ≤10s)	$R_{\theta JA}$	80	°C/W

➢ Electrical Characteristics (T_J=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	20	---	---	V
Static Drain-Source On-Resistance2	$R_{DS(ON)}$	V_{GS}=4.5V , I_D=5.5A	---	---	7.2	mΩ
		V_{GS}=4.0V , I_D=5.5A	---	---	7.5	
		V_{GS}=3.7V , I_D=5.5A	---	---	8.2	
		V_{GS}=3.1V , I_D=5.5A	---	---	9	
		V_{GS}=2.5V , I_D=5.5A	---	---	10.2	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	0.5	---	1.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=18V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=18V , V_{GS}=0V , T_J=55°C	---	---	5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V , V_{DS}=0V	---	---	±10	uA
Forward Transconductance	gfs	V_{DS}=5V , I_D=5.5A	---	38	---	S
Total Gate Charge (4.5V)	Q_g	V_{DS}=16V , V_{GS}=4.5V , I_D=11A	---	23	---	nC
Gate-Source Charge	Q_{gs}		---	3.5	---	
Gate-Drain Charge	Q_{gd}		---	8.4	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=16V , V_{GS}=4.5V , R_G=6ΩI_D=5.5A	---	10.2	---	ns
Rise Time	T_r		---	41	---	
Turn-Off Delay Time	$T_{d(off)}$		---	67	---	
Fall Time	T_f		---	31	---	
Input Capacitance	C_{iss}	V_{DS}=10V , V_{GS}=0V , f=1MHz	---	1767	---	pF
Output Capacitance	C_{oss}		---	184	---	
Reverse Transfer Capacitance	C_{rss}		---	155	---	

➢ Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current1	I_S	V_G=V_D=0V , Force Current	---	---	11	A
Pulsed Source Current2	I_{SM}		---	---	70	A
Diode Forward Voltage2	V_{SD}	V_{GS}=0V , I_S=11A , T_J=25°C	---	---	1.2	V

Note :
1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, t≤10s.
2.The data tested by pulsed , pulse width ≦ 10us , duty cycle ≦ 1%

➢ Typical Characteristics

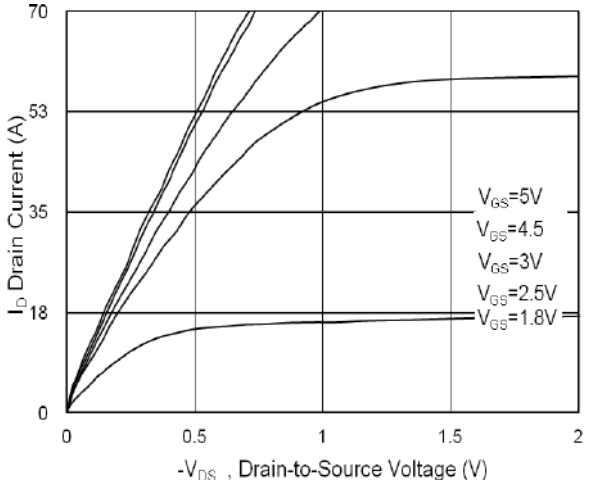


Fig.1 Typical Output Characteristics

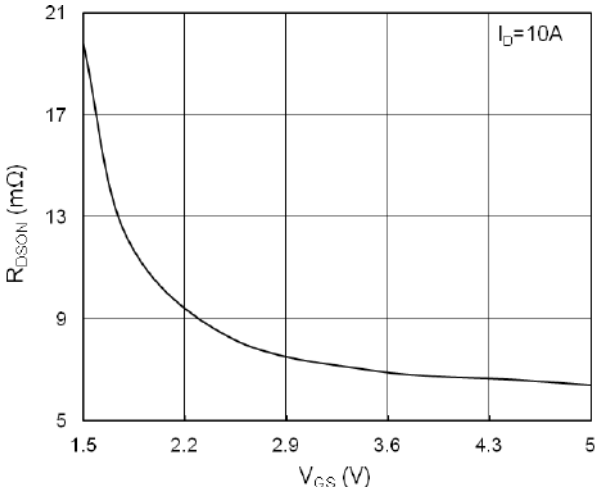


Fig.2 On-Resistance vs. Gate-Source

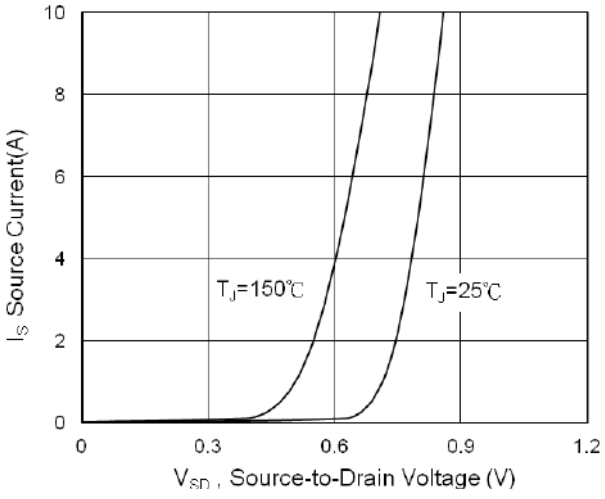


Fig.3 Forward Characteristics Of Reverse

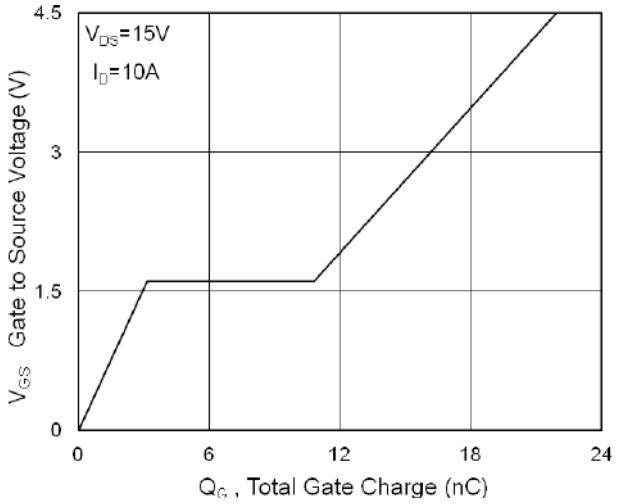


Fig.4 Gate-Charge Characteristics

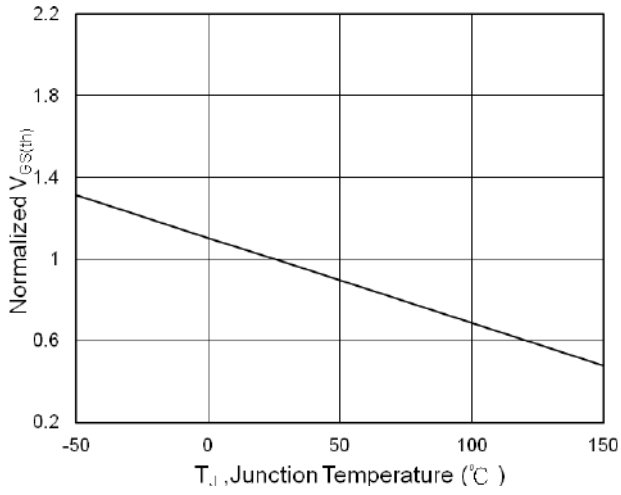


Fig.5 $V_{GS(th)}$ vs. T_J

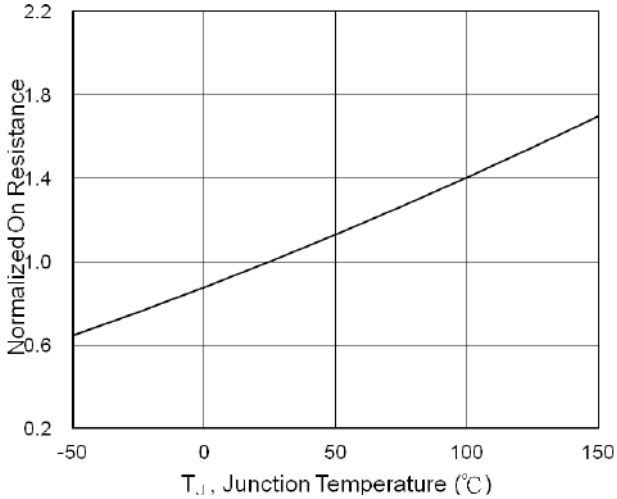


Fig.6 Normalized R_{DSON} vs. T_J

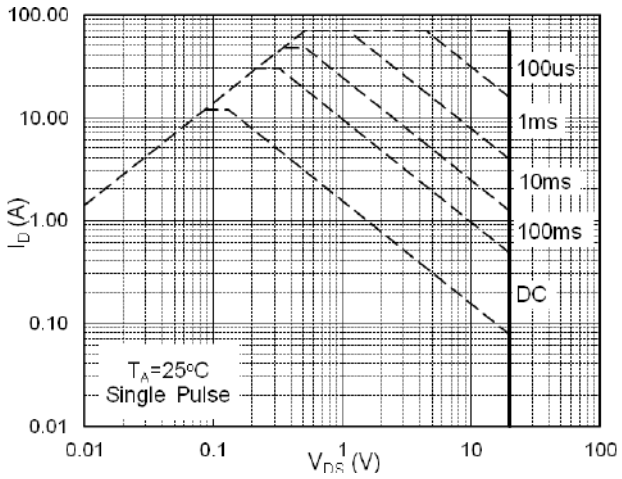


Fig.7 Capacitance

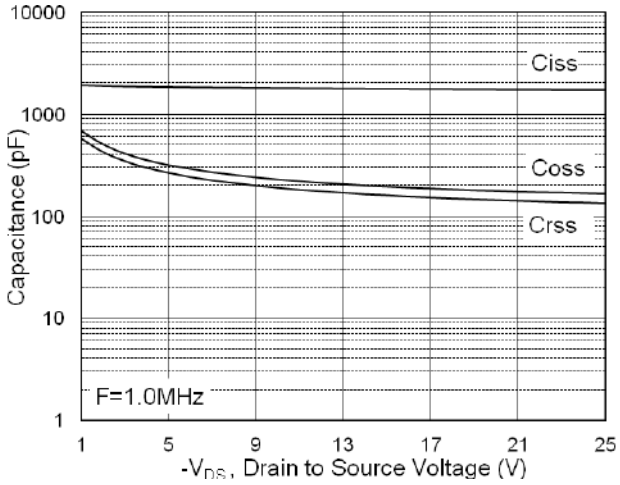


Fig.8 Safe Operating Area

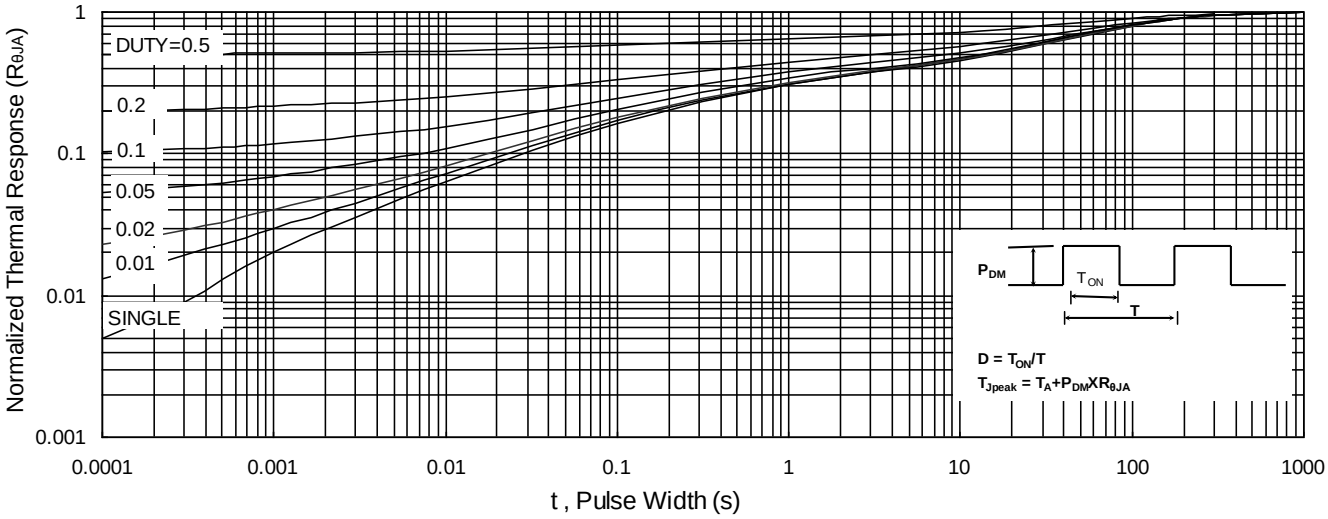


Fig.9 Normalized Maximum Transient Thermal Impedance

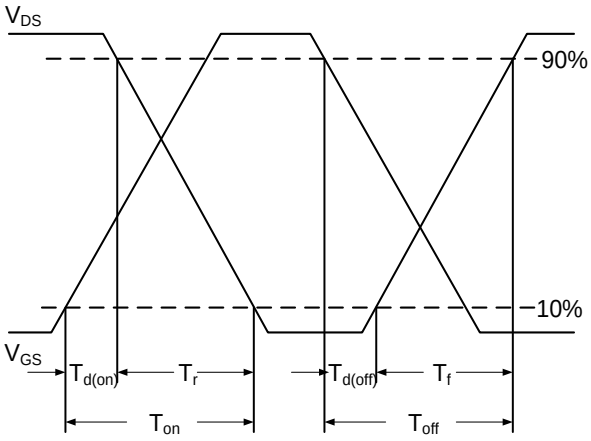


Fig.10 Switching Time Waveform

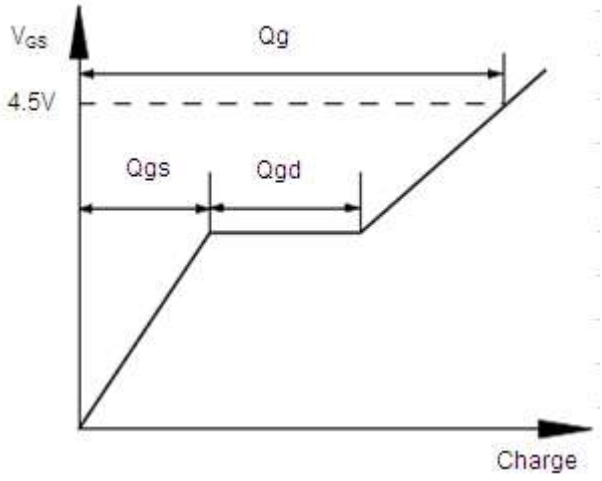
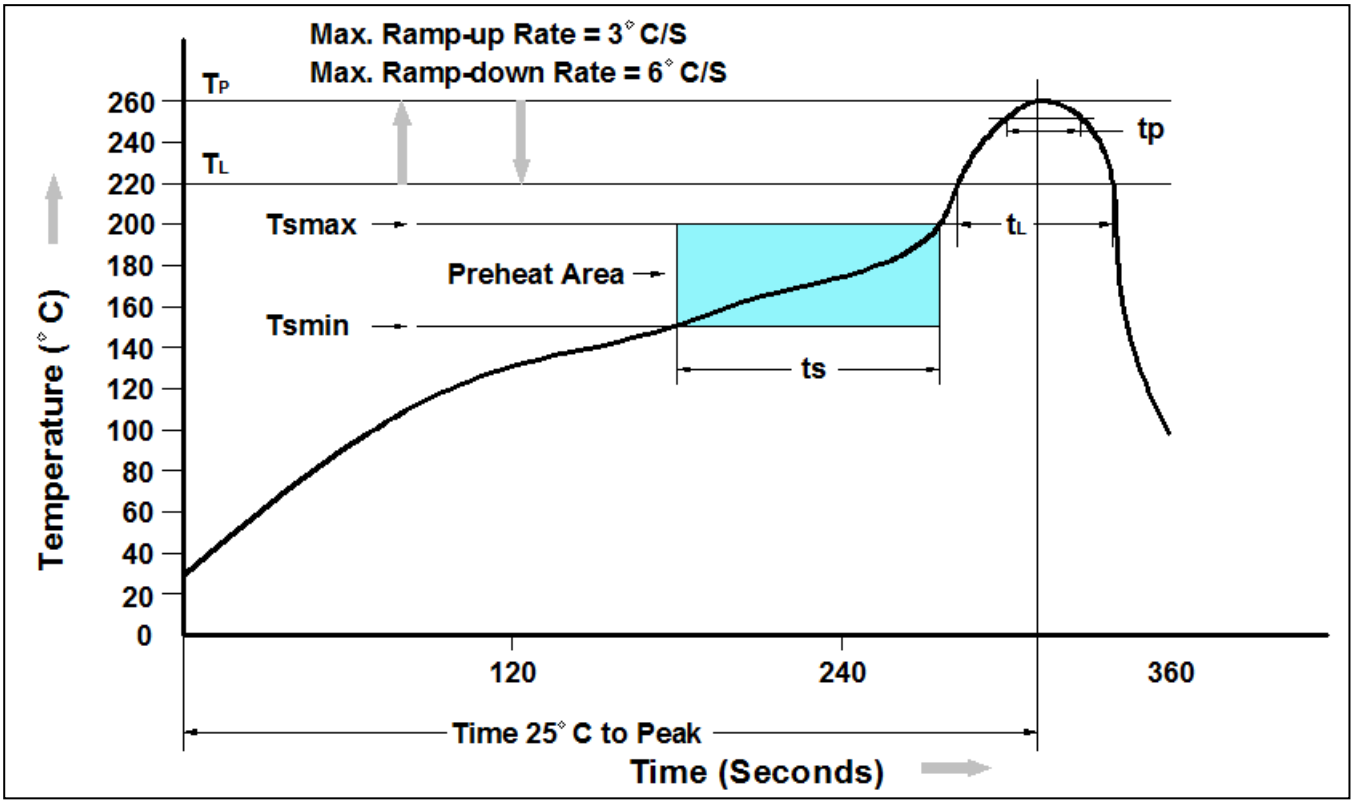


Fig.11 Gate Charge Waveform

➢ Recommand IR Reflow Soldering Thermal Profile

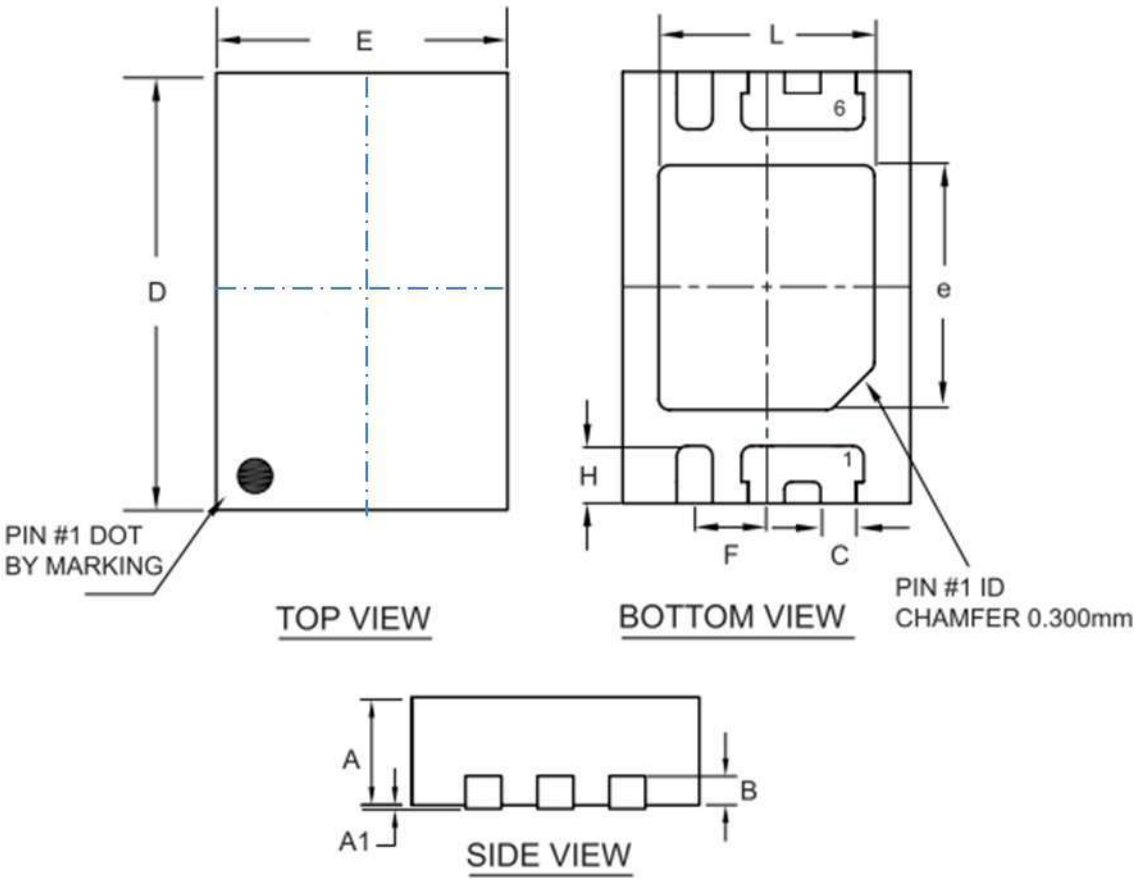


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Average Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time (tP) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

➢ Ordering Information

Part Number	Description	Quantity
PAN82TE33F	DFN2X3-6L Reel	3000 pcs

➢ Package Information (DFN2X3-6L)



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
D	2.950	3.050	0.116	0.120
E	1.950	2.050	0.077	0.081
H	0.350	0.450	0.014	0.018
L	1.450	1.550	0.057	0.061
e	1.650	1.750	0.065	0.069
B	0.195	0.211	0.0076	0.008
C	0.200	0.300	0.008	0.012
F	0.500 BSC		0.020 BSC	

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.