PAN30TD30DA

N-CH 30V Fast Switching MOSFET

V_{DS}=30V, I_D=50A, $RDS_{(ON)}$=2.2mΩ

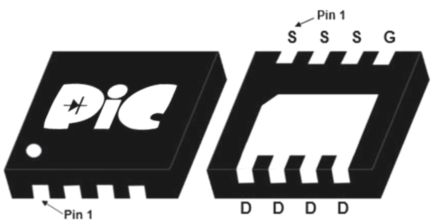
General Description

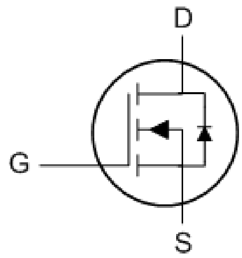
This PAN30TD30DA N-Channel enhancement mode power field effect transistor is the high density trench technology and this advanced technology can provide excellent Rds(On) performance and efficiency for power switching and load switching application., this device also comply with the RoHS and Green Product requirement with full function reliability approved.

Feature

- ●Green Device Available
- ●Super Low Gate Charge
- ●100% EAS Guaranteed
- ●Excellent CdV/dt effect decline
- ●Advanced high cell density Trench technology
- ●DFN3.3x3.3-8L package design

DFN3.3x3.3-8L





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}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V[1,6]	I_D@T_C=25℃	50	A
Continuous Drain Current, V_{GS} @ 10V[1,6]	I_D@T_C=100℃	39	A
Continuous Drain Current, V_{GS} @ 10V[1]	I_D@T_A=25℃	25	A
Continuous Drain Current, V_{GS} @ 10V[1]	I_D@T_A=70℃	20	A
Pulsed Drain Current[2]	I_{DM}	200	A
Single Pulse Avalanche Energy[3]	EAS	120	mJ
Avalanche Current	I_{AS}	49	A
Total Power Dissipation[4]	P_D@T_C=25℃	56.5	W
Total Power Dissipation[4]	P_D@T_A=25℃	2.1	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃
Thermal Resistance Junction-Ambient [1]	$R_{\theta JA}$	60	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	2.2	℃/W

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	BV_{DSS}	30	---	---	V
Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	$R_{DS(ON)}$	---	1.5	2.2	mΩ
	V_{GS}=4.5V , I_D=20A		---	2.1	3.1	
Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	$V_{GS(th)}$	1.2	1.8	2.3	V
Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	I_{DSS}	---	---	1	uA
	V_{DS}=24V , V_{GS}=0V , T_J=55℃		---	---	5	
Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	I_{GSS}	---	---	±100	nA
Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	R_g	---	3	---	Ω
Total Gate Charge	V_{DS}=20V , V_{GS}=4.5V , I_D=20A	Q_g	---	44.5	---	nC
Gate-Source Charge		Q_{gs}	---	14.3	---	
Gate-Drain Charge		Q_{gd}	---	19.9	---	
Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3Ω, I_D=20A	$T_{d(on)}$	---	9	---	ns
Rise Time		T_r	---	12	---	
Turn-Off Delay Time		$T_{d(off)}$	---	98	---	
Fall Time		T_f	---	21	---	
Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	C_{iss}	---	4776	---	pF
Output Capacitance		C_{oss}	---	659	---	
Reverse Transfer Capacitance		C_{rss}	---	626	---	

➢ Diode Characteristics

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	I_S	---	---	50	A
Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	V_{SD}	---	---	1.2	V

Note :

1.Pulse width limited by maximum junction temperature.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=49A

4.Ensure that the channel temperature does not exceed 150°C.

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

6.The maximum current rating is package limited.

Typical Characteristics

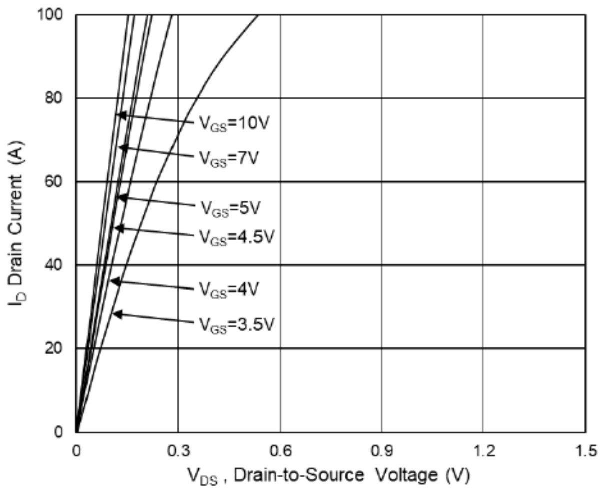


Fig.1 Typical Output Characteristics

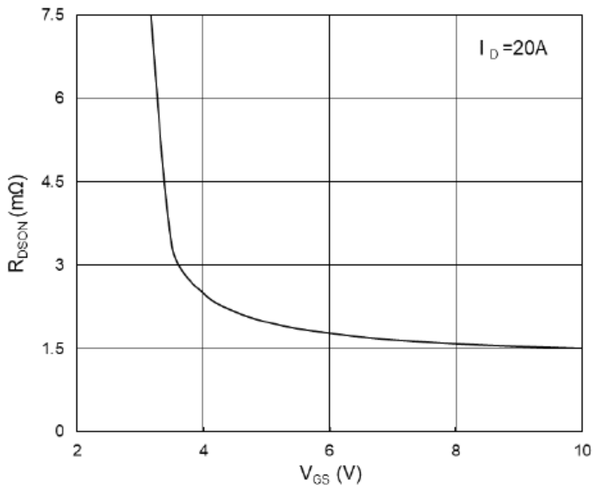


Fig.2 On-Resistance vs G-S Voltage

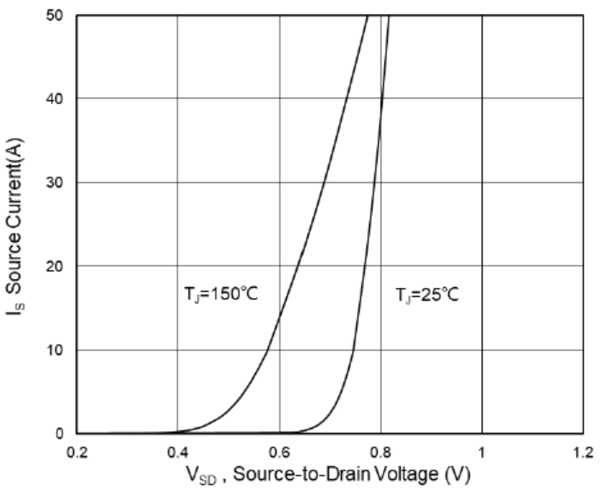


Fig.3 Source Drain Forward Characteristics

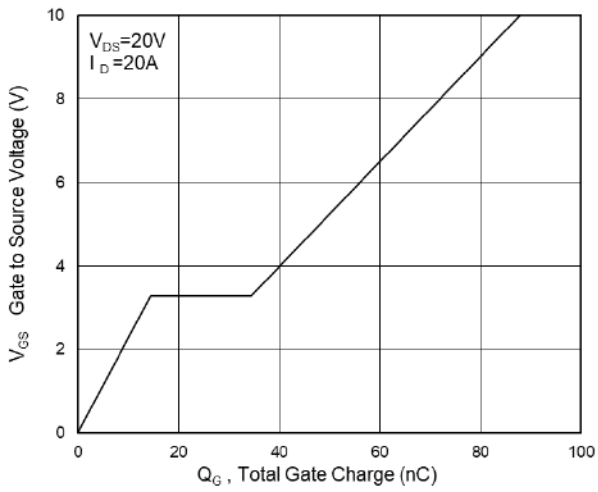


Fig.4 Gate-Charge Characteristics

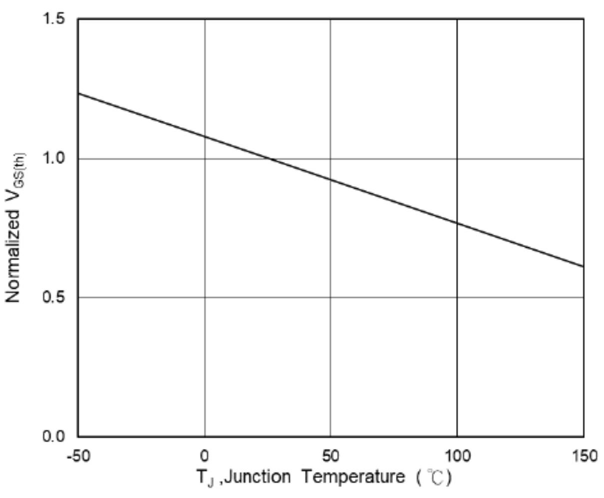


Fig.5 Normalized $V_{GS(th)}$ vs T_J

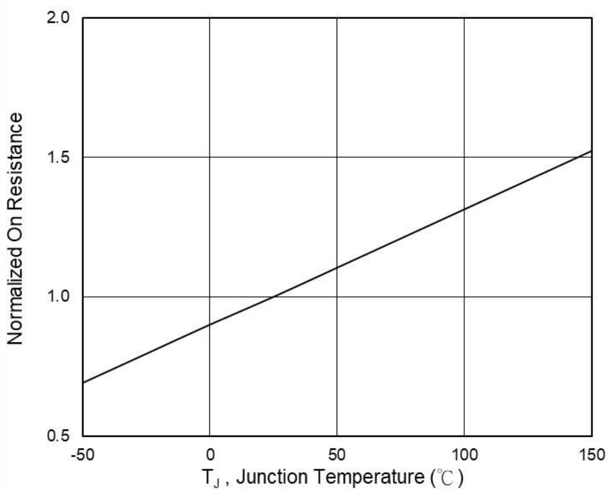


Fig.6 Normalized R_{DSON} vs T_J

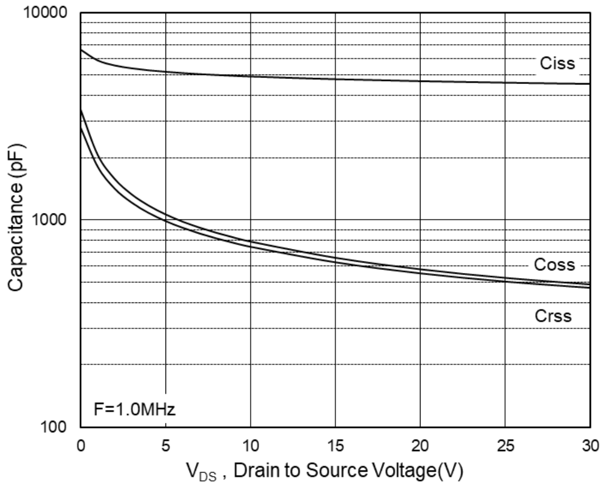


Fig.7 Capacitance

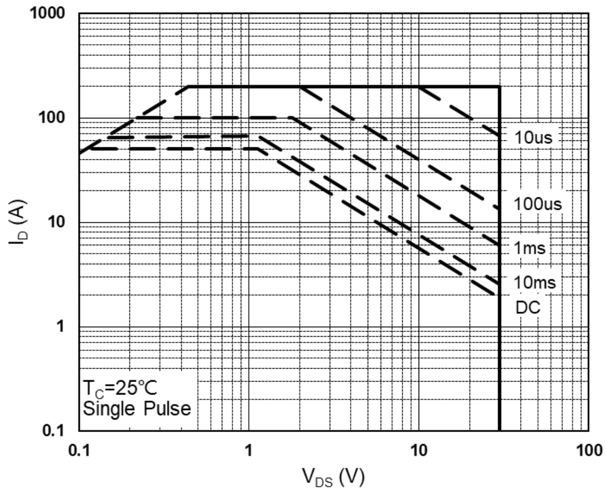


Fig.8 Safe Operating Area

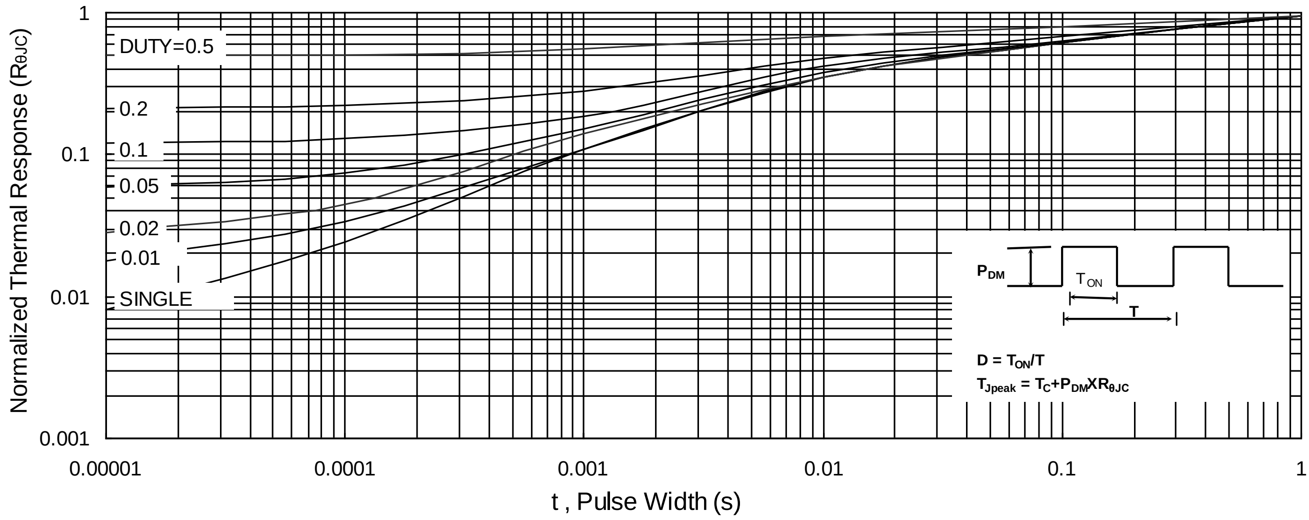


Fig.9 Normalized Maximum Transient Thermal Impedance

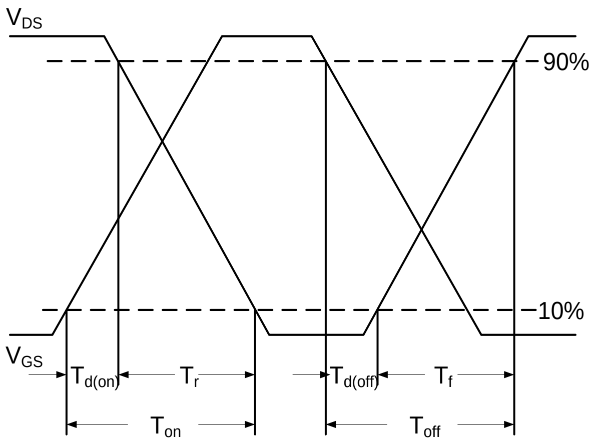


Fig.10 Switching Time Waveform

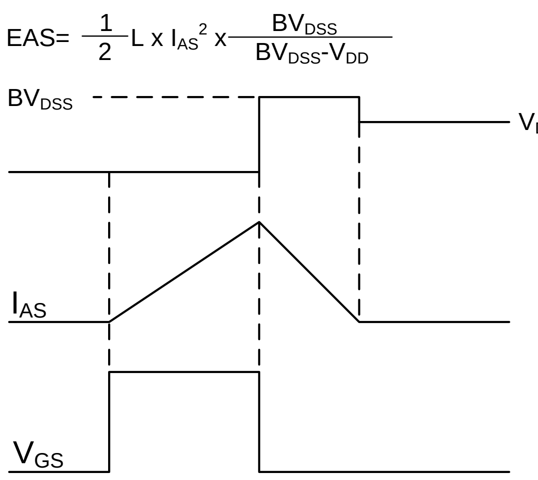
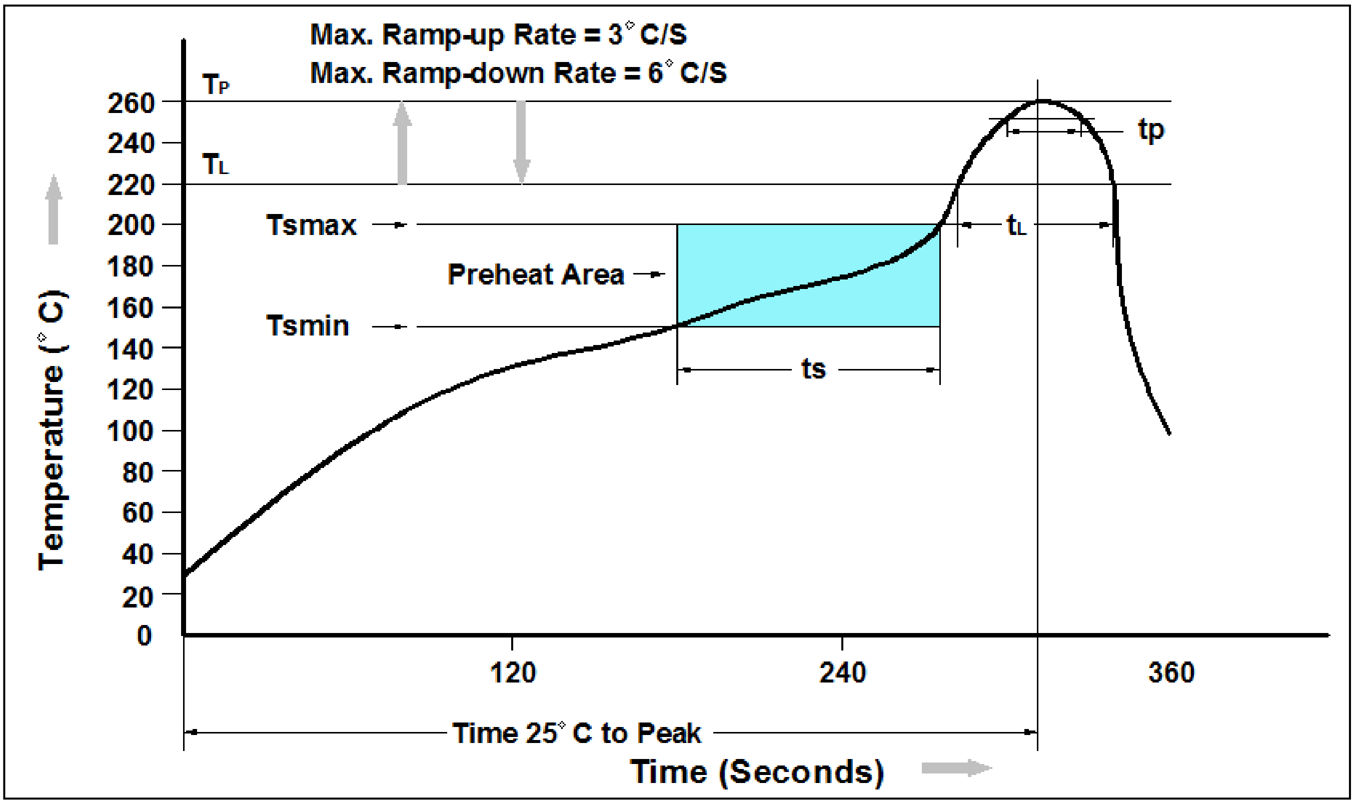


Fig.11 Unclamped Inductive Waveform

➢ Recommand IR Reflow Soldering Thermal Profile

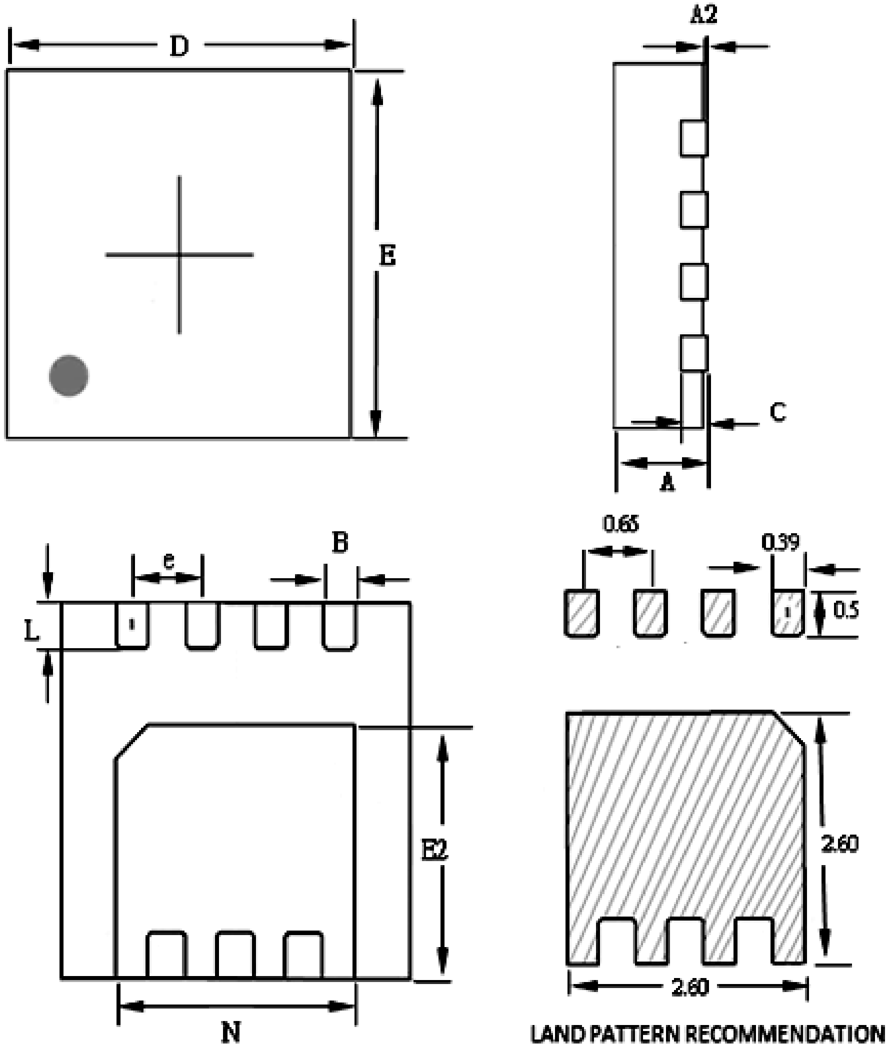


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Average Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Temperature	260°C +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
PAN30TD30DA	DFN3.3x3.3-8L Reel	3000 pcs

➢ Package Information (DFN3.3X3.3-8L)



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A2	0.00	--	0.05	0.000	--	0.002
B	0.24	0.30	0.35	0.009	0.012	0.014
C	0.10	0.15	0.25	0.004	0.006	0.010
D	3.15	3.30	3.40	0.124	0.130	0.134
E	3.15	3.30	3.40	0.124	0.130	0.134
E2	2.15	2.25	2.35	0.085	0.089	0.093
L	0.35	0.40	0.45	0.014	0.016	0.018
N	2.10	2.25	2.35	0.083	0.089	0.093
e	--	0.65	--	--	0.026	--

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