NTS074N03P3H

N-channel 30V Enhancement Mode Power MOSFET

VOLTAGE:	30	Volts	CURRENT:	50	Ampers

FEATURES

- Advanced trench MOSFET technology
- Low RDS(ON)
- Ultra Low Gate Charge
- RoHS Compliant
- 100% UIS and RG Tested
- High Power and current handing capability

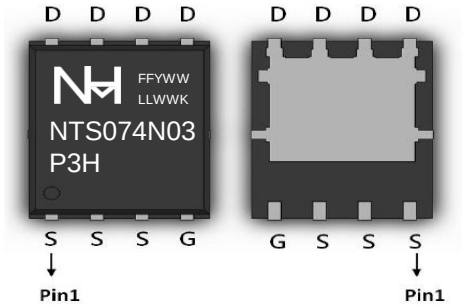
TYPICAL APPLICATIONS

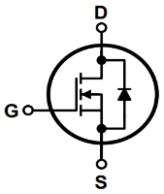
- PD Charger V-BUS
- SMPS 2nd Synchronous Rectifier
- MB/VGA Vcore
- BLDC Motor driver
- POL application

PRODUCT SUMMARY

B_{VDSS},Min. at Max. Tj	30	V
I_D	50	A
$R_{DS(ON)}$,Max. at Vgs=10V	7.4	mΩ
Qg,Typ.	16	nC

PDFN3*3 **Marking and Polarity**





Remark:

①. NH=niuhang trademark;

②. FF=Product line code,According to actual changes

YWW=Data code,According to actual changes

LLWWF=Inernal code,According to actual changes

③. NTS074N03P3H=Modle.

Absolute Maximum Ratings (Ratings at 25℃ ambient temperature unless otherwise specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (Note 1)	Ta=25℃ Ta=100℃	I_D	50 32	A
Drain Current-Pulsed	(Note 1)	I_{DM}	150	A
Maximum Power Dissipation Power Dissipation Derating Factor above 25℃	Ta=25℃ Ta=100℃	P_D	30 12	W
Derating Factor		D_F	0.24	W/℃
Junction Temperature		T_J	-55 to 150	℃
Storage temperature range		T_{STD}	-55 to 150	℃
Avalanche Current,Single pulse	L= 0.1 mH	I_{AS}	21	A
Single Pulse Avalanche Energy	L=0.1mH,IAS=21A, VDD=15V, RG=25Ω, Starting TJ =25℃	E_{AS}	22	mJ

Thermal Characteristcs (Ratings at 25℃ ambient temperature unless otherwise specified)

Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	110	℃/W
Thermal Resistance Junction-Case (Note 2)	$R_{\theta JC}$	4.2	℃/W

Notes: 1. Repetitive Rating : Pulse width limited by maximum junction temperature

2 The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25° C. The value in any given application depends on the user's specific board design.This transistor is sensitive to electrostatic discharge and should be handled with care.

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Electrical Characteristcs (Ratings at 25℃ ambient temperature unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V,ID=250uA	30	-	-	V
Drain-Source Leakage Current	I_{DSS}	VDS=24V,VGS=0V	-	-	1	uA
Gate-Body Leakage Current	I_{GSS}	VGS=±20V,VDS=0V	-	-	±100	nA
Static on Characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	VGS=VDS,ID=250uA	1.1	1.6	2.1	V
Drain-Source On Resistance	$R_{DS(ON)}$	VGS=10V,ID=8A	-	6.2	7.4	mΩ
		VGS=4.5V,ID=6A	-	8.5	10.0	
Forward Transconductance	g_{FS}	VDS=5V,ID=8A	-	12	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	VDS=15V,VGS=0V, f=1.0MHz	-	1000	-	pF
Output Capacitance	C_{oss}		-	150	-	pF
Reverse Transfer Capacitance	C_{rss}		-	120	-	pF
Switching Paramters						
Turn-On Delay Time	$t_{d(on)}$	VDS=20V,ID=20A, VGS=10V,RG=1.6Ω	-	6	-	ns
Turn-On Rise Time	t_r		-	22	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	48	-	ns
Turn-Off Rise Time	t_f		-	20	-	ns
Gate Resistance	R_g	VDS=0V,VGS=0V,f=1.0MHz	-	3.50	-	Ω
Total Gate Charge	Q_g	VDS=25V,ID=8A,VGS=10V	-	30	-	nC
Gate-Source Charge	Q_{gs}		-	2	-	nC
Gate-Drain Charge	Q_{gd}		-	9.0	-	nc
Drain-Source Diode Characteristics and Maximum Ratings						
Max. Diode Forward Cuurent	I_{SD}		-	-	50	A
Max. Pulsed Forward Cuurent	I_{SM}		-	-	150	A
Diode Forward Voltage	V_{SD}	VGS=0V,IS=10A	-	0.70	1.1	V
Reverse Recovery Time	t_{rr}	IF=8A,di/dt=100A/us	-	14	-	ns
Reverse Recovery Charge	Q_{rr}		-	6	-	μC

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Typical Characteristics Curves

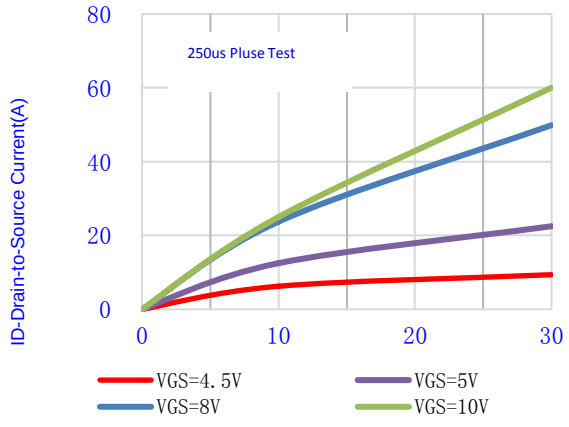

Fig.1-Output Characteritsics

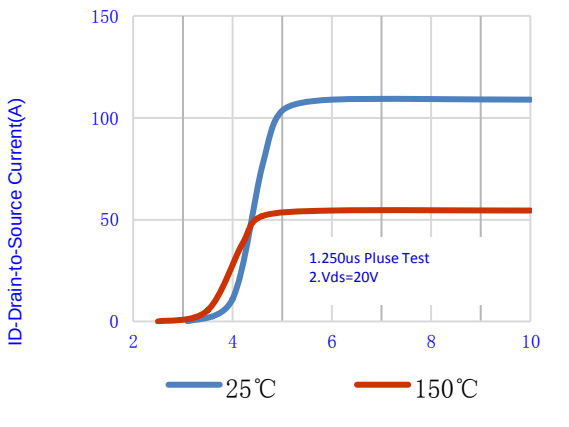

Fig.2- Transfer Characteritsics

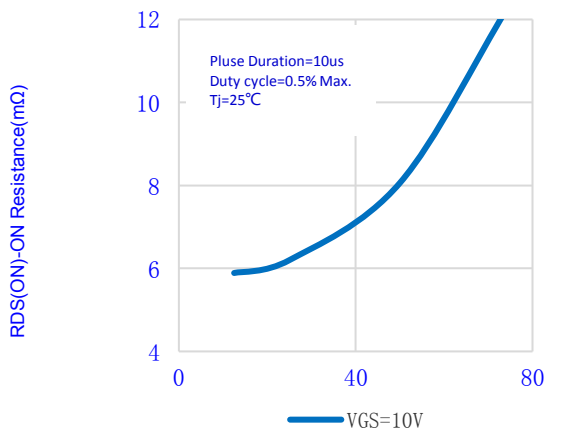

Fig.3- On Resistance vs. Drain Current

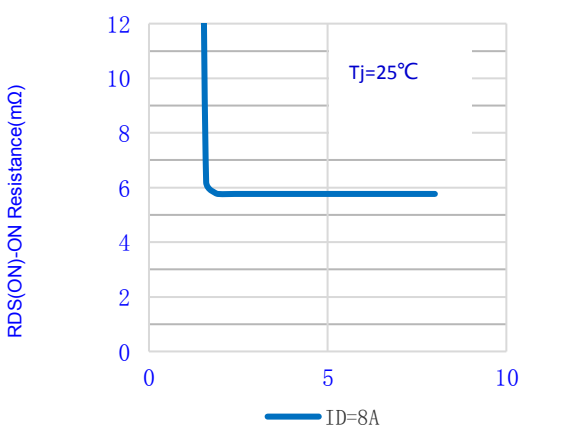

Fig.4- On Resistance vs. Gate Source Voltage

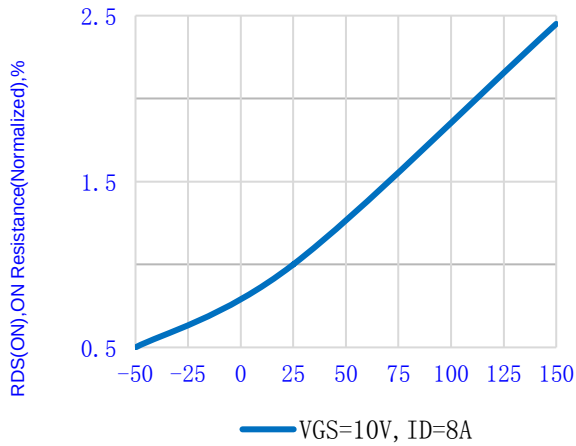

Fig.5-On Resistance vs. Junction Temperature

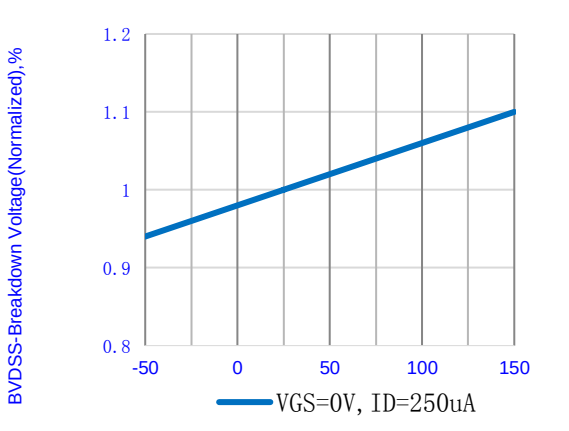

Fig.6- Breakdown Voltage vs. Junction Temperature

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Typical Characteristics Curves

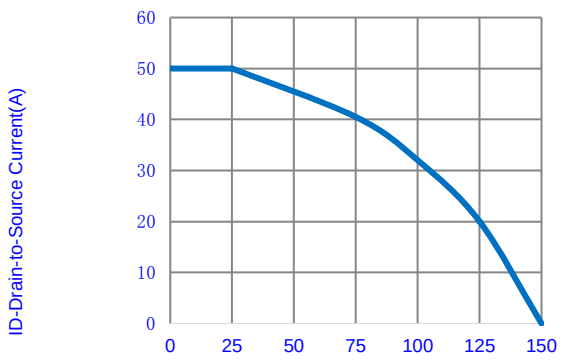

Fig.7-Maximum Continuous Drain Current vs. Case Temperature

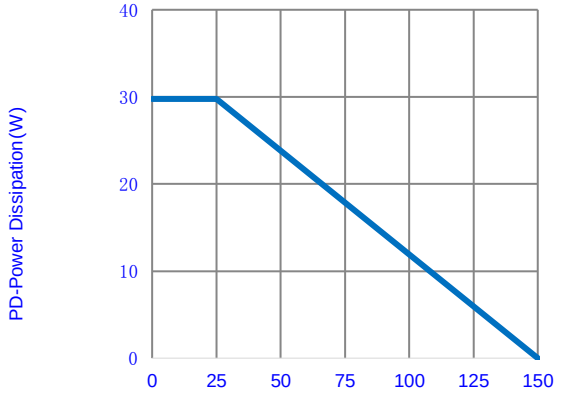

Fig.8-Maximum Power Dissipation vs. Case Temperature

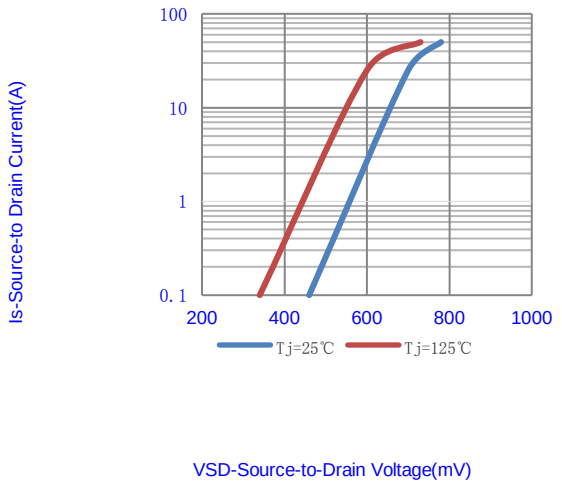

Fig.9- Source-Drain Diode Forward Voltage

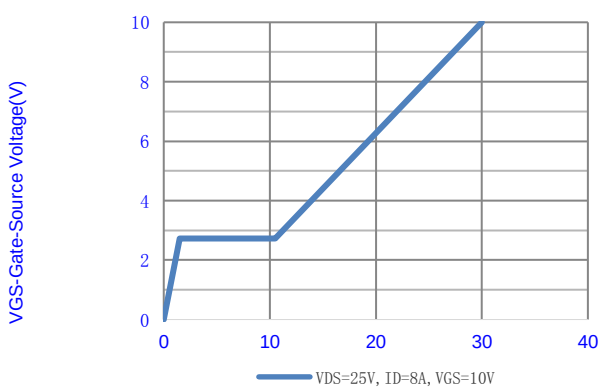

Fig.10-Gate Charge Waveform

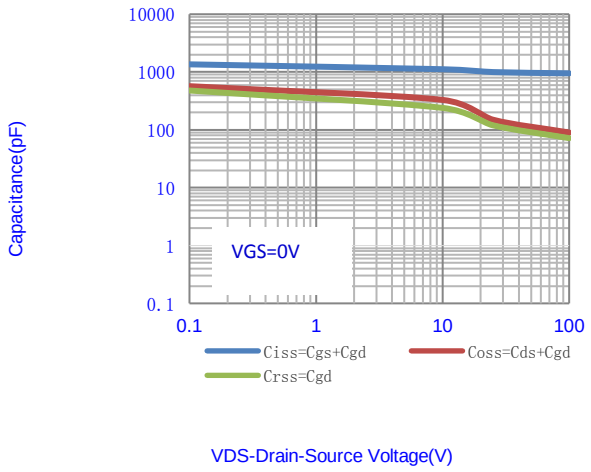

Fig.11- Gate-Source Voltage-VGS(V)

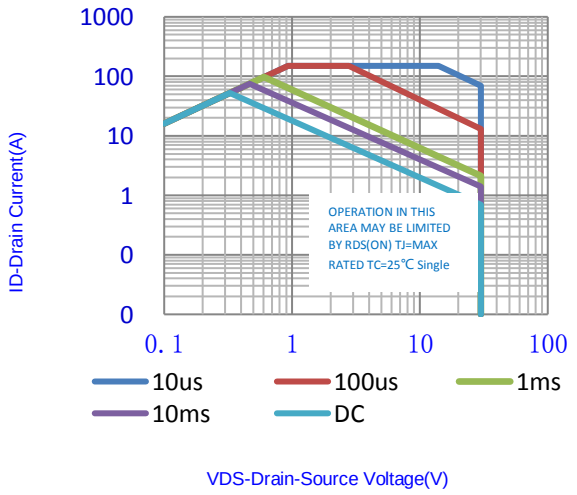

Fig.12-Maximum Safe Operating Area(SOA)

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Typical Characteristics Curves

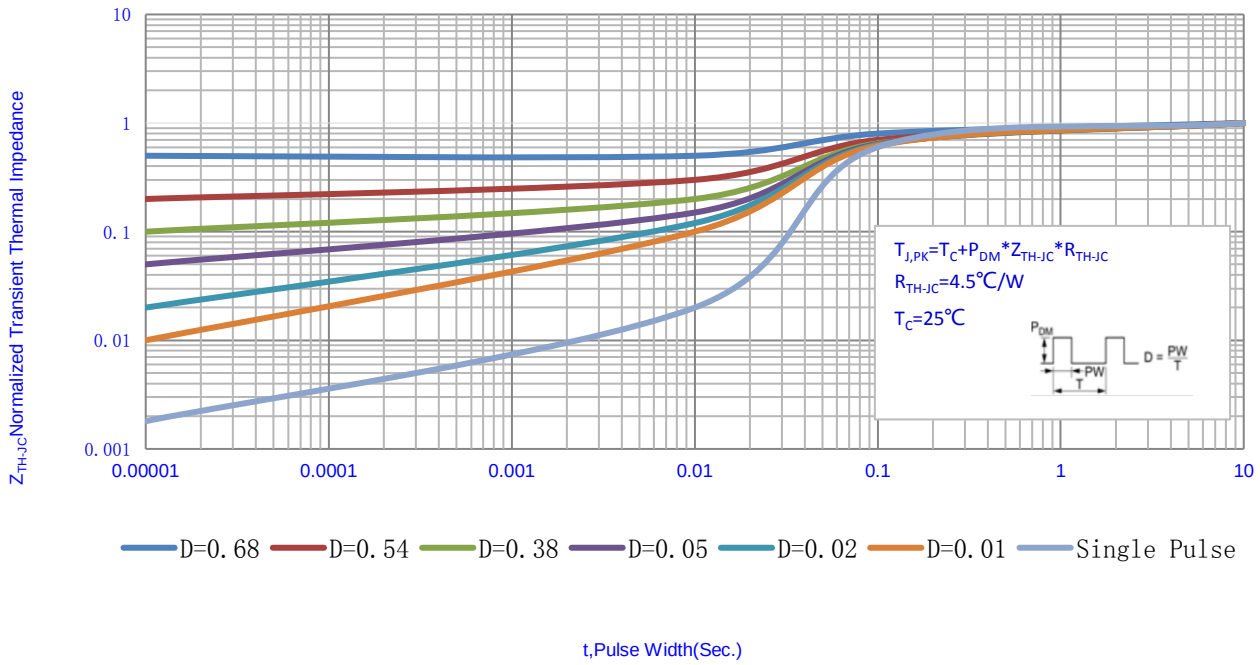

Fig.13- Normalized Transient Thermal Impedance vs.Pulse Width

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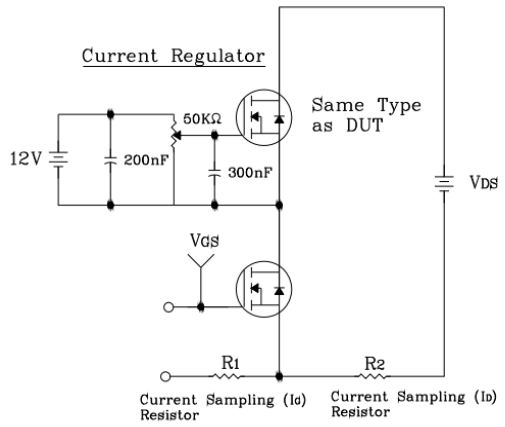
Test Circuit & Waveform



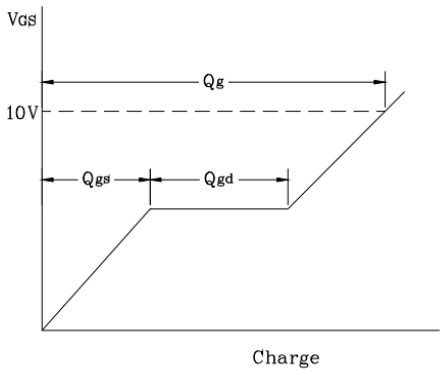
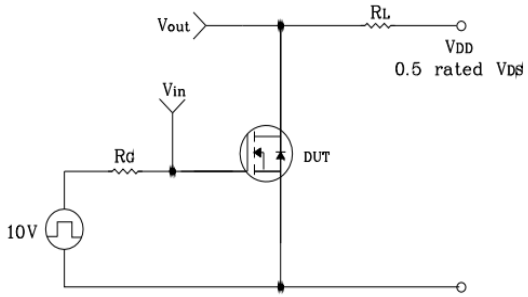


Fig.12-Gate Charge Test Circuit & Waveform



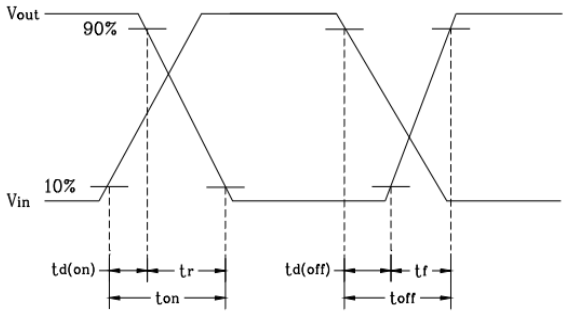
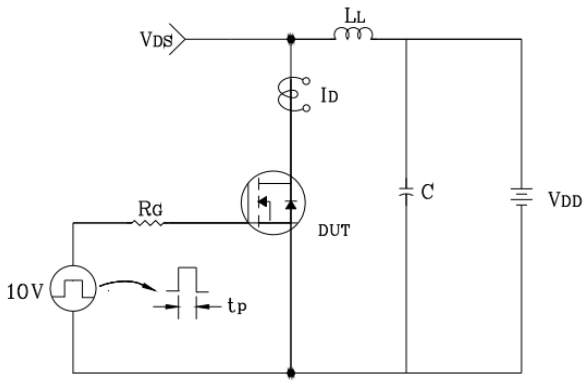


Fig.13- Resistive Switching Test Circuit & Waveform



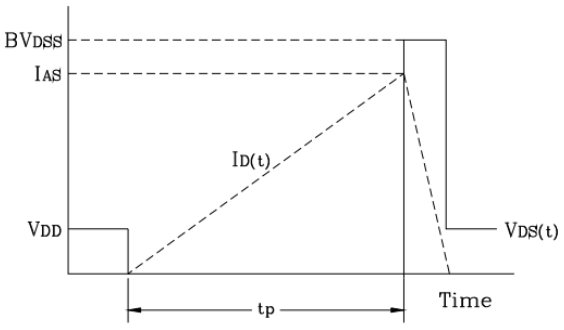


Fig.14- EAS Test Circuit & Waveform

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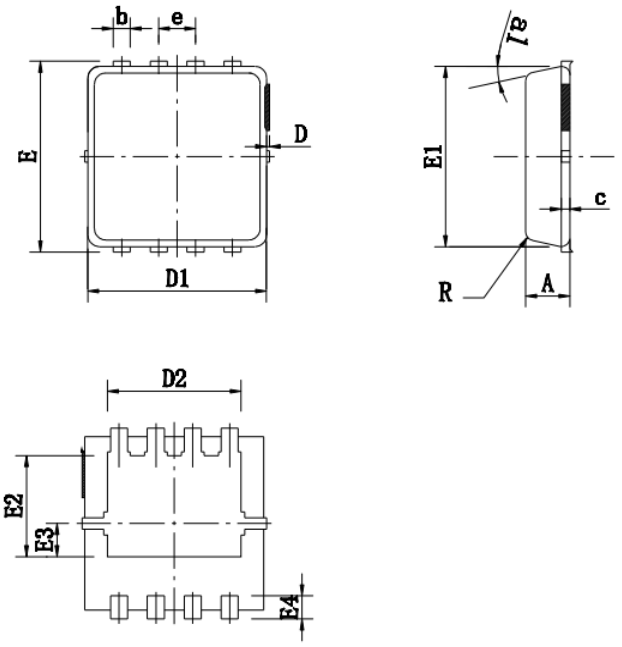
OUTLINE DRAWINGS — PDFN3*3



OUTLINE DIMENSIONS

Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.750	0.780	0.810	0.030	0.031	0.032
b	0.297	0.300	0.350	0.012	0.012	0.014
c	-	0.152	-	-	0.006	-
D	0.000	0.050	0.100	0.000	0.002	0.004
D1	3.120	3.150	3.180	0.123	0.124	0.125
D2	-	2.350	-	-	0.093	-
E	3.200	3.300	3.400	0.126	0.130	0.134
E1	3.090	3.120	3.150	0.122	0.123	0.124
E2	-	1.750	-	-	0.069	-
E3	-	0.575	-	-	0.023	-
E4	-	0.400	-	-	0.016	-
R	-	0.150	-	-	0.006	-
e	-	0.650	-	-	0.026	-
a1	-	12°	-	-	12°	-

PACKING INFORMATION — PDFN3*3

Package Method	Reel Size (mm)	Quantity (pcs/reel)	Inner Box Size L×W×H(mm)	Quantity (pcs/Inner Box)	Outer Carton Size L×W×H(mm)	Quantity (pcs/carton)
Tape Reel	Φ330	5000	340×340×50	10000	360×360×260	50000

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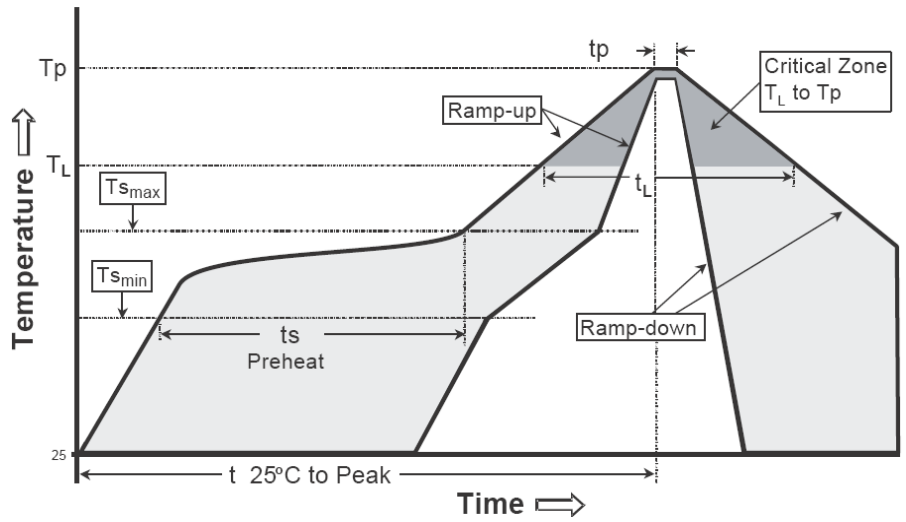
Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(TS min) −Temperature Max(TS max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

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