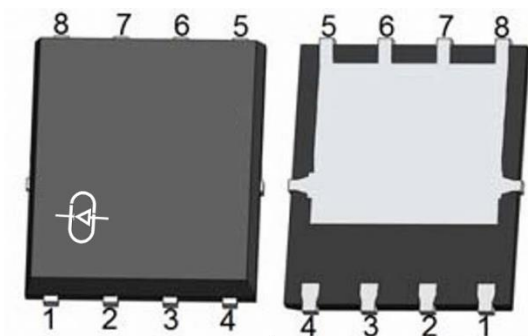


95A, 100V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

DESCRIPTION:



The ALP095N10B is an 95A, 100V N-Channel Enhancement mode Power MOSFET and it has fast a High density cell design with low gate charge.

FEATURES:

- $V_{DS} = 100V$, $I_D = 95A$
- $R_{DS(ON)} = 6.0m\Omega$ @ $V_{GS} = 10V$, $I_D = 95A$.
- Low Gate Charge
- 100% E_{AS} guaranteed
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicated Halogen Free part, ex. ALP095N10B-H

APPLICATIONS:

- DC to DC Converter.
- Power Management switches.
- LED Backlighting.

MECHANICAL CHARACTERISTICS

- Case: Molded plastic, PDFN5060-8L
- Mounting Position: Any.

MAXIMUM RATINGS

MAXIMUM RATINGS @ $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified			
PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Note 1) $T_C = 25^{\circ}\text{C}$ $T_C = 100^{\circ}\text{C}$	I_D	95 60	A
Pulsed Drain Current (Note 4)	I_{DM}	380	A
Single pulse avalanche energy (Note 3)	E_{AS}	245	mJ
Total Power Dissipation $T_C = 25^{\circ}\text{C}$	P_D	113.6	W
Thermal Resistance Junction to Ambient (Note 1)	$R_{\theta JA}$	60	$^{\circ}\text{C/W}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.1	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	-55 to +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS @ TA = 25 °C unless otherwise specified

PARAMETER		CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		$V_{GS}=0V, I_D=250\mu A$	$V_{(BR)DSS}$	100			V
Zero gate voltage drain current	$T_J=25^\circ C$	$V_{DS}=100V, V_{GS}=0V$	I_{DSS}			1.0	μA
	$T_J=100^\circ C$					100	
Gate-body leakage current		$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}			± 100	nA
ON CHARACTERISTICS							
Gate-Threshold Voltage		$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2.0	3.0	4.0	V
Drain-to-Source On-Resistance (Note 2)		$V_{GS}=10V, I_D=20A$	$R_{DS(on)}$		4.6	6.0	m Ω
Forward Transconductance (Note 2)		$V_{DS}=10V, I_D=20A$	g_{fs}		58		S

DYNAMIC CHARACTERISTICS							
PARAMETER	CONDITIONS		SYMBOL	MIN	TYP.	MAX	UNIT
Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F_{req}=1.0MHz$		C_{iss}		5518		pF
Output Capacitance	$V_{DS}=50V, V_{GS}=0V, F_{req}=1.0MHz$		C_{oss}		655		pF
Reverse Transfer Capacitance	$V_{DS}=50V, V_{GS}=0V, F_{req}=1.0MHz$		C_{rss}		23		pF

SWITCHING CHARACTERISTICS							
PARAMETER	CONDITIONS		SYMBOL	MIN	TYP.	MAX	UNIT
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, F_{req}=1.0MHz$		R_g		1.4		Ω
Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=20A$		Q_g		81.8		nC
Gate to Source Charge	$V_{DS}=50V, V_{GS}=10V, I_D=20A$		Q_{gs}		23.5		nC
Gate to Drain Charge	$V_{DS}=50V, V_{GS}=10V, I_D=20A$		Q_{gd}		22.5		nC
Turn-On Delay Time	$V_{DS}=50V, V_{GS}=10V, I_D=20A, R_G=3\Omega$		$t_{d(on)}$		15.4		nS
Turn-On Rise time	$V_{DS}=50V, V_{GS}=10V, I_D=20A, R_G=3\Omega$		t_r		13		nS
Turn-Off Delay Time	$V_{DS}=50V, V_{GS}=10V, I_D=20A, R_G=3\Omega$		$t_{d(off)}$		34		nS
Turn-Off Fall time	$V_{DS}=50V, V_{GS}=10V, I_D=20A, R_G=3\Omega$		t_f		6.2		nS

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
PARAMETER	CONDITIONS		SYMBOL	MIN	TYP.	MAX	UNIT
Continuous Source Current (Note 1, 5)	$V_G=V_D=0V$, Force Current		I_S			95	A
Diode forward Voltage (Note 2)	$I_F=20A, V_{GS}=0V$		V_{DS}			1.2	V
Body Diode Reverse recovery time	$T_J=25^\circ C, I_F=20A, di_F/dt=100A/\mu s$		t_{rr}		55		nS
Body Diode Reverse recovery charge	$T_J=25^\circ C, I_F=20A, di_F/dt=100A/\mu s$		Q_{rr}		101		nC

Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The E_{AS} data shows Max. rating. The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.4mH, I_{AS}=35A$
4. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ C$.
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

TYPICAL DEVICE RATING AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)

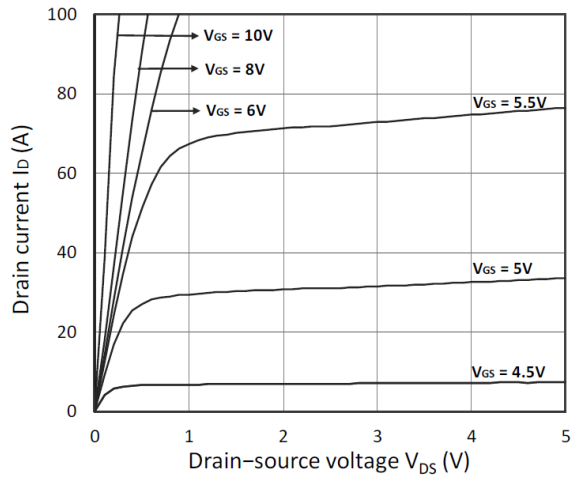


Fig.1 OUTPUT CHARACTERISTICS

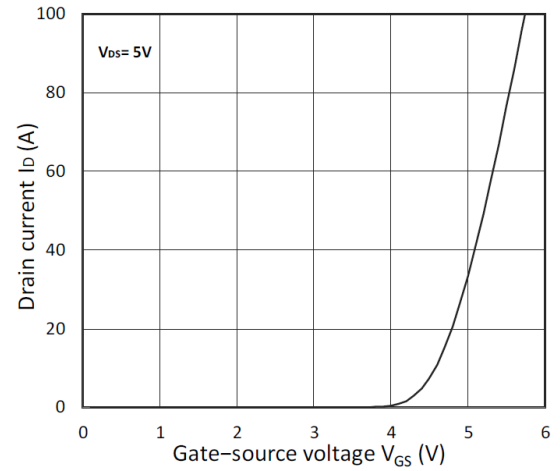


Fig.2 TRANSFER CHARACTERISTICS

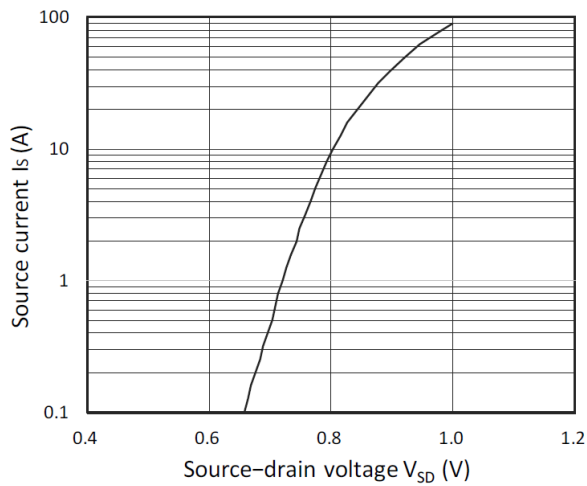


Fig.3 FORWARD CHARACTERISTICS OF REVERSE

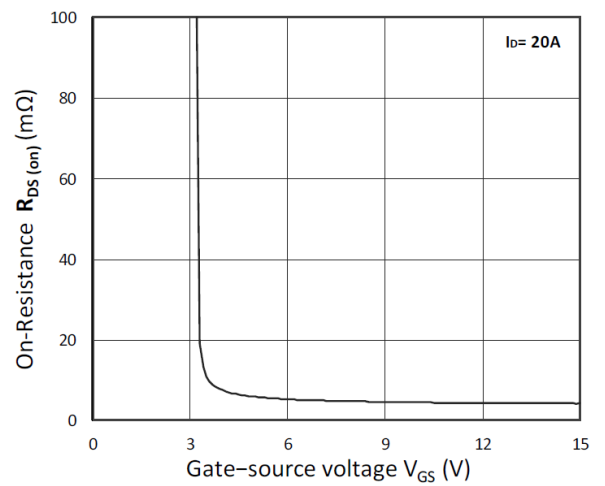


Fig.4 $R_{DS(ON)}$ vs. V_{GS}

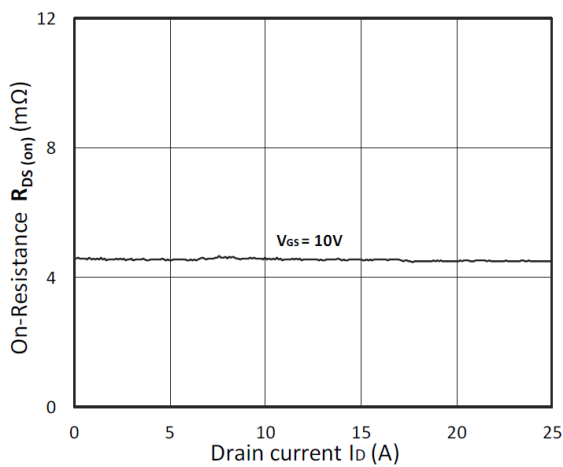


Fig.5 $R_{DS(ON)}$ vs. I_D

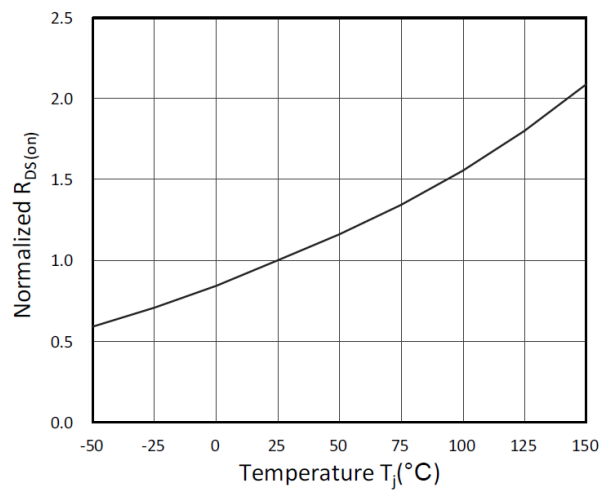


Fig.6 NORMALIZED $R_{DS(ON)}$ vs. TEMPERATURE

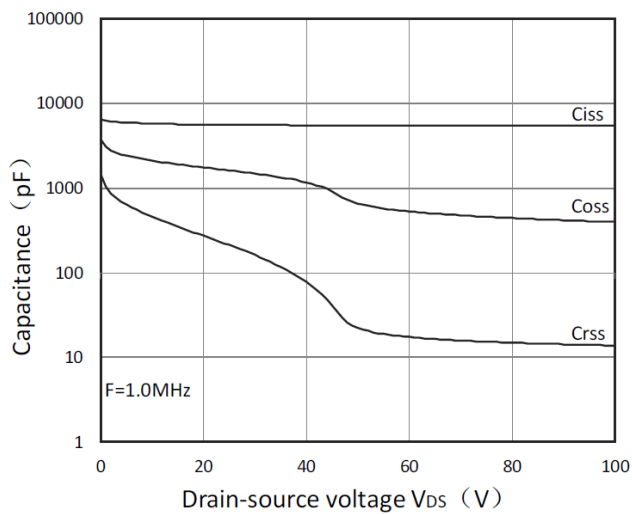


Fig.7 CAPACITANCE CHARACTERISTICS

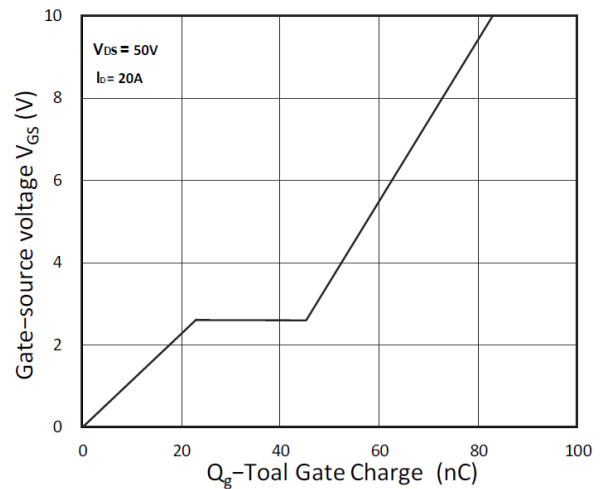


Fig.8 GATE CHARGE CHARACTERISTICS

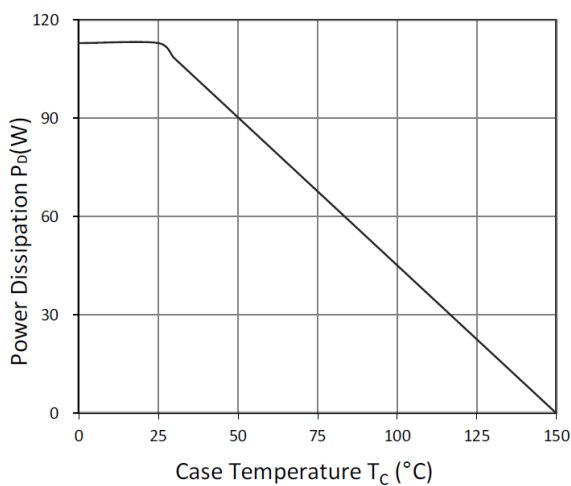


Fig.9 POWER DISSIPATION

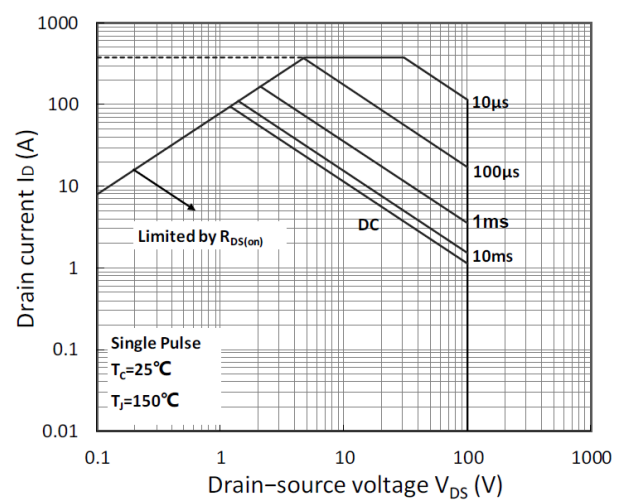


Fig.10 SAFE OPERATING AREA

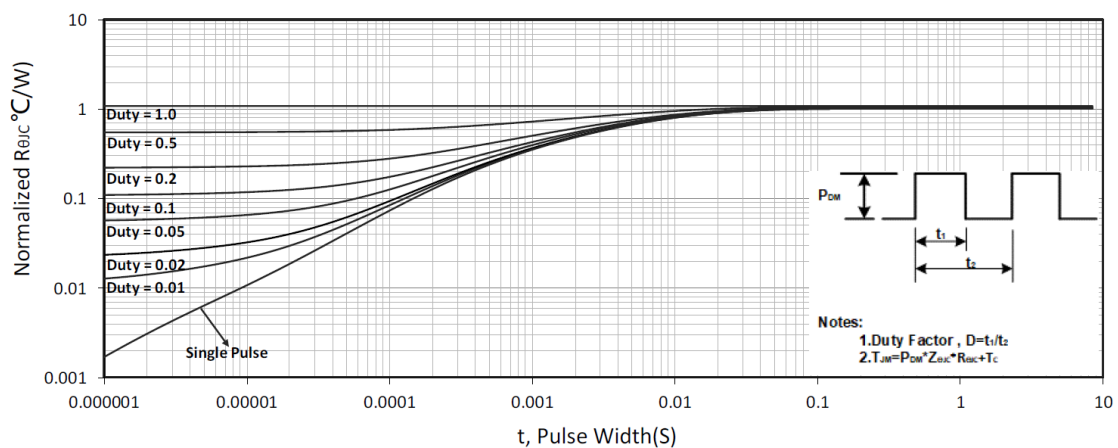


Fig.11 NORMALIZED MAXIMUM TRANSIENT THERMAL IMPEDANCE

TEST CIRCUIT

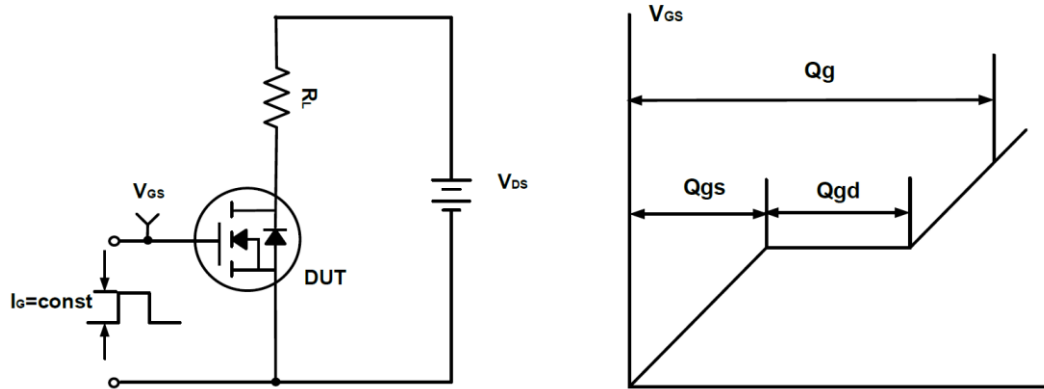


Figure A. GATE CHARGE TEST CIRCUIT & WAVEFORMS

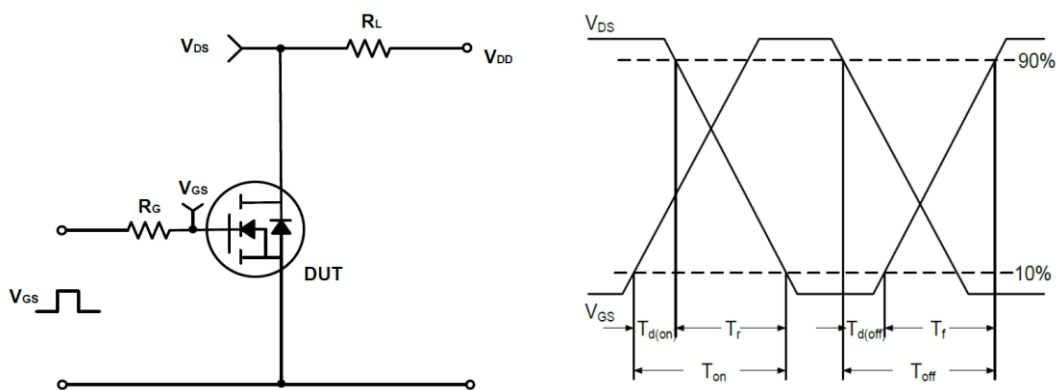


Figure B. SWITCHING TEST CIRCUIT & WAVEFORMS

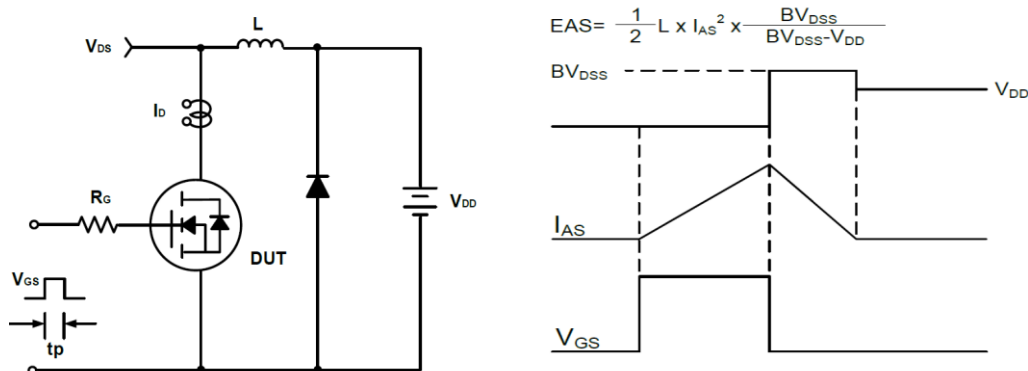
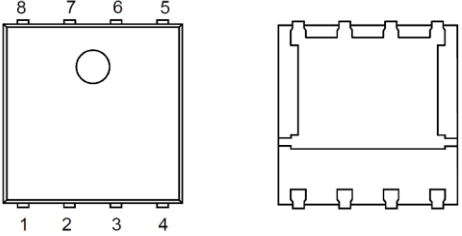
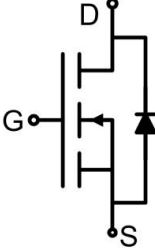


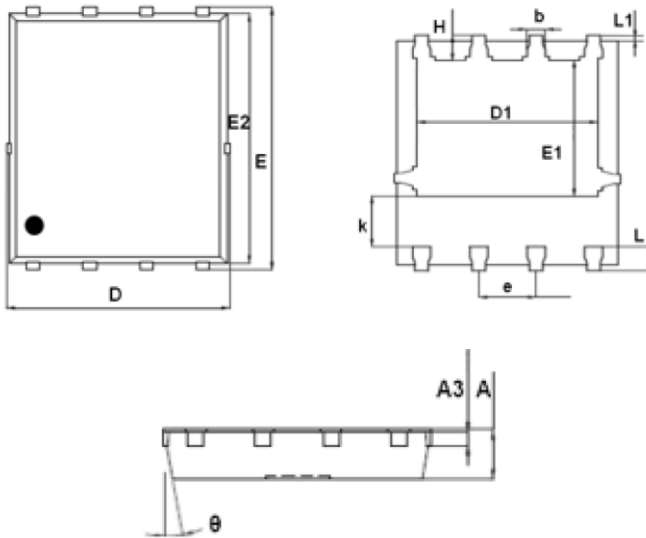
Figure C. UNCLAMPED INDUCTIVE SWITCHING CIRCUIT & WAVEFORMS

PINNING INFORMATION

PIN	SIMPLIFIED OUTLINE	CIRCUIT DIAGRAM
Pin1 Source Pin2 Source Pin3 Source Pin4 Gate Pin5 Drain Pin6 Drain Pin7 Drain Pin8 Drain		

PACKAGE INFORMATION

PDFN5060-8L

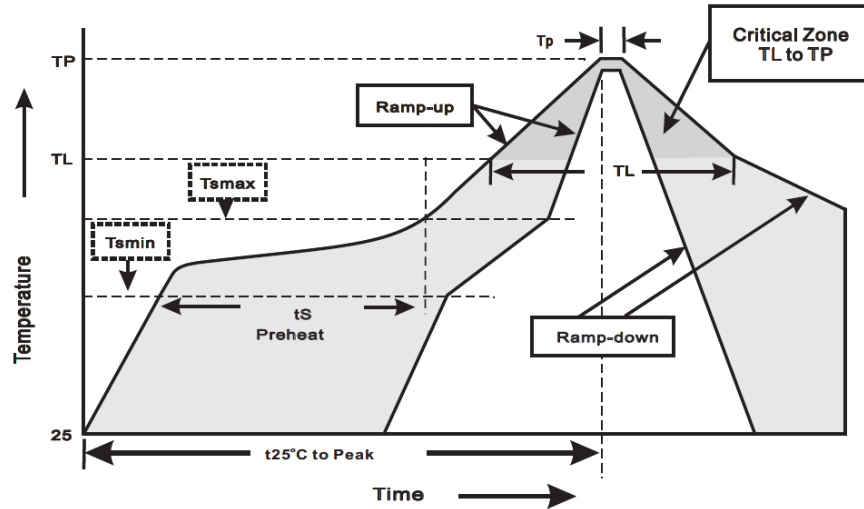


OUTLINE DIMENSIONS		
SYMBOL	MILLIMETERS	
	MIN	MAX
A	0.90	1.20
A3	0.15	0.35
D	4.80	5.40
E	5.90	6.35
D1	3.61	4.31
E1	3.30	3.92
E2	5.50	6.06
k	1.10	-
b	0.30	0.51
e	1.27BSC	
L	0.38	0.71
L1	0.05	0.36
H	0.38	0.71
θ	0°	12°

SOLDERING PARAMETERS

SUGGESTED THERMAL PROFILES FOR SOLDERING PROCESSES

1. Storage environment: Temperature=5 °C~40 °C Humidity=55% ±25%
2. Reflow soldering of surface-mount devices



3. Reflow soldering

PROFILE FEATURE	SOLDERING CONDITION
Average ramp-up rate (T_L to T_P)	<3 °C/sec
Preheat	
- Temperature Min (T_{smin})	150 °C
- Temperature Max (T_{smax})	200 °C
- Time (min to max) (t_s)	60 ~ 120 sec
T_{smax} to T_L	
- Ramp-upRate	<3 °C/sec
Time maintained above:	
- Temperature (T_L)	217 °C
- Time(t_L)	60 ~ 260 sec
Peak Temperature (T_P)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(t_P)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<6 minutes



beyond boundaries...

ALP095N10B

PDFN5060-8L

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