

•General Description

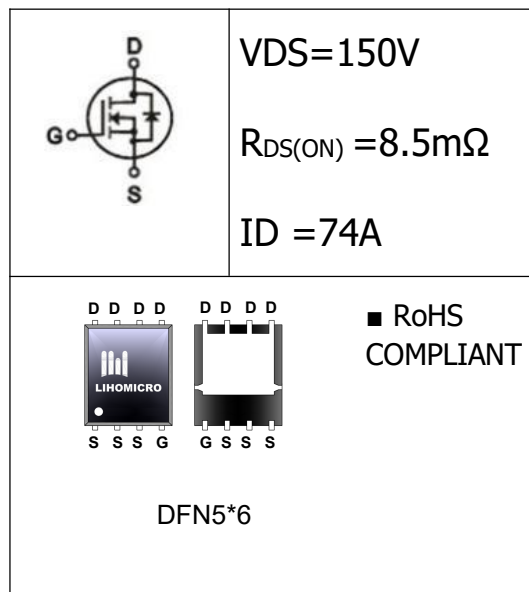
The N-Channel MOSFET LH085N150 has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

•Features

- Fast switching
- Low $R_{DS(on)}$ & FOM

•Application

- LED/LCD/PDP TV and monitor Lighting
- Power Supplies


•Ordering Information:

Part Number	LH085N150
Package	DFN5*6
Basic Ordering Unit (pcs)	5000
Normal Package Material Ordering Code	LH085N150N-DFN5*6-TAP
Halogen Free Ordering Code	LH085N150N-DFN5*6-TAP-HF

•Absolute Maximum Ratings (TC =25°C)

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current , $T_C = 25^\circ C$ ^{1,6}	I_D	74	A
	$I_{D(TC=100^\circ C)}$	47	
Pulsed drain current ($T_C = 25^\circ C$, t_p limited by T_{jmax}) ²	I_D pulse	250	A
Single Pulse Avalanche Energy ³	E_{AS}	320	mJ
Avalanche Current	I_{AS}	40.5	A
Power Dissipation($T_C=25^\circ C$)	P_D	114	W
Operating Temperature	T_J	-55~+175	°C
Storage Temperature	T_{STG}	-55~+175	°C

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	150	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	--	3.0	V
Drain-source On Resistance ²	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	--	7.0	8.5	mΩ
		$V_{GS}=6V, I_D=20A$	--	9.4	15	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=150V, V_{GS}=0V, T_J=25^\circ C$	--	--	1	μA
		$V_{DS}=150V, V_{GS}=0V, T_J=100^\circ C$	--	--	100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	±100	nA
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=20A$	--	85	--	S
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	--	2.6	--	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=75V, f=1.0MHz$	--	3784	--	pF
Output Capacitance	C_{oss}		--	257	--	
Reverse transfer Capacitance	C_{rss}		--	7.3	--	
Turn-on delay time ⁵	$T_d(on)$	$V_{DS}=75V, V_{GS}=10V, I_D=20.0A, R_G=10\Omega$	--	18	--	ns
Rise time ⁵	T_r		--	8	--	
Turn -Off Delay Time ⁵	$T_d(off)$		--	29	--	
Fall time ⁵	T_f		--	10	--	
Total Gate Charge(10V)	Q_g	$I_D=20A, V_{DS}=75V, V_{GS}=10V$	--	49	--	nC
Total Gate Charge(4.5V)	Q_g		--	21	---	
Gate-to-Source Charge	Q_{gs}		--	11	--	
Gate-to-Drain Charge	Q_{gd}		--	5	---	
Continuous Diode Forward Current ^{1,5}	I_S	$V_{GS}=V_{DS}=0V, T_C=25^\circ C$	--	--	74	A
Pulsed Diode Forward Current ^{2,5}	I_{SM}		--	--	250	A
Diode Forward Voltage ²	V_{SD}	$T_J=25^\circ C, I_S=20.0A, V_{GS}=0V$	--	0.9	1.2	V
Reverse Recovery Time	t_{rr}	$I_f=I_S, di_F/dt=100A/\mu s$	--	60	--	ns
Reverse Recovery Charge	Q_{rr}		--	150	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case ¹	Rth _{JC}	1.1	°C/W
Thermal Resistance Junction-ambient ¹	Rth _{JA}	55	°C/W

Notes:

1. The data tested on surface on FR-4 1 inch² PCB with 2OZ copper.
2. Pulse test: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. The EAS data shows MAX. rating. Test condition is VDD=25V, VGS=10V, L=0.4mH, IAS=40.5A.
4. Power dissipation is limited by 175°C junction temperature.
5. All test data same as ID and IDM, in real application, should be limited by total power dissipation.
6. Package limitation current is 60A.

•Typical Characteristics

Fig.1 Output Characteristics

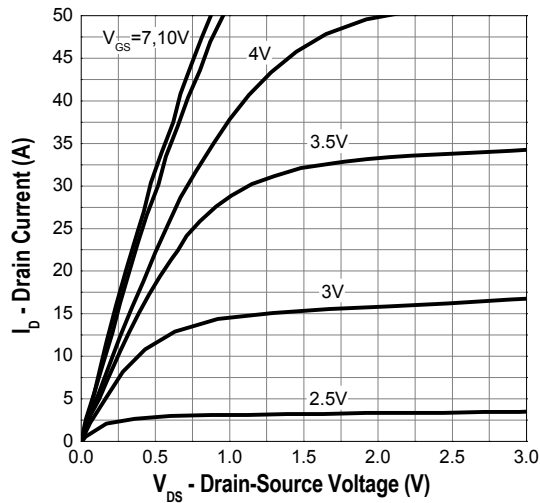


Fig.2 Gate Threshold Voltage

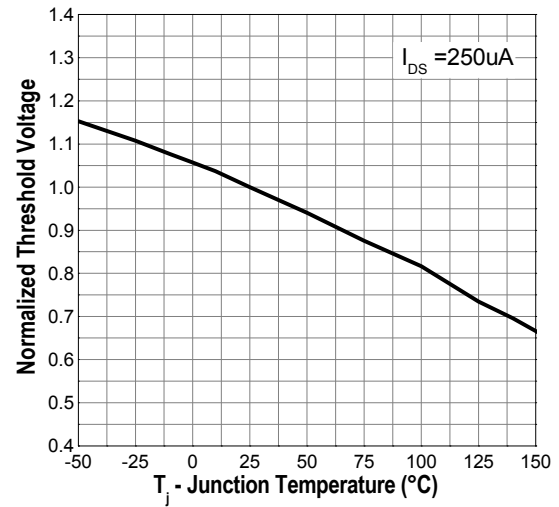


Fig.3 Gate-Source On Resistance

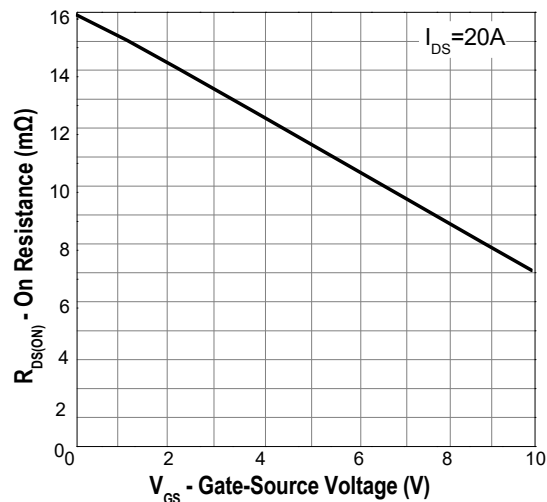


Fig.4 Drain-Source On Resistance

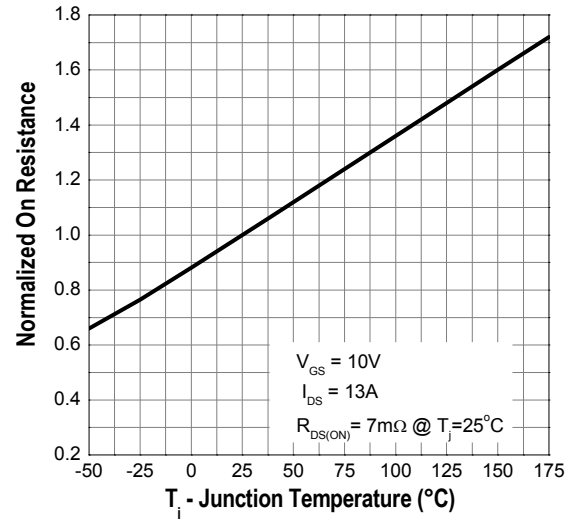


Fig.5 Drain-Source On Resistance

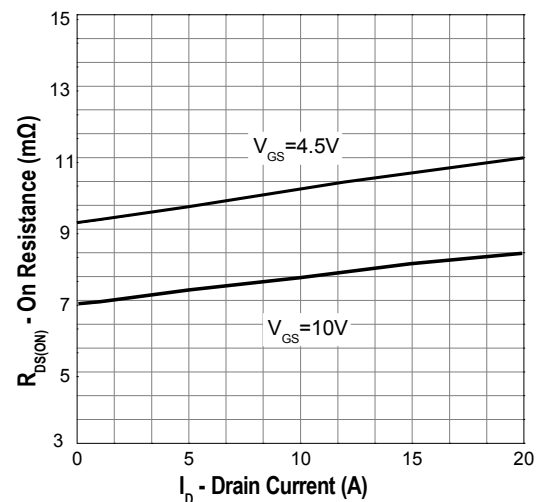
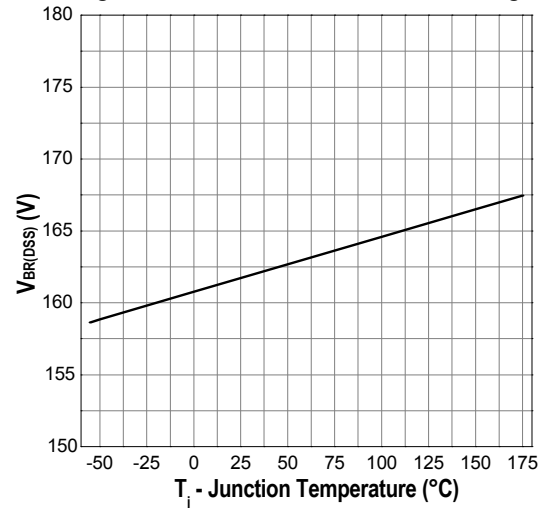
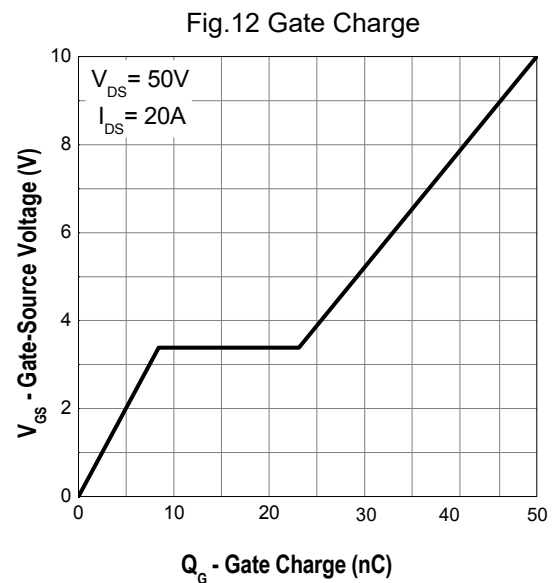
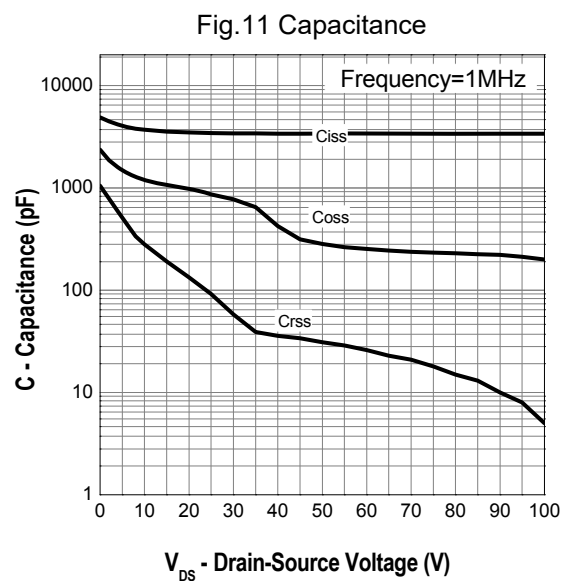
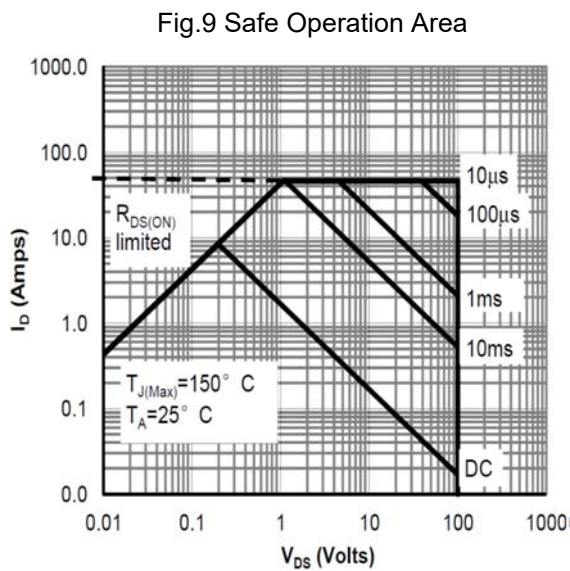
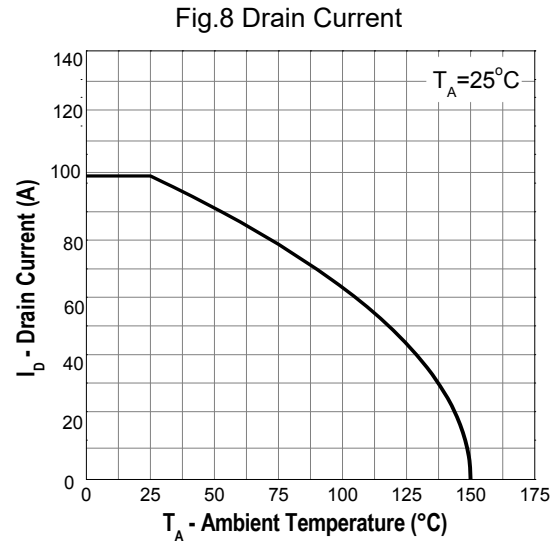
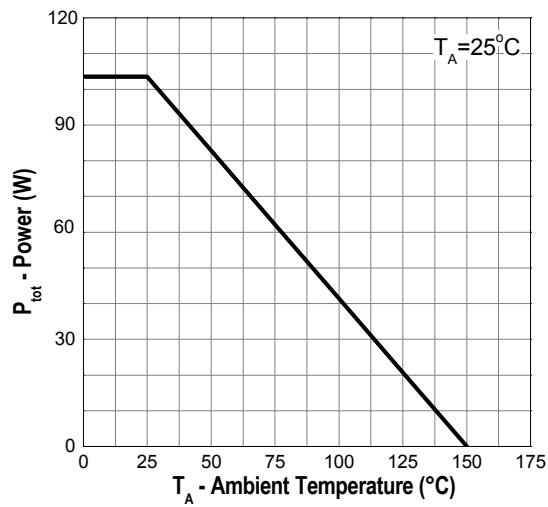


Fig.6 Drain-Source Breakdown Voltage



• **Typical Characteristics(Cont.)**



● **Test Circuit & Waveforms**

Fig. 1-1 Switching Time Measurement Circuit

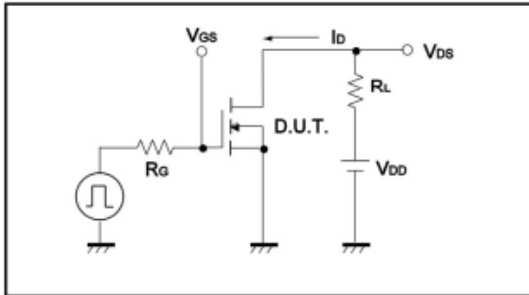


Fig. 1-2 Switching Waveforms

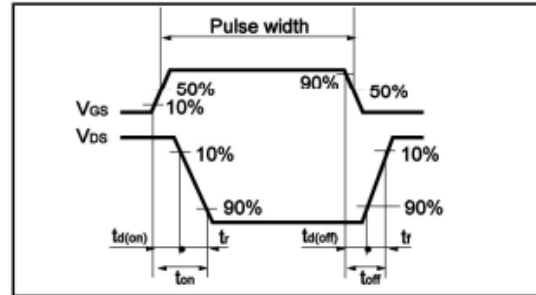


Fig. 2-1 Gate Charge Measurement Circuit

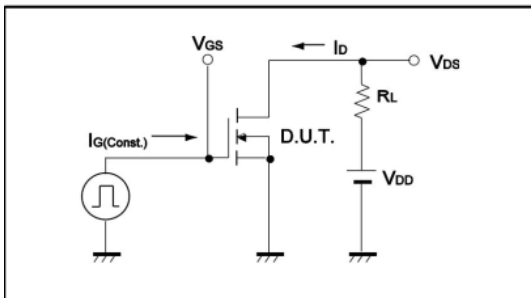


Fig. 2-2 Gate Charge Waveform

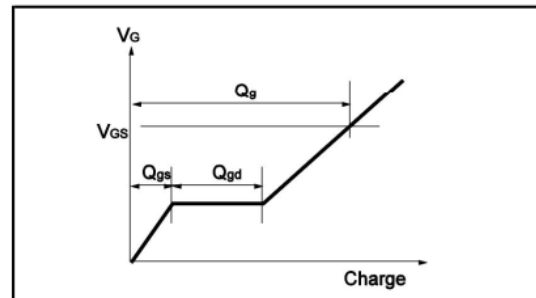


Fig. 3-1 Avalanche Measurement Circuit

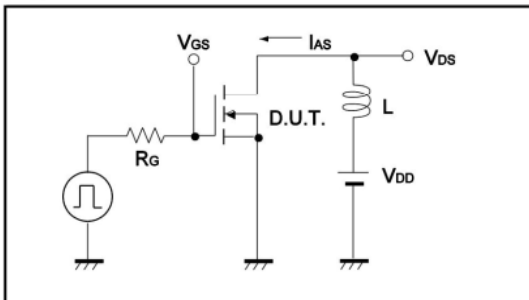


Fig. 3-2 Avalanche Waveform

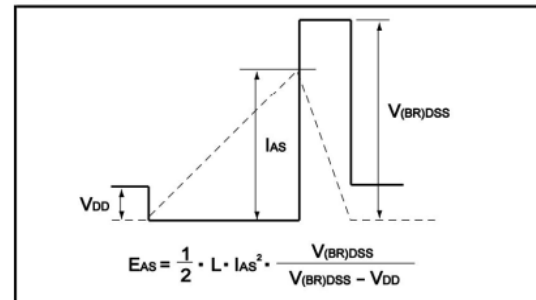


Fig. 4-1 Diode Recovery Measurement Circuit

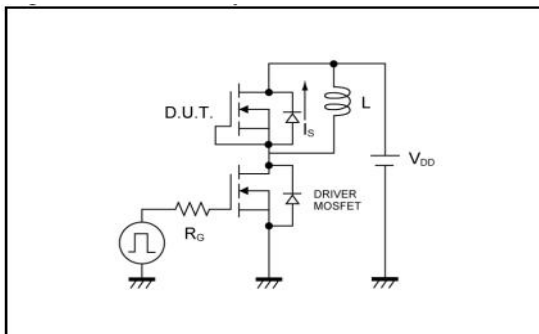
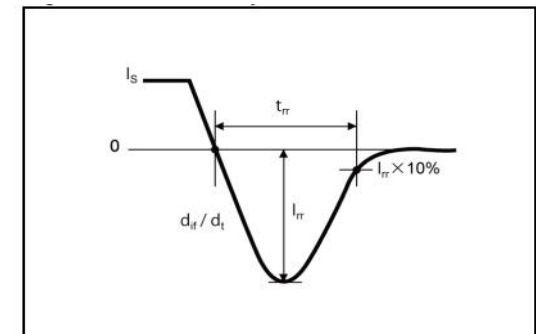


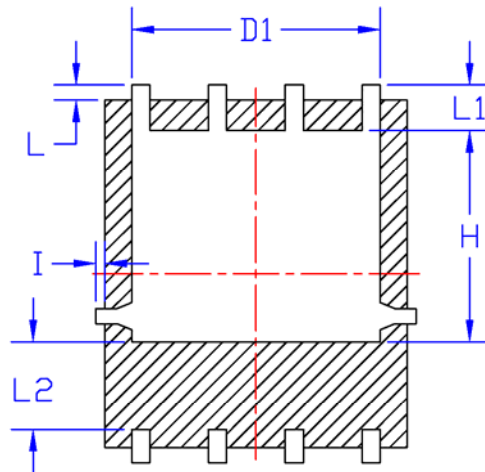
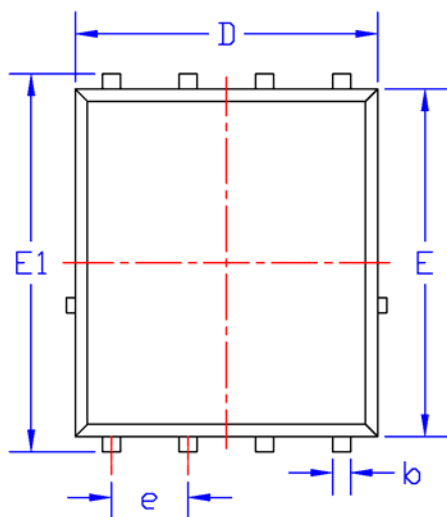
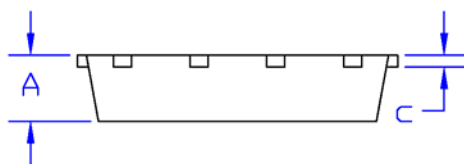
Fig. 4-2 Diode Recovery Waveform



●Dimensions (DFN5*6)

UNIT:mm

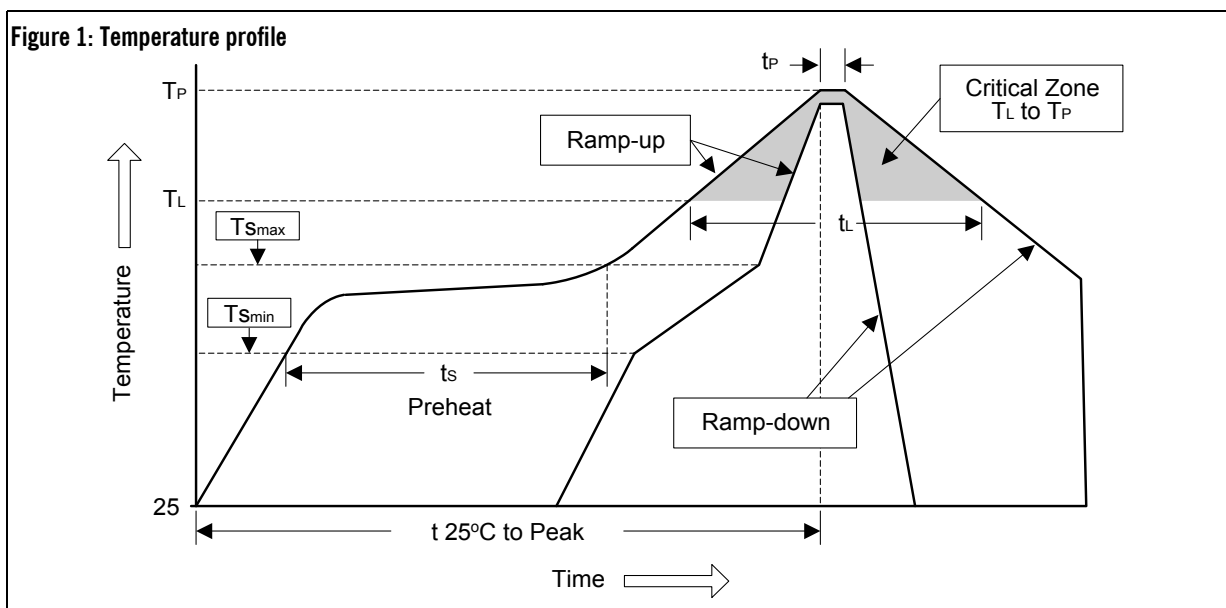
SYMBOL	min	max	SYMBOL	min	max
A	1.00	1.20	e	1.27BSC	
b	0.30	0.50	L	0.05	0.30
c	0.20	0.30	L1	0.40	0.80
D	4.80	5.20	L2	1.20	2.00
D1	3.90	4.30	H	3.30	3.80
E	5.50	5.90	I	—	0.18
E1	5.90	6.40			



• Soldering Methods for Lihomicro's Products

- 1.Storage environment: Temperature=10°C to 35°C Humidity=65%±15%
- 2.Molder Plastic: UL Flammability Classification Rating 94V-0
- 3.Reflow soldering of surface-mount devices

Figure 1: Temperature profile



● Classification Reflow Profiles

Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat		
- Temperature Min (T_{Smin})	100°C	150°C
- Temperature Max (T_{Smax})	150°C	200°C
- Time (min to max) (ts)	60 to 120 sec	60 to 180 sec
T_{Smax} to T_L		
- Ramp-up Rate	<3°C/sec	<3°C/sec
Time maintained above:		
- Temperature (T_L)	183°C	217°C
- Time (t_L)	60 to 150 sec	60 to 150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10 to 30 sec	20 to 40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

Flow (wave) soldering (solder dipping)

Products	Peak Temperature	Dipping Time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec

● Reliability Test Program

Testitem	Method	Description
Solderability	JESD-22,B102	5sec , 245°C
Holt	JESD-22,A108	1000Hrs,Bias@125°C
PCT	JESD-22,A102	168Hrs,100%RH,2atm,121°C
TCT	JESD-22,A104	500Cycles, -65°C ~150°C