

•General Description

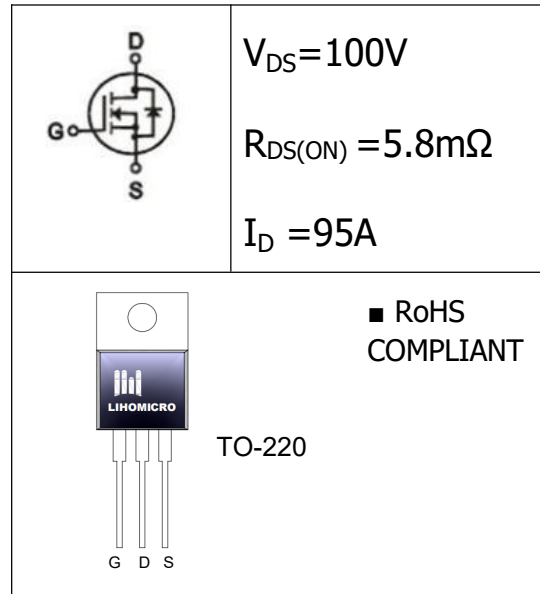
The SGT MOSFET LH058N100 has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

•Features

- Fast switching & Low $R_{DS(on)}$
- 100% UIS Test
- Low Miller Capacitance

•Application

- Lighting
- Power Supplies
- PD Fast Charging


•Ordering Information:

Part Number	LH058N100
Package	TO-220
Basic Ordering Unit (pcs)	1000
Normal Package Material Ordering Code	LH058N100T-TO-220-TU
Halogen Free Ordering Code	LH058N100T-TO-220-TU-HF

•Absolute Maximum Ratings (TC = 25°C)

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, $T_C = 25^\circ\text{C}$	I_D	95	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, tp limited by T_{jmax}) ¹	I_D pulse	285	A
Single Pulse Avalanche Energy ²	E_{AS}	112	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	106	W
Operating Temperature	T_J	-55~+150	°C
Storage Temperature	T_{STG}	-55~+150	°C

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	--	100	--	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 ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=15A$	--	5.0	5.8	mΩ
		$V_{GS}=4.5V, I_D=10A$	--	6.6	9.2	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V, T_J=25^{\circ}C$	--	--	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=125^{\circ}C$	--	--	10	
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
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=50V, f=1.0MHz$	--	3323	--	pF
Output Capacitance	C_{oss}		--	600	--	
Reverse transfer Capacitance	C_{rss}		--	23	--	
Turn-on delay time	$T_d(on)$	$V_{GS}=10V, I_D=20.0A, R_G=2.0\Omega$	--	10.1	--	ns
Rise time	T_r		--	6.7	--	
Turn -Off Delay Time	$T_d(off)$		--	45.5	--	
Fall time	T_f		--	7.6	--	
Total Gate Charge	Q_g	$I_D=20A, V_{DS}=50V, V_{GS}=10V$	--	45	---	nC
Gate-to-Source Charge	Q_{gs}		--	9.3	--	
Gate-to-Drain Charge	Q_{gd}		--	4.9	---	
Diode Forward Voltage	V_{SD}	$T_J=25^{\circ}C, I_S=20.0A, V_{GS}=0V$	--	--	1.1	V
Reverse Recovery Time	t_{rr}	$I_f=I_S, di_F/dt=100A/\mu s$	--	33	--	ns
Reverse Recovery Charge	Q_{rr}		--	150.3	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	1.3	°C/W
Thermal Resistance Junction-ambient	R_{thJA}	54.5	°C/W

Notes:

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

2. $I_{AS}=26A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$

3. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

● **Typical Characteristics**

Fig.1 Output Characteristics

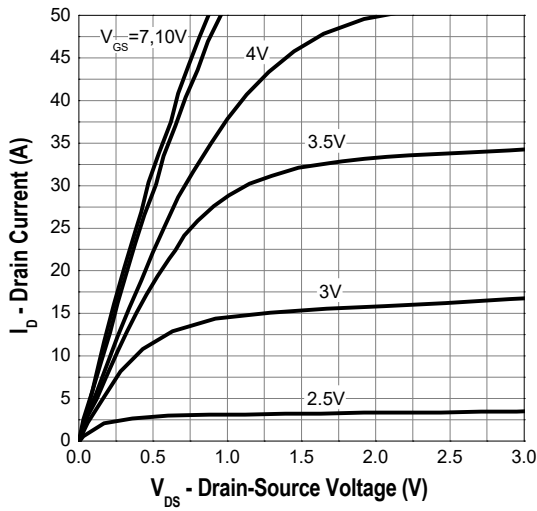


Fig.2 Gate Threshold Voltage

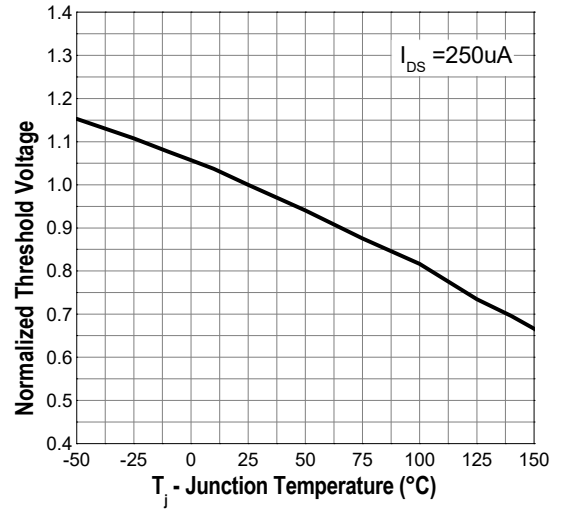


Fig.3 Gate-Source On Resistance

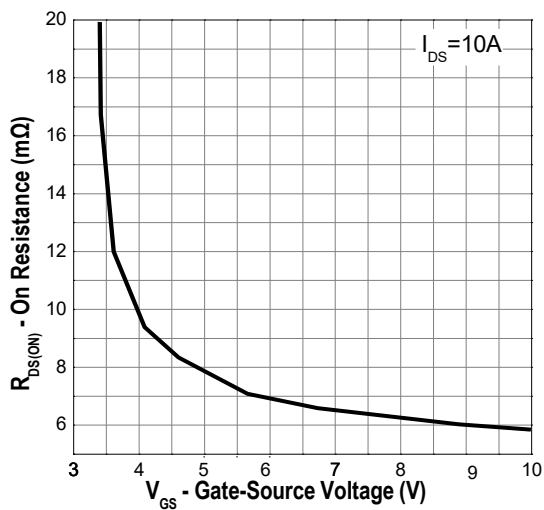


Fig.4 Drain-Source On Resistance

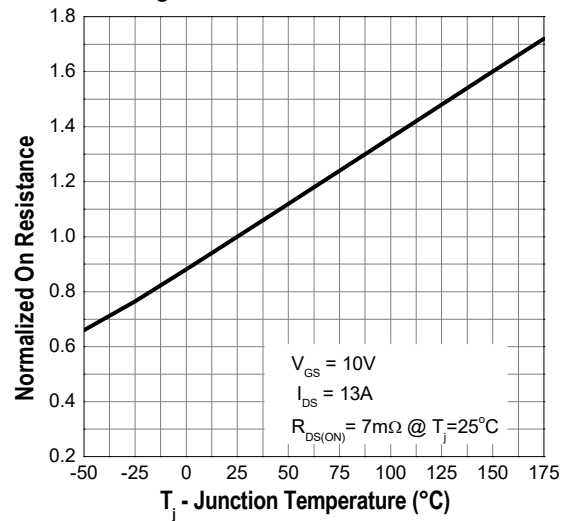


Fig5. Transfer Characteristics

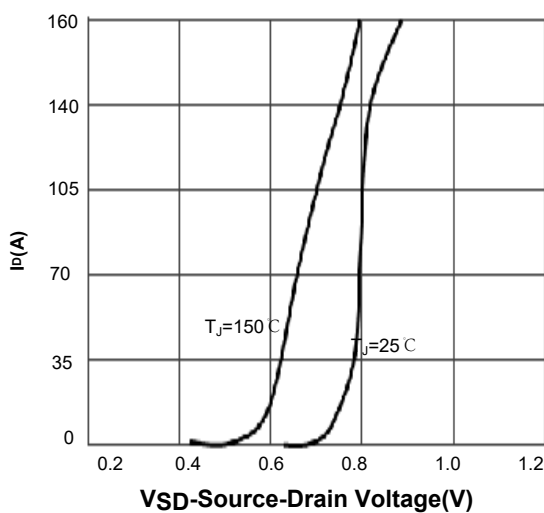
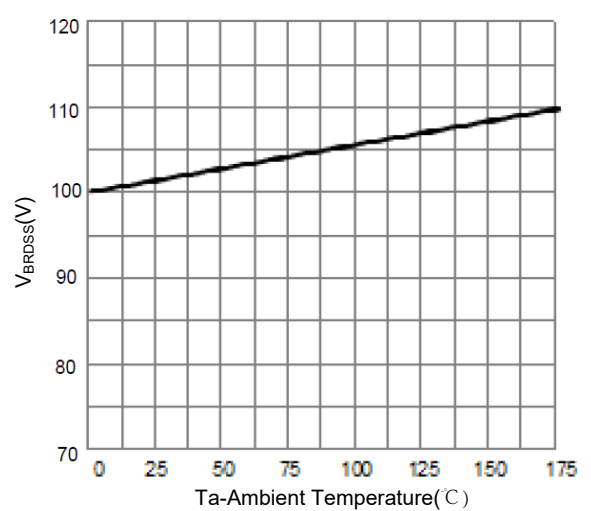


Fig.6 Drain-Source Breakdown Voltage



•Typical Characteristics(cont.)

Fig.7 Power Dissipation

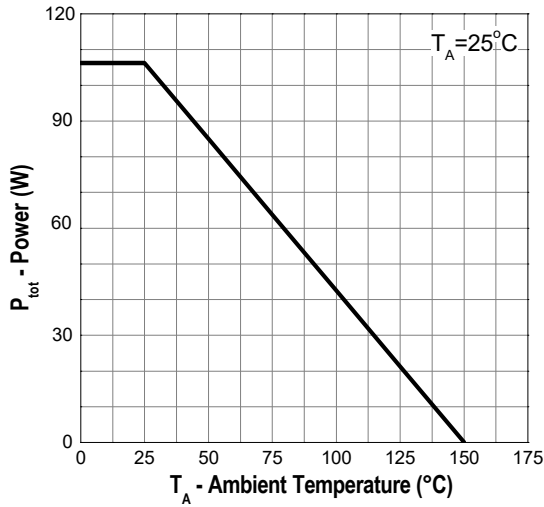


Fig.8 Drain Current

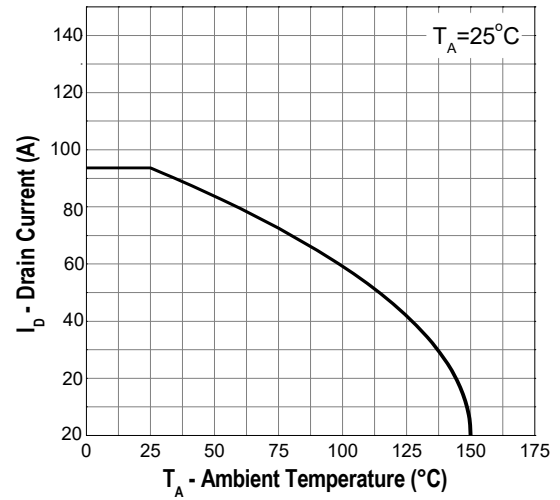


Fig.9 Safe Operation Area

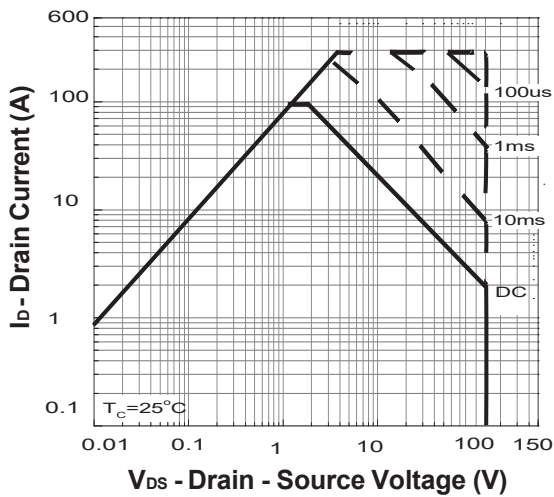


Fig.10 Transient Thermal Impedance

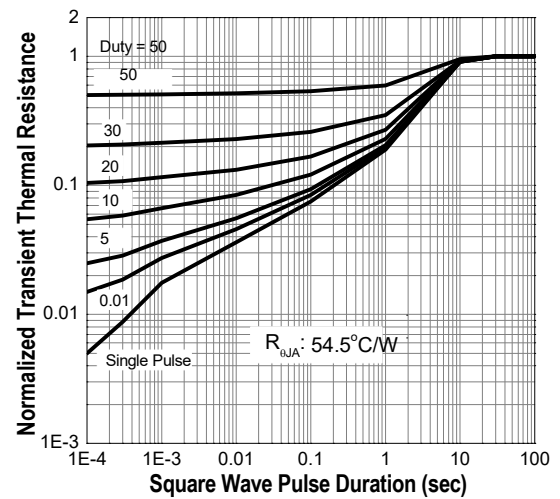


Fig.11 Capacitance

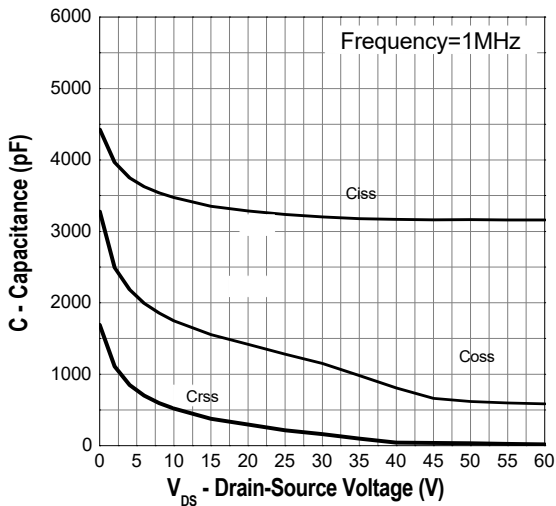
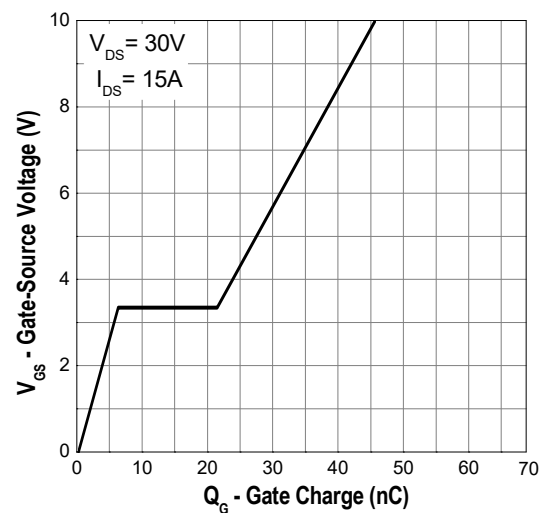


Fig.12 Gate Charge



• Test Circuits & Waveforms

Fig.1 Gate Charge Waveform

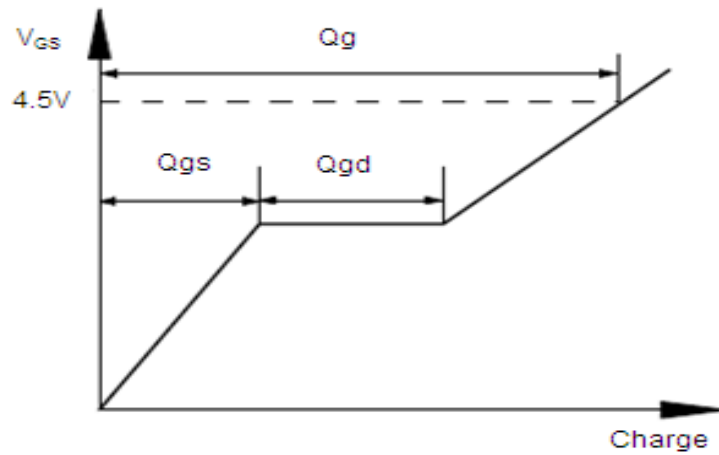


Fig.2 Switching Time Waveform

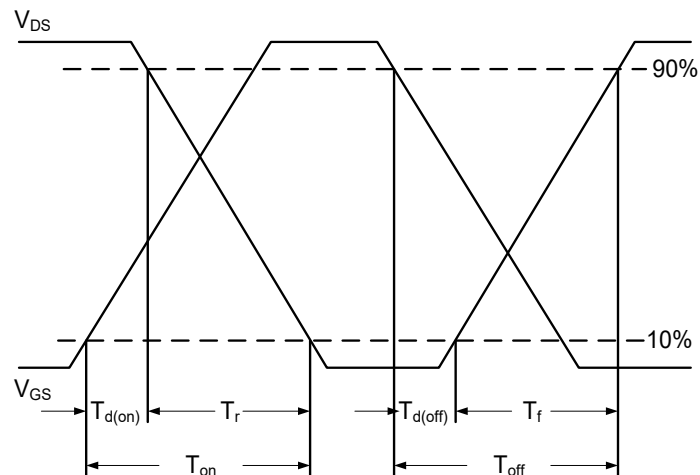
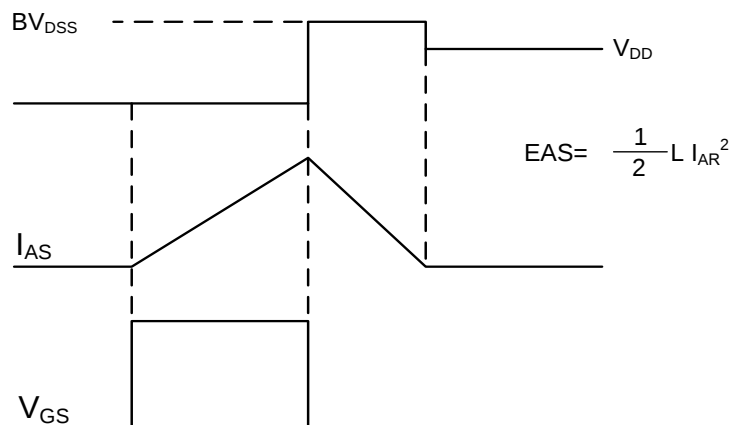


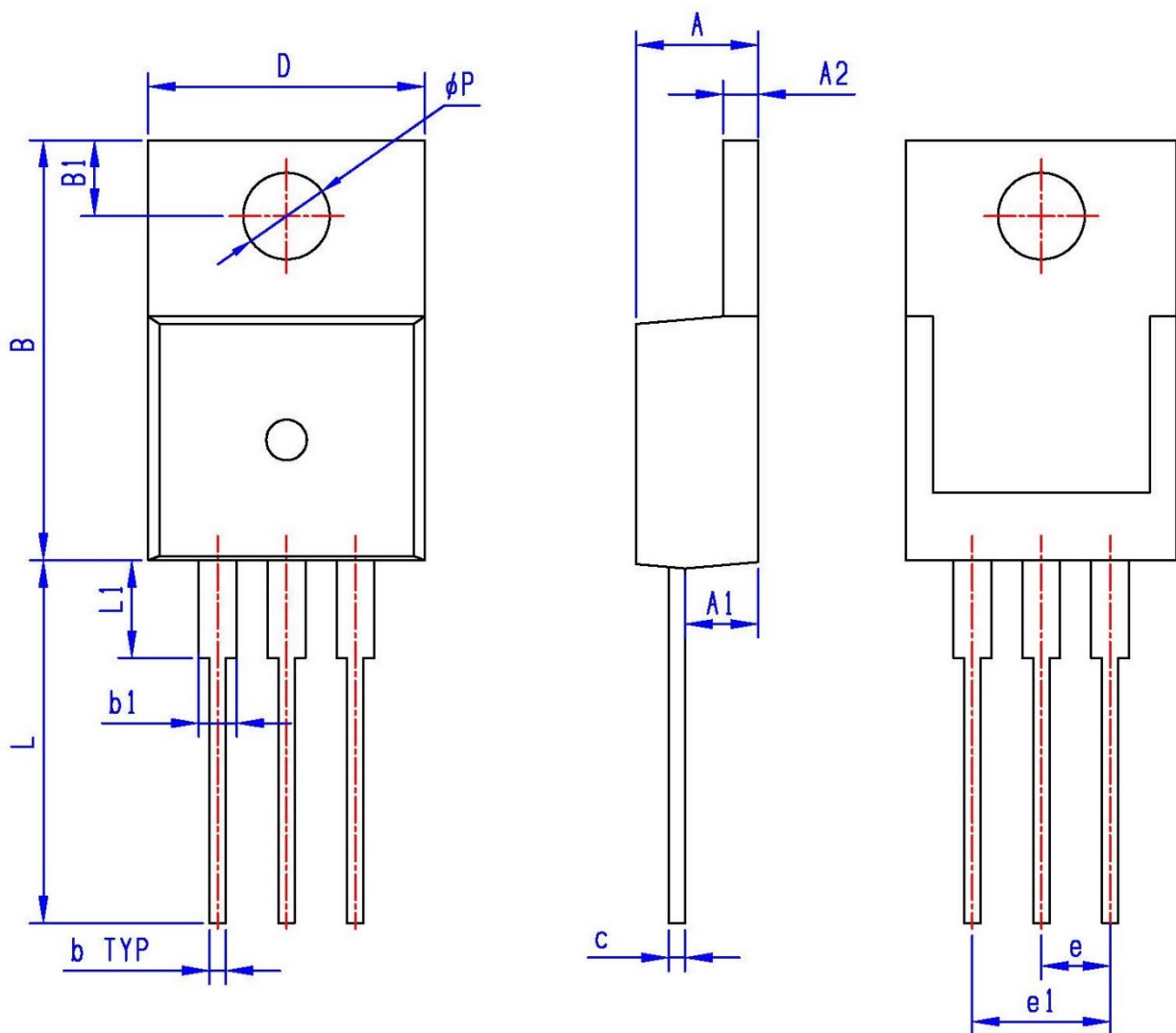
Fig.11 Unclamped Inductive Switching Waveform



●Dimensions (TO-220)

UNIT:mm

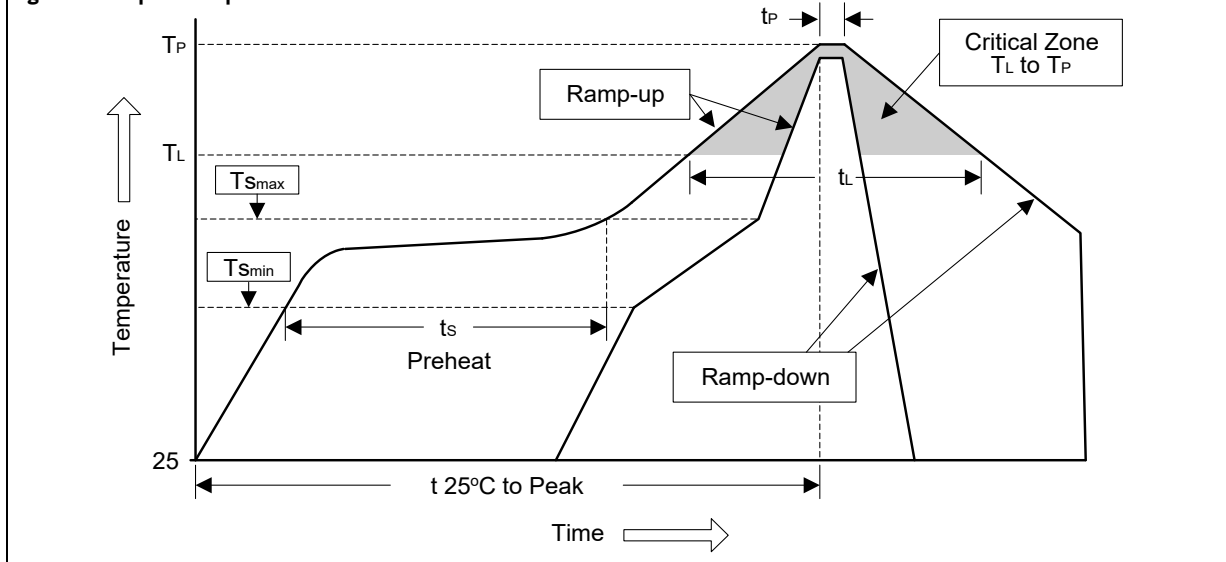
SYMBOL	min	max	SYMBOL	min	max
A	4.25	4.85	B1	2.60	3.00
A1	2.30	3.00	e	2.40	2.70
A2	1.20	1.40	e1	4.95	5.25
b	0.60	0.90	L	12.60	14.40
b1	1.10	1.70	L1	2.40	4.00
c	0.40	0.70	∅P	3.50	3.90
D	9.80	10.60			
B	15.20	16.20			



• Soldering Methods for Lihomicro's Products

1. Storage environment: Temperature=10°C to 35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
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) (t_s)	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

3. 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