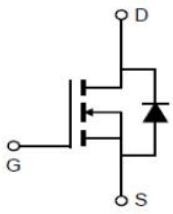
•General Description

The Power MOSFET LH9N100 has the low $R_{DS(on)}$,low gate charge,fast switching and excellent avalanche characteristics.This device offers extremely fast and robust body diode,and is suitable for telecom and power supplies.



VDS=1000V

$R_{DS(ON)}$=1.2Ω

ID=9A

TO-220

■ RoHS COMPLIANT

•Features

■Low Thermal Resistance
■Fast Switching
■High Input Resistance

•Application

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

•Ordering Information:

Part number	LH9N100
Package	TO-220
Basic ordering unit (pcs)	1000
Normal Package Material Ordering Code	LH9N100T-TO220-TU
Halogen Free Ordering Code	LH9N100T-TO220-TU-HF

•Absolute Maximum Ratings（TC =25℃）

PARAMETER		SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage		BV_{DSS}	1000	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	TC = 25°C	I_D	9	A
	TC = 100°C		5.4	
Pulsed drain current (TC = 25°C, tp limited by Tjmax)[1]		I_{DM}	36	A
Single Pulse Avalanche Energy[2]		E_{AS}	405	mJ
Power Dissipation(TC=25℃)		P_D	160	W
Junction Temperature		T_J	-55~+150	℃
Storage Temperature		T_{STG}	-55~+150	℃

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D=250uA	1000	1100	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=VGS,I_D=250uA	2.5	--	4.5	V
Drain-source On Resistance[3]	$R_{DS(ON)}$	V_{GS} =10V, I_D=6A	--	1.2	1.4	Ω
Drain-Source Leakage Current	I_{DSS}	V_{DS}=1000V,V_{GS}=0V,T_J=25℃	--	--	10	uA
		V_{DS}=1000V,V_{GS}=0V,T_J=125℃	--	--	250	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30	--	--	±10	uA
Forward Transconductance[3]	gfs	V_{DS}=15V,I_D=6A	--	15	--	S
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = 25V f = 1.0MHz	--	3200	--	pF
Output Capacitance	Coss		--	250	--	
Reverse transfer Capacitance	Crss		--	20	--	
Turn -Off Delay Time[3]	Td(off)	V_{DD}=600V, R_G=25Ω	--	51	--	ns
Total Gate Charge	Qg	I_D = 3A, V_{DS} = 960V V_{GS} = 10V [3]	--	80	---	nC
Gate-to-Source Charge	Qgs		--	16	--	
Gate-to-Drain Charge	Qgd		--	42	---	
Continuous Diode Forward Current	I_S		--	--	9.0	A
Pulsed Diode Forward Current	I_{SM}		--	--	36.0	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=6A V_{GS} =0V	--	0.9	1.5	V

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	Rth_{JC}	0.78	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	62.5	℃/W

Notes:

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

2. I_{AS} = 9A, V_{DD} = 50V, R_G = 25Ω,L=10mH, Starting T_J = 25°C

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

●Typical Characteristics

Fig1 Typical Output Characteristics, Tc=25℃

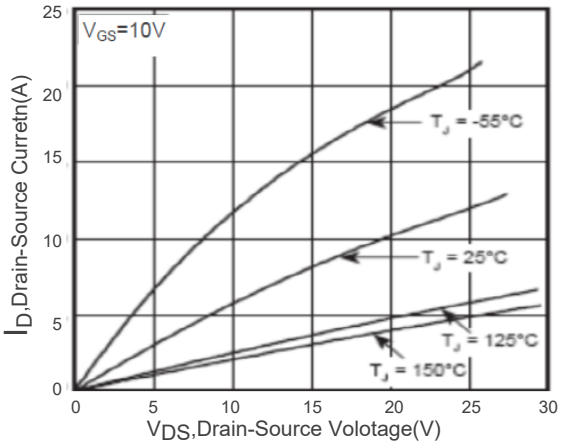


Fig2 On-Resistance Vs.Drain Current and Gate Voltage

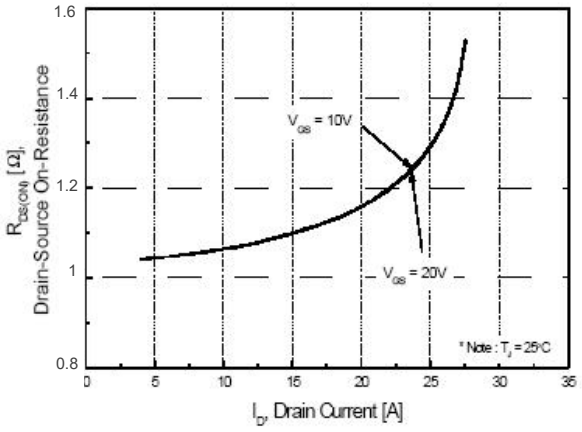


Fig3 Normalized On-Resistance Vs.V_{GS}

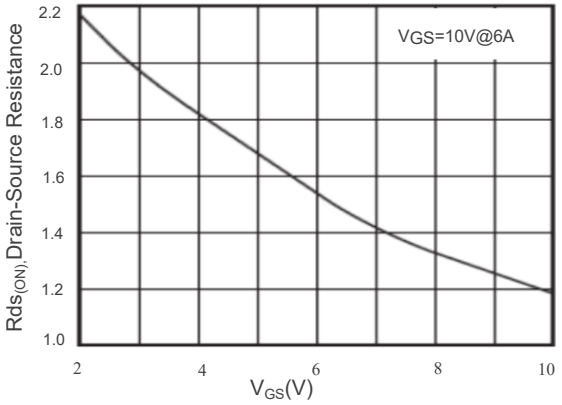


Fig4 Typical Source-Drain Diode Forward Voltage

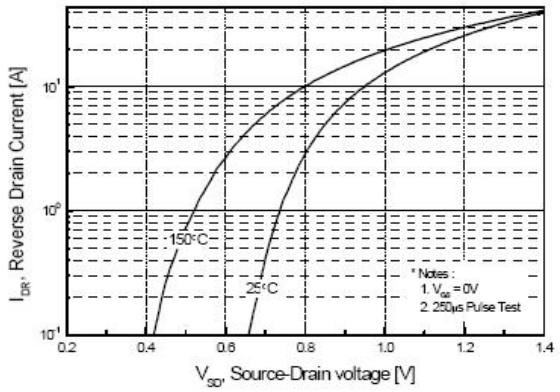


Fig5 Maximum Drain Current Vs.Case Temperature

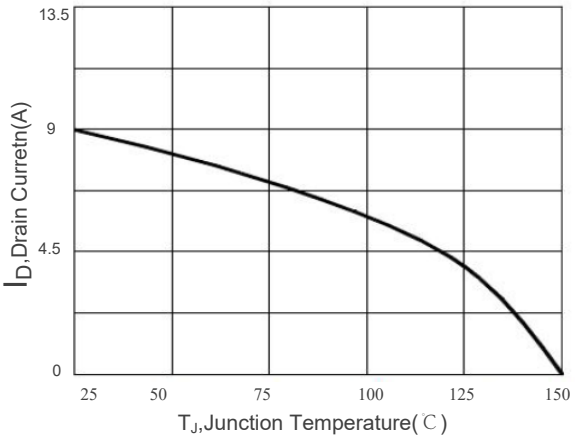
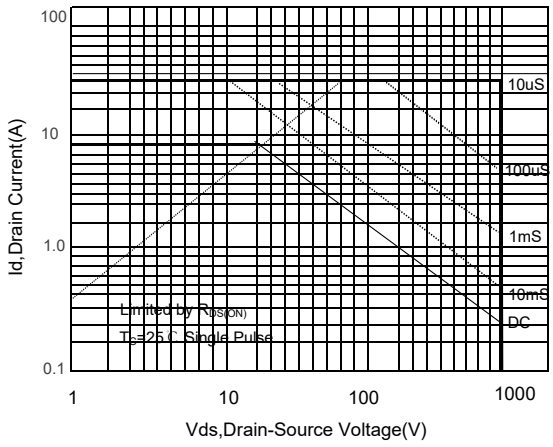


Fig6 Maximum Safe Operating Area



●Typical Characteristics

Fig7 Capacitance vs Drain-Source Voltage

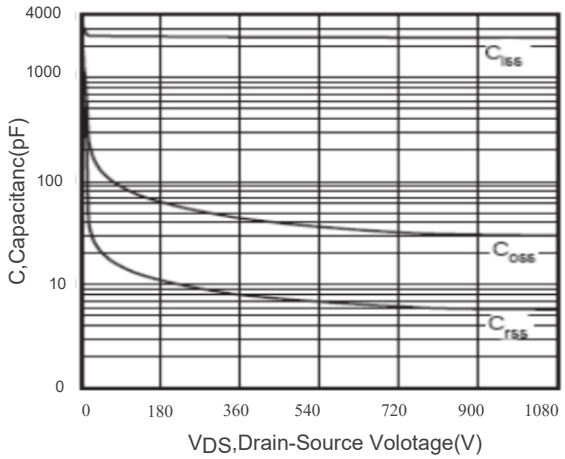


Fig8 Gate Charge vs Gate-Source Voltage

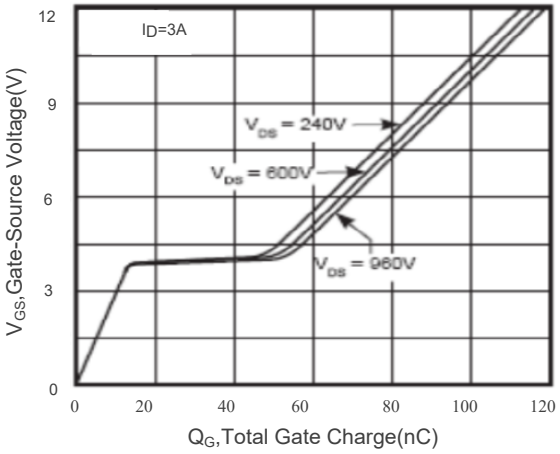
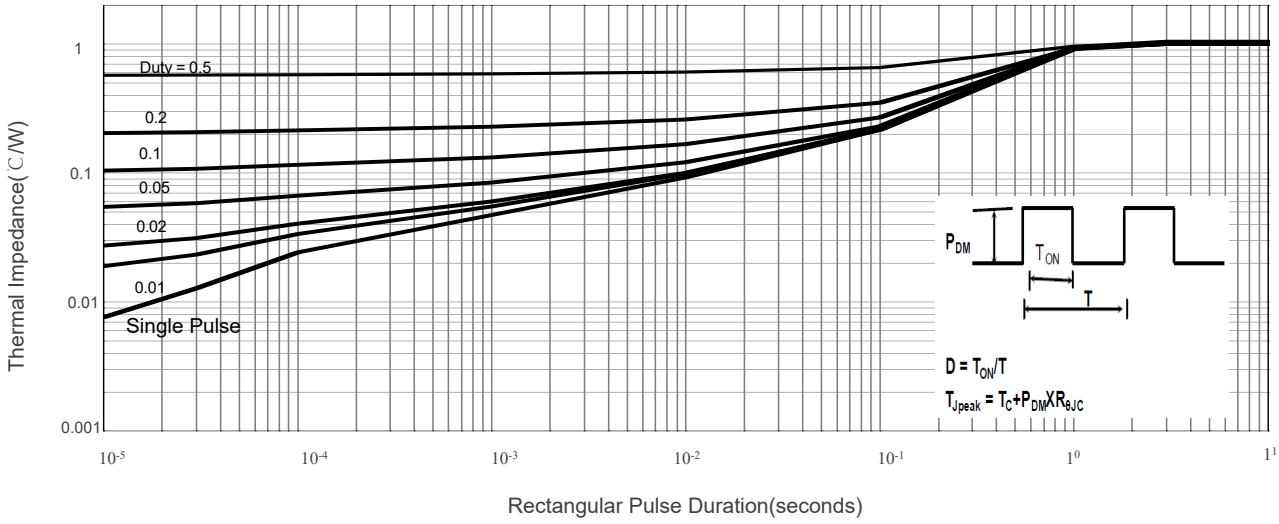


Fig9 Maximum Transient Thermal Impedance



●Test Circuits & Waveforms

Fig10. Gate Charge Test Circuit and Waveform

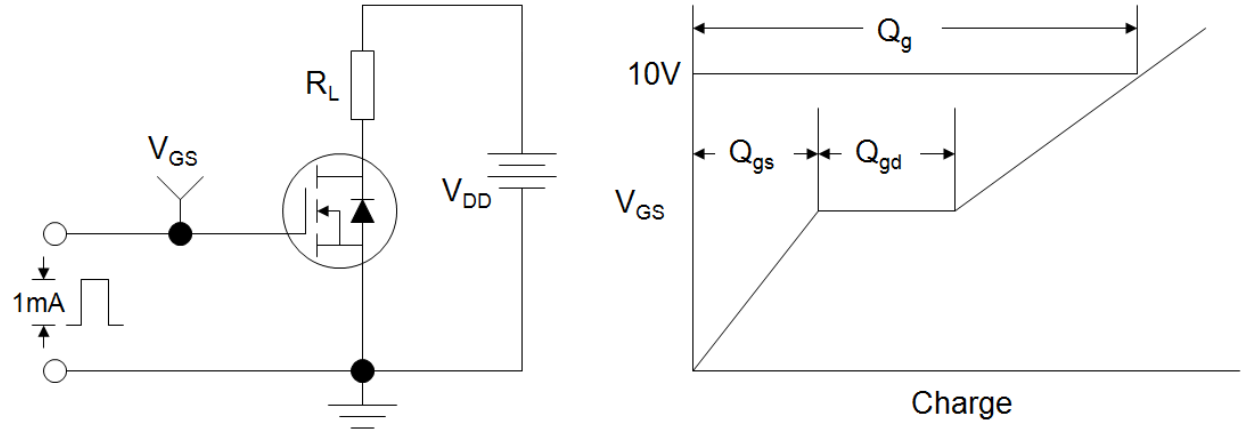


Fig 11. Resistive Switching Test Circuit and Waveform

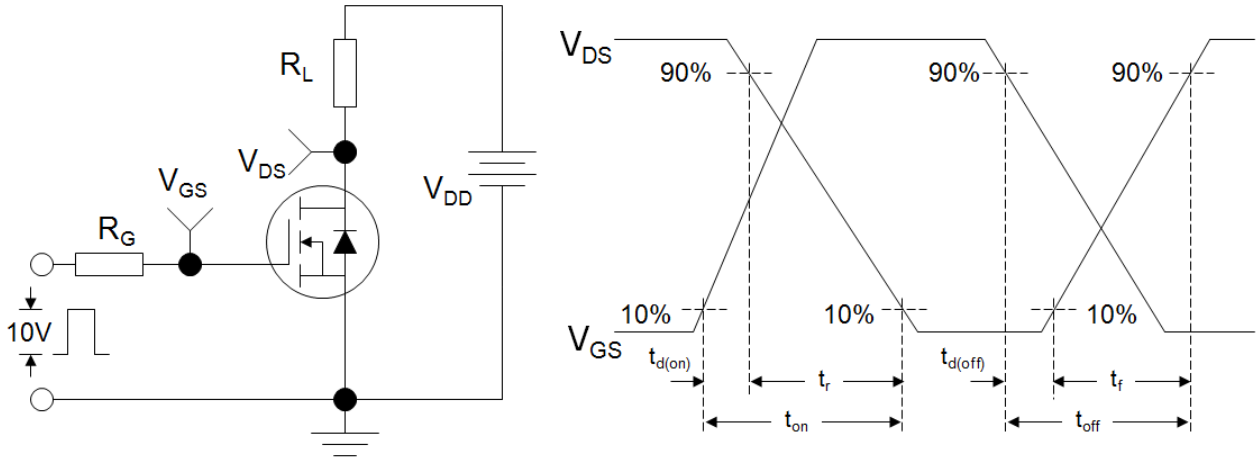
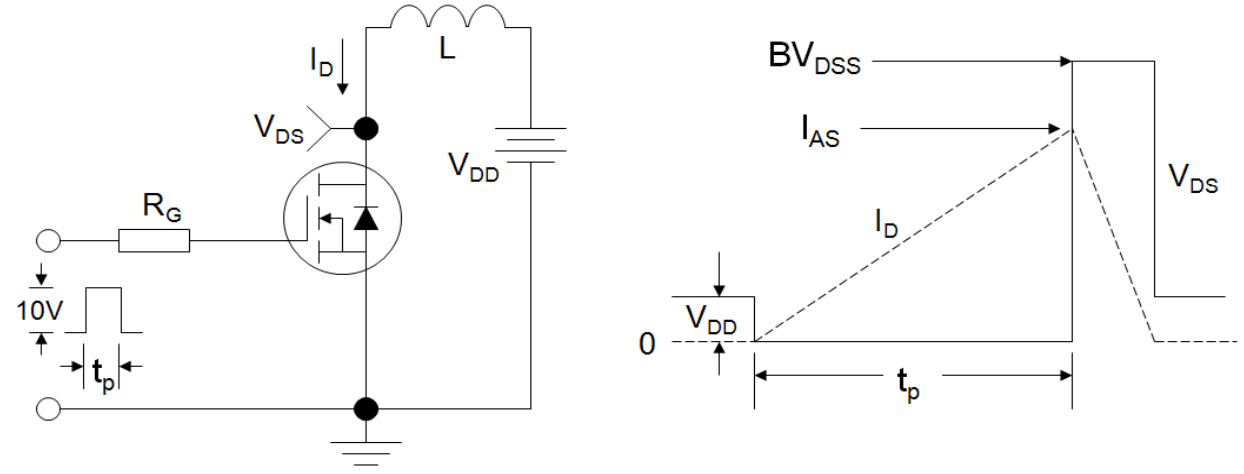


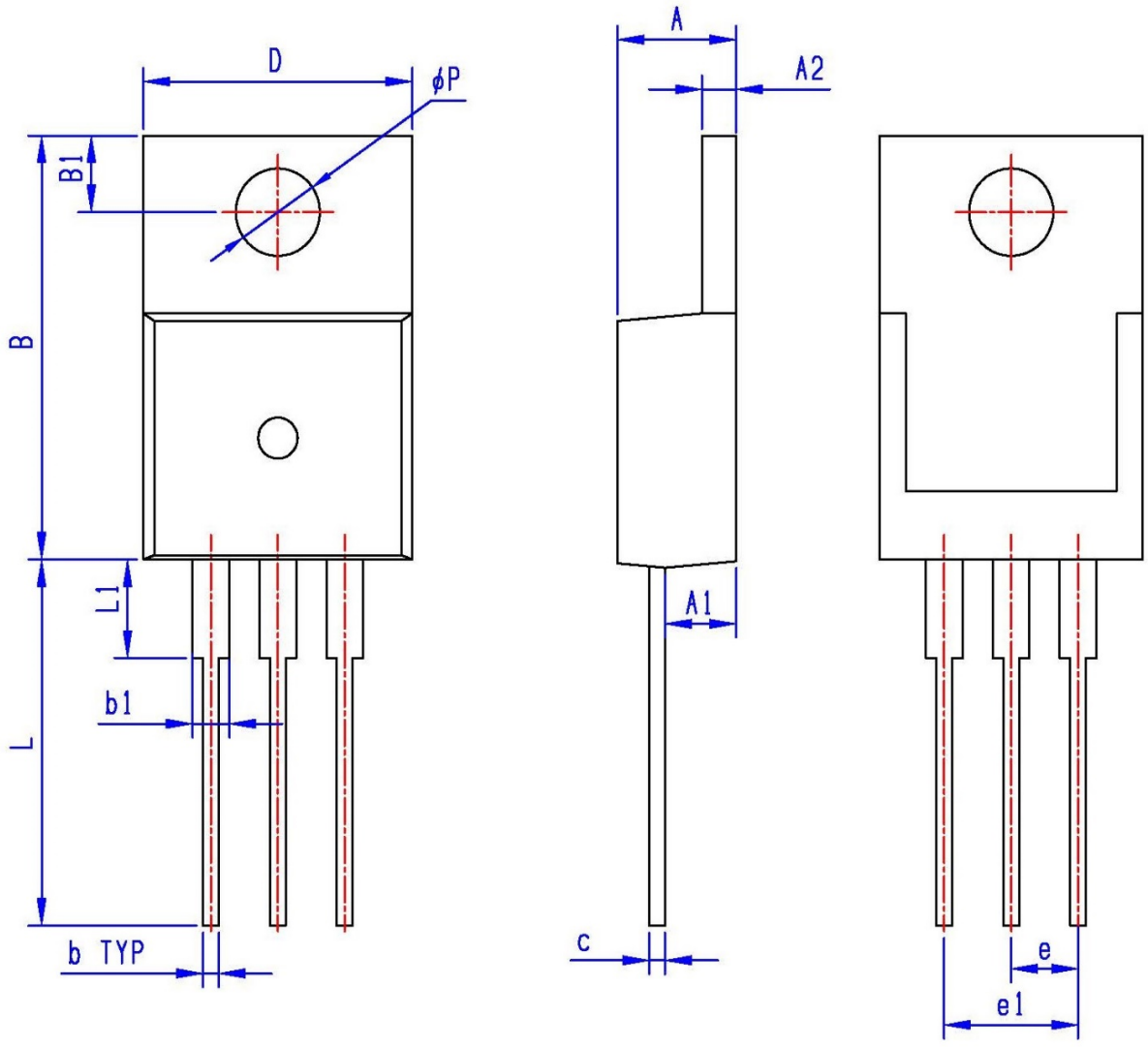
Fig12. Unclamped Inductive Switching Test Circuit and Waveform



●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	12.40	14.20
b1	1.10	1.70	L1	2.40	3.40
c	0.40	0.70	⌀P	3.50	3.90
D	9.80	10.60			
B	15.20	16.20			



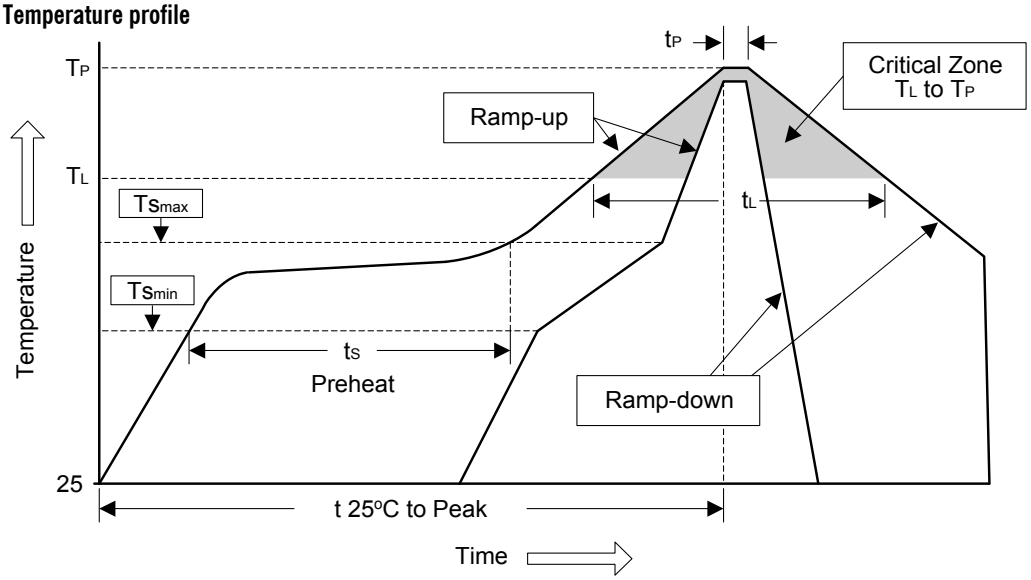
• Soldering Methods for Lihomicro's Products

1. Storage environment: Temperature=10°C to 35°C Humidity=65%±15%

2. 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 (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60 to 120 sec	 150°C 200°C 60 to 180 sec
Tsmax to T_L - Ramp-up Rate	 ＜3°C/sec	 ＜3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60 to 150 sec	 217°C 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
Solderabity	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