

•General Description

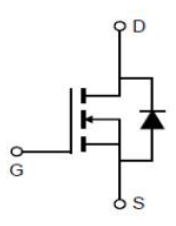
The SGT MOSFET LH030N100 has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

•Features

- Fast Switching
- Low $R_{DS(on)}$ & FOM
- Low Miller Capacitance

•Application

- Lighting
- Power Supplies
- PD Fast Charging

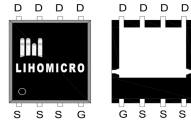


$V_{DS} = 100V$

$R_{DS(ON)} = 3.0m\Omega$

$I_D = 130A$

■ RoHS COMPLIANT



DFN5*6

•Ordering Information:

Part Number	LH030N100
Package	DFN5*6
Basic Ordering Unit (pcs)	5000
Normal Package Material Ordering Code	LH030N100N-DFN5*6-TAP
Halogen Free Ordering Code	LH030N100N-DFN5*6-TAP-HF

•Absolute Maximum Ratings (TC =25℃)

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current , $T_C = 25^\circ C$	I_D	130	A
Pulsed drain current ($T_C = 25^\circ C$, tp limited by T_{jmax}) ¹	I_D pulse	390	A
Single Pulse Avalanche Energy ²	E_{AS}	460	mJ
Power Dissipation($T_C=25^\circ C$)	P_D	27	W
Operating Temperature	T_J	-55~+175	℃
Storage Temperature	T_{STG}	-55~+175	℃

●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	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	4.0	V
Drain-source On Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	--	2.6	3.0	mΩ
		$V_{GS}=6V, I_D=20A$	--	3.2	4.2	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ C$	--	--	10	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=125^\circ C$	--	--	100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	±100	nA
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	--	1.0	--	Ω
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$	--	43	--	S

DYNAMIC CHARACTERISTICS

Input Capacitance	C_{iss}	$V_{GS}=10V,$ $V_{DS}=50V$ $f=1.0MHz$	--	3600	--	pF
Output Capacitance	C_{oss}		--	1517	--	
Reverse transfer Capacitance	C_{rss}		--	80	--	
Turn-on delay time	$T_{d(on)}$	$V_{GS}=10V,$ $I_D=45A$ $R_G=3.6\Omega$	--	13.7	--	ns
Rise time	T_r		--	26	--	
Turn -Off Delay Time	$T_{d(off)}$		--	54.4	--	
Fall time	T_f		--	31.2	--	

GATE CHARGE CHARATERISTICS

Total Gate Charge	Q_g	$I_D=20A,$ $V_{DS}=50V$ $V_{GS}=10V$	--	74.3	---	nC
Gate-to-Source Charge	Q_{gs}		--	14	--	
Gate-to-Drain Charge	Q_{gd}		--	25	---	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

Diode Forward Voltage	V_{SD}	$T_J=25^\circ C, I_S=20.0A$ $V_{GS}=0V$	--	--	1.2	V
Reverse Recovery Time	t_{rr}	$I_f=I_S$ $di_F/dt=100A/\mu s$	--	110	--	ns
Reverse Recovery Charge	Q_{rr}		--	520	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	4.7	°C/W
Thermal Resistance Junction-ambient	R_{thJA}	54.5	°C/W

Notes:

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

2. $I_{AS}=20A, V_{DD}=60V, R_G=50\Omega$, Starting $T_J=25^\circ C$

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

•Typical Characteristics

Fig1.Output Characteristics

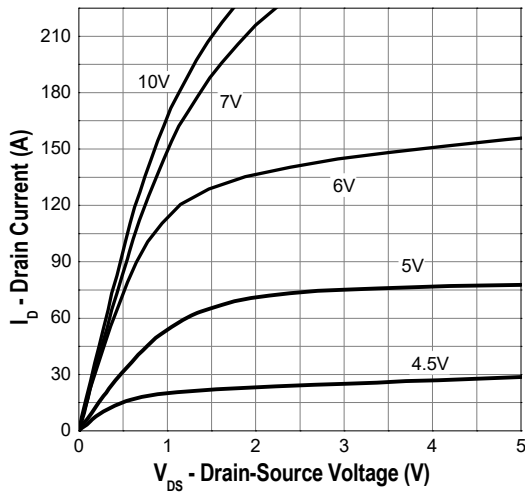


Fig2.Gate Threshold Voltage

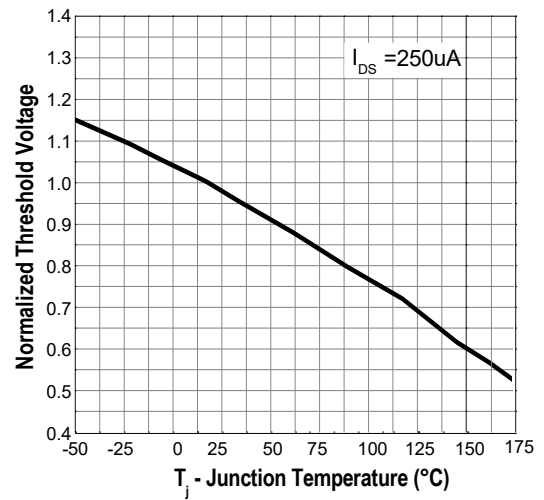


Fig3.Gate-Source On Resistance

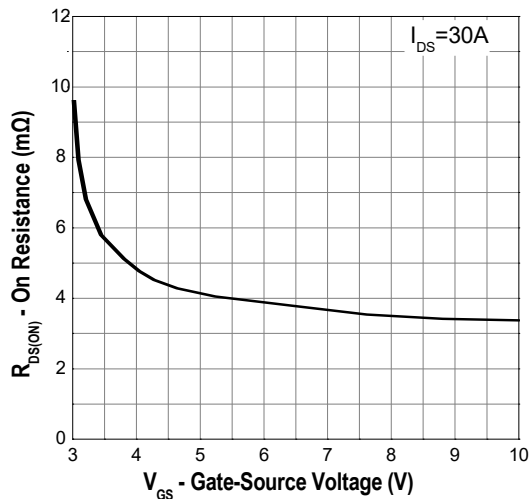


Fig4.Drain-Source On Resistance

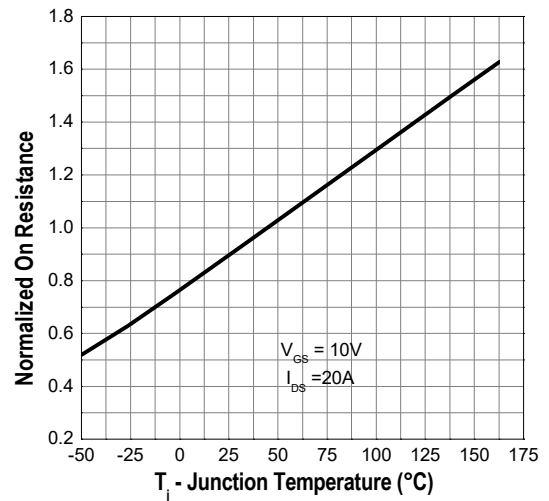


Fig5.Drain-Source On Resistance

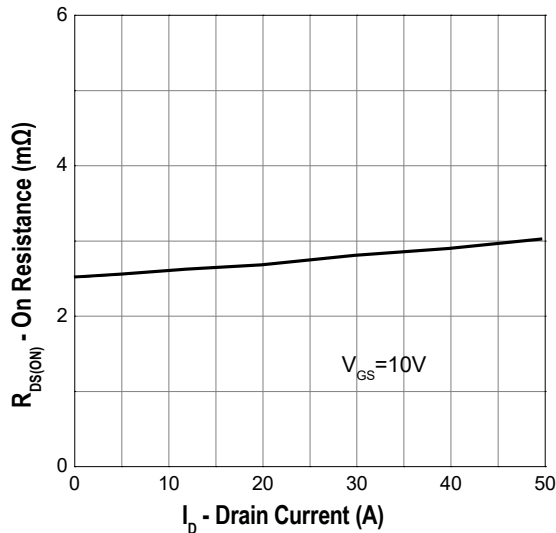
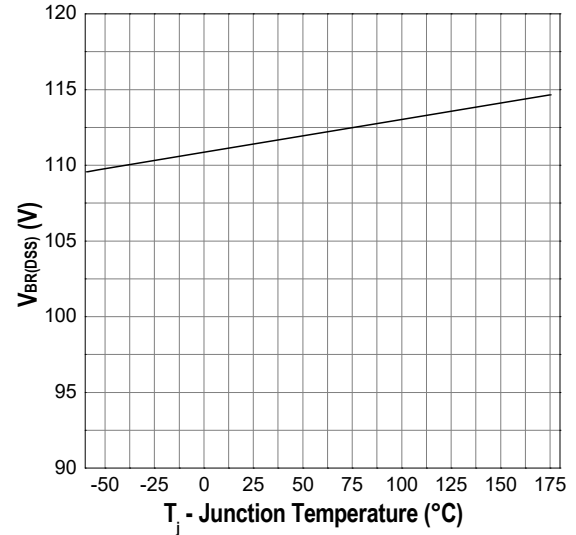


Fig6.Drain-source Breakdown Voltage



● **Typical Characteristics**(cont.)

Fig7.Power Dissipation

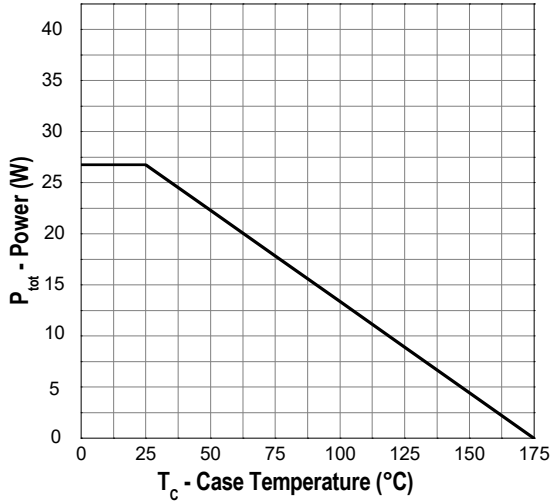


Fig8.Drain Current

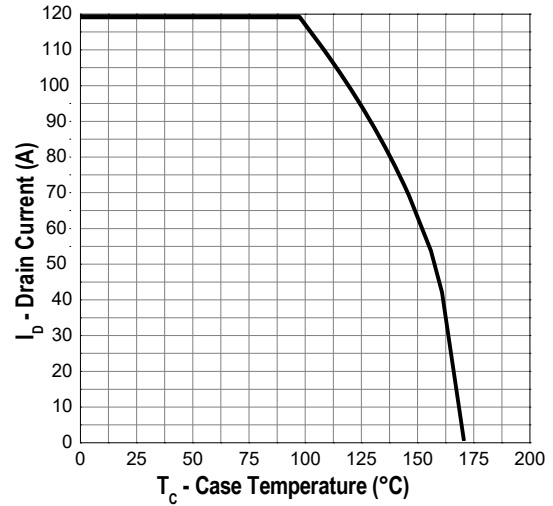


Fig9.Safe Operation Area

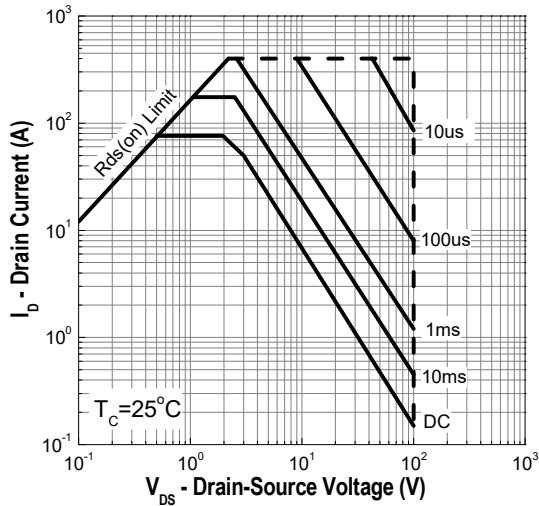


Fig10.Transient Thermal Impedance

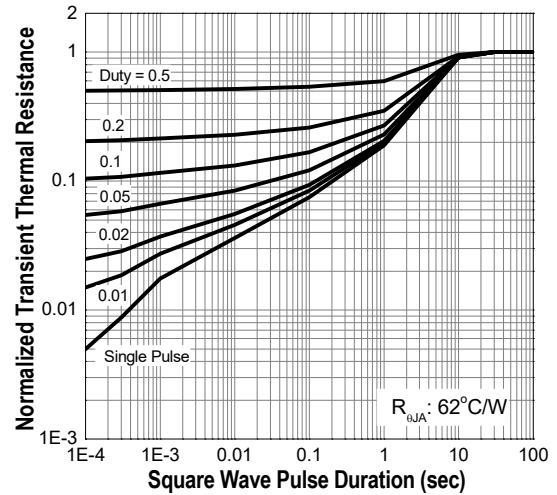


Fig11.Capacitance

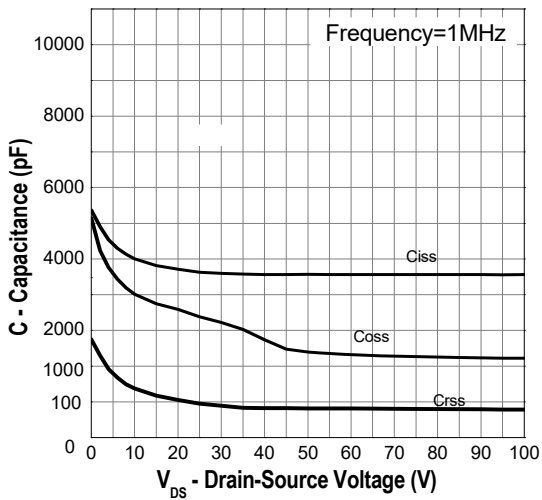
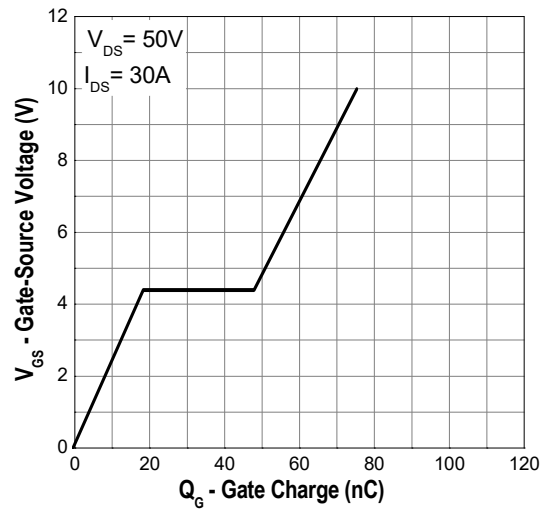


Fig12.Gate Charge



• Test Circuits & Waveforms

Fig.1 Gate Charge Waveform

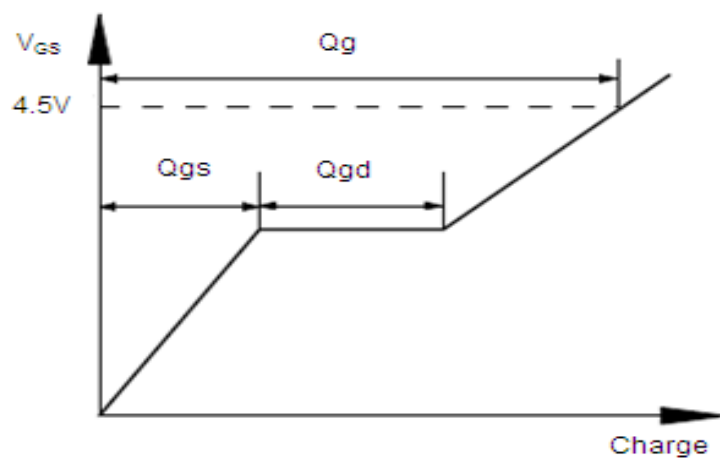


Fig.2 Switching Time Waveform

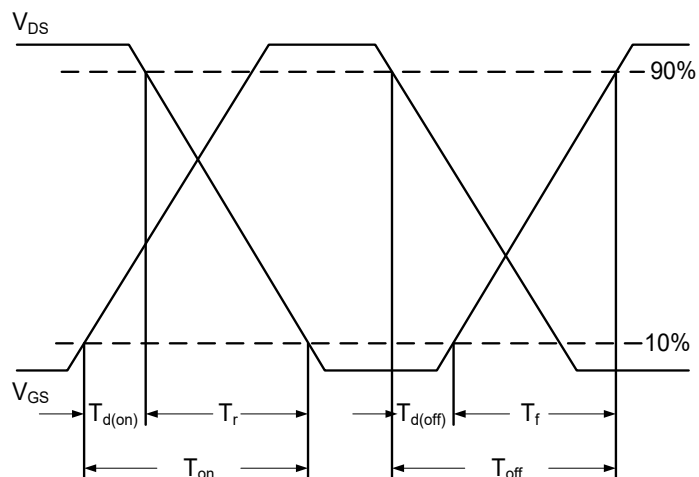
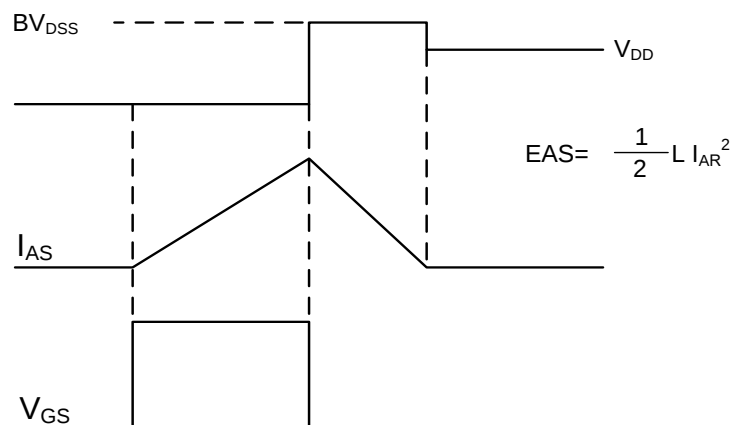


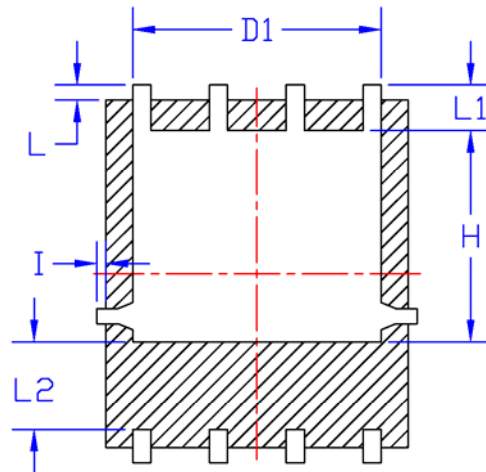
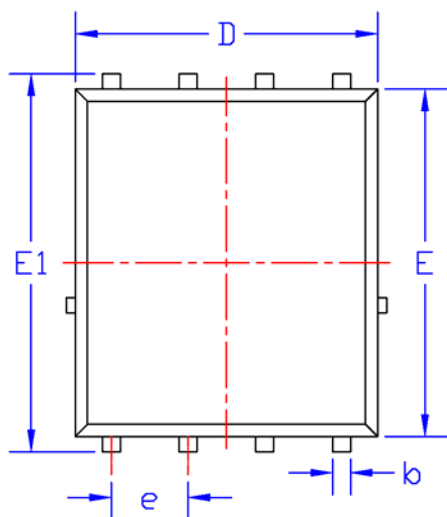
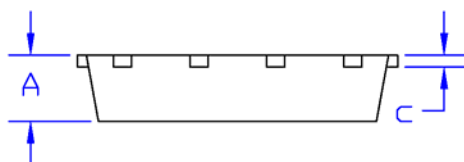
Fig.11 Unclamped Inductive Switching Waveform



●Dimensions (DFN5*6)

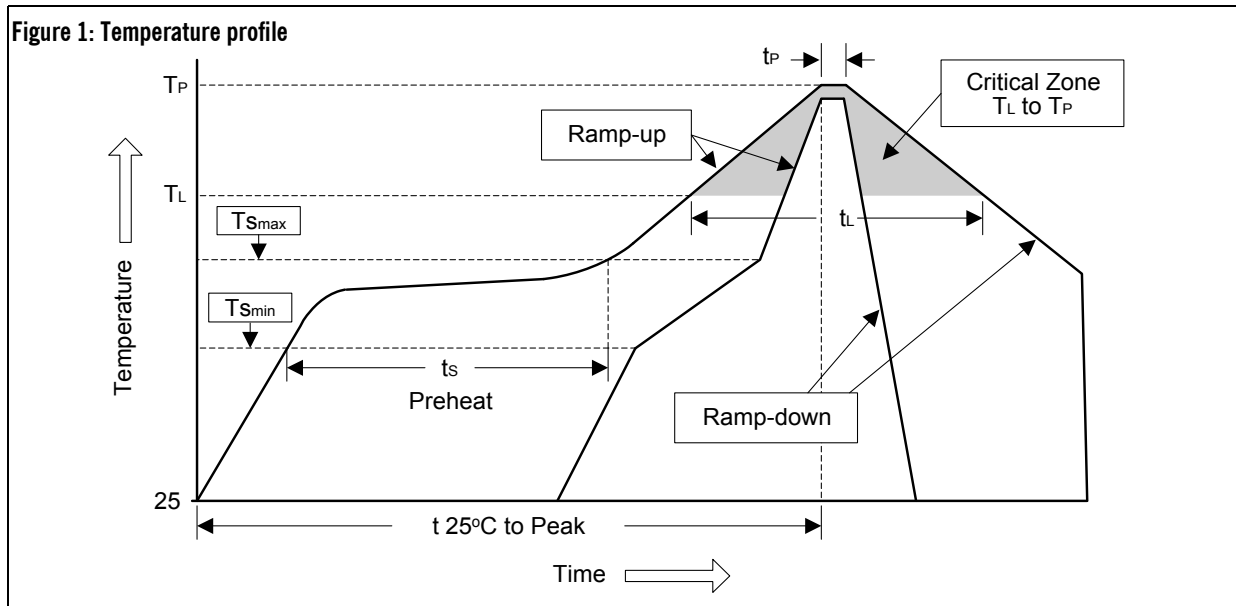
UNIT:mm

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



● 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