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DATASHEET

EHP-69 Series
EHP-69/GT01C-P01/TR

Received
■ MASS PRODUCTION
□ PRELIMINARY
□ CUSTOMER DESIGN
DEVICE NO. : *
PAGE : *

Revised record

REV.	DESCRIPTION	RELEASE DATE
1	New spec	2011.04.08

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Device No: XXXXXXX

EHP-69 Series
EHP-69/GT01C-P01/TR

Features

- Small & compact package and with high efficiency
- Typical luminous flux: 100 lm @ 500mA
- Typical color temperature: 6000 K@500mA
- Optical efficiency@500mA : 55 lm/W
- ESD protection (according to JEDEC 3b) up to 2KV
- Moisture Sensitivity Level (MSL) Class 3
- Grouping parameter: Total luminous flux, Color coordinates, Forward Voltage.
- RoHS compliant & Pb free

Description

- Encapsulating Resin: Silicone resin with phosphor
- Electrodes: Ag plating
- Die attach: Silver paste
- Chip: InGaN

Applications

- Camera flash light /strobe light for mobile devices
- Torch light for DV(Digital Video) application
- Signal and Symbol Luminaries for orientation maker lights (e.g. steps, exit ways, etc.)

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Device Selection Guide

Chip Materials	Emitted Color
InGaN	Shiny White

Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
DC operating Current(Torch Mode)(1)	I_F	350	mA
Peak Pulsed Forward Current(Pulse Mode)(2)	I_{pulse}	500	mA
ESD Resistance (JEDEC 3b)	V_B	2000	V
Reverse Voltage	V_R	Note 3	V
Junction Temperature	T_J	125	℃
Operating Temperature	T_{OP}	-40 ~ +85	℃
Storage Temperature	T_{stg}	-40 ~ +100	℃
Soldering Temperature	T_{sol}	260	℃
Allowable Reflow Cycles	N/A	2	

Notes:

1. Pulse time > 50ms, $T_{soldering}$ = 25℃
2. 1 Duty≦0.1, pulse width≦50ms, $T_{soldering}$ = 25℃
3. EHP-69 series are not designed for reverse bias used.
4. All specification are assured by reliability test for 1000hr, IV degradation less than 30%
5. All reliability items are tested under good thermal management with 1.0x1.0 cm^2 MCPCB

JEDEC Moisture Sensitivity

	Floor Life		Soak Requirements Standard	
Level	Time (hours)	Conditions	Time (hours)	Conditions
3	168	≦ 30℃/ 60%RH	192 +5/-0	30℃/ 60%RH

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Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux(1)	I_V	80	100	130	lm	IF = 500mA
Forward Voltage(2)	V_F	2.95	----	4.15	V	
Color Temperature	CCT	4500	----	7000	K	

Forward Voltage Binning

Bin	Min.	Typ.	Max.	Unit	Condition
V1	2.95	----	3.25	V	IF = 500mA
V2	3.25	----	3.55		
V3	3.55	----	3.85		
V4	3.85	----	4.15		

Luminous Flux Binning

Bin	Min.	Typ.	Max.	Unit	Condition
K4	80	----	100	Lm	IF = 500mA
K5	100	----	130		

Note.
1. Brightness measurement tolerance: ±10%.
2. Forward Voltage measurement tolerance: ±0.1V.
3. 1 Duty≦0.1, pulse width≦50ms, Tsoldering = 25℃
4. Temperature of solder pad 25℃

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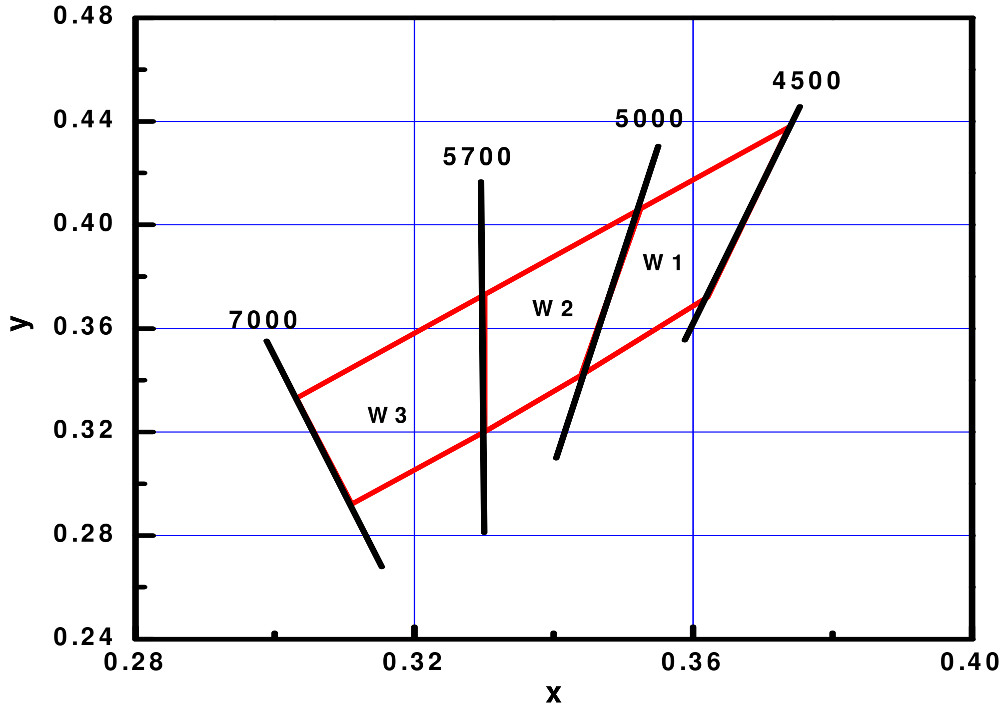
White Bin Structure



Cool-White Bin Coordinate

Bin	CIE X	CIE Y
W1	0.3738	0.4378
	0.3524	0.4061
	0.3440	0.3420
	0.3620	0.3720
Reference Range: 4500~5000K		

Bin	CIE X	CIE Y
W2	0.3524	0.4061
	0.3300	0.3730
	0.3300	0.3200
	0.3440	0.3420
Reference Range: 5000~5700K		

Bin	CIE X	CIE Y
W3	0.303	0.333
	0.33	0.373
	0.33	0.32
	0.311	0.292
Reference Range: 5700~7000K		

Notes:

1. Color coordinates measurement allowance : ±0.01
2. Color bins are defined at I_F=500mA and 50ms pulse operation condition

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Reliability Data

Stress Test	Stress Condition	Stress Duration
Reflow	Tsol=260℃, 10sec, 6min	3 times
Thermal Shock	H：＋100℃ 20min. '∫ 10sec. 'L：－ 40℃ 20min.	500 Cycles
Temperature Cycle	H：＋100℃ 30min. '∫ 5min. 'L：－ 40℃ 30min.	1000 Cycles
High Temperature/Humidity Storage	Ta=85℃ , RH=85%	1000hours
High Temperature Storage	Ta=100℃	1000hours
Low Temperature Storage	Ta=-40℃	1000hours
Room Temperature Operation Life	Ta=25℃, IF=350mA	1000hours
Pulse Test	Ta=25℃, IF=1000mA 100ms on / 900ms off	30000times
ESD Human Body Model	2000V, Interval:0.5sec	3 times

*lm: BRIGHTNESS ATTENUATE DIFFERENCE(1000hrs)＜50%
*VF: FORWARD VOLTAGE DIFFERENCE＜20%

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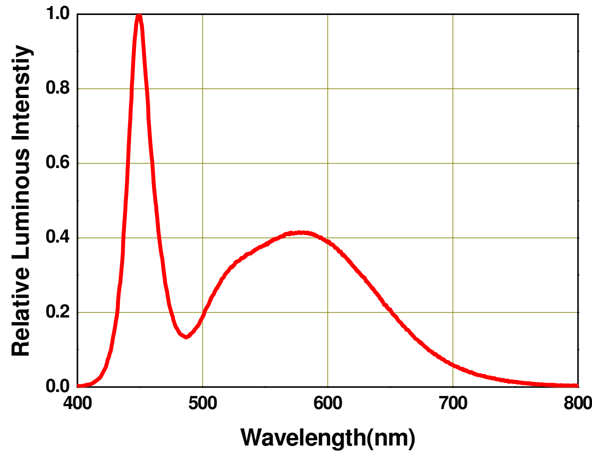
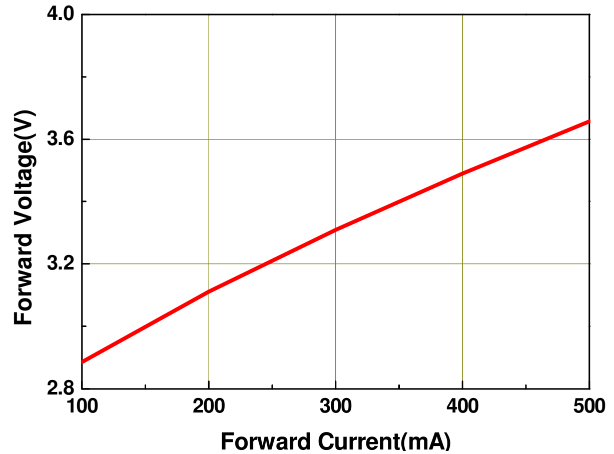
Typical Electro-Optical Characteristics Curves

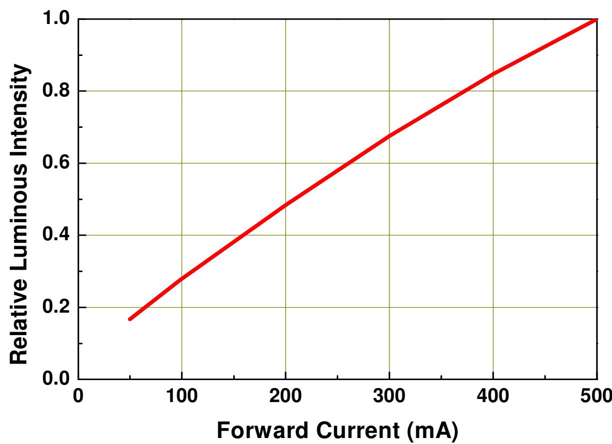
Relative Spectral Distribution, I_F=500mA



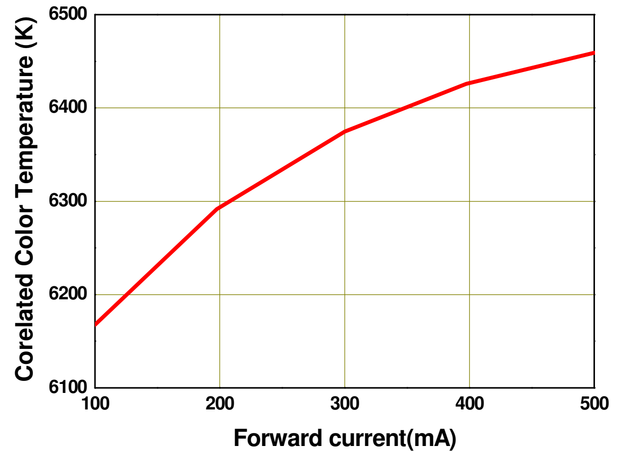
Forward Voltage vs. Forward Current



Relative Luminous Intensity vs Forward Current



Correlated Color Temperature (CCT) vs. Forward current



Note.

1. Data was tested at pulse time = 50ms
2. Data was tested under superior thermal management, $T_{soldering}$ <70℃.

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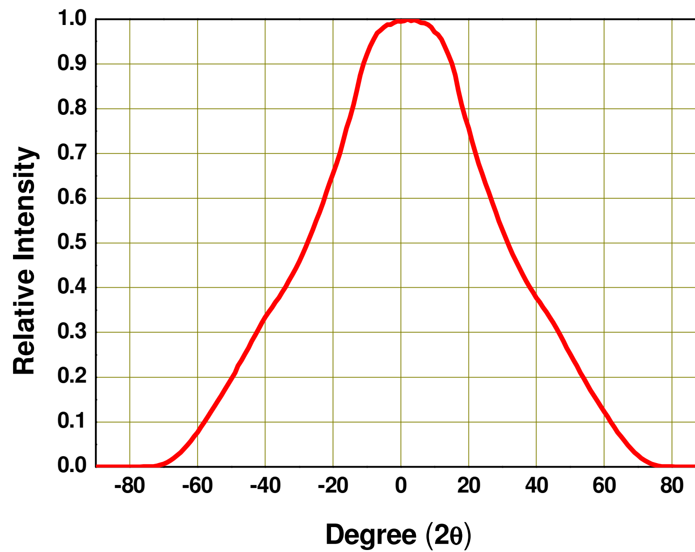
Typical Representative Spatial Radiation Pattern



Note.

1. $2\theta_{1/2}$ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.

2. Viewing angle tolerance is ± 10° .

Mechanical Dimension

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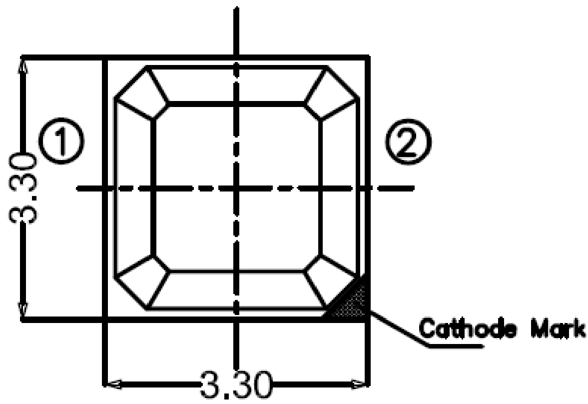
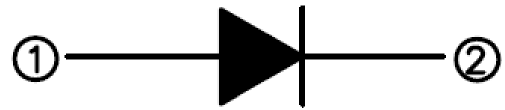
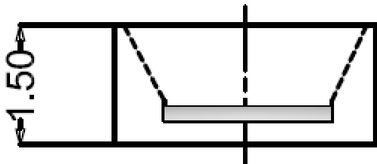
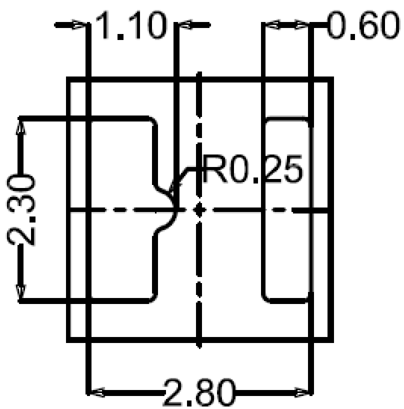


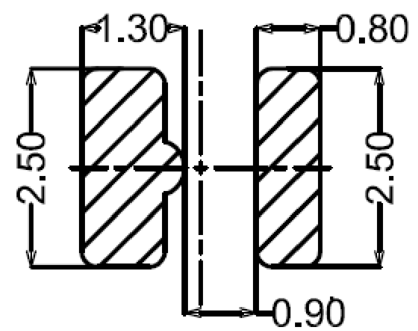


Polarity





Bot. view



Soldering patterns

Note: Tolerances unless mentioned ±0.1mm. Unit = mm

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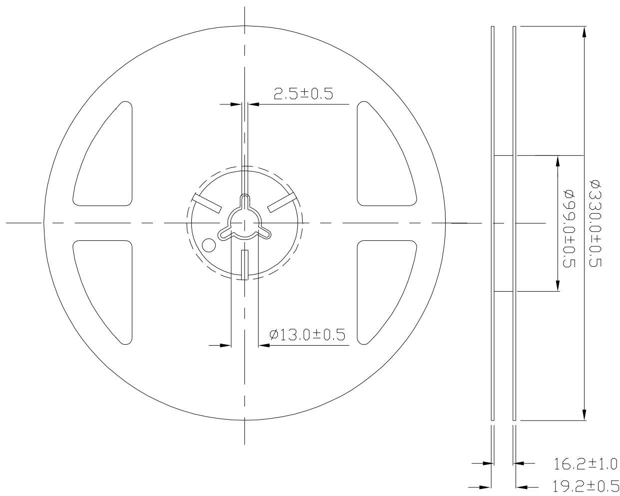
Moisture Resistant Packing Materials

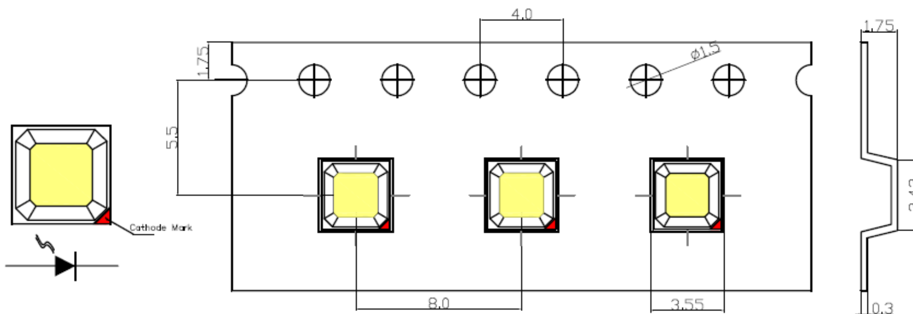
Label Explanation

CPN: Customer's Production Number
P/N : Production Number
QTY: Packing Quantity
CAT: Rank of Luminous Flux
HUE: Color Rank
REF: Rank of Forward Voltage
LOT No: Lot Number
MADE IN TAIWAN: Production Place

Reel Dimensions



Carrier Tape Dimensions: Loaded Quantity 1000 pcs Per Reel



Note: Tolerances unless mentioned ±0.1mm. Unit = mm

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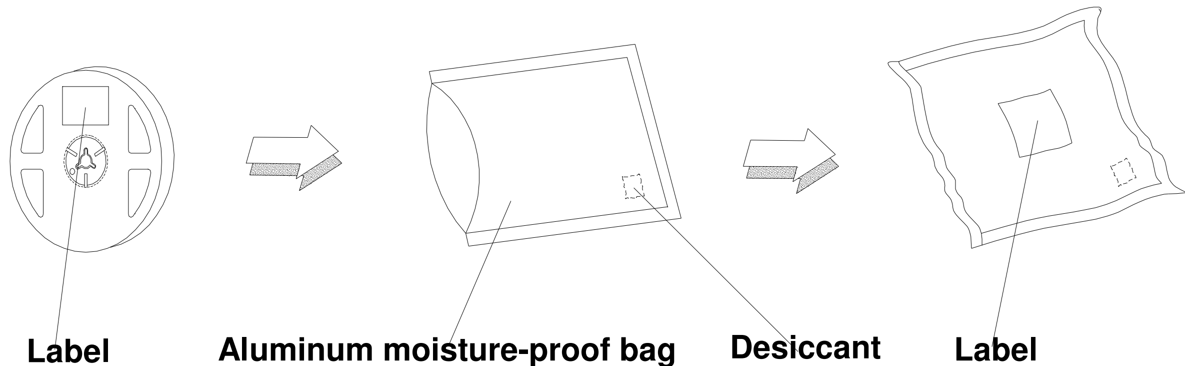
Moisture Resistant Packaging



Note: Tolerances unless mentioned ±0.1mm. Unit = mm

Precautions for Use

1. Over-current-proof

Although the EHP-69 series has a conductive ESD protection mechanism, customer must not use the device in reverse and should apply resistors for extra protection. Otherwise, slight voltage shifts may cause significant current change resulting in burn out failure.

2. Storage

i. Do not open the moisture proof bag before the devices are ready to use.
ii. Before the package is opened, LEDs should be stored at temperatures less than 30℃ and humidity less than 90%.
iii. LEDs should be used within a year.
iv. After the package is opened, LEDs should be stored at temperatures less than 30℃ and humidity less than 60%.
v. LEDs should be used within 168 hours (7 days) after the package is opened.
vi. If the moisture absorbent material (silicone gel) has faded away or LEDs have exceeded the storage time, baking treatment should be implemented based on the following conditions: pre-curing at 60±5℃ for 24 hours.

3. Thermal Management

i. For maintaining the high flux output and achieving reliability, EHP-69 series LEDs should be mounted on a metal core printed circuit board (MCPCB) or other kinds of heat sink with proper thermal connection to dissipate approximately 1W of thermal energy at 350mA operation.
ii. Heat dissipation or thermal conduction design is strongly recommended on MCPCB for reflow soldering purposes.

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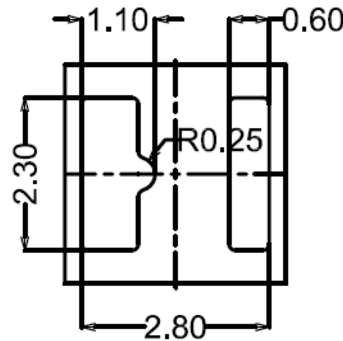
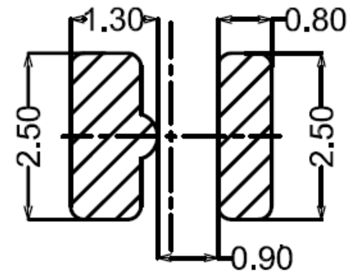




■ **Temperature of soldering pad should be controlled under 70℃**

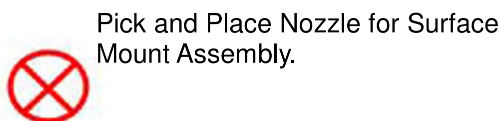
iii. Sufficient thermal management must be implemented. Otherwise, the junction temperature of die may exceed over the limit at high current driving conditions and the LEDs' lifetime may be decrease dramatically.

iv. For further thermal management suggestions, please consult the Everlight Design Guide or local representatives for assistance.

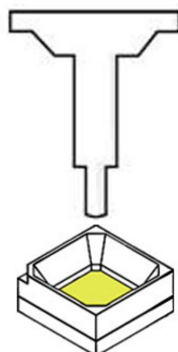
v. The solder pad should be controlled below 70°C when turn on the device, or the die junction temperature will be over the limit under large electronic driving and LED lifetime will decrease critically.

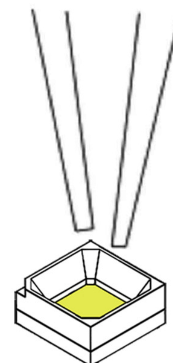
4. Proper Handling

To avoid contamination of materials, damage of internal components, and shortening of LED lifetime, do not subject LEDs to conditions as those listed below.



Tweezers





Avoid directly contacting with nozzle.

Do not touch the resin to avoid scratching or other damage.

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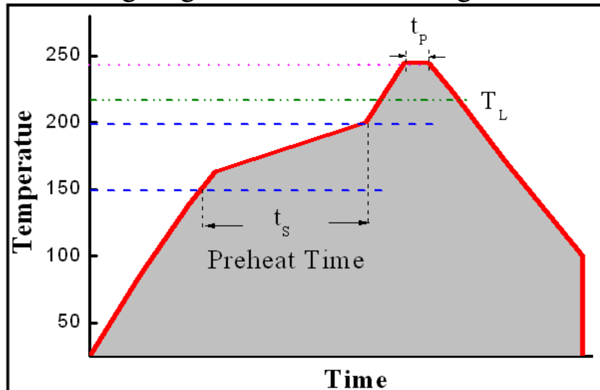
5. Reflow Soldering Process

a. EHP-69 series are suitable for SMT process.

b. Curing of glue in oven according to standard operation flow processes.



Profile Feature	Lead Free Assembly
Ramp-Up Rate	2-3 ℃/S
Preheat Temperature	150-200 ℃
Preheat Time (t_S)	60-120 S
Liquid Temperature (T_L)	217 ℃
Time maintained above T_L	60-90 S
Peak Temperature (T_P)	240±5 ℃
Peak Time (t_P)	Max 20 S
Ramp-Down Rate	3-5 ℃/S

c. Reflow soldering should not be done more than twice.

d. In soldering process, stress on the LEDs during heating should be avoided.

e. After soldering, do not warp the circuit board.

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