Harvatek Surface Mount CHIP LEDs Approval Sheet

Model No.: HT-E311FCH-K569

Introduction

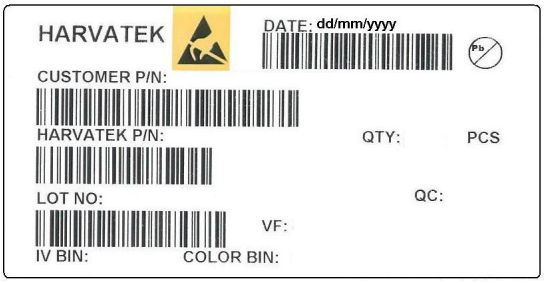
- *The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by HARVATEK for any infringements of intellectual property or other rights of the third parties which may result from it use.*
- *Harvatek is continually effort to improve the quality of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing HARVATEK products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such HARVATEK products cause loss of human life, bodily injury or damage to property.*
- *The HARVATEK products listed in this document are intended for usage in general electronics (computer, personal equipment, office equipment, industrial robotics, domestic, etc…) These products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury.*
- *In developing your designs, please ensure that HARVATEK products are used within specified operating ranges as set forth in the most recent HARVATEK products specifications.*
- *Also, please keep in mind the precautions listed in this document.*

Product Specification

	Specification	Material	Quantity
Iv	Red:45-180mcd Green:112.5-360mcd Blue:45-112.5mcd @20mA/ Ta= 25^{O} C		
Lambda(λ_D)	Red: 615-630nm Green: 515-535nm Blue: 465-480nm @20mA/ Ta= 25^{O} C		
Vf	Red: 1.6-2.4V Green: 2.7-3.6V Blue: 2.7-3.6 V @20mA/ Ta= 25^{O} C		
Ir	< 100 µA @ V_R = 5 V		
Resin	Diffused	Epoxy resin	
Carrier tape	According to EIA 481-1A specs	Conductive Black Tape	1000pcs per reel
Reel	According to EIA 481-1A specs	Conductive Black	
Label	HT standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel one bag
Carton	HT standard	Paper	Non-specified

ESD protection for GaP and AlGaAs chips are still necessary even though they are safety in low static-electric discharge. Material in AlInGaP, GaN, or/and InGaN chips are **STATIC SENSITIVE device**. ESD protection shall be considered and taken in the initial design stage. If manual work/process is needed, please ensure the device is well protective from ESD within all the process.

Label Spec.:



■**Customer P/N: To Be Defined**

■ **Harvatek P/N**

H T - E 3 1 1 F C H-K569

Series Name	Emitting Color
HT-E311: 3.2x1.5x1.0mm	Full Color: Red, Green and Blue KXXX Produce code

■ **Lot No.**

1	2	3	4	5	6	7	8	9	10
P	**1**	**2**	**2**	**3**	**0**	**A**	**-**	**D**	**T**

Code 1	Code 2	Code 3	Code 4, 5	Code 6, 7	Code 9	Code 10
	Mfg. Year	Mfg. Month	Mfg. Date	Lots	Resin Color	Packaging
Internal Tracing Code	1: 2001 2: 2002 3: 2003 4: 2004 …..	1: Jan. 2: Feb. …. 9: Sep. A: Oct. B: Nov. C: Dec.	1~31/ (30)	01~99, A,B,C…	D: Milky White	T: Taped Reel

■ Iv Bin: Red / Green / Blue

Color	Bin Code	Spec. Range
Red	P	45-71.5mcd
	Q	71.5-112.5mcd
	R	112.5-180mcd
Green	R	112.5-180mcd
	S	180-285mcd
	T	285-360mcd
Blue	P	45-71.5mcd
	Q	71.5-112.5mcd

■ Color Bin: Red / Green / Blue

Color	Bin Code	Spec. Range
Red	-	615-630nm
Green	A	515-520nm
	B	520-525nm
	C	525-530nm
	D	530-535nm
Blue	B	465-470nm
	C	470-475nm
	D	475-480nm

■ Vf Bin: Red / Green / Blue

Color	Bin Code	Spec. Range
Red	-	1.6-2.4 V
Green	G43	2.7-3.0V
	H33	3.0-3.3V
	J23	3.3-3.6V
Blue	G43	2.7-3.0V
	H33	3.0-3.3V
	J23	3.3-3.6V

■ Electro-Optical Characteristics

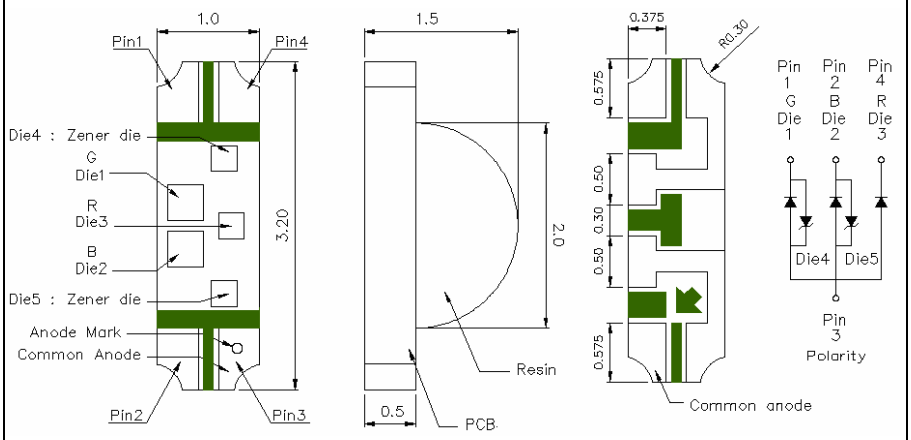
(I_F @ 20mA, T_a 25°C)

Code for parts	Lighting Color			V_F(V)		λ (nm)			I^*_V(mcd)
				typ	max	λ_D	λ_P	△λ	Min
HT-E311FCH-Kxxx	Die3	Ultra Bright Red	USD	1.9	2.4	622	636	17	71.5
	Die1	Green	NG	3.3	3.6	527	520	40	112.5
	Die2	Blue	NB	3.3	3.6	470	468	40	45

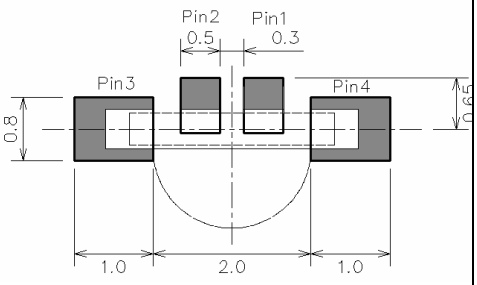
■ Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

Tolerance: +/-0.05

Outline Dim.



Soldering Pattern



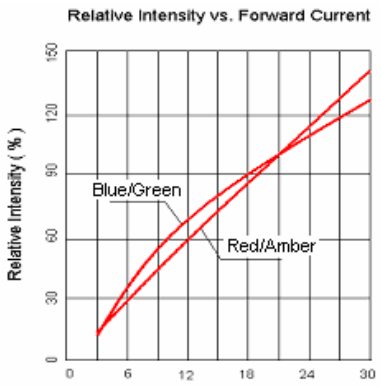
1. Soldering terminal may shift in x, y direction.
2. Common anode.

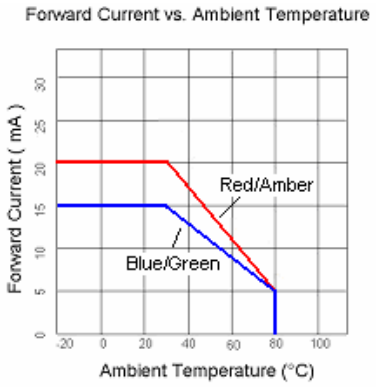
■ Absolute Maximum Ratings

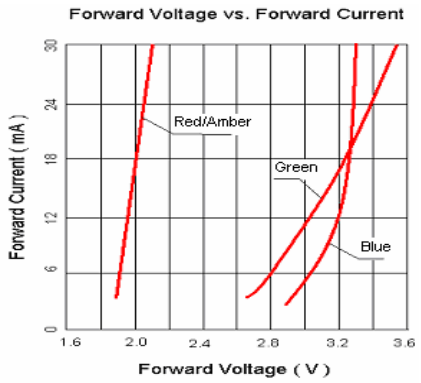
(T_a 25°C)

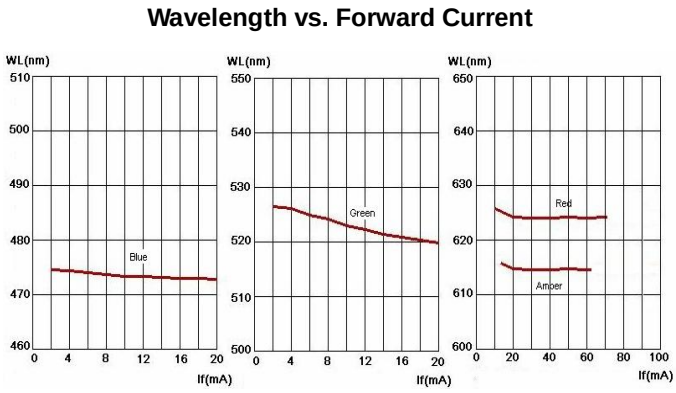
Series	P_d (mW)	I_F (mA)	I_{FP} (mA)	V_R (V)	I_R (uA)	T_{OP} (°C)	T_{ST} (°C)
Red	60	25	100	5	<100@ V_R = 5	-30~+80	-40~+85
Blue/Green	72	20	80				

■ Characteristics of HT-E311 Full Color Series

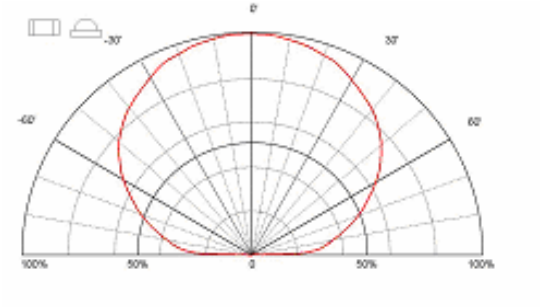




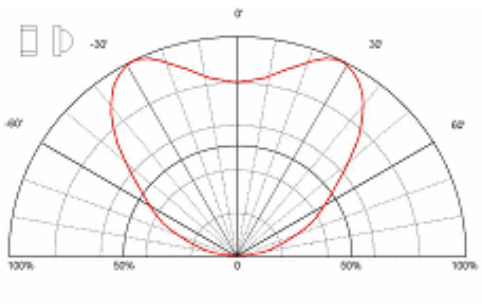




Directive Characteristics

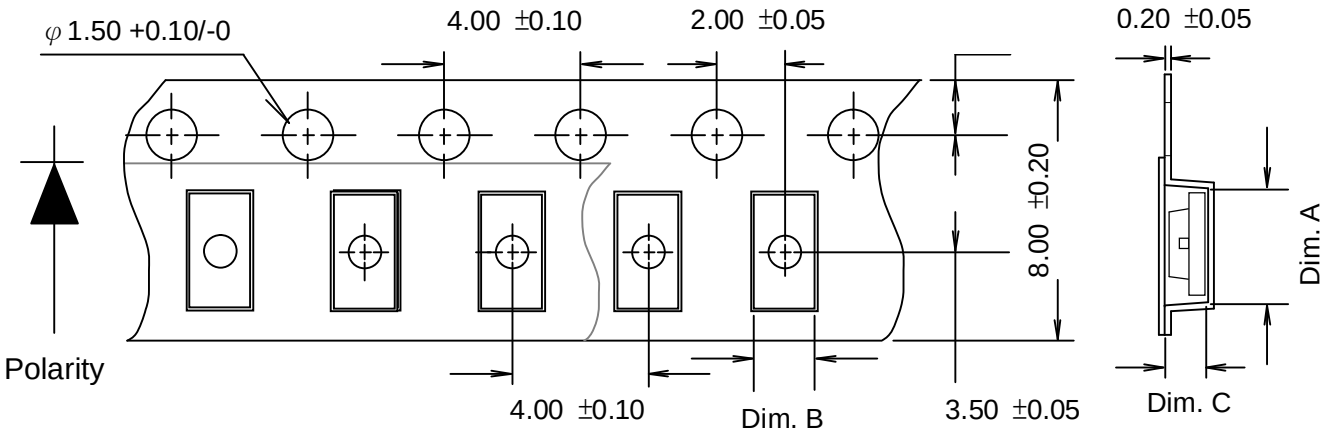


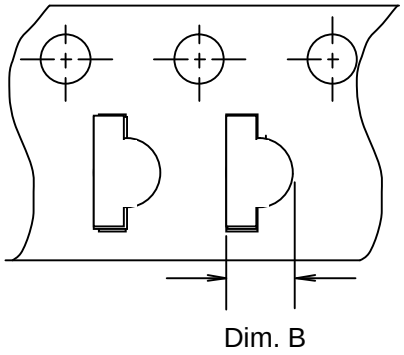
Directive Characteristics



Packaging Tape, Reel, and Packing Model

Tape Dimension

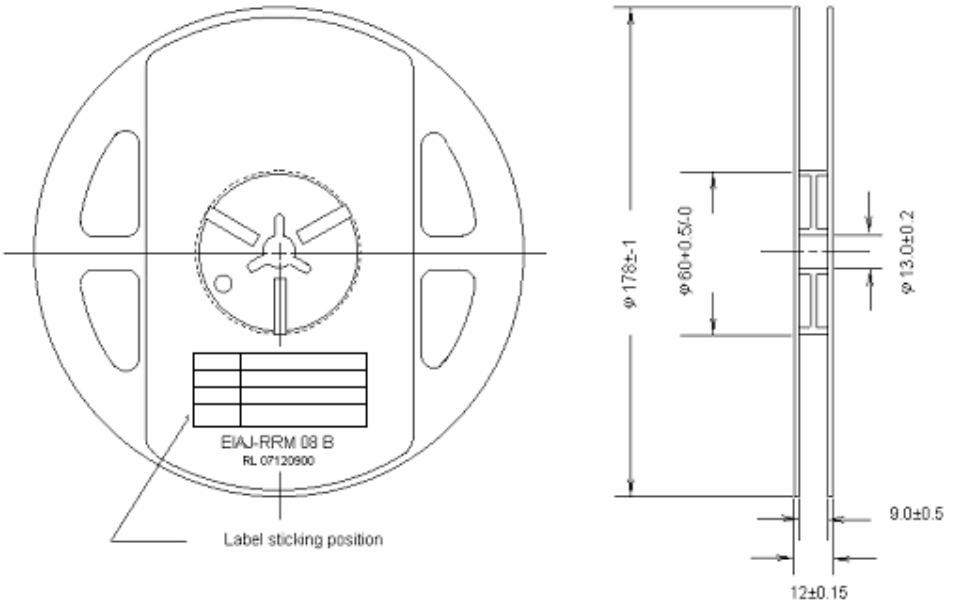




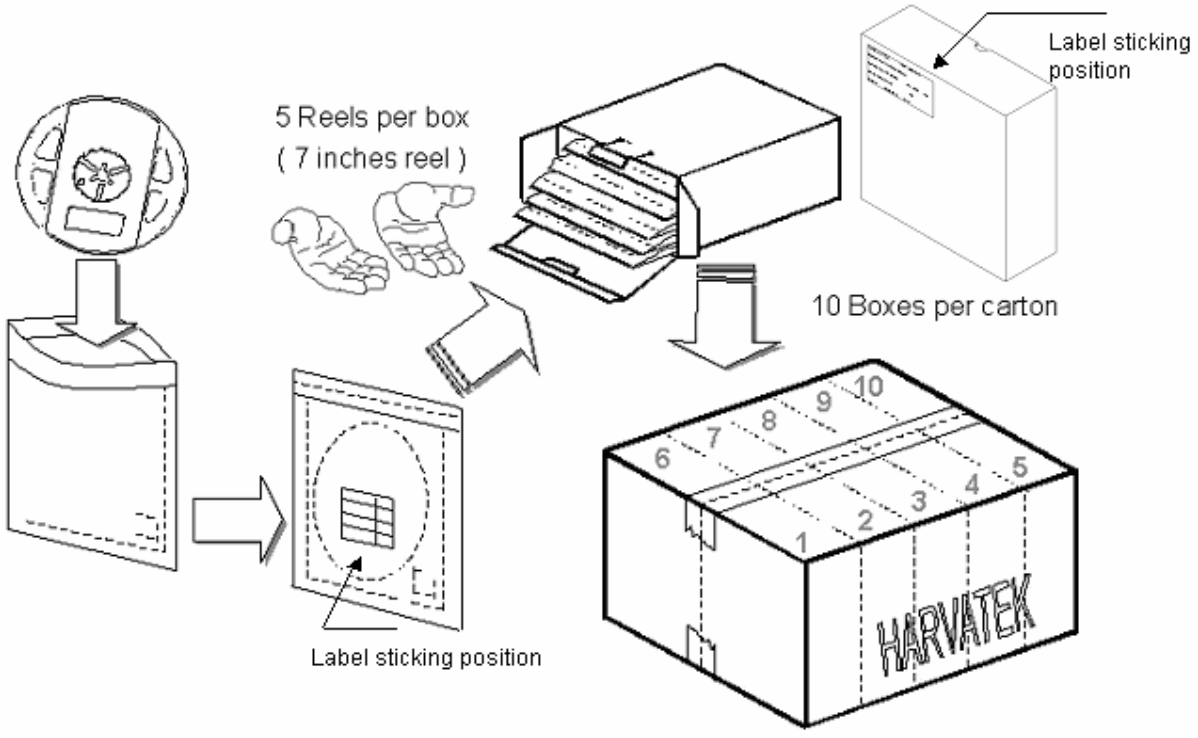
Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-E311	3.40±0.10	1.70±0.10	1.20±0.10	1K

Unit: mm

Reel Dimension



Packing Model



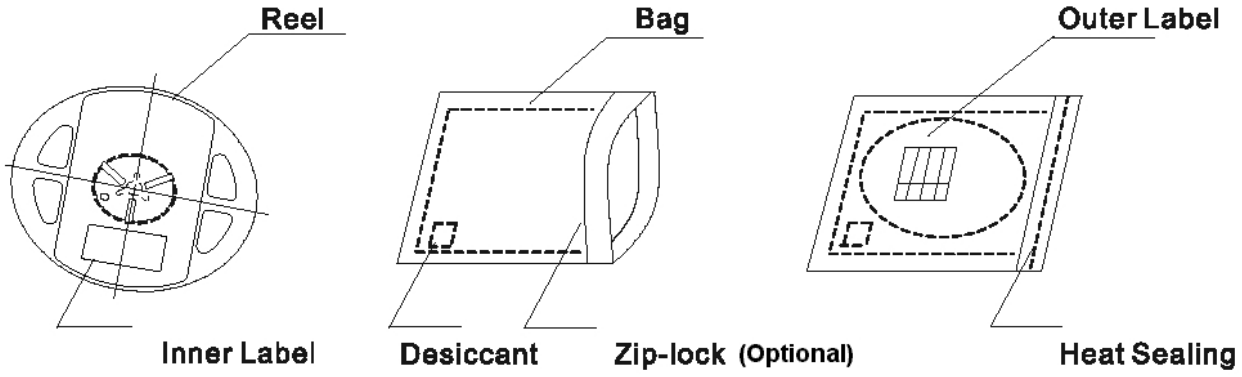
5 boxes per carton is available according to shipping quantity.

Dry Pack

Any SMD optical device, like this chip LED, is **MOISTURE SENSITIVE device**. Avoid absorbing moisture at any time during transportation or storage. Every reel will be packaged in the moisture barrier anti-static bag (Specific bag material will depend upon customers' requirement or option). And the bag is well sealed before shipment.

By customer's requirement, we will put a humidity indicator in each moisture barrier anti-static bag before shipment.

The package is the following:



Cautions of Pick and Place

It should be avoided to load stress on the resin during high temperature.

Avoid rubbing or scraping the resin by any object.

Electric-static may cause damage to the component. Please confirm that the equipment grounding well. Using an ionizer fan is recommended.

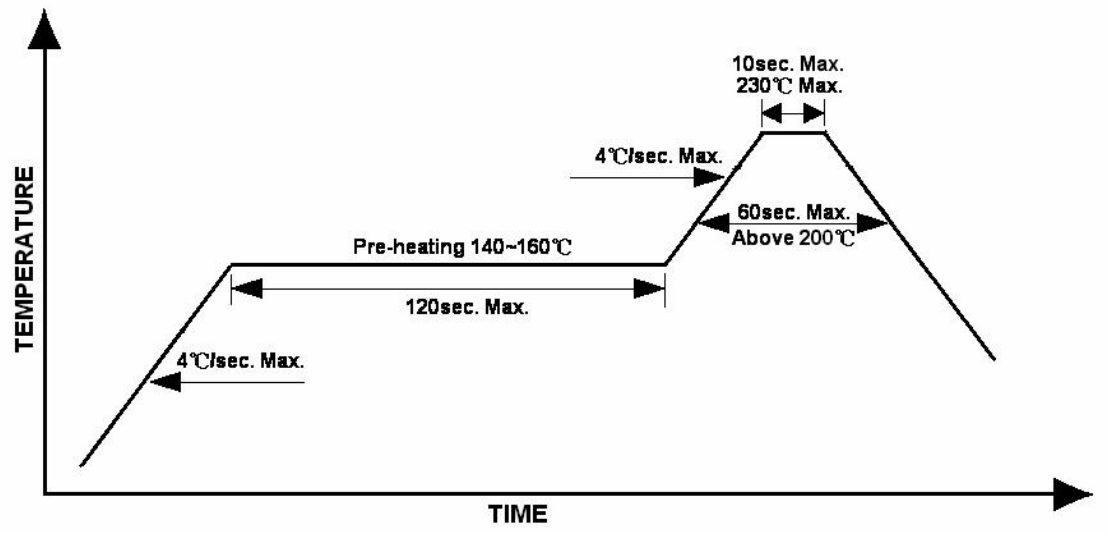
PRECAUTIONS

1. Avoid absorbing moisture at any time during transportation or storage.
2. Anti-Static process is needed especially when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a proper series current limit resistor. Avoid driving reverse voltage over the specification of LEDs when turning the unit ON/OFF.
4. Any application should refer to the specifications of absolute maximum ratings.
5. Avoid any direct contact with the viewing area.
6. If possible, assemble the unit in a clean room or dust-free environment.

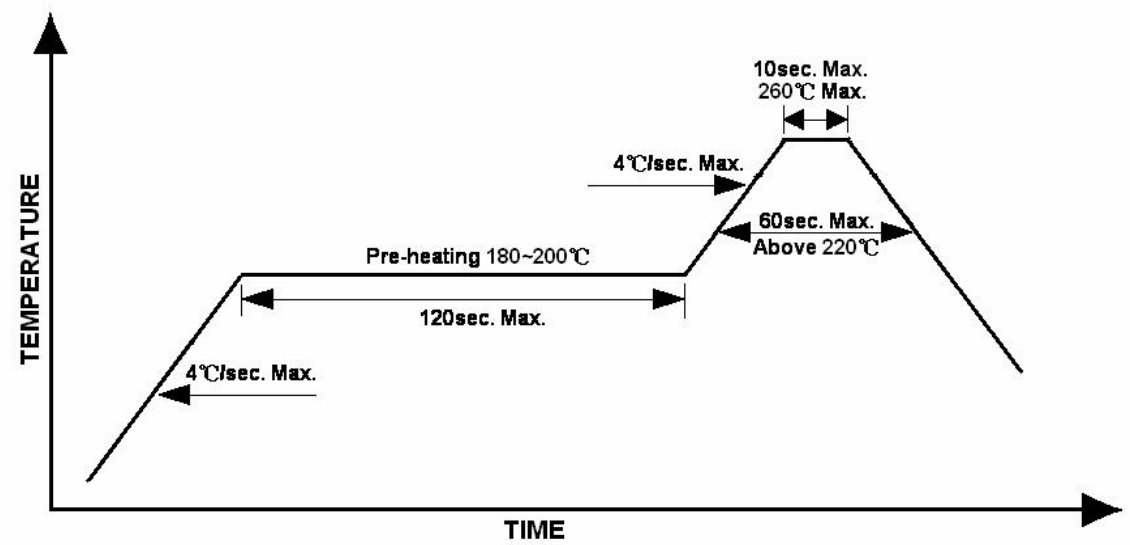
Reflow Soldering

- Recommend tin glue specifications:
  Melting temperature: 178~192 ^{O}C
  Contains: Sn 63%, Pb 37%
- Never take next process until the component is cooled down to room temperature after reflow.
- The recommended reflow soldering profile (measuring on the surface of the LED resin) is following:

Temperature Profile (Lead Solder)



Temperature Profile (Lead-free Solder)



Rework

- Customer must finish rework within 5 sec. under 260 ^{O}C.
- The head of iron cannot touch copper foil.
- Twin-head type is preferred.

Cleaning

The conditions of cleaning after soldering:

An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.

Temperature×Time: <50 ^{O}C×30sec, or <30 ^{O}C×3min

Ultra sonic cleaning: < 15W/ bath; Bath volume: 1liter max.

Curing: 100 ^{O}C max, <3min

Do not contact with component on the assembly board.

Reliability Test

Item	Frequency/ lots/ samples/ failures	Standards Reference	Conditions
Precondition	For all reliability monitoring tests according to JEDEC Level 2	J-STD-020	1.) Baking at 85°C for 24hrs 2.) Moisture storage at 85°C/ 60% R.H. for 168hrs
Solderability	1Q/ 1/ 22/ 0	JESD22-B102-B And CNS-5068	Accelerated aging 155°C/ 24hrs Tinning speed: 2.5±0.5cm/s Tinning: A: 215°C/ 3±1s or B: 260°C/ 10±1s
Resistance to soldering heat		CNS-5067	Dipping soldering terminal only Soldering bath temperature A: 260+/-5°C; 10+/-1s B: 350+/-10°C; 3+/-0.5s
Operating life test	1Q/ 1/ 40/ 0	CNS-11829	1.) Precondition: 85°C baking for 24hrs 85°C/ 60%R.H. for 168hrs 2.) T_{amb}25°C; I_F=20mA; duration 1000hrs
High humidity, high temperature bias	1Q/ 1/ 45/ 0	JESD-A101-B	T_{amb}: 85°C Humidity: 85% R.H., I_F=5mA Duration: 1000hrs
High temperature bias	1Q/ 1/ 20/ 0	HT specs.	T_{amb}: 55°C I_F=20mA Duration: 1000hrs
Pulse life test	1Q/ 1/ 40/ 0		T_{amb}25°C, I_f=20mA,, I_p=100mA, Duty cycle=0.125 (tp=125 μs,T=1sec) Duration 500hrs)
Temperature cycle	1Q/ 1/ 76/ 0	JESD-A104-A IEC 68-2-14, Nb	A cycle: -40 degree C 15min; +85 degree C 15min Thermal steady within 5 min.. 300 cycles 2 chamber/ Air-to-air type
High humidity storage test	1Q/ 1/ 40/ 0	CNS-6117	60±3°C 90+5/-10% R.H. for 500hrs
High temperature storage test	1Q/ 1/ 40/ 0	CNS-554	100±10°C for 500hrs
Low temperature storage test	1Q/ 1/ 40/ 0	CNS-6118	-40±5°C for 500hrs