

**Technical Data Sheet**  
**High Power LED – 0.5W (Preliminary)****EHP-A09/CM31H-PU5/TR****Features**

- Feature of the device: small package with high efficiency
- Typical view angle: 120°
- Typical color temperature: 3500 K.
- ESD protection.
- Soldering methods: SMT
- Grouping parameter: luminous Intensity, color coordinates, forward voltage.
- Optical efficiency: 33 lm/W.
- Thermal resistance (junction to sink): 50 K/W
- The product itself will remain within RoHS compliant version.

**Applications**

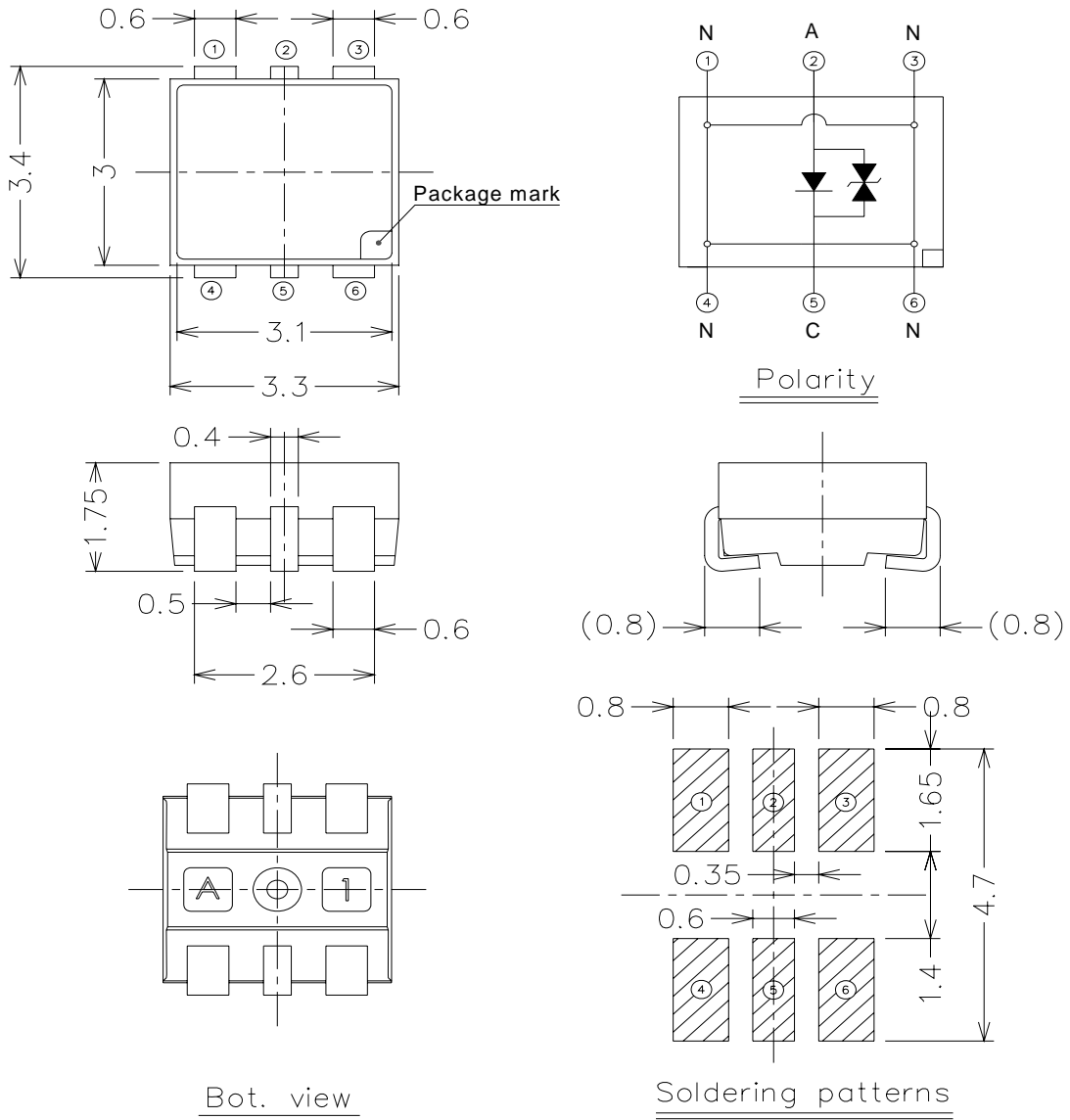
- Interior automotive lighting (e.g. dashboard backlighting)
- backlighting (illuminated advertising, general lighting)
- Reading lamps (aircraft, car, bus)
- Signal and symbol luminaries
- Marker lights (e.g. steps, exit ways, etc.)

**Materials**

Items	Description
Reflector	Heat resistant polymer
Encapsulating Resin	Silicone resin
Electrodes	Ag plating
Die attach	Silver paste
Chip	InGaN

**EHP-A09/CM31H-PU5/TR**

**Dimensions**



**Notes: 1. Dimensions are in millimeters.**

**2. Tolerances unless dimensions  $\pm 0.1\text{mm}$ .**

**EHP-A09/CM31H-PU5/TR**
**Maximum Ratings ( $T_{Ambient}=25^{\circ}C$ )**

Parameter	Symbol	Rating	Unit
DC Operating Current	$I_F$	150	mA
Pulsed Forward Current <sup>(1)</sup>	$I_{PF}$	200	mA
ESD Sensitivity	ESD	2000	V
Junction Temperature	$T_j$	125	°C
Operating Temperature	$T_{opr}$	-40 ~ +85	°C
Storage Temperature	$T_{stg}$	-40 ~ +100	°C
Power Dissipation	$P_d$	0.5	W
Junction To Heat-Sink Thermal Resistance	$R_{th}$	50	K/W

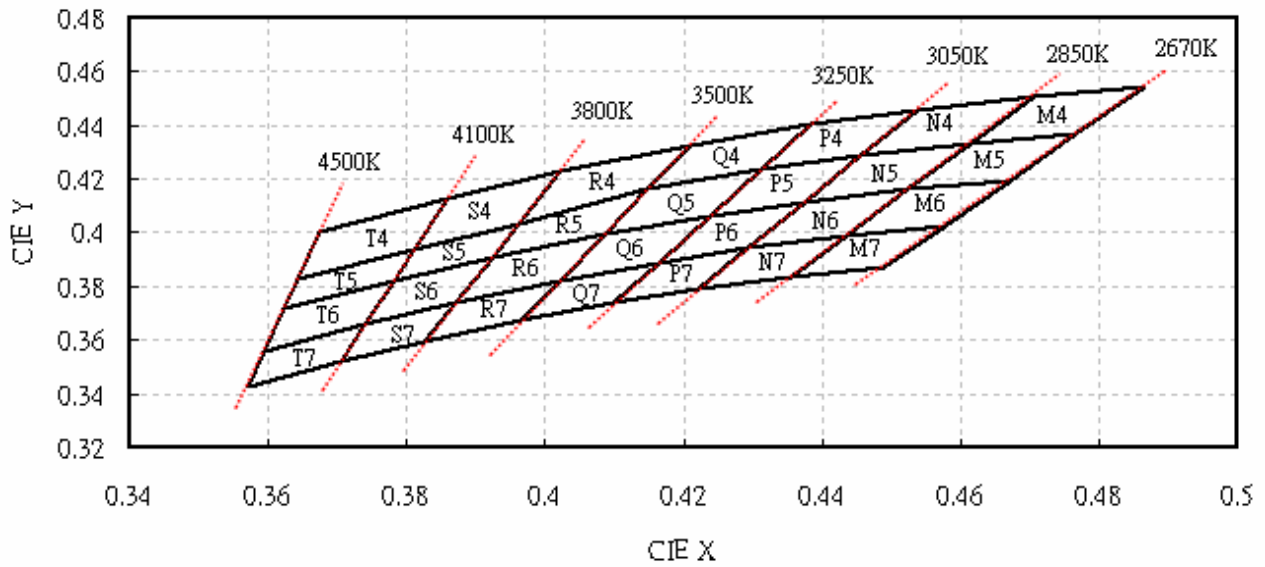
**Electro-Optical Characteristics ( $T_{Ambient}=25^{\circ}C$ )**

Parameter	Bin	Symbol	Min	Typ.	Max	Unit	Condition
Luminous Intensity <sup>(2)</sup>	C2	$I_v$	3550	----	4500	mcd	$I_F=150mA$
	D1		4500	----	5600		
	D2		5600	----	7100		
Forward Voltage <sup>(3)</sup>	V1	$V_F$	2.95	----	3.25	V	
	V2		3.25	----	3.55		
	V3		3.55	----	3.85		
Viewing Angle <sup>(4)</sup>	----	$2\theta_{1/2}$	----	120	----	deg	
Color Temperature <sup>(5)</sup>	----	CCT	2670	3500	4500	K	

**Luminous Intensity v.s Luminous Flux (Reference)**

Luminous Intensity ( $I_v$ )	Luminous Flux ( $\Phi_v$ )
3550~4500 mcd	11~13 lm
4500~5600 mcd	13~16 lm
5600~7100 mcd	16~20 lm

- Note. 1.  $t_p \leq 100\mu s$ , Duty cycle = 0.25      2. Luminous Intensity measurement tolerance:  $\pm 10\%$   
 3. Forward Voltage measurement tolerance:  $\pm 0.1V$   
 4.  $2\theta_{1/2}$  is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.  
 5. X, Y coordination for white light bin areas refer to High Power Illumination emitters labeling and binning (DSE-A08-002).

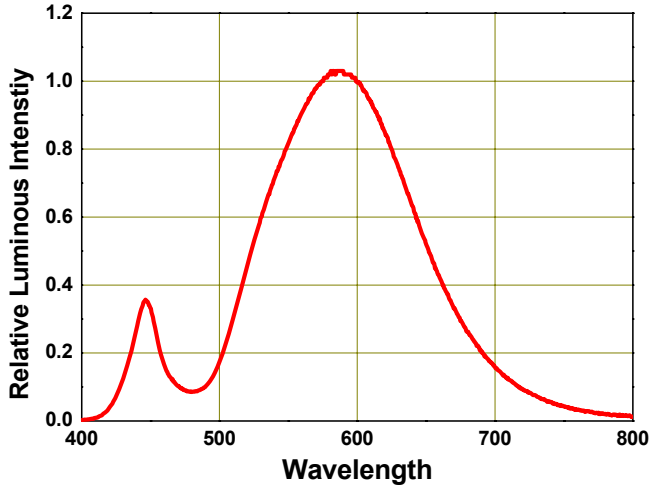
**EHP-A09/CM31H-PU5/TR**
**Warm-White Bin Structure**

**Standard Specification**

Part number	CCT range(K)	Color bins	Brightness range(mcd)
EHP-A09/CM31H-PU5/2832/TR	2850-3250	N4~N7、P4~P7	3550-7100
EHP-A09/CM31H-PU5/3238/TR	3250-3800	Q4~Q7、R4~R7	3550-7100
EHP-A09/CM31H-PU5/3845/TR	3800-4500	S4~S7、T4~T7	3550-7100

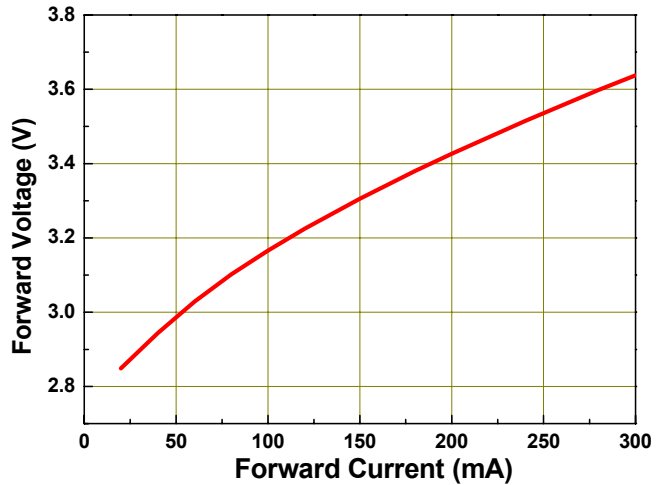
**EHP-A09/CM31H-PU5/TR**

Typical Electro-Optical Characteristics Curves

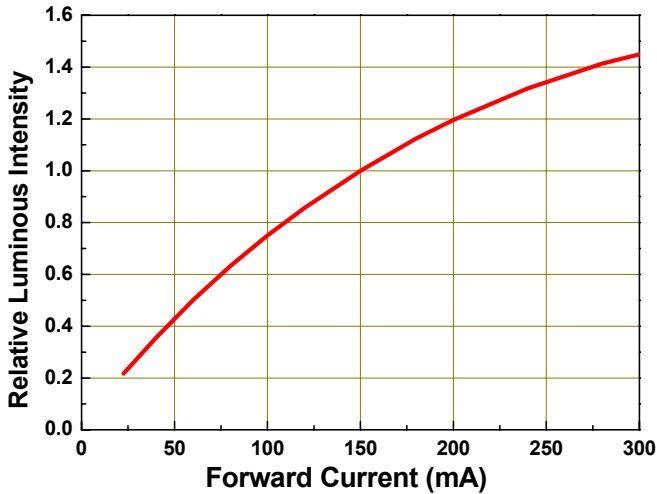
Relative Spectral Distribution,  
 $I_f=150\text{mA}$ ,  $T_{\text{Ambient}}=25^\circ\text{C}$



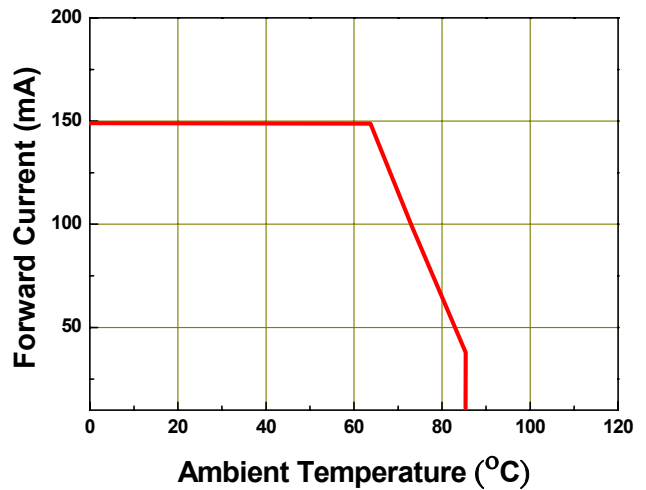
Forward Voltage vs Forward Current,  
 $T_{\text{Ambient}}=25^\circ\text{C}$



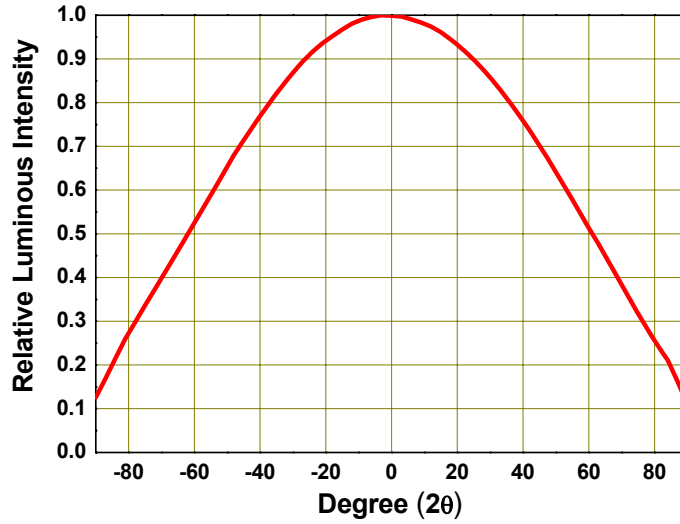
Relative Luminous Intensity vs Forward Current,  
 $T_{\text{Ambient}}=25^\circ\text{C}$



Ambient Temperature & Operating Current Derating based on  $T_{\text{JMAX}} = 125^\circ\text{C}$



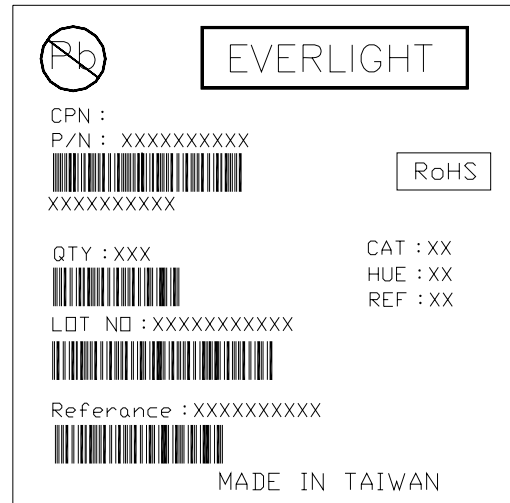
**Typical Representative Spatial Radiation Pattern**



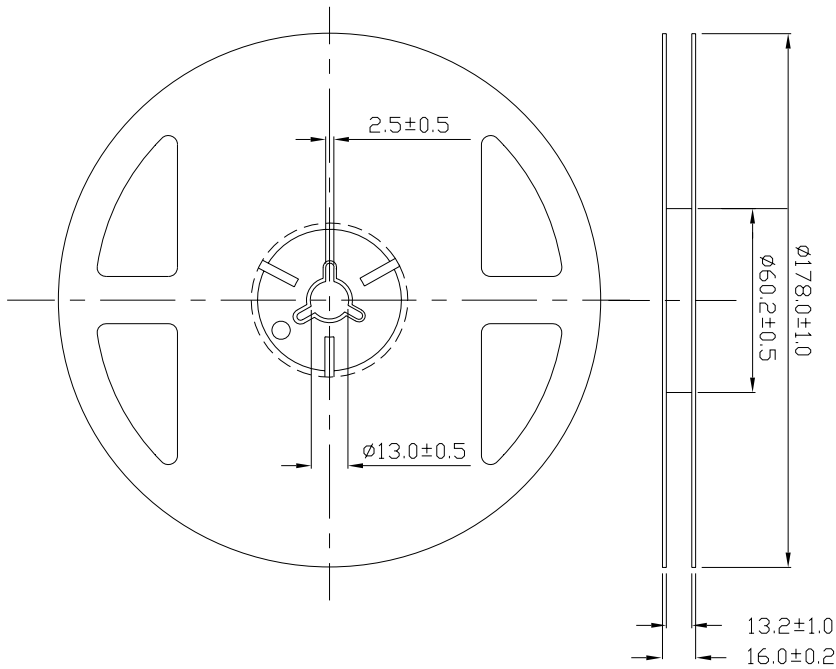
**EHP-A09/CM31H-PU5/TR**

**Label explanation**

- CPN: Customer's Production Number**
- P/N : Production Number**
- QTY: Packing Quantity**
- CAT: Luminous Ranks**
- HUE: Domain Wavelength**
- REF: Voltage Rank**
- LOT No: Lot Number**
- MADE IN TAIWAN: Production Place**



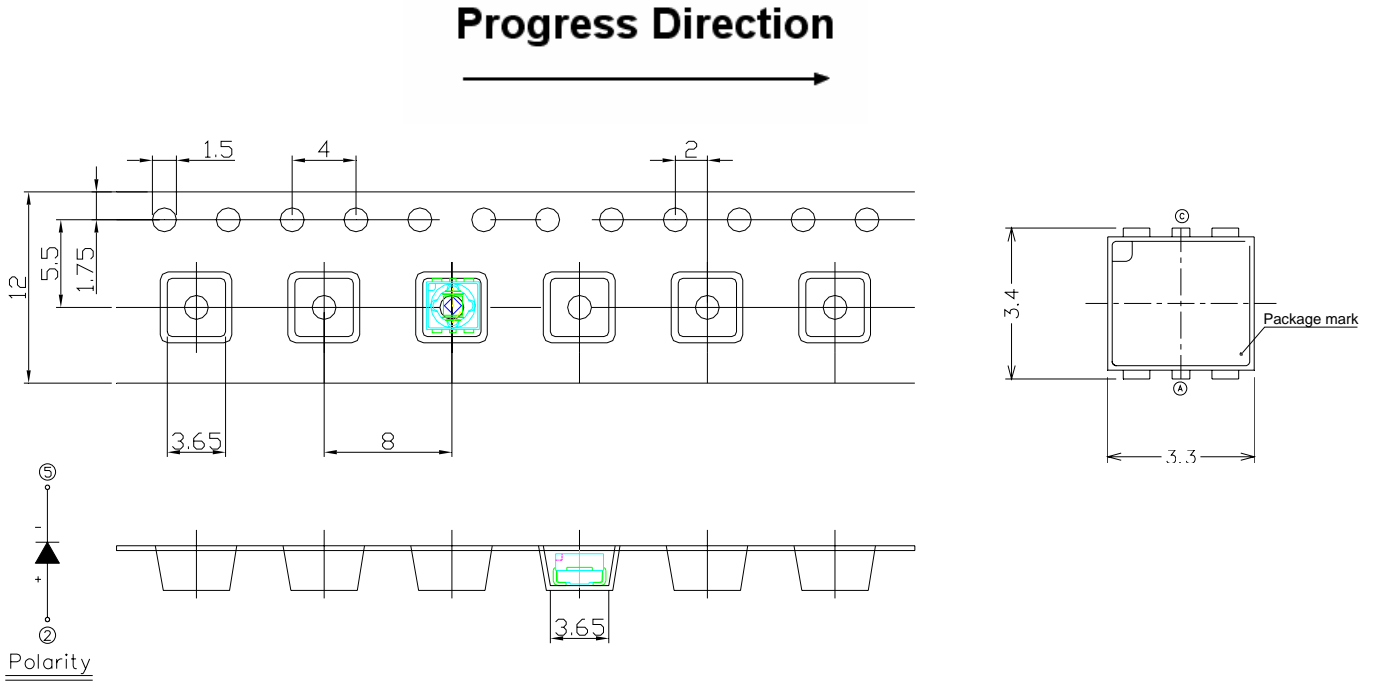
**Reel Dimensions**



- Note: 1. Dimensions are in millimeters.**
- 2. The tolerances unless mentioned is ±0.1mm.**

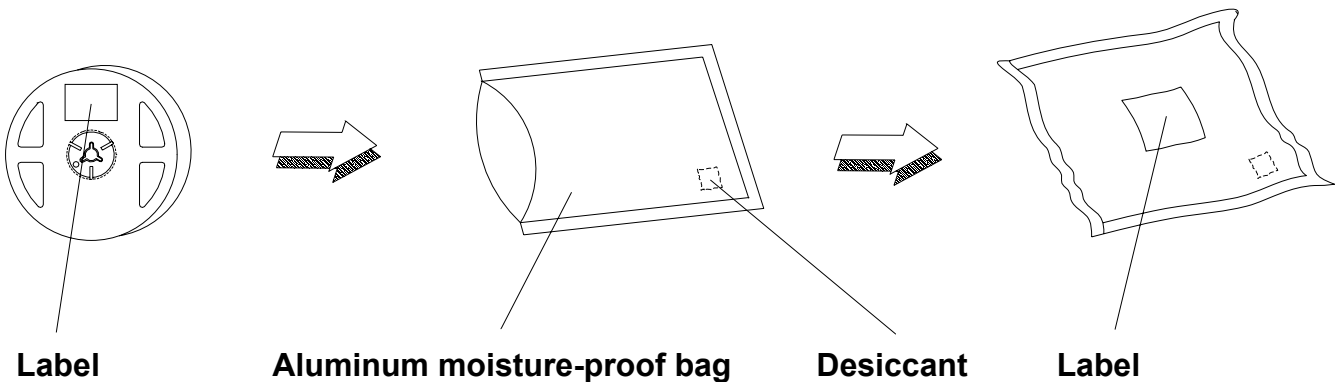
**EHP-A09/CM31H-PU5/TR**

Carrier Tape Dimensions: Loaded quantity 1000 PCS per reel



- Note: 1. Dimensions are in millimeters.**
- 2. The tolerances unless mentioned is  $\pm 0.1\text{mm}$ .**

**Moisture Resistant Packaging**





## Precautions For Use

### 1. Over-current-proof

Though EHP-A09 has conducted ESD protection mechanism, customers must not use the device in reverse and should apply resistors for extra protection. Otherwise, slight voltage difference may cause enormous current shift and burn out failure would happen.

### 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 temperature less than 30°C and humidity less than 90%.
- iii. LEDs should be used within a year.
- iv. After the package is opened, LEDs should be stored at temperature less than 30°C and humidity less than 70%.
- 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 the conditions: pre-curing at 60±5°C for 24 hours.

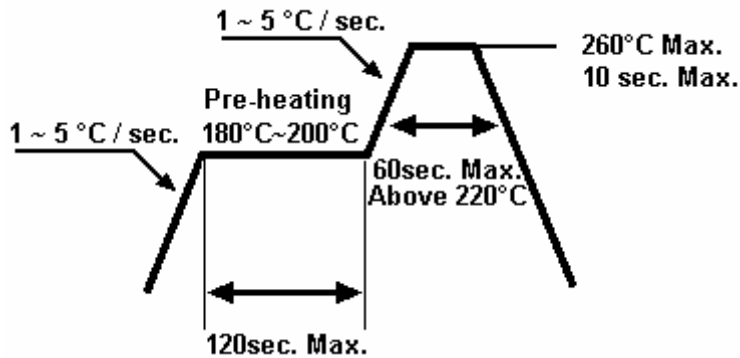
### 3. Thermal Management

- i. For maintaining the high flux output and achieving reliability, EHP-A09 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 approximate 0.5W of thermal energy at 150mA operation.
- ii. Special thermal designs are also recommended to take in heat dissipation management, such as FR4 PCB on Aluminum with thermal vias or FPC on Aluminum with thermal conductive adhesive, etc.
- iii. Sufficient thermal management must be implemented. Otherwise, the junction temperature of dies might be over the limit at high current driving condition and LEDs' lifetime might be decreases dramatically.
- iv. For further thermal management suggestions, please consult Everlight Design Guide or local representatives for assistance.

#### 4. Soldering Condition

##### 4-1. For Reflow process

- i. EHP-A09 series are suitable for SMT process.
- ii. Lead reflow soldering temperature profile



- iii. Reflow soldering should not be done more than two times.
- iv. In soldering process, stress on the LEDs during heating should be avoided.
- v. After soldering, do not warp the circuit board.