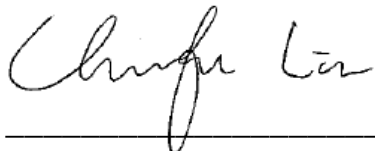
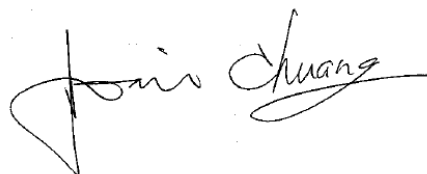


**Harvatek Surface Mount CHIP LEDs Approval Sheet**  
**Model No.: HT-297USD/UYG**

**Acknowledged by**



**Section Manager**  
**Production Engineering Dept.**



**Manager**  
**Production Engineering Dept.**

|   |                           |               |                |                |
|---|---------------------------|---------------|----------------|----------------|
| Official Product  | HT Part No. HT-297USD/UYG | Your Part No. |                | Data Sheet No. |
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**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 HARATEK 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.*

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### Product Specification

|                       | Specification  | Material                          | Quantity         |
|-----------------------|--|-----------------------------------|------------------|
| Iv                    | USD: 45-180mcd<br>UYG: 28-112.5mcd<br>@20mA/ Ta= 25° C<br>Tolerance: ± 10% |                                   |                  |
| lambda( $\lambda_D$ ) | USD: 615-635nm<br>UYG: 570-577nm<br>@20mA/ Ta= 25° C<br>Tolerance: ± 0.5nm |                                   |                  |
| Vf                    | 1.6-2.4V<br>@20mA/ Ta= 25° C   |                                   |                  |
| Ir                    | < 100 $\mu$ A @ $V_R = 5$ V  |                                   |                  |
| Resin                 | Milky Diffused   | Epoxy resin                       |                  |
| Carrier tape          | According to EIA 481-1A specs  | Conductive Black Tape             | 4000pcs 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    |

Others:

Every mid-box will be loaded 5 reels. These 5 reels can be different in lot, Iv, lambda, or Vf. Every reel will have an independent label to identify its specification and the mid-box there will have a corresponding label post on it.

#### ATTENTION: Electricstatic Discharge (ESD) protection




The symbol shown on the page herein to introduce 'Electro-Optical Characteristics'. ESD protection for GaP and AlGaAs based chips is still necessary even though they are safe in low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD protection has to considered and taken in the initial design stage.

If manual work/process is needed, please ensure the device is well protected from ESD during all the process.

|   |                           |               |                |                |
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## Label Spec.:

|                   |            |   |                      |
|-------------------|------------|---|----------------------|
| <b>HARVATEK</b>   |            |  | Date: yyyy/mm/dd<br> |
| CUSTOMER P/N:<br> |            |   |                      |
| HARVATEK P/N:<br> |            | QTY: PCS<br>  |                      |
| LOT NO:<br>       |            | QC  |                      |
| IV BIN:           | COLOR BIN: | VF:   |                      |

### ■ Harvatek P/N

**H T - 2 9 7 USD/UYG**

| Series Name                          | Emitting Color  |
|--------------------------------------|---|
| ....<br>HT-297: 1.6x0.8x0.5mm<br>... | USD:<br>Ultra Bright Red<br>UYG:<br>Ultra Bright Yellow Green |

### ■ 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<br>Tracing Code | Z: 2000<br>1: 2001<br>2: 2002<br>3: 2003<br>..... | 1: Jan.<br>2: Feb.<br>....<br>9: Sep.<br>A: Oct.<br>B: Nov.<br>C: Dec. | 1~31/ (30) | 01~99,<br>A,B,C... | D: Diffused | T: Taped Reel |

|   |                           |               |                |                |
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## ■ Iv Bin: Red / Yellow Green

| Color        | Bin Code | Spec. Range  |
|--------------|----------|--------------|
| Red          | P        | 45-72mcd     |
|              | Q        | 72-112.5mcd  |
|              | R        | 112.5-180mcd |
| Yellow Green | N        | 28-45mcd     |
|              | P        | 45-72mcd     |
|              | Q        | 72-112.5mcd  |

## ■ Color Bin: Red / Yellow Green

| Color        | Bin Code | Spec. Range |
|--------------|----------|-------------|
| Red          | -        | 615-635nm   |
| Yellow Green | D        | 570-573.5nm |
|              | E        | 573.5-577nm |

## ■ Vf Bin: Red / Yellow Green

| Color        | Bin Code | Spec. Range |
|--------------|----------|-------------|
| Red          | -        | 1.6-2.4V    |
| Yellow Green | -        | 1.6-2.4V    |

|   |                           |               |                |                |
|---|---------------------------|---------------|----------------|----------------|
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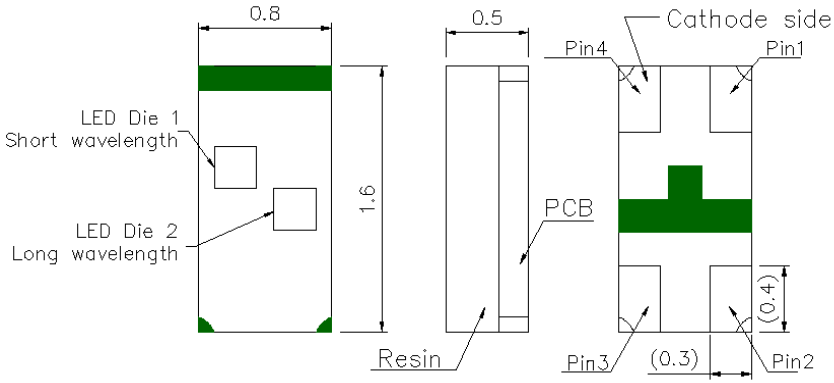
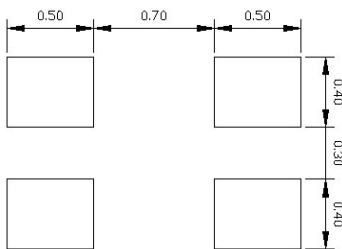
### Electro-Optical Characteristics

(I<sub>F</sub> @ 20mA, T<sub>a</sub> 25 °C)

| Code for parts | Lighting Color                  | Material | V <sub>F</sub> (V) |     | λ(nm)          |                |    | I <sub>v</sub> (mcd) |
|----------------|---------------------------------|----------|--------------------|-----|----------------|----------------|----|----------------------|
|                |                                 |          | typ                | max | λ <sub>D</sub> | λ <sub>P</sub> | Δλ | Typ                  |
| HT-297USD/UYG  | Ultra Bright Red (USD)          | AlInGaP  | 1.9                | 2.4 | 622            | 636            | 17 | 72                   |
|                | Ultra Bright Yellow Green (UYG) | AlInGaP  | 2.0                | 2.4 | 573            | 574            | 20 | 45                   |

### Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.1

| Outline Dim.   | Soldering Pattern   |
|--|---|
|  <p>Die 1(UYG ) - Pin 1 + Pin 2<br/>Die 2( USD) - Pin 3+ Pin 4<br/>In general, wavelength of Die 1 &lt; or = Die 2</p> |  <p>Unit:mm</p> |
| Soldering terminal may shift in x, y direction.  |   |

### Absolute Maximum Ratings

(T<sub>a</sub> 25 °C)

| Series        | P <sub>d</sub> (mW) | I <sub>F</sub> (mA) | I <sub>FP</sub> (mA) | V <sub>R</sub> (V) | T <sub>OP</sub> (°C) | T <sub>ST</sub> (°C) |
|---------------|---------------------|---------------------|----------------------|--------------------|----------------------|----------------------|
| HT-297USD/UYG | 48                  | 20                  | 100**                | 5                  | -30~+80              | -40~+85              |

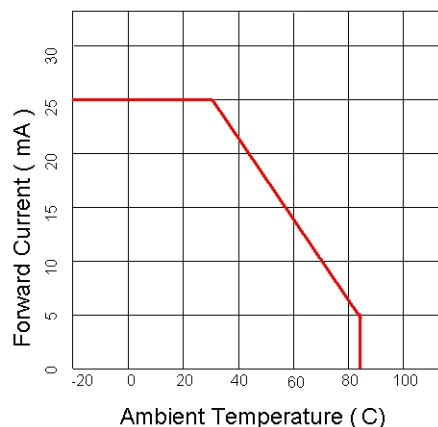
\*\* Condition for I<sub>FP</sub> is pulse of 1/10 duty and 0.1msec width

|   |                           |               |                |                |
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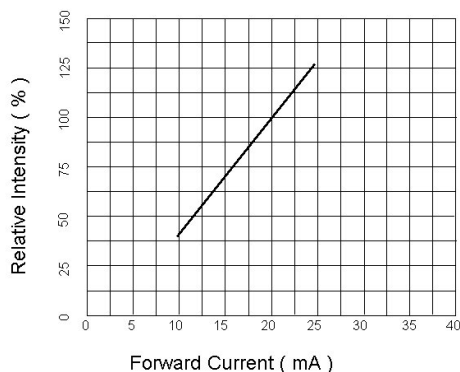


### Characteristics of HT-297 Series

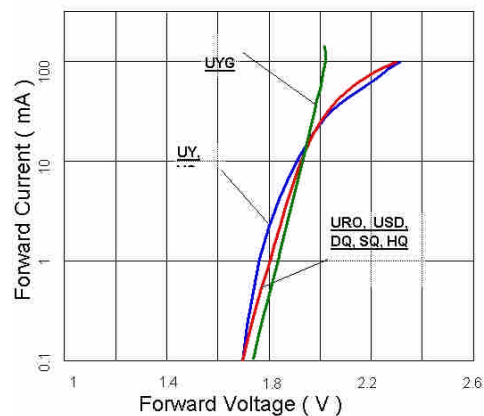
Forward Current vs. Ambient Temperature



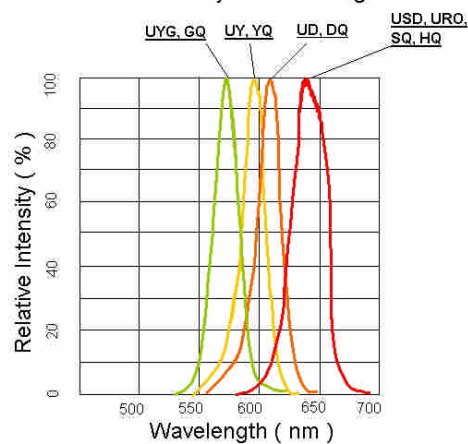
Relative Intensity vs. Forward Current



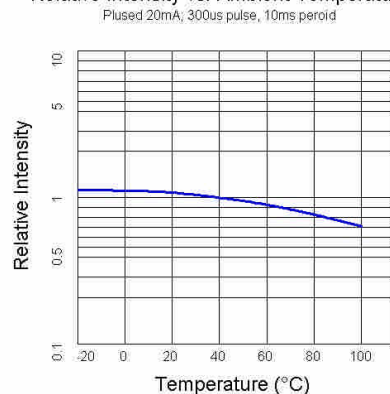
Forward Voltage vs. Forward Current



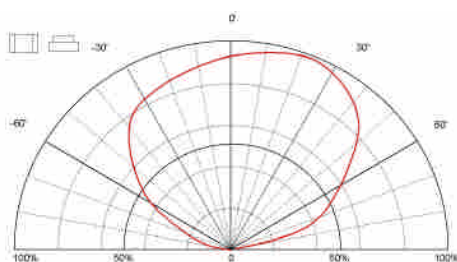
Relative Intensity vs. Wavelength



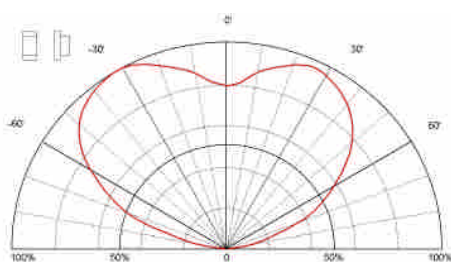
Relative Intensity vs. Ambient Temperature



Directive Characteristics



Directive Characteristics

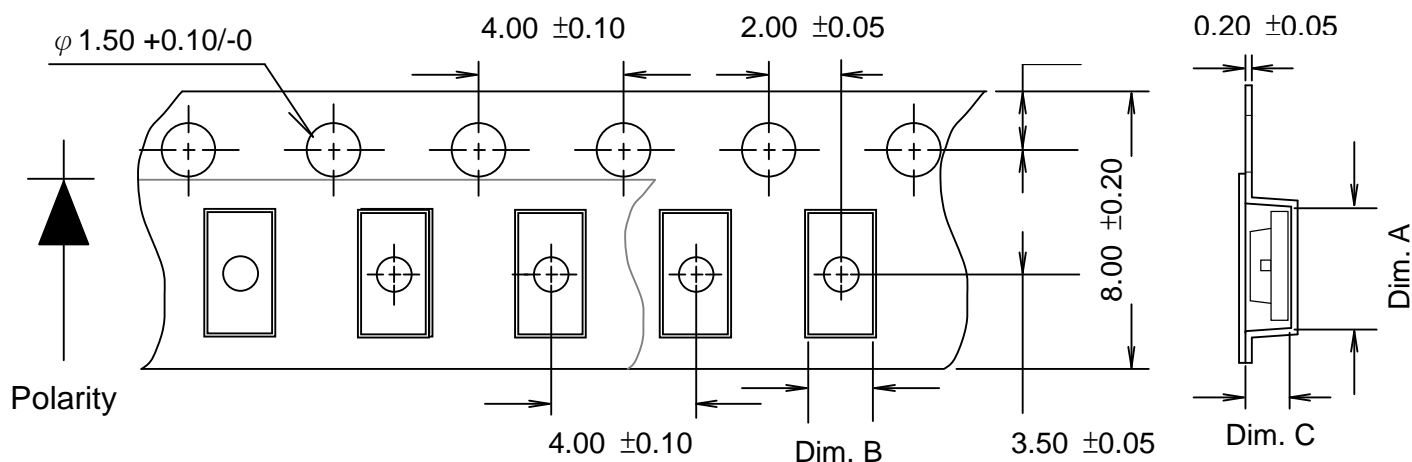


|   |                           |               |                |
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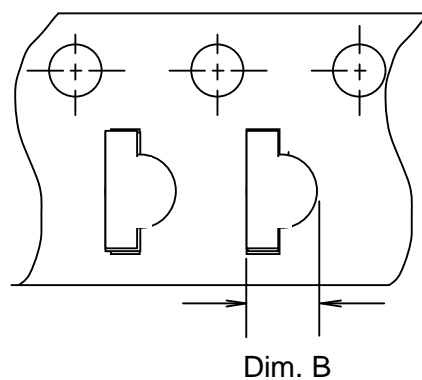


### Packaging Tape, Reel, and Packing Model

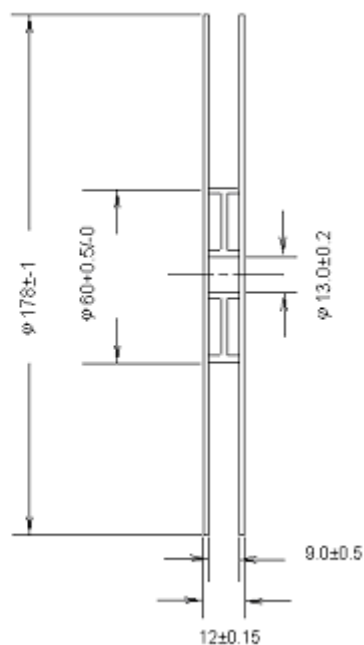
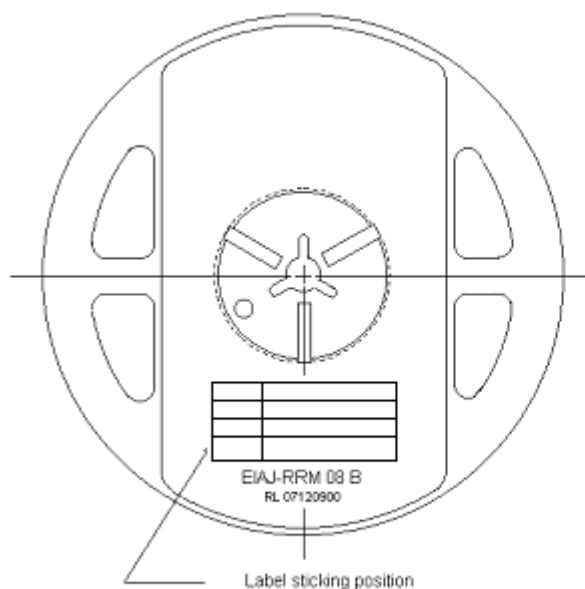
#### Tape Dimension



| Part No. | Dim. A          | Dim. B          | Dim. C          | Q'ty/Reel |
|----------|-----------------|-----------------|-----------------|-----------|
| HT-297   | $1.75 \pm 0.05$ | $0.90 \pm 0.05$ | $0.60 \pm 0.05$ | 4K        |



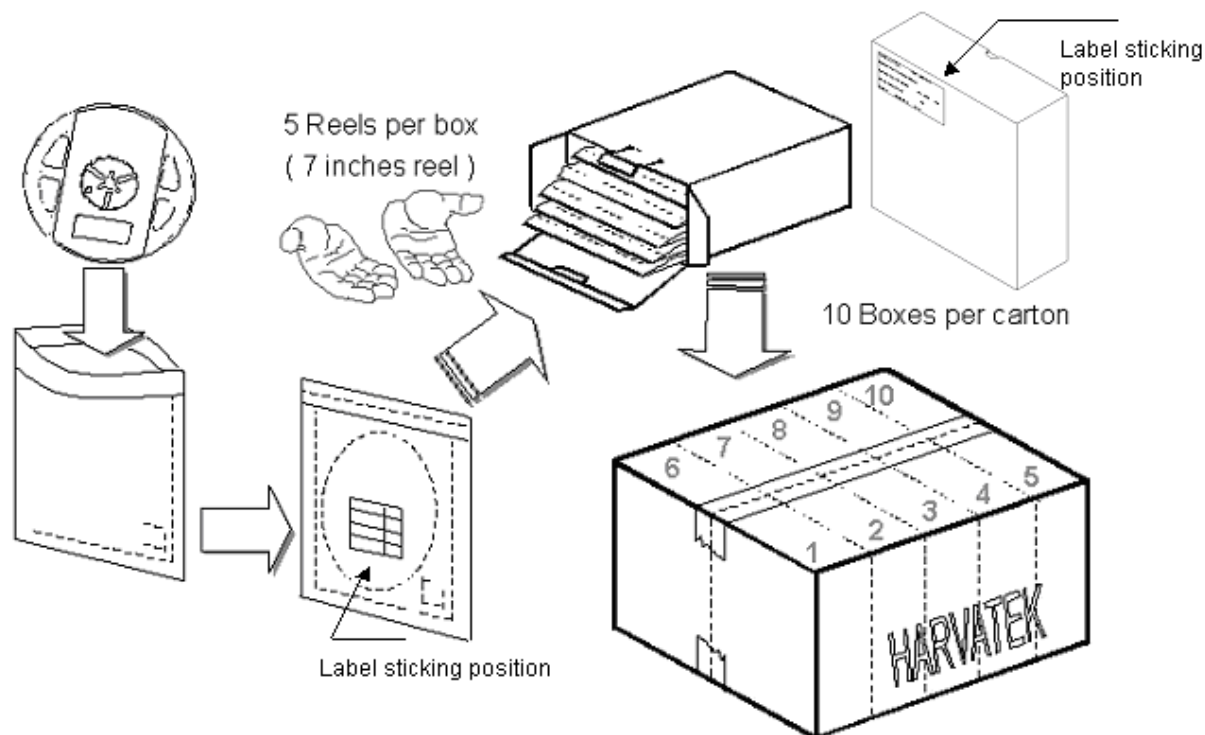
#### Reel Dimension



|   |                           |               |                |                |
|---|---------------------------|---------------|----------------|----------------|
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## Packing Model



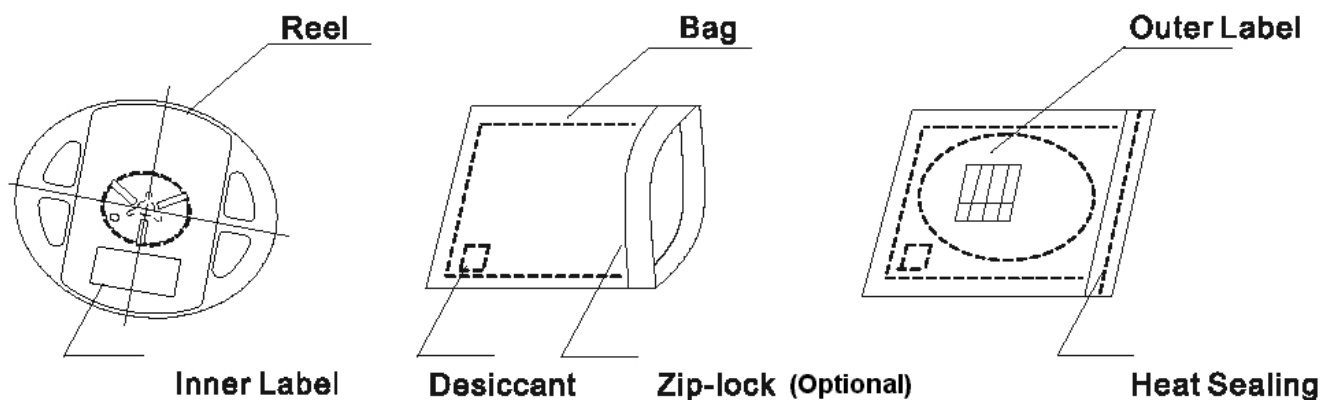
5 boxes per carton is available according to shipping quantity.

### 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:



|   |                           |               |                |
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## 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.

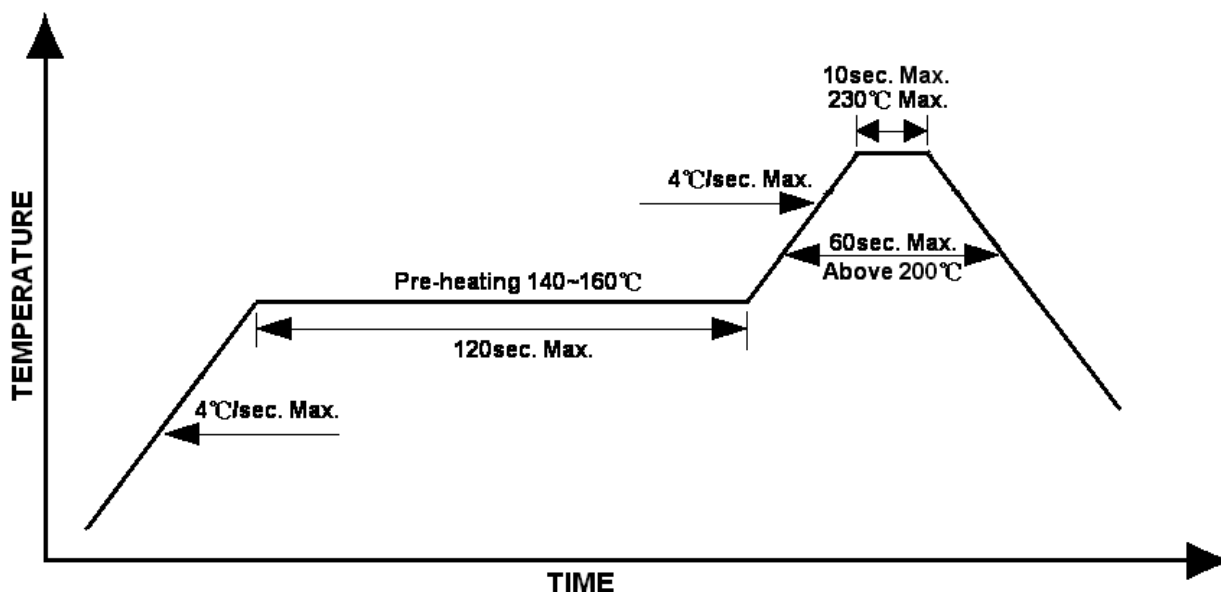
## PRECAUTIONS

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 °C
- ◆ 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:

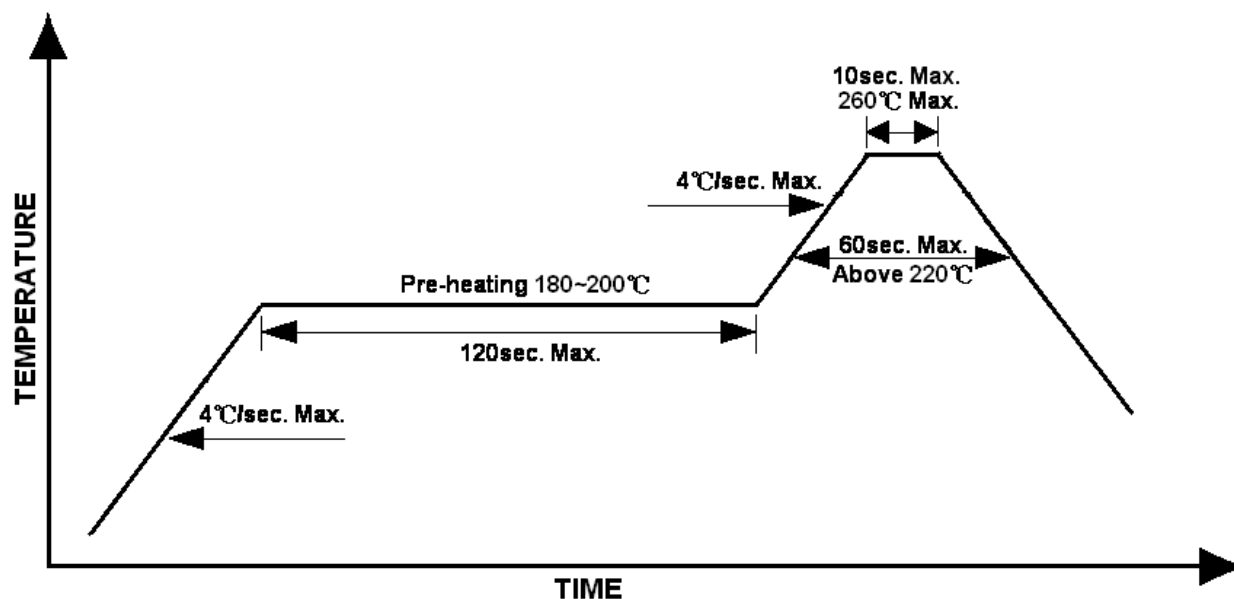
Lead Solder



|   |                           |               |                |                |
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Lead-free Solder



## Rework

- ◆ Customer must finish rework within 5 sec. under 260 °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 °C×30sec, or <30 °C×3min

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

Curing: 100 °C max, <3min

Do not contact with component on the assembly board.

## 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.

|   |                           |               |                |                |
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