

# JU2024 炬

## 30V/15W Series



### Introduction

Everlight's JU2024 30V/15W Series is a ceramic substrate based LED achieving high efficiency while maintaining high CRI at Energy Star / ANSI color temperature ranges.

### Features

- ◆ High Power COB & High CRI LED
- ◆ Multi-Chip Solution
- ◆ Dimension: 20 mm x 24 mm x 1.6 mm
- ◆ Main Parameters: Luminous Flux, Forward Voltage, Chromaticity and Color Rendering Index
- ◆ ESD Protection
- ◆ RoHS compliant
- ◆ Energy Star / ANSI Compliant Binning Structure
- ◆ Typical Viewing Angle: 120°

### Applications

- ◆ Replacement Bulb
- ◆ Indoor General Lighting
- ◆ Recessed Can Lighting

## Table of Contents

|  |    |
|--|----|
| Table of Contents .....                              | 2  |
| Product Nomenclature .....                           | 3  |
| Absolute Maximum Ratings .....                       | 4  |
| PN of the JU2024 series:White LEDs .....             | 5  |
| Product Binning:Luminous Flux Bins .....             | 6  |
| Product Binning:White Bin Structure .....            | 7  |
| Product Binning:Warm White Bin Structure .....       | 8  |
| Product Binning:Warm White Bin Coordinates .....     | 8  |
| Product Binning: Neutral-White Bin Structure.....    | 9  |
| Product Binning: Neutral-White Bin Coordinates ..... | 9  |
| Product Binning: Cool-White Bin Structure .....      | 10 |
| Product Binning: Cool-White Bin Coordinates .....    | 11 |
| Product Binning:Forward Voltage Bins .....           | 12 |
| Mechanical Dimension .....                           | 13 |
| Pad Configuration .....                              | 14 |
| Typical Electro-Optical Characteristic Curve .....   | 15 |
| Product Labeling.....                                | 19 |
| Carrier Tray Specification .....                     | 20 |
| Precautions of Use .....                             | 21 |
| Revision History.....                                | 23 |

## Product Nomenclature

The product name is designated as below:

# JU2024- CDEFGHJ-KLMNP-QRST

Family name

JU2024

Designation:

CD = lighting color and wavelength<sup>[1]</sup>

EF = color bin or CCT bin

G = internal code

HJ = min. luminous flux (lm) or radiation power (mW) performance

KL = forward voltage bin<sup>[2]</sup>

M = internal code

NP = power consumption<sup>[3]</sup>

Q= internal code

R= Dam Diameter<sup>[4]</sup>

S= internal code

T=Type of Package<sup>[5]</sup>

### Notes

1. Table of lighting color and wavelength

| Symbol | Color         | CCT range   | Color Rendering Index |
|--------|---------------|-------------|-----------------------|
| GT     | Cool-White    | 4745~7050K  | >65                   |
| KT     | Cool-White    | 4745~7050K  | >80                   |
| LM     | Warm-White    | 2580~3710K  | >70                   |
|        | Neutral-White | 3710K-4745K |                       |
| KM     | Warm White    | 2580~3710K  | >80                   |
|        | Neutral-White | 3710K-4745K |                       |

2. Table of forward voltage bin:

| Symbol | Description       |
|--------|-------------------|
| 30     | 30V Input Voltage |

3. Power consumption:

| Symbol | Description |
|--------|-------------|
| 15     | 15W         |

4. Dam Diameter:

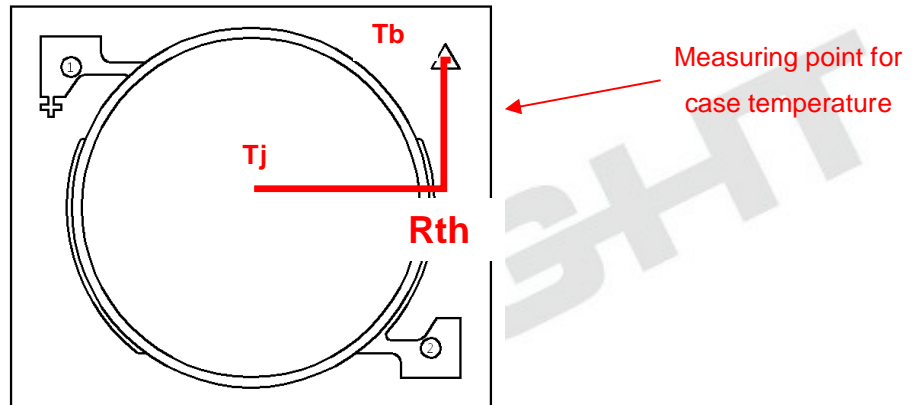
| Symbol | Description |
|--------|-------------|
| G      | 16.0~16.9mm |

5. Table of packaging types:

| Symbol | Description |
|--------|-------------|
| T      | Tray        |

## Absolute Maximum Ratings

| Parameter                    | Symbol      | Ratings            | Unit |
|------------------------------|-------------|--------------------|------|
| Max. DC Forward Current (mA) | $I_F$       | 550 <sub>[1]</sub> | mA   |
| Max. Peak Pulse Current (mA) | $I_{Pulse}$ | 800 <sub>[2]</sub> | mA   |
| Power Dissipation            | $P_d$       | 16.5               | W    |
| Thermal Resistance           | $R_{th}$    | 2.4                | °C/W |
| Max. Junction Temperature    | $T_J$       | 115                | °C   |
| Operating Temperature        | $T_{Opr}$   | -40 ~ +85          | °C   |
| Storage Temperature          | $T_{Stg}$   | -40 ~ +85          | °C   |



### Notes:

1. For optimal performance, Everlight recommends 500mA operation.
2.  $t_p$  100ms, Duty cycle = 25%
3. The JU2024 series LEDs are not designed for reverse bias use.

**PN of the JU2024 Series : White LEDs**



| Color              | Order Code of JU2024      | Minimum Luminous Flux (lm) | Typical Luminous Flux (lm) | CCT (K)     | Forward Voltage (V) | Forward Current (mA) | CRI (min.) |
|--------------------|---------------------------|----------------------------|----------------------------|-------------|---------------------|----------------------|------------|
| Warm White 2700    | JU2024-KM277P5-30515-0G0T | 1425                       | 1580                       | 27K-1~27K-4 | 27.0~33.0           | 500                  | 80         |
| Warm White 3000    | JU2024-KM307P6-30515-0G0T | 1500                       | 1650                       | 30K-1~30K-4 | 27.0~33.0           | 500                  | 80         |
| Warm White 3500    | JU2024-KM357P6-30515-0G0T | 1500                       | 1700                       | 35K-1~35K-4 | 27.0~33.0           | 500                  | 80         |
| Neutral White 4000 | JU2024-KM407P6-30515-0G0T | 1575                       | 1750                       | 40K-1~40K-4 | 27.0~33.0           | 500                  | 80         |
| Neutral White 4500 | JU2024-KM457P7-30515-0G0T | 1650                       | 1780                       | 45K-1~45K-4 | 27.0~33.0           | 500                  | 80         |
| Cool White 5000    | JU2024-KT507P7-30515-0G0T | 1650                       | 1800                       | 50K-1~50K-4 | 27.0~33.0           | 500                  | 80         |
| Cool White 5700    | JU2024-KT577P7-30515-0G0T | 1725                       | 1850                       | 57K-1~57K-4 | 27.0~33.0           | 500                  | 80         |
| Cool White 6500    | JU2024-KT657P7-30515-0G0T | 1725                       | 1850                       | 65K-1~65K-4 | 27.0~33.0           | 500                  | 80         |

**Notes:**

1. CRI measurement tolerance:  $\pm 2$ .
2. Luminous flux measurement tolerance:  $\pm 10\%$ .
3. The data of luminous flux measured at thermal pad=25
4. Typical luminous flux or light output performance is operated within the condition guided by this datasheet.

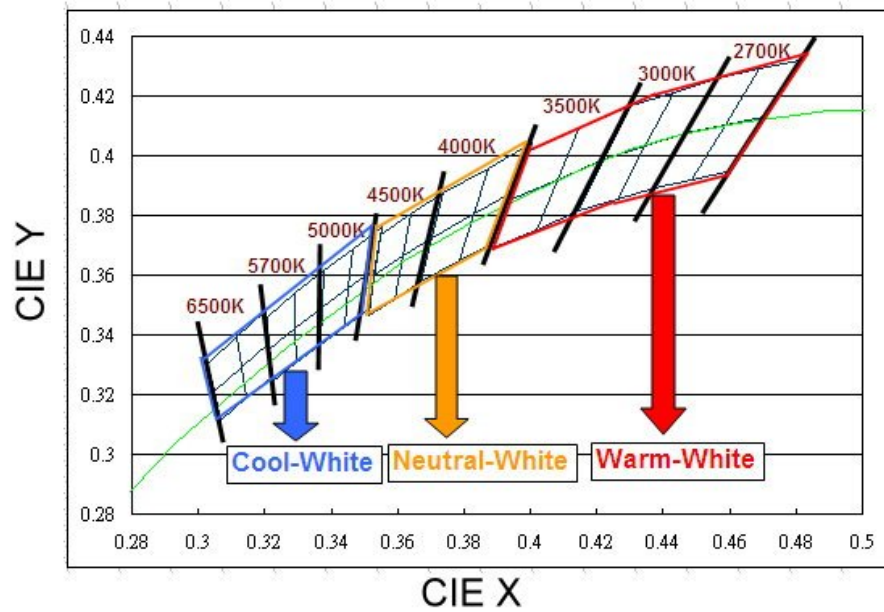
## Product Binning

### Luminous Flux Bins

| Group | Bin | Minimum Photometric Flux (lm) | Maximum Photometric Flux (lm) |
|-------|-----|-------------------------------|-------------------------------|
| K     | 1   | 225                           | 250                           |
|       | 2   | 250                           | 275                           |
|       | 3   | 275                           | 300                           |
|       | 4   | 300                           | 325                           |
|       | 5   | 325                           | 350                           |
|       | 6   | 350                           | 375                           |
|       | 7   | 375                           | 400                           |
|       | 8   | 400                           | 425                           |
|       | 9   | 425                           | 450                           |
| N     | 1   | 450                           | 475                           |
|       | 2   | 475                           | 500                           |
|       | 3   | 500                           | 550                           |
|       | 4   | 550                           | 600                           |
|       | 5   | 600                           | 650                           |
|       | 6   | 650                           | 700                           |
|       | 7   | 700                           | 750                           |
|       | 8   | 750                           | 800                           |
|       | 9   | 800                           | 900                           |

| Group | Bin | Minimum Photometric Flux (lm) | Maximum Photometric Flux (lm) |
|-------|-----|-------------------------------|-------------------------------|
| P     | 1   | 900                           | 1000                          |
|       | 2   | 1000                          | 1100                          |
|       | 3   | 1100                          | 1200                          |
|       | 4   | 1200                          | 1350                          |
|       | 5   | 1350                          | 1500                          |
|       | 6   | 1500                          | 1650                          |
|       | 7   | 1650                          | 1800                          |
|       | 8   | 1800                          | 2000                          |
|       | 9   | 2000                          | 2200                          |
| S     | 1   | 2200                          | 2400                          |
|       | 2   | 2400                          | 2650                          |
|       | 3   | 2650                          | 2900                          |
|       | 4   | 2900                          | 3200                          |
|       | 5   | 3200                          | 3500                          |
|       | 6   | 3500                          | 3850                          |
|       | 7   | 3850                          | 4200                          |
|       | 8   | 4200                          | 4600                          |

### White Bin Structure

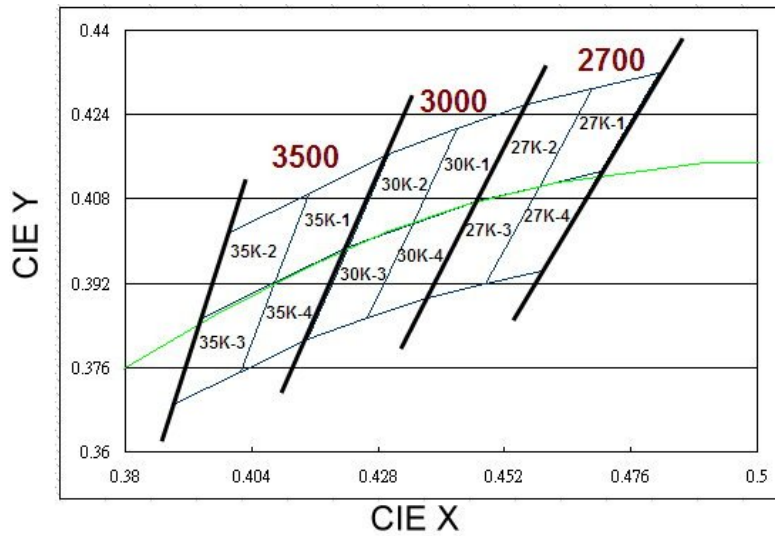


Chromaticity specification defined by ANSI

**Notes:**

1. The CCT range of Cool-White varies from 4745K to 7050K.
2. The CCT range of Neutral-White varies from 3710K to 4745K.
3. The CCT range of Warm-White varies from 2580K to 3710K
4. Color coordinates measurement allowance :  $\pm 0.01$
5. Color bins are defined at  $I_f=500\text{mA}$  operation

Warm White Bin Structure



Warm White Bin Coordinates

2700K

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 27K-1                       | 0.469 | 0.429 |
|                             | 0.459 | 0.410 |
|                             | 0.470 | 0.413 |
|                             | 0.481 | 0.432 |
| Reference Range: 2580~2700K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 27K-2                       | 0.456 | 0.426 |
|                             | 0.447 | 0.408 |
|                             | 0.459 | 0.410 |
|                             | 0.469 | 0.429 |
| Reference Range: 2700~2870K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 27K-4                       | 0.459 | 0.410 |
|                             | 0.448 | 0.392 |
|                             | 0.459 | 0.394 |
|                             | 0.470 | 0.413 |
| Reference Range: 2580~2700K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 27K-3                       | 0.447 | 0.408 |
|                             | 0.437 | 0.389 |
|                             | 0.448 | 0.392 |
|                             | 0.459 | 0.410 |
| Reference Range: 2700~2870K |       |       |

3000K

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 30K-1                       | 0.456 | 0.426 |
|                             | 0.443 | 0.421 |
|                             | 0.435 | 0.403 |
|                             | 0.447 | 0.408 |
| Reference Range: 2870~3000K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 30K-2                       | 0.443 | 0.421 |
|                             | 0.430 | 0.417 |
|                             | 0.422 | 0.399 |
|                             | 0.435 | 0.403 |
| Reference Range: 3000~3170K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 30K-4                       | 0.447 | 0.408 |
|                             | 0.435 | 0.403 |
|                             | 0.426 | 0.385 |
|                             | 0.437 | 0.389 |
| Reference Range: 2870~3000K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 30K-3                       | 0.435 | 0.403 |
|                             | 0.422 | 0.399 |
|                             | 0.415 | 0.381 |
|                             | 0.426 | 0.385 |
| Reference Range: 3000~3170K |       |       |



**3500K**

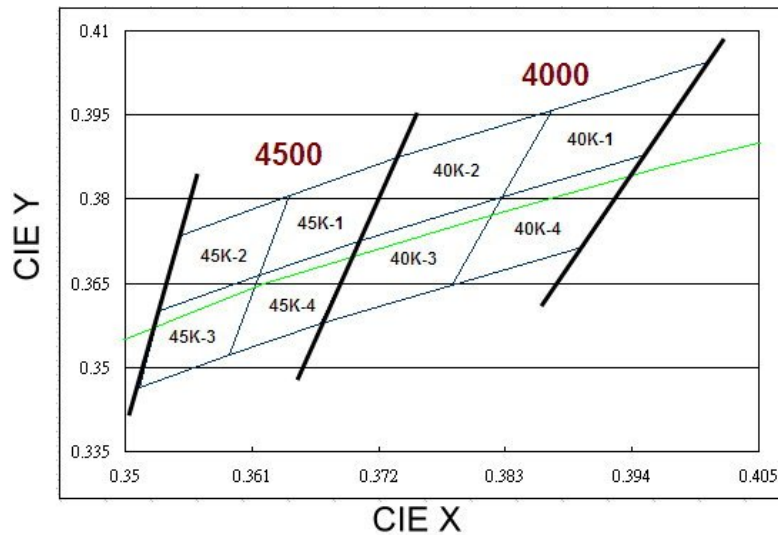
| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 35K-1                       | 0.415 | 0.409 |
|                             | 0.408 | 0.392 |
|                             | 0.422 | 0.399 |
|                             | 0.430 | 0.417 |
| Reference Range: 3220~3500K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 35K-2                       | 0.400 | 0.402 |
|                             | 0.394 | 0.385 |
|                             | 0.408 | 0.392 |
|                             | 0.415 | 0.409 |
| Reference Range: 3500~3710K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 35K-4                       | 0.408 | 0.392 |
|                             | 0.402 | 0.375 |
|                             | 0.415 | 0.381 |
|                             | 0.422 | 0.399 |
| Reference Range: 3220~3500K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 35K-3                       | 0.394 | 0.385 |
|                             | 0.389 | 0.369 |
|                             | 0.402 | 0.375 |
|                             | 0.408 | 0.392 |
| Reference Range: 3500~3710K |       |       |

**Neutral-White Bin Structure**



**Neutral-White Bin Coordinates**

**4000K**

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 40K-1                       | 0.387 | 0.396 |
|                             | 0.383 | 0.380 |
|                             | 0.395 | 0.388 |
|                             | 0.401 | 0.404 |
| Reference Range: 3710~4000K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 40K-2                       | 0.374 | 0.387 |
|                             | 0.370 | 0.373 |
|                             | 0.383 | 0.380 |
|                             | 0.387 | 0.396 |
| Reference Range: 4000~4260K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 40K-4                       | 0.383 | 0.380 |
|                             | 0.378 | 0.365 |
|                             | 0.390 | 0.372 |
|                             | 0.395 | 0.388 |
| Reference Range: 3710~4000K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 40K-3                       | 0.370 | 0.373 |
|                             | 0.367 | 0.358 |
|                             | 0.378 | 0.365 |
|                             | 0.383 | 0.380 |
| Reference Range: 4000~4260K |       |       |

**4500K**

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 45K-1                       | 0.364 | 0.381 |
|                             | 0.362 | 0.366 |
|                             | 0.370 | 0.373 |
|                             | 0.374 | 0.387 |
| Reference Range: 4260~4500K |       |       |

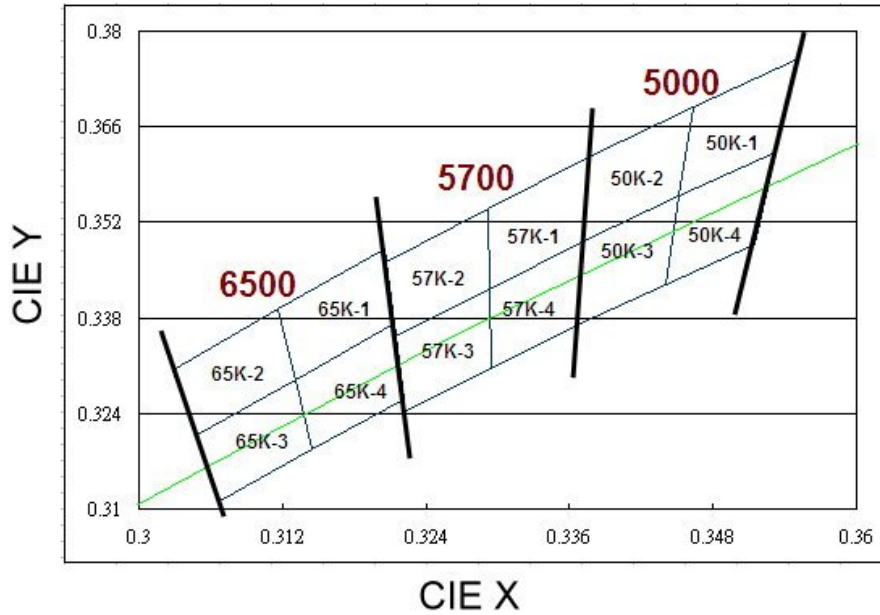
| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 45K-2                       | 0.355 | 0.374 |
|                             | 0.353 | 0.360 |
|                             | 0.362 | 0.366 |
|                             | 0.364 | 0.381 |
| Reference Range: 4500~4745K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 45K-4                       | 0.362 | 0.366 |
|                             | 0.359 | 0.352 |
|                             | 0.367 | 0.358 |
|                             | 0.370 | 0.373 |
| Reference Range: 4260~4500K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 45K-3                       | 0.353 | 0.360 |
|                             | 0.351 | 0.347 |
|                             | 0.359 | 0.352 |
|                             | 0.362 | 0.366 |
| Reference Range: 4500~4745K |       |       |



Cool-White Bin Structure



Cool-White Bin Coordinates

5000K

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 50K-1                       | 0.346 | 0.369 |
|                             | 0.345 | 0.356 |
|                             | 0.353 | 0.362 |
|                             | 0.355 | 0.376 |
| Reference Range: 4745~5000K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 50K-2                       | 0.338 | 0.362 |
|                             | 0.337 | 0.349 |
|                             | 0.345 | 0.356 |
|                             | 0.346 | 0.369 |
| Reference Range: 5000~5310K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 50K-4                       | 0.345 | 0.356 |
|                             | 0.344 | 0.343 |
|                             | 0.352 | 0.349 |
|                             | 0.353 | 0.362 |
| Reference Range: 4745~5000K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 50K-3                       | 0.337 | 0.349 |
|                             | 0.337 | 0.337 |
|                             | 0.344 | 0.343 |
|                             | 0.345 | 0.356 |
| Reference Range: 5000~5310K |       |       |

5700K

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 57K-1                       | 0.329 | 0.354 |
|                             | 0.329 | 0.342 |
|                             | 0.337 | 0.349 |
|                             | 0.338 | 0.362 |
| Reference Range: 5310~5700K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 57K-2                       | 0.321 | 0.346 |
|                             | 0.322 | 0.335 |
|                             | 0.329 | 0.342 |
|                             | 0.329 | 0.354 |
| Reference Range: 5700~6020K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 57K-4                       | 0.329 | 0.342 |
|                             | 0.329 | 0.331 |
|                             | 0.337 | 0.337 |
|                             | 0.337 | 0.349 |
| Reference Range: 5310~5700K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 57K-3                       | 0.322 | 0.335 |
|                             | 0.322 | 0.324 |
|                             | 0.329 | 0.331 |
|                             | 0.329 | 0.342 |
| Reference Range: 5700~6020K |       |       |

**6500K**

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 65K-1                       | 0.312 | 0.339 |
|                             | 0.313 | 0.329 |
|                             | 0.321 | 0.337 |
|                             | 0.321 | 0.348 |
| Reference Range: 6020~6500K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 65K-2                       | 0.303 | 0.330 |
|                             | 0.305 | 0.321 |
|                             | 0.313 | 0.329 |
|                             | 0.312 | 0.339 |
| Reference Range: 6500~7050K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 65K-4                       | 0.313 | 0.329 |
|                             | 0.315 | 0.319 |
|                             | 0.322 | 0.326 |
|                             | 0.321 | 0.337 |
| Reference Range: 6020~6500K |       |       |

| Bin                         | CIE X | CIE Y |
|-----------------------------|-------|-------|
| 65K-3                       | 0.305 | 0.321 |
|                             | 0.307 | 0.311 |
|                             | 0.315 | 0.319 |
|                             | 0.313 | 0.329 |
| Reference Range: 6500~7050K |       |       |

**Notes:**

1. Color coordinates measurement allowance :  $\pm 0.01$ .



### Forward Voltage Bins

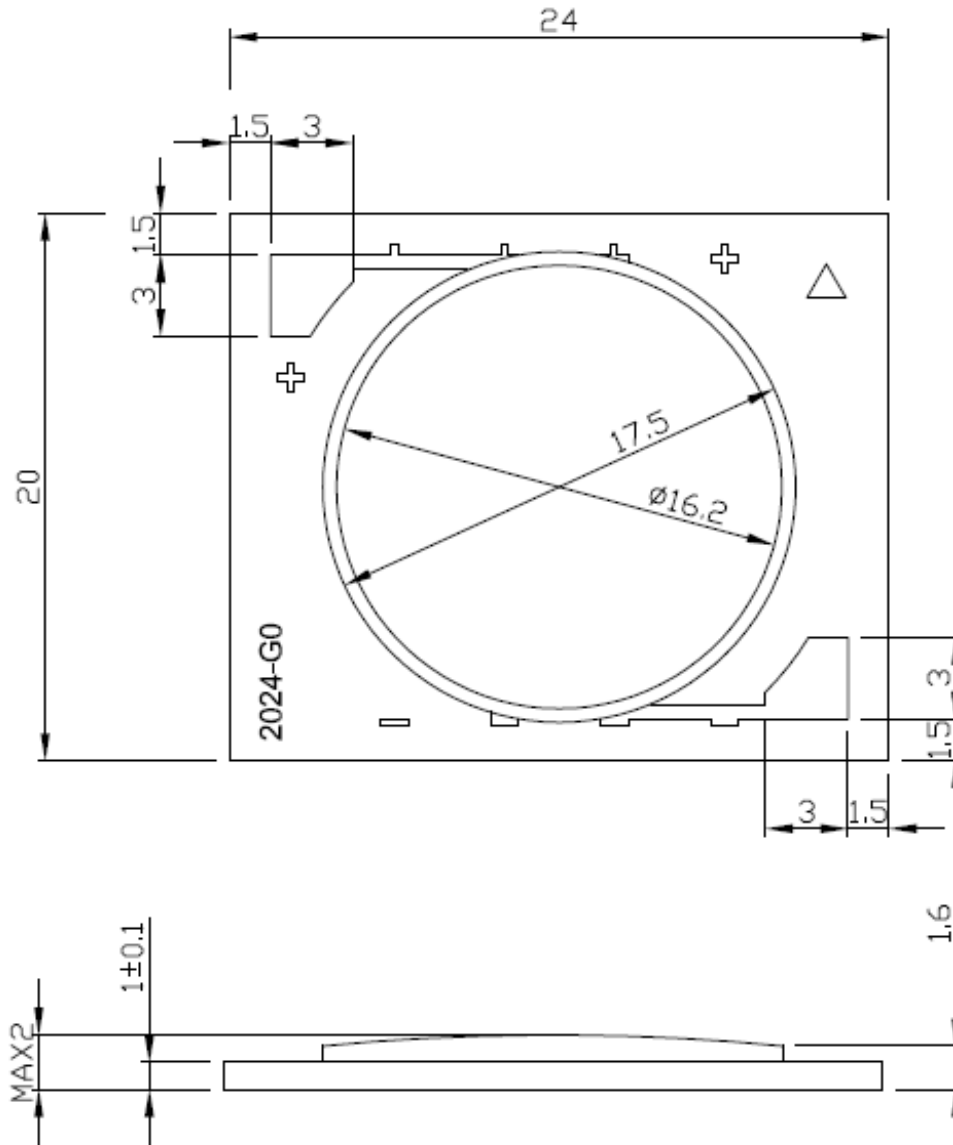
| Bin | Minimum Forward Voltage (V) | Maximum Forward Voltage (V) |
|-----|-----------------------------|-----------------------------|
| W1  | 27                          | 29                          |
| W2  | 29                          | 31                          |
| W3  | 31                          | 33                          |

**Notes:**

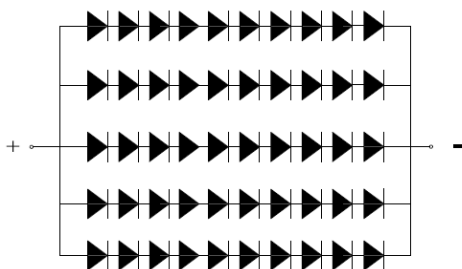
1. Forward voltage measurement tolerance:  $\pm 2\%$ .
2. Forward voltage bins are defined at  $I_f=500\text{mA}$  operation.
3. Other Forward Voltage bins for White LEDs available upon request. Please contact your local Everlight sales office.

EVERLIGHT

## Mechanical Dimension



## Chip Configuration

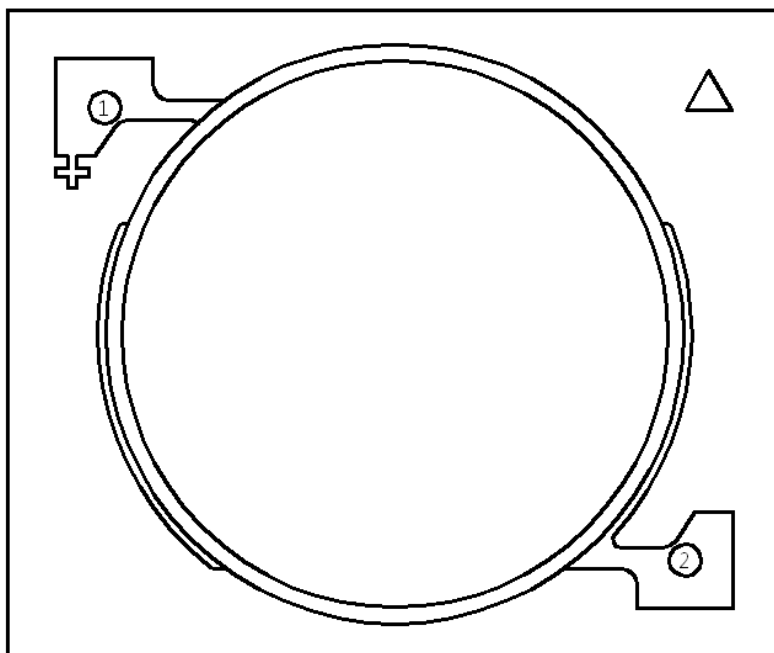


10series × 5parallel = 50 pcs of LEDs

**Note:**

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are  $\pm 0.25\text{mm}$ .

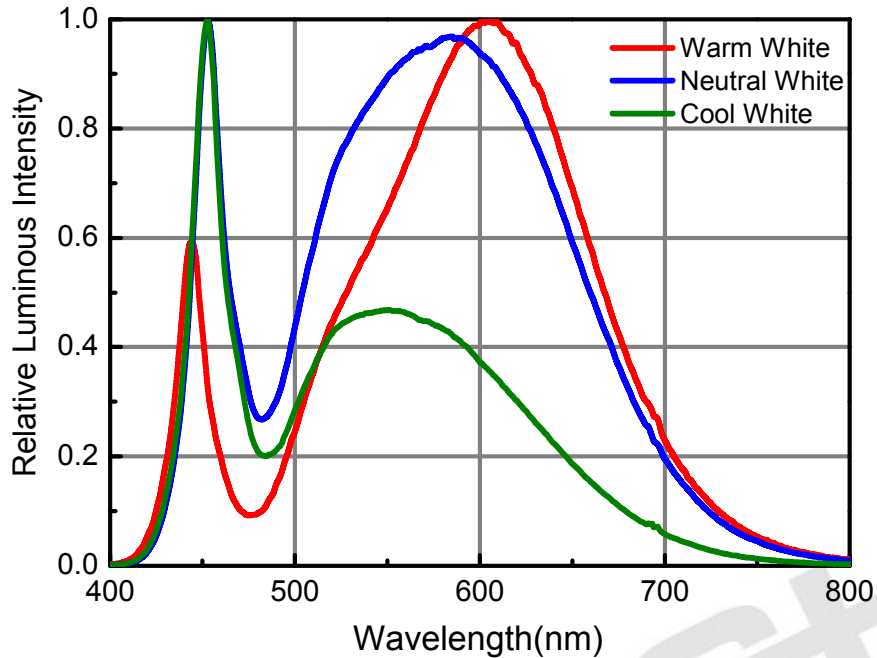
## Pad Configuration



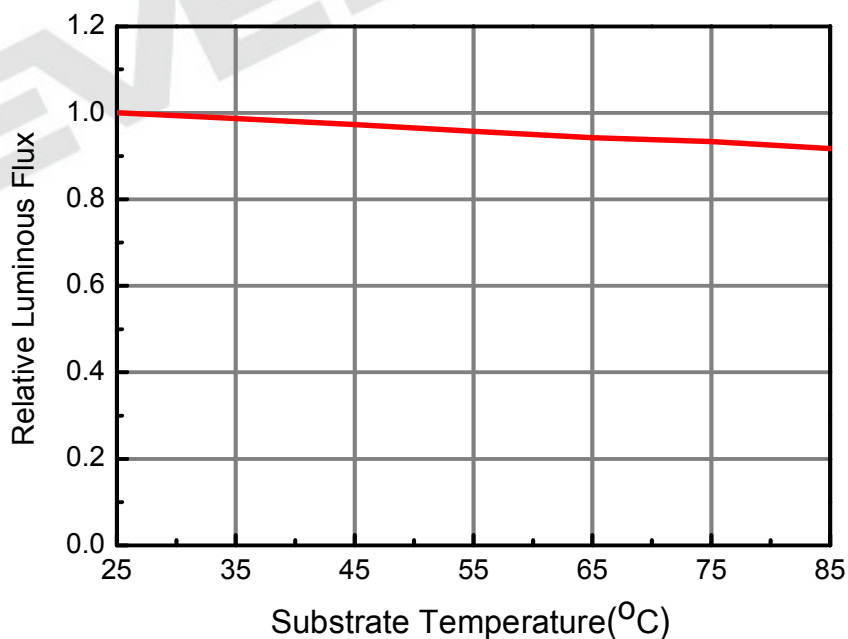
| PAD | FUNCTION |
|-----|----------|
| 1   | ANODE    |
| 2   | CATHODE  |

## 15W COB Series Typical Electro-Optical Characteristic Curve

Relative Spectral Distribution  
@ Substrate Temperature = 25

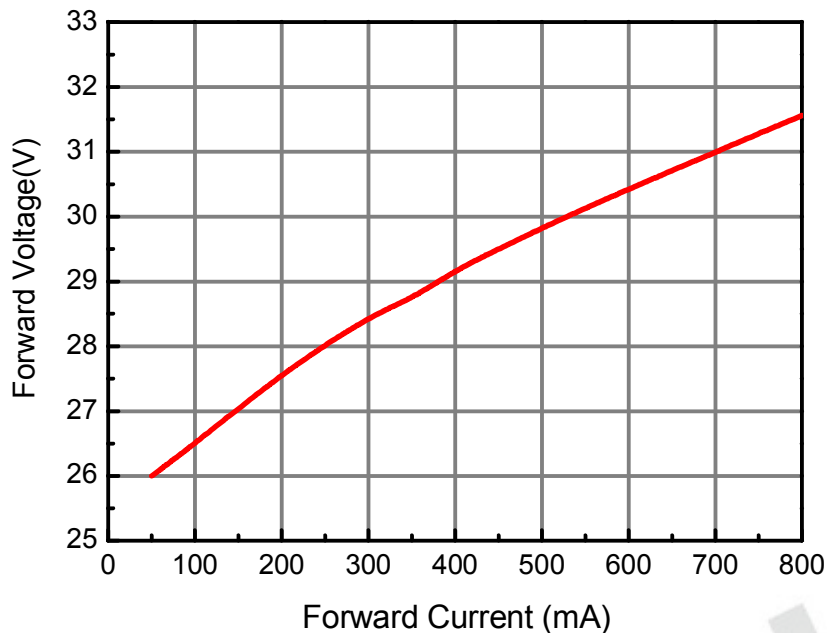


Relative Luminous Flux vs. Substrate Temperature  
@ Forward Current = 500mA

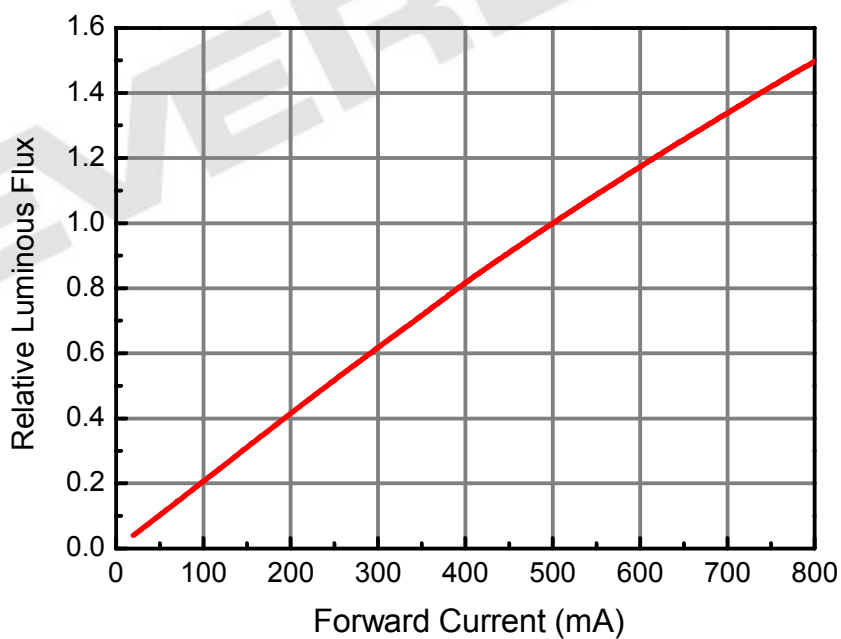




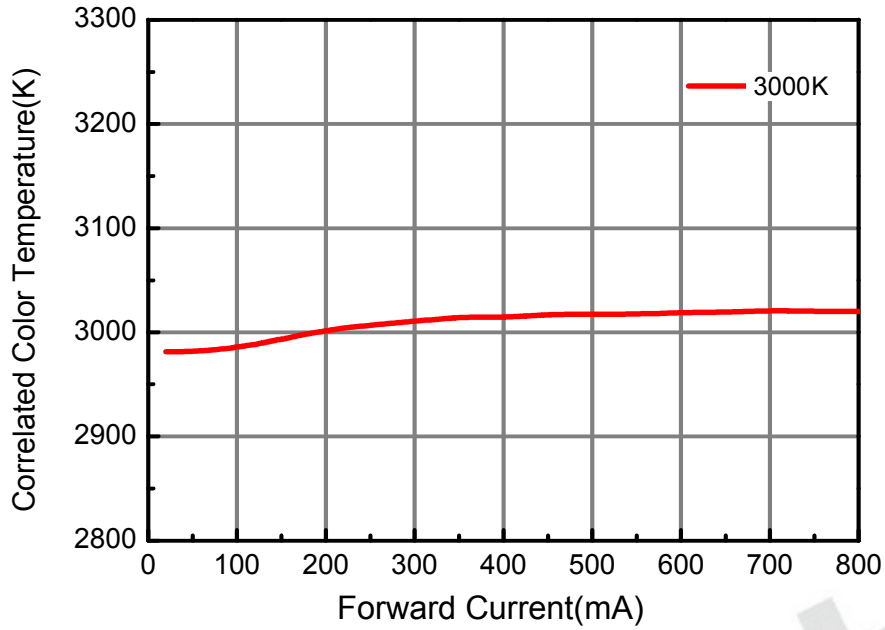
Forward Voltage vs. Forward Current  
@ Substrate Temperature = 25



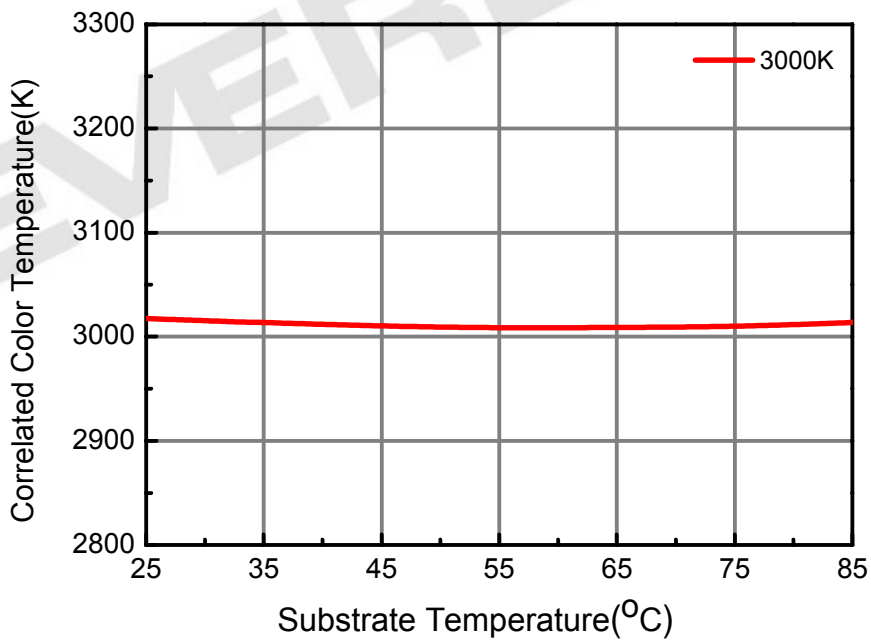
Relative Luminous Flux vs. Forward Current  
@ Substrate Temperature = 25



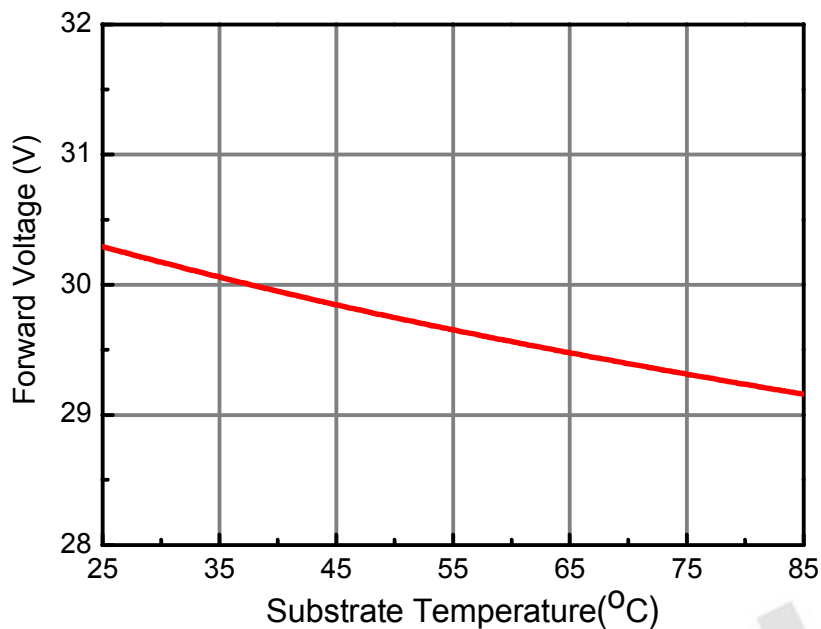
Correlated Color Temperature vs. Forward Current  
@ Substrate Temperature = 25



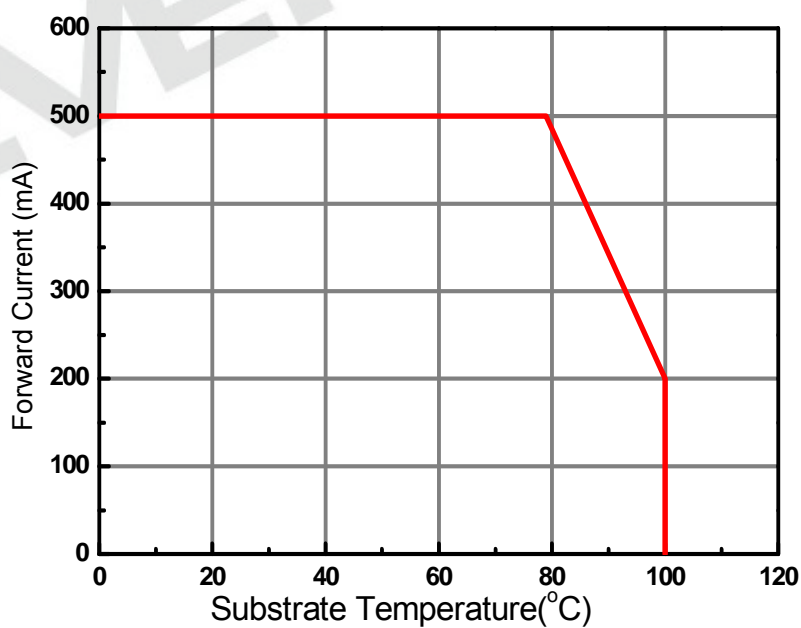
Correlated Color Temperature vs. Substrate Temperature  
@ Forward Current = 500mA



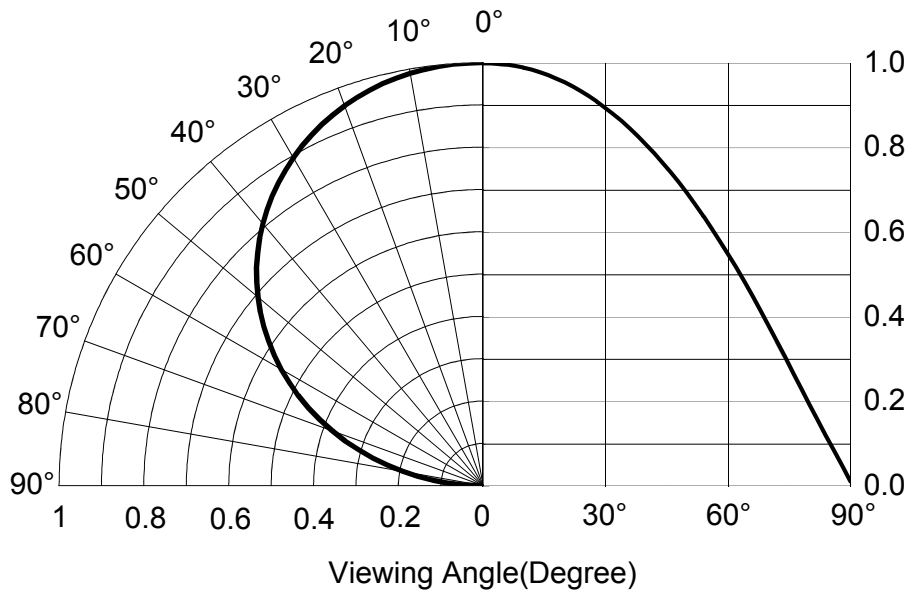
Forward Voltage vs. Substrate Temperature  
@ Forward Current = 500mA



Forward Current Derating Curve  
@ Junction Temperature <115



Typical Diagram Characteristics of Radiation Patterns



Notes:

1. 2θ1/2 is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. Viewing angle tolerance is ± 5° .

Product Labeling

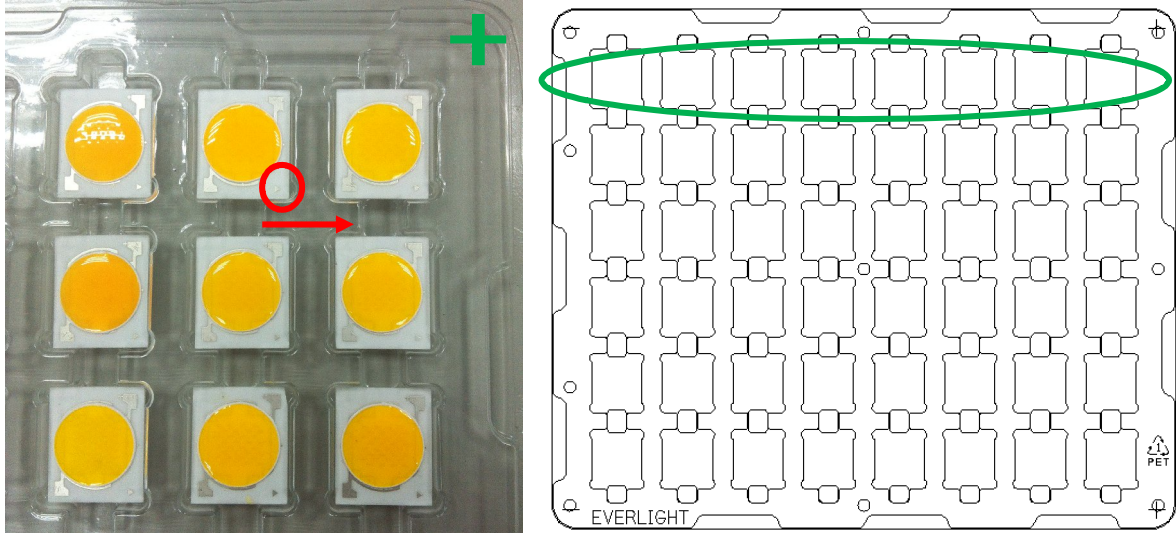
Label Explanation

- CPN: Customer Specification (when required)
- P/N : Everlight Production Number
- QTY: Packing Quantity
- CAT: Luminous Flux (Brightness) Bin
- HUE: Color Bin
- REF: Forward Voltage Bin
- LOT No: Lot Number
- MADE IN TAIWAN: Production Place



## Carrier Tray Specification

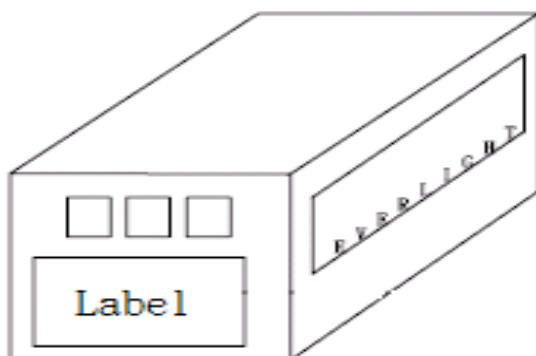
Loaded Quantity: 48 PCS Per Tray



### LED Direction

- The **triangle mark** on the LEDs will be toward the **Anode mark** on the carrier tray.

### Outside Carton



### Packaging Quantity

- 48 PCS Per Tray
- 10 Trays Per Outside Carton

## Precautions of Use

### Over-Current-Proof

- Though the JU2024 has a conducted ESD protection mechanism, customers must not use the device in reverse and should apply resistors for extra protection. Otherwise slight voltage shift may cause significant current changes and bum out failure may happen.

### Storage

- Before the package is opened. The LEDs should be stored at 30°C or less and 50%RH or less after being shipped from Everlight and the storage life limits are 6 months. If the LEDs are stored for 6 months or more, they should be stored in a sealed container with a nitrogen atmosphere and moisture absorbent material.
- After opening the package: The LED's should be stored under 30°C or less and 30%RH or less. The LED should be used with 168hrs (7days) after opening the package. If unused LEDs remain, it should be stored in moisture proof packages.
- Do not stack assemblies..



### Handling

- Don not putting mechanical stress on the LED.
- Never touch the optical surface with finger or sharp object. The LED surface could be soiled or damaged, which could affect the optical performance of the LED.
- In low-humidity work environment, please keep handling the LEDs with appropriate ESD grounding.
- It is recommended to handle the LED with powder-less latex gloves.

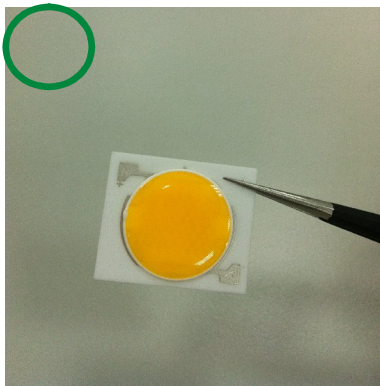


## Manual Handling

When handling the product, do not apply direct pressure on the optical surface.



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



## Thermal Management

- Sufficient thermal management must be implemented. The substrate temperature must be kept under 85 °C at the driving current 500mA. Otherwise, the junction temperature of die may exceed over the limit at high current driving conditions and the LEDs' lifetime may be decrease dramatically.

## Revision History

Current version: **02.27.2013**

Issue No: DHE-0002068

Version: 4

| Page | Subjects (major change in previous version)  | Date of change |
|------|--|----------------|
| 5    | Change the P/N of the JU2024 series : order code & Luminous flux level   | 01.25.2013     |
| 5    | Added New order code of White Series:<br>Warm White 2700K&3500K<br>Neutral White: 4000K&4500K<br>Cool White: 5000K,5700K&6500K | 02.18.2013     |
| 5    | Modified the typical luminous flux of JU2024 series.   | 02.27.2013     |

EVERLIGHT