

## Harvatek High Power LED Datasheet

### HT-CT46



|   |                        |               |                |                |
|---|------------------------|---------------|----------------|----------------|
| Official Product  | HT Part No.<br>HT-CT46 | Your Part No. |                | Data Sheet No. |
| Tentative Product   | *****                  | *****         |                |                |
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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 its use.
- HARVATEK is continually making an 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 of the precautions listed in this document.

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## Product Specification

|                              | Specification                         | Material       | Quantity        |
|------------------------------|---------------------------------------|----------------|-----------------|
| Total Flux                   | Typical 1450 lm<br>@ 300 mA/Ta = 25°C |                |                 |
| Correlated Color Temperature | 2700 K~3000 K<br>@ 300 mA/Ta = 25 °C  |                |                 |
| V <sub>F</sub>               | Typical 36 V<br>@ 300 mA/Ta = 25 °C   |                |                 |
| I <sub>R</sub>               | HT standard                           |                |                 |
| Resin                        | Warm White                            | Silicone resin |                 |
| Tray                         | HT standard                           |                | 60 pcs per tray |
| Label                        | HT standard                           | Paper          |                 |
| Carton                       | HT standard                           | Paper          | Non-specified   |

Others:

### ATTENTION: Electric Static Discharge (ESD) protection

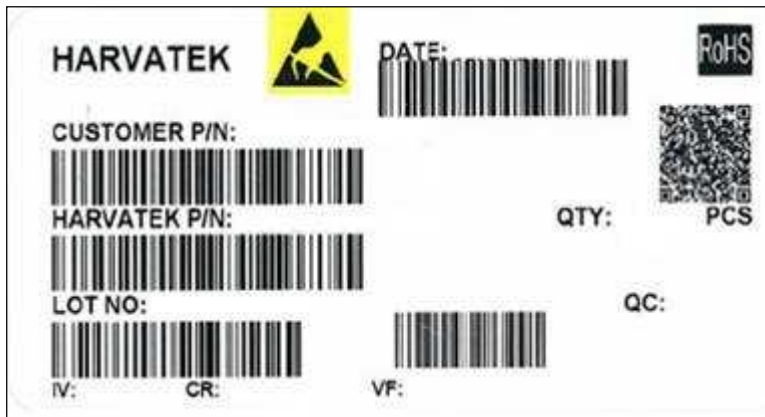


The symbol shown on the page herein to introduce 'Electro-Optical Characteristics'. ESD protection for GaP and AlGaAs based chips is still necessary even though they are safe in low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD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

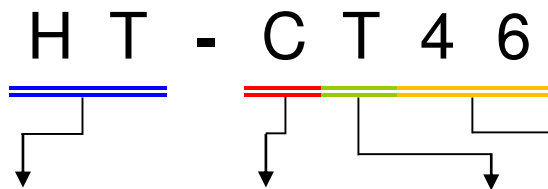
|   |                       |               |                |                |
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**Label spec.**



**Description of Model No. and Lot No.**

**Model No.**



| Company          | Material   | Dice   | Package                          |
|------------------|------------|--------|----------------------------------|
| HT: For Harvatek | C: Ceramic | T: COX | 46: 20 mm*20 mm*1.6 mm,<br>12S5P |

**Lot No.**

| 1                     | 2        | 3  | 4   | 5  | 6                  | 7        | 8            | 9        | 10       |
|-----------------------|----------|--|---|--|--------------------|----------|--------------|----------|----------|
| <b>E</b>              | <b>1</b> | <b>A</b>                                       | <b>1</b>  | <b>A</b>   | <b>2</b>           | <b>2</b> | <b>L</b>     | <b>1</b> | <b>2</b> |
| Code 1 2              |          | Code 3   | Code 4  | Code 5   | Code 6             | Code 7   | Code 8       | Code 9   | Code 10  |
|                       |          | Mfg. Year                                      | Mfg. Month  | Mfg. Date  | Consecutive number |          | Special code |          |          |
| Internal Tracing Code |          | 2010-A<br>2011-B<br>2012-C<br>2013-D<br>.<br>. | 1:Jan.<br>2:Feb.<br>...<br>A:Oct.<br>B:Nov.<br>C:Dec. | 1:A<br>2:B<br>3:C<br>...<br>26:Z<br>27:7<br>28:8<br>29:9<br>30:3<br>31:4 | 01~ZZ              |          | 000~ZZZ      |          |          |

|   |                        |               |                |                |
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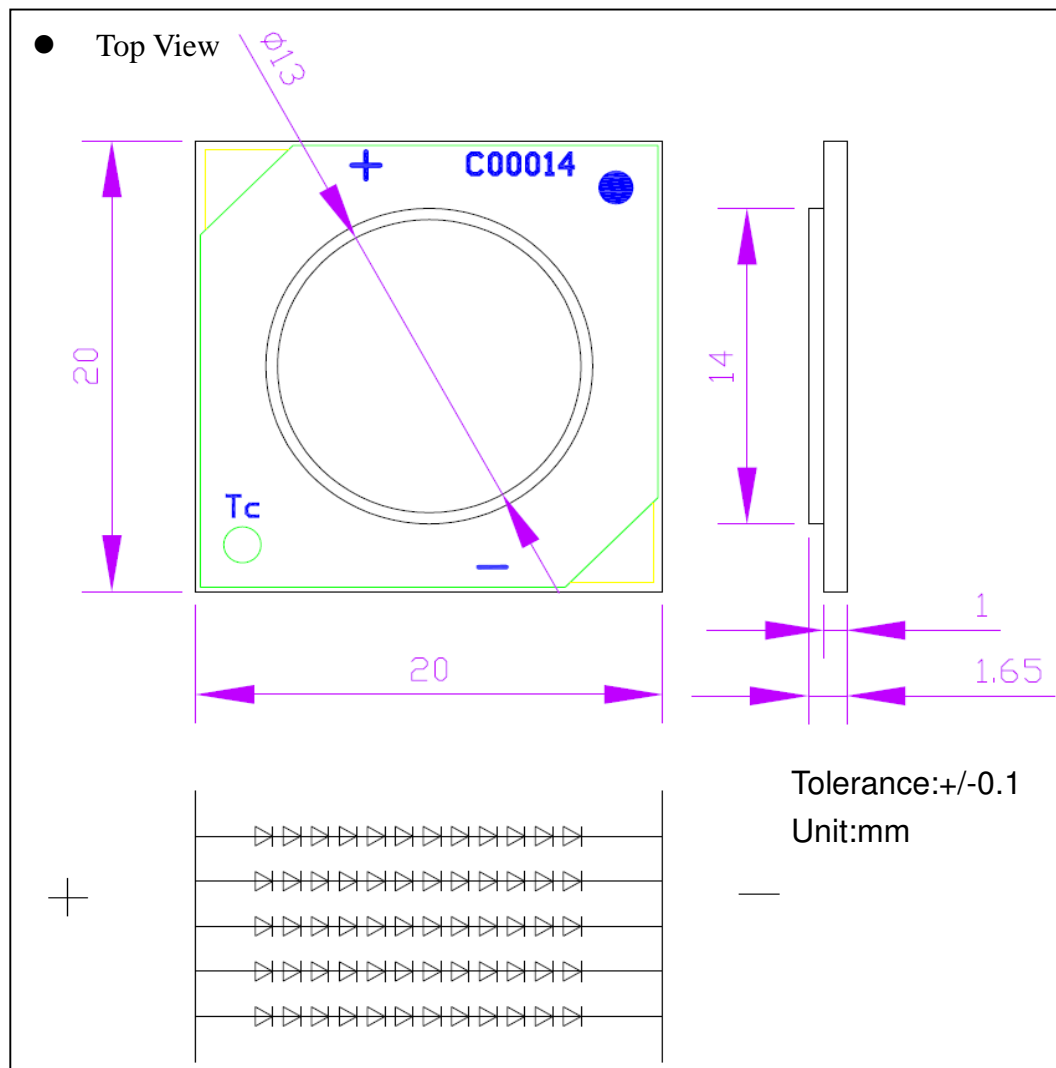
## Product Feature

- High efficiency
- Wide view angle
- Easy to be fixed
- No UV
- Long operating time
- High Brightness
- More energy efficient than incandescent and most halogen lamps
- Low thermal resistance
- Color uniformity

## Application

- Bulb light
- Garden lighting
- Road lights
- Architectural lighting
- Spotlight

## Product Out Line Dimension



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

#### Absolute Maximum Ratings

(T<sub>a</sub> =25°C)

| Parameter                | Rating   | Unit | Conditions      |
|--------------------------|----------|------|-----------------|
| DC Forward Current*1     | 450      | mA   | -               |
| LED junction Temperature | ≤ 125    | °C   | -               |
| Operating Temperature    | -30~+85  | °C   | -               |
| Storage Temperature      | -40~+100 | °C   | -               |
| Soldering Temperature    | 260      | °C   | For 5 sec. Max. |

\*1: Proper current derating must be observed to maintain junction temperature below the maximum.

#### Electro-Optical Characteristics

(T<sub>a</sub> =25°C)

| Parameter   | Symbol            | Min. | TYP. | Max. | Unit |
|---|-------------------|------|------|------|------|
| Viewing angle   | 2θ <sub>1/2</sub> | 115  | -    | -    | Deg. |
| Forward Voltage (I <sub>F</sub> =300 mA)                        | V <sub>F</sub>    | 32   | 36   | 40   | V    |
| Luminous Flux (T <sub>c</sub> = 25°C@300 mA)                    | Flux              | 1300 | 1450 | -    | lm   |
| Luminous Flux (T <sub>c</sub> = 85°C@300 mA)                    | Flux              | 1130 | 1260 | -    | lm   |
| Correlated Color Temperature                                    | CCT               | 2700 | 3000 | -    | K    |
| Thermal Resistance Junction to Board<br>(I <sub>F</sub> =300mA) | Rθ <sub>J-B</sub> | -    | 1.1  | -    | °C/W |
| CRI   |                   | 80   | -    | -    |      |

Note: Test data for the warm white.

#### Luminous Flux Rank

| Rank Code | Symbol | Condition              | Min. | Typ. | Max. | Unit |
|-----------|--------|------------------------|------|------|------|------|
| E20       | ΦV     | I <sub>F</sub> =300 mA | 1300 | 1450 | -    | lm   |

Note: It maintains a tolerance of ±10% on flux.

#### Electrical Rank

| Rank Code | Symbol         | Condition              | Min. | Typ. | Max. | Unit |
|-----------|----------------|------------------------|------|------|------|------|
| Full      | V <sub>F</sub> | I <sub>F</sub> =300 mA | 32   | 36   | 40   | V    |

Note: It maintains a tolerance of ±0.1V on forward voltage measurements.

|   |                        |               |                |                |
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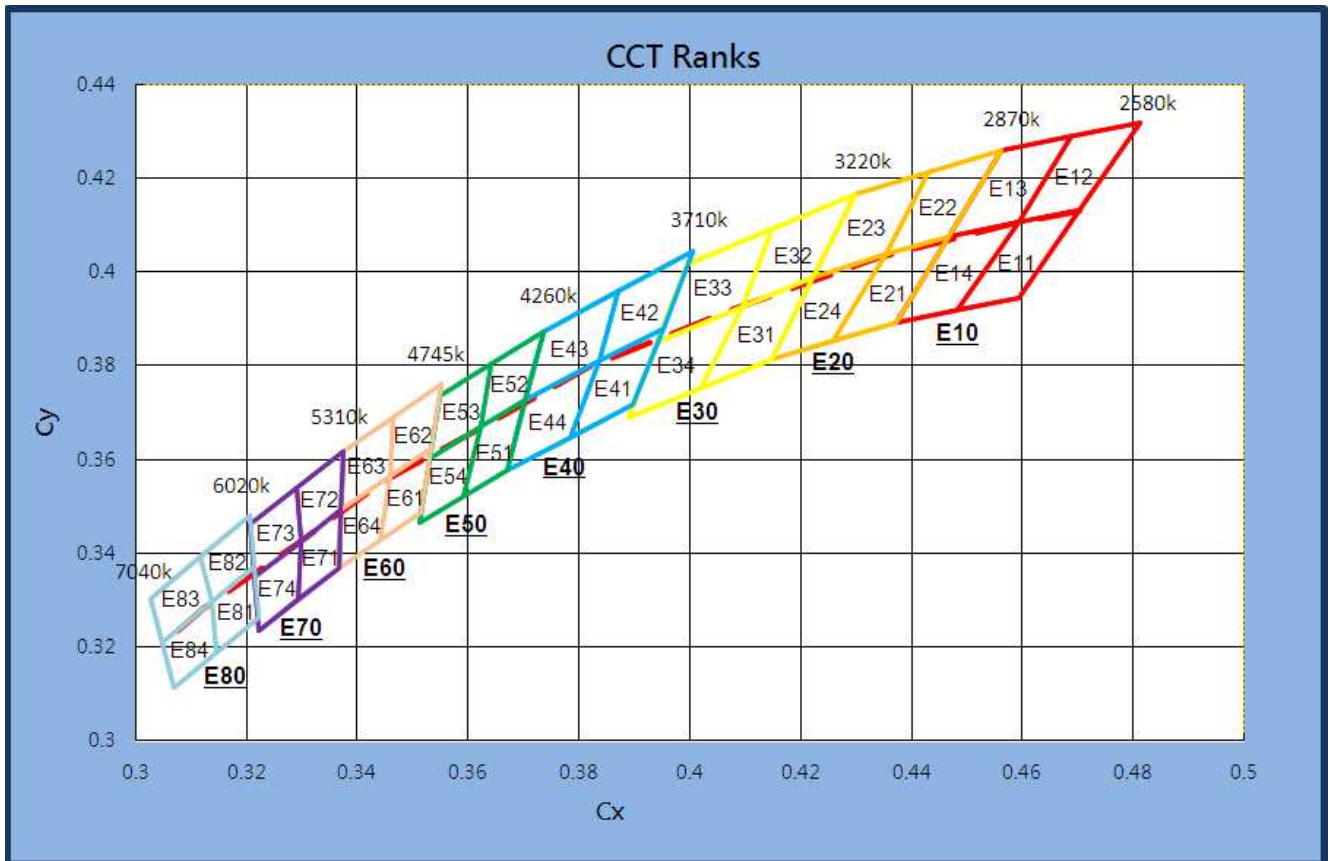
### Correlated Color Temperature Rank

| Color         | Condition              | BIN Code | Nominal CCT(K) | Secondary BIN No. | Min.   | Typ. | Max.   | Unit |
|---------------|------------------------|----------|----------------|-------------------|--------|------|--------|------|
| Warm White    | I <sub>F</sub> =300 mA | E10      | 2700           | E11               | 2580   | -    | 2725   | K    |
|               |                        |          |                | E12               | 2580   | -    | 2725   |      |
|               |                        |          |                | E13               | 2725   | -    | 2870   |      |
|               |                        |          |                | E14               | 2725   | -    | 2870   |      |
|               |                        | E20      | 3000           | E21               | 2870   | -    | 3045   |      |
|               |                        |          |                | E22               | 2870   | -    | 3045   |      |
|               |                        |          |                | E23               | 3045   | -    | 3220   |      |
|               |                        |          |                | E24               | 3045   | -    | 3220   |      |
|               |                        | E30      | 3500           | E31               | 3220   | -    | 3465   |      |
|               |                        |          |                | E32               | 3220   | -    | 3465   |      |
|               |                        |          |                | E33               | 3465   | -    | 3710   |      |
|               |                        |          |                | E34               | 3465   | -    | 3710   |      |
| Neutral White | I <sub>F</sub> =300 mA | E40      | 4000           | E41               | 3710   | -    | 3985   |      |
|               |                        |          |                | E42               | 3710   | -    | 3985   |      |
|               |                        |          |                | E43               | 3985   | -    | 4260   |      |
|               |                        |          |                | E44               | 3985   | -    | 4260   |      |
| E50           | 4500                   | E51      | 4260           | -                 | 4502.5 |      |        |      |
|               |                        | E52      | 4260           | -                 | 4502.5 |      |        |      |
|               |                        | E53      | 4502.5         | -                 | 4745   |      |        |      |
|               |                        | E54      | 4502.5         | -                 | 4745   |      |        |      |
| Cool White    | I <sub>F</sub> =300 mA | E60      | 5000           | E61               | 4745   | -    | 5027.5 |      |
|               |                        |          |                | E62               | 4745   | -    | 5027.5 |      |
|               |                        |          |                | E63               | 5027.5 | -    | 5310   |      |
|               |                        |          |                | E64               | 5027.5 | -    | 5310   |      |
|               |                        | E70      | 5700           | E71               | 5310   | -    | 5665   |      |
|               |                        |          |                | E72               | 5310   | -    | 5665   |      |
|               |                        |          |                | E73               | 5665   | -    | 6020   |      |
|               |                        |          |                | E74               | 5665   | -    | 6020   |      |
| E80           | 6500                   | E81      | 6020           | -                 | 6530   |      |        |      |
|               |                        | E82      | 6020           | -                 | 6530   |      |        |      |
|               |                        | E83      | 6530           | -                 | 7040   |      |        |      |
|               |                        | E84      | 6530           | -                 | 7040   |      |        |      |

Note:It maintains a tolerance of  $\pm 5\%$  on CCT.

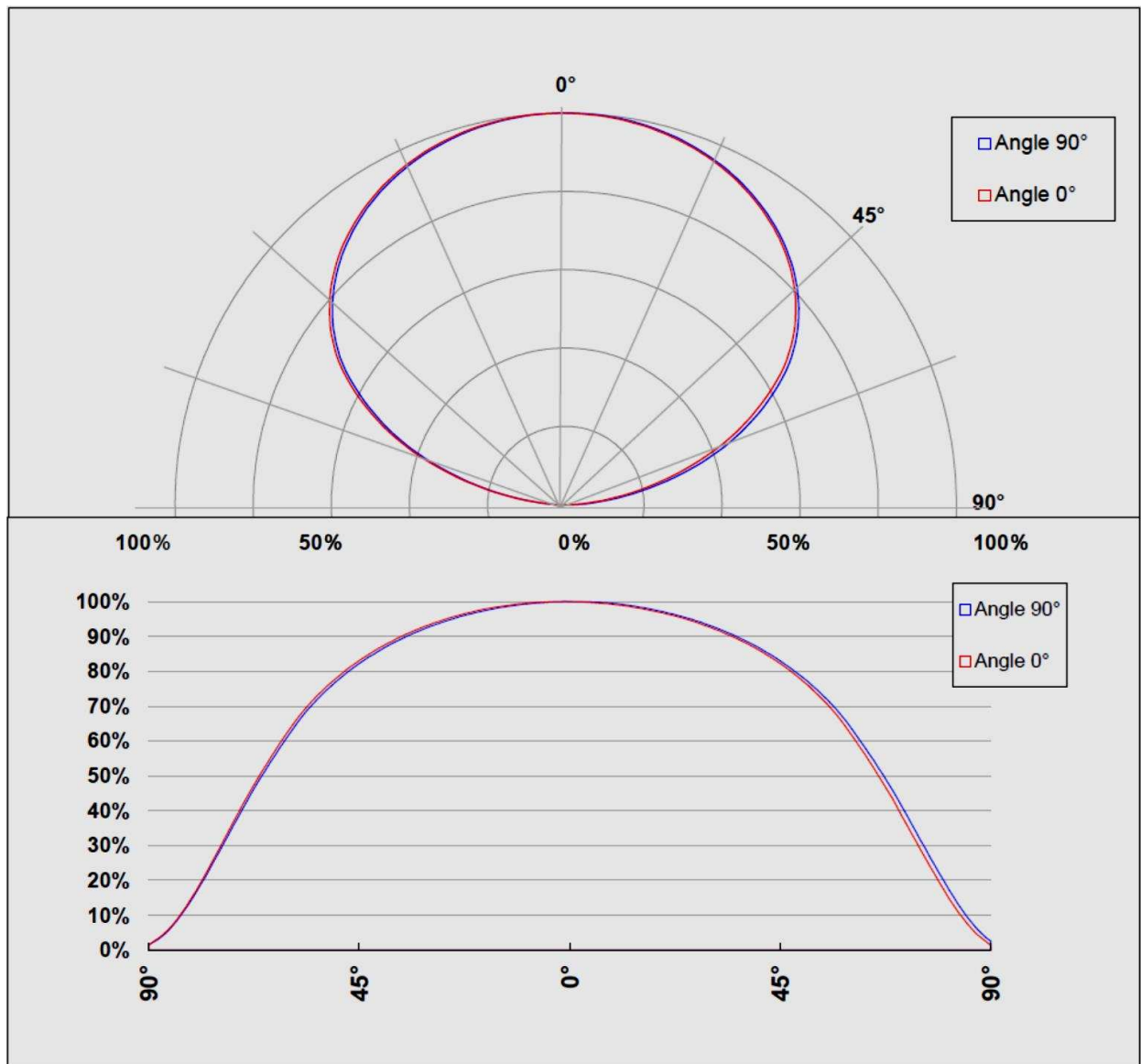
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## Color Temperature Coordinates

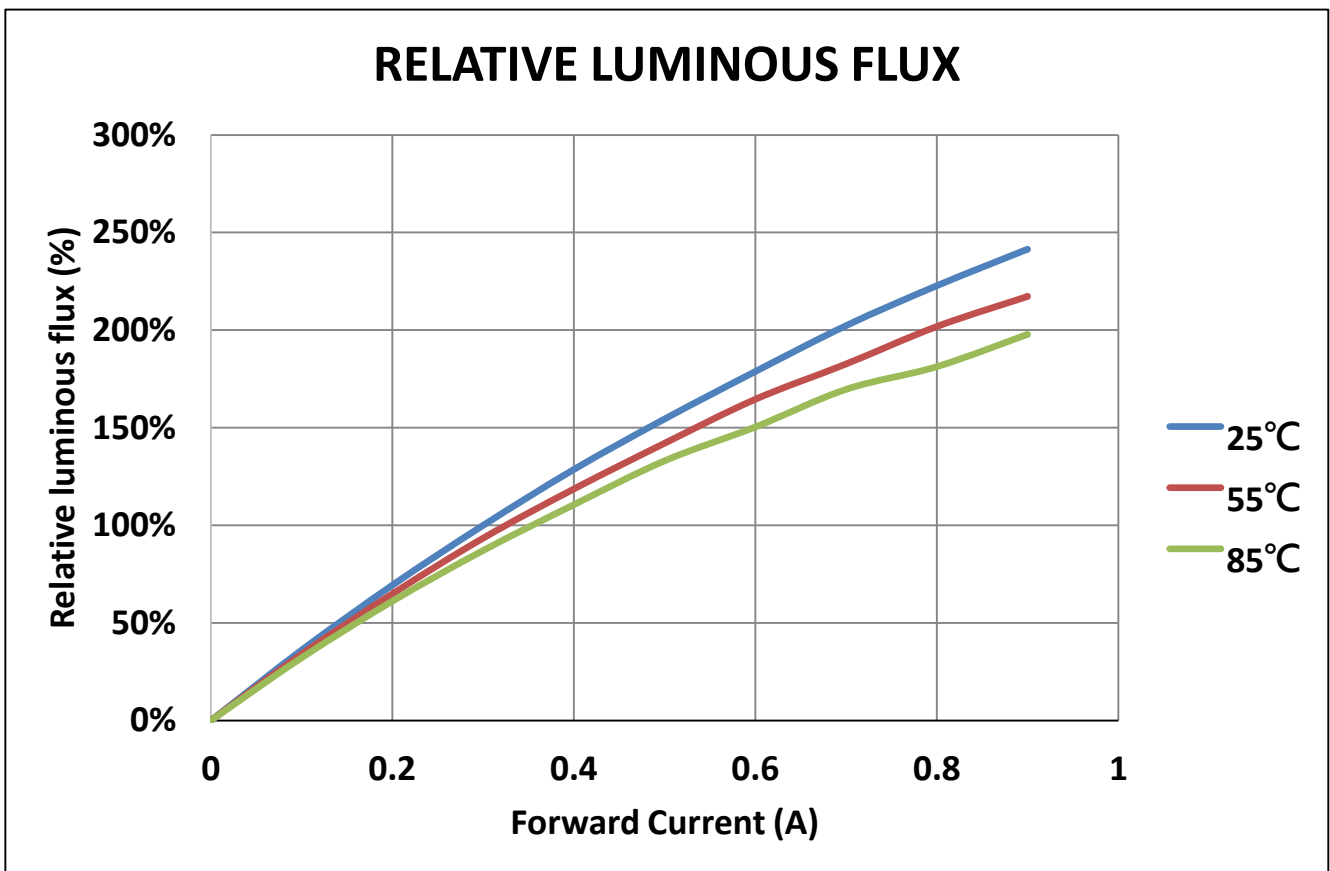
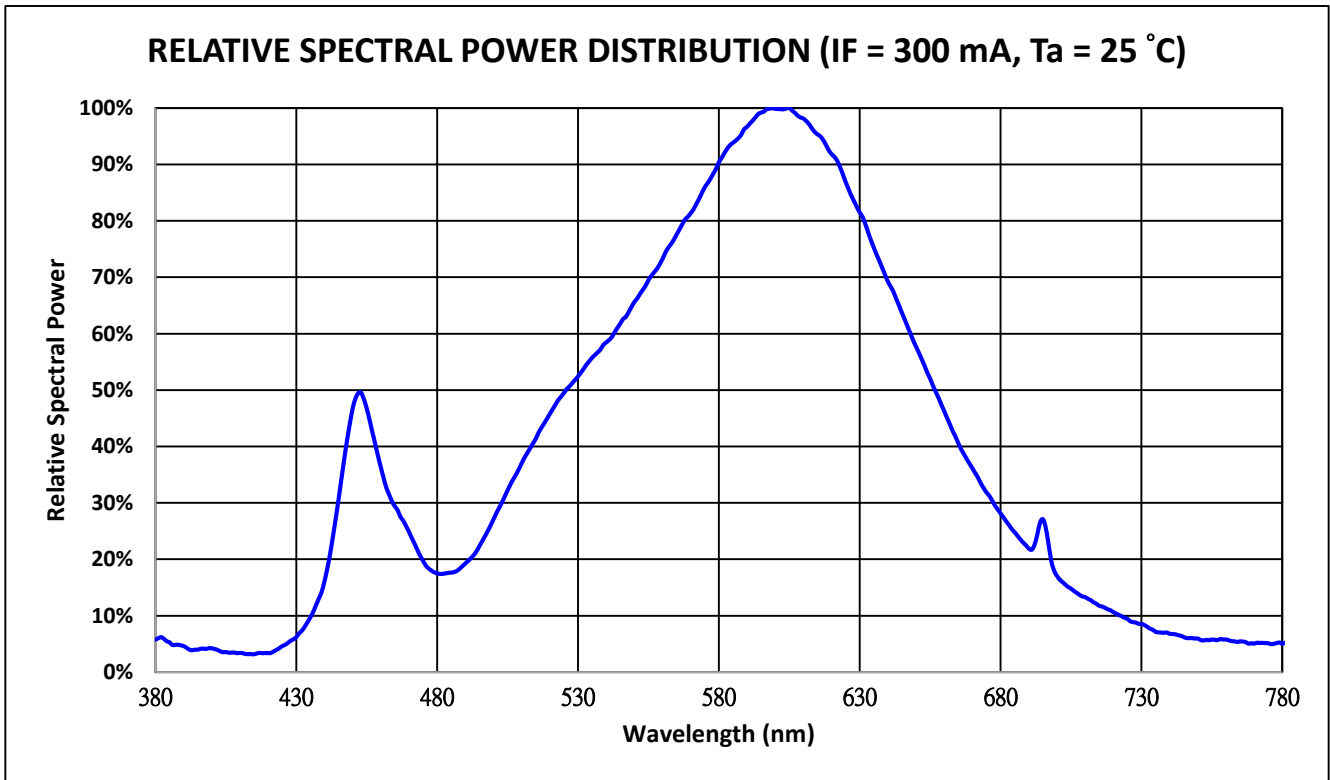


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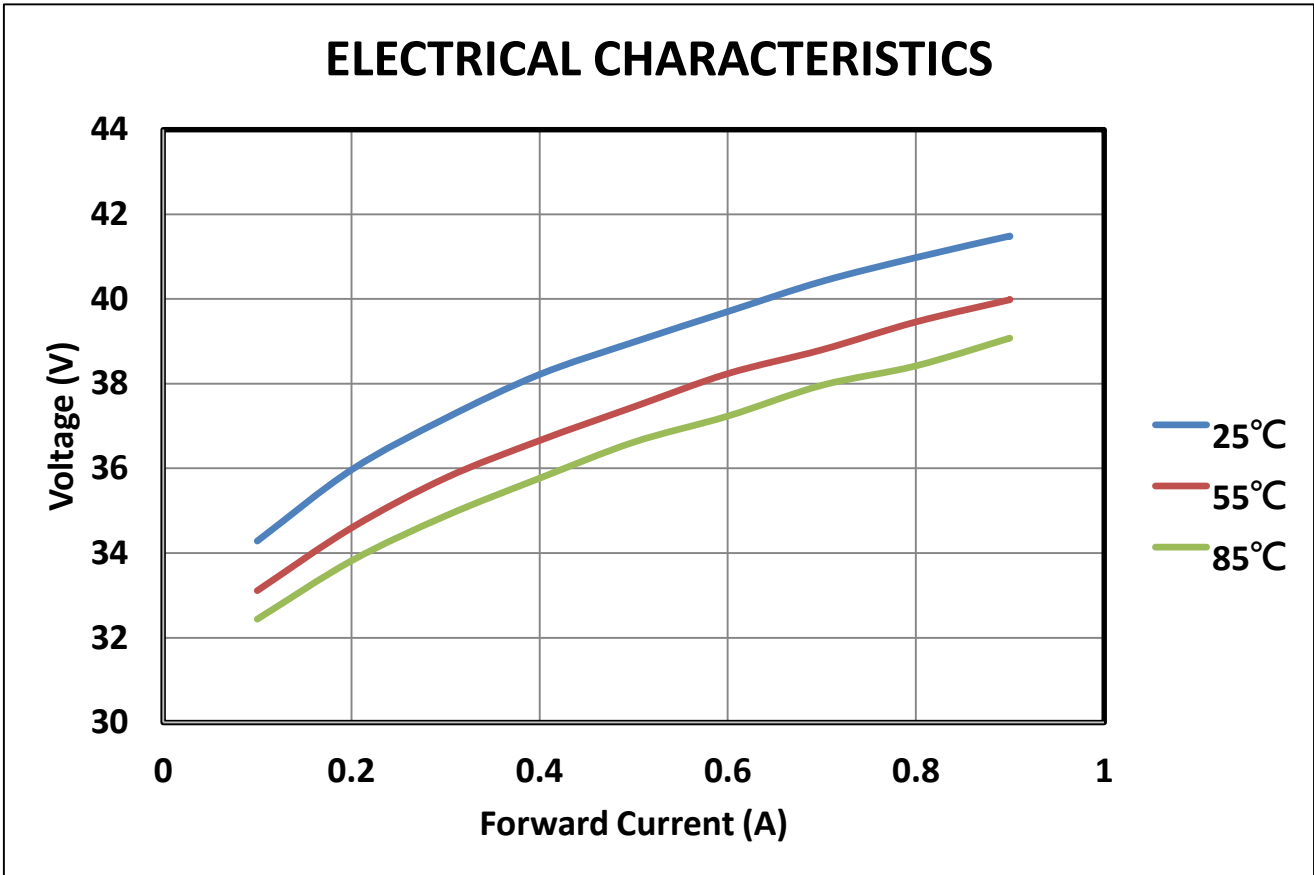
## Characteristics Curve



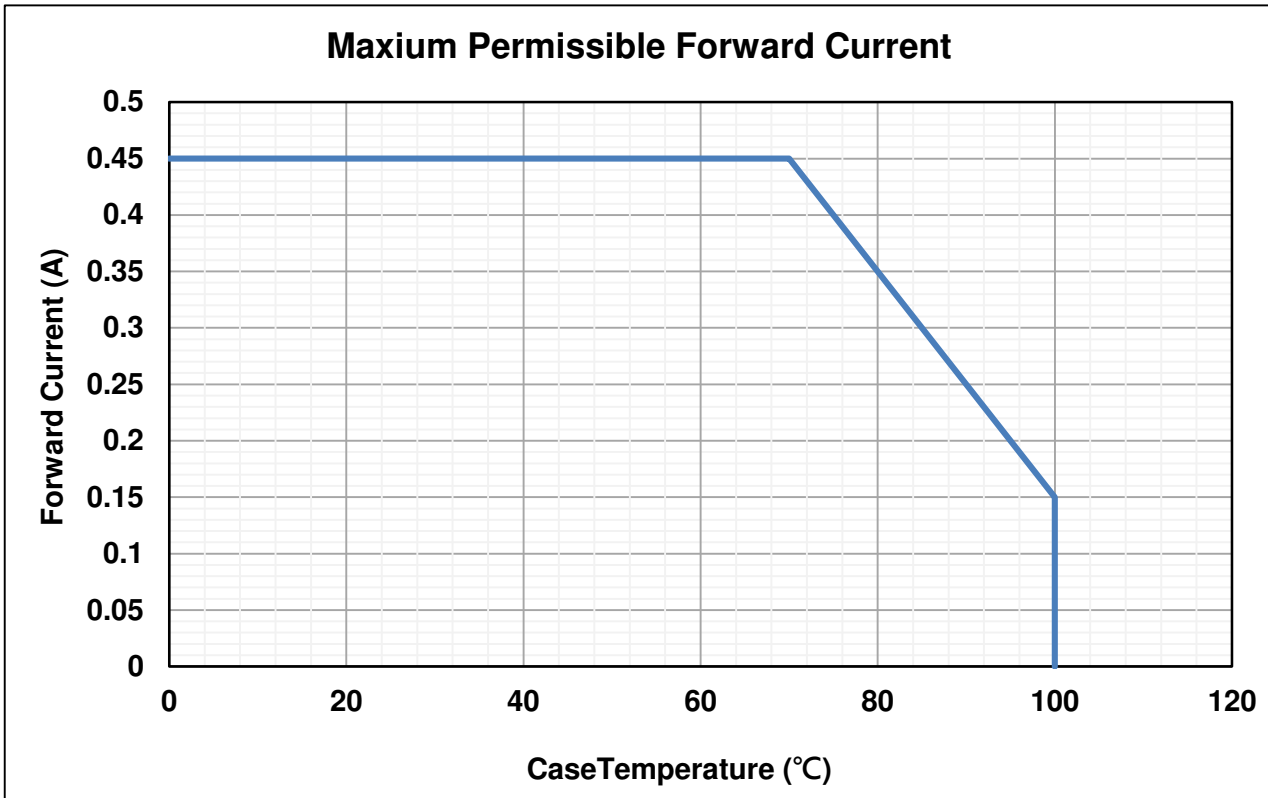
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### LEDs and Eye Safety:

In the 1993 edition of IEC-60825-1, LEDs were included: "Throughout this part 1 light emitting diodes (LED) are included whenever the word "laser" is used."The CENELEC document EN 60825-1 contains all the technical content of the IEC standard.

The scope of the IEC standard status that "...products which are sold to other manufacturers for use as components of any system for subsequent sale are not subject to IEC 60825-1, since the final product will itself be subject to this standard. "Therefore, it is important to determine the Laser Safety Class of the final product. However, it is important that employees working with LEDs are trained to use them safely.

Most of the products containing LEDs will fall in either Class 1 or Class 2. A Class 1 label is optional:

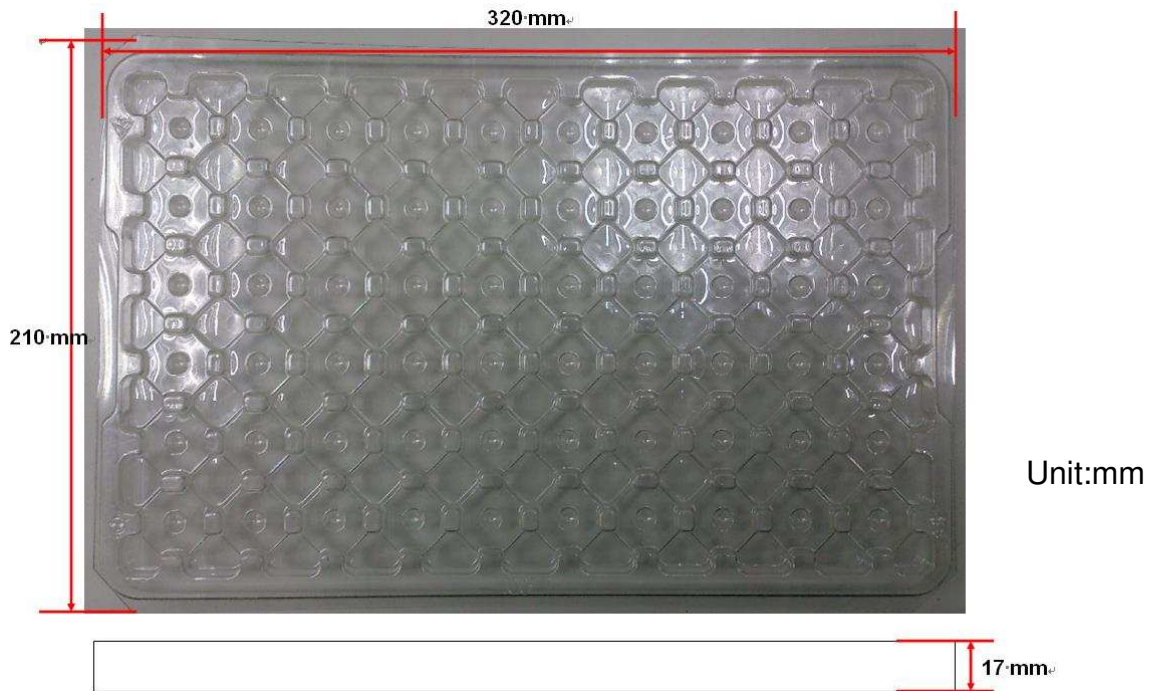
#### CLASS 1 LED PRODUCT

If a label is not used, this description must be included in the information for the user. Amendment 2 to IEC 60825-1 is expected to be published in January 2001. The CENELEC equivalent is expected to follow three months after the IEC publication. This document contains increased Class 1 and Class 2 limits, as well as the introduction of less restrictive Class 1M and Class 2M.

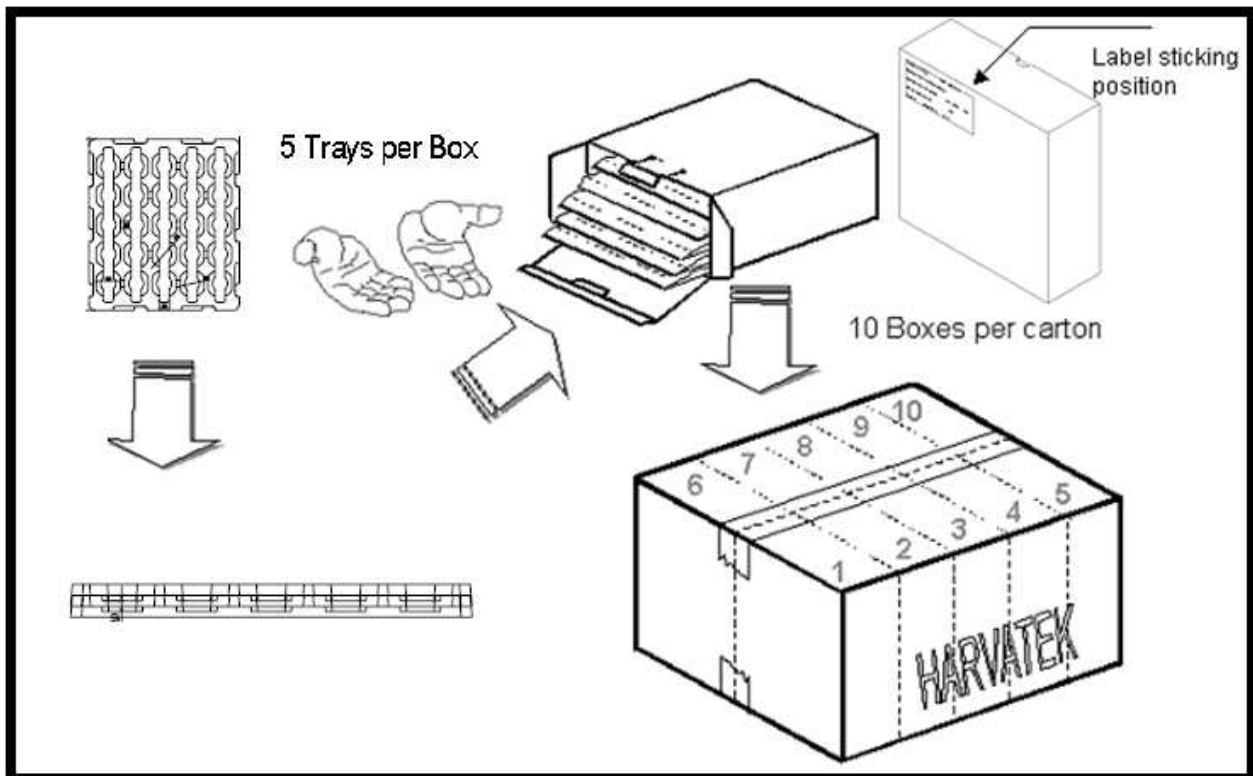
|   |                        |               |                |                |
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For the exact classification and further information, the IEC document can be used:  
IEC-60825-1 ISBN 2-8318-4169-0

## Tray and Packing Tray Dimension



## Packing Model



|   |                       |               |                |                |
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5 boxes per carton is available depending on shipment quantity.

## Storage

It's recommended to store the products in the following conditions:

Humidity: 60 %RH Max.

Temperature: 5°C ~30°C (41°F~86°F)

## PRECAUTIONS

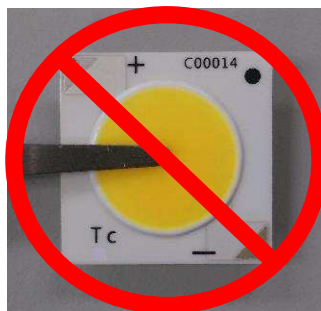
1. Avoid exposure to moisture at all times during transportation or storage.
2. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the specified limit.
3. Avoid operation beyond the limits as specified by the absolute maximum ratings.
4. Avoid direct contact with the surface through which the LED emits light.
5. If possible, assemble the unit in a clean room or dust-free environment.

## Cautions of Pick and Place

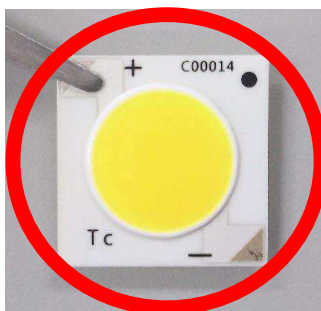
- Avoid stress on the resin at elevated temperature.
- Avoid rubbing or scraping the resin by any object.
- Electric-static may cause damage to the component. Please ensure that the equipment is properly grounded. Use of an ionizer fan is recommended.

## Handling of Silicone Resin for LEDs

(1) During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound.



(2) In general, LEDs should only be handled from the side. By the way, this also applies to LEDs without a silicone sealant, since the surface can also become scratched.



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- (3)Silicone differs from materials conventionally used for the manufacturing of LEDs. These conditions must be considered during the handling of such devices. Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust. As mentioned previously, the increased sensitivity to dust requires special care during processing. In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after the soldering of wire.
- (4)SSC suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin. Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the LED.
- (5)Please do not mold this product into another resin (epoxy, urethane, etc) and do not handle this product with acid or sulfur material in sealed space.
- (6)Avoid leaving fingerprints on silicone resin parts.

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