

**Harvatek Surface Mount LED Data Sheet
HT-U16D Series
Preliminary**

| | | | |
|--|-------------------------|----------------|----------------|
| Official Product | Product: HT-U16D Series | | Data Sheet No. |
| Tentative Product | ***** | | HT-U16D |
| Specifications are subject to change without notice. Data and drawings herein are copyrighted. | Sep. 18, 2008 | Version of 1.0 | Page 1 of 1 |

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LIFE SUPPORT POLICY

HARVATEK's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President of HARVATEK or HARVATEK INTERNATIONAL. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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Product Specifications

| Product | Emission Color | Technology | Test Current I_F (mA) | Forward Voltage V_F (V) | Orderable Part Number |
|------------|------------------------|------------|----------------------------|------------------------------|--------------------------|
| HT-U16DUSD | Ultra Bright Orange | AlInGaP | 20 | 2.7 typ. | HT-U16DUSD-XXXX |
| HT-U16DNG | Green | InGaN | 20 | 3.3 typ. | HT-U16DNG-XXXX |
| HT-U16DNBH | Blue | InGaN | 150 | 3.3 typ. | HT-U16DNBH-XXXX |
| HT-U16DSWH | White | InGaN | 150 | 3.3 typ. | HT-U16DSWH-XXXX |

| | Specification | Material | Quantity |
|--------------|----------------------|-----------------------------------|------------------|
| ESD | 2000V (HBM) | | |
| Resin | Water clear | Silicone | |
| Carrier tape | Per EIA 481-1A specs | Conductive black tape | 1000pcs per reel |
| Reel | Per EIA 481-1A specs | Conductive black | |
| Label | HT standard | Paper | |
| Packing bag | 220x240mm | Aluminum laminated bag/ no-zipper | One reel per bag |
| Carton | HT standard | Paper | |

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Others:

Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv, λ_D and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

ATTENTION: Electrostatic Discharge (ESD) protection



The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD precaution must be taken during design and assembly.

If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

Label Specifications

| | | |
|------------------------------|---|----------------------|
| HARVATEK |  | Date: yyyy/mm/dd |
| CUSTOMER P/N: | | |
| HARVATEK P/N: | QTY: PCS | |
| LOT NO: | | QC |
| Iv BIN: COLOR BIN: Vf: | | |

| | | |
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■ Harvatek P/N:

H T - U16D YYY - XXXX



| Series Name | Emitting Color | Customer Code |
|--|---|-------------------------------|
| HT-U16D HT: Harvatek U16D: Mid-power series 3.5 (L) x 2.8 (W) x 1.3 (H) mm | YYY USD: Super Bright Orange@20mA NG: Green@20mA NBH: Blue@150mA SWH: White@150mA | XXXX Customer Product 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 | Z: 2000 1: 2001 2: 2002 3: 2003 | 1: Jan. 2: Feb. 9: Sep. A: Oct. B: Nov. C: Dec. | 1~31/ (30) | 01~99, A,B,C... | D: Diffused C: Clear | T: Tape & Reel |

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■ Luminous Intensity (Iv) Bin:

| Bin | Luminous Intensity Range (mcd) | | Bin | Luminous Intensity Range (mcd) | |
|------|--------------------------------|---------|------|--------------------------------|---------|
| | Minimum | Maximum | | Minimum | Maximum |
| | | | Z2 | 1270.0 | 1440.0 |
| AA1 | 1440.0 | 1610.0 | AA2 | 1610.0 | 1800.0 |
| AB1 | 1800.0 | 2010.0 | AB2 | 2010.0 | 2250.0 |
| AC1 | 2250.0 | 2530.0 | AC2 | 2530.0 | 2850.0 |
| AD1 | 2850.0 | 3200.0 | AD2 | 3200.0 | 3600.0 |
| AE1 | 3600.0 | 4000.0 | AE2 | 4000.0 | 4500.0 |
| AES1 | 3600.0 | 4000.0 | AES2 | 4000.0 | 4350.0 |
| AFS1 | 4350.0 | 4710.0 | AFS2 | 4710.0 | 5100.0 |
| AF1 | 4500.0 | 5000.0 | AF2 | 5000.0 | 5600.0 |
| AG1 | 5600.0 | 6300.0 | AG2 | 6300.0 | 7150.0 |
| AH1 | 7150.0 | 8000.0 | AH2 | 8000.0 | 9000.0 |
| AJ1 | 9000.0 | 10000.0 | | | |
| | | | | | |

@150mA / Ta=25° C, Tolerance: ± 10%

■ Luminous Flux Bin:

| Rank Code | Symbol | Condition | Min. | Typ. | Max. | Unit |
|-----------|--------|-----------------------|------|------|------|------|
| PN | ΦV | I _F =150mA | 18.0 | - | 23.5 | lm |
| PP | | | 23.5 | - | 30.6 | |

@150mA / Ta=25° C, Tolerance: ± 10%

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■ Wavelength (λ) Bin:

| Bin | Wavelength Range (nm) | | | | | |
|-----|---------------------------|-------|-----------------|-------|-----------|-------|
| | Super Bright Orange (USD) | | True Green (NG) | | Blue (NB) | |
| | Min | Max | Min | Max | Min | Max |
| - | 615.0 | 630.0 | | | | |
| A | | | 515.0 | 520.0 | 460.0 | 464.0 |
| B | | | 520.0 | 525.0 | 464.0 | 468.0 |
| C | | | 525.0 | 530.0 | 468.0 | 472.0 |
| D | | | 530.0 | 535.0 | 472.0 | 476.0 |
| E | | | 535.0 | 540.0 | 476.0 | 480.0 |
| F | | | | | 480.0 | 485.0 |
| H | | | | | | |
| J | | | | | | |

@150mA / Ta=25°C, Tolerance: ± 0.5 nm

■ Forward Voltage (V_F) Bin:

| Color | Bin Code | Spec. Range |
|---------------------------|----------|-------------|
| Blue (NB) | H6 | 3.0 – 3.2 V |
| Green (NG) | J5 | 3.2 – 3.4 V |
| White (TW) | J6 | 3.4 – 3.6 V |
| Super Bright Orange (USD) | G6 | 2.6 – 2.8 V |
| | H5 | 2.8 – 3.0 V |

@150mA / Ta=25°C, Tolerance: ± 0.05 V

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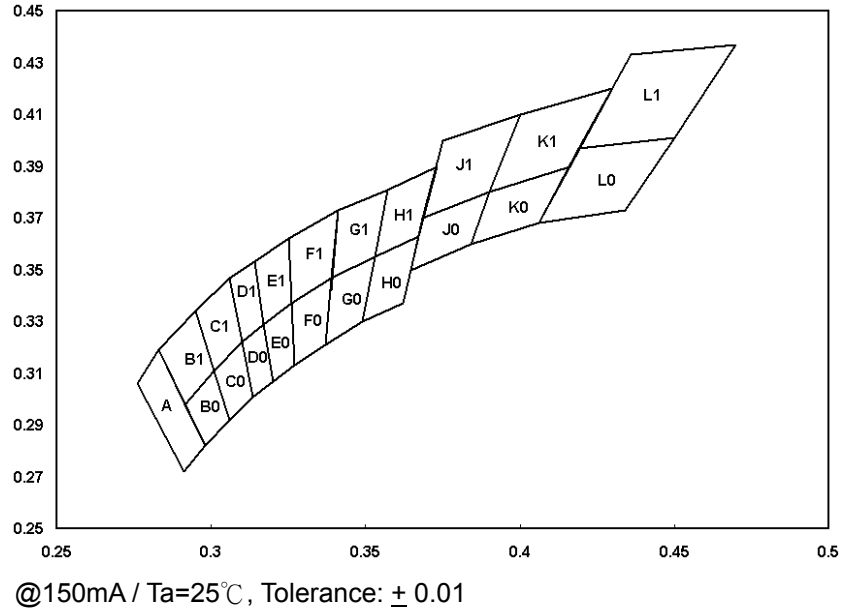
Correlated Color Temperature Rank (TW only)

| Color | Condition | Bin Code | Min. | Typ. | Max. |
|------------|-----------------------|----------|-------|-------|-------|
| Warm White | I _F =150mA | L1 | 2,750 | 3,000 | 3,250 |
| | | L0 | 2,750 | 3,000 | 3,250 |
| | | K1 | 3,250 | 3,500 | 3,750 |
| | | K0 | 3,250 | 3,500 | 3,750 |
| | | J1 | 3,750 | 4,000 | 4,250 |
| | | J0 | 3,750 | 4,000 | 4,250 |
| | | H1 | 4,250 | 4,500 | 4,750 |
| Pure White | | H0 | 4,250 | 4,500 | 4,750 |
| | | G1 | 4,750 | 5,000 | 5,250 |
| | | G0 | 4,750 | 5,000 | 5,250 |
| | | F1 | 5,250 | 5,500 | 5,750 |
| | | F0 | 5,250 | 5,500 | 5,750 |
| | | E1 | 5,750 | 6,000 | 6,250 |
| | | E0 | 5,750 | 6,000 | 6,250 |
| Cold White | I _F =150mA | D1 | 6,250 | 6,500 | 6,750 |
| | | D0 | 6,250 | 6,500 | 6,750 |
| | | C1 | 6,750 | 7,000 | 7,500 |
| | | C0 | 6,750 | 7,000 | 7,500 |
| | | B1 | 7,500 | 8,000 | 8,500 |
| | | B0 | 7,500 | 8,000 | 8,500 |
| | | A | 8,500 | 9,000 | 9,500 |

Tolerance: ±5%

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Correlated Color Temperature and Chromaticity Correlation (TW only)



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Product Characteristics

Absolute Maximum Ratings

| Product | Emission Color | P _d (mW) | I _F (mA) | I _{FP} * (mA) | V _R (V) | T _{OP} (°C) | T _{ST} (°C) |
|------------|---------------------|---------------------|---------------------|------------------------|--------------------|----------------------|----------------------|
| HT-U16DUSD | Ultra Bright Orange | | | | | | |
| HT-U16DNG | Green | | | | | | |
| HT-U16DNBH | Blue | 570 | 180 | 200 | 5 | -40~+100 | -40~+100 |
| HT-U16DSWH | White | 570 | 180 | 200 | 5 | -40~+100 | -40~+100 |

* Condition for I_{FP} is pulse of 1/10 duty and 0.1msec width

Electro-Optical Characteristics

(T_a = 25 °C)

| Product | Emission Color | I _F (mA) | V _F (V) | | λ(nm) | | | I _v (mcd) | |
|------------|---------------------|---------------------|--------------------|-----|----------------|----------------|----|----------------------|--------|
| | | | typ | max | λ _D | λ _P | Δλ | min | typ |
| HT-U16DUSD | Ultra Bright Orange | 20 | 2.8 | 3.0 | 622 | 636 | 17 | 2500.0 | 6200.0 |
| HT-U16DNG | Green | 20 | 3.3 | 3.6 | 527 | 520 | 40 | 4850.0 | 5025.0 |
| HT-U16DNBH | Blue | 150 | 3.3 | 3.6 | 465 | 468 | 40 | 1220.0 | 1340.0 |

| Product | Emission Color | I _F (mA) | V _F (V) | | λ(nm) | | | Φ _V (lm) | |
|------------|----------------|---------------------|--------------------|-----|----------------|----------------|----|---------------------|-----|
| | | | typ | max | λ _D | λ _P | Δλ | min | typ |
| HT-U16DSWH | White | 150 | 3.3 | 3.6 | X=0.29 Y=0.31 | | | 18.1 | 23 |

* Per NIST standard

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Package Outline Dimension and Recommended Soldering Pattern

Unit: mm Tolerance: +/-0.1

| Outline Dimension | Solder Pattern |
|---|-----------------|
| | |
| <p>Soldering terminals may shift in the x, y direction.</p> | <p>Unit: mm</p> |

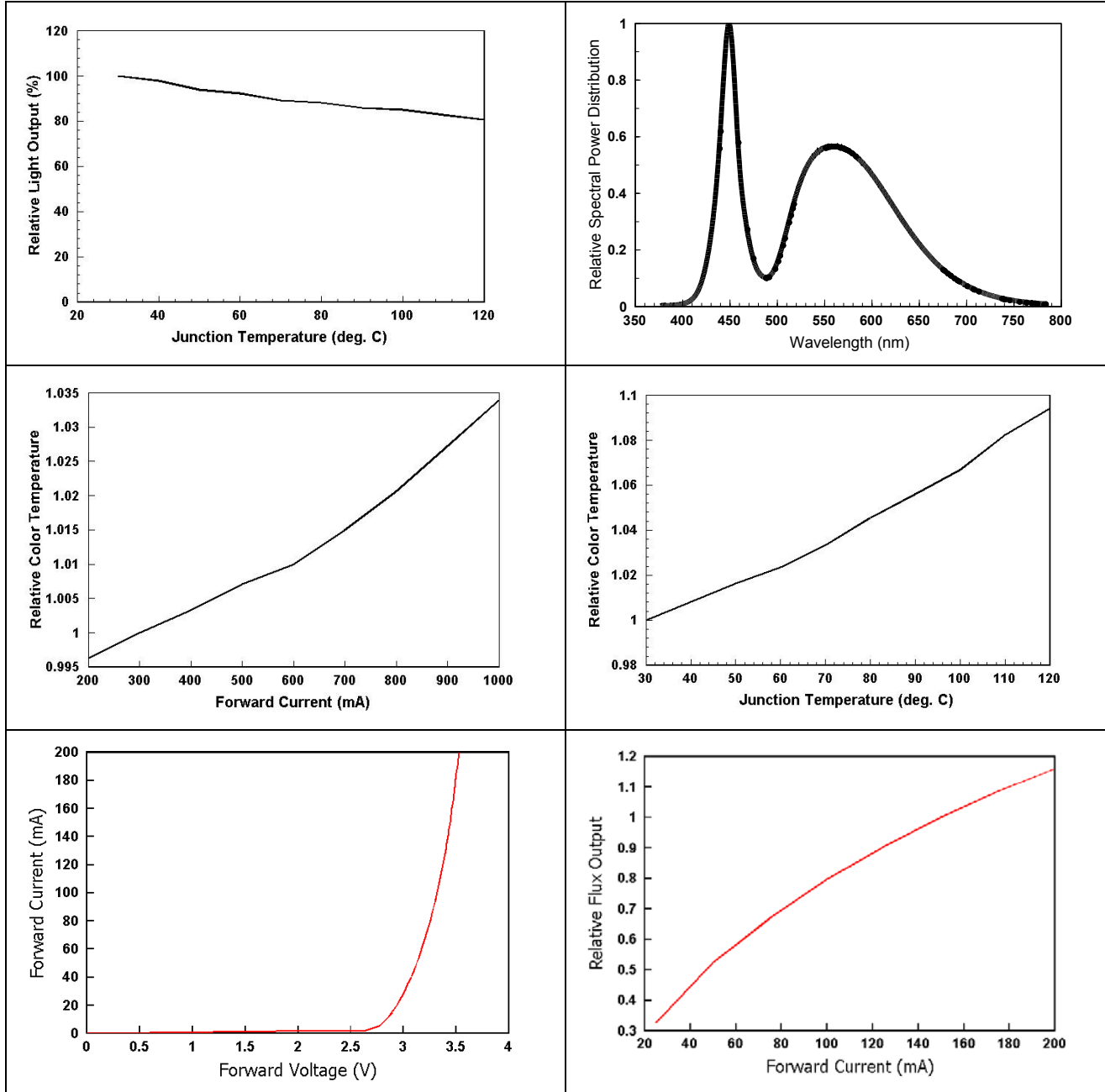
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Characteristic Curves for NB



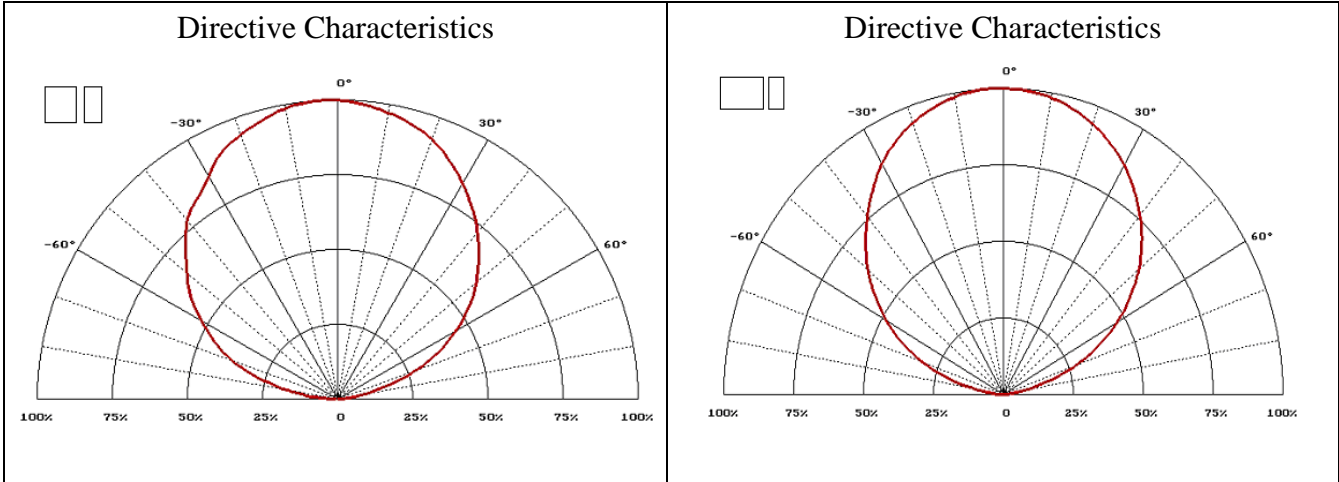
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Characteristic curves for TW



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Radiation Pattern



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Packaging

Tape Dimension

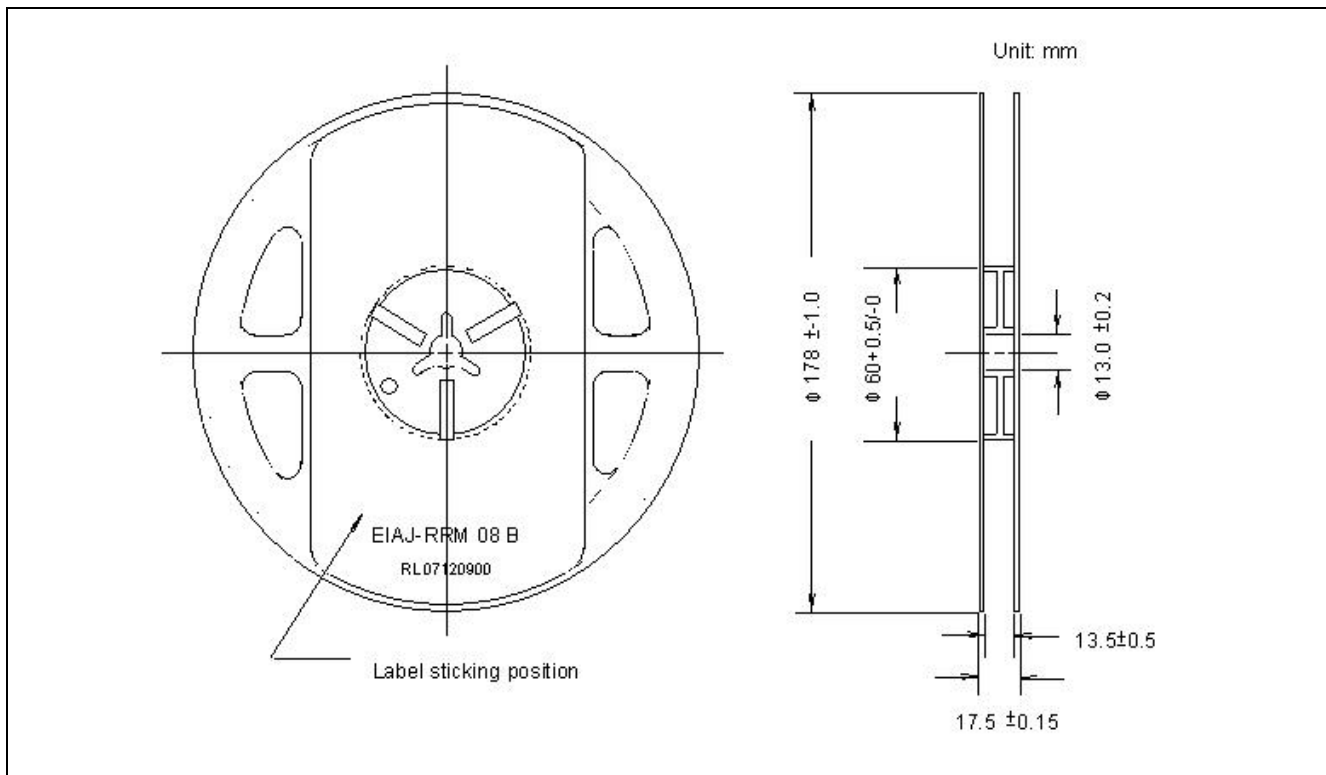


| Part No. | Dim. A | Dim. B | Dim. C | Q'ty/Reel |
|----------|-------------|-------------|-------------|-----------|
| HT-U16D | 3.7+/-0.1mm | 3.0+/-0.1mm | 1.5+/-0.1mm | 2K |

Unit: mm

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Reel Dimension



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Packing



5 boxes per carton is available depending on shipment quantity.

| | Specification | Material | Quantity |
|--------------|----------------------|-----------------------------------|------------------|
| Carrier tape | Per EIA 481-1A specs | Conductive black tape | 2000pcs per reel |
| Reel | Per EIA 481-1A specs | Conductive black | |
| Label | HT standard | Paper | |
| Packing bag | 220x240mm | Aluminum laminated bag/ no-zipper | One reel per bag |
| Carton | HT standard | Paper | Non-specified |

Others:

Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv, λ_D and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

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Dry Pack

All SMD optical devices are **MOISTURE SENSITIVE**. Avoid exposure to moisture at all times during transportation or storage. Every reel is packaged in a moisture protected anti-static bag. Each bag is properly sealed prior to shipment.

Upon request, a humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

The packaging sequence is as follows:



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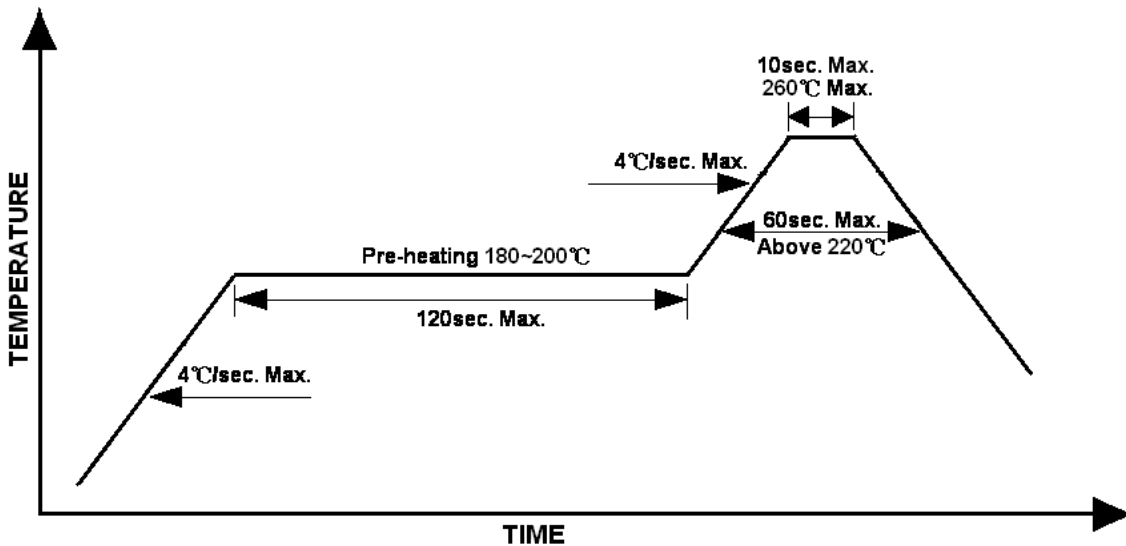
Reflow Soldering

- Recommended tin glue specifications: melting temperature in the range of 178~192 °C
- The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):

Lead Solder Profile



Lead-free Solder Profile



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Precautions

1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. 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.
4. Avoid operation beyond the limits as specified by the absolute maximum ratings.
5. Avoid direct contact with the surface through which the LED emits light.
6. If possible, assemble the unit in a clean room or dust-free environment.

Reworking

- Rework should be completed within 5 seconds under 260 °C.
- The iron tip must not come in contact with the copper foil.
- Twin-head type is preferred.

Cleaning

Following are cleaning procedures after soldering:

- An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.
- Temperature x Time should be 50°C x 30sec. or <30°C x 3min
- Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 °C max, <3min

Cautions of Pick and Place

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

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Revision History

| Changes since last revision | Page | Version No. | Revision Date |
|-----------------------------|------|-------------|---------------|
| New format | | 1.0 | 09-18-2008 |
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Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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