LITEON
OPTOELECTRONICS

# Specific Lighting

## Product Data Sheet

## LTPL-C035GH530

**Spec No.: DS23-2016-0106**

Effective Date: 12/14/2016

Revision: -

**LITE-ON DCC**

**RELEASE**

BNS-OD-FC001/A4

# Specific Lighting
# LTPL-C035GH530

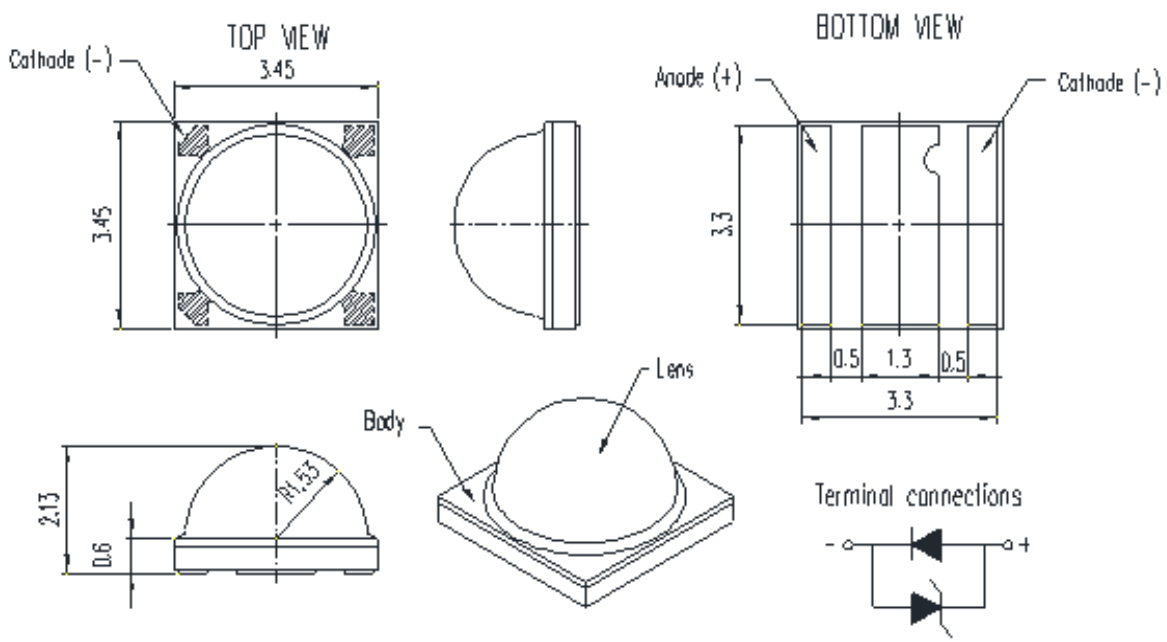
## 1. Description

The LiteON C034 Product is a revolutionary, energy efficient and ultra-compact new light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. It gives you total design freedom and unmatched brightness, creating a new opportunities for solid state lighting to displace conventional lighting technologies.

### Features

- I.C. compatible
- RoHS compliant and Pb free
- Lower operating costs
- Reduced maintenance costs

## 2. Outline Dimensions




**Notes :**

1. All dimensions are in millimeters and dimension tolerances are ± 0.2mm except lens height and ceramic length / width dimension tolerance are ± 0.1mm
2. Thermal pad of the device is electrically neutral from the anode and cathode pads

## 3. Absolute Maximum Ratings at Ta=25℃

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| DC Forward Current | *If* | 500 | mA |
| Power Consumption | *Po* | 1.9 | W |
| Operating Temp Range | *Topr* | -40 ~ +85 | °C |
| Storage Temp Range | *Tstg* | -55 ~ +100 | °C |
| Junction Temperature | *Tj* | 125 | °C |

**Notes:**

Operating the LED under reverse bias condition long time might result in damage or failure of the component.

## 4. Electro-Optical Characteristics at Ta=25°C

| Parameter | Symbol | Values | | Test Condition | Unit |
|---|---|---|---|---|---|
| Forward Voltage | *Vf* | Min. | 2.6 | If = 350mA | V |
| | | Typ. | 3.0 | | |
| | | Max. | 3.8 | | |
| Luminous Flux | *Im* | Min. | 90 | If = 350mA | mW |
| | | Typ. | 120 | | |
| | | Max | 150 | | |
| Dominant Wavelength | *Wd* | Min. | 520 | If = 350mA | nm |
| | | Max | 540 | | |
| Viewing Angle | $2\theta_{1/2}$ | Typ. | 130 | If = 350mA | ° |
| Thermal Resistance | $Rth_{jc}$ | Typ | 9 | --- | ˚C/W |

**Notes:**

1. Luminous flux (*Im*) is the total Luminous flux output as measured with an integrating sphere.
2. Thermal resistance (Junction to case) measurement tolerance is ± 10%

## 5. Bin Code List

| *Vf* : Forward Voltage Spec. Table | | |
|---|---|---|
| *Vf* Bin | *Vf* (V) @ *If* = 350mA | |
| | Min. | Max. |
| V0 | 2.6 | 3.0 |
| V1 | 3.0 | 3.4 |
| V2 | 3.4 | 3.8 |

Forward Voltage Tolerance: +/- 0.1 V

| *Im* : Luminous Flux Spec. Table | | |
|---|---|---|
| *Im* Bin | *Φe* (mW) @ *If* = 350mA | |
| | Min. | Max. |
| L1 | 90 | 110 |
| L2 | 110 | 130 |
| L3 | 130 | 150 |

Luminous Flux Tolerance: +/- 10%

| *Wd*: Dominant Wavelength Spec table | | |
|---|---|---|
| *Wd* Bin | *Wd* (nm) @ *If* = 350mA | |
| | Min. | Max. |
| D5E | 520 | 525 |
| D5F | 525 | 530 |
| D5G | 530 | 535 |
| D5H | 535 | 540 |

Dominant Wavelength Tolerance: +/- 3nm

Notes:

1. Bin classification code is marked on each packing bag.
2. If there is any special or limited bin request, please contact with LiteOn's sales

## 6. Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

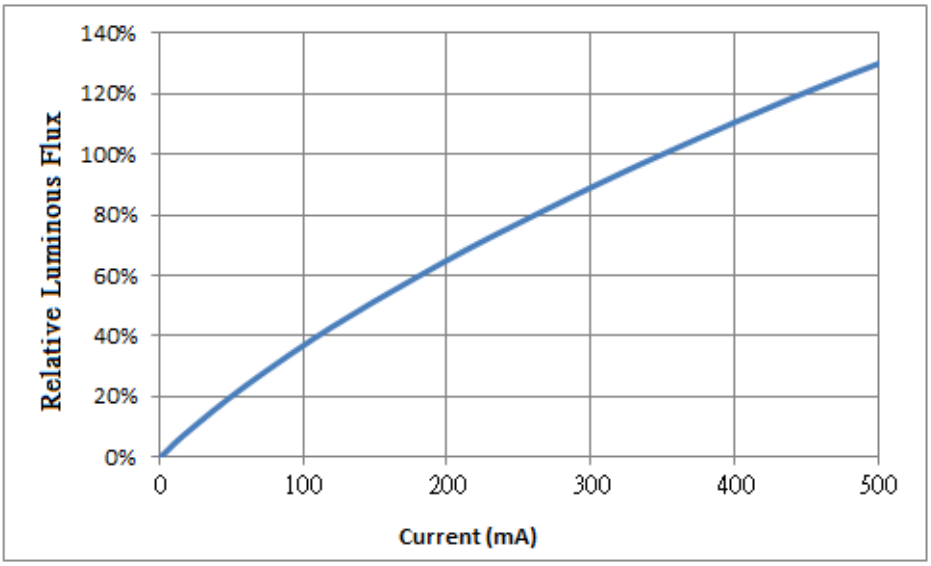



Fig 1. Relative Luminous Flux vs. Forward Current

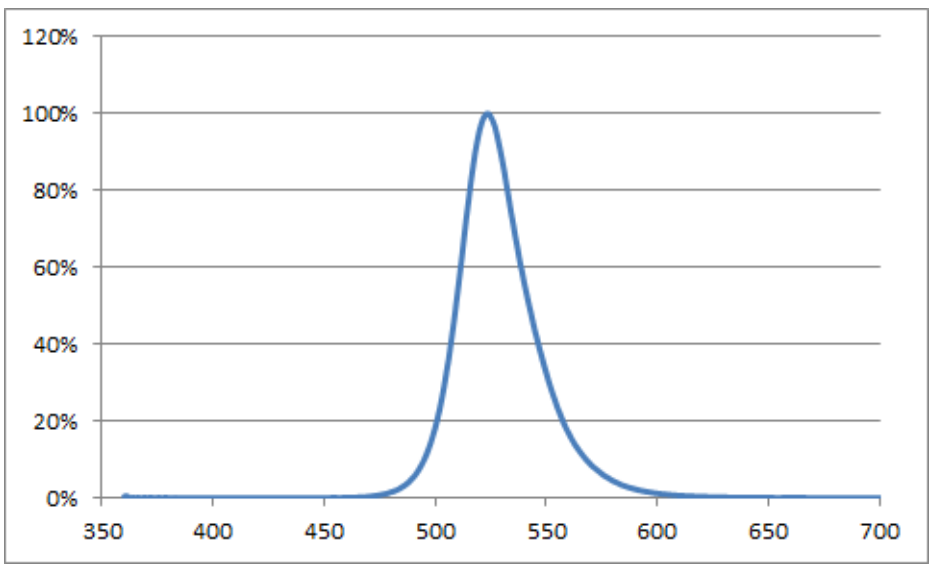



Fig 2. Relative Spectral Distribution

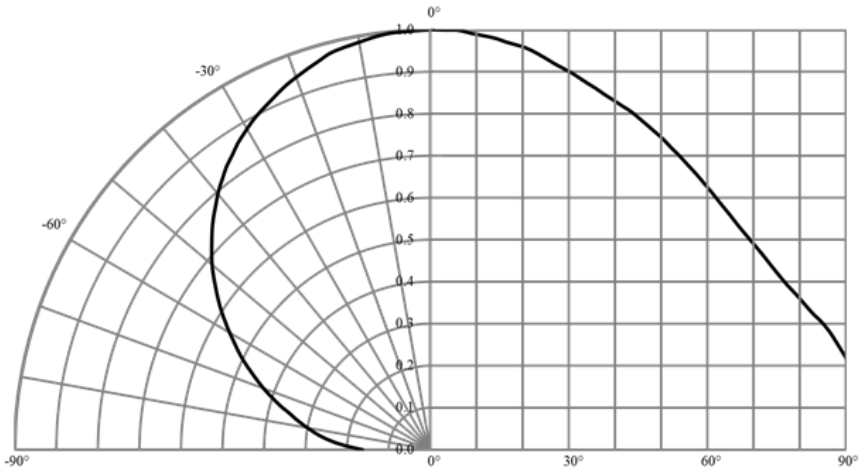



Fig 3. Radiation Characteristics

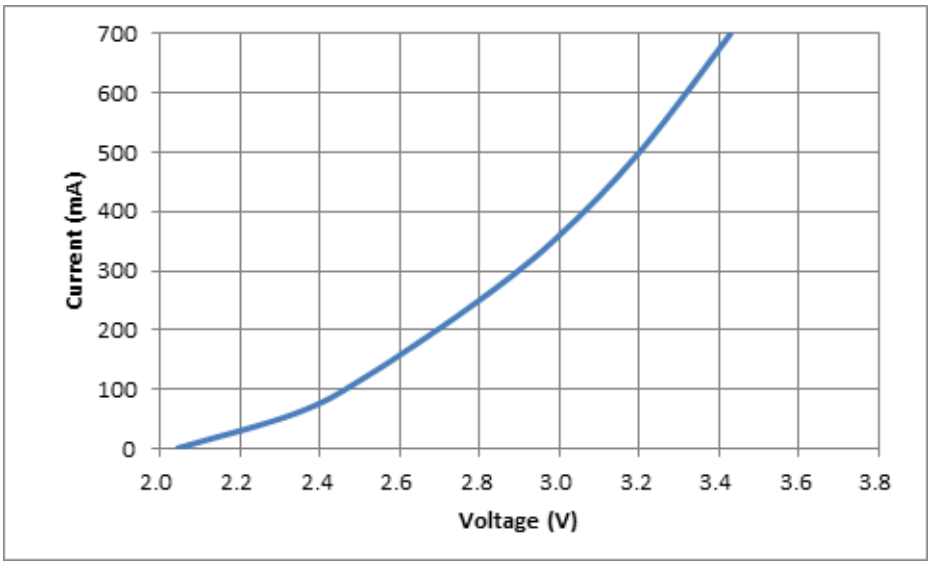



Fig 4. Forward Current vs. Forward Voltage

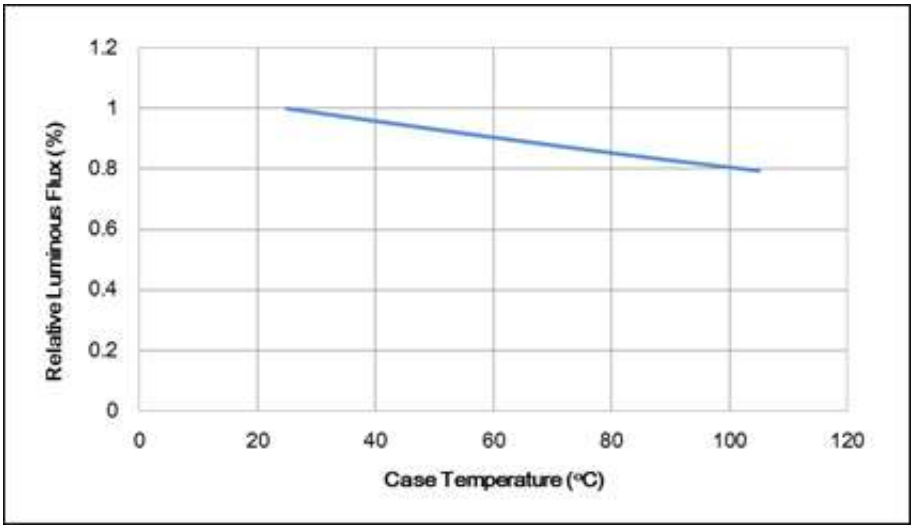



Fig.5 Relative Luminous Flux vs Case Temperature

## 7. Reliability Test Plan

| No | Test item | Condition | Duration | Number of Failed |
|---|---|---|---|---|
| 1 | Low Temperature Operating Life (LTOL) | Tc= -30°C, IF=350mA | 1000 hrs | 0/10 |
| 2 | Room Temperature Operating Life (RTOL) | 25°C, IF= 350mA | 1000 hrs | 0/10 |
| 3 | High Temperature Operating Life (HTOL) | Tc=85°C, IF= 60mA | 1000 hrs | 0/10 |
| 4 | Wet High Temperature Operating Life (WHTOL) | 60°C/90%RH, IF= 350mA | 500 hrs | 0/10 |
| 5 | Non-Operating Thermal Shock (TMSK) | -40°C to 125°C<br>30minutes dwell, <10 seconds transfer | 100 cycles | 0/10 |
| 6 | High temperature storage | $T_A$=100°C | 1000 hrs | 0/10 |

**Notes:**

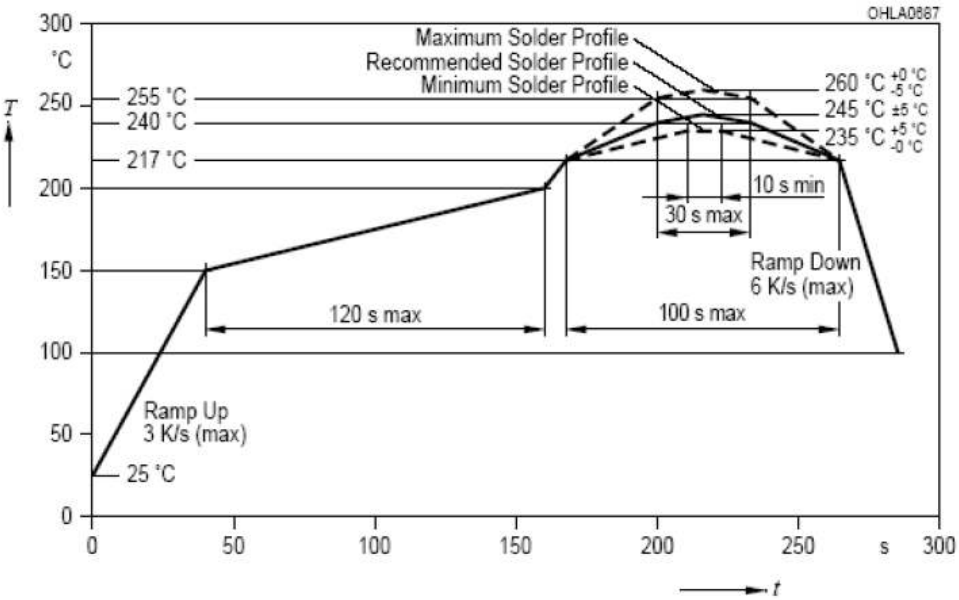
1. Operating life test are mounted on thermal heat sink
2. Storage item are only component, not put on heat sink.

Criteria for Judging the Damage

| Item | Symbol | Test Condition | Criteria for Judgment | |
|---|---|---|---|---|
| | | | Min. | Max. |
| Forward Voltage | *Vf* | *If* = Typical Current | -10% | +10% |
| Luminous Flux | *Im* | *If* = Typical Current | -15% | +15% |

## 8. User Guide

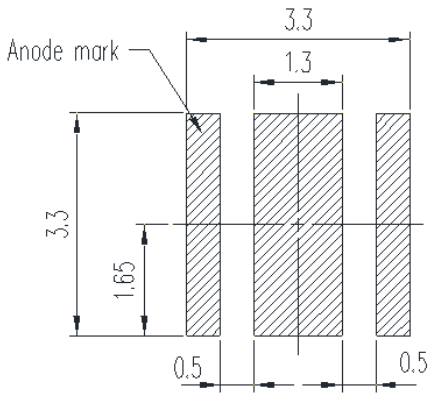
### Suggested Reflow Soldering Characteristics




Notes:

1. All temperatures refer to topside of the package, measured on the package body surface.
2. The soldering profile could be further referred to different soldering grease material characteristic. The grease vendor will provide this information.
3. A rapid-rate process is not recommended for the LEDs cooling down from the peak temperature.
4. Although the recommended reflow conditions are specified above, the reflow or hand soldering condition at the lowest possible temperature is desirable for the LEDs.
5. LiteOn cannot make a guarantee on the LEDs which have been already assembled using the dip soldering method.

## Recommend Printed Circuit Board Attachment Pad




**Notes:**

1. The LEDs can be soldered using the reflow soldering or hand soldering method. The recommended hand soldering condition is 300°C max. and 2secs max. only once, and the operation of reflow soldering is only up to three times at maximum.
2. All temperatures refer to topside of the package, measured on the package body surface.
3. The soldering profile could be further referred to different soldering grease material characteristic. The grease vendor will provide this information.
4. A rapid-rate process is not recommended for the LEDs cooling down from the peak temperature.
5. Although the recommended reflow conditions are specified above, the reflow or hand soldering condition at the lowest possible temperature is desirable for the LEDs.
6. LiteOn cannot make a guarantee on the LEDs which have been already assembled using the dip soldering method.

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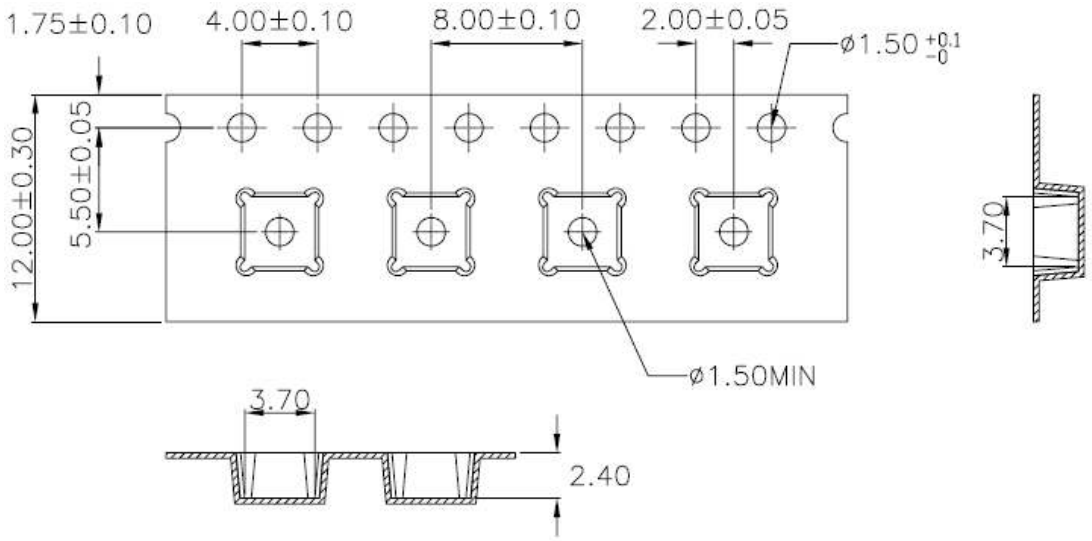
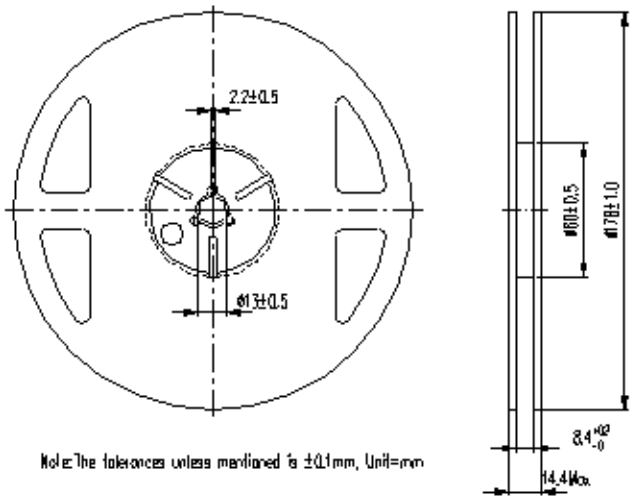
## Package Dimensions of Tape




## Package Dimensions of Reel




**Notes:**

1. Empty component pockets sealed with top cover tape.
2. 7 inch reel-maximum 500 pieces per reel.
3. The maximum number of consecutive missing lamps is two.
4. In accordance with EIA-481-1-B specifications.

## 9. Cautions

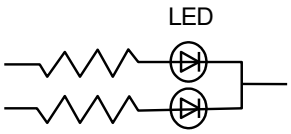
### Cleaning

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED if necessary.

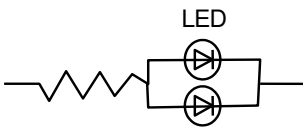
Do not use unspecified chemical liquid to clean LED, it could harm the package.

### Drive Method

An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit below.




Circuit model A




Circuit model B

(A) Recommended circuit.

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

(C) This LED should be used under forward current, particularly not used under continuous reverse current to avoid the damage to LED.

The electrode pads are plated with gold, but it is still not recommended to the use under any of the following conditions, please confirm the performance and reliability are well enough if you use it under any of the following conditions

・Do not use sulfur-containing materials in commercial products including the materials such as seals and adhesives that may contain sulfur.

・Do not put this product in a place with a lot of moisture (over 85% relative humidity), dew condensation, briny air, and corrosive gas (Cl, H2S, NH3, SO2, NOX, etc.).

### Manual Handling Remark

The LED should only be picked up by making contact with the sides of the LED body. It should not put any pressure on the lens either by finger or any hand tool. Do not puncture or push the lens.

## ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no light up" at low currents. To verify for ESD damage, check for "light up" and $V_F$ of the suspect LEDs at low currents. The $V_F$ of "good" LEDs should be >2.0V@0.5mA.

Training and Certification

1. Working area is ESD-certified.
2. Training records and re-certification dates monitored.

Static-Safe Workstation & Work Areas

1. Static-safe working stations or work-areas have ESD signs.
2. All surfaces and objects at all static-safe workstation and within 1 ft measure less than 100V.
3. All ionizer activated, positioned towards the units.
4. Each work surface mats grounding is good.

Personnel Grounding

1. Every person (including visitors) handling ESD sensitive (ESDS) items wear wrist strap, heel strap or conductive shoes with conductive flooring.
2. If conductive footwear used, conductive flooring also present.
3. Garments, hairs or anything closer than 1 ft to ESD items measure less than 100V.
4. The wrist strap or heel strap/conductive shoes are checked daily and result recorded.
5. All wrist strap or heel strap checkers calibration up to date.

Device Handling

1. Each ESDS items identified by EIA-471 labels on item or packaging..
2. No static charge generators (e.g. plastics) inside shielding containers with ESDS items.
3. All flexible conductive and dissipative package materials are inspected before reuse or recycles

## Storage

This product is qualified as Moisture sensitive Level 3 per JEDEC J-STD-020 Precaution when handling this moisture sensitive product is important to ensure the reliability of the product.

The package is sealed:

The LEDs should be stored at 30°C or less and 85%RH or less. And the LEDs are limited to use within one year, while the LEDs is packed in moisture-proof package with the desiccants inside.

The package is opened:

The LEDs should be stored at 30°C or less and 60%RH or less. The LEDs are limited to solder process within 168hrs. If the Humidity Indicator shows the pink color in 10% even higher or exceed the storage limiting time since opened, we recommended to baking LEDs at 60°C at least 24hours before solder. To seal the remainder LEDs return to package, it's recommended to be with workable desiccants in original package.

## 10. Datasheet Version:

| Version | Date | Owner | Change Item |
|---|---|---|---|
| 1. | 2016/6/14 | ChunChieh | Initial Version |
| 2. | 2016/8/29 | ChunChieh | Change Radiant Flux Bin to Luminous Flux Bin P.4<br>Change Peak Wavelength Bin to Dominant Wavelength Bin P.4 |