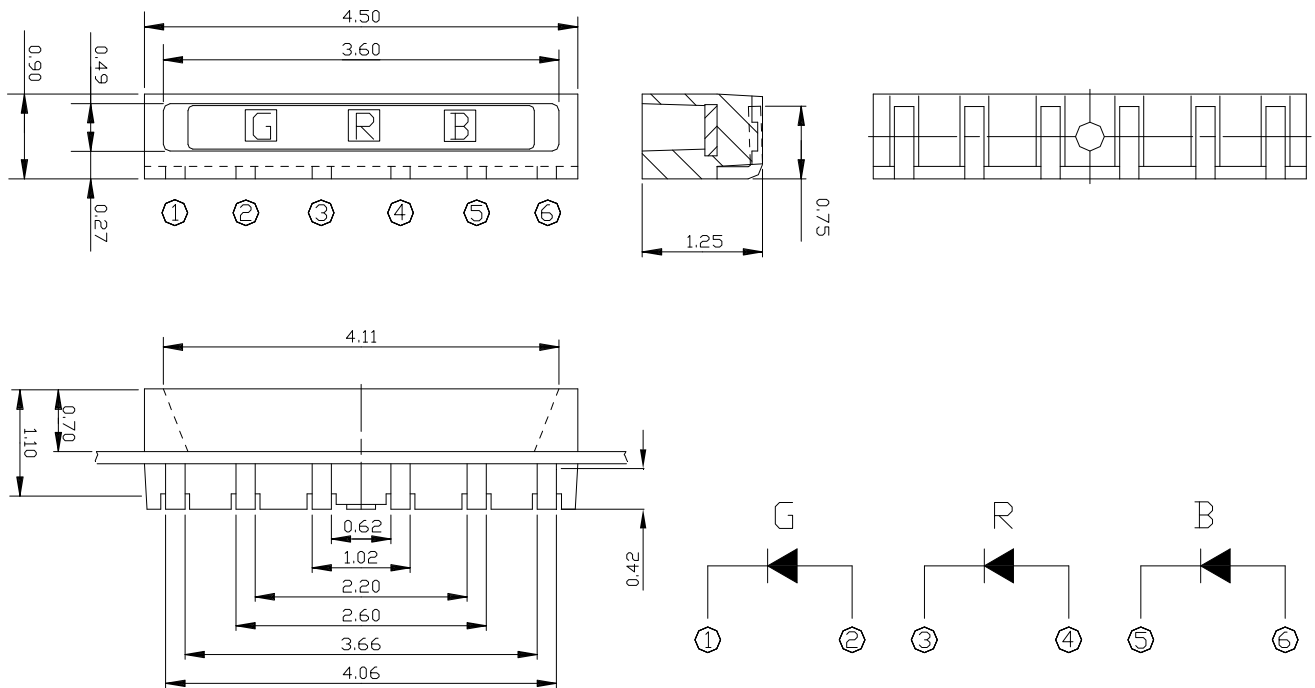


Property of Lite-On Only

Features

- * Package in 12mm tape on 7" diameter reels.
- * Compatible with automatic placement equipment.
- * Compatible with infrared and vapor phase reflow solder process.
- * EIA STD package.
- * I.C. compatible.
- * Meet green product and Pb-free(According to RoHS)

Package Dimensions



| Part No. | Lens Color | Source Color |
|--------------|----------------|--------------|
| LTW-008RGB-L | White Diffused | InGaN Blue |
| | | InGaN Green |
| | | AlInGaP Red |

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.1 mm (.004") unless otherwise noted.

Property of Lite-On Only

Absolute Maximum Ratings at Ta=25 °C

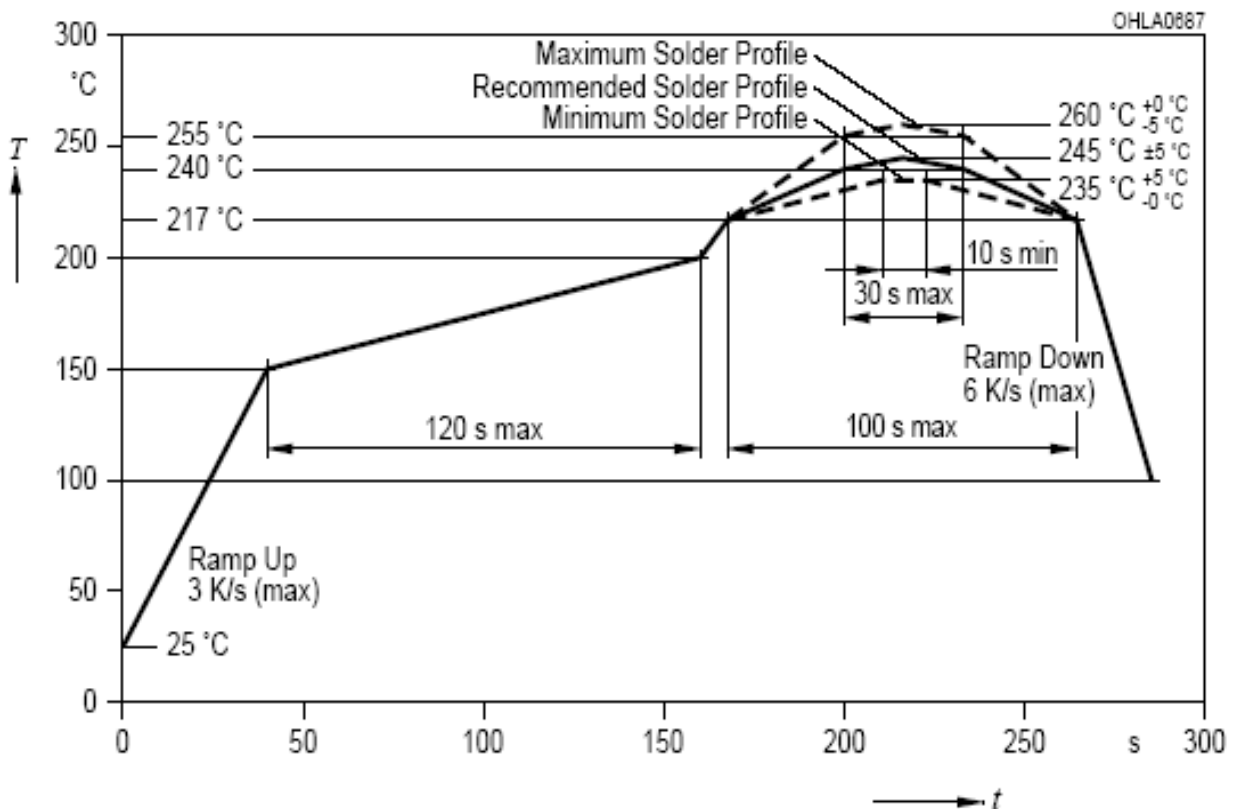
| Parameter | Symbol | Rating | | | Unit |
|-----------------------------------|-----------|----------------------|-----|-----|------|
| | | R | G | B | |
| Power Dissipation | P_o | 75 | 120 | 120 | mW |
| Peak Forward Current ¹ | I_{FP} | 100 | 100 | 100 | mA |
| Continuous Forward Current | I_F | 30 | 30 | 30 | mA |
| Reverse Voltage | V_R | 5 | | | V |
| Operating Temperature Range | T_{opr} | -40 ~ +85 | | | °C |
| Storage Temperature Range | T_{stg} | -40 ~ +100 | | | °C |
| Soldering Condition | T_{sol} | 260°C For 10 Seconds | | | |

Note:

1. Reverse Voltage can't be continued operating.
2. 1/10 Duty Cycle, 0.1ms Pulse Width.

Suggestion IR Reflow Profile For Pb Free Process :

IR-Reflow Soldering Profile for lead free soldering (Acc. to J-STD-020D)



Property of Lite-On Only

Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Values | | | | Test Condition | Unit |
|----------------------------------|-----------------|--------|------|------|------|--|---------------|
| | | | R | G | B | | |
| Luminous flux ¹ | Φ_v | Min | 1.27 | 1.86 | 0.26 | R: $I_F = 20\text{mA}$ G: $I_F = 20\text{mA}$ B: $I_F = 20\text{mA}$ | lm |
| | | Typ. | | | | | |
| | | Max. | 1.79 | 3.19 | 0.79 | | |
| Luminous Intensity | IV | Min | 500 | 700 | 100 | R: $I_F = 20\text{mA}$ G: $I_F = 20\text{mA}$ B: $I_F = 20\text{mA}$ | mcd |
| | | Typ. | | | | | |
| | | Max. | 700 | 1200 | 300 | | |
| Viewing Angle | $2\theta_{1/2}$ | Typ. | 120 | | | $I_F = 20\text{mA}$ | ° |
| Dominant Wavelength ² | λ_d | Min | 610 | 520 | 455 | R: $I_F = 20\text{mA}$ G: $I_F = 20\text{mA}$ B: $I_F = 20\text{mA}$ | nm |
| | | Typ. | | | | | |
| | | Max. | 620 | 530 | 465 | | |
| Peak Wavelength | λ_p | Min | | | | R: $I_F = 20\text{mA}$ G: $I_F = 20\text{mA}$ B: $I_F = 20\text{mA}$ | nm |
| | | Typ. | 623 | 518 | 455 | | |
| | | Max. | | | | | |
| Forward Voltage ³ | V_F | Min | 1.8 | 2.7 | 2.7 | R: $I_F = 20\text{mA}$ G: $I_F = 20\text{mA}$ B: $I_F = 20\text{mA}$ | V |
| | | Typ. | | | | | |
| | | Max. | 2.4 | 3.3 | 3.3 | | |
| Luminous Flux | Φ_v | Typ. | 1.57 | 2.66 | 0.49 | $I_F = 20\text{mA}$ | lm |
| Reverse Current | I_R | Max. | 10 | | | $V_R = 5\text{V}$ | μA |
| Spectrum Radiation Bandwidth | $\Delta\lambda$ | Typ. | 20 | 33 | 22 | $I_F = 20\text{mA}$ | nm |

Note :

1. Tolerance of Luminous Flux +/- 10%
2. Tolerance of Dominant Wavelength +/- 1nm
3. Tolerance of Forward Voltage +/- 0.1V
4. Caution in ESD:

Static Electricity and surge damages the LED. It is recommend to use a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.

5. CAS140B is the test standard for the chromaticity coordinates Lm.

Property of Lite-On Only

Bin Code List

| VF Spec. Table | | | | |
|---|-----------|-----------|-----------|-----------|
| Forward Voltage (V) at I_F : R=20mA, G=20mA, B=20mA | | | | |
| Rank | | | | |
| Red | 1.8 – 2.1 | | 2.1 – 2.4 | |
| Green | 2.7 – 3.0 | 3.0 – 3.3 | 2.7 – 3.0 | 3.0 – 3.3 |
| Blue | | | | |
| 2.7 – 3.0 | V00 | V10 | W00 | W10 |
| 3.0 – 3.3 | V01 | V11 | W01 | W11 |

Tolerance on each Forward Voltage bin is +/- 0.10volt.

| Lm Spec. Table | | | | | |
|--|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|
| Luminous Flux (lm) at I_F : R=20mA, G=20mA, B=20mA | | | | | |
| Rank | | | | | |
| Red | 1.27 – 1.79 (*500 – 700) | | | | |
| Green | 1.86 – 2.13 (*700 – 800) | 2.13 – 2.39 (*800 – 900) | 2.39 – 2.66 (*900 – 1000) | 2.66 – 2.92 (*1000-1100) | 2.92 – 3.19 (*1100-1200) |
| Blue | | | | | |
| 0.26 – 0.52 (*100 – 200) | A21 | A31 | A41 | A51 | A61 |
| 0.52 – 0.79 (*200 – 300) | A22 | A32 | A42 | A52 | A62 |

Tolerance on each Luminous Flux bin is +/- 10%.

* Luminous intensity (mcd)

Bin Code List

| λ_D Spec. Table | | |
|---|-----------|-----------|
| Dominated Wavelength (nm) at I_F : R=20mA, G=20mA, B=20mA | | |
| Rank | | |
| Red | 610 – 620 | |
| Blue \ Green | 520 – 525 | 525 – 530 |
| 455 – 460 | M | N |
| 460 – 465 | P | R |

Tolerance on each Dominated Wavelength bin is +/- 1nm.

Property of Lite-On Only

Typical Electrical / Optical Characteristics Curve

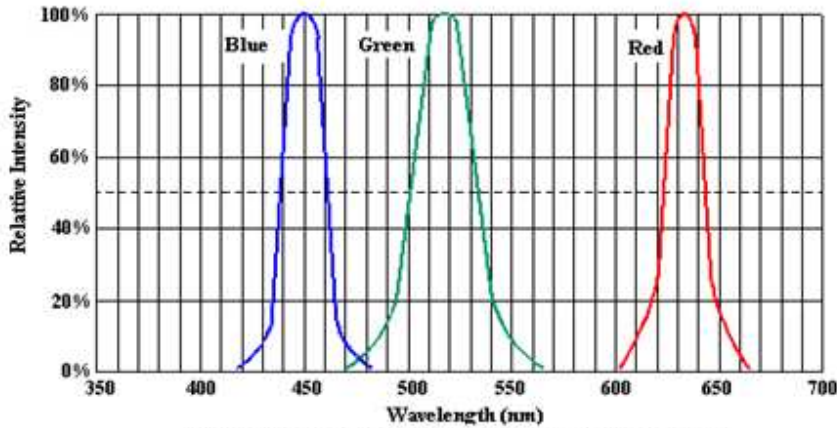
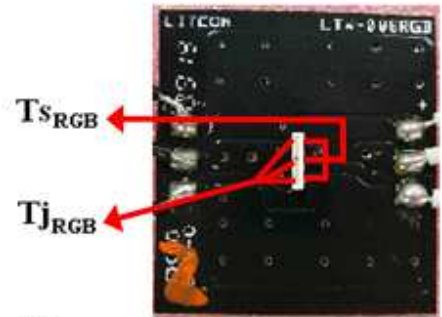


Fig.1 Relative Intensity vs Dominant Wavelength



Ts: Soldering Pin Temperature

Tj: Junction Temperature

Tb: Board Temperature

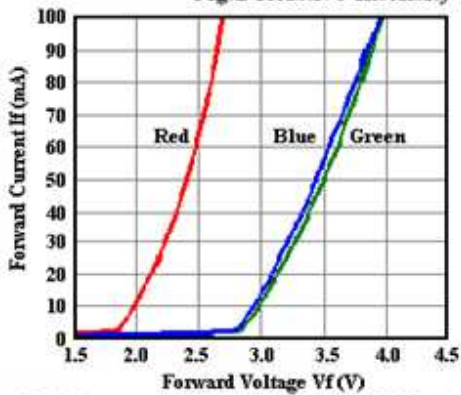


Fig.2 Forward Current vs Forward Voltage

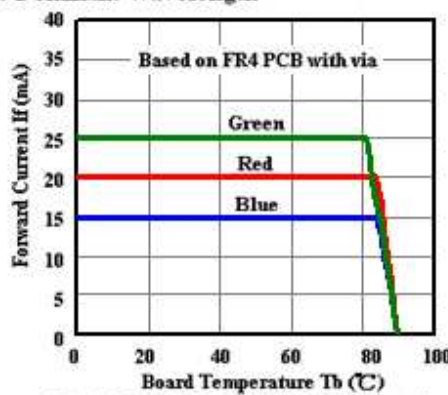


Fig.3 Forward Current Derating Curve

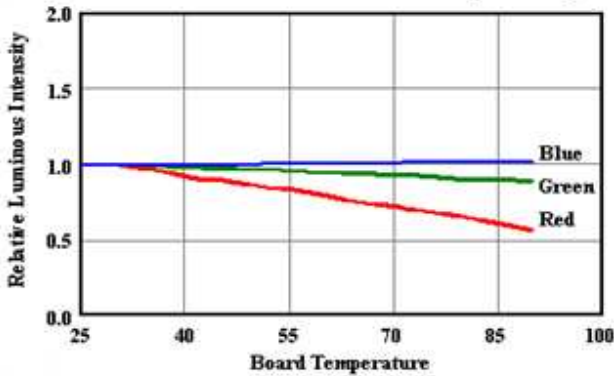


Fig.5 Luminous Intensity vs Board Temperature
(The characteristic curve are the same as R, G and B chip lighting up simultaneously)

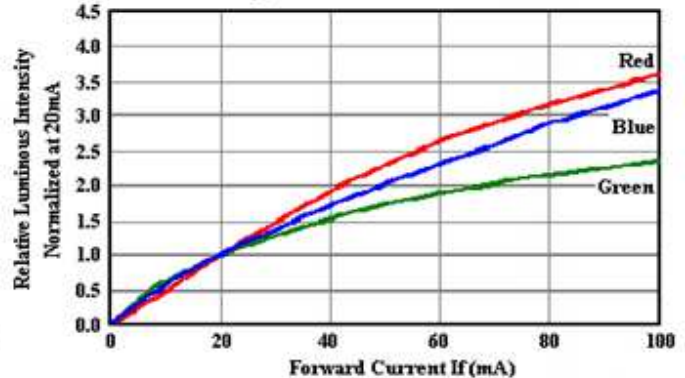


Fig.4 Relative Luminous Intensity vs Forward Current

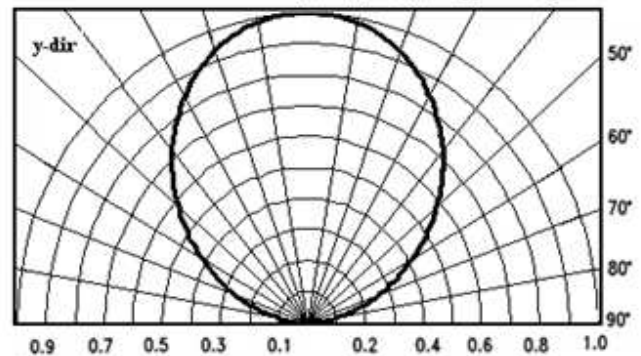
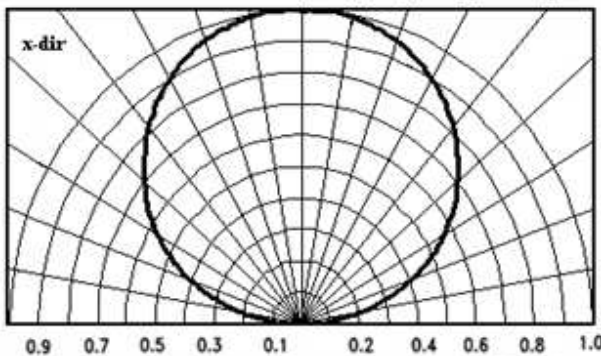


Fig.6 Spatial Distribution

Property of Lite-On Only

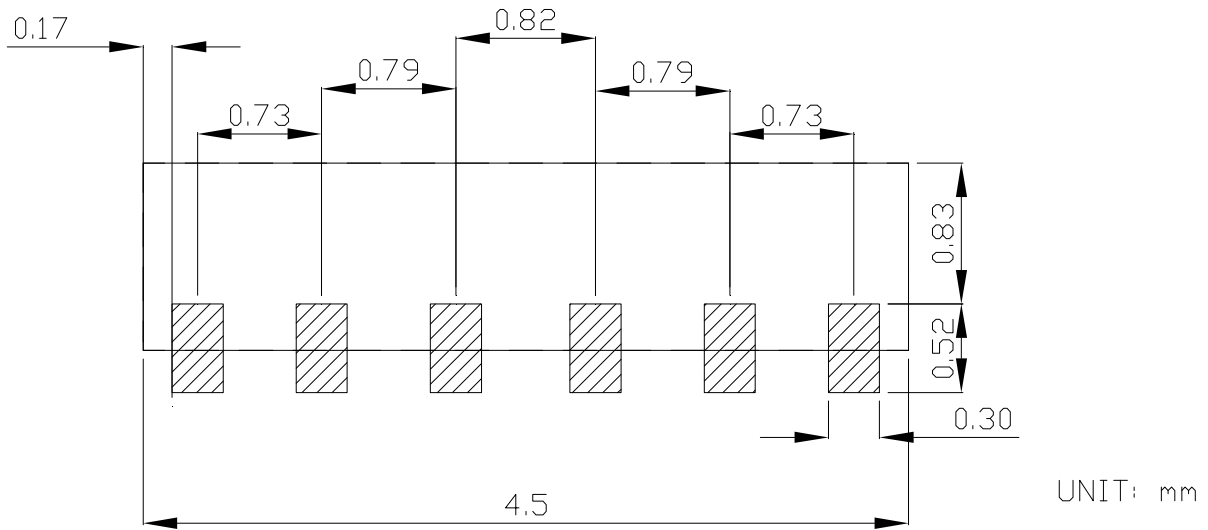
User Guide

Cleaning

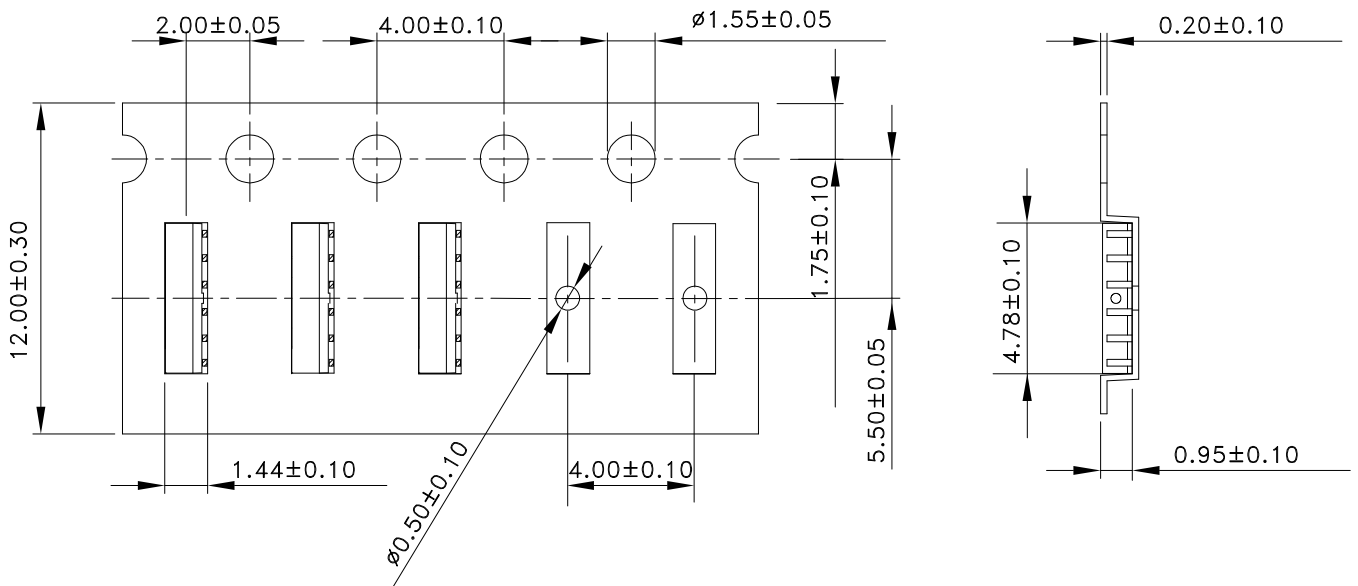
Do not use unspecified chemical liquid to clean LED they could harm the package.
If cleaning is necessary, immerse the LED in ethyl alcohol or isopropyl alcohol at normal temperature for less one minute.

Recommend Printed Circuit Board Attachment Pad

Infrared / vapor phase
Reflow Soldering



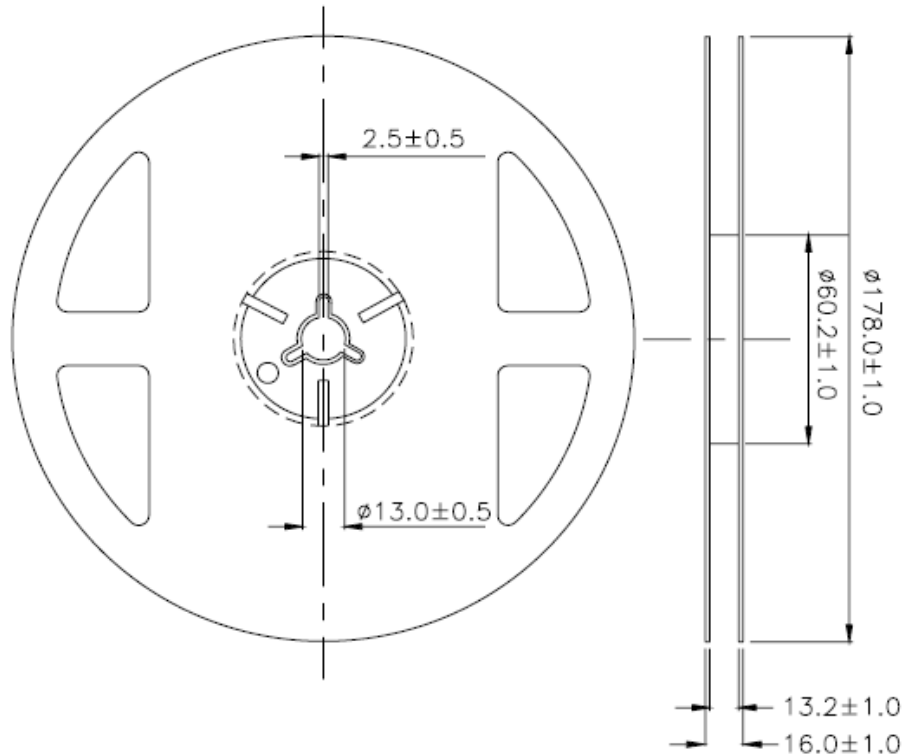
Package Dimensions of Tape



Note:

1.All dimensions are in millimeters.

Property of Lite-On Only

Package Dimensions of Reel

Note: Tolerances Unless Dimension ± 0.1 mm ,Unit = mm

The material of reel was PC.

Notes:

1. Empty component pockets sealed with top cover tape.
2. 7 inch reel-2000 pieces per reel.
3. The maximum number of consecutive missing lamps is two.
4. In accordance with EIA-481-1-B specifications.
5. Vacate 20 cm (min) on start of packing tape and vacate 50 cm (min) on last of packing tape.

CAUTIONS

1. Application

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). Consult Liteon's Sales in advance for information on applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).

2. 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 90%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. Moreover, 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, that we recommended to baking LEDs at 60°C at least 48hrs. To seal the remainder LEDs return to package, it's recommended to be with workable desiccants in original package.

3. Cleaning

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

4. Soldering

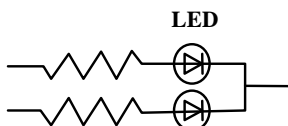
Recommended soldering conditions:

| Reflow soldering | | Soldering iron | |
|------------------|---------------|----------------|-----------------|
| Pre-heat | 120~150°C | Temperature | 300°C Max. |
| Pre-heat time | 120 sec. Max. | Soldering time | 3 sec. Max. |
| Soldering Temp. | 260°C Max. | | (one time only) |
| Soldering time | 30 sec. Max. | | |

5. Drive Method

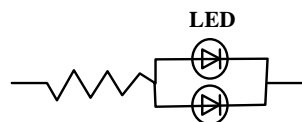
An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

Circuit model A



(A) Recommended circuit.

Circuit model B



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

Property of Lite-On Only

6. ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED.

Suggestions to prevent ESD damage:

- Use of 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 Vf of the suspect LEDs at low currents.

The Vf of "good" LEDs should be $>2.0V @ 0.1mA$ for InGaN product.

7.1 Reliability Test

| Test Item | Test Condition | Reference Standard | Note | Number of Damaged |
|---|--|--------------------------|--------------------|-------------------|
| Solderability (Reflow Soldering) | Tsld=245±5°C, 3sec. (Lead Free Solder) | JEITA ED-4701 300 303 | 1 time Over 95% | 0/50 |
| Thermal Shock | -30°C ~ 85°C 30min. 30min. | JEITA ED-4701 300 307 | 100 cycles | 0/50 |
| Temperature Cycle | -40°C ~ 25°C ~ 100°C ~ 25°C 30min. 5min. 30min. 5min. | JEITA ED-4701 100 105 | 100 cycles | 0/50 |
| High Temperature Storage | Ta=100°C | JEITA ED-4701 200 201 | 1000 hrs. | 0/50 |
| Temperature Humidity Storage | Ta=60°C, RH=90% | JEITA ED-4701 100 103 | 1000 hrs. | 0/50 |
| Low Temperature Storage | Ta=-40°C | JEITA ED-4701 200 202 | 1000 hrs. | 0/50 |
| Steady State Operating Life Condition 1 | Ta=25°C, IF=20mA | | 1000 hrs. | 0/50 |
| Steady State Operating Life Condition 2 | Ta=25°C, IF=30mA | | 500 hrs. | 0/50 |
| Steady State Operating Life of High Temperature | Ta=85°C, IF=5mA | | 1000 hrs. | 0/50 |
| Steady State Operating Life of High Humidity Heat | 60°C, RH=90%, IF=15mA | | 500 hrs. | 0/50 |
| Steady State Operating Life of low Temperature | Ta=-30°C, IF=20mA | | 1000 hrs. | 0/50 |

7.2 Criteria for Judging the Damage

| Item | Symbol | Test Conditions | | Criteria for Judgment | |
|--------------------|--------|-----------------|---|-----------------------|----------------|
| | | | | Min. | Max. |
| Forward Voltage | VF | IF=20mA | - | - | U.S.L.*) × 1.1 |
| Reverse Current | IR | VR=5V | - | - | U.S.L.*) × 2.0 |
| Luminous Intensity | IV | IF=20mA | - | U.S.L.***) × 0.7 | - |

8. Others

The appearance and specifications of the product may be modified for improvement without prior notice.

9. Suggested Checking List

Training and Certification

1. Everyone working in a static-safe area is ESD-certified?
2. Training records kept and re-certification dates monitored?

Static-Safe Workstation & Work Areas

1. Static-safe workstation 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 where operator stand or walk?
3. Garments, hairs or anything closer than 1 ft to ESD items measure less than 100V*?
4. Every wrist strap or heel strap/conductive shoes checked daily and result recorded for all DLs?
5. All wrist strap or heel strap checkers calibration up to date?

Note: *50V for Blue LED.

Device Handling

1. Every ESDS items identified by EIA-471 labels on item or packaging?
2. All ESDS items completely inside properly closed static-shielding containers when not at static-safe workstation?
3. No static charge generators (e.g. plastics) inside shielding containers with ESDS items?
4. All flexible conductive and dissipative package materials inspected before reuse or recycle?

Others

1. Audit result reported to entity ESD control coordinator?
2. Corrective action from previous audits completed?
3. Are audit records complete and on file?