LIGITEK ELECTRONICS CO.,LTD.
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LED SMD

Lead-Free Parts

# LG-110RGB-C-CT

# DATA SHEET

DOC. NO : QW0905-LG-110RGB-C-CT

REV. : A

DATE : 04 - Feb. - 2015

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## Features:

1. Package in 8.0mm carrier tape on 7" diameter reel.

2. Compatible with automatic placement equipment.

3. Compatible with reflow solder process.

## Descriptions:

1. The LG-110 SMD Taping is much smaller than lead frame type components, thus enable smaller board size, higher packing density, reduced storage space and finally smaller equipment to be obtained.

2. Besides, lightweight makes them ideal for miniature applications. etc.

## Applications:

1. Automotive : backlighting in dashboard and switch.

2. Telecommunication : indicator and backlighting in telephone and fax.

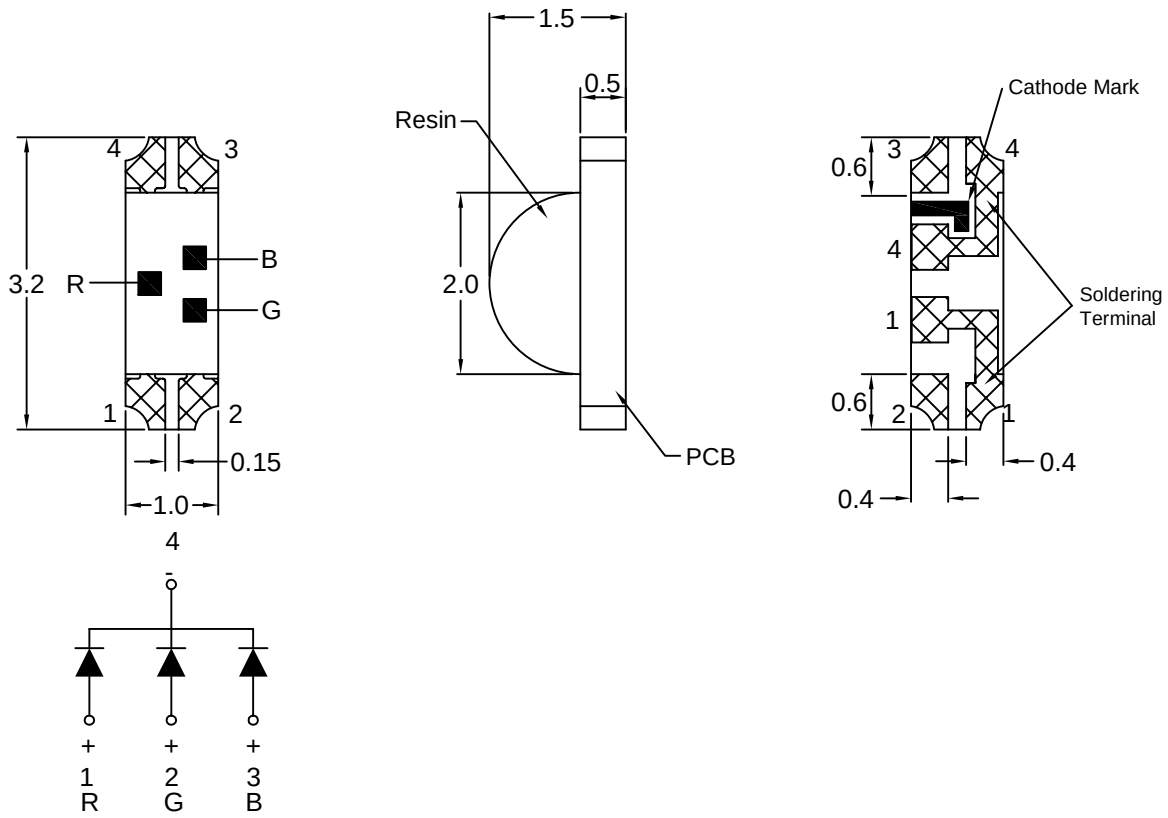
3. Flat backlight for LCD, switch and symbol

4. General use.

## Device Selection Guide:

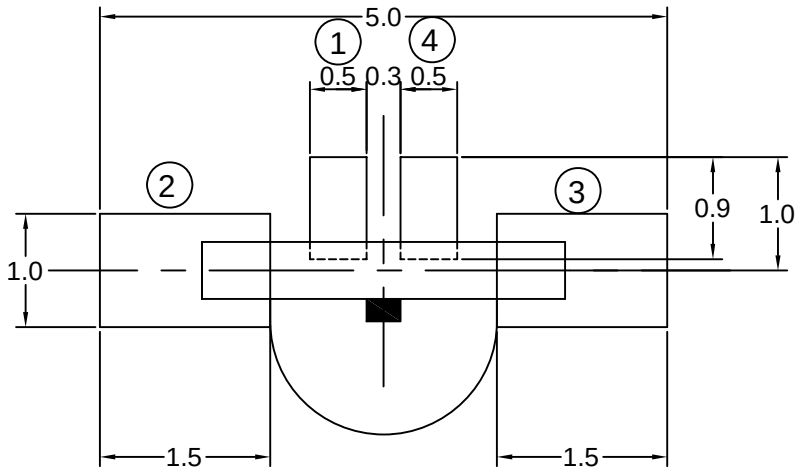
| PART NO | MATERIAL | COLOR | |
|---|---|---|---|
| | | Emitted | Lens |
| LG-110RGB-C-CT | AlGaInP | Red | Water Clear |
| | InGaN | Green | |
| | InGaN | Blue | |

## Package Dimensions




Note : 1.All dimension are in millimeter tolerance is ±0.1mm unless otherwise noted.
2.Specifications are subject to change without notice.

## Recommended Soldering Pad Dimensions




Note : The tolerances unless mentioned is ±0.1mm,Angle±0.5. Unit=mm.

# Absolute Maximum Ratings at Ta=25℃

| Parameter | Symbol | Ratings | | | UNIT |
|---|---|---|---|---|---|
| | | HRFS | DGM | DBK | |
| Power Dissipation | PD | 78 | 108 | 108 | mW |
| Peak Forward Current Duty 1/10@10KHz | $I_{FP}$ | 60 | 100 | 100 | mA |
| Forward Current | $I_F$ | 30 | 30 | 30 | mA |
| Reverse Current @5V | Ir | 10 | 50 | 50 | μA |
| Electrostatic Discharge | ESD | 2000 | 500 | 500 | V |
| Operating Temperature | $T_{opr}$ | -20 ~ + 80 | | | ℃ |
| Storage Temperature | Tstg | -30 ~ + 100 | | | ℃ |

# Typical Electrical & Optical Characteristics (Ta=25℃)

| Items | Symbol | | Min. | Typ. | Max. | UNIT | CONDITION |
|---|---|---|---|---|---|---|---|
| Luminous Intensity | Iv | HRFS | 125 | 320 | ---- | mcd | IF=20mA |
| | | DGM | 320 | 550 | ---- | | |
| | | DBK | 80 | 150 | ---- | | |
| Dominant Wavelength | λD | HRFS | ---- | 625 | ---- | nm | IF=20mA |
| | | DGM | ---- | 525 | ---- | | |
| | | DBK | ---- | 470 | ---- | | |
| Spectral Line Half-Width | △λ | HRFS | ---- | 20 | ---- | nm | IF=20mA |
| | | DGM | ---- | 36 | ---- | | |
| | | DBK | ---- | 30 | ---- | | |
| Forward Voltage | $V_F$ | HRFS | 1.7 | ---- | 2.6 | V | IF=20mA |
| | | DGM | 2.8 | ---- | 3.6 | | |
| | | DBK | 2.8 | ---- | 3.6 | | |
| Viewing Angle | 2θ 1/2 | HRFS | ---- | 120 | ---- | deg | IF=20mA |
| | | DGM | ---- | 120 | ---- | | |
| | | DBK | ---- | 120 | ---- | | |

# Luminous Intensity Classification

| BIN CODE | | Iv(mcd) at 20mA | |
|---|---|---|---|
| | | Min. | Max. |
| HRFS | R | 125 | 200 |
| | S | 200 | 320 |
| | T | 320 | 500 |

| BIN CODE | | Iv(mcd) at 20mA | |
|---|---|---|---|
| | | Min. | Max. |
| DGM | T | 320 | 500 |
| | U | 500 | 800 |
| | V | 800 | 1250 |

| BIN CODE | | Iv(mcd) at 20mA | |
|---|---|---|---|
| | | Min. | Max. |
| DBK | Q | 80 | 125 |
| | R | 125 | 200 |
| | S | 200 | 320 |

# Typical Electro-Optical Characteristics Curve

## HRFS CHIP

Fig.1 Forward current vs. Forward Voltage

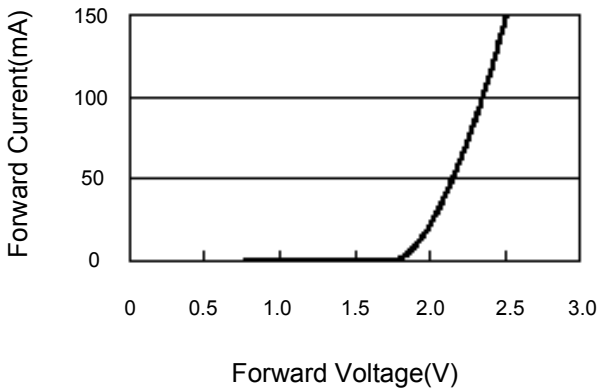



Fig.2 Luminous Intensity vs. Forward Current

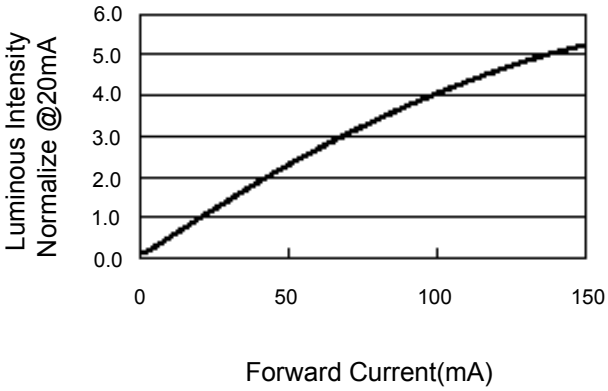



Fig.3 Forward Voltage vs. Temperature

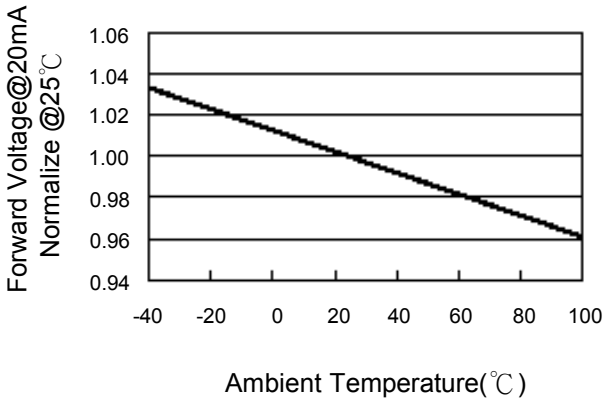



Fig.4 Luminous Intensity vs. Temperature

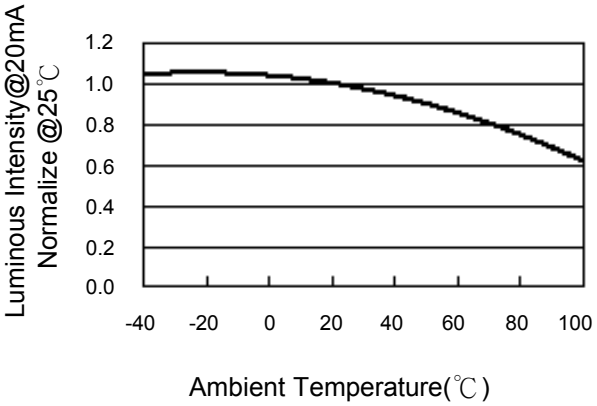



Fig.5 Relative Intensity vs. Wavelength

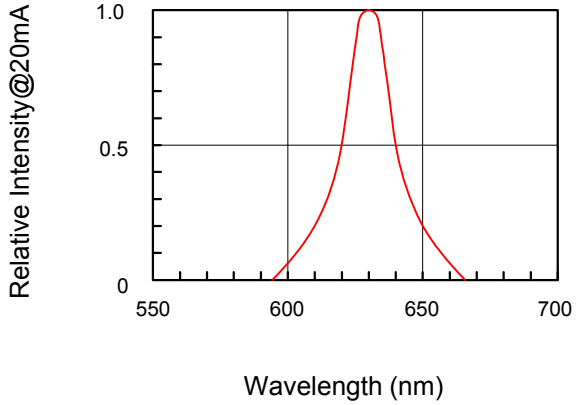
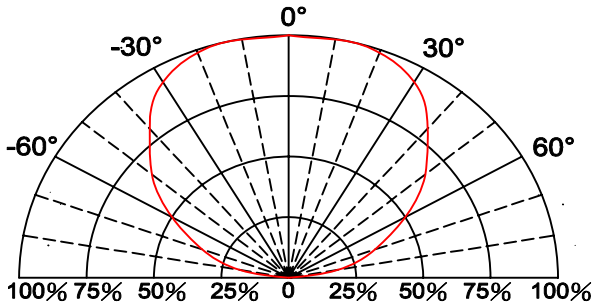



Fig.6 Directive Radiation



# Typical Electro-Optical Characteristics Curve

DGM CHIP

Fig.1 Forward current vs. Forward Voltage

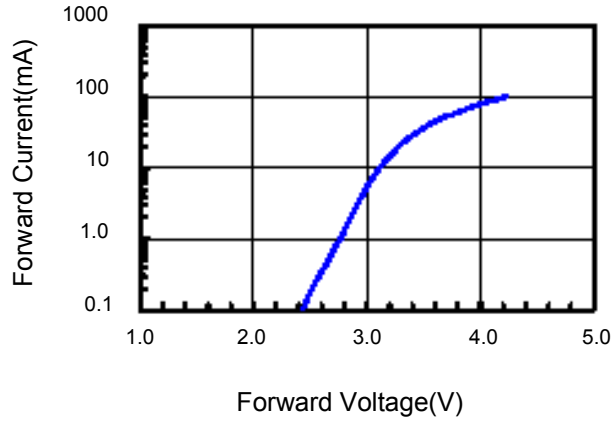



Fig.2 Relative Intensity vs. Forward Current

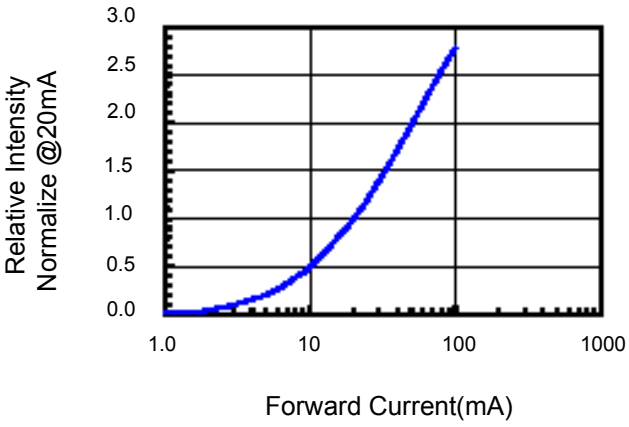



Fig.3 Forward Voltage vs. Temperature

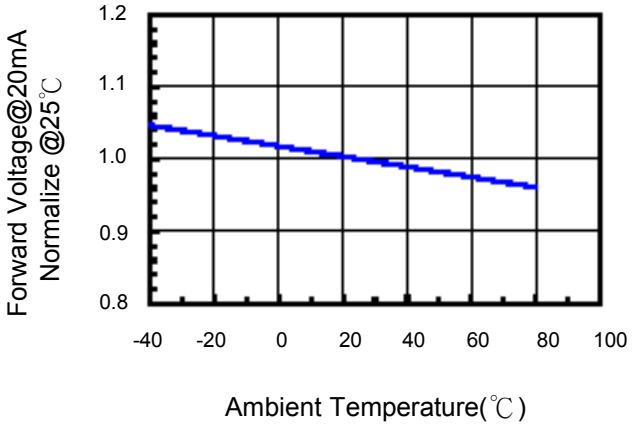



Fig.4 Relative Intensity vs. Temperature

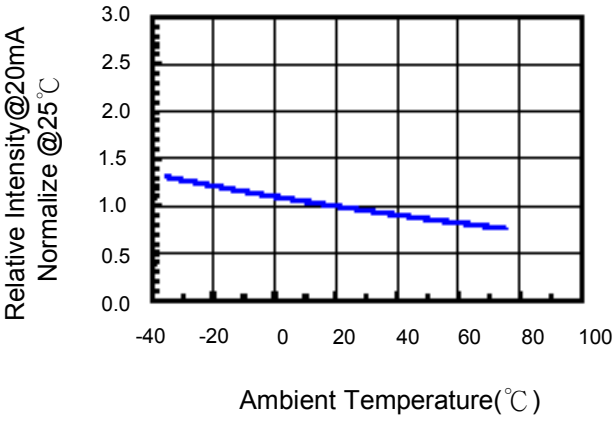



Fig.5 Relative Intensity vs. Wavelength

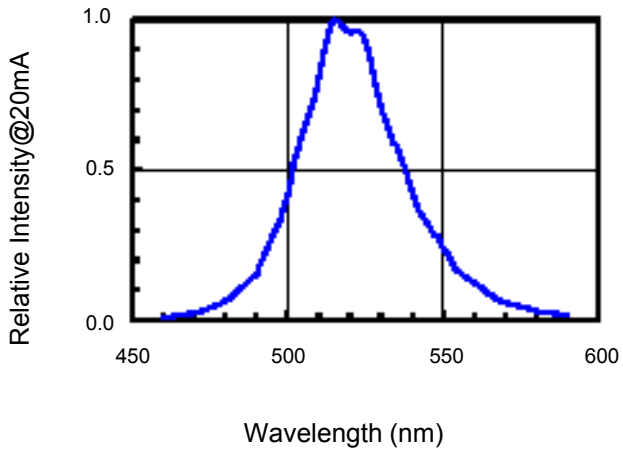
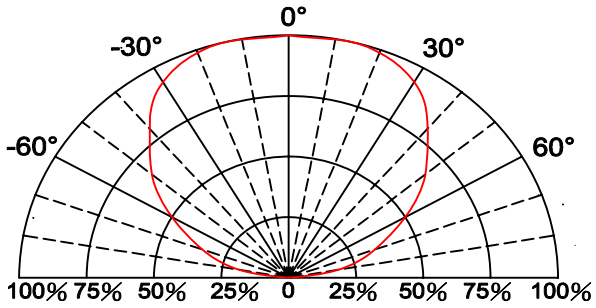



Fig.6 Directive Radiation



# Typical Electro-Optical Characteristics Curve

DBK CHIP

Fig.1 Forward current vs. Forward Voltage

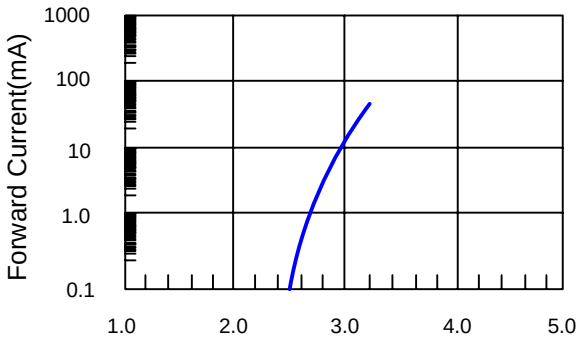



Fig.2 Relative Intensity vs. Forward Current

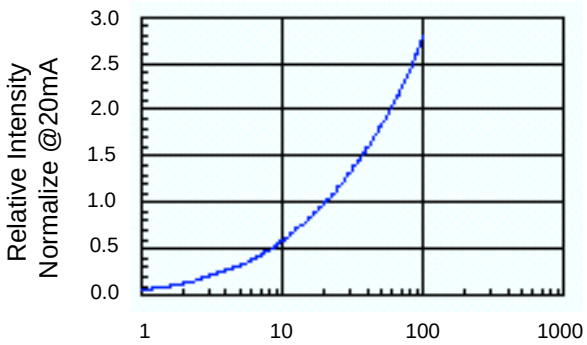



Fig.3 Forward Voltage vs. Temperature

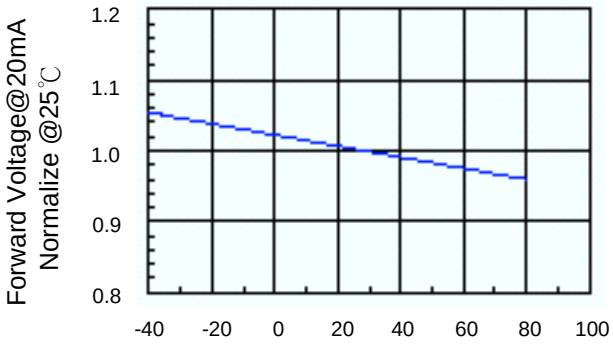



Fig.4 Relative Intensity vs. Temperature

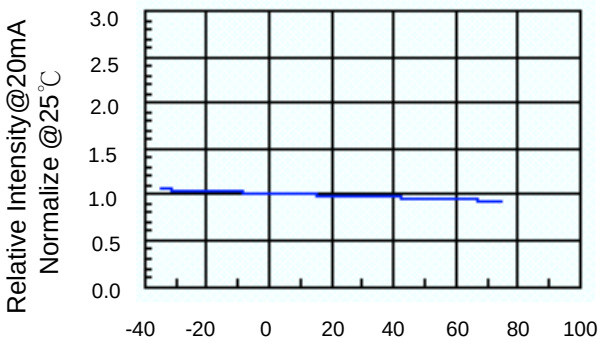



Fig.5 Relative Intensity vs. Wavelength

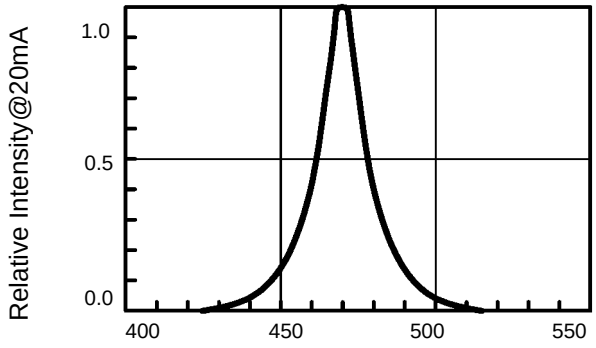
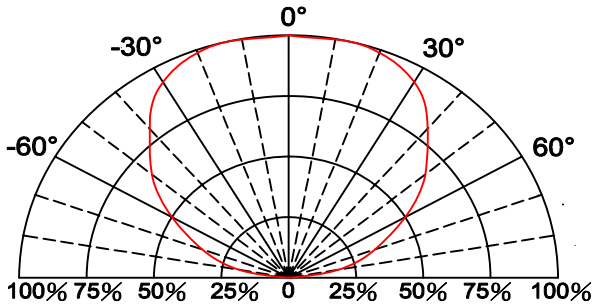
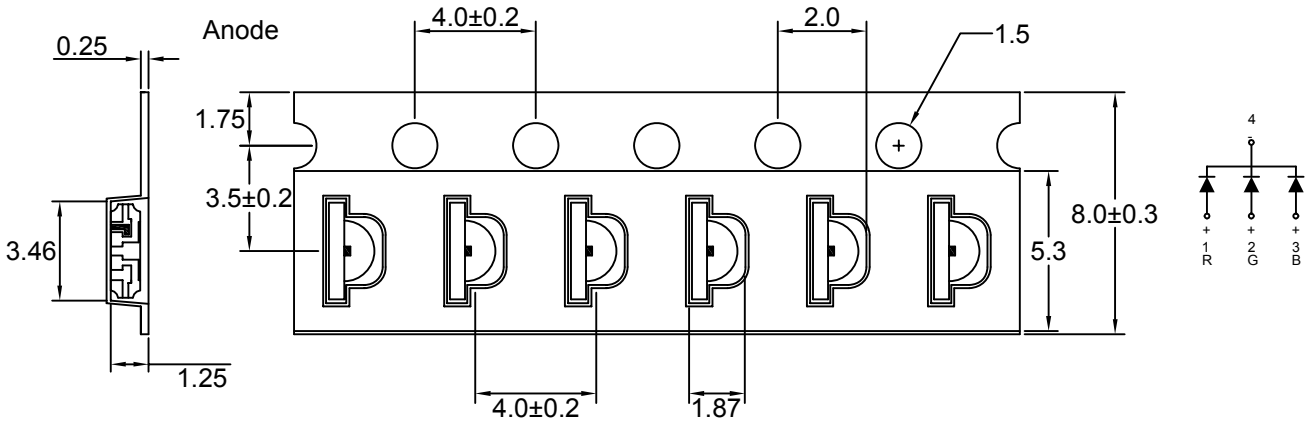



Fig.6 Directive Radiation

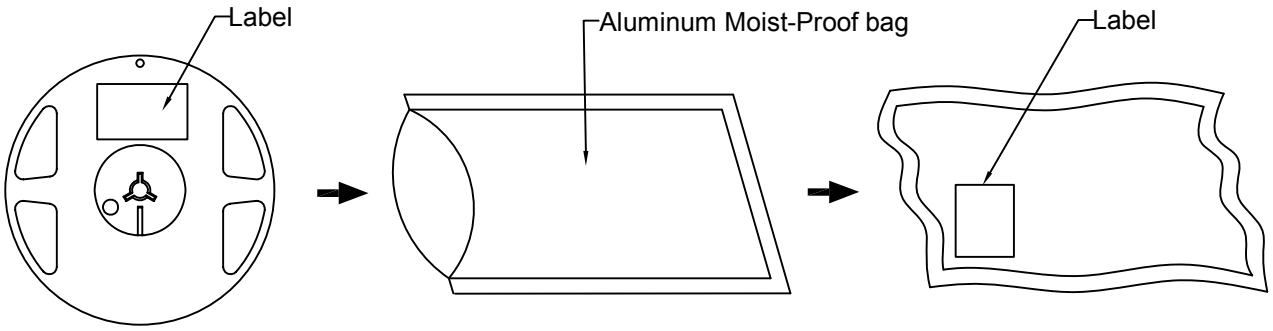


# Carrier Type Dimensions



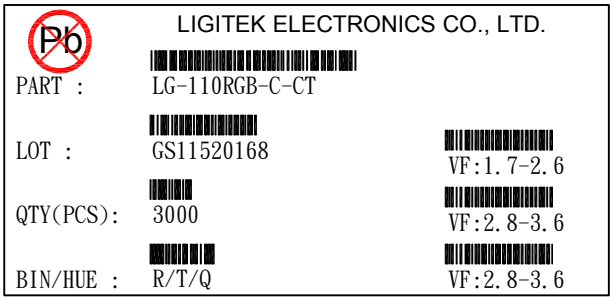

Note : The tolerances unless mentioned is ±0.1mm,Angle± 0.5. Unit=mm.

• Packing Specifications




| Part No. | Description | Quantity/Reel |
|---|---|---|
| LG-110RGB-C-CT | 8.0mm tape,7"reel | 3000 devices |

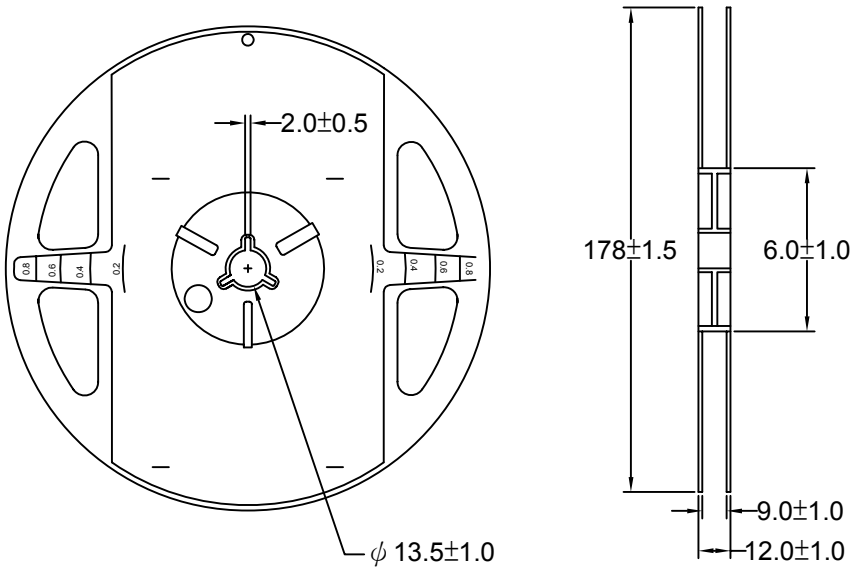
## Label Explanation




BIN : Luminous Intensity

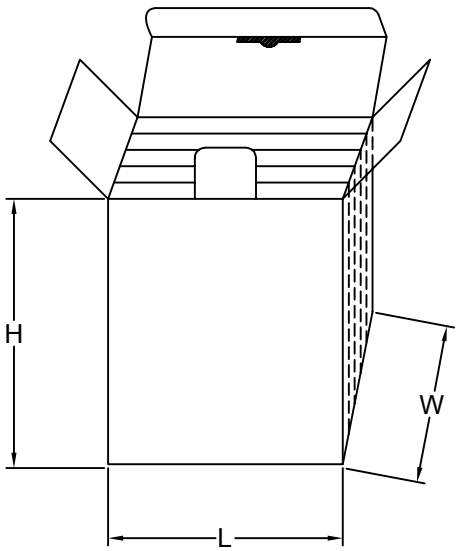
VF : Forward Voltage

## Reel Dimensions

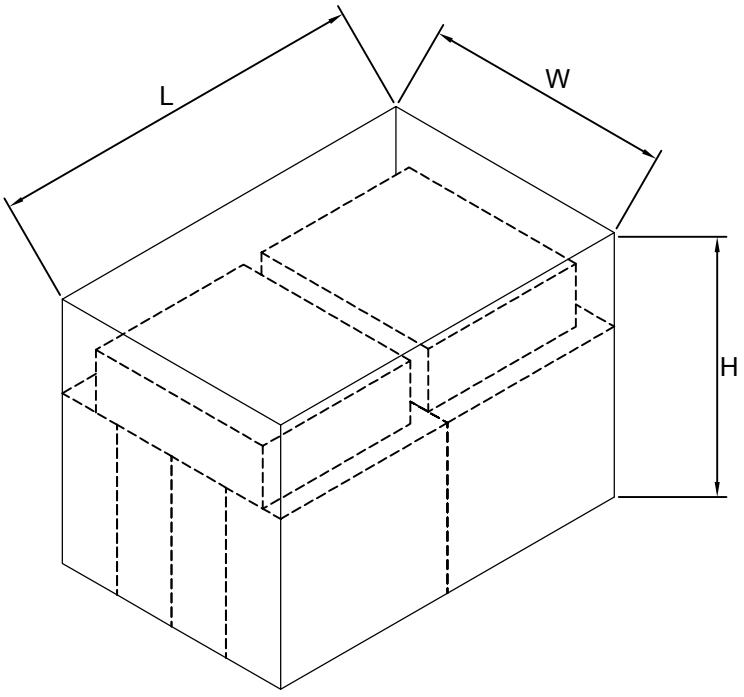


# Box Explanation

1. 5 BAG / INNER BOX
2. INNER BOX SIZE : L X W X H 23cm X 8.5cm x 26cm



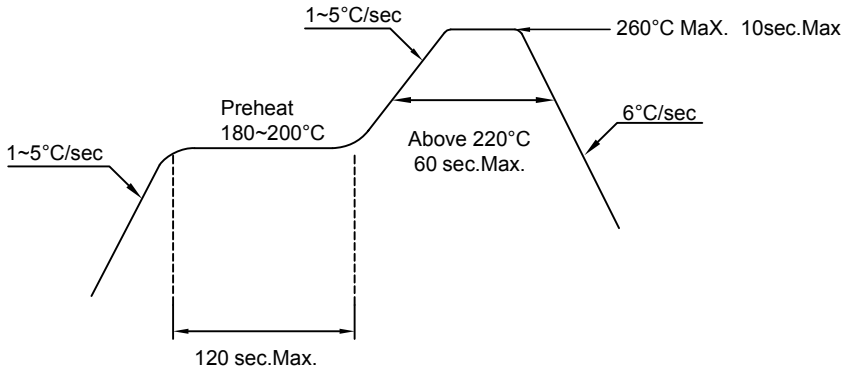

3. 10 INNER BOXES / CARTON
4. CARTON SIZE : L X W X H 58cm X 34cm x 35cm



Recommended Soldering Conditions

1. Hand Solder
   Basic spec is ≦ 280℃ 3 sec one time only.

2. PB-Free Reflow Solder




Note:
1.Reflow soldering should not be done more than two times.
2.When soldering,do not put stress on the LEDs during heating.
3.After soldering,do not warp the circuit board.

## Precautions For Use:

### Storage time:

1.The operation of Temperatures and RH are : 5℃~35℃,RH60%.

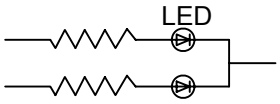
2.Once the package is opened, the products should be used within a week.
Otherwise, they should be kept in a damp proof box with descanting agent.
Considering the tape life, we suggest our customers to use our products within a year(from production date).

3.If opened more than one week in an atmosphere 5℃ ~ 35℃,RH60%,
they should be treated at 60℃±5 ℃fo r 15hrs.

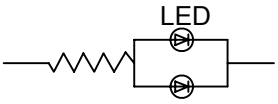
## Drive Method:

LED is a current operated device, and therefore, requirer some kind of current limiting incorporated into the driver circuit. This current limiting typically takes the form of a current limiting resistor placed in series with the LED.
Consider worst case voltage variations than could occur across the current limiting resistor. The forwrd current should not be allowed to change by more than 40% of its desired value.

Circuit model A




Circuit model B




(A) Recommended circuit.
(B) The difference of brightness between LED could be found due to the VF-IF characteristics of LED.

## Cleaning:

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

## ESD(Electrostatic Discharge):

Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrosatic glove is recommended when handing these LED. All devices, equipment and machinery must be properly grounded.

Reliability Test:

| Classification | Test Item | Test Condition | Reference Standard |
|---|---|---|---|
| Endurance Test | Operating Life Test | 1.Ta=Under Room Temperature As Per Data Sheet Maximum Rating.<br>2.If=20mA<br>3.t=1000 hrs (-24hrs, +72hrs) | MIL-STD-750D: 1026<br>MIL-STD-883D: 1005<br>JIS C 7021: B-1 |
| | High Temperature Storage Test | 1.Ta=105℃±5℃<br>2.t=1000 hrs (-24hrs, +72hrs) | MIL-STD-883D:1008<br>JIS C 7021: B-10 |
| | Low Temperature Storage Test | 1.Ta=-40℃±5℃<br>2.t=1000 hrs (-24hrs, +72hrs) | JIS C 7021: B-12 |
| | High Temperature High Humidity Storage Test | 1.Ta=65℃±5℃<br>2.RH=90%~95%<br>3.t=1000hrs¡Ó2hrs | MIL-STD-202F:103B<br>JIS C 7021: B-11 |
| Environmental Test | Thermal Shock Test | 1.Ta=105℃±5℃&-40℃±5℃<br>(10min) (10min)<br>2.total 10 cycles | MIL-STD-202F: 107D<br>MIL-STD-750D: 1051<br>MIL-STD-883D: 1011 |
| | Solderability Test | 1.T.Sol=235℃±5℃<br>2.Immersion time 2±0.5sec<br>3.Coverage ≧95% of the dipped surface | MIL-STD-202F: 208D<br>MIL-STD-750D: 2026<br>MIL-STD-883D: 2003<br>IEC 68 Part 2-20<br>JIS C 7021: A-2 |
| | Temperature Cycling | 1.105℃ ~ 25℃ ~ -40℃<br>30mins 5mins 30mins 5mins<br>2.10 Cyeles | MIL-STD-202F: 107D<br>MIL-STD-750D: 1051<br>MIL-STD-883D: 1010<br>JIS C 7021: A-4 |
| | IR Reflow | 1.T=260°C Max. 10sec.Max.<br>2. 6 Min | MIL-STD-750D:2031.2<br>J-STD-020 |