



# TOYO LED ELECTRONICS LIMITED

Unit 10-11, 19/F, Metro Loft, 38 Kwai Hei Street, Kwai Chung, New Territories, Hong Kong

Tel : (852) 2540 7288  
http://www.toyo-led.com

Fax : (852) 2517 1797  
E-mail : sales@toyo-led.com



## P/N: TY-AO3535RGB3-R10-BK-P6

3.7 \* 3.5mm TOP SMD Series

### Features:

- ✧ 3.7mm×3.5mm SMT LED, 2.80mm thickness
- ✧ PLCC-6 package
- ✧ White package
- ✧ Suitable for all SMT assembly and solder process
- ✧ Black silk-screened surface

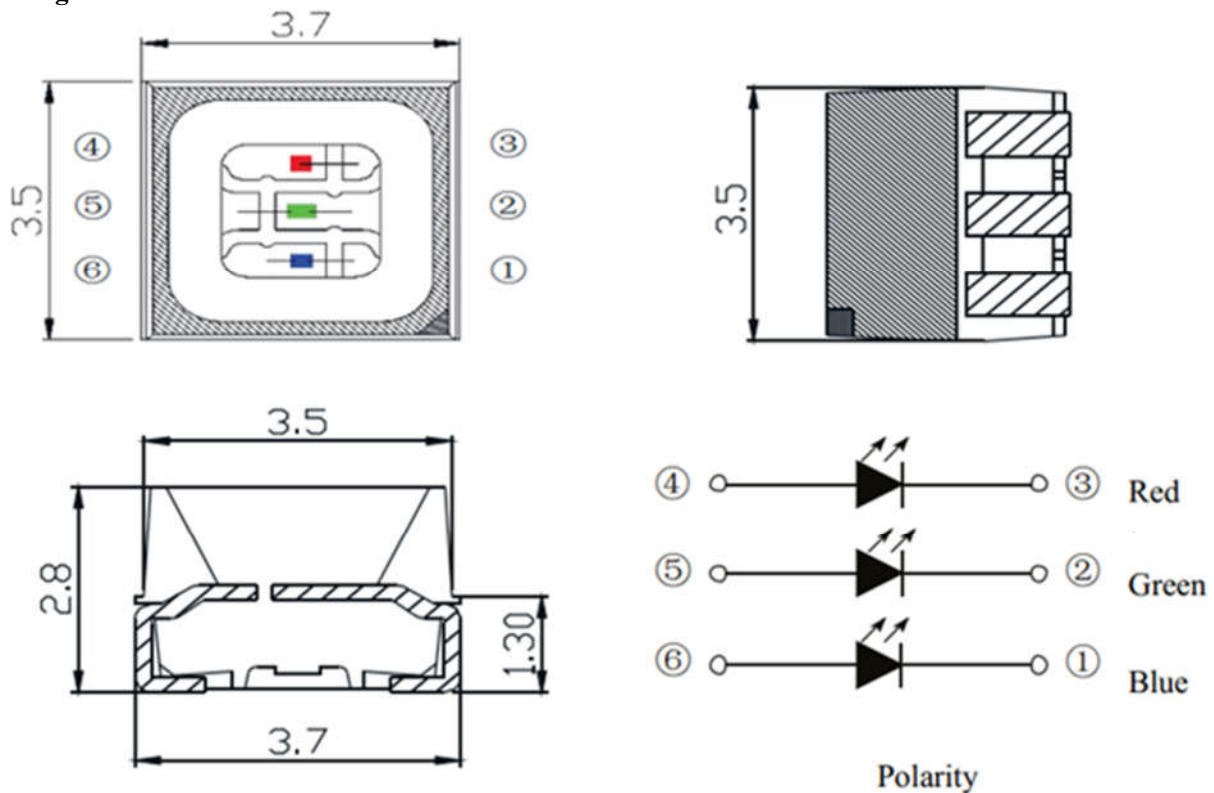
### Description

- ✧ The Red source color devices are made with AlGaInP on sapphire Light Emitting Diode.
- ✧ The Green source color devices are made with InGaN on Green Light Emitting Diode.
- ✧ The Blue source color devices are made with InGaN on sapphire Light Emitting Diode.

### Application

- ✧ Optical indicator
- ✧ Indicator and backlighting in telephone and fax
- ✧ Flat backlight for LCD, switch and symbol
- ✧ Light pipe application
- ✧ General use

### Package Outline Dimensions



### NOTES:

1. All dimensions are in millimeter;
2. Tolerance is  $\pm 0.2$ mm unless other specified;
3. Specifications are subject to change without notice.



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| Part No.                | Emitted Color |       |      | Len's Color |
|-------------------------|---------------|-------|------|-------------|
| TY-AO3535RGB3-R10-BK-P6 | Red           | Green | Blue | Water clear |

### ➤ Absolute Maximum Ratings(Ta=25°C)

| Item                                                    | Symbol           |   | Maximum             | Unit |
|---------------------------------------------------------|------------------|---|---------------------|------|
| Power Dissipation                                       | PD               | R | 60                  | mW   |
|                                                         |                  | G | 90                  |      |
|                                                         |                  | B | 90                  |      |
| Forward Current                                         | IF               | R | 25                  | mA   |
|                                                         |                  | G | 25                  |      |
|                                                         |                  | B | 25                  |      |
| Peak Forward Current(1/10 Duty Cycle 0.1ms Pulse Width) | IFP              | R | 60                  | mA   |
|                                                         |                  | G | 60                  |      |
|                                                         |                  | B | 60                  |      |
| Reverse Voltage                                         | VR               |   | 5                   | V    |
| Electrostatic Discharge                                 | ESD              |   | 2000                | V    |
| Operating Temperature Range                             | T <sub>opr</sub> |   | -40 to+85           | °C   |
| Storage Temperature Range                               | T <sub>stg</sub> |   | -40 to+85           | °C   |
| Lead Solder Temperature                                 | Tsol             |   | 260°C for 3 seconds |      |

### ➤ Electrical/Optical Characteristics(Ta=25°C)

| Item                    | Symbol |     | Condition | Min. | Typ. | Max | Unit |
|-------------------------|--------|-----|-----------|------|------|-----|------|
| Forward Voltage         | VF     | R   | IF=20mA   | --   | 2.2  | 2.4 | V    |
|                         |        | G/B |           | --   | 3.0  | 3.6 |      |
| Luminous Intensity      | IV     | R   | IF=20mA   | 400  | 800  | --  | mcd  |
|                         |        | G   |           | 1000 | 2000 | --  |      |
|                         |        | B   |           | 200  | 500  | --  |      |
| Chromaticity Coordinate | WD     | R   | IF=20mA   | 615  | 624  | 630 | nm   |
|                         |        | G   |           | 515  | 520  | 535 |      |
|                         |        | B   |           | 460  | 470  | 485 |      |
| Viewing Angle           | 2θ1/2  |     | IF=20mA   | ---  | 110  | --- | deg  |
| Reverse Current         | IR     |     | VR=5V     | ---  | --   | 10  | uA   |

#### NOTES:

1. Tolerance is ±0.25mm unless other specified;
2. Luminous intensity testing tolerance is ±10%;
3. Dominant Emission Wavelength testing tolerance is ±1nm;
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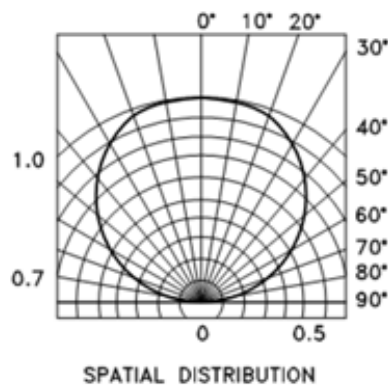
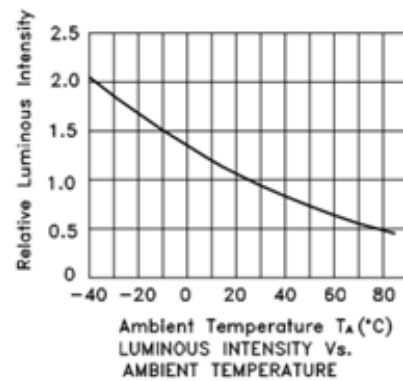
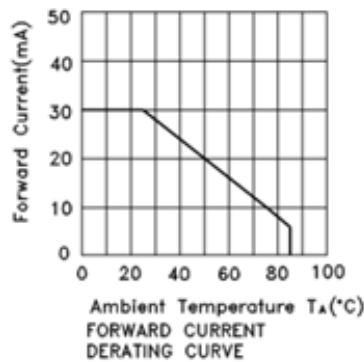
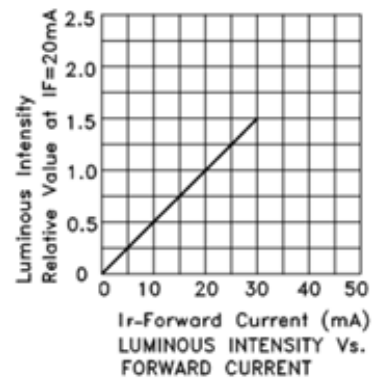
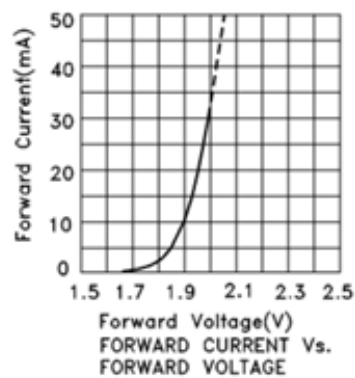
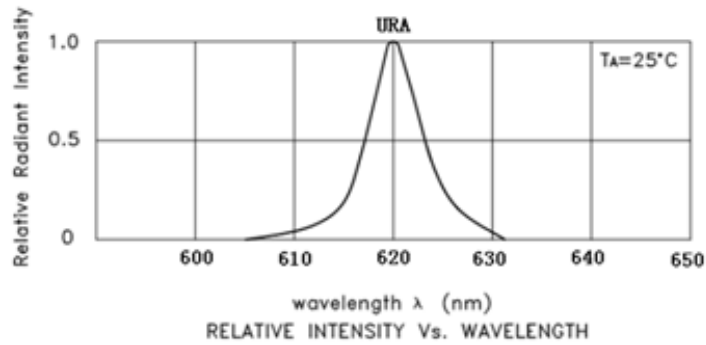
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ISO 9001



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## Typical Electro-Optical Characteristics Curves





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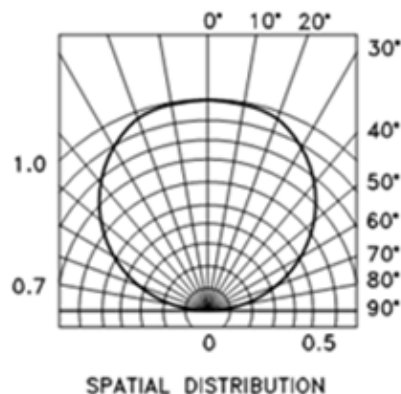
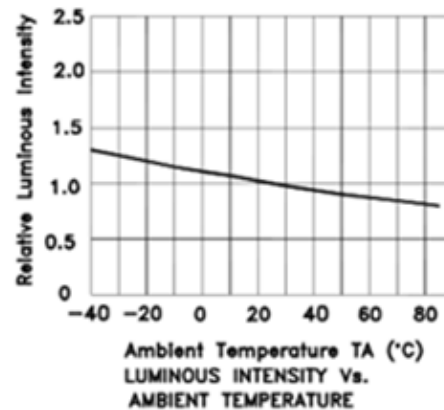
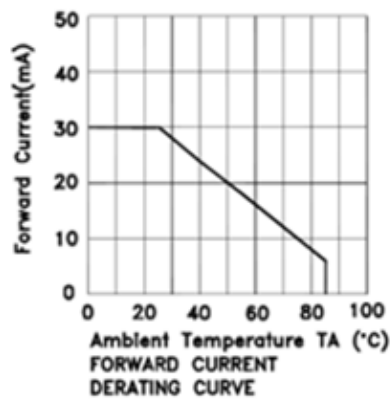
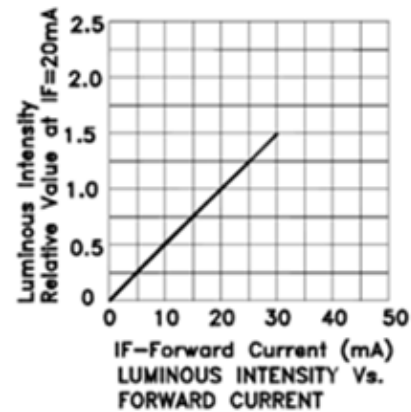
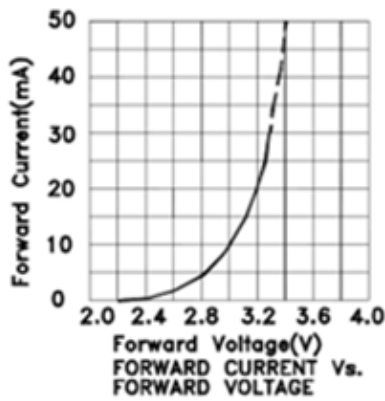
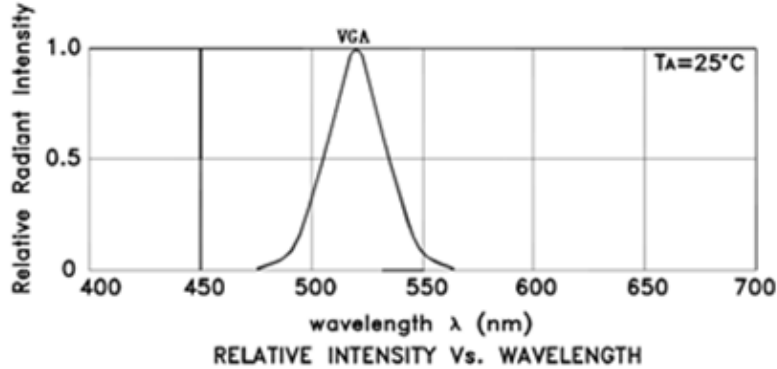
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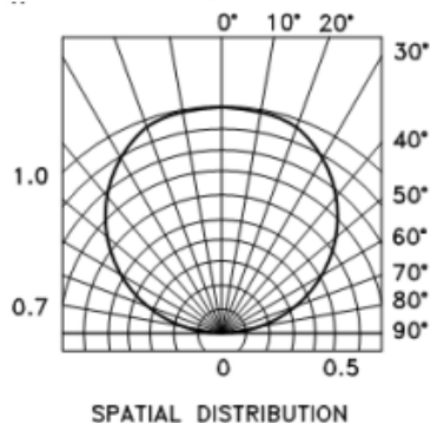
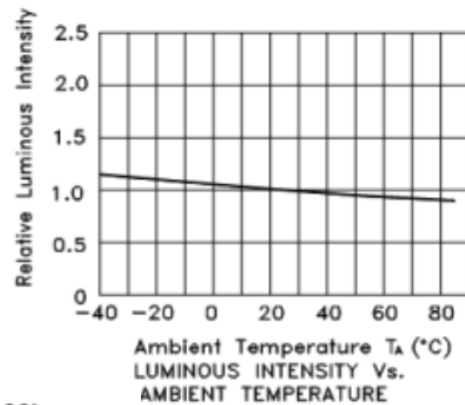
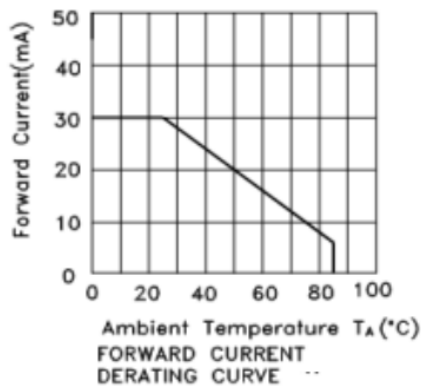
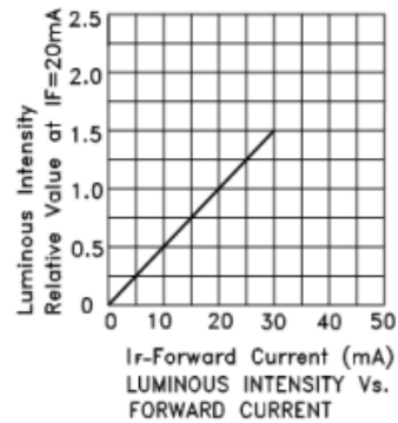
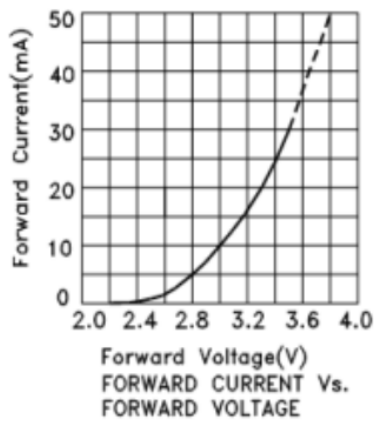
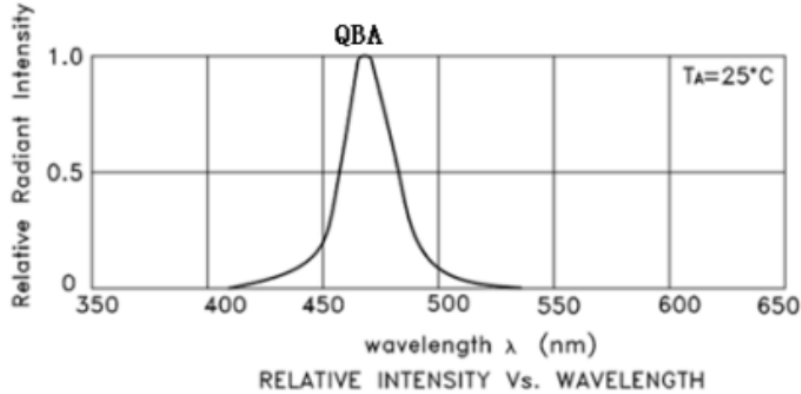
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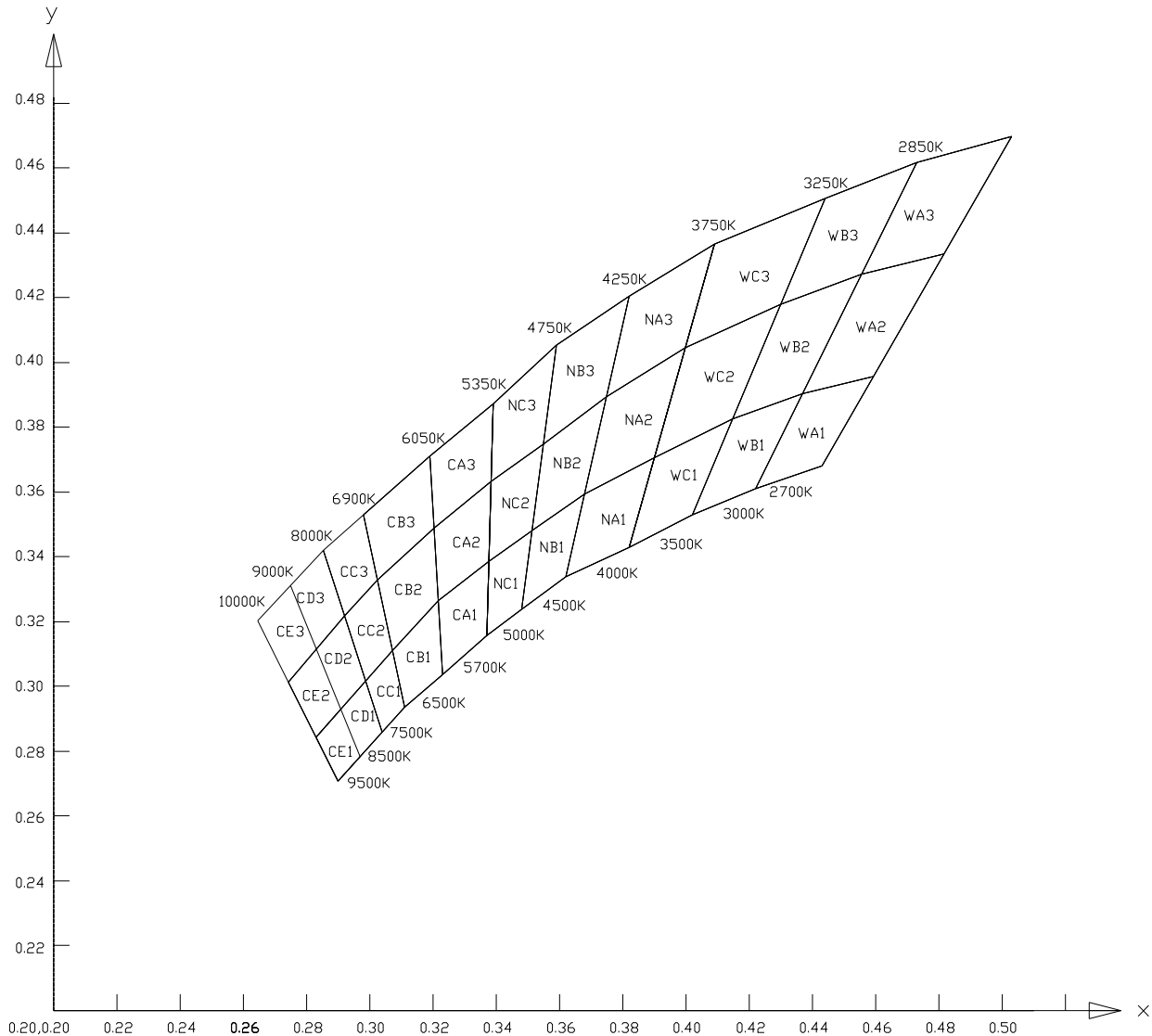


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## ✧ Typical photoelectricity characteristic curve chart

CIE 1931 xy CHROMATICITY DIAGRAM





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## ➤ Reliability Test Items And Conditions

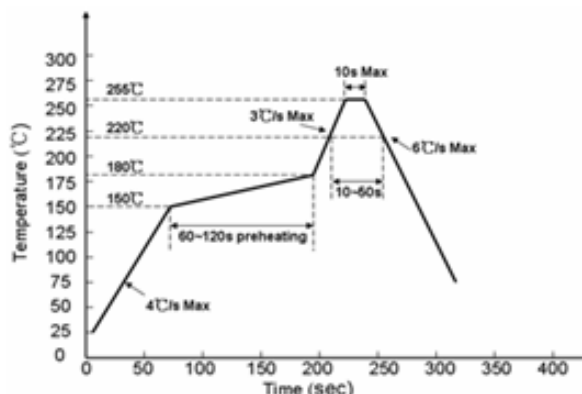
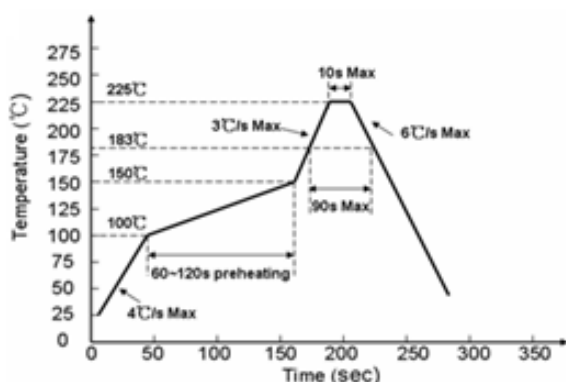
| NO. | Test Item                  | Reference             | Item Test Conditions                                | Duration /Cycle | Sample Size | Ac/Re |
|-----|----------------------------|-----------------------|-----------------------------------------------------|-----------------|-------------|-------|
| 1   | Reflow Soldering           | JESD22-B106           | Ts1d=260±10°C, ≤10sec                               | 3times          | 22          | 0/1   |
| 2   | Temperature Cycle          | JESD22-A104           | 85°C±5°C (30Min)~25°C±5°C (5min) ~-40°C±5°C (30Min) | 100 cycle       | 22          | 0/1   |
| 3   | Thermal Shock              | JESD22-A105           | -40°C (15Min) ~105°C (15Min)/ 1Min                  | 100 cycle       | 22          | 0/1   |
| 4   | High Temperature Stora     | JESD22-A108           | Ta=100±5°C                                          | 1000hrs         | 22          | 0/1   |
| 5   | Humidity Heat Storage      | JESD22-A101           | 85±5°C/85±5%RH;                                     | 1000hrs         | 22          | 0/1   |
| 6   | Low Temperature Storage    | JESD22-A119           | Ta=-40±5°C                                          | 1000hrs         | 22          | 0/1   |
| 7   | Life Test                  | EIAJED-4701100<br>103 | Ta=25±5°C IF=20mA                                   | 1000hrs         | 22          | 0/1   |
| 8   | High Temperature Life Test | JESD22-A108           | Ta=100±5°C IF=5mA                                   | 1000hrs         | 22          | 0/1   |
| 9   | Low Temperature Life Test  | EIAJED-4701200<br>202 | Ta=-40±5°C IF=20mA                                  | 1000hrs         | 22          | 0/1   |

## ➤ SMT Reflow Soldering Instructions

| Reflow soldering |                            |                            | Hand welding   |                           |
|------------------|----------------------------|----------------------------|----------------|---------------------------|
|                  | Lead Solder                | Lead-free Solder           | Temperature    | 350° C Max.               |
| Pre-heat         | 140 ~ 160° C               | 180 ~ 200° C               | Soldering time | 3 sec.Max. (onetime only) |
| Pre-heat time    | 120 sec. Max.              | 120 sec. Max.              |                |                           |
| Peak temperature | 230° C Max.                | 260° C Max.                |                |                           |
| Soldering time   | 10 sec. Max.               | 10 sec. Max.               |                |                           |
| Condition        | Refer to the picture below | Refer to the picture below |                |                           |

(Lead Solder)

(Lead-Free Solder)





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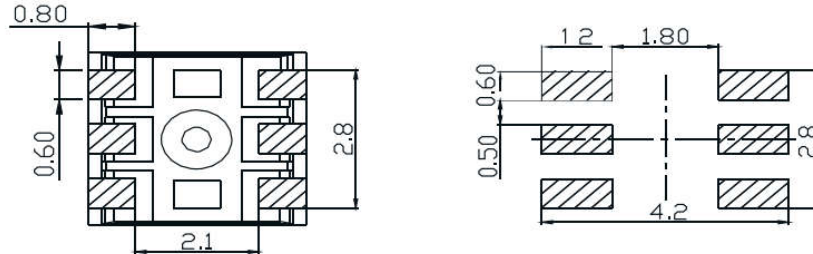
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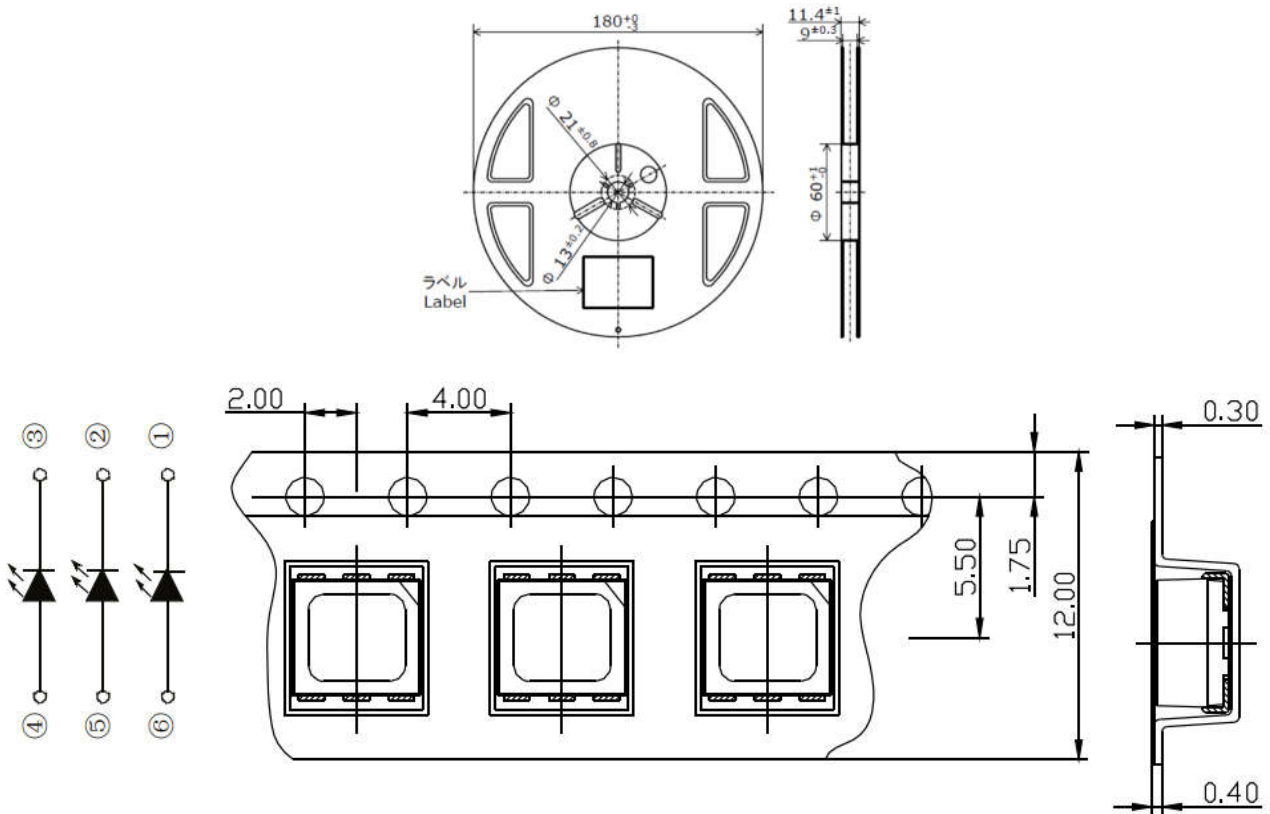
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## ➤ Recommended Soldering Pad Dimensions



## ➤ Tape Specification: 500pcs per reel



## ➤ Package Label

| SMD LED                                                     |            |
|-------------------------------------------------------------|------------|
| PART NO:                                                    | _____      |
| LOT NO :                                                    | _____      |
| Q' TY :                                                     | _____      |
| VF : _____                                                  | IV : _____ |
| WL : _____                                                  | BIN: _____ |
| DATA :                                                      | _____      |
| TOYO LED ELECTRONICS LIMITED                                |            |
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QA Pass

Pb



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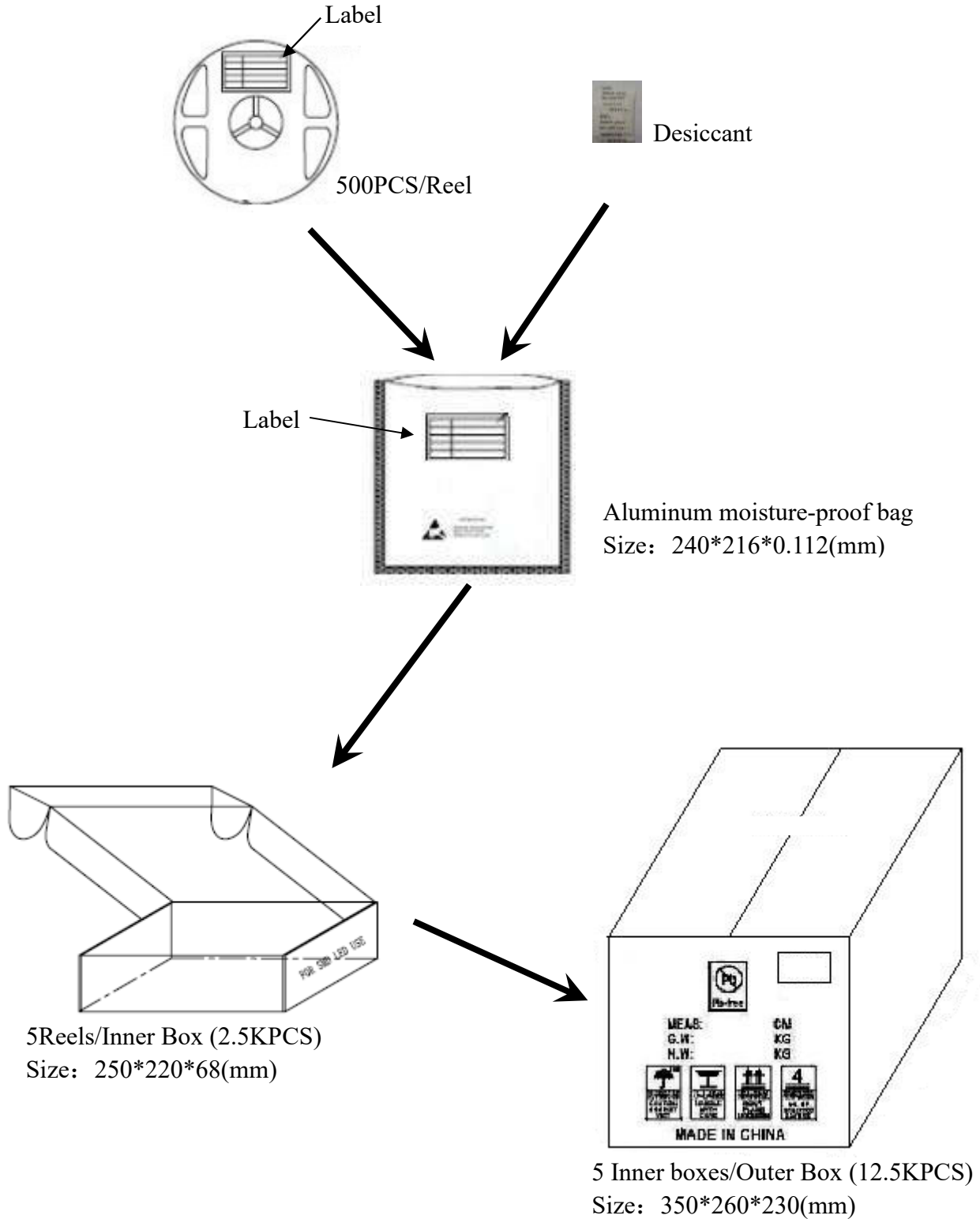
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## ➤ Package & Shipping Instructions





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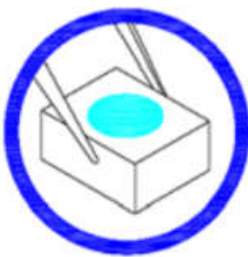
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### ➤ Handling Precautions

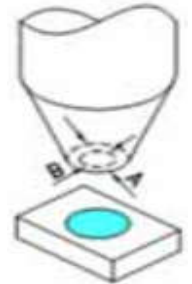
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force.

As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

1. Handle the component along the side surface by using forceps or appropriate tools; do not directly touch or handle the silicone lens surface, it may damage the internal circuitry.



2. The outer diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks. The inner diameter of the nozzle should be as large as possible. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.



3. Do not stack together assembled PCBs containing LEDs. Impact may scratch the silicone lens or damage the internal circuitry

4. Not suitable to operate in acidic environment,  $\text{pH} < 7$



5. LED operating environment and sulfur element composition cannot be over 100PPM in the LED mating usage material.

6. When we need to use external glue for LED application products, please make sure that the external glue matches the LED packaging glue. Additionally, as most of LED packaging glue is silica gel, and it has strong Oxygen permeability as well as

strong moisture permeability; in order to prevent external material from getting into the inside of LED, which may cause the malfunction of LED, the single content of Bromine element is required to be less than 900PPM, the single content of Chlorine element is required to be less than 900PPM, the total content of Bromine element and Chlorine element in the external glue of the application products is required to be less than 1500PPM