

# SPECIFICATION

REFOND P/N

RF-WMRI32DS-FH-JZ

R&D

Mass Production



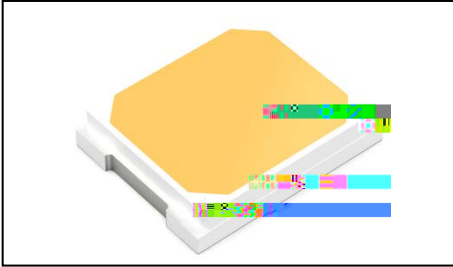
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## 1. Description

### 1.1



The yellow LED, which was fabricated by using a blue chip and the phosphor.

Product Package: 2.80mmX3.50mmX0.70mm.

LED

2.80mmX3.50mmX0.70mm.

### 1.2 Features

PLCC2 Package.

Extremely wide viewing angle.

Suitable for all SMT assembly and solder process.

Available on tape and reel.

Moisture sensitivity level: Level 2.

Compliance with RoHS and REACH.      RoHS    REACH

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101  
Stress Test Qualification for Automotive Grade Discrete Semiconductors :

AEC

### 1.3 Application

Automotive Lighting Interior and Exterior.



### 1.4 Package Dimension

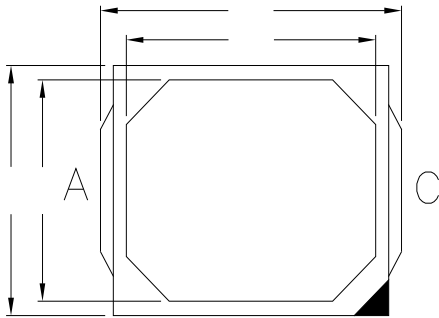


Fig.1-1 Top View

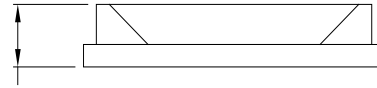


Fig.1-2 Side View

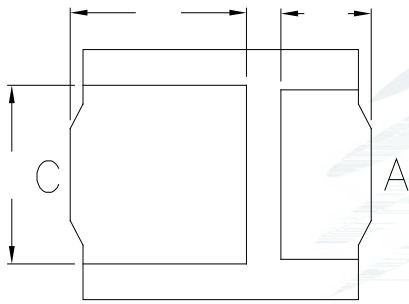


Fig.1-3 Bottom View

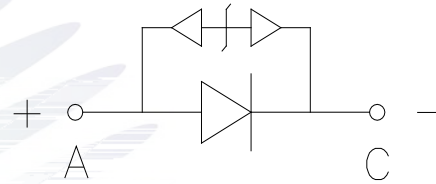


Fig.1-4 Polarity

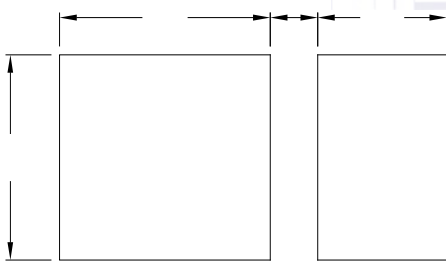


Fig.1-5 Soldering Patterns

#### Notes

1. All dimensions units are millimeters.
2. All dimensions tolerances are  $\pm 0.2\text{mm}$  unless otherwise noted.



$\pm 0.$

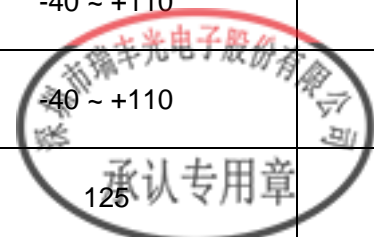
## 1.5 Product Parameters

Table 1-1 Electrical / Optical Characteristics at Ts=25°C

| Item                | Symbol      | Test Condition     | Value |      |      | Unit          |
|---------------------|-------------|--------------------|-------|------|------|---------------|
|                     |             |                    | Min.  | Typ. | Max. |               |
| Forward Voltage     | $V_F$       | $I_F=150\text{mA}$ | 2.8   | 3.1  | 3.4  | V             |
| Reverse Current     | $I_R$       | $V_R=5\text{V}$    | ---   | ---  | 10   | $\mu\text{A}$ |
| Luminous Flux       |             | $I_F=150\text{mA}$ | 37    | 40   | 50   | lm            |
| Viewing Angle       |             | $I_F=150\text{mA}$ | ---   | 120  | ---  | deg           |
| Thermal Resistance. | $R_{THJ-S}$ | $I_F=150\text{mA}$ | ---   | ---  | 23   | /W            |

Table 1-2 Absolute Maximum Ratings at Ts=25°C

| Parameter                     | Symbol    | Rating     | Units |
|-------------------------------|-----------|------------|-------|
| Power Dissipation             | $P_D$     | 612        | mW    |
| Forward Current               | $I_F$     | 180        | mA    |
| Peak Forward Current          | $I_{FP}$  | 350        | mA    |
| Reverse Voltage               | $V_R$     | 5          | V     |
| Electrostatic Discharge (HBM) | $E_{SD}$  | 8000       | V     |
| Operating Temperature         | $T_{OPR}$ | -40 ~ +110 | °C    |
| Storage Temperature           | $T_{STG}$ | -40 ~ +110 | °C    |
| Junction Temperature          | $T_J$     | 125        | °C    |





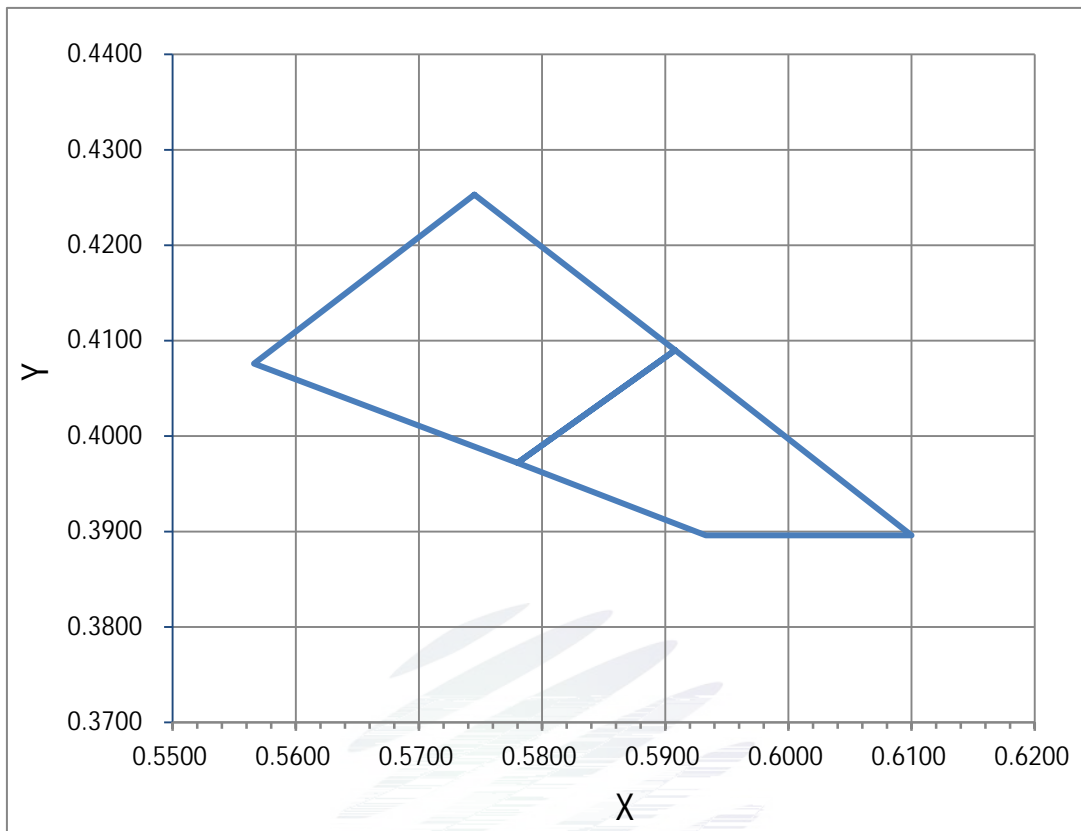


Fig 1-6 The C.I.E Chromaticity Diagram CIE

Table 1-4

| BIN CODE | CIE-X1 | CIE-Y1 | CIE-X2 | CIE-Y2 | CIE-X3 | CIE-Y3 | CIE-X4 | CIE-Y4 |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|
| Y2       | 0.5745 | 0.4253 | 0.5566 | 0.4076 | 0.5780 | 0.3972 | 0.5908 | 0.4090 |
| Y3       | 0.5908 | 0.4090 | 0.5780 | 0.3972 | 0.5933 | 0.3896 | 0.6100 | 0.3896 |



### 1.7 Typical Optical Characteristics Curves

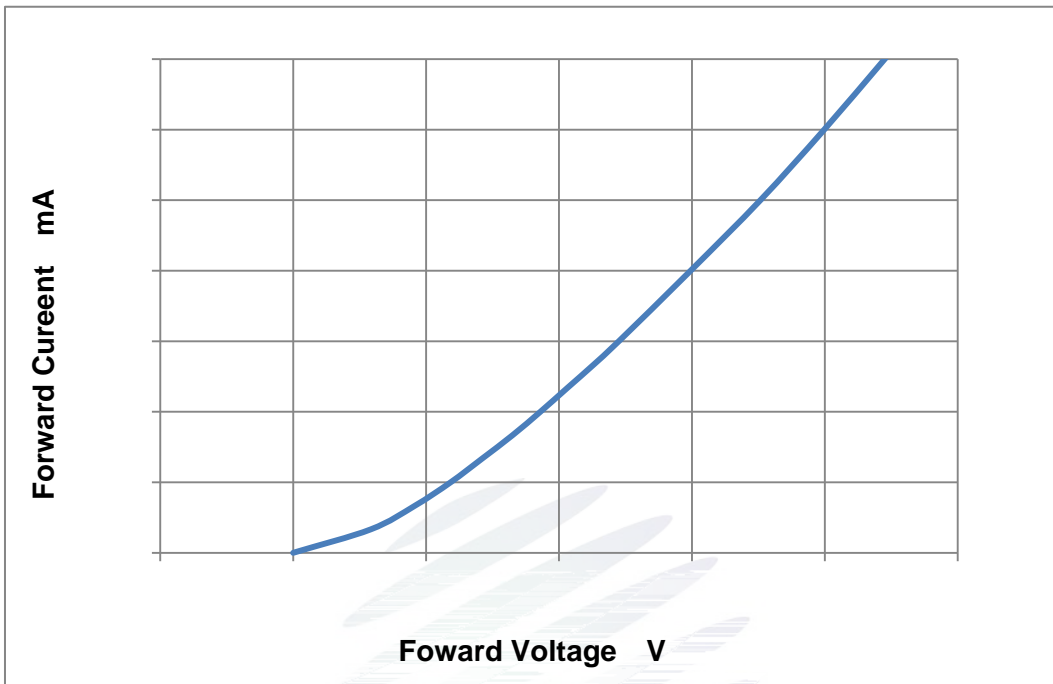


Fig. 1-7 Forward Voltage Vs Forward Current

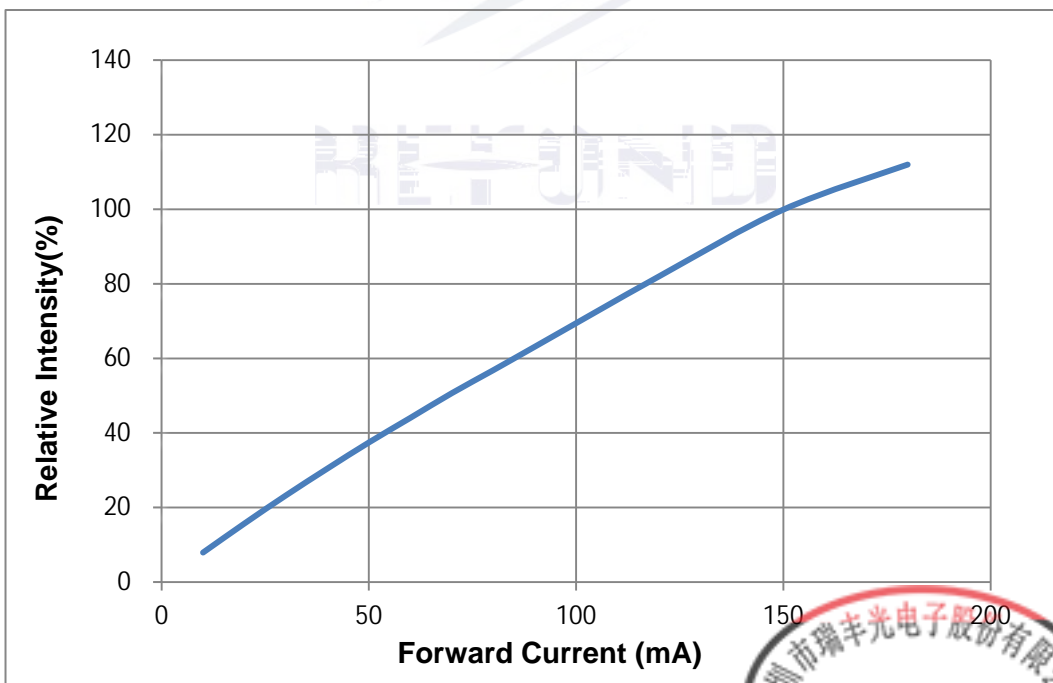


Fig. 1-8 Forward Current Vs Relative Intensity





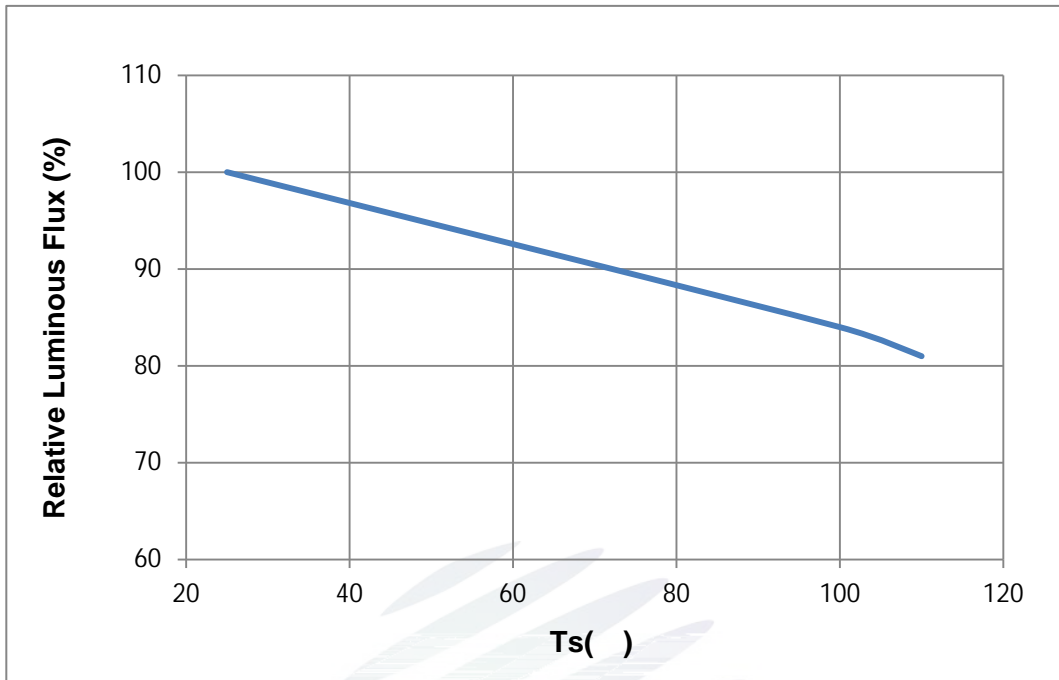


Fig. 1-9 Solder Temperature Vs Relative Intensity

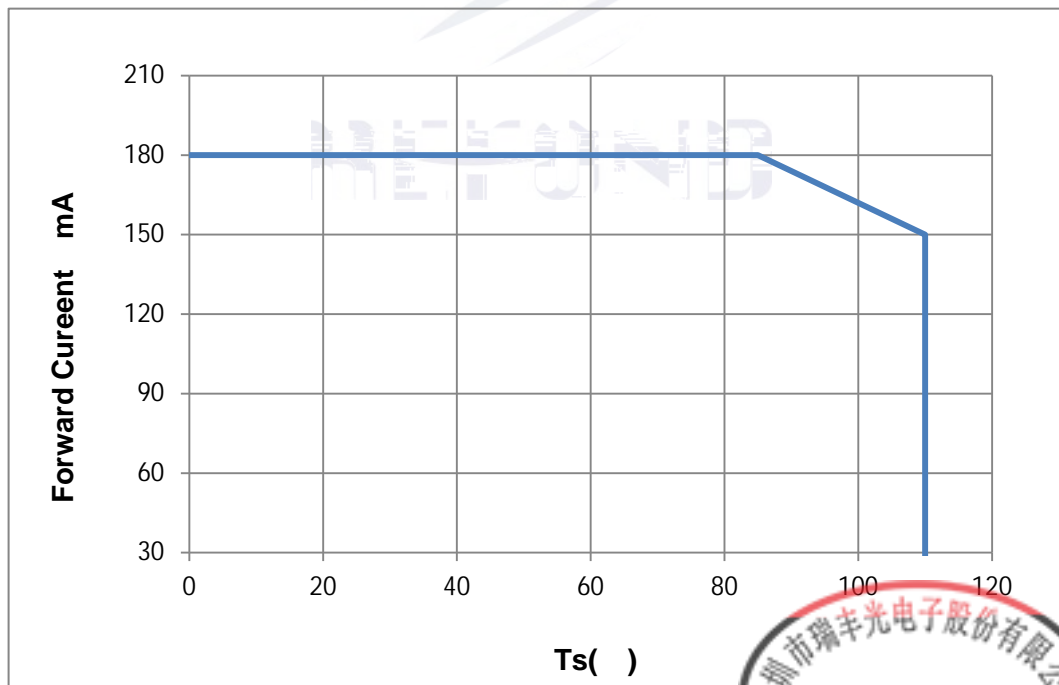


Fig. 1-10 Solder Temperature Vs Forward Current



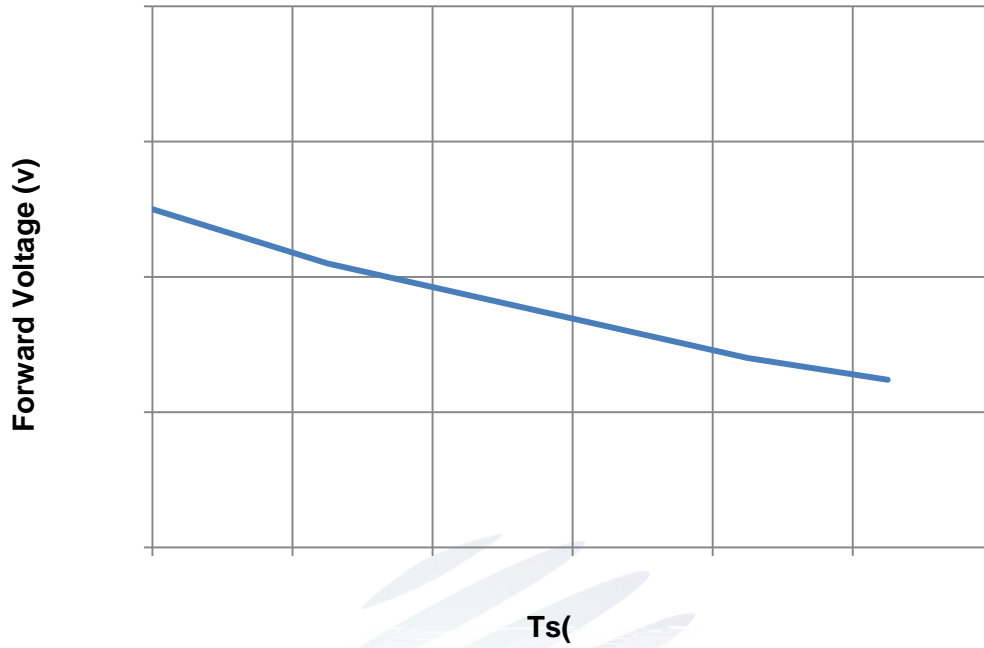


Fig. 1-11 Forward Voltage Vs Solder Temperature

Fig. 1-12 Solder Temperature vs. Color Shift

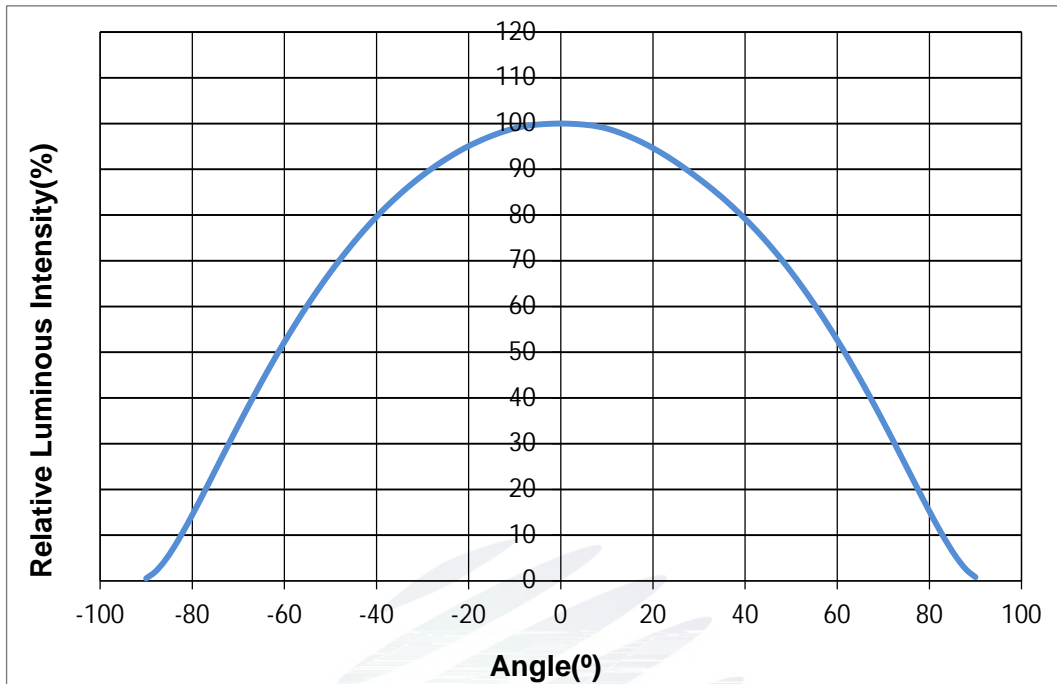


Fig. 1-13 Radiation diagram

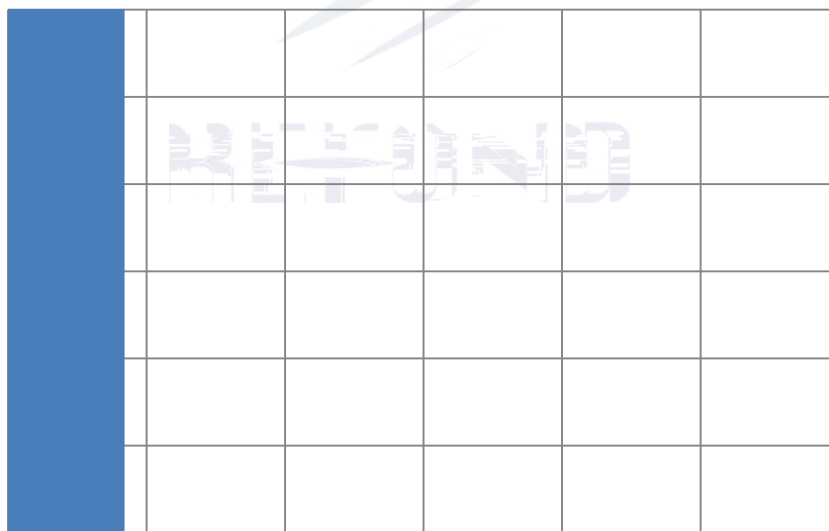


Fig. 1-14 Spectrum Distribution



## 2. Packaging

### 2.1 Packaging Specification



### 2.1.3 Label Form Specification

Table 2 Specification

|                |                  |
|----------------|------------------|
| PART NO.       | Part Number      |
| SPEC NO.       | Spec Number      |
| LOT NO.        | Lot Number       |
| BIN CODE       | Bin Code         |
|                | Luminous flux    |
| XY             | Chromaticity Bin |
| V <sub>F</sub> | Forward Voltage  |
| WLD            | Wavelength       |
| QTY            | Packing Quantity |
| DATE           | Made Date        |

Fig. 2-3 Label

### 2.2 Moisture Resistant Packing

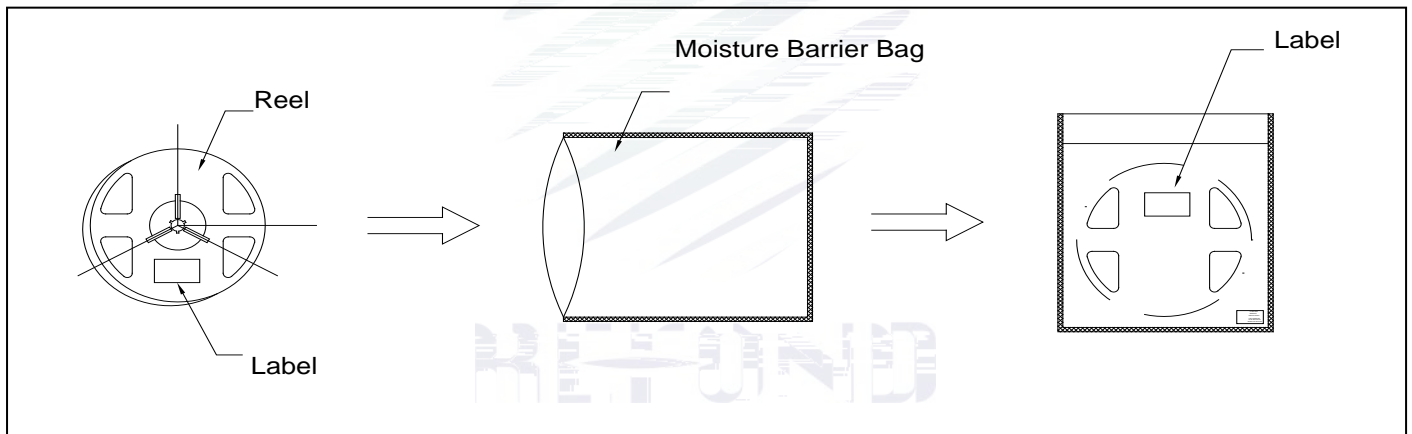


Fig.2-4 Moisture Resistant Packing

### 2.3 Cardboard Box

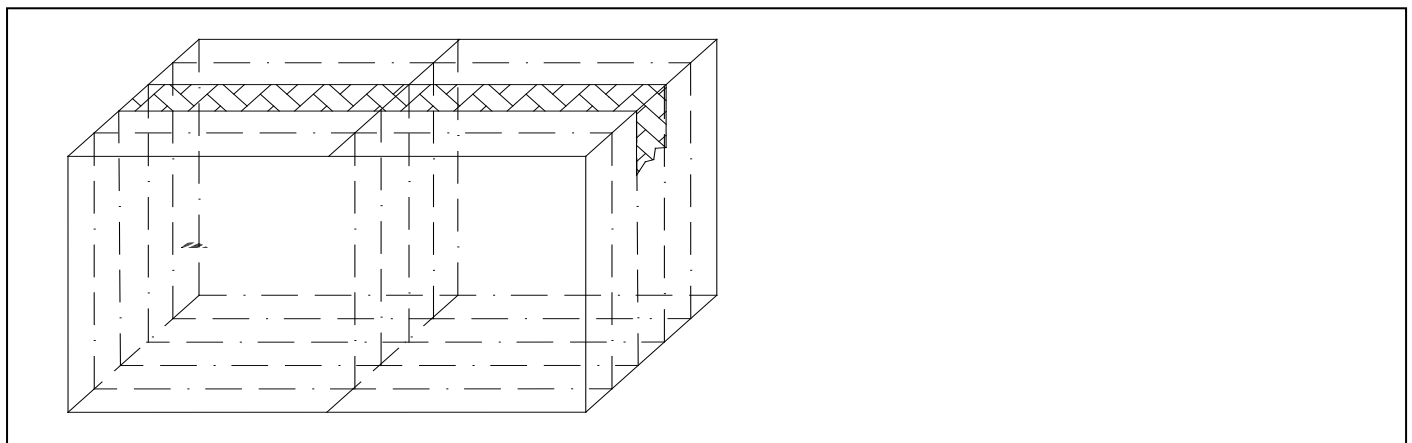


Fig.2- Cardboard Box

## 2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

| Test Items                                  | Ref.Standard           | Test Condition                | Time       | Quantity | Ac/Re<br>/ |
|---|------------------------|-------------------------------|------------|----------|------------|
| Reflow                                      | JESD22-B106            | Temp:260 max<br>T=10 sec      | 2times     | 20pcs.   | 0/1        |
| MSL2<br>2                                   | JESD22-A113            | 85 / 60%RH                    | 168 hrs.   | 20pcs.   | 0/1        |
| Thermal Shock                               | JEITAED-4701<br>300307 | -40 15min<br>10s<br>125 15min | 1000 cycle | 20pcs.   | 0/1        |
| Life Test                                   | JESD22-A108            | Ta=105<br>If=150mA            | 1000hrs.   | 20pcs.   | 0/1        |
| High Temperature<br>High Humidity Life Test | JESD22-A101            | 85 / 85%RH<br>If=150mA        | 1000hrs.   | 20pcs.   | 0/1        |



## 2.5 Criteria For Judging Damage

Table 2-4 Criteria For Judging Damage

| Test Items      | Symbol | Test Condition | Criteria For Judgement |             |
|-----------------|--------|----------------|------------------------|-------------|
|                 |        |                | Min.                   | Max.        |
| Forward Voltage | $V_F$  | $I_F=150mA$    | -                      | U.S.L*)x1.1 |
| Reverse Current | $I_R$  | $V_R = 5V$     | -                      | U.S.L*)x2.0 |
| Luminous Flux   |        | $I_F=150mA$    | L.S.L*)x0.7            | -           |

### Notes

- 1.U.S.L: Upper standard level                      L.S.L: Lower standard level
- 2.The above reliability tests is based on the verification of a single/strip LED of Refond's existing experimental platform,the reliability experiment was taken under good heat dissipation conditions. when customers applies the LED to the series and parallel circuit, should take consideration of all the factors such as the current, voltage distribution, heat dissipation and others. LED
- 3.The technical information shown in the data sheets is limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license.



### 3. SMT Reflow Soldering Instructions SMT

#### 3.1 SMT Reflow Soldering Instructions SMT

Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Reflow parameters

|                                 |                     |                |        |             |
|---------------------------------|---------------------|----------------|--------|-------------|
| Average temperature rise speed  | T <sub>max</sub>    | T <sub>P</sub> | 3 °C/  | Max 3 °C/ s |
| Preheating: minimum temperature | (T <sub>min</sub> ) |                | 150 °C | Average     |







## 4. Handling Precautions

### 4.1 Handling Precautions

(1) LED operating environment and sulfur element composition cannot be over 100PPM in the LED mating usage material. This is provided for informational purposes only and is not a warranty or endorsement. LED

LED

(2) In order to prevent ex-ternal 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 materials of the application products is required to be less than 1500PPM. This is provided for informational purposes only and is not a warranty or endorsement. LED LED

1500PPM.

(3) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of LEDs and discolor when exposed to heat and photonic energy. The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues. Refond advises against the use of any chemicals or materials that have been found or are suspected to have an adverse affect on device performance or reliability. To verify compatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended to be used. Attaching LEDs, do not use adhesives that outgas organic vapor. LED

LED

LED

LED

(4) 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.





Table 4-1 Storage

| Conditions |                             | Temperature | Humidity | Time   |
|------------|-----------------------------|-------------|----------|--|
| Storage    | Before Opening Aluminum Bag | 30          | 75%      | Within 1 Year From Date                          |
|            | After Opening Aluminum Bag  | 30          | 60%      | Recommended for use<br>within 24 hours<br><br>24 |
| Baking     |                             | 60±5        | -        | 24hours<br><br>24                                |

REFOND



Version History/

| Date       | Revisor     | Version | Verifier    | Remarks         |
|------------|-------------|---------|-------------|-----------------|
| 2017/07/15 | hao daijian | E0      | hangshiming | ew              |
| 2022/09/14 | Xian Zhou   | E2      | Zhu Yiming  | Template update |
|            |             |         |             |                 |
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REFOND



Declare

This specification is written both in English and in Chinese and the latter is formal.