

# SPECIFICATION

REFOND P/N

RF-A2P08-WBE2-A1

R&D

Mass Production



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### 1.4 Package Dimension

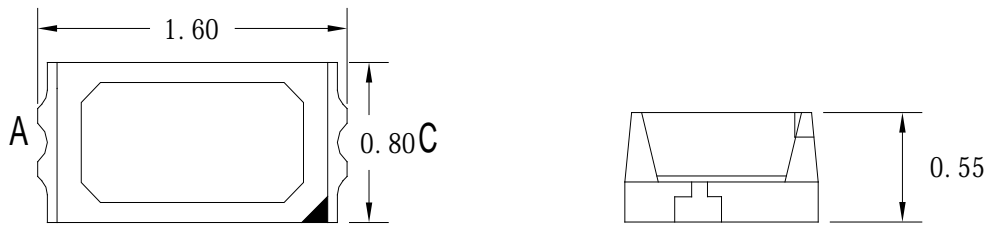
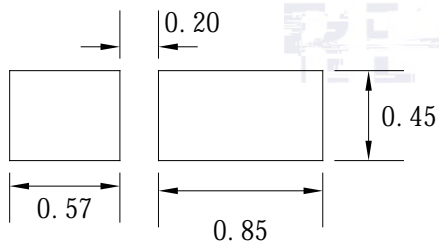


Fig. 1-1 Top View



#### Notes

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

0.2



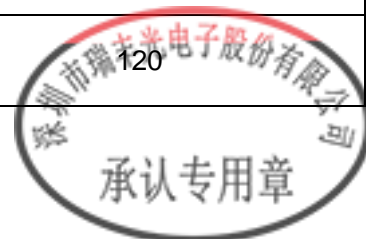
## 1.5 Product Parameters

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

| Item                | Symbol      | Test Condition | Value |      |      | Unit        |
|---------------------|-------------|----------------|-------|------|------|-------------|
|                     |             |                | Min.  | Typ. | Max. |             |
| Forward Voltage     | $V_F$       | $I_F=5mA$      | 2.5   | 2.8  | 3.1  | V           |
| Reverse Current     | $I_R$       | $V_R=5V$       | ---   | ---  | 10   | $\mu A$     |
| Luminous Intensity  | $I_V$       | $I_F=5mA$      | 280   | 360  | 530  | mcd         |
| Viewing Angle       | 2 1/2       | $I_F=5mA$      | ---   | 120  | ---  | deg         |
| Thermal Resistance. | $R_{THJ-S}$ | $I_F=5mA$      | ---   | ---  | 300  | $^{\circ}W$ |

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

| Parameter                     | Symbol    | Rating     | Units |
|-------------------------------|-----------|------------|-------|
| Power Dissipation             | $P_D$     | 93         | mW    |
| Forward Current               | $I_F$     | 30         | mA    |
| Peak Forward Current          | $I_{FP}$  | 100        | mA    |
| Reverse Voltage               | $V_R$     | 5          | V     |
| Electrostatic Discharge (HBM) | $E_{SD}$  | 2000       | V     |
| Operating Temperature         | $T_{OPR}$ | -40 ~ +100 |       |
| Storage Temperature           | $T_{STG}$ | -40 ~ +100 |       |
| Junction Temperature          | $T_J$     | 120        |       |



## Notes

1. 1/10 Duty cycle, 10ms pulse width. 10ms, 1/10.
2. The above forward voltage measurement allowance tolerance is  $\pm 0.1V$ .
3. The above color coordinates measurement allowance tolerance is 0.005.
4. The above luminous intensity measurement allowance tolerance  $\pm 10\%$ .
5. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.
6. All measurements were made under the standardized environment of Refond.
7. When the LEDs are in operation the maximum current should be decided after measuring the package temperature, junction temperature should not exceed the maximum rate. LED
8. ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handling is needed. LED  
ESD2

## 1.6 Bin Range Of Forward Voltage and Luminous Intensity (IF=5mA)

### BIN (IF=5mA)

Table 1-3

|        |         |         |         |         |         |         |
|--------|---------|---------|---------|---------|---------|---------|
| VF     | E2      | F1      | F2      | G1      | G2      | H1      |
|        | 2.5-2.6 | 2.6-2.7 | 2.7-2.8 | 2.8-2.9 | 2.9-3.0 | 3.0-3.1 |
| IV mcd | I2      | J1      | J2      |         |         |         |
|        | 280-350 | 350-430 | 430-530 |         |         |         |





### 1.7 Typical Optical Characteristics Curves

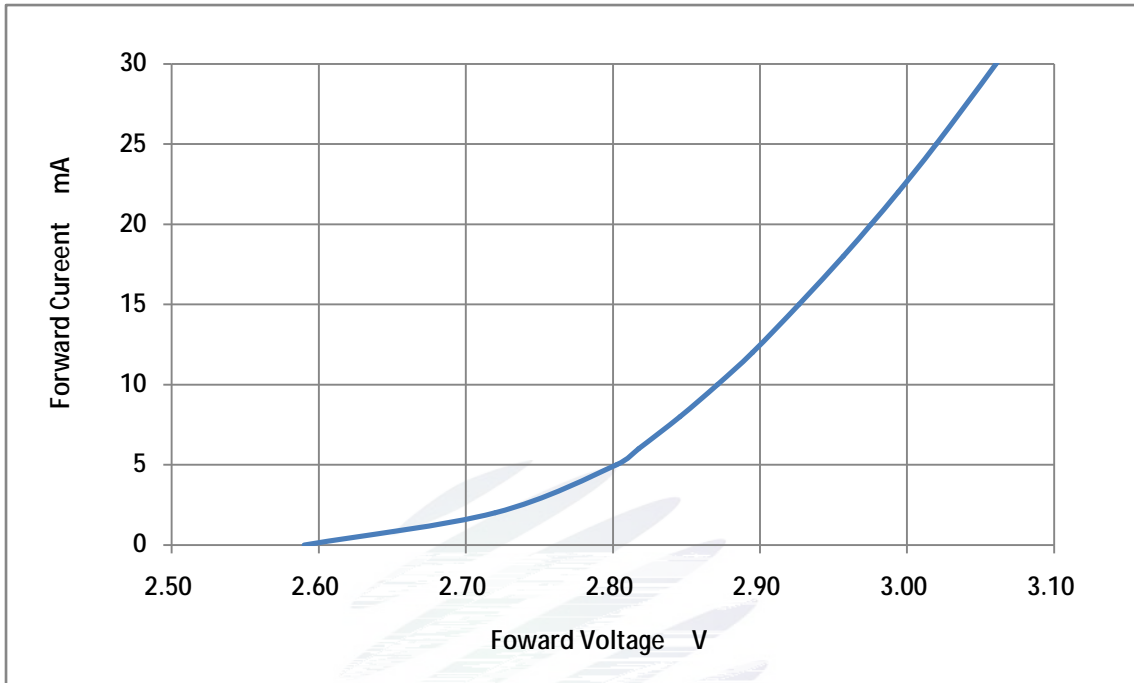


Fig. 1-7 Forward Voltage Vs Forward Current

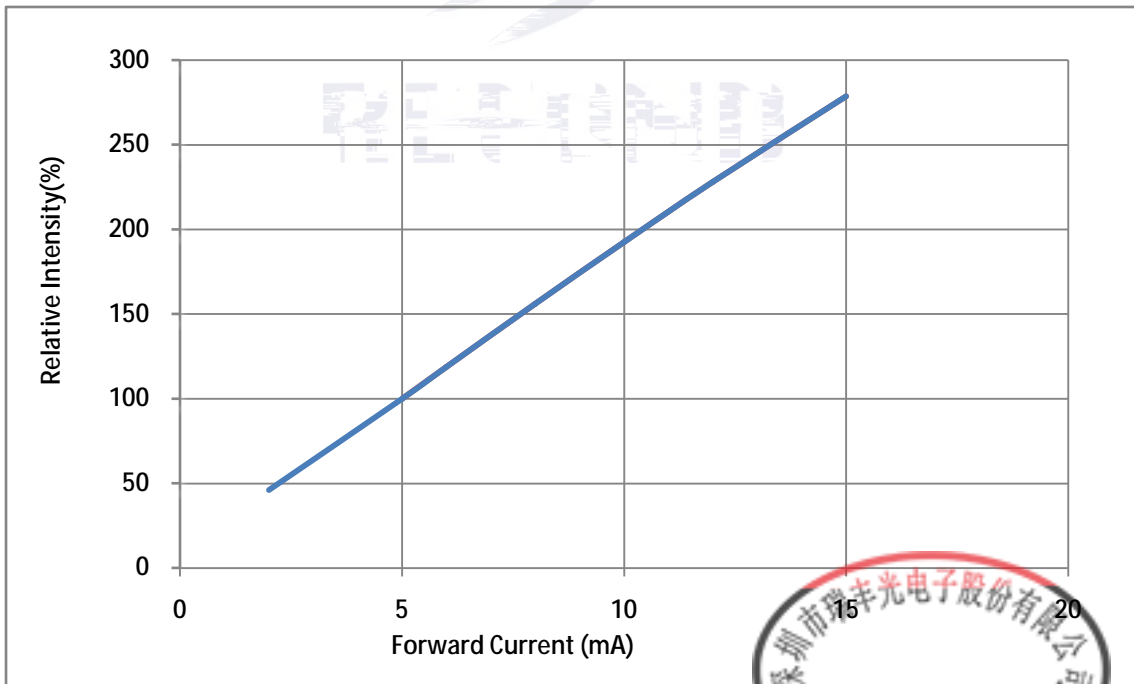


Fig. 1-8 Forward Current Vs Relative Intensity





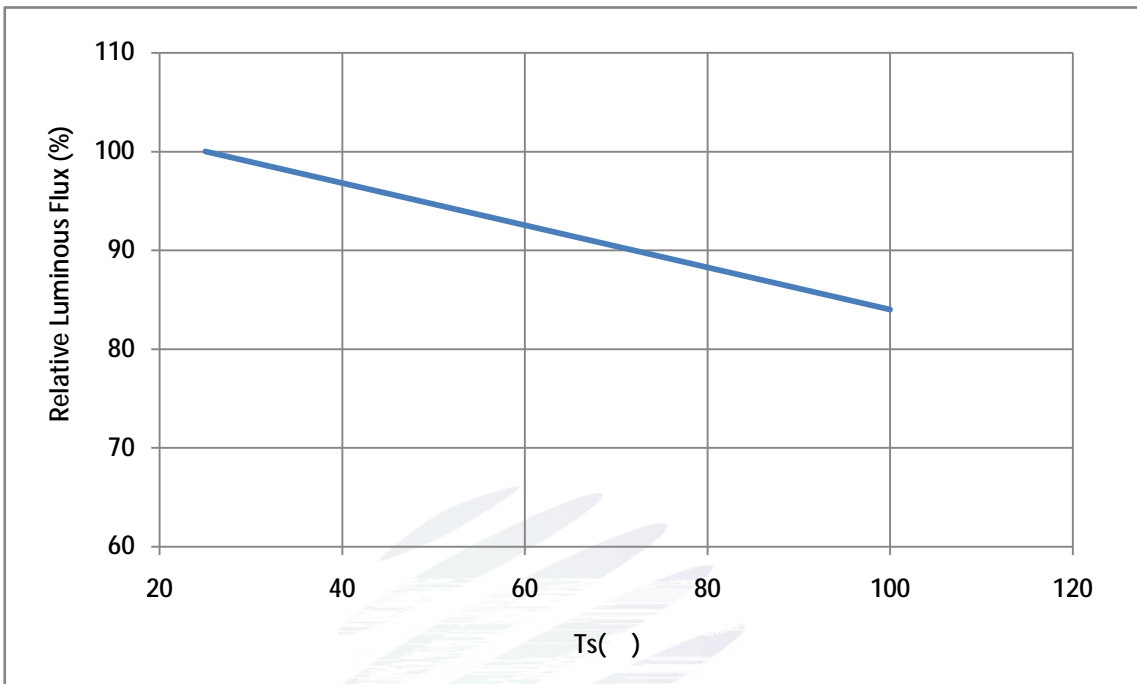


Fig. 1-9 Solder Temperature Vs Relative Intensity

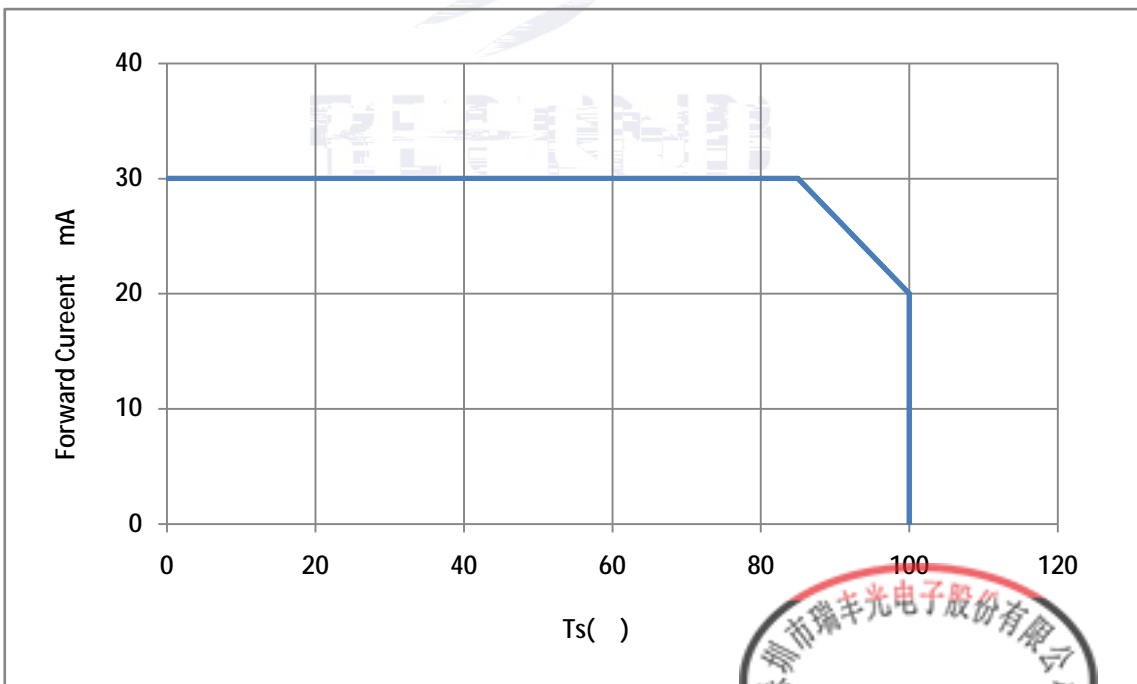


Fig. 1-10 Solder Temperature Vs Forward Current

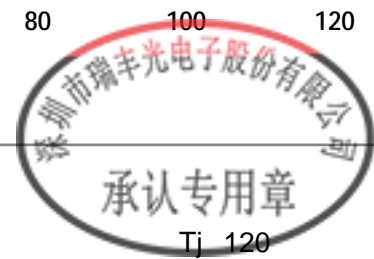


Fig. 1-11 Forward Voltage Vs Solder Temperature

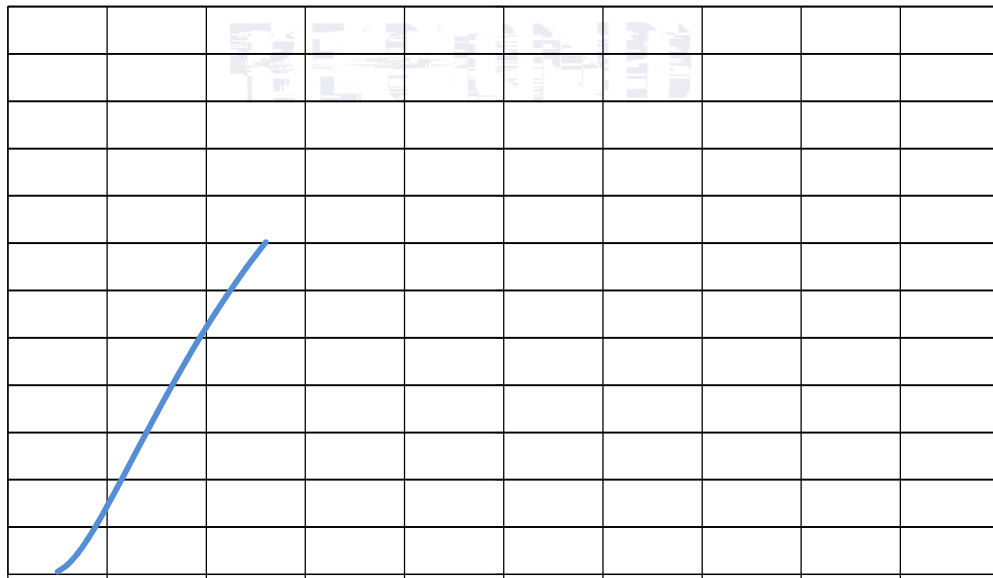
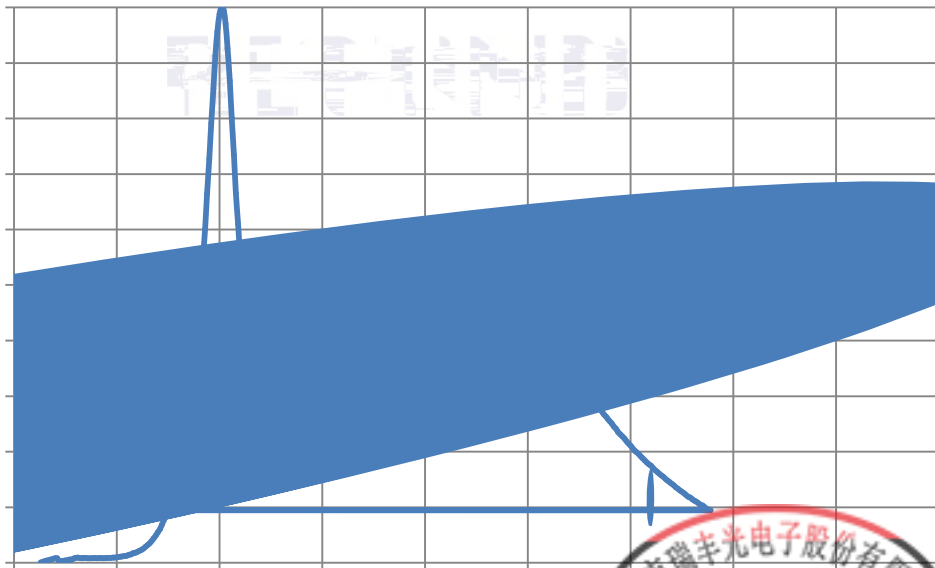


Fig. 1-12 Radiation diagram



## 2. Packaging

### 2.1 Packaging Specification

Package: 4000pcs/reel. 4000pcs

#### 2.1.1 Carrier Tape Dimension

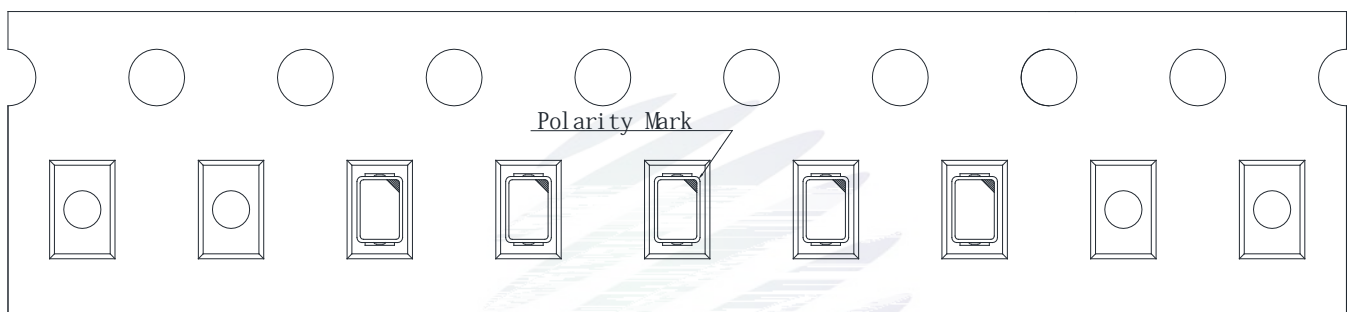
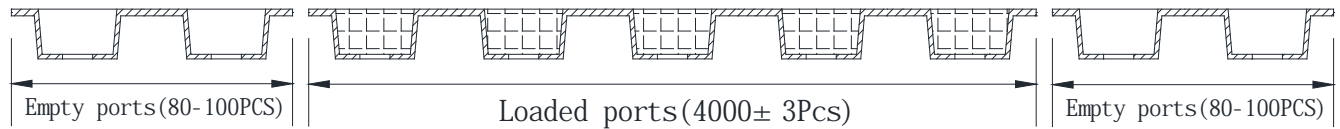


Fig.2-1 Carrier Tape Dimension

#### 2.1.2 Reel Dimension

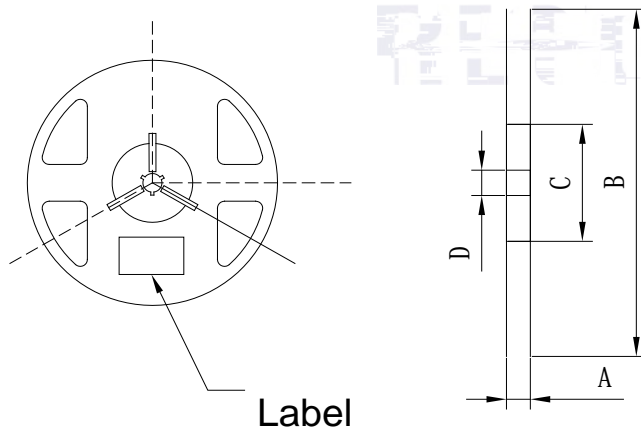


Fig.2-2 Reel Dimension

Table 2-1 Reel Dimension

|   |            |
|---|------------|
| A | 8.0 0.1mm  |
| B | 178 1mm    |
| C | 60 1mm     |
| D | 13.0 0.5mm |

#### Notes

The tolerances unless mentioned  $\pm 0.1\text{mm}$ . Unit : mm



### 2.1.3 Label Form Specification

Table 2-2 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 Form Specification

### 2.2 Moisture Resistant Packing

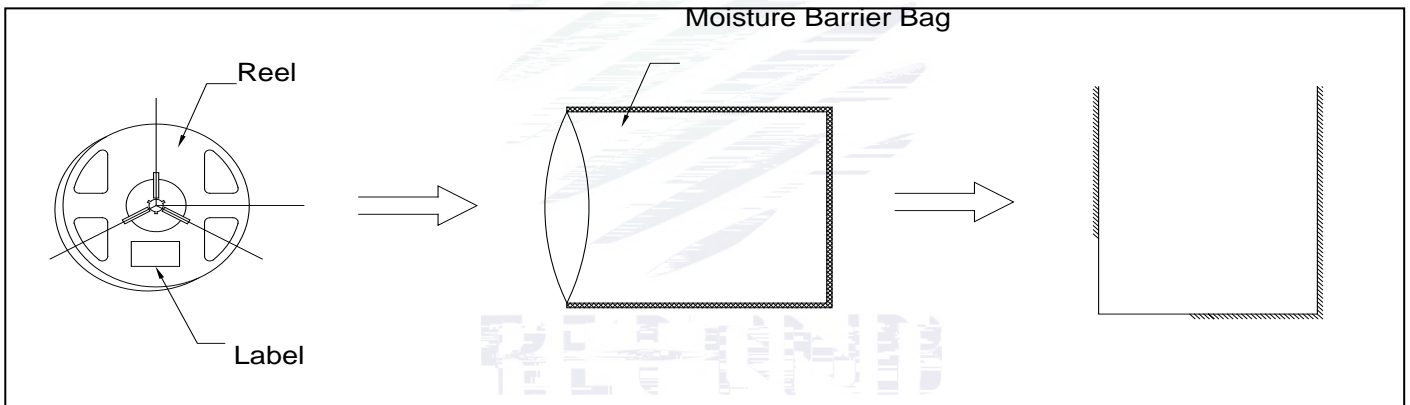


Fig.2-4 Moisture Resistant Packing

### 2.3 Cardboard Box



Fig.2-5 Cardboard Box





### 3. SMT Reflow Soldering Instructions SMT

#### 3.1 SMT Reflow Soldering Instructions SMT

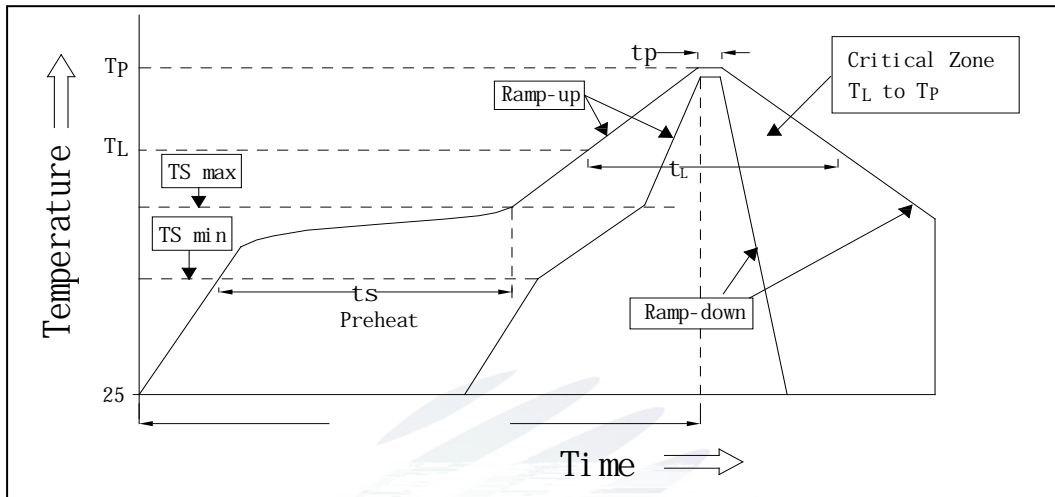
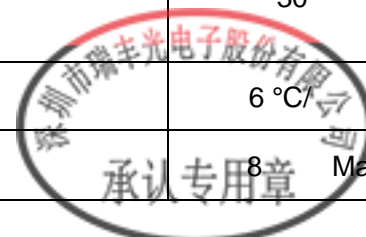


Fig.3-1SMT Reflow Soldering Instructions SMT

Table 3-1Reflow parameters

|                                                            |                                 |                   |
|------------------------------------------------------------|---------------------------------|-------------------|
| Average temperature rise speed                             | $T_{smax}$ $T_P$                | 3 °C/ Max 3 °C/ s |
| Preheating: minimum temperature                            | ( $T_{smin}$ )                  | 150 °C            |
| Preheating: Max temperature                                | ( $T_{smax}$ )                  | 200 °C            |
| Preheating: Time                                           | $T_{smin}$ $T_{smax}$           | 60 - 120 60s-120s |
| Time limited to maintain high temperature: the temperature | ( $T_L$ )                       | 217 °C            |
| Time limited to maintain high temperature: The Time        | ( $t_L$ )                       | 60 Max 60s        |
| Peak /Classification of temperature:                       | ( $T_P$ )                       | 260 °C            |
| Time limit classification of peak temperature time         | $t_p$                           | 10 Max 10s        |
| ( $T_P$ ) 5 °C<br>actual peak temperature (TP)             | Hold time within 5 °C with the  | 30 Max 30s        |
| Cooling speed                                              |                                 | 6 °C/ Max 6 °C/ s |
| 25 °C                                                      | Needed time from 25 °C to $T_P$ | 8 Max 8 minutes   |





Notes

(1)Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings , LED will be damaged. 24 LED

(2)Whensoldering , do not put stress on the LEDs during heating.

3.1.1 Soldering Iron

(1) When do soldering by hand, keep the temperature of iron below less 300 less than 3 seconds. 300 3

(2) Soldering by hand should be done only one time.

3.1.2 Repairing

Repairing



## 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 100PPM.

(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.

900PPM LED 900PPM

(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

(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.



Fig 4-1 Handling Precautions

(5) In designing a circuit, the current through each LED can not exceed the absolute maximum rating specified



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>24H |

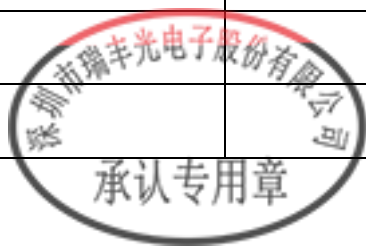
Baking

60 5 -



## Version History/

| Date       | Revisor       | Version | Verifier   | Remarks         |
|------------|---------------|---------|------------|-----------------|
| 2020/03/18 | Huang nianhua | E0      | Zhu yiming | New issue       |
| 2022/07/13 | Lu Xian       | E1      | Zhu yiming | Template update |
|            |               |         |            |                 |
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Declare

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