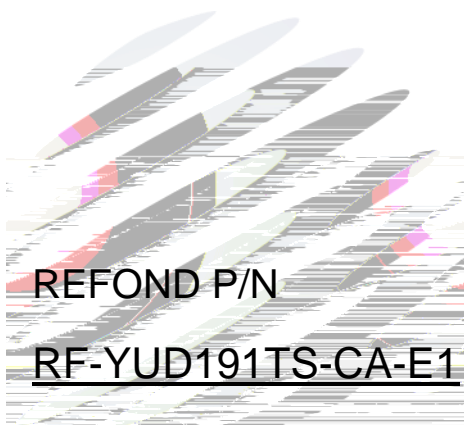


SPECIFICATION



Mass Product



Contents

| | |
|--------------------------------------------|----|
| 1. Description | |
| 1.1 General Description | |
| 1.2 Features | |
| 1.3 Application | |
| 1.4 Package Dimension | |
| 1.5 Product Parameters | |
| 1.6 Typical Optical Characteristics Curves | |
| 2. Packaging | |
| 2.1 Packaging Specification | |
| 2.1.1 Carrier Tape Dimension | 11 |
| 2.1.2 Reel Dimension | 11 |
| 2.1.3 Label Form Specification | 12 |
| 2.2 Moisture Resistant Packing | |
| 2.3 Cardboard Box | |
| 2.4 Reliability Test Items And Conditions | |
| 2.5 Criteria For Judging Damage | |
| 3. SMT Reflow Soldering Instructions SMT | |
| 3.1 SMT Reflow Soldering Instructions SMT | |
| 4. Handling Precautions | |
| 4.1 Handling Precautions | |





1.4 Package Dimension

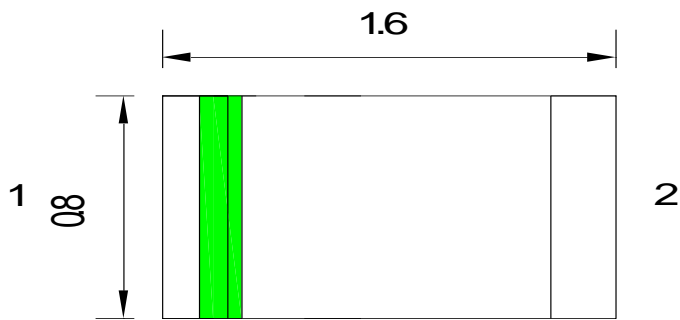


Fig.1-1 Top view

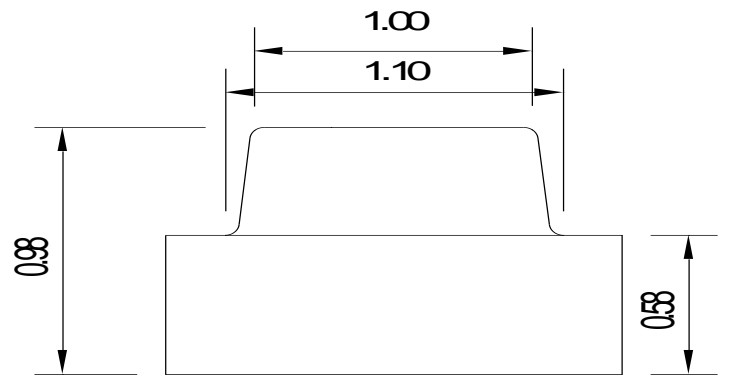


Fig.1-2 Side view

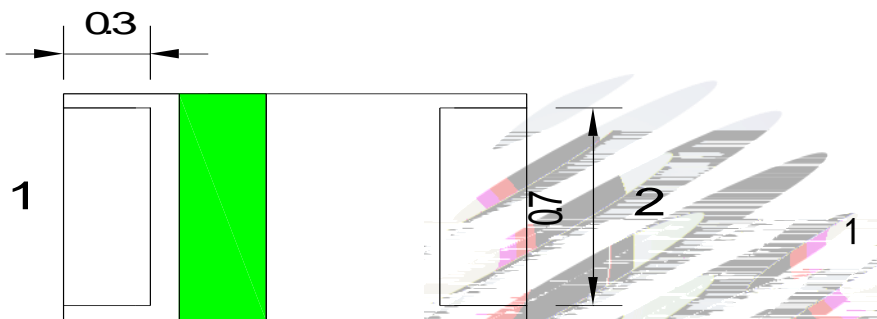


Fig.1-3 Bottom view

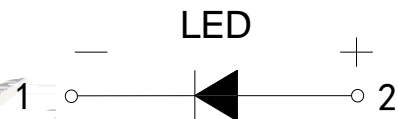


Fig.1-4 Polarity

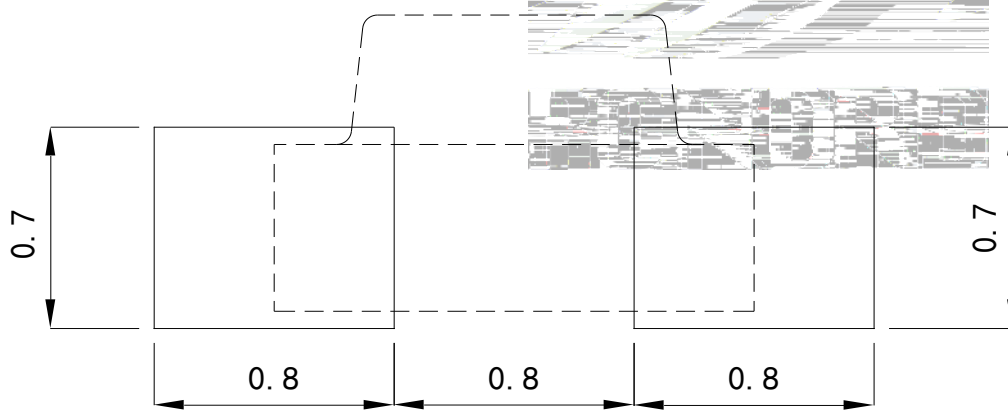


Fig.1-5 Soldering patterns

Notes

All dimensions units are millimeters.

All dimensions tolerances are 0.2mm unless otherwise noted.



1.5 Product Parameters

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

| Item | Test Condition | Symbol | Value | | | Unit |
|-------------------------|-------------------|----------|-------------|------|------|------|
| | | | Min. () | Typ. | Max. | |
| Spectral Half Bandwidth | $I_F=20\text{mA}$ | Δ | -- | 15 | -- | nm |



Notes : $V_R=5V$ For test conditions. $V_R=5V$

1.6 Typical Optical Characteristics Curves

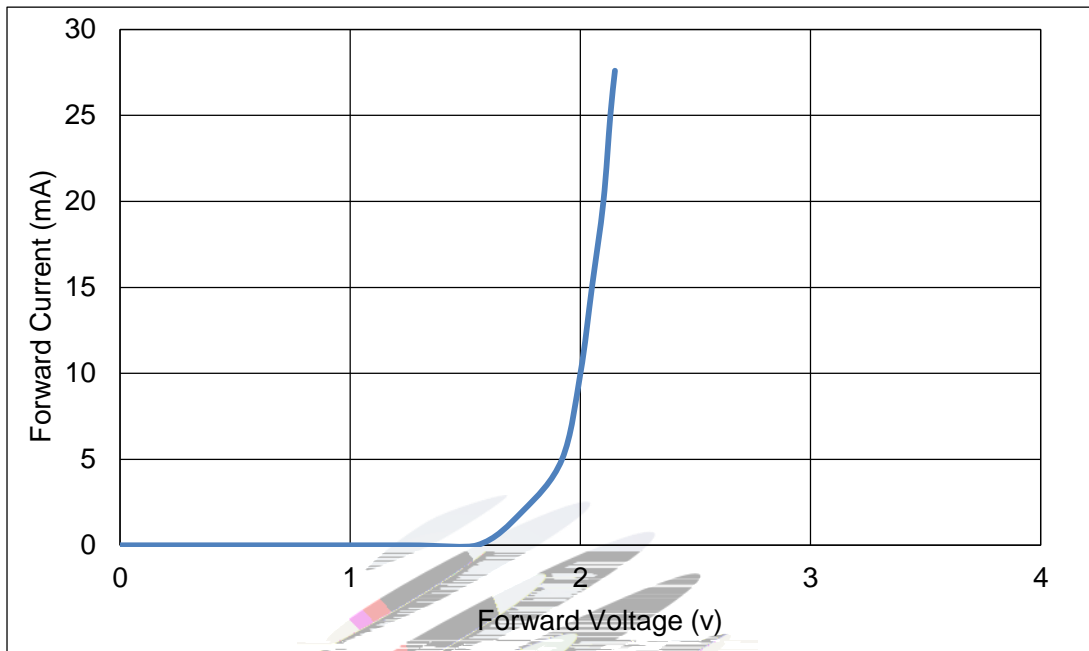


Fig 1-6 Forward Voltage Vs Forward Current

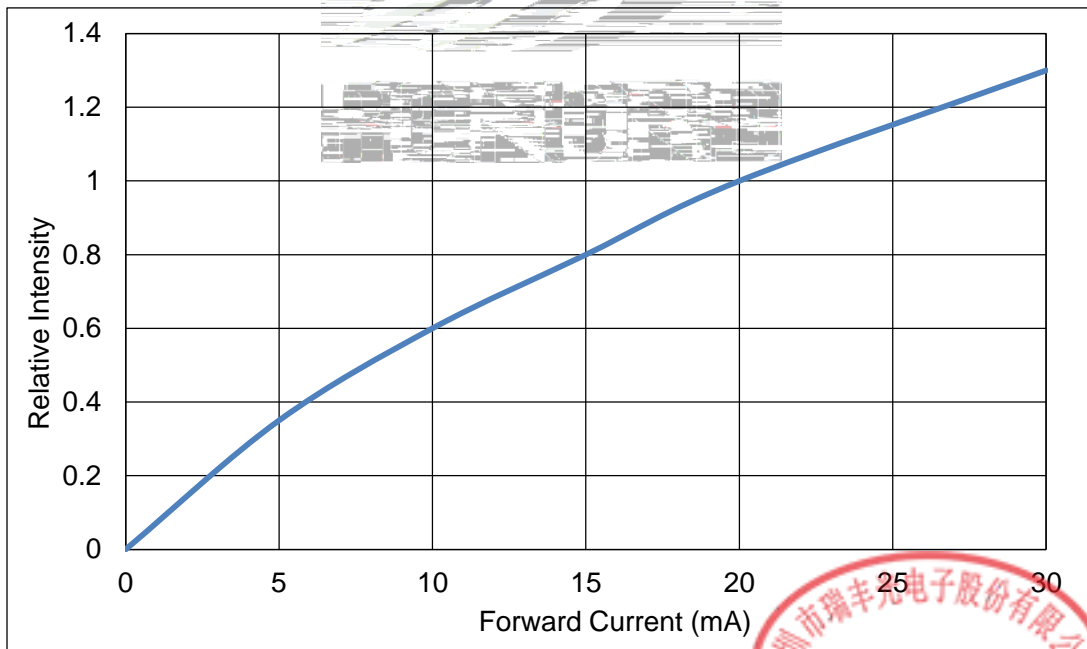


Fig 1-7 Forward Current Vs Relative Intensity





Fig 1-10 Forward Current Vs Dominate Wavelength (Ta



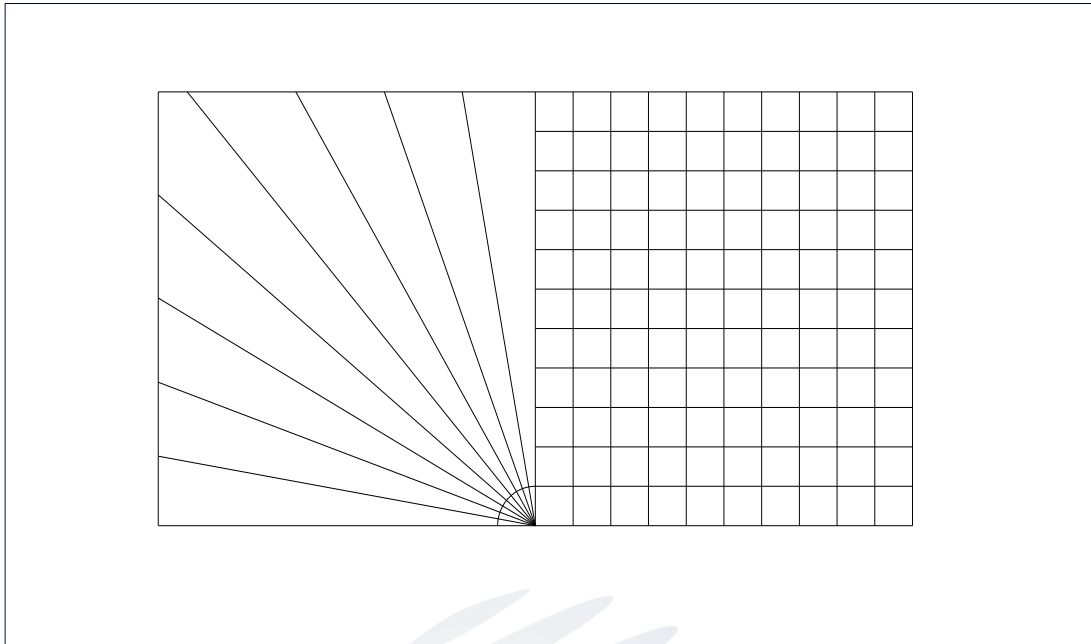
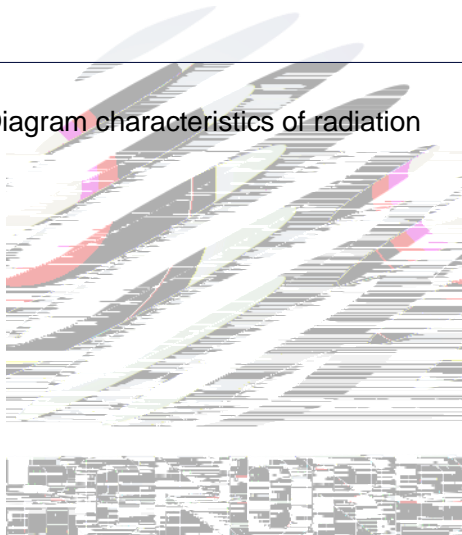


Fig 1-12 Diagram characteristics of radiation



2. Packaging

2.1 Packaging Specification

Package: 4000pcs/reel. 4000pcs

2.1.1 Carrier Tape Dimension

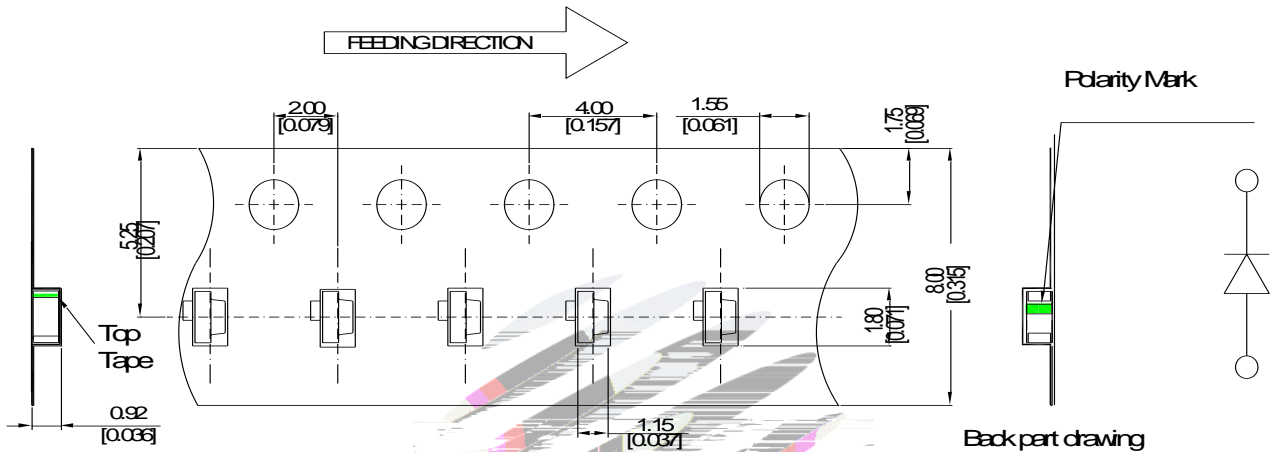


Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension

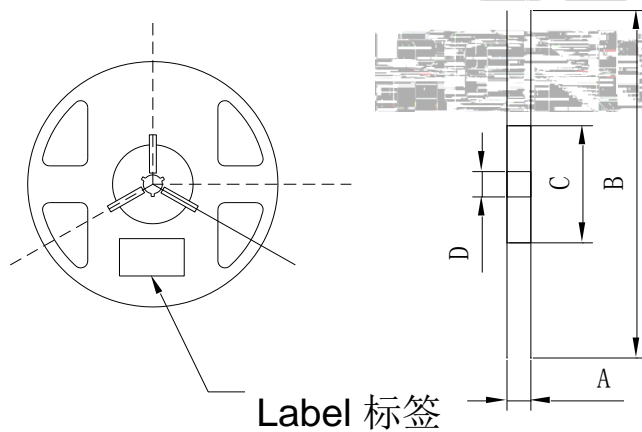


Fig.2-2 Reel Dimension

Table 2-1 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

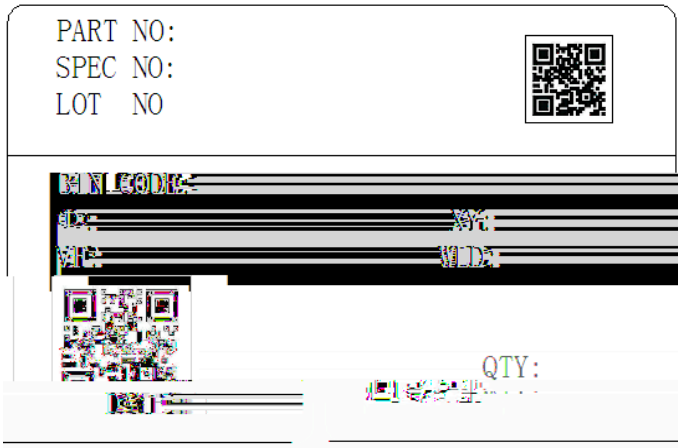


Table 2-2 Parameter

| | |
|----------------|------------------|
| PART NO. | Part Number |
| SPEC NO. | Spec Number |
| LOT NO. | Lot Number |
| BIN CODE | Bin Code |
| | Luminous flux |
| XY | Chromaticity Bin |
| V _F | 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

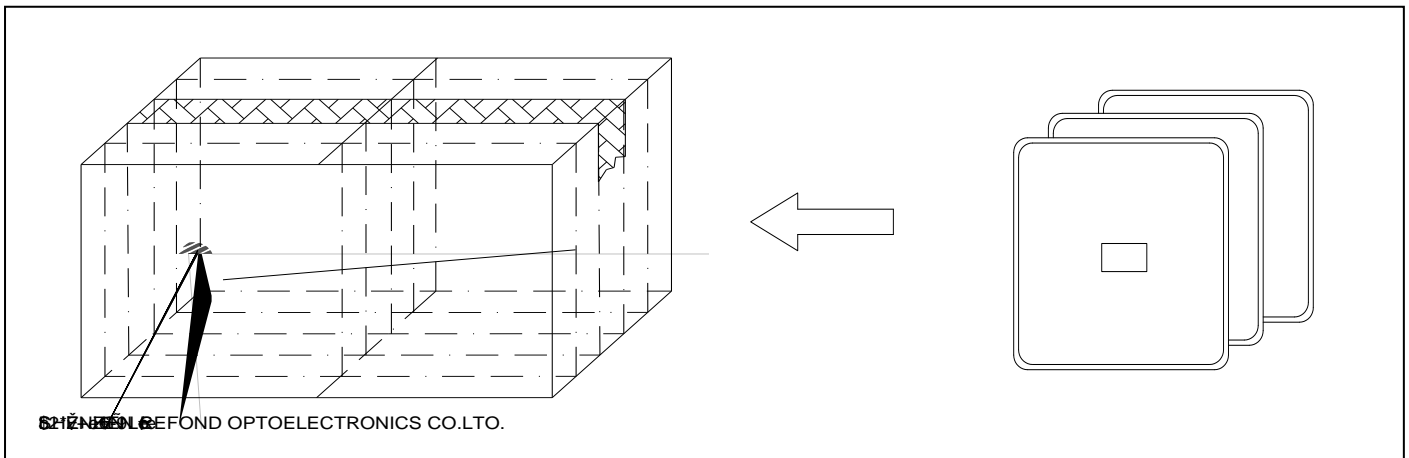


Fig.2-5 Cardboard Box

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 / |
|--------------------------|--------------|--------------------------------------------|------------|----------|---------|
| Reflow | JESD22-B106 | Temp:260 max T=10 sec | 2 times | 22Pcs. | 0/1 |
| Temperature Cycle | JESD22-A104 | 100 30 min 5 min -40 30 min | 100 cycles | 22Pcs. | 0/1 |
| Thermal Shock | JESD22-A106 | -40 15min 100 15min | 300 cycles | 22Pcs. | 0/1 |
| High Temperature Storage | JESD22-A103 | T _{emp} :100 | 1000 hrs. | 22Pcs. | 0/1 |
| Low Temperature Storage | JESD22-A119 | T _{emp} :-40 | 1000 hrs. | 22Pcs. | 0/1 |
| Life Test | JESD22-A108 | T _a =25 I _F =20mA | 1000 hrs. | 22Pcs. | 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 | $I_F=20mA$ | - | U.S.L*)x1.1 |
| Reverse Current | I_R | $V_R= 5V$ | - | U.S.L*)x2.0 |
| Luminous Flux | | $I_F=20mA$ | 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.

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

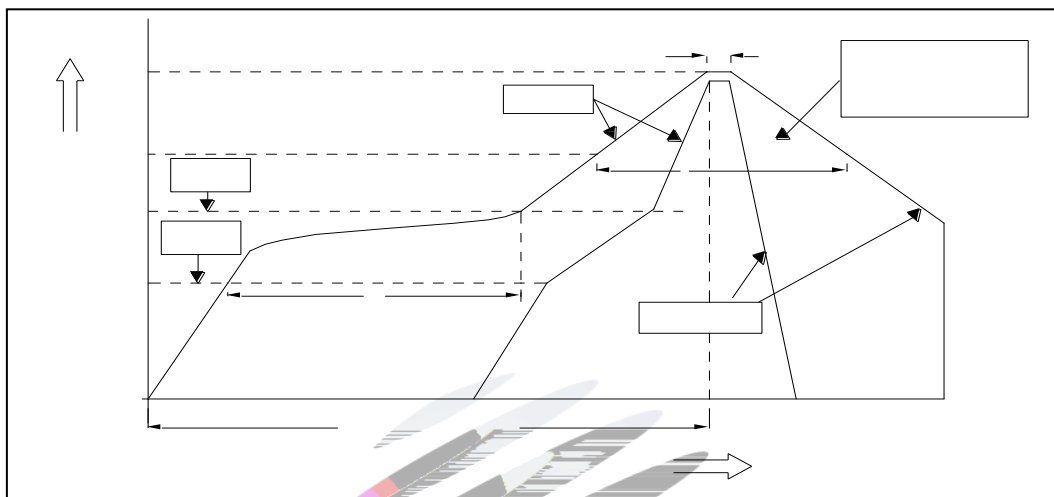


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Parameter

| | | |
|-------------------------------------------------------------|-----------------------|-------------------|
| 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 - 150 60s-150s |
| Peak /Classification of temperature: | / (T_p) | 260 °C |
| Time limit classification of peak temperature time | t_p | 10 Max 10s |
| Hold time within 5 °C with the actual peak temperature (TP) | (T_p) | 30 Max 30s |
| Cooling speed | 5 °C | 6 °C/ Max 6 °C/ s |
| Needed time from 25 °C to T_p | 25 °C | 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.

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

3.1.1 Soldering Iron

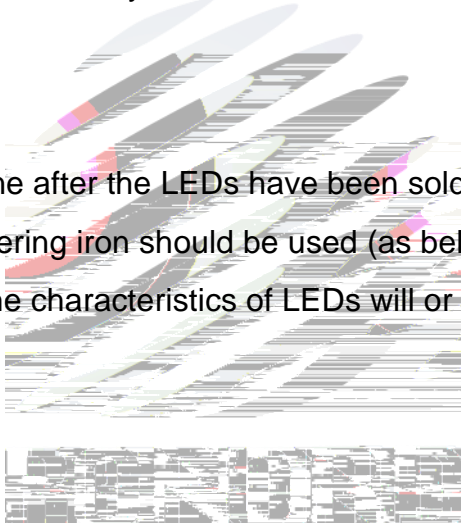
(1) When do soldering by hand, keep the temperature of iron below less 300°C less than 3 seconds.

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

3.1.2 Repairing

Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed in advance whether the characteristics of LEDs will or not be damaged by repairing.

LED



3.1.3 Cautions

(1) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board. LED

(2) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.



4. Handling Precautions

4.1 Handling Precautions

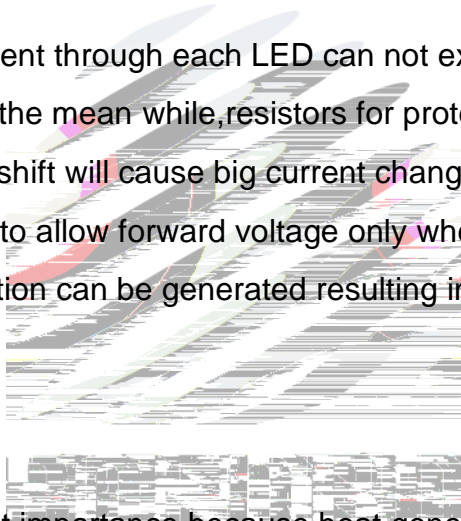


(4) Handle the component along the side surface by using forceps or appropriate tools; Do not directly touch or Handle the silicone lens surface, it may damage the internal circuitry.



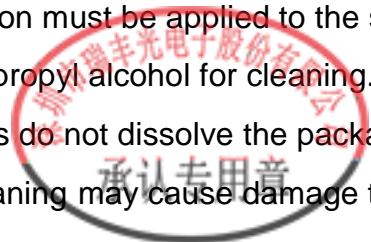
Fig 4-1 产品使用注意事项

(5) In designing a circuit, the current through each LED can not exceed the absolute maximum rating specified for each LED. In the mean while, resistors for protection should be applied, otherwise slight voltage shift will cause big current change, burn out may happen. The driving circuit must be designed to allow forward voltage only when it is ON or OFF. If the reverse voltage is applied to LED, migration can be generated resulting in LED damage.



(6) Thermal Design is paramount importance because heat generation may result in the Characteristics decline, such as brightness decreased, Color change and so on. Please consider the heat generation of the LEDs when making the system design. LED

(7) Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust, requiring special care during processing. In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after the soldering of components. Refond suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin. Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the



LED.

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% | 168hours 168 |
| Baking | | 60 ± 5 | - | 24hours 24 |

(8) If the moisture absorbent material — silica gel — has faded away or the LEDs have exceeded the storage time, baking treatment should be performed after unpacking and based on the following condition $60 \pm 5 \text{ }^{\circ}\text{C}$ for above 24 hours.

If the package is flatulence or damaged, please notify the sales staff to assist.

(9) Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS).

(10) Other points for attention, please refer to our relevant information.



| Date | Revisor | Version | Verifier | Remarks |
|------------|---------|---------|----------|---------|
| 2019.07.15 | | E/0 | | |
| 2021.07.25 | | E/1 | | |
| 2022.09.01 | | E/2 | | |
| | | | | |
| | | | | |





Declare

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