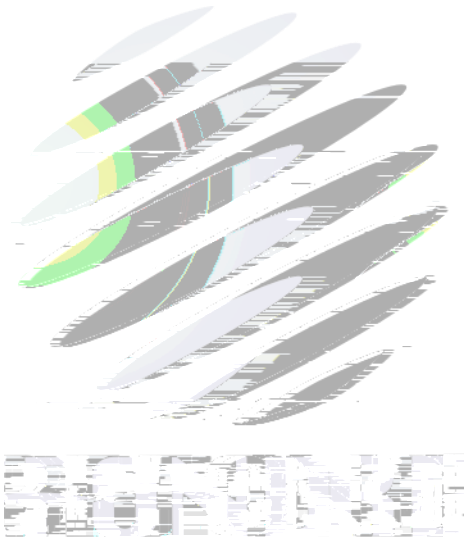
# SPECIFICATION

REFOND P/N

RF-YUL191TS-BC-E1

Mass Product

# Contents



## 1.4 Package Dimension

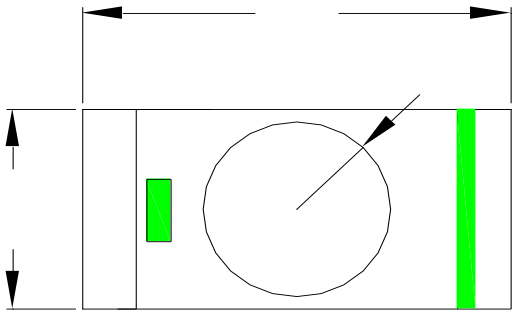


Fig.1-1 Top view

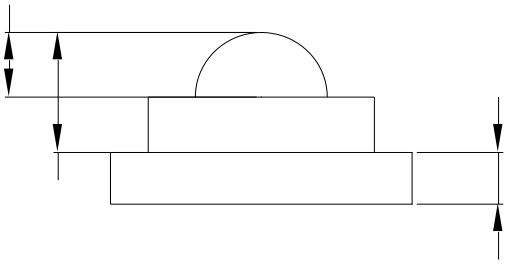


Fig.1-2Side view

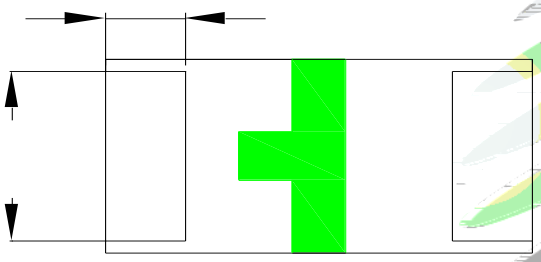


Fig.1-3Bottom view

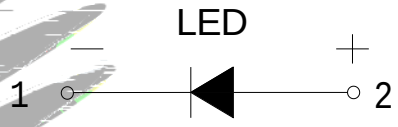



Fig.1-4Polarity

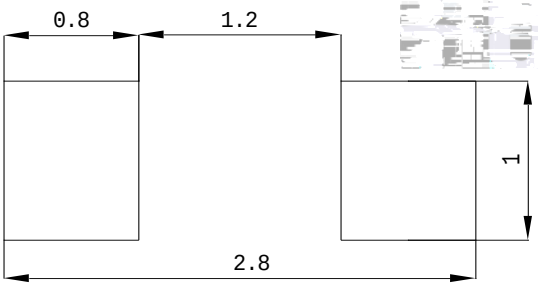



Fig.1-5 Soldering patterns

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 | $I_F$=20mA | | | -- | 15 | -- | nm |
| Forward Voltage | $I_F$=20mA | $V_F$ | A0 | 1.6 | -- | 1.8 | V |
| | | | B0 | 1.8 | -- | 2.0 | V |
| | | | C0 | 2.0 | -- | 2.2 | V |
| | | | D0 | 2.2 | -- | 2.4 | V |
| Dominant Wavelength | $I_F$=20mA | D | D00 | 585 | -- | 590 | nm |
| | | | E00 | 590 | -- | 595 | nm |
| Luminous Intensity | $I_F$=20mA | $I_V$ | J10 | 350 | -- | 430 | mcd |
| | | | J20 | 430 | -- | 530 | mcd |
| | | | K10 | 530 | -- | 650 | mcd |
| Viewing Angle at 50% IV | $I_F$=20mA | | | -- | 60 | -- | deg |
| Reverse Current | $V_R$=5V | $I_R$ | | -- | -- | 10 | A |
| Thermal Resistance | $I_F$=20mA | $R_{THJ-S}$ | | -- | -- | 450 | /W |

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

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

Notes

1. 1/10 Duty cycle, 0.1ms pulse width.

2. The above forward voltage measurement allowance tolerance is ±0.1V.

3. The above dominant wavelength measurement allowance tolerance is±2nm.

## 1.6 Typical optical characteristics curves

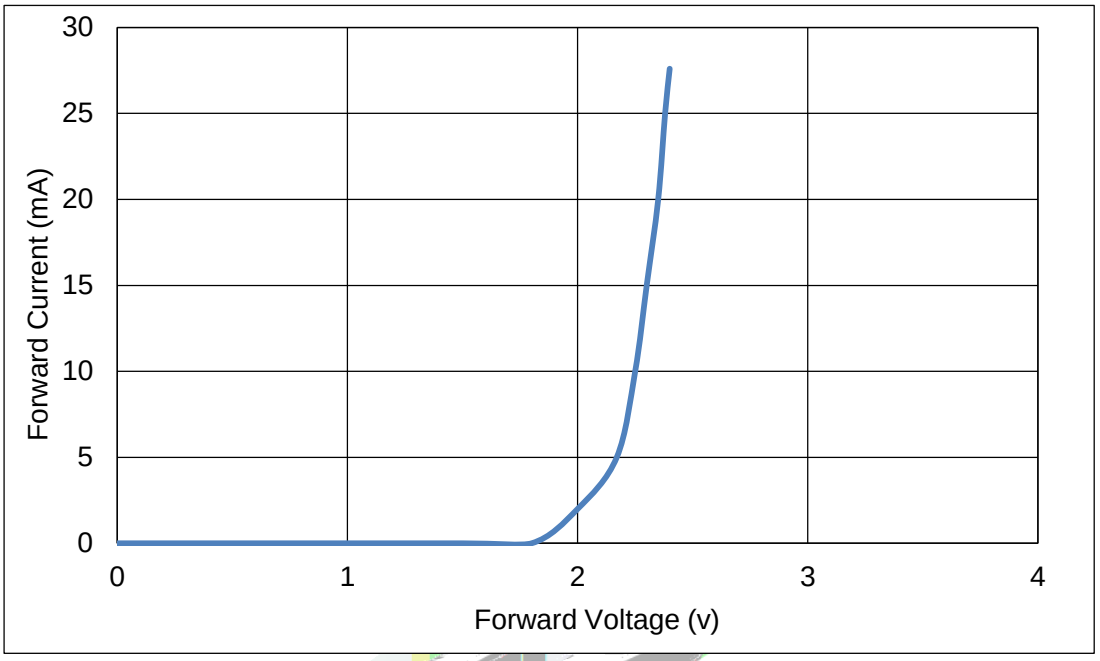



Fig 1-6Forward Voltage Vs. Forward Current

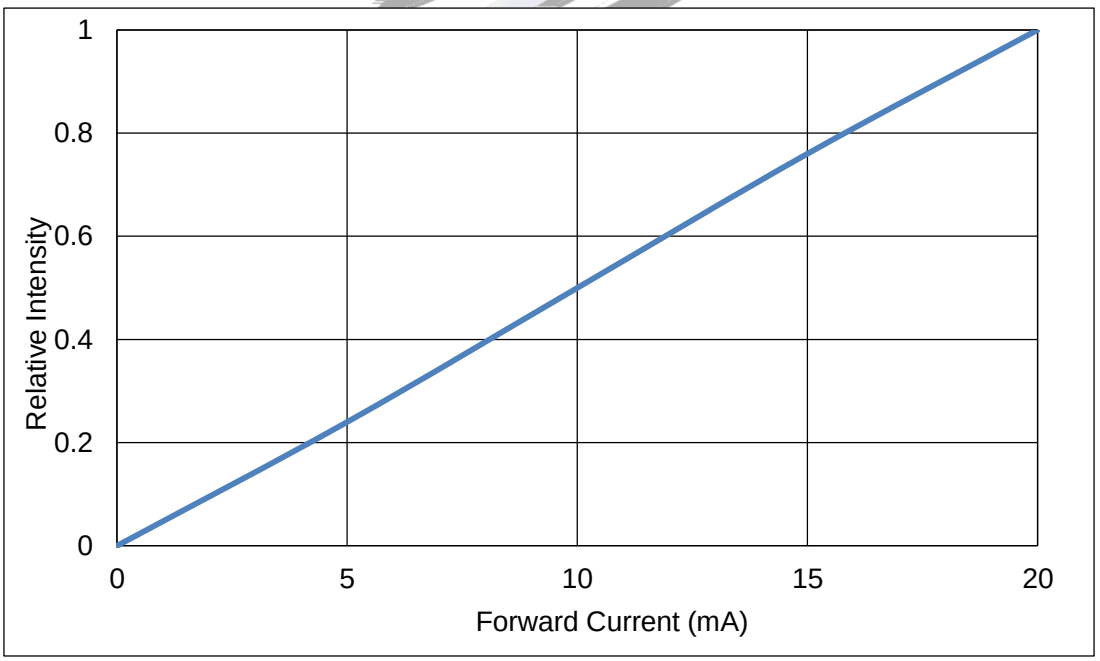



Fig 1-7Forward Current Vs. Relative Intensity

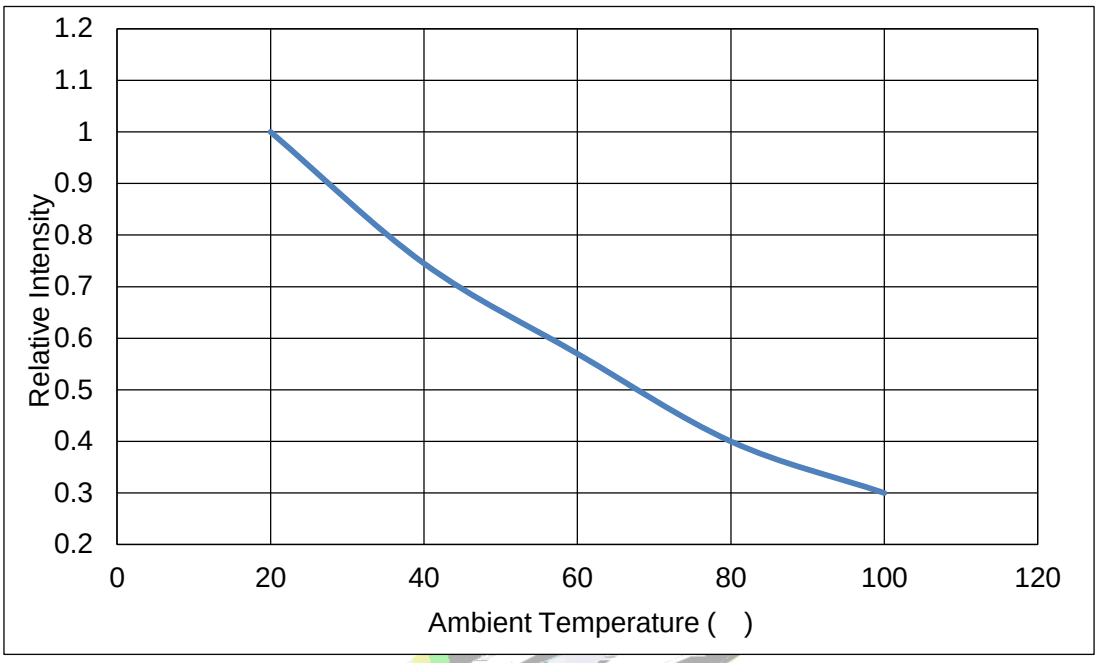



Fig 1-8Solder Temperature Vs Relative Intensity

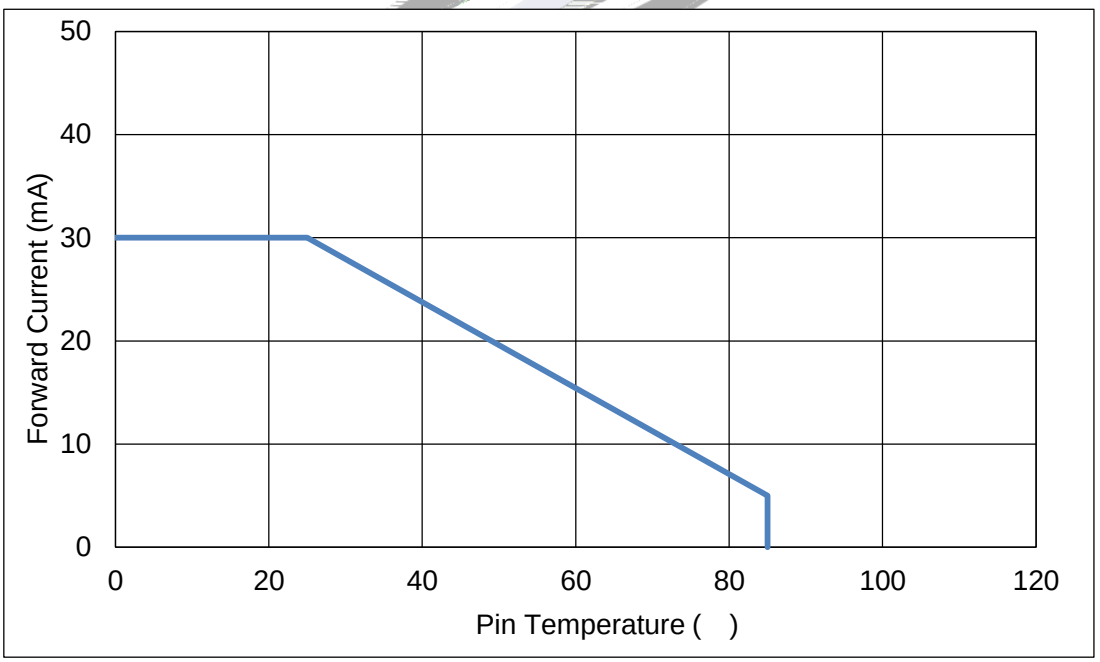



Fig 1-9Solder Temperature VsForward Current

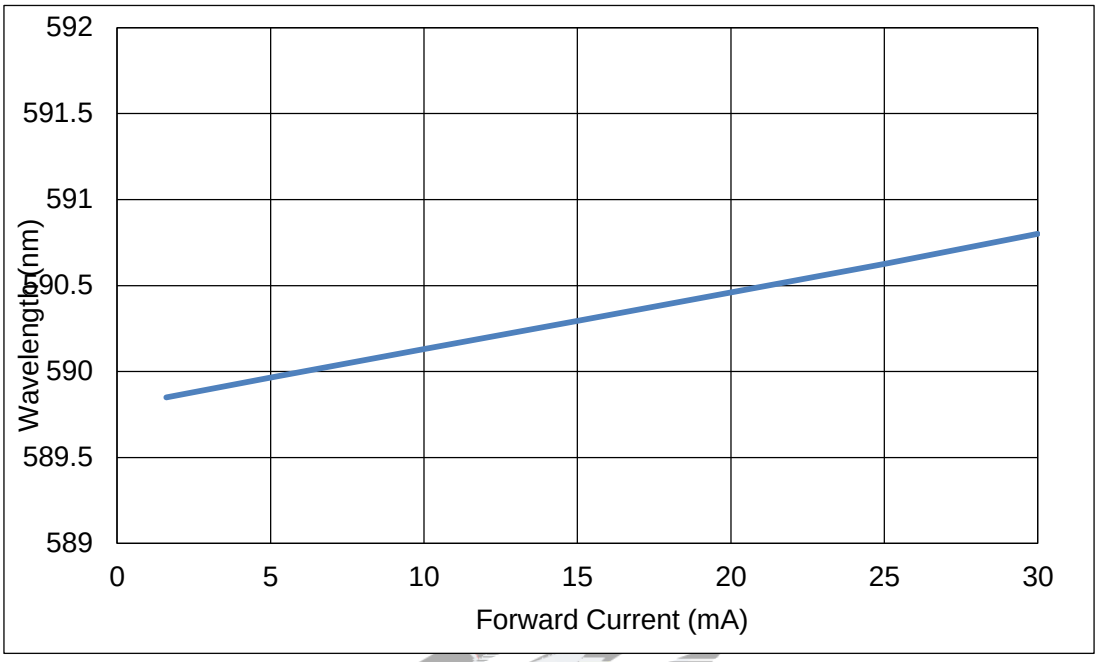



Fig.1-10 Forward Current Vs. Dominate Wavelength (Ta=25 )

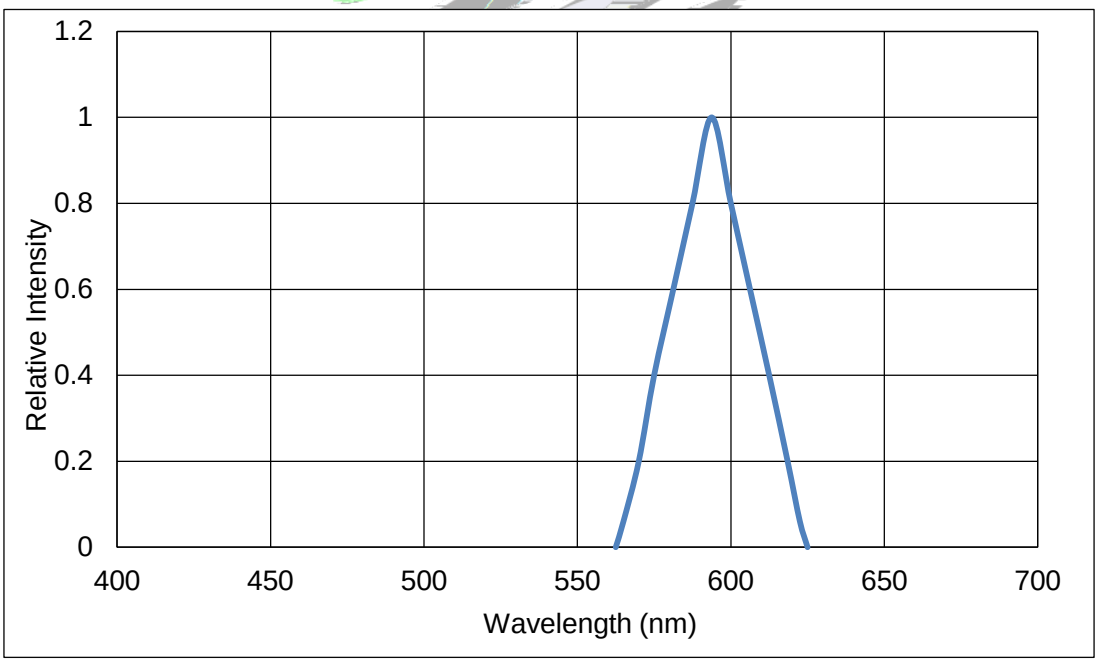



Fig.1-11 Relative Intensity Vs. Wavelength (Ta=25 )

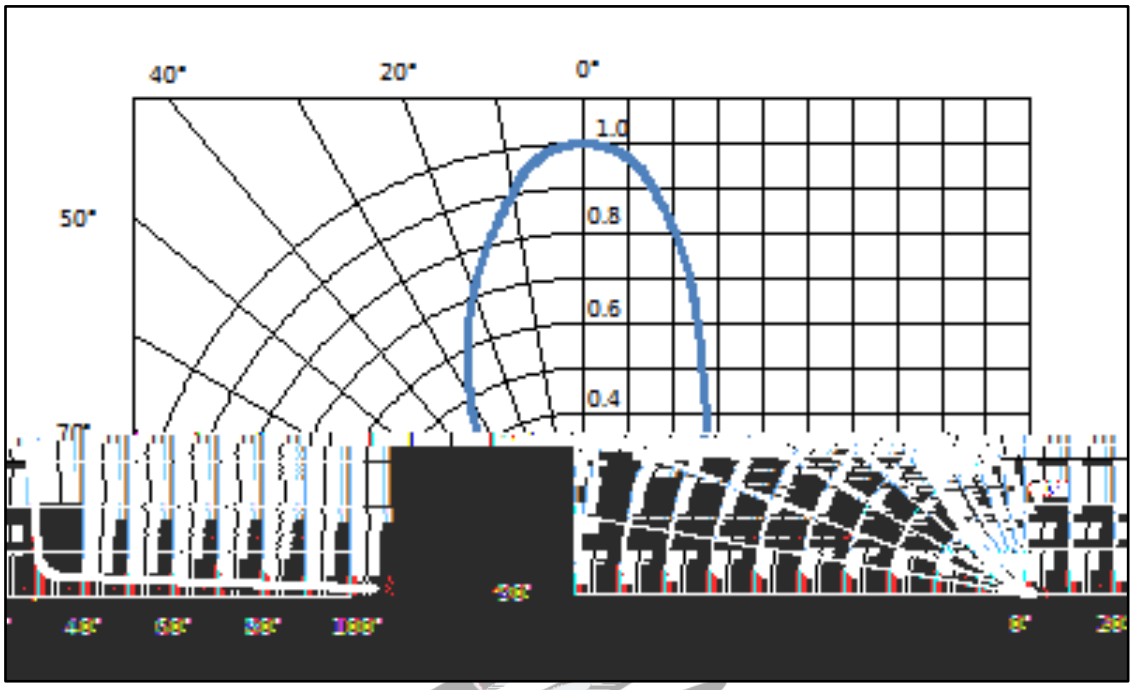



Fig.1-12 Diagram characteristics of radiation

# 2. Packaging

## 2.1 Packaging Specification

Package:3000pcs/reel. 3000pcs

Carrier Tape Dimension

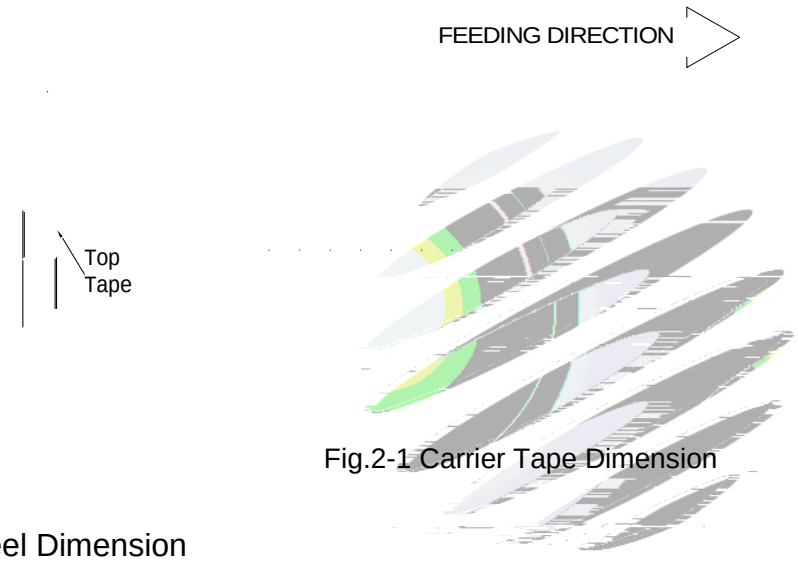
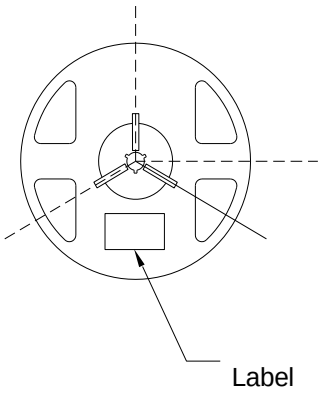



Fig.2-1 Carrier Tape Dimension

2.1.2 Reel Dimension



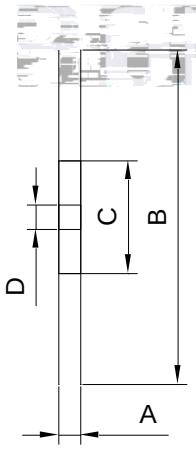




Fig 2-2 Reel Dimension

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 ±0.1mm. Unit : mm

### 2.1.3 Label Form Specification

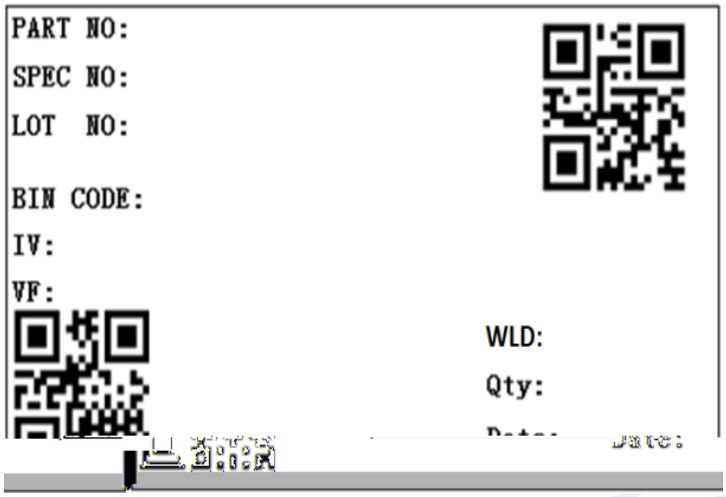



Fig 2-3 Label Form Specification

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 |

## 2.2 Moisture Resistant Packing

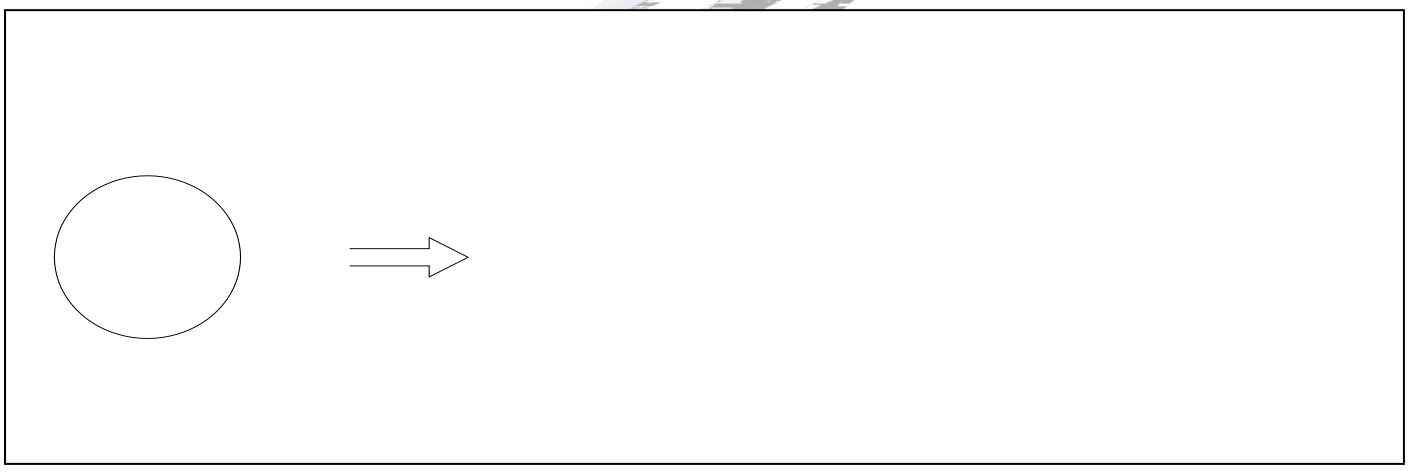


Fig 2-4 Moisture Resistant Packing

## 2.3 Cardboard Box

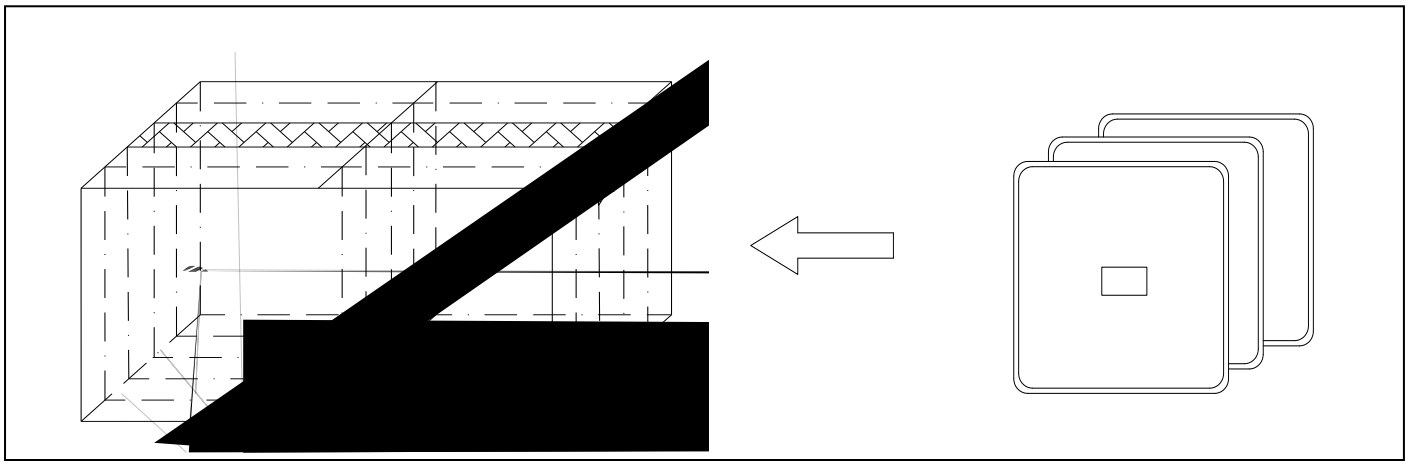


Fig 2-5 Cardboard Box

## 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 | $T_{emp}$:260 max<br>T=10 sec | 2 times | 22Pcs | 0/1 |
| Temperature Cycle | JESD22-A104 | 100 30 min<br>5 min<br>-40 30 min | 100 cycles | 22Pcs | 0/1 |
| Thermal Shock | JESD22-A106 | -40 15min<br>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<br>$I_F$=20mA | 1000 hrs | 22Pcs | 0/1 |

## 2.5 Criteria For Judging Damage

Table 2-4Criteria 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 th e LED to the series and parallel circuit,should take consideration of all the factors such as the current, voltage di stribution, 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

## 3.1SMT Reflow Soldering Instructions SMT

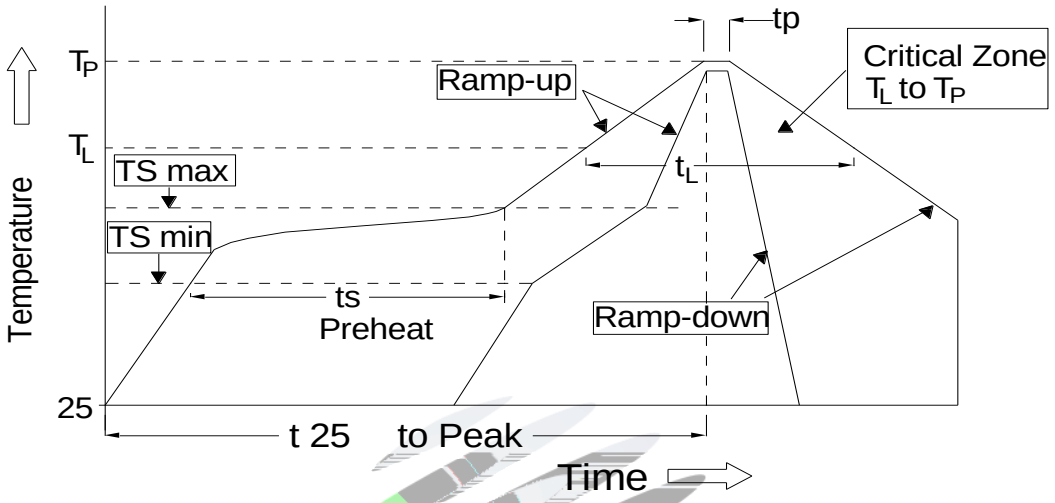



Fig.3-1SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1 Parameter

| | |
|---|---|
| Average temperature rise speed Tsmax TP | 3 °C/ Max 3 °C/ s |
| Preheating: minimum temperature (Tsmin) | 150 °C |
| Preheating: Max temperature (Tsmax) | 200 °C |
| Preheating: Time Tsmin Tsmax | 60 - 120 60s-120s |
| Time limited to maintain high temperature: the temperature (TL) | 217 °C |
| Time limited to maintain high temperature: The Time (tL) | 60 - 150 60s-150s |
| Peak /Classification of temperature: / (TP) | 260 °C |
| Time limit classification of peak temperature time tp | 10 Max 10s |
| Hold time within 5 C with the actual peak temperature (TP) (TP) 5 °C | 30 Max 30s |
| Cooling speed | 6 °C/ Max 6 °C/ s |
| Needed time from 25 °C to Tp 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℃ 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

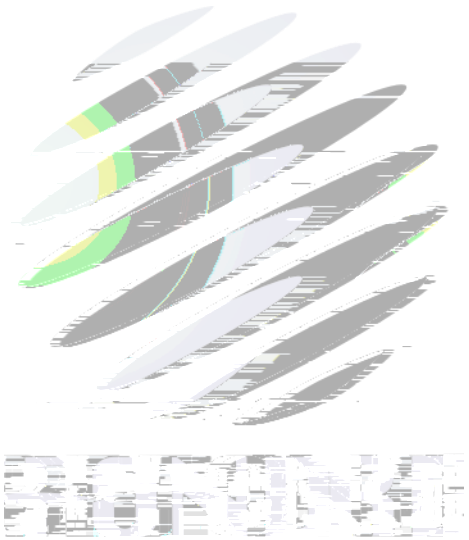
(1)Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board.LED

(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

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



(4) In designing a circuit,the current through each LED must be exceed the absolute maximum rating specified for each LED.In the meanwhile,resistors for protection should beapplied, 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.

(5) 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

(6)Storage

Table 4-1 Storage

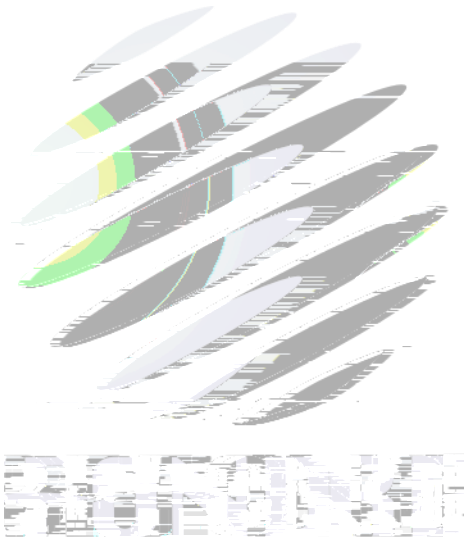
| Conditions | | Temperature | Humidity | Time |
|---|---|---|---|---|
| Storage | Before Opening Aluminum Bag | | 75% | Within 1 Year from Delivery Date |
| | After Opening Aluminum Bag | | | 168hours<br>168 |
| Baking | | 60±5 | - | 24 |

(7) 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±5）℃ for above 24 hours.

(8) 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.



Version History/

| Date | Revisor | Version | Verifier | Remarks |
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| 2021-03--13 | | E/1 | | |
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