

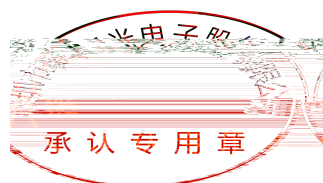
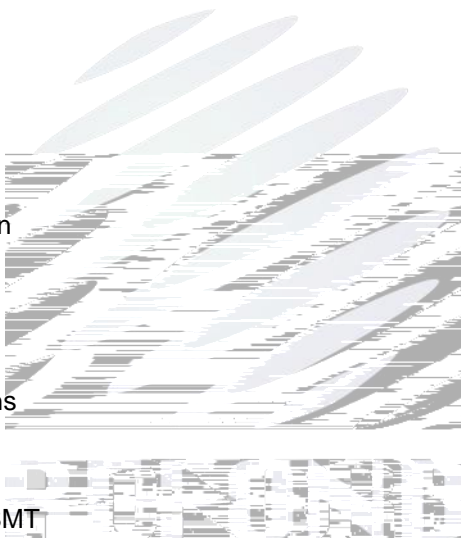
REFOND P/N  
RF-W2S155TS-A41

Mass Product



# Contents

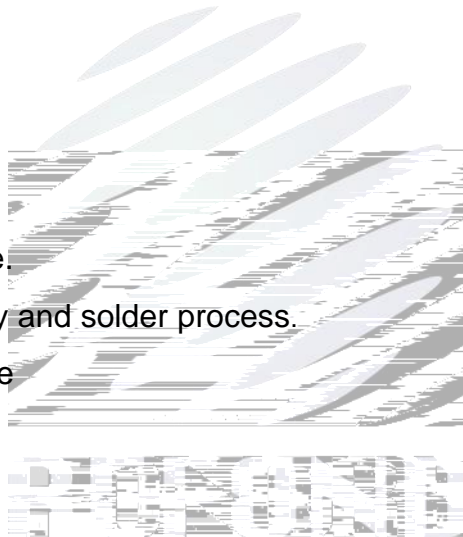
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The Colour LED which was fabricated using blue, green and red chip. Package Dimension :  
3.2mmX2.7mmX0.7mm.

3.2mmX2.7mmX0.7mm

Extremely wide viewing angle.  
Suitable for all SMT assembly and solder process.  
Moisture sensitivity level: 1ele



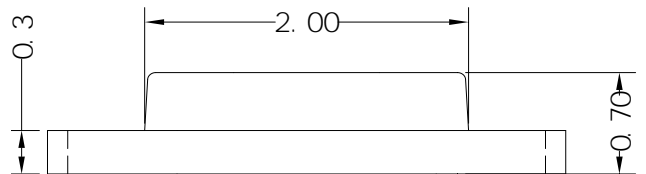


Fig.1-2 Side view

Fig.1-1 Top view



Fig.1-3 Bottom view



Fig.1-4 Polarity

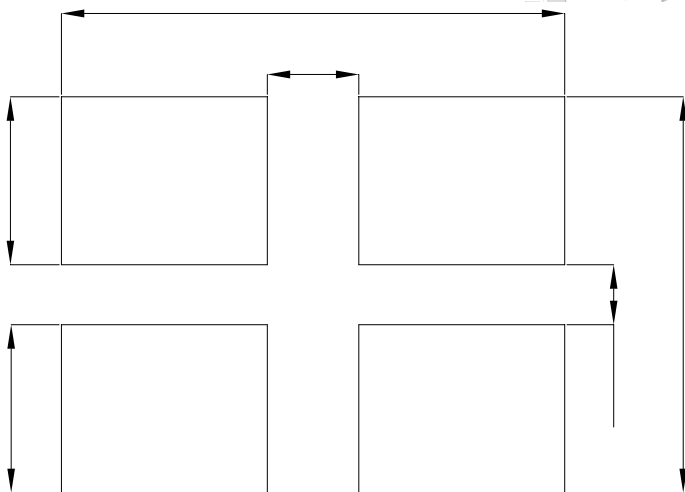


Fig.1-5 Soldering patterns



Notes

All dimensions units are millimeters.

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

Table 1-1 Electrical / Optical Characteristics at  $T_s=25^\circ\text{C}$

| Item                    | Test Condition    | Symbol | Code | Value       |       |      | Unit  |    |
|-------------------------|-------------------|--------|------|-------------|-------|------|-------|----|
|                         |                   |        |      | Min.<br>( ) | Typ.  | Max. |       |    |
| Spectral Half Bandwidth | $I_F=20\text{mA}$ |        | R    | --          | 15    | --   | nm    |    |
|                         |                   |        | G    | /           | --    | 30   |       | -- |
|                         |                   |        | B    | --          | 30    | --   |       |    |
| Forward Voltage         | $I_F=20\text{mA}$ | $V_F$  | R 1L | 1.8         | --    | 2.4  | V     |    |
|                         |                   |        | G 3F | 2.8         | --    | 3.4  |       |    |
|                         |                   |        | B 3F | 2.8         | --    | 3.4  |       |    |
| Dominant wavelength     | $I_F=20\text{mA}$ | d      | R    | G00         | 630   | --   | 635   | nm |
|                         |                   |        |      | H00         | 635   | --   | 640   |    |
|                         |                   |        | G    | D10         | 515   | --   | 517.5 |    |
|                         |                   |        |      | D20         | 517.5 | --   | 520   |    |
|                         |                   |        |      | E10         | 520   | --   | 522.5 |    |
|                         |                   |        |      | E20         | 522.5 | --   | 525   |    |
|                         |                   |        | B    | D10         | 465   | --   | 467.5 |    |
|                         |                   |        |      | D20         | 467.5 | --   | 470   |    |
|                         |                   |        |      | E10         | 470   | --   | 472.5 |    |
|                         |                   |        |      | E20         | 472.5 | --   | 475   |    |

|                     |                      |                    |                      |       |     |     |     |     |
|---------------------|----------------------|--------------------|----------------------|-------|-----|-----|-----|-----|
| Luminous Intensity  | I <sub>F</sub> =20mA | I <sub>v</sub>     | R                    | 1BS   | 40  | --  | 90  | mcd |
|                     |                      |                    | G                    | 1AU   | 260 | --  | 330 |     |
|                     |                      |                    |                      | 1AV   | 330 | --  | 430 |     |
|                     |                      |                    |                      | 1CG   | 430 | --  | 560 |     |
|                     |                      |                    |                      | 1CL   | 560 | --  | 700 |     |
|                     |                      |                    |                      | 1CM   | 700 | --  | 900 |     |
|                     |                      | B                  | 1DM                  | 60    | --  | 90  |     |     |
|                     |                      |                    | 1AP                  | 90    | --  | 120 |     |     |
|                     |                      |                    | G20                  | 120   | --  | 150 |     |     |
|                     |                      |                    | 1AW                  | 150   | --  | 200 |     |     |
|                     |                      |                    | 1GK                  | 200   | --  | 260 |     |     |
|                     |                      | Viewing Angle      | I <sub>F</sub> =20mA | 2 1/2 | --  | 140 | --  |     |
| Reverse Current     | V <sub>R</sub> =5V   | I <sub>R</sub>     | --                   | --    | 10  | μA  |     |     |
| Thermal Resistance. | I <sub>F</sub> =20mA | R <sub>THJ-S</sub> | --                   | --    | 450 | /W  |     |     |

Notes : V<sub>R</sub>=5V For test conditions. V<sub>R</sub>=5V



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

| Parameter                     | Symbol    | Rating    |    |    | Units |
|-------------------------------|-----------|-----------|----|----|-------|
|                               |           | R         | G  | B  |       |
| Power Dissipation             | $P_d$     | 48        | 68 | 68 | mW    |
| Forward Current               | $I_F$     | 20        |    |    | mA    |
| Peak Forward Current Of Pulse | $I_{FP}$  | 60        |    |    | mA    |
| Electrostatic Discharge (HBM) | $E_{SD}$  | 1000      |    |    | V     |
| Operating Temperature         | $T_{opr}$ | -40 ~ +85 |    |    |       |
| Storage Temperature           | $T_{stg}$ | -40 ~ +85 |    |    |       |
| Junction Temperature          | $T_j$     | 95        |    |    |       |

Notes

- 1/10 Duty cycle, 0.1ms pulse width.
- The above forward voltage measurement allowance tolerance is  $\pm 0.1V$ .
- The above dominant wavelength measurement allowance tolerance is  $\pm 2nm$ .
- The above luminous intensity measurement allowance tolerance  $\pm 10\%$ .
- Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.
- All measurements were made under the standardized environment of Refond.
- 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



M' 3 / 4 9 W  
M' 3 / 4 9 W

Fig1-6





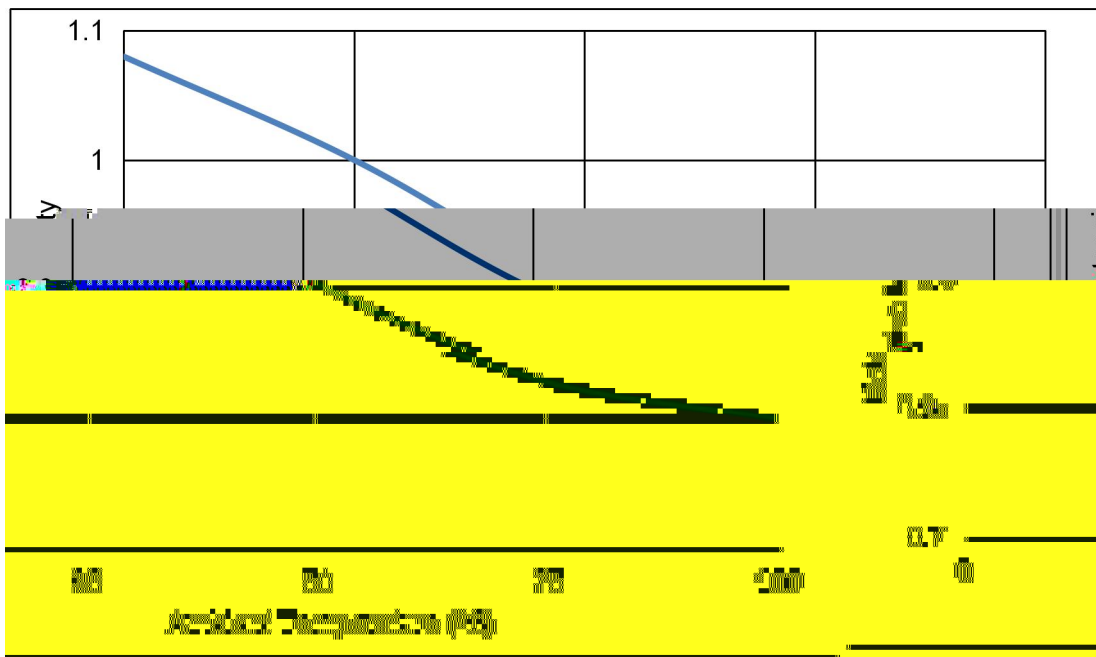


Fig.1-8 Pin Temperature Vs Relative Intensity

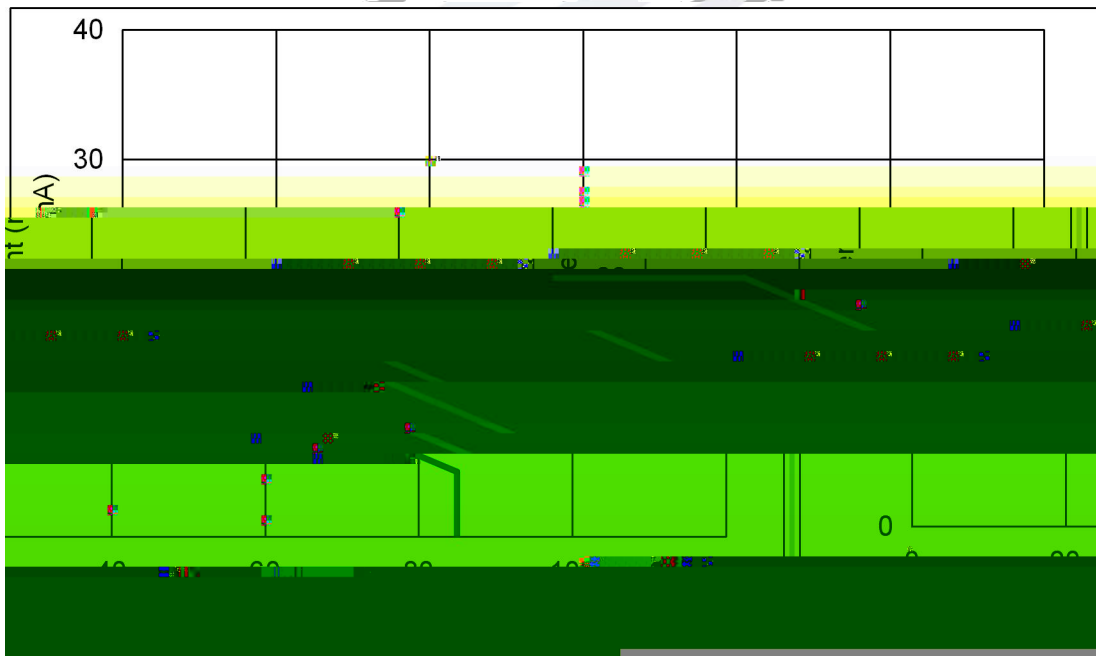


Fig.1-9 Pin Temperature Vs Forward Current



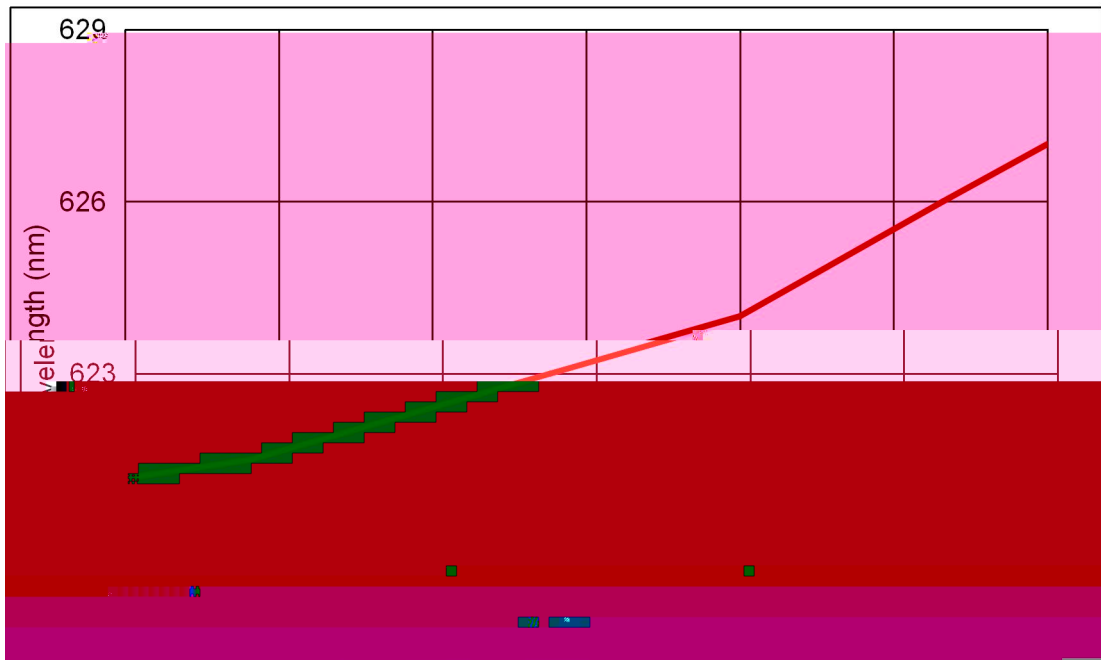


Fig.1-10 Forward Current Vs Dominant Wavelength (Ta=25 )

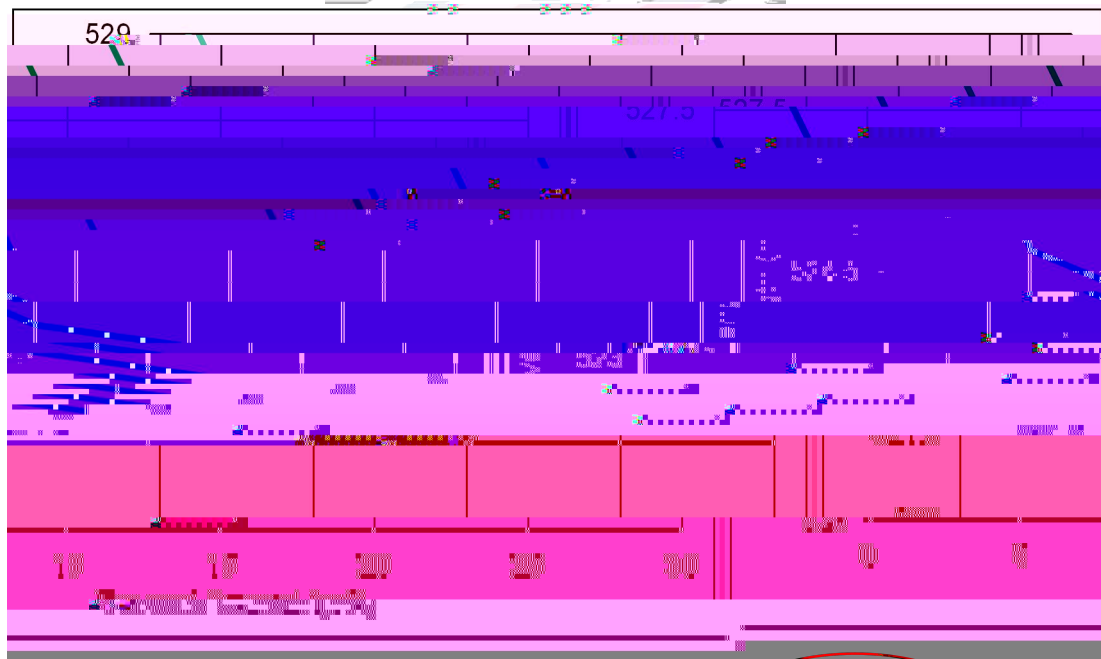


Fig.1-11 Forward Current Vs Dominant Wavelength (Ta=25 )



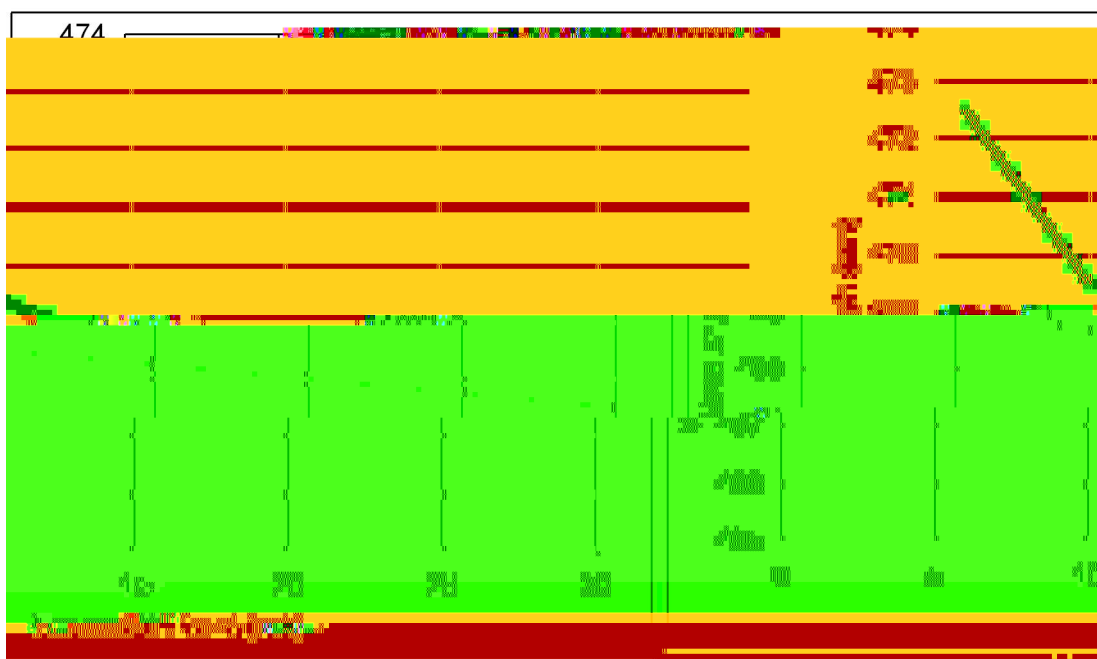


Fig.1-12 Forward Current Vs Dominate Wavelength (Ta=25 )

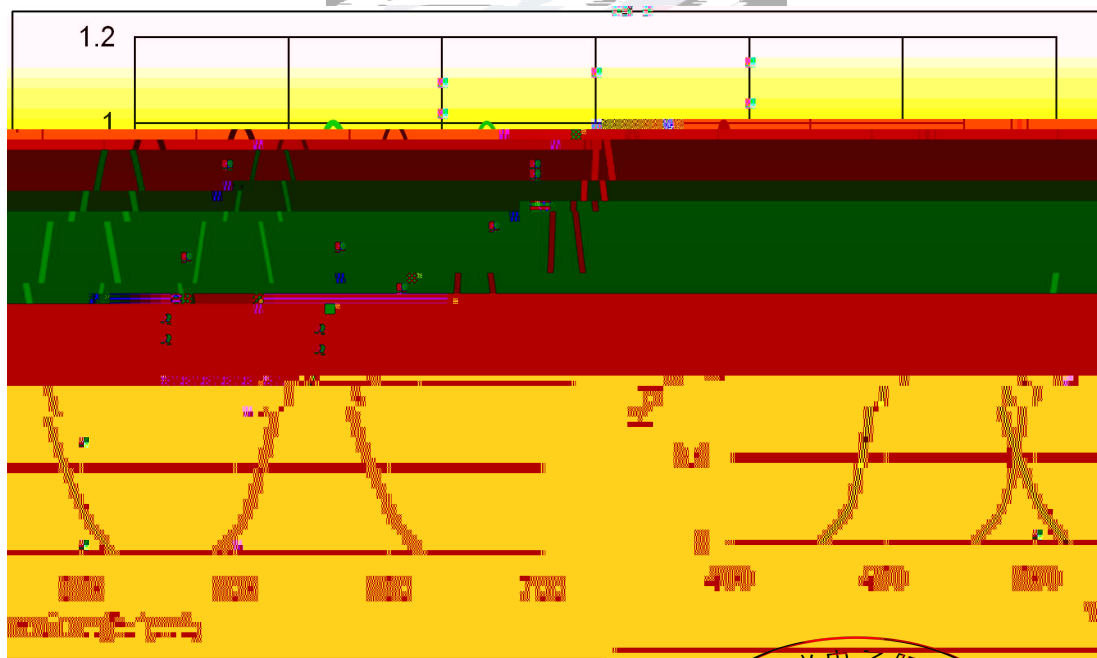


Fig.1-13 Relative Intensity Vs Wavelength (Ta=25 )



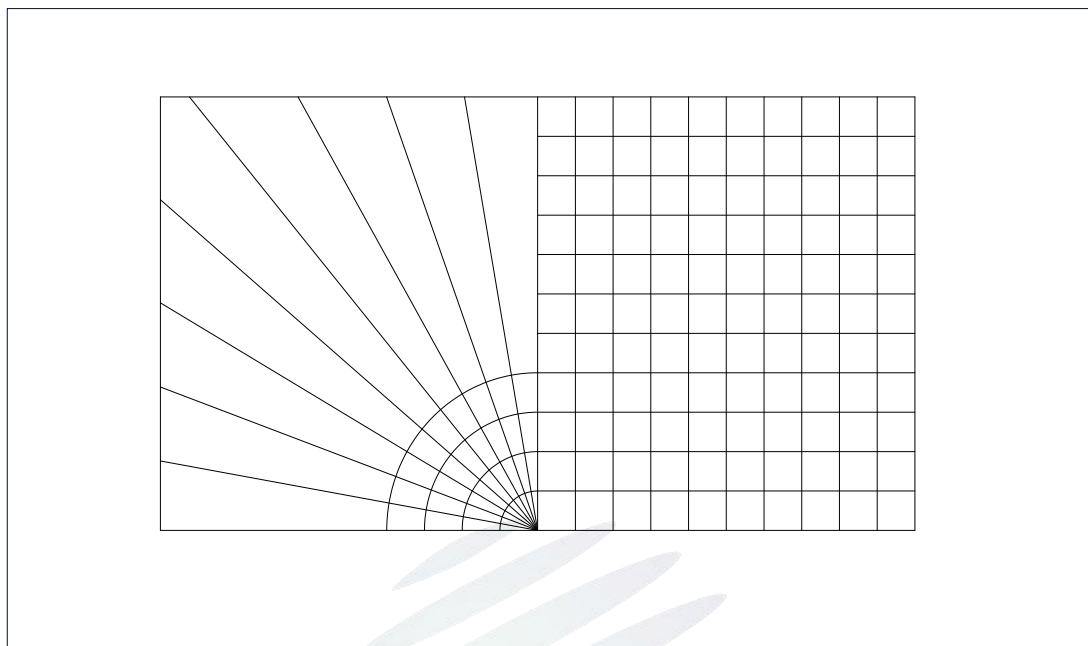
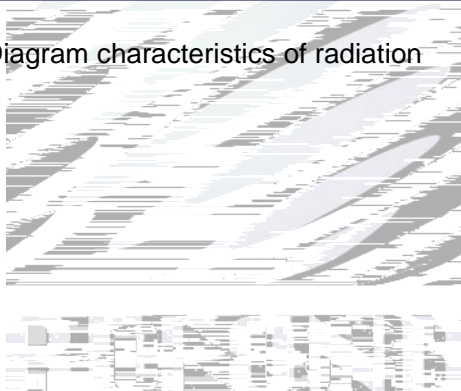


Fig.1-14 Diagram characteristics of radiation



Package:3000pcs/reel.

3000pcs

### 2.1.1 Carrier Tape Dimension

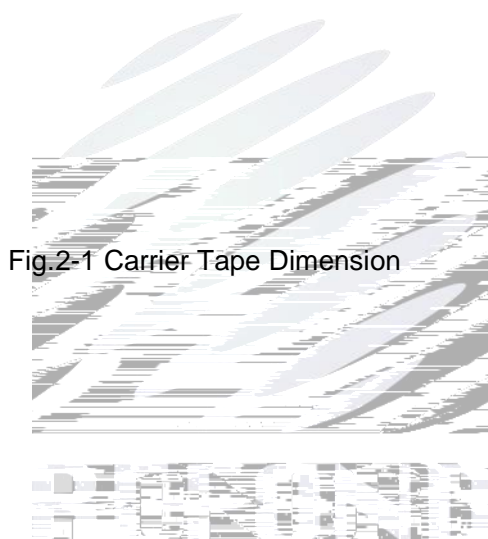


Fig.2-1 Carrier Tape Dimension

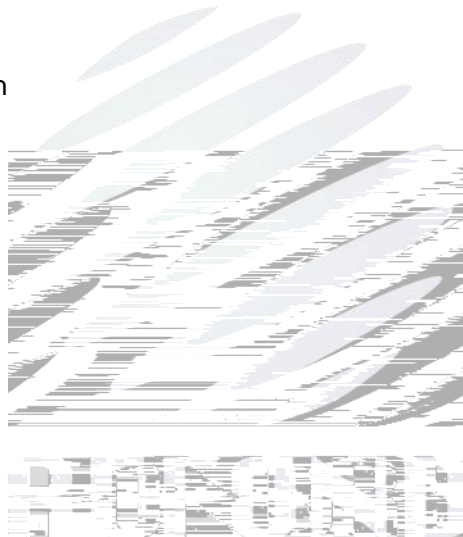
### 2.1.2 Reel Dimension

TaL

### 2.1.3 Label Form Specification



Fig. 2-3 Label Form Specification



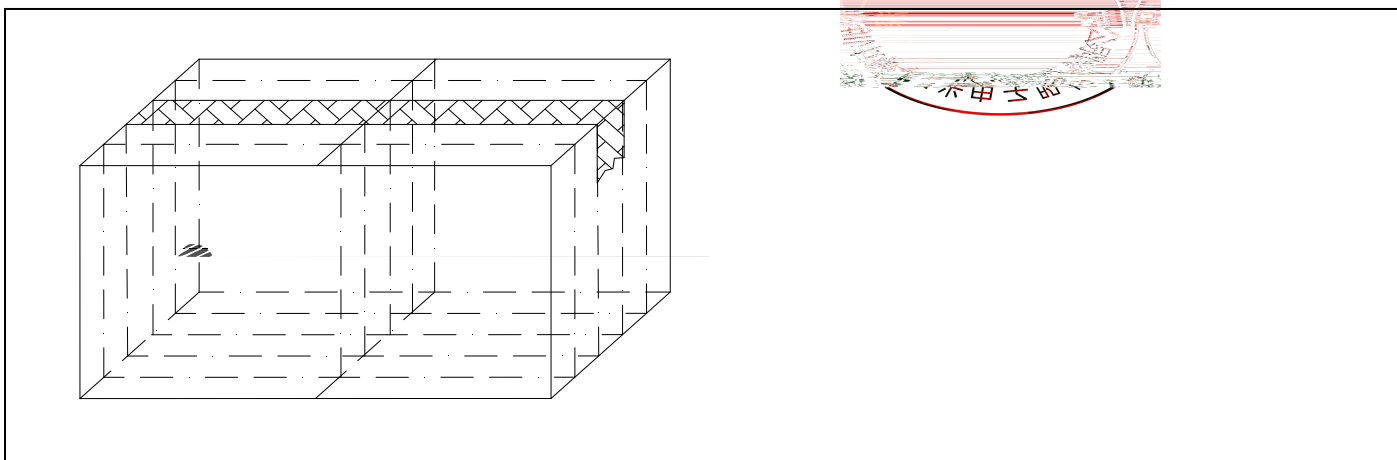


Fig.2-5 Cardboard Box

Table 2-3 Reliability Test Items And Conditions

| Test Items               | Ref.Standard | Test Condition                             | Time       | Quantity | Ac/Re / |
|--------------------------|--------------|--|------------|----------|---------|
| Reflow                   | JESD22-B106  | Temp: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  | Temp:100                                   | 1000 hrs.  | 22Pcs.   | 0/1     |
| Low Temperature Storage  | JESD22-A119  | Temp:-40                                   | 1000 hrs.  | 22Pcs.   | 0/1     |
| Life Test                | JESD22-A108  | T <sub>a</sub> =25<br>I <sub>F</sub> =20mA | 1000 hrs.  | 22Pcs.   | 0/1     |

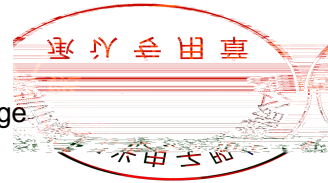
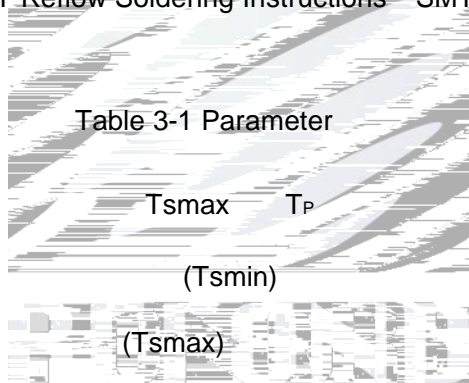


Table 2-4 Criteria For Judging Damage





Fig.3-1 SMT Reflow Soldering Instructions SMT

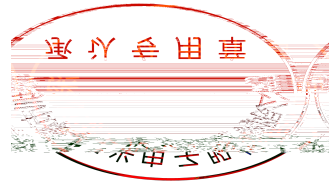


| Parameter  | Symbol                | Value             |
|--|-----------------------|-------------------|
| Average temperature rise speed                                   | $T_{smax}$ $T_P$      | 3 °C/ Max 3 °C/ s |
| Preheating: minimum temperature                                  | ( $T_{smin}$ )        | 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 ( $T_P$ ) | ( $T_P$ )             |                   |

Notes

(1)Re





# Refond

(4) In designing a circuit, the current through each LED can not exceed the absolute maximum current specified for each LED. This means the, resistor calculation should be done carefully, otherwise, a large 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

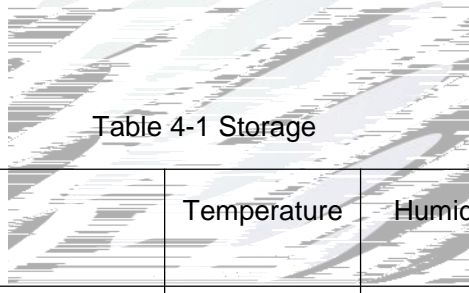


Table 4-1 Storage

| Conditions |                             | Temperature | Humidity | Time                    |
|------------|-----------------------------|-------------|----------|-------------------------|
| Storage    | Before Opening Aluminum Bag | 30          | 75%      | Within 1 Year From Date |
|            | After Opening Aluminum Bag  | 30          | 60%      | 168hours<br>168         |
| Baking     |                             | 60 ± 5      | -        | 24hours<br>24           |

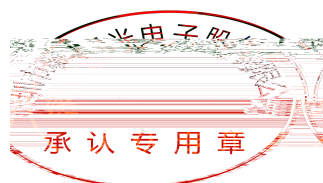
(7) If the moisture absorbent material silica gel has faded away or the LEDs have exceeded the storage time baking treatment should be performed after unpacking and based on the following condition 60±5 for above 24 hours.

If the package is flatulence



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

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







Declare

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

