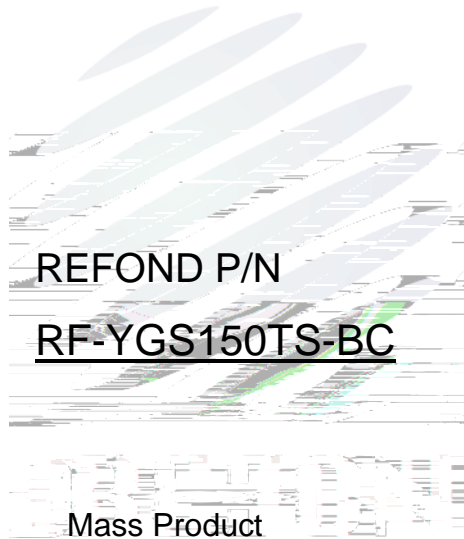


# SPECIFICATION



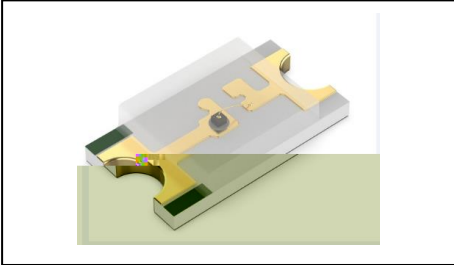
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# 1. Description

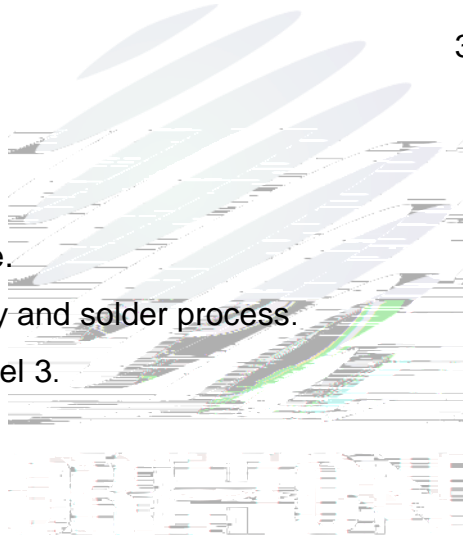
## 1.1 General Description



The Colour LED which was fabricated using a green-yellow chip Package Dimension : 3.2mmX1.6mmX0.7mm.

LED

3.2mmX1.6mmX0.7mm



## 1.2 Features

- Extremely wide viewing angle.
- Suitable for all SMT assembly and solder process.
- Moisture sensitivity level: Level 3.
- RoHS compliant.

## 1.3 Application

- Optical indicator.
- Switch and symbol, display.
- General use.



### 1.4 Package Dimension

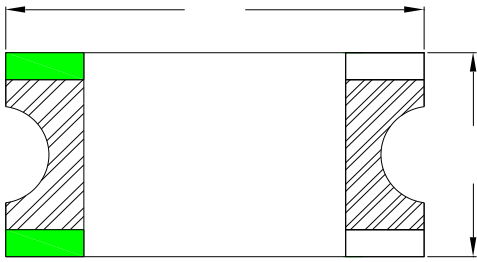


Fig.1-1 Top view

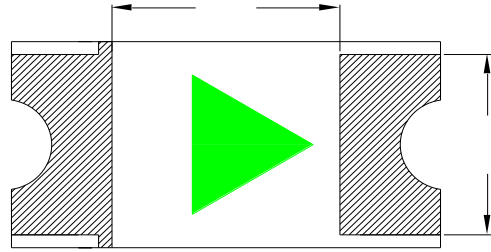


Fig.1-2 Bottom view

Fig.1-3 Side view



Fig.1-4 Polarity

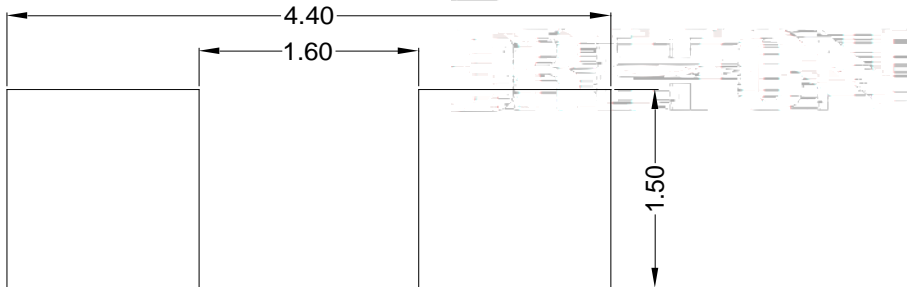
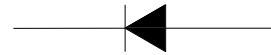


Fig.1-5 Soldering patterns

#### Notes

All dimensions units are millimeters.

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



## 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 <sub>F</sub> =20mA	Δ		--	15	--	nm
Forward Voltage	I <sub>F</sub> =20mA	V <sub>F</sub>	B0	1.8	--	2.0	V
			C0	2.0	--	2.2	V
			D0	2.2	--	2.4	V
Dominant Wavelength	I <sub>F</sub> =20mA	λ <sub>D</sub>	A20	562.5	--	565	nm
			B10	565	--	567.5	nm
			B20	567.5	--	570	nm
			C10	570	--	572.5	nm
			C20	572.5	--	575	nm
Luminous Intensity	I <sub>F</sub> =20mA	I <sub>v</sub>	B00	12	--	18	mcd
			C00	18	--	28	mcd
			D00	28	--	43	mcd
			E00	43	--	65	mcd
			F10	65	--	80	mcd
			F20	80	--	100	mcd
Viewing Angle	I <sub>F</sub> =20mA	/ ., /		--	140	--	deg
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

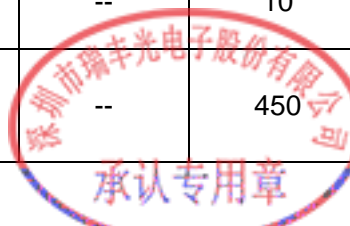
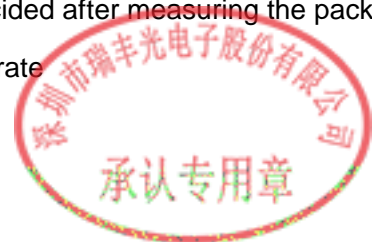


Table 1-2 Absolute Maximum Ratings at Ts=25°C

Parameter	Symbol	Rating	Units
Power Dissipation	$P_d$	72	mW
Forward Current	$I_F$	30	mA
Peak Forward Current Of Pulse	$I_{FP}$	60	mA
Electrostatic Discharge (HBM)	$E_{SD}$	2000	V
Operating Temperature	$T_{opr}$	-40 ~ +85	°C
Storage Temperature	$T_{stg}$	-40 ~ +85	°C
Junction Temperature	$T_j$	95	°C

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



## 1.6 Typical Optical Characteristics Curves

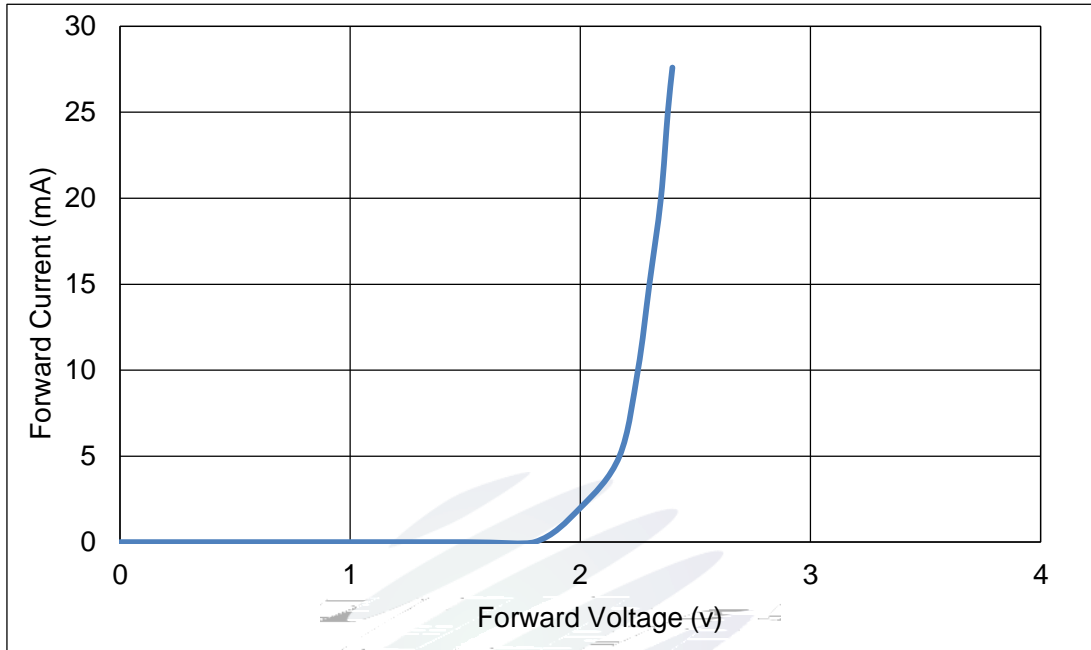


Fig 1-6 Forward Voltage Vs Forward Current

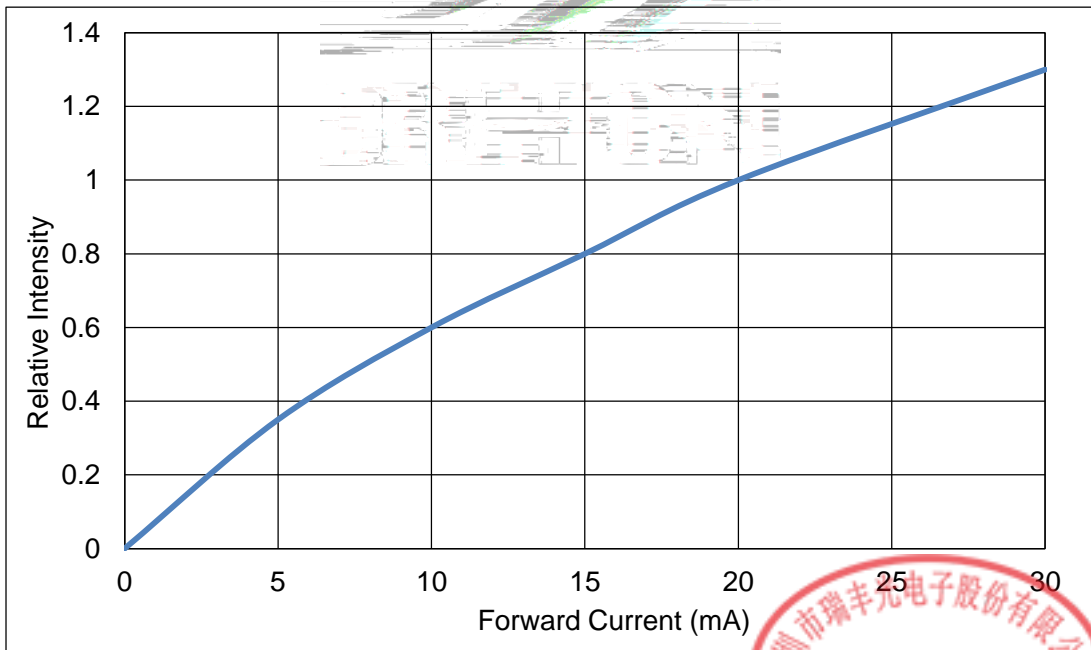
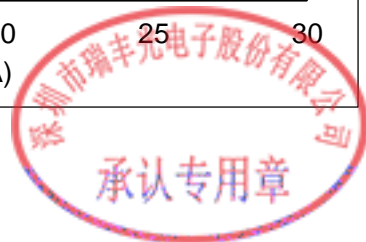


Fig 1-7 Forward Current Vs Relative Intensity



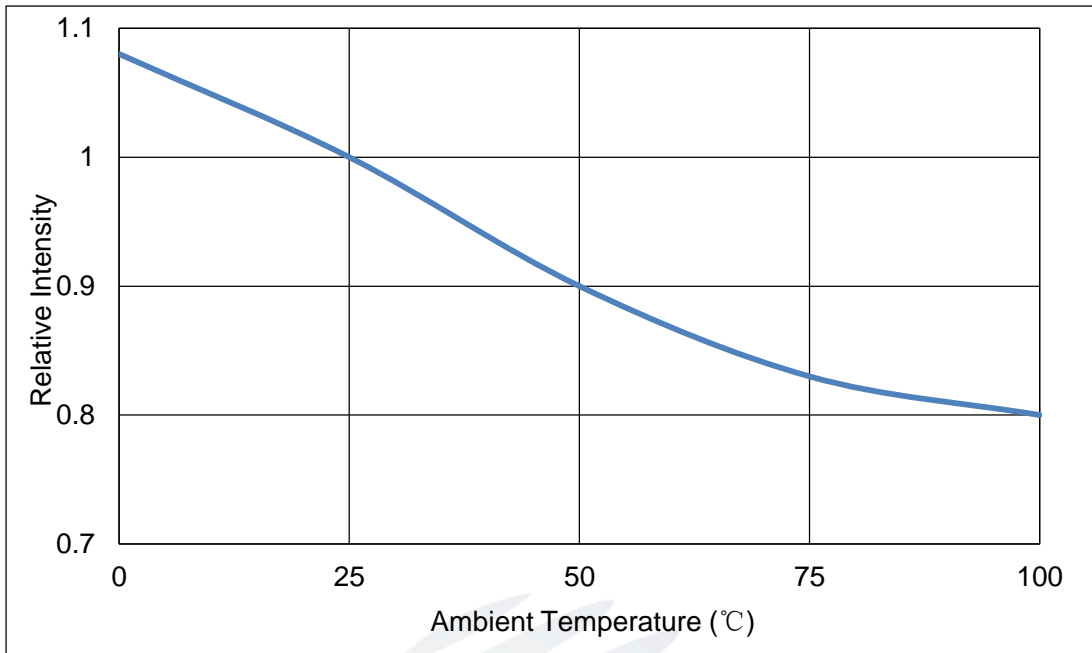


Fig 1-8 Pin Temperature Vs Relative Intensity

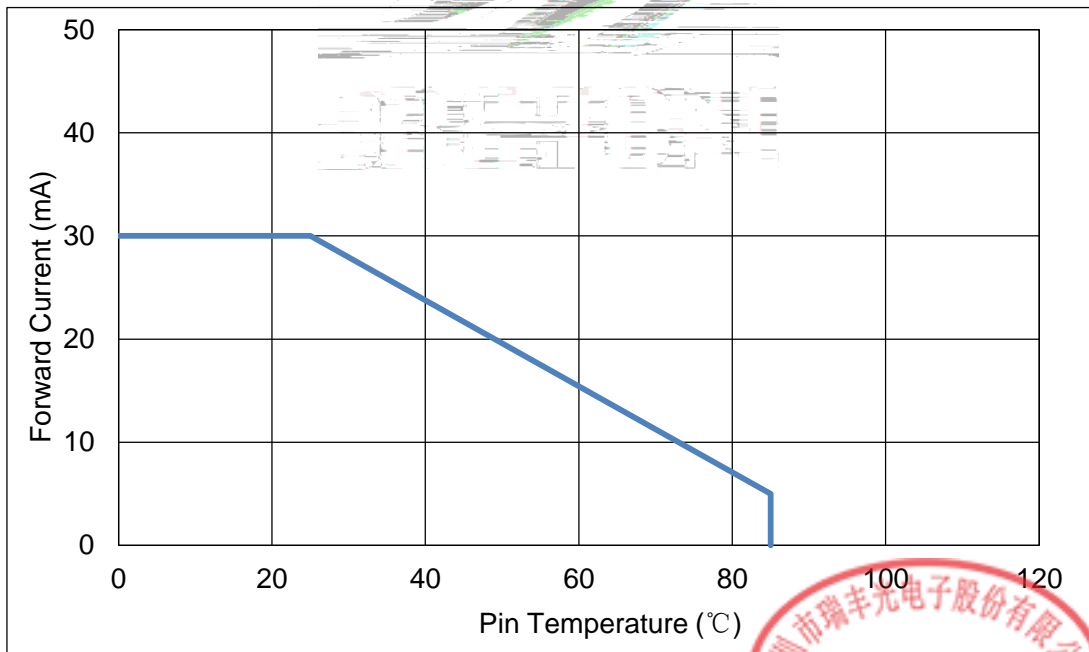


Fig 1-9 Pin Temperature Vs Forward Current



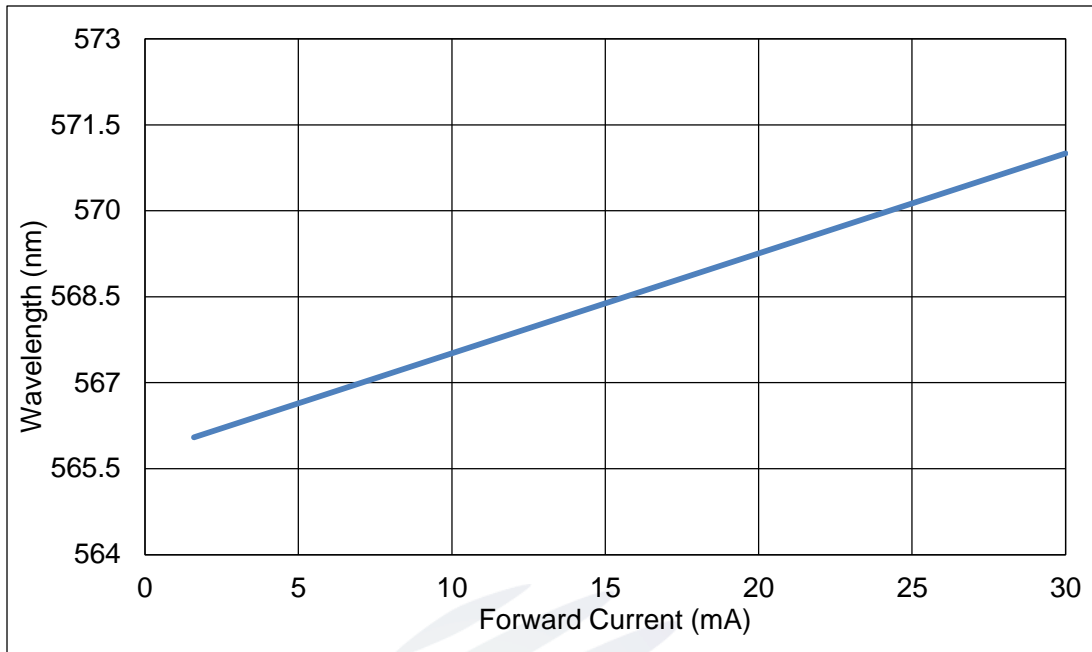


Fig 1-10 Forward Current Vs Dominate Wavelength (Ta=25°C)

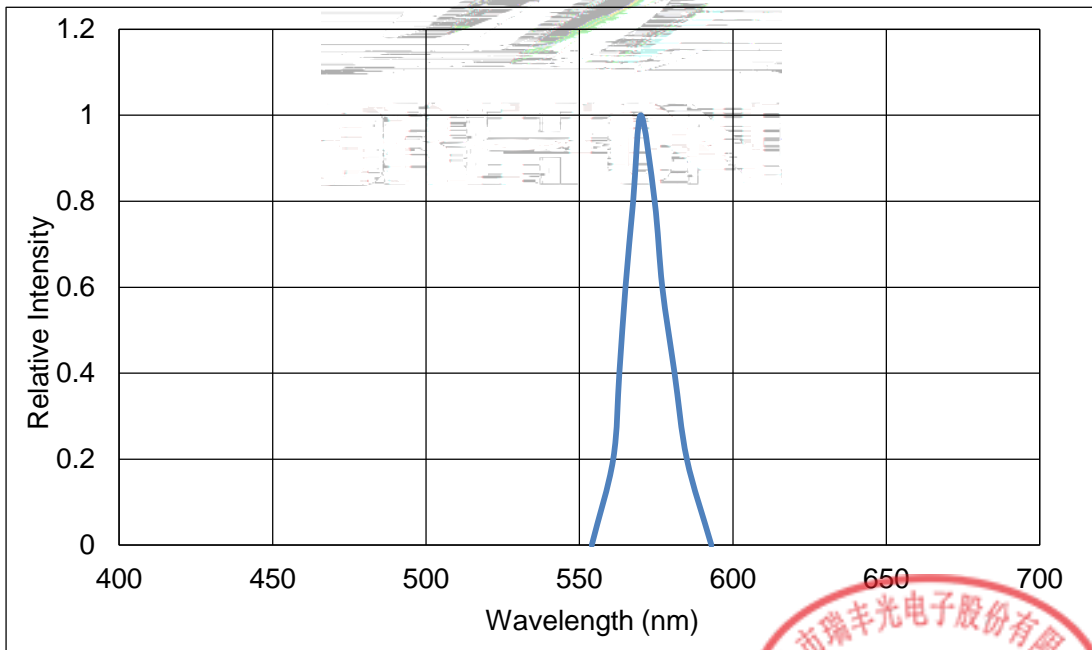
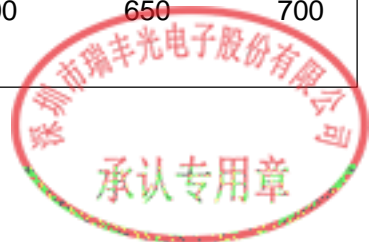


Fig 1-11 Relative Intensity Vs Wavelength (Ta=25°C)



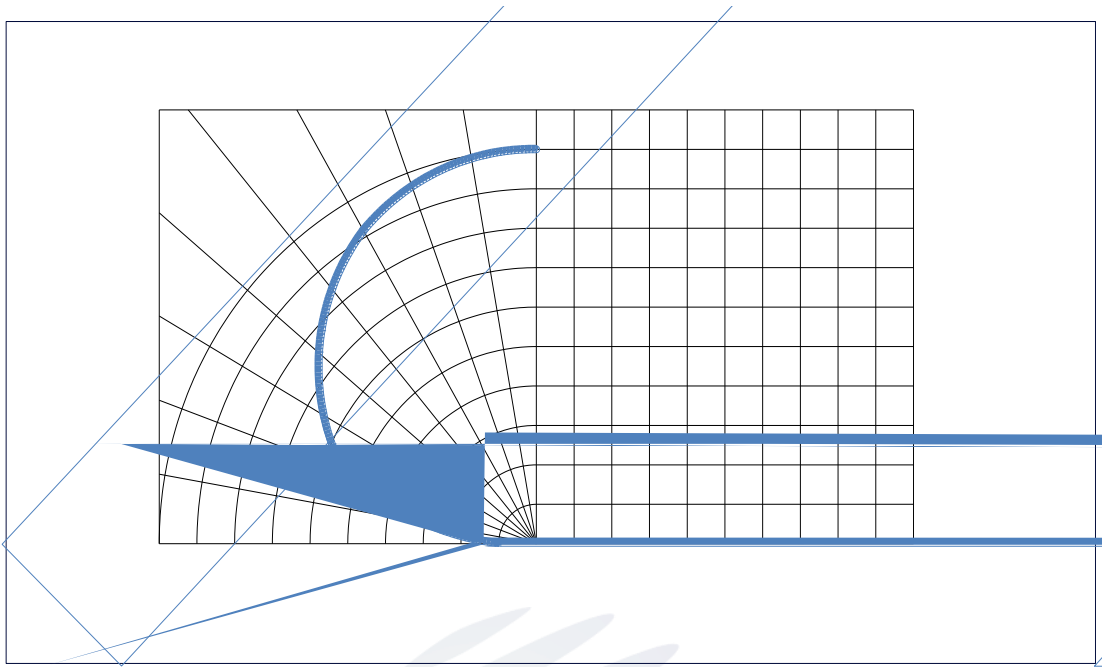
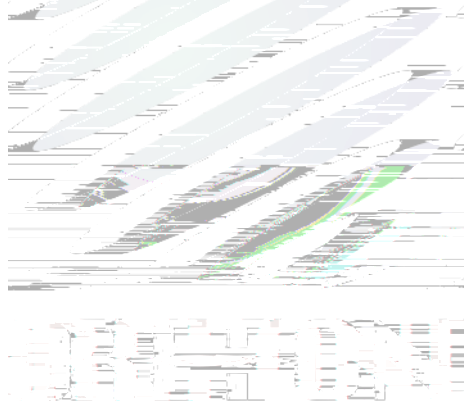


Fig 1-12 Diagram characteristics of radiation



## 2. Packaging

### 2.1 Packaging Specification

Package:4000pcs/reel. 4000pcs

#### 2.1.1 Carrier Tape Dimension

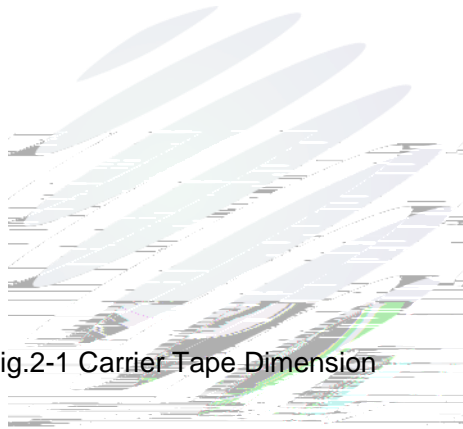


Fig.2-1 Carrier Tape Dimension

#### 2.1.2 Reel Dimension



Table 2-1 Dimension

A	8.0 0.1mm
---	-----------

B

Fig.2-2 Reel Dimension

#### Notes

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

### 2.1.3 Label Form Specification



PART NO:		
SPEC NO:		
LOT NO		
BIN CODE:		
Φ:	XY:	
VF:	WLD:	
	QTY:	
	DATE:	

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 <sub>F</sub>	Forward Voltage
WLD	Wavelength
QTY	Packing Quantity
DATE	Made Date

Fig. 2-3 Label Form Specification

### 2.2 Moisture Resistant Packing

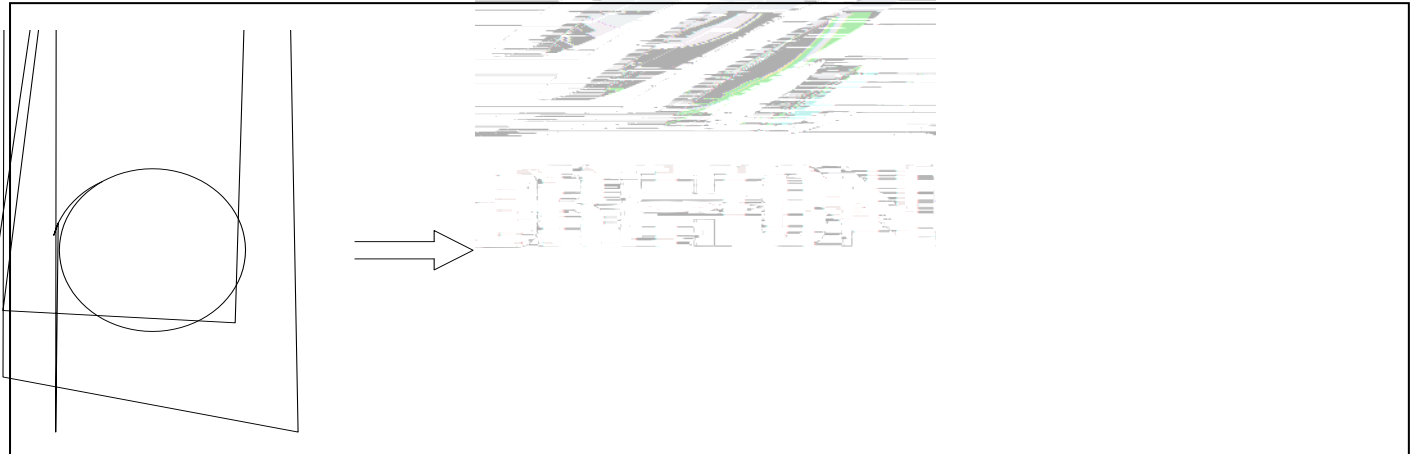


Fig.2-4 Moisture Resistant Packing



## 2.3 Cardboard Box

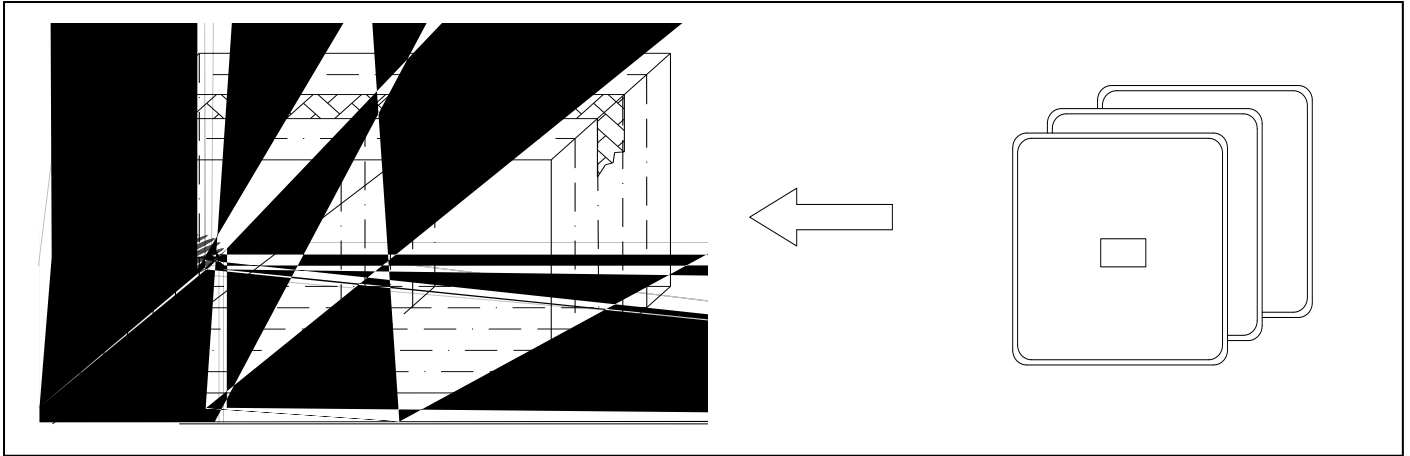


Fig.2-5 Cardboard Box

## 2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Test Items And Conditions

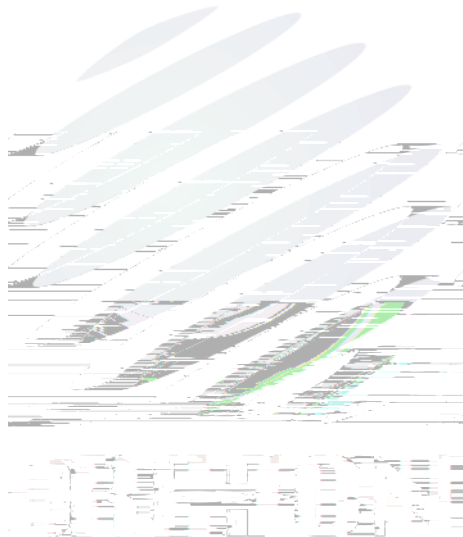
Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow	JESD22-B106	Temp:260 max T=10 sec	2 times	22Pcs.	0/1
Temperature Cycle	JESD22-A104	100 30 min 5 min -40 30 min	100 cycles	22Pcs.	0/1
Thermal Shock	JESD22-A106	-40 15min 100 15min	300 cycles	22Pcs.	0/1
High Temperature Storage	JESD22-A103	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 I <sub>F</sub> =20mA	1000 hrs.	22Pcs.	0/1



## 2.5 Criteria For Judging Damage

Table 2-4 Criteria For Judging Damage

Test Items	Symbol	Test
------------	--------	------



### 3. SMT Reflow Soldering Instructions SMT 回流焊说明

#### 3.1 SMT Reflow Soldering Instructions SMT

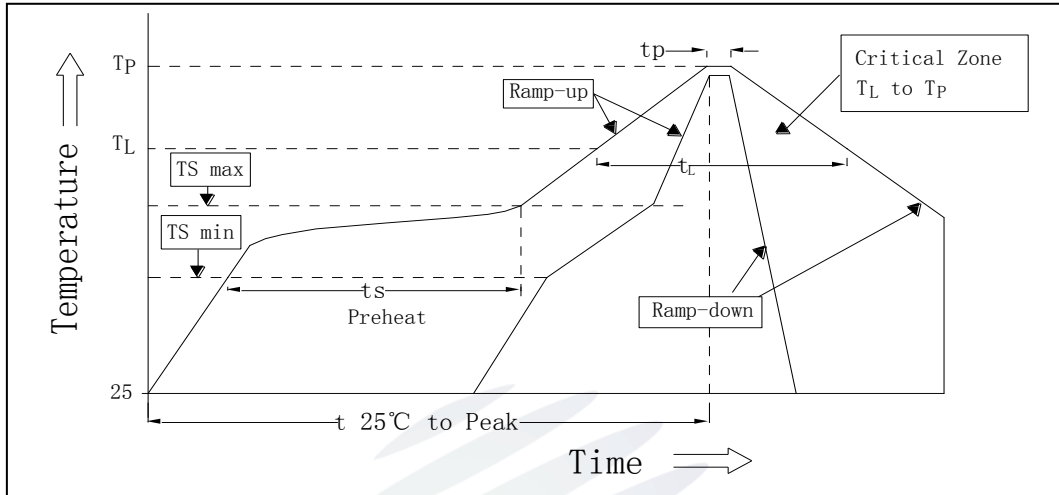
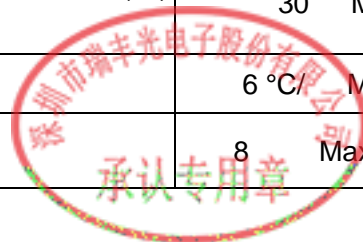


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Parameter

Average temperature rise speed	$T_{smax}$ $T_P$	3 °C/ s 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 ( $T_P$ )	( $T_P$ )	30 Max 30s
Cooling speed		6 °C/ s 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

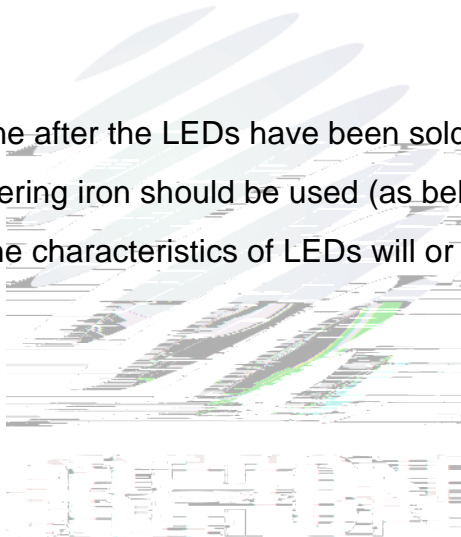
(1) When do soldering by hand, keep the temperature of iron below less 300°C less than 3 seconds.

(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

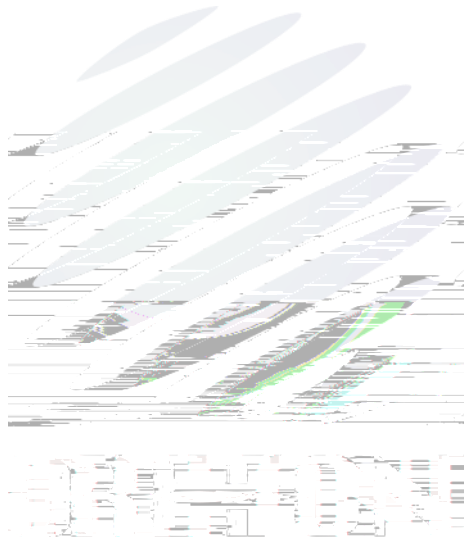
(1) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board.LED

(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.

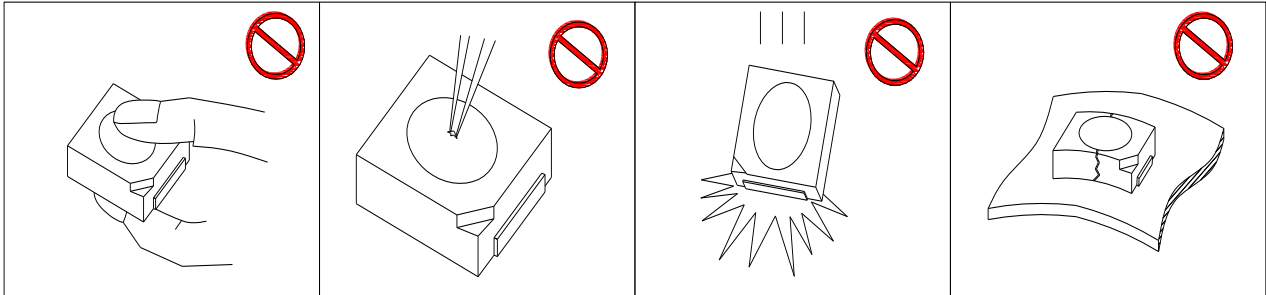
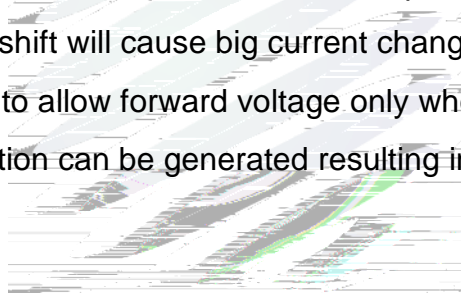


Fig 4-1

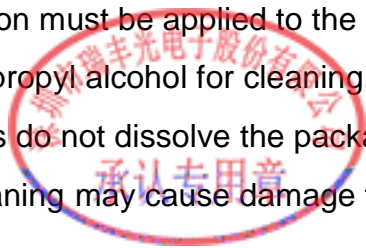
产品使用注意事项

(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

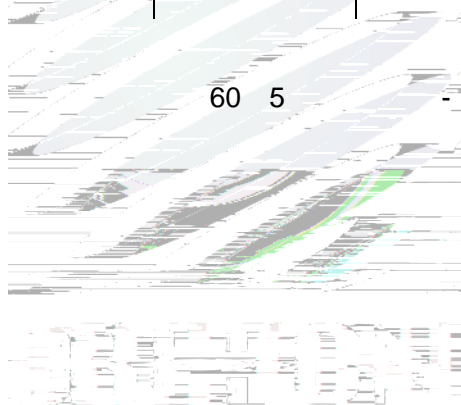


LED.

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

Baking



24hours





Declare

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