

# SPECIFICATION

REFOND P/N

RF-A3E31-WYSG-B6

R&D

Mass Production



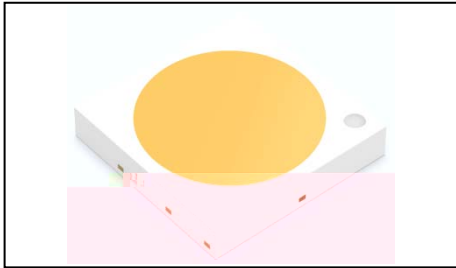
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# 1. Description

## 1.1 General Description



The White LED, which was fabricated by using a blue chip and the phosphor.

Product Package: 3.0mmX3.0mmX0.55mm.

LED

3.0mmX3.0mmX0.55mm

## 1.2 Features

- ▶ EMC Package. EMC
- ▶ Extremely wide viewing angle.
- ▶ Suitable for all SMT assembly and solder process. SMT
- ▶ Available on tape and reel.
- ▶ Moisture sensitivity level: Level 2. Level2
- ▶ Compliance with RoHS and REACH. RoHS REACH
- ▶ Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102 Stress Test Qualification for Automotive Grade Discrete Semiconductors AEC-Q102

## 1.3 Application

- ▶ Automotive Lighting Interior and Exterior.



## 1.4 Package Dimension

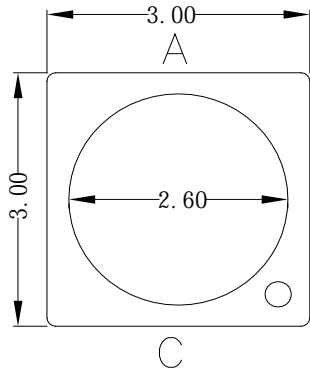


Fig.1-1 Top View 正面视图

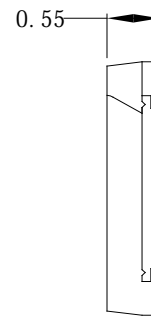


Fig.1-2 Side View 侧面视图

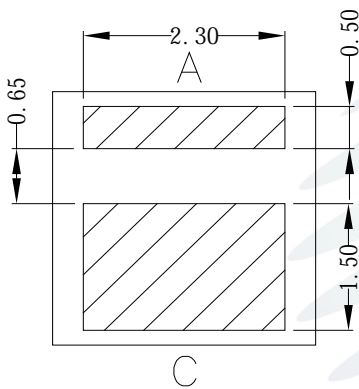


Fig.1-3 Bottom View 背面视图

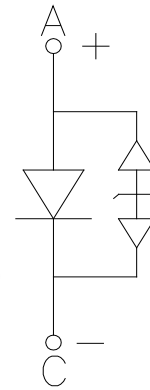


Fig.1-4 Polarity 极性

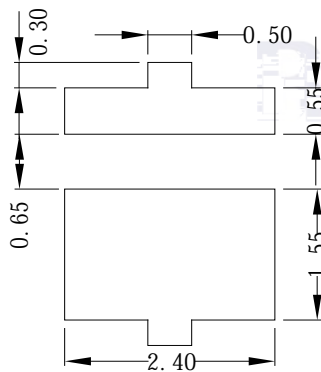


Fig.1-5 Soldering Patterns 推荐焊盘

### Notes

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



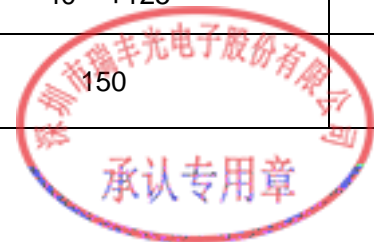
## 1.5 Product Parameters

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

Item	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	$V_F$	$I_F=300mA$	2.8	3.1	3.4	V
Reverse Current	$I_R$	$V_R=5V$	---	---	---	uA
Luminous Flux	$\Phi$	$I_F=300mA$	75.3	85	93.2	lm
Viewing Angle	2θ1/2	$I_F=300mA$	---	120	---	deg
Thermal Resistance.	$R_{THJ-S}$	$I_F=300mA$	---	---	16	°C/W

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

Parameter	Symbol	Rating	Units
Power Dissipation	$P_D$	1428	mW
Forward Current	$I_F$	420	mA
Peak Forward Current	$I_{FP}$	700	mA
Reverse Voltage	$V_R$	5	V
Electrostatic Discharge (HBM)	$E_{SD}$	8000	V
Operating Temperature	$T_{OPR}$	-40 ~ +125	
Storage Temperature	$T_{STG}$	-40 ~ +125	
Junction Temperature	$T_J$	150	



Notes

1. 1/10 Duty cycle, 10ms pulse width. 10ms, 1/10.
2. The above forward voltage measurement allowance tolerance is  $\pm 0.1V$ .  $\pm 0.1V$ .
3. The above color coordinates measurement allowance tolerance is  $\pm 0.005$ .  $\pm 0.005$ .
4. The above luminous intensity measurement allowance tolerance  $\pm 10\%$ .  $\pm 10\%$ .
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 8000V ESD (HBM). ESD protection during products handling is needed. 90% LED  
ESD8000V ,

## 1.6 Bin Range Of Forward Voltage and Luminous Flux (IF=300mA)

### BIN

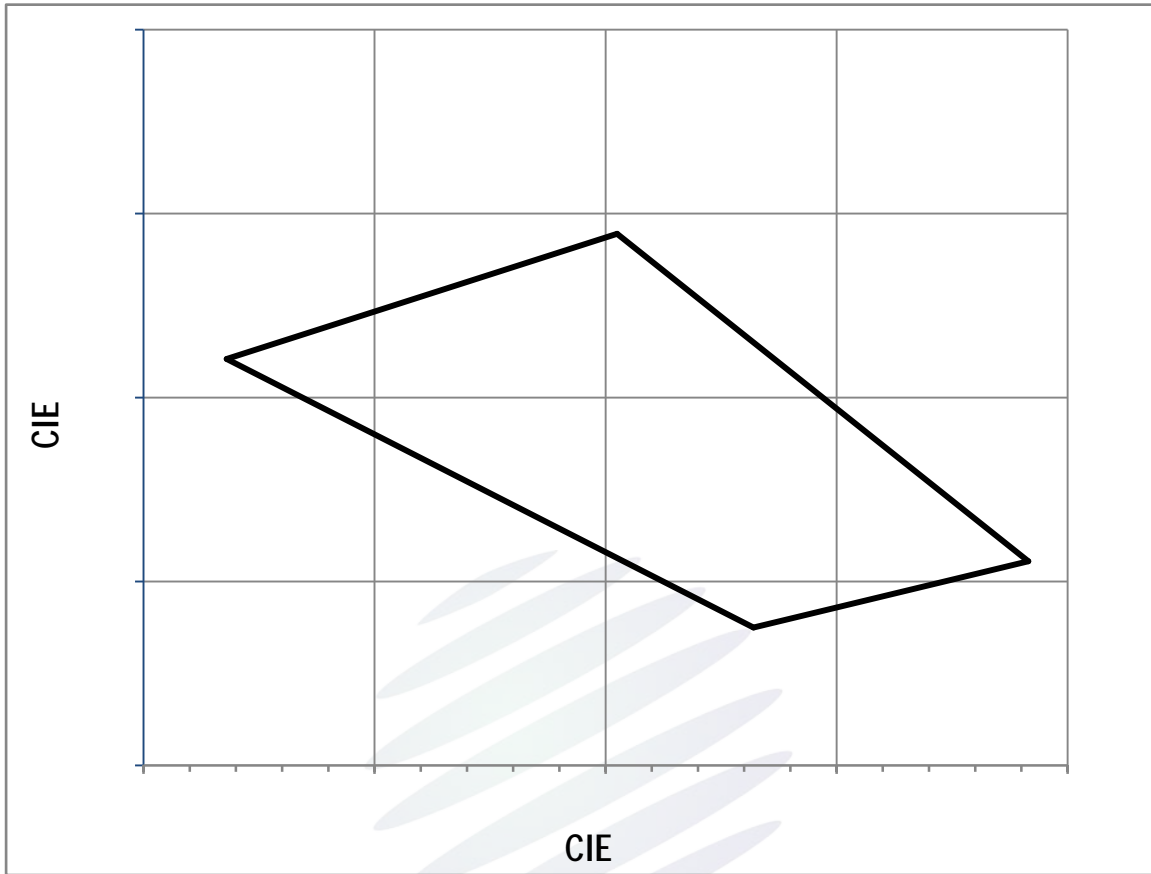


Fig. 1-6 The C.I.E Chromaticity Diagram CIE

Table 1-4

BIN CODE	X1	Y1	X2	Y2	X3	Y3	X4	Y4
5E	0.5536	0.4221	0.5764	0.4075	0.5883	0.4111	0.5705	0.4289



## 1.7 Typical Optical Characteristics Curves

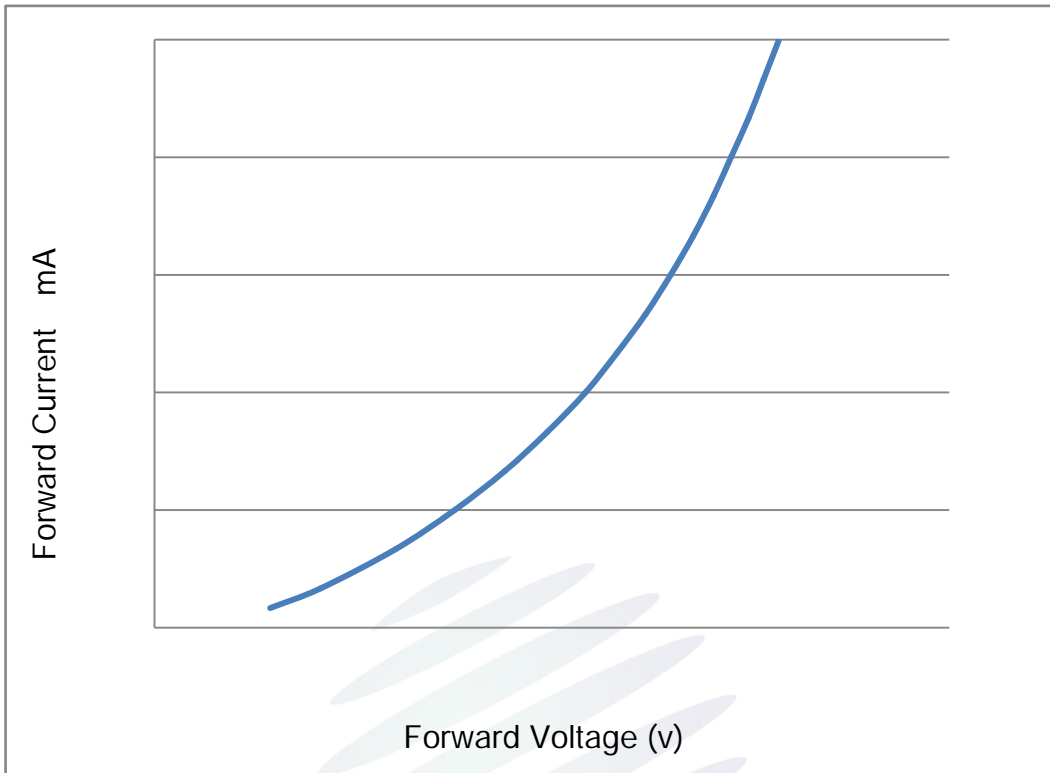


Fig. 1-7 Forward Voltage Vs Forward Current

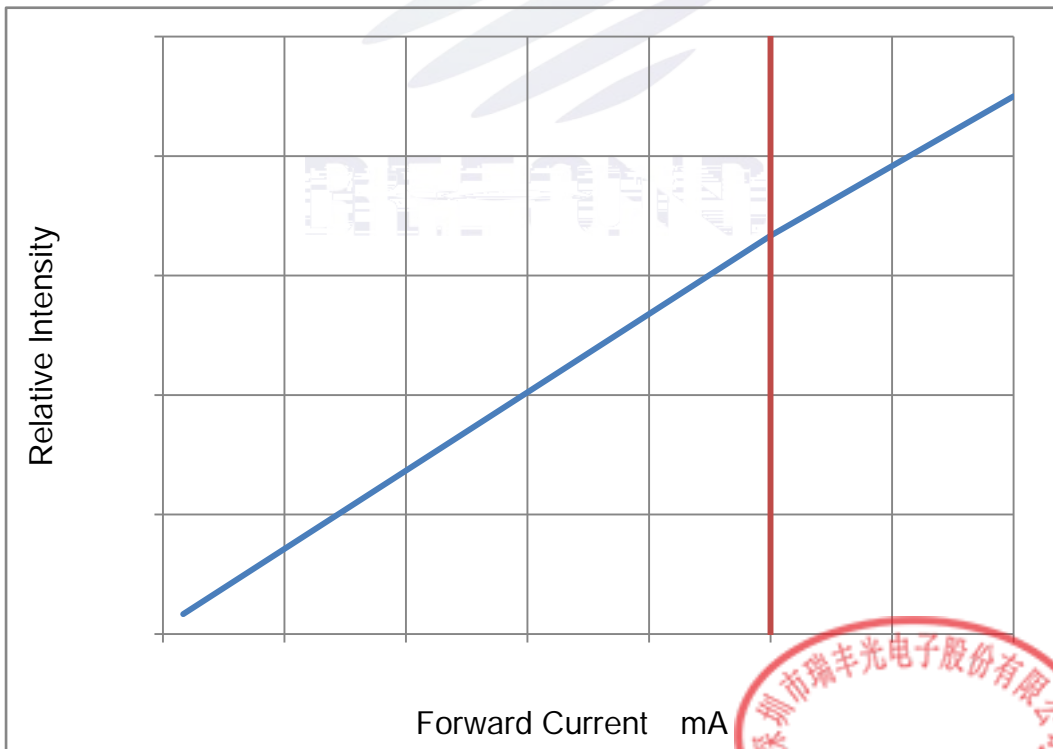


Fig. 1-8 Forward Current Vs Relative Intensity



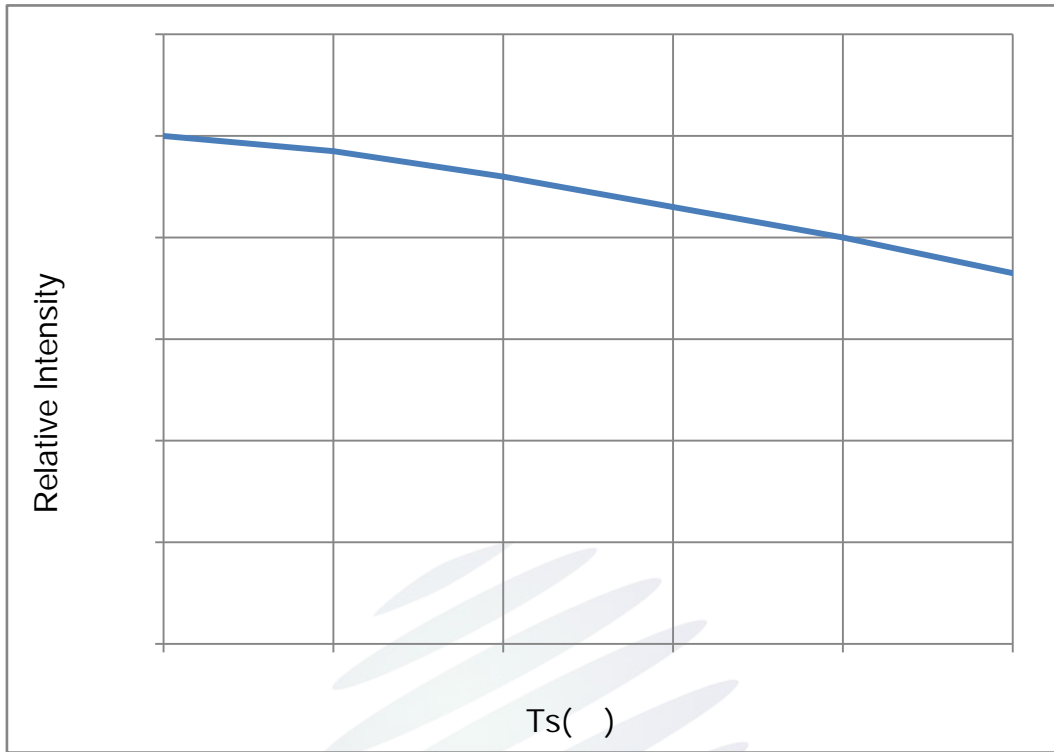


Fig. 1-9 Solder Temperature Vs Relative Intensity

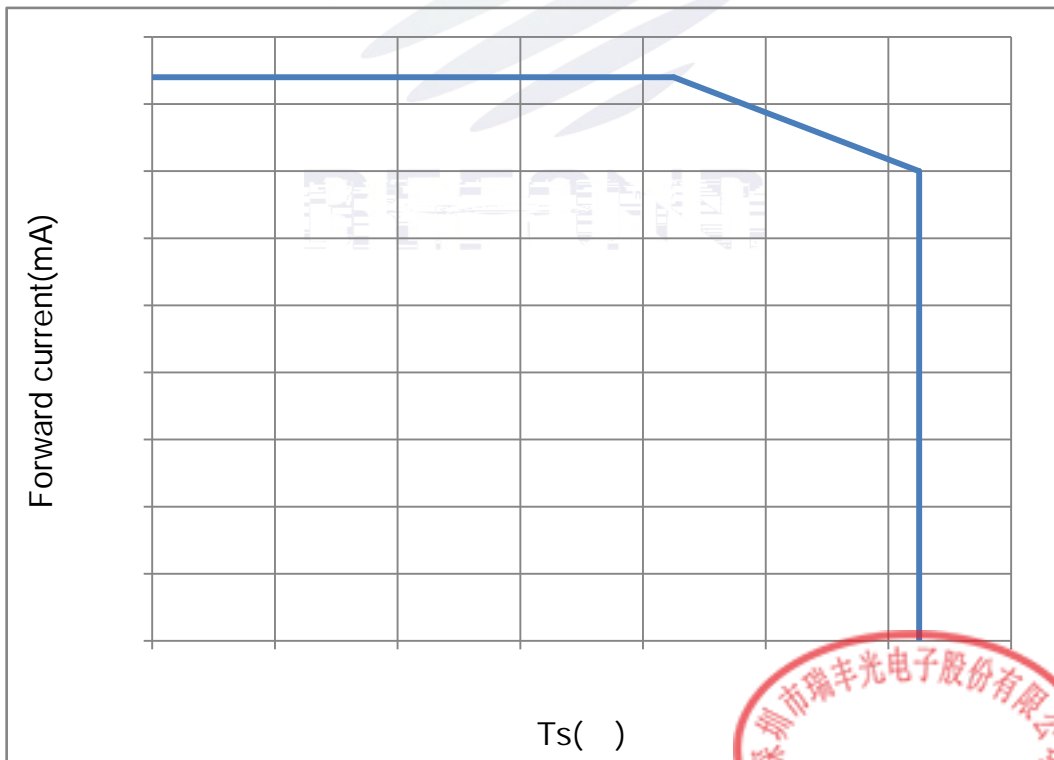
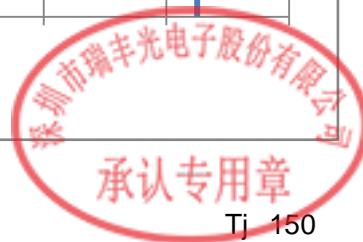


Fig. 1-10 Solder Temperature Vs Forward Current



Tj 150



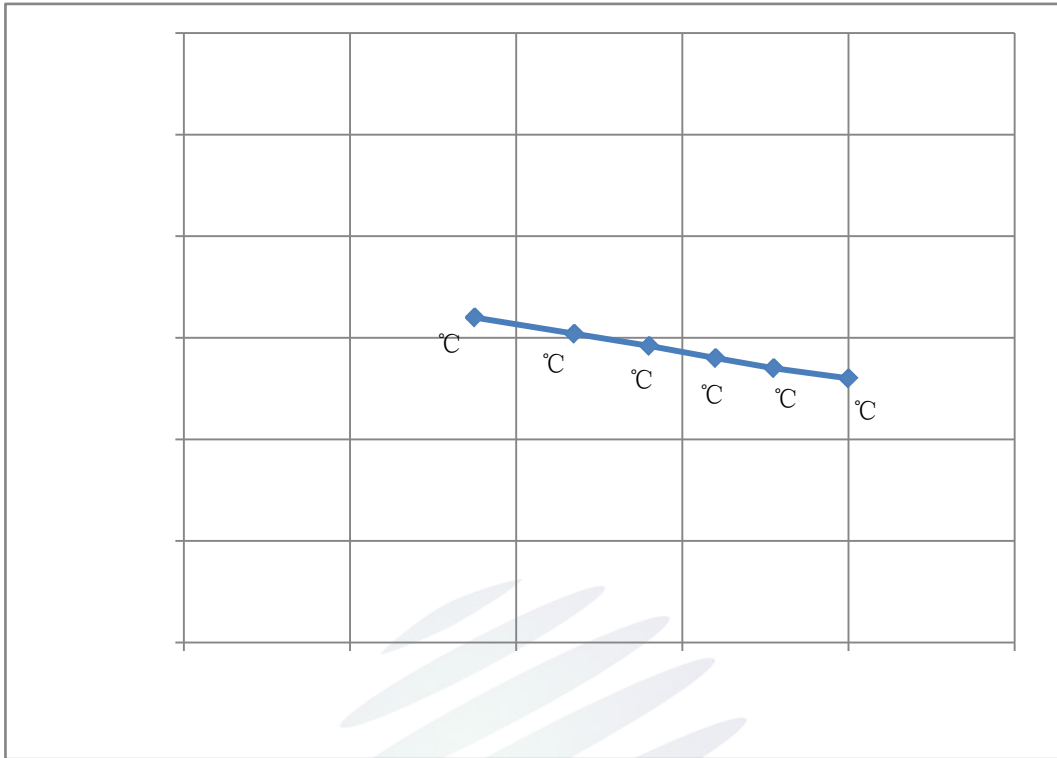


Fig. 1-13 Chromaticity Coordinate Vs Solder Temperature

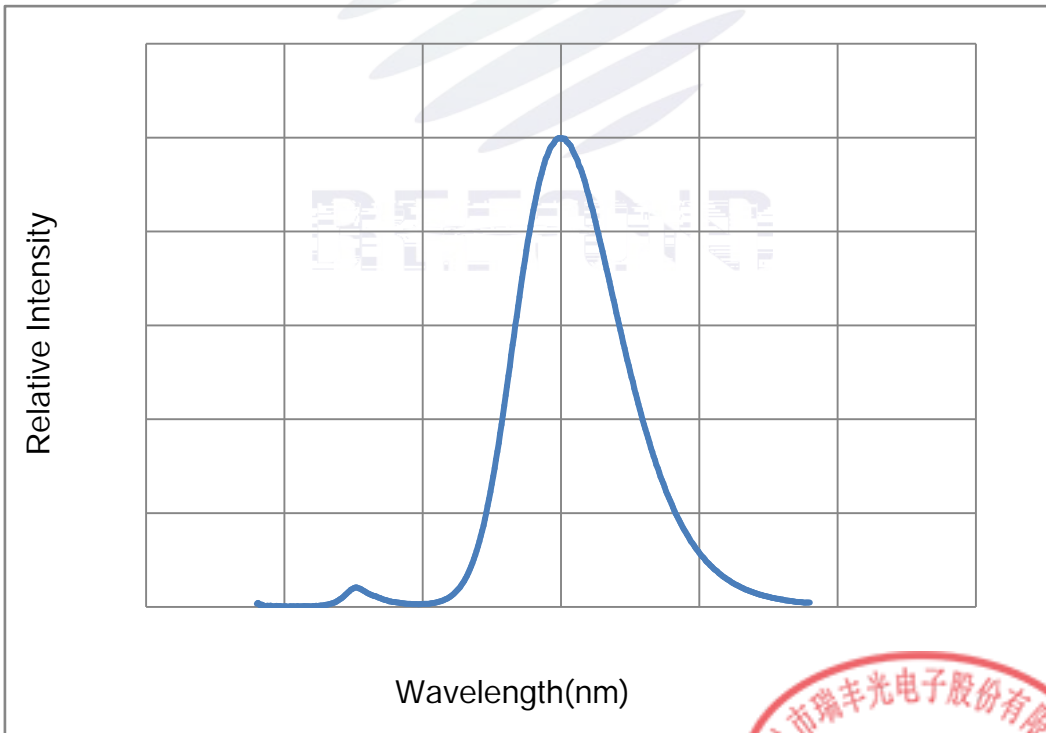


Fig. 1-14 Spectrum Distribution



## 2. Packaging

### 2.1 Packaging Specification

Package:4000pcs/reel.

#### 2.1.1 Carrier Tape Dimension

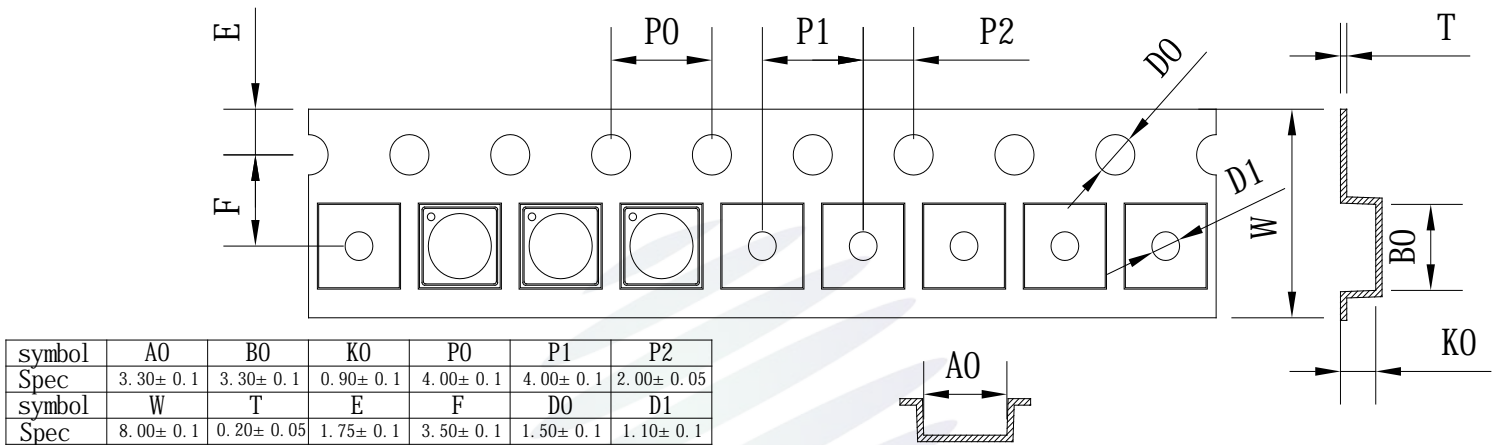


Fig.2-1 Carrier Tape Dimension

#### 2.1.2 Reel Dimension

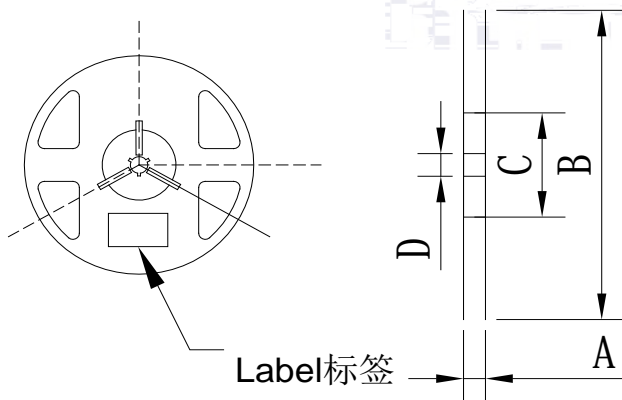


Fig.2-2 Reel Dimension

Table 2-1 Reel Dimension

A	12±0.1mm
B	180±1mm
C	60±1mm
D	13.0±0.5mm

#### Notes

The tolerances unless mentioned ±0.1mm. Unit : mm

±0.1



### 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
$\Phi$	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

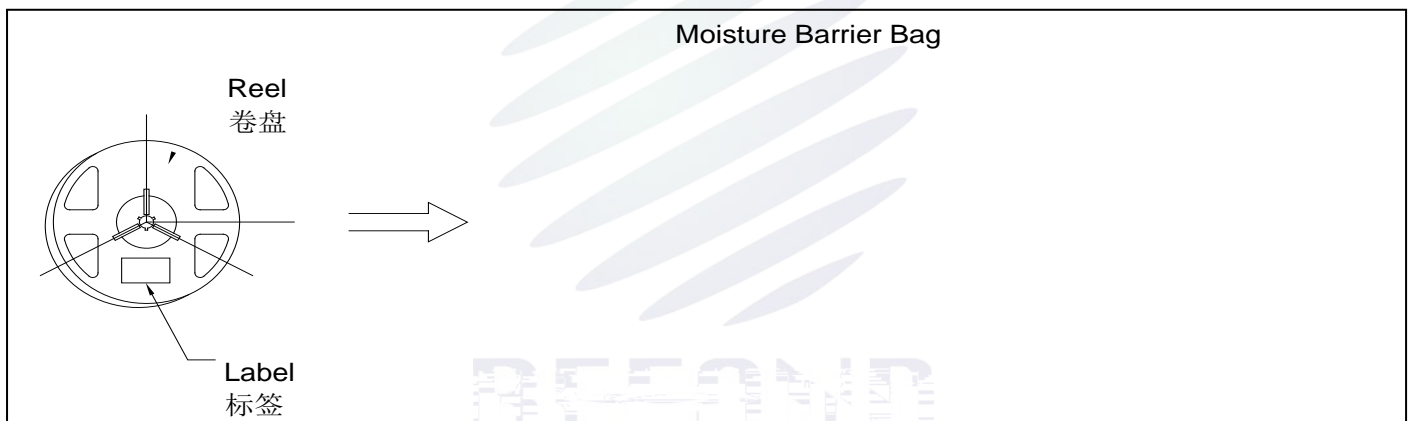


Fig.2-4 Moisture Resistant Packing

### 2.3 Cardboard Box

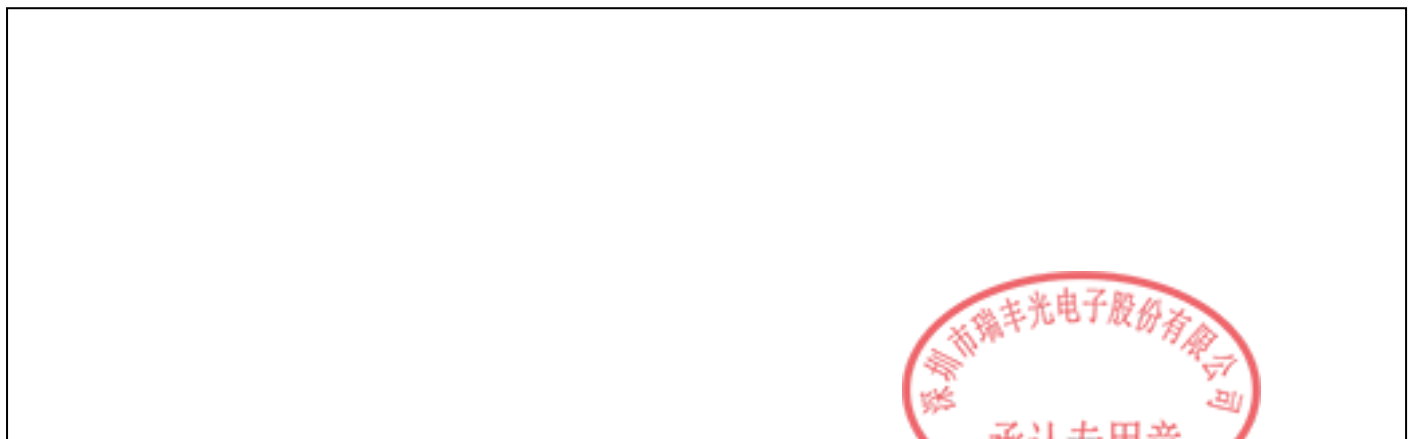


Fig.2-5 Cardboard Box



## 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	2times	20pcs.	0/1
MSL2 2	JESD22-A113	85 / 60%RH	168 hrs.	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min ↑↓10s 125 15min	1000 cycle	20pcs.	0/1
Life Test	JESD22-A108	Ta=125 If=300mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH If=300mA	1000hrs.	20pcs.	0/1





## SMT Reflow Soldering Instructions SMT

### 3.1 SMT Reflow Soldering Instructions SMT

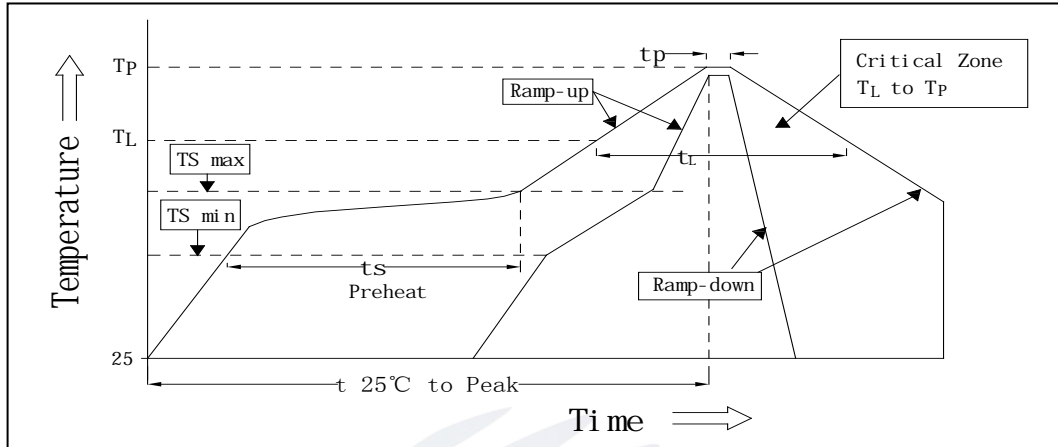


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Reflow parameters 回流焊参数

Average temperature rise speed	Tsmax TP	3 °C/	Max 3 °C/ s
Preheating: minimum temperature	(Tsmi n)	150 °C	
Preheating: Max temperature	(Tsmax)	200 °C	
Preheating: Time	Tsmi n 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	Max 60s
Peak /Classification of temperature:	/ (TP)	260 °C	
Time limit classification of peak temperature time tp		10	Max 10s
(TP) 5 °C	Hold time within	30	Max 30s
5 °C with the actual peak temperature (TP)			
Cooling speed		6 °C/	Max 6 °C/ s
25 °C	Needed time from 25 °C to Tp	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)When soldering , do not put stress on the LEDs during heating.

3.1.1 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

LED

3.1.2 Cautions

(1)The encapsulated material of the LEDs is silicone. Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be impacted on the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when use the picking up nozzle, the pressure on the silicone resin should be proper. LED LED

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

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





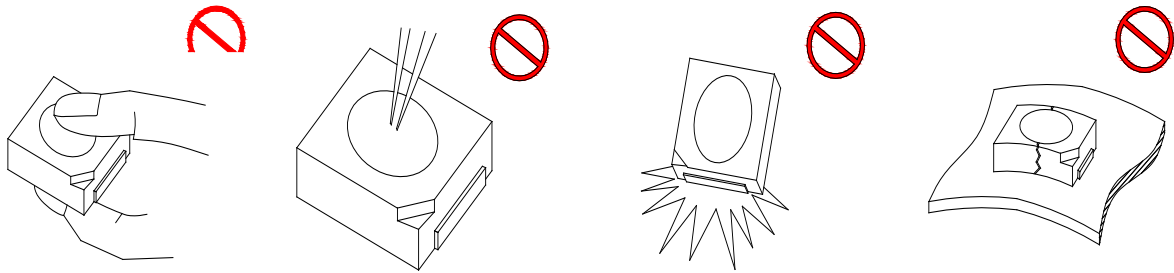


Fig 4-1Cautions

(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, other wise 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.

LED

LED

(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.

LED







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Declare

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

