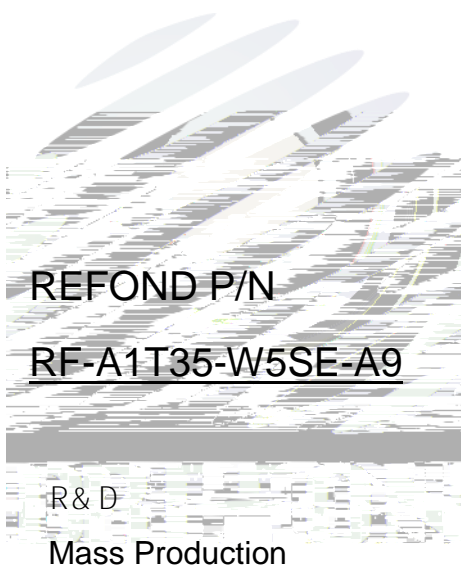


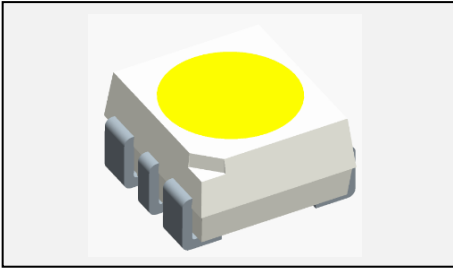
# SPECIFICATION





# 1. Description

## 1.1



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

Product Package: 3.5mmX3.5mmX1.9mm.

LED

3.5mmX3.5mmX1.9mm.

## 1.2 Features

PLCC Package. PLCC

Extremely wide viewing angle.

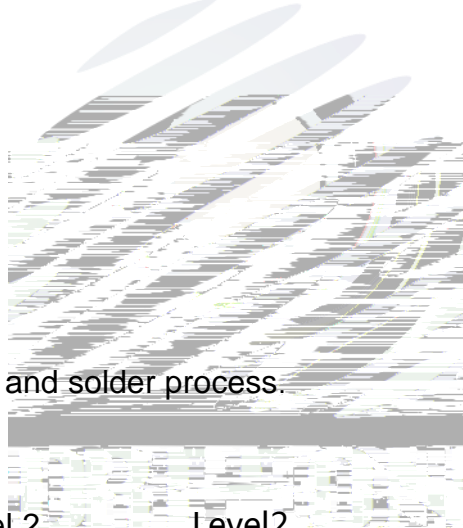
Suitable for all SMT assembly and solder process.

Available on tape and reel.

Moisture sensitivity level: Level 2.

Level2

RoHS compliant. RoHS



SMT

Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101 Stress Test Qualification for Automotive Grade Discrete Semiconductors AEC-Q101

## 1.3 Application

Automotive Lighting Interior and Exterior.

## 1.4 Package Dimension

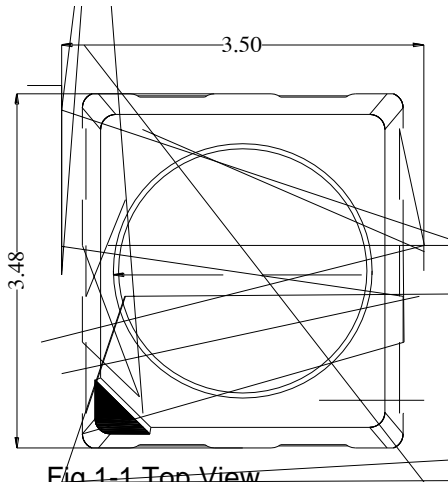


Fig.1-1 Top View

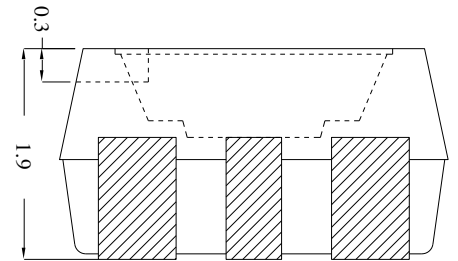


Fig.1-2 Side View

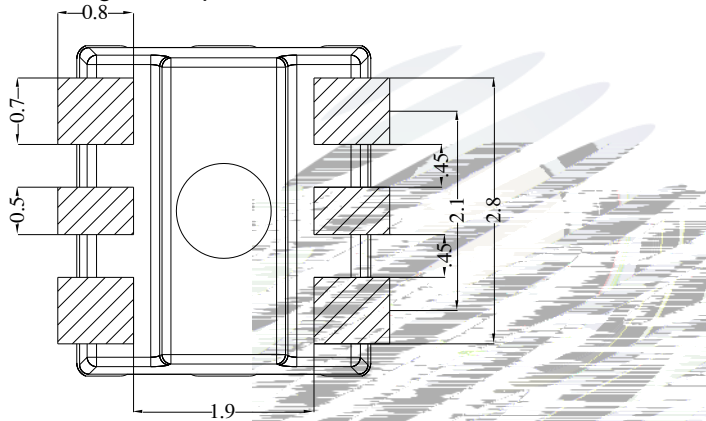


Fig.1-3 Bottom View

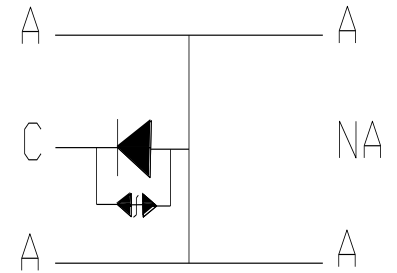


Fig.1-4 Polarity

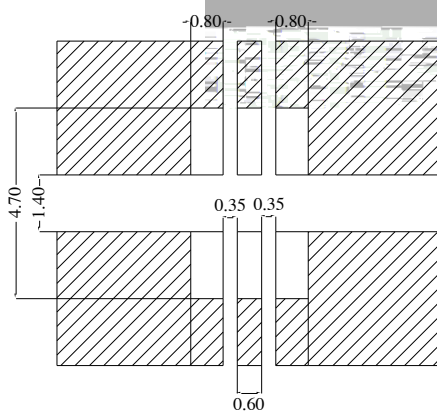


Fig.1-5 Soldering Patterns

### Notes

1. All dimensions units are millimeters.
2. All dimensions tolerances are  $\pm 0.05\text{mm}$  unless otherwise noted.

$\pm 0.05$

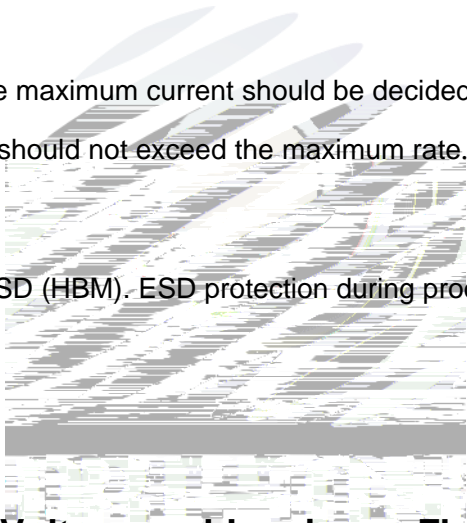


Notes

1. 1/10 Duty cycle, 0.1ms pulse width.      0.1ms,      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=150mA)**  
**BIN (IF=150mA)**

Table 1-3

V <sub>F</sub>	G1	G2	H1	H2	I1	I2
	2.8-2.9	2.9-3.0	3.0-3.1	3.1-3.2	3.2-3.3	3.3-3.4
Im	OB	PA	PB			

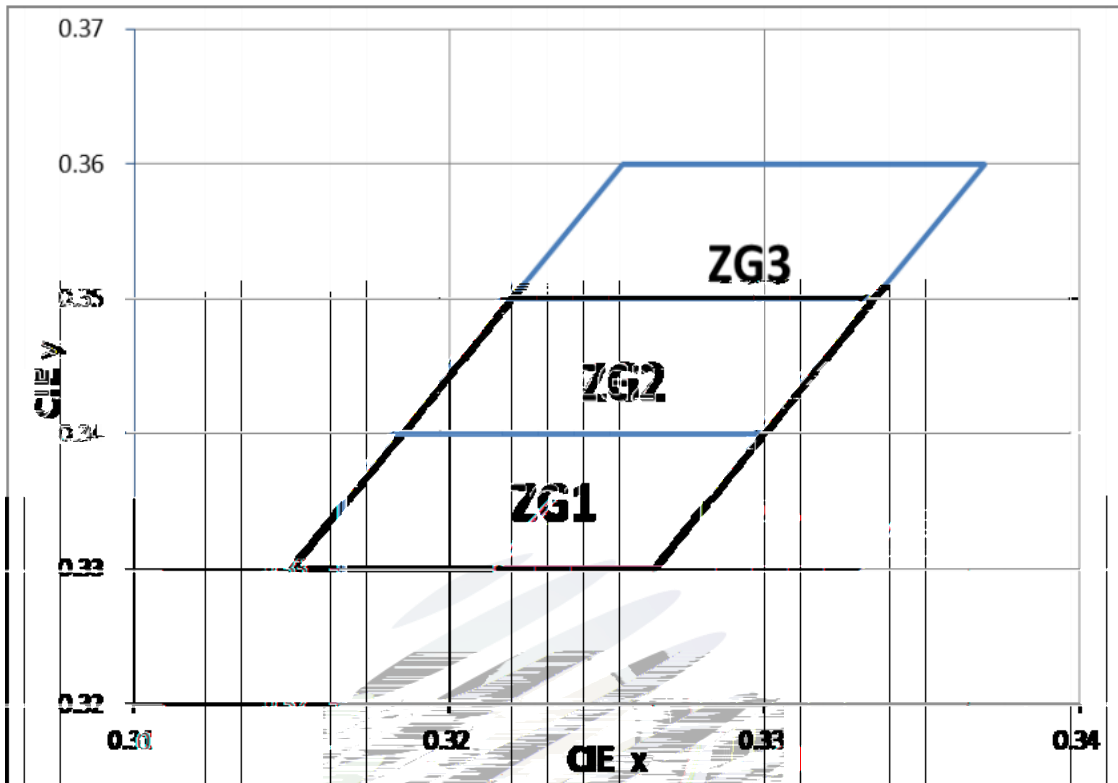


Fig 1-6 The C.I.E Chromaticity Diagram CIE

Table 1-4

BINCODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
ZG1	0.3150	0.3300	0.3185	0.3400	0.3300	0.3400	0.3265	0.3300
ZG2	0.3185	0.3400	0.3220	0.3500	0.3335	0.3500	0.3300	0.3400
ZG3	0.3220	0.3500	0.3255	0.3600	0.3370	0.3600	0.3335	0.3500







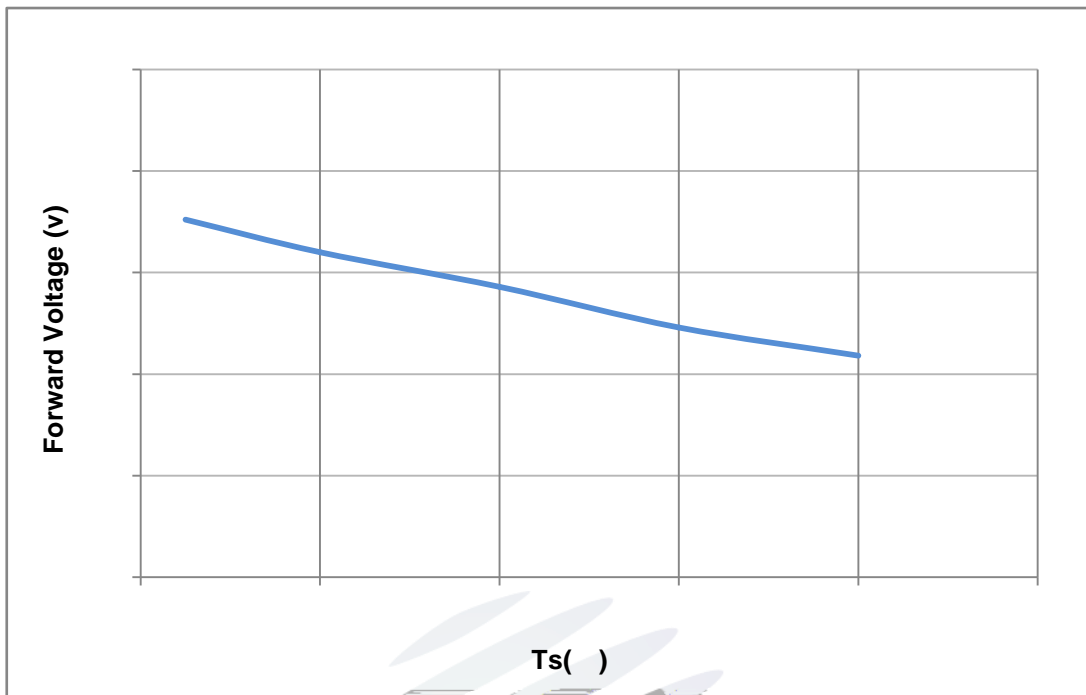


Fig. 1-11 Forward Voltage Vs Solder Temperature

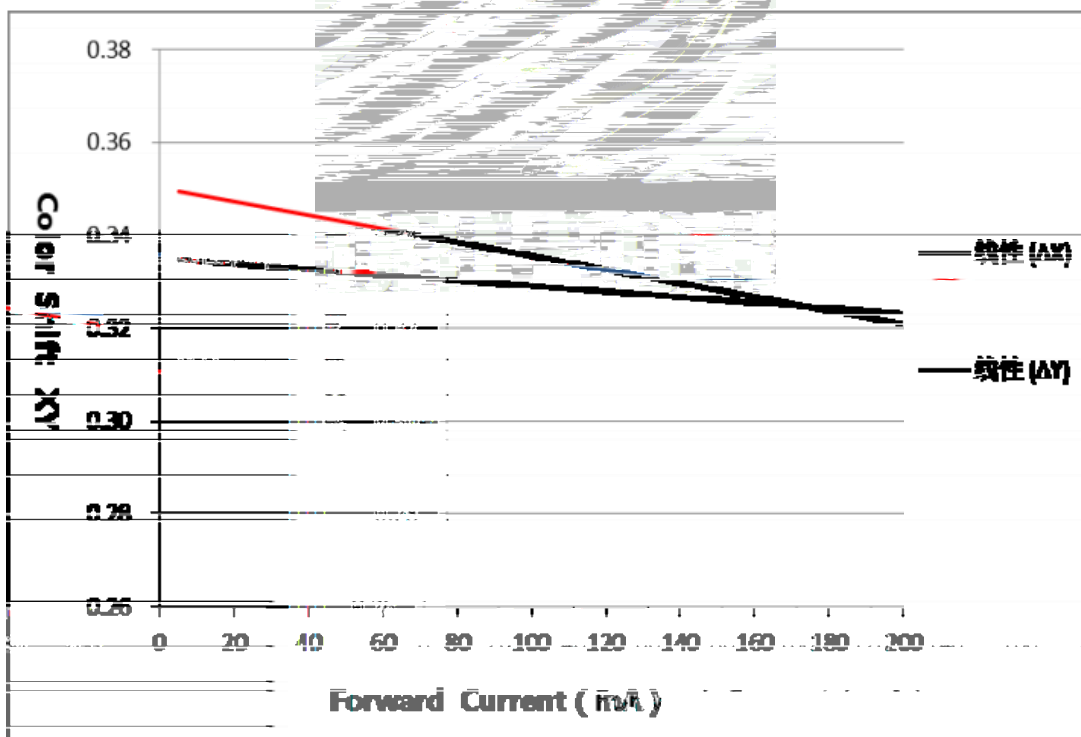


Fig. 1-12 Forward current vs.

(Ts=25°C)

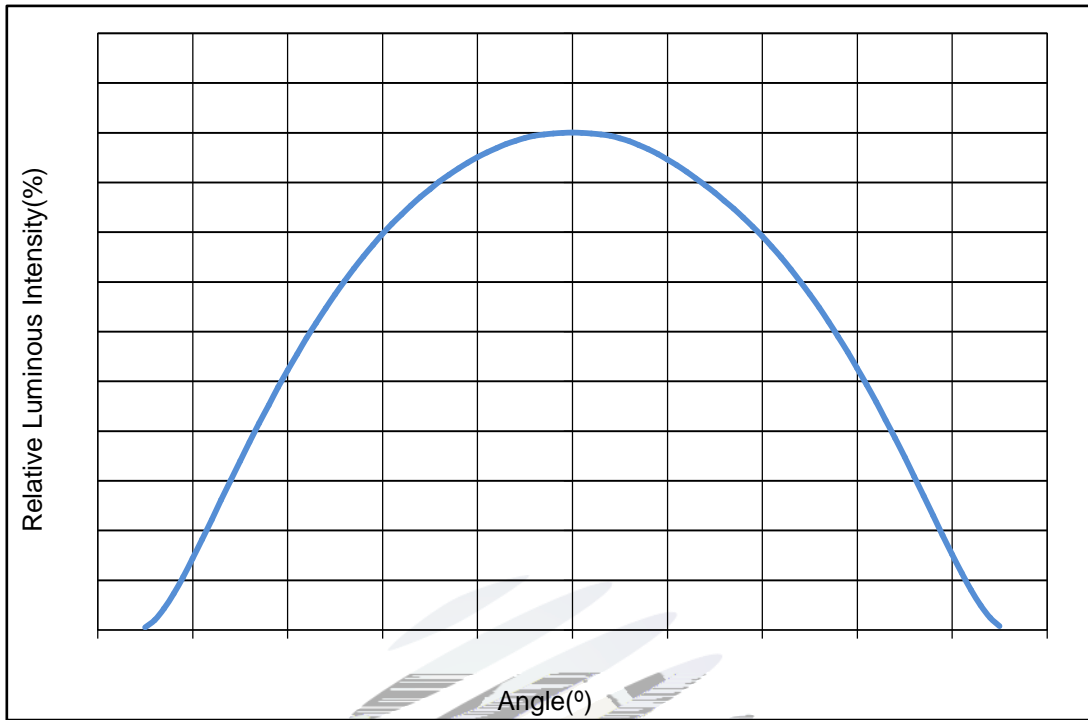


Fig. 1-13 Radiation diagram

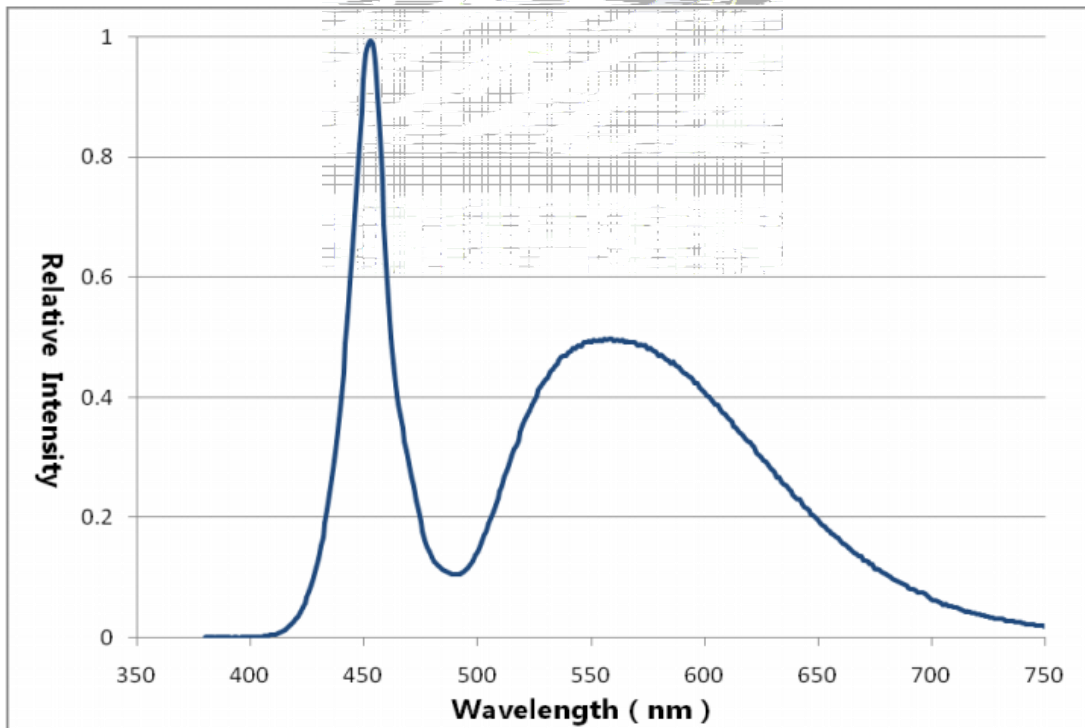


Fig. 1-14 Spectrum Distribution

## 2. Packaging

### 2.1 Packaging Specification

Package:4000pcs/reel.

#### 2.1.1 Carrier Tape Dimension

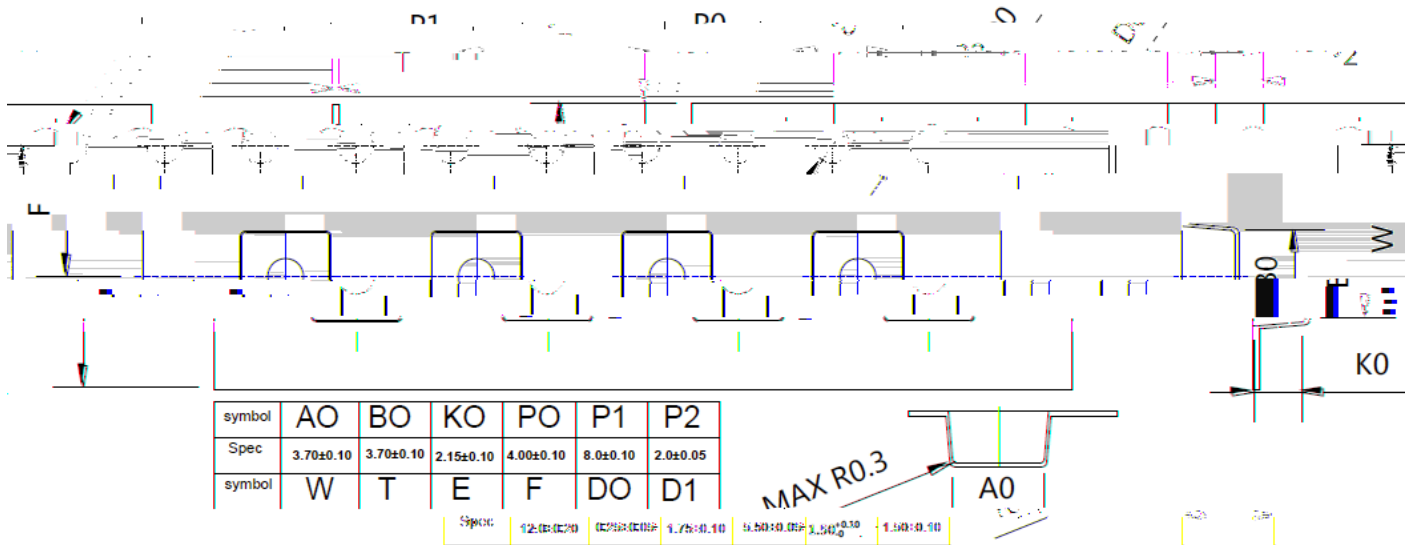


Fig.2-1 Carrier Tape Dimension

#### 2.1.2 Reel Dimension

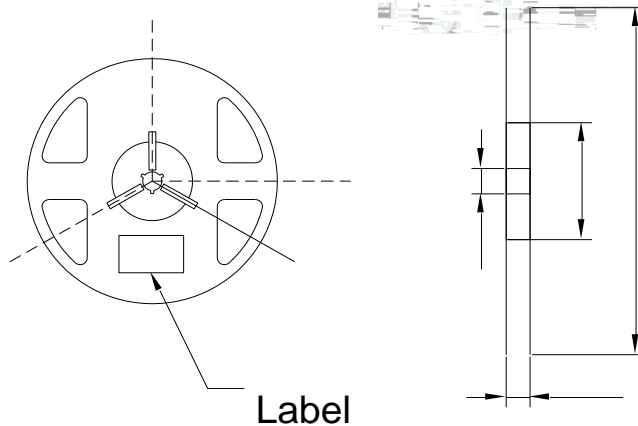


Fig.2-2 Reel Dimension

Table 2-1 Reel Dimension

A	12±0.1mm
B	330±1mm
C	100±1mm
D	13.0±0.5mm

#### Notes

The tolerances unless mentioned ±0.1mm. Unit : mm

±0.1

### 2.1.3 Label Form Specification

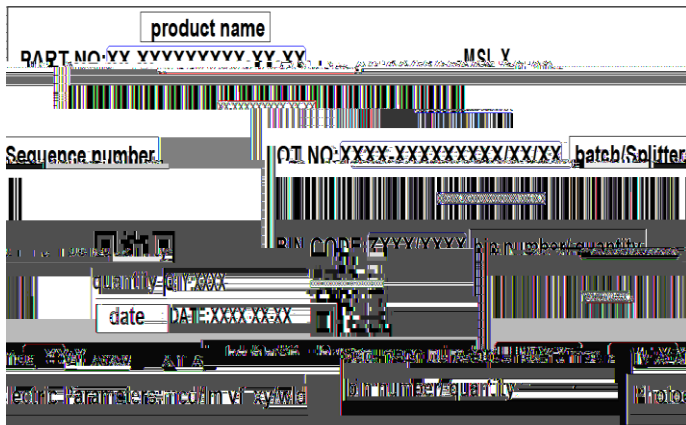


Fig. 2-3 Label

Table 2-2 Specification

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

### 2.2 Moisture Resistant Packing

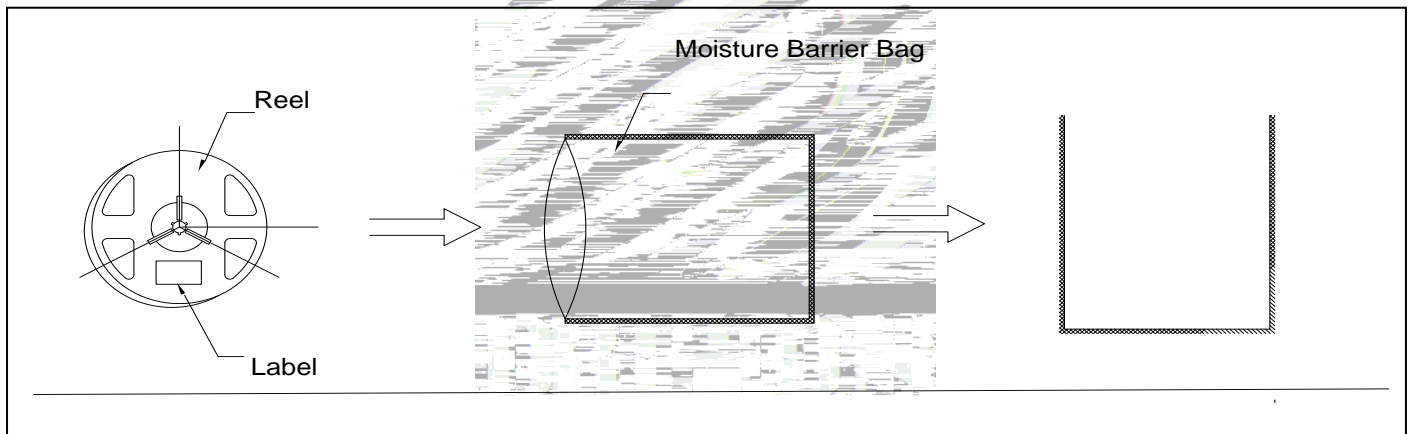


Fig.2-4 Moisture Resistant Packing

### 2.3 Cardboard Box

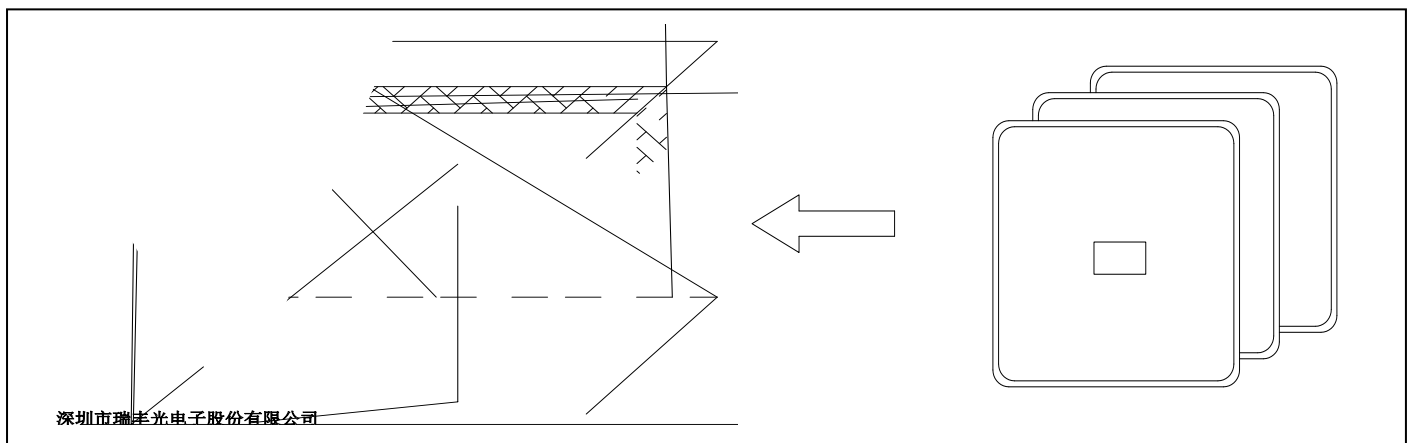


Fig.2- Cardboard Box 包装纸箱

## 2.4 Reliability Test Items And Conditions

压

Table 2-3 Reliability Test Items And Conditions

压

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow	JESD22-B106	Temp:260 max T=10 sec	2times	20pcs.	0/1
Thermal Shock	JEITAED-4701 300307	-40 15min 10s 100 15min	1000 cycle	20pcs.	0/1
High Temperature Storage	JEITAED-4701 200 201	Temp:100	1000hrs.	20pcs.	0/1
Low Temperature Storage	JEITA ED-4701 200 202	Temp:-40	1000hrs.	20pcs.	0/1
Life Test	JESD22-A108	Ta=25 If=150mA	1000hrs.	20pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH If=150mA	1000hrs.	20pcs.	0/1
Temperature Humidity Storage	JEITA ED-4701 100 103	TA=85 RH=85%	1000hrs.	20pcs.	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	$V_F$	$I_F=150\text{mA}$	-	U.S.L*)x1.1
Reverse Current	$I_R$	$V_R = 5\text{V}$	-	U.S.L*)x2.0



### 3. SMT Reflow Soldering Instructions SMT

#### 3.1 SMT Reflow Soldering Instructions SMT

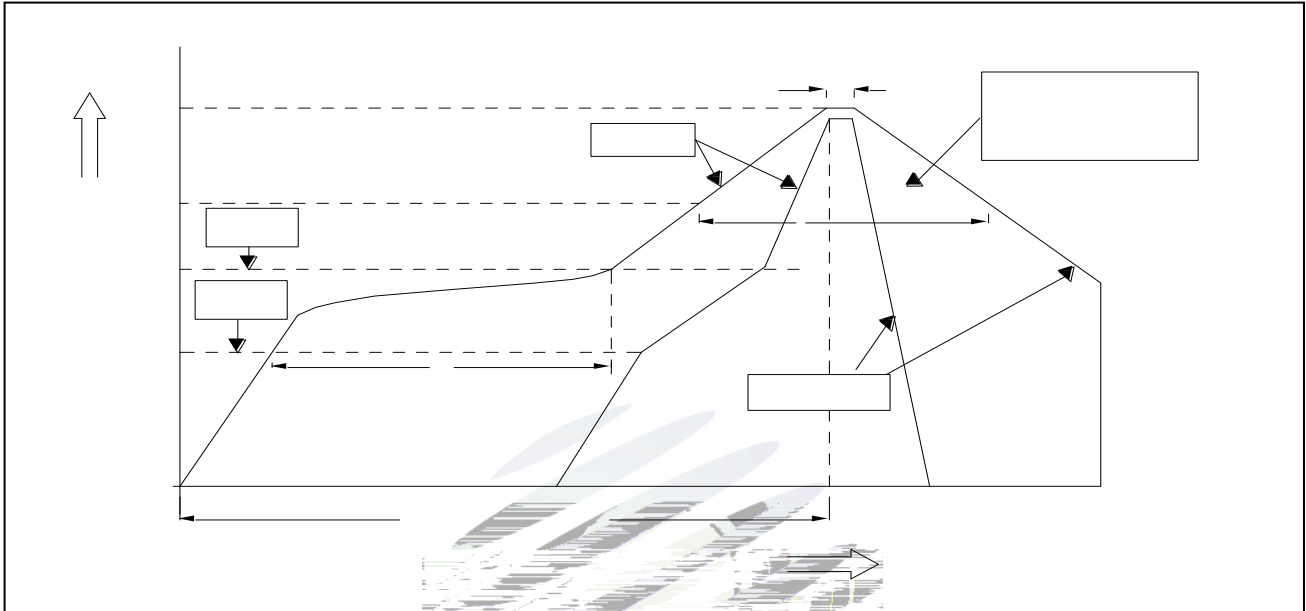


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Reflow parameters

Average temperature rise speed	$T_{smx}$ $T_P$	3 °C/	Max 3 °C/ s
Preheating: minimum temperature	( $T_{smin}$ )	150 °C	
Preheating: Max temperature	( $T_{smx}$ )	200 °C	
Preheating: Time	$T_{smin}$ $T_{smx}$	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	Max 60s
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 ( $T_P$ ) 5°C		30	Max 30s
Cooling speed		6 °C/	Max 6 °C/ s



Needed time from 25 °C to T <sub>p</sub> 25°C	8	Max 8 minutes
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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 Soldering Iron

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

(2) Soldering by hand



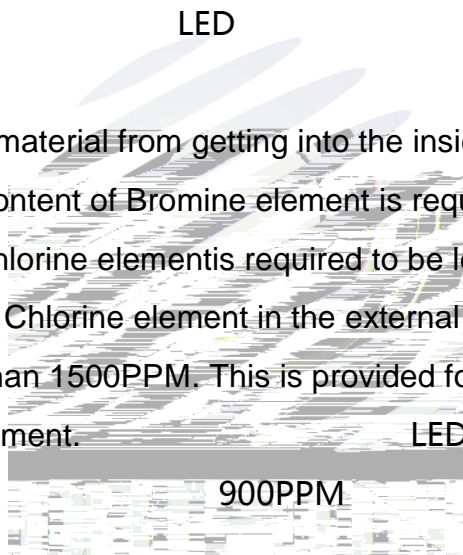
(3) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.

## 4. Handling Precautions

### 4.1 Handling Precautions

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

(2) In order to prevent external material from getting into the inside of LED, which may cause the malfunction of LED, the single content of Bromine element is required to be less than 900PPM, the single content of Chlorine element is required to be less than 900PPM, the total content of Bromine element and Chlorine element in the external materials of the application products is required to be less than 1500PPM. This is provided for informational purposes only and is not a warranty or endorsement.



LED 900PPM

## LED

### LED

(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.

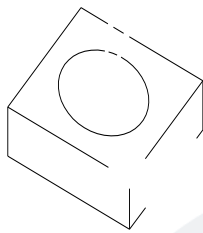


Fig 4-1 Handling Precautions

(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.

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

### 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



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







www.refond.com



Declare

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