



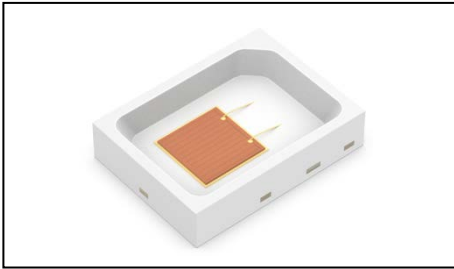
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## 1. Description

### 1.1 General Description



The red source color devices are made with AlGaInP on Substrate Light Emitting Diode .Product Package:2.7mmX2.0mmX0.6mm.

该红光 LED 由 AlGaInp 四种元素芯片激发而成，产品尺寸：2.7mmX2.0mmX0.6mm.

### 1.2 Features

EMC Package. EMC封装

Extremely wide viewing angle.发光角度大

Suitable for all SMT assembly and solder process.适用于所有的SMT组装和焊接工艺

Available on tape and reel.适用于载带及卷轴

Moisture sensitivity level: Level 2.防潮等级 Level2

Compliance with RoHS and REACH. 符合RoHS和REACH要求

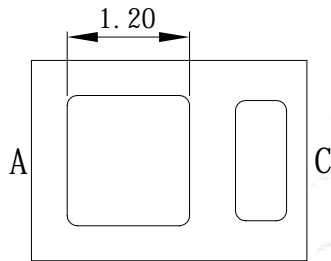
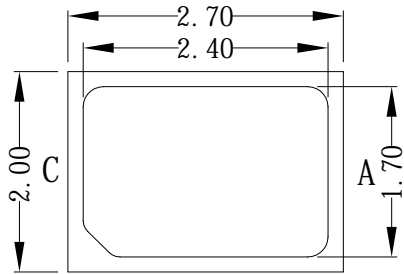
Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102 Stress Test Qualification for Automotive Grade Discrete Semiconductors  
AEC-Q102

### 1.3 Application

Automotive Lighting Interior and Exterior.汽车内饰和外饰照明



## 1.4 Package Dimension



### Notes

1. All dimensions units are millimeters.
2. All dimensions tolerances are 0.05mm unless otherwise noted.

± 0.05

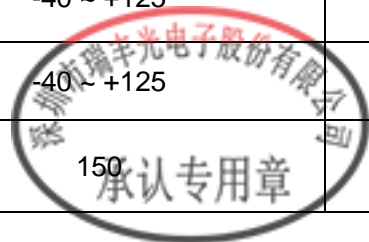
## 1.5 Product Parameters

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

Item	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	$V_F$	$I_F=350\text{mA}$	2.0	---	2.6	V
Reverse Current	$I_R$	$V_R=5\text{V}$	---	---	10	$\mu\text{A}$
Luminous Flux		$I_F=350\text{mA}$	61.2	---	83.7	lm
Dominant wavelength	$\lambda_d$	$I_F=350\text{mA}$	612.5	617	620	nm
Viewing Angle	2 1/2	$I_F=350\text{mA}$	---	120	---	deg
Thermal Resistance.	$R_{THJ-S}$	$I_F=350\text{mA}$	---	---	22	/W

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

Parameter	Symbol	Rating	Units
Power Dissipation	$P_D$	1092	mW
Forward Current	$I_F$	420	mA
Peak Forward Current	$I_{FP}$	700	mA
Reverse Voltage	$V_R$	5	V
Electrostatic Discharge (HBM)	$E_{SD}$	2000	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 2000V ESD (HBM). ESD protection during products handing is needed. 90% LED      ESD2000V ,

## 1.6 Bin Range Of Forward Voltage and Luminous Flux (IF=350mA)

### BIN (IF=350mA)

Table 1-3

$V_F$	C0	C1	C2
	2.0-2.2	2.2-2.4	2.4-2.6
	PB	QA	QB
	61.2-67.8	67.8-75.3	75.3-83.7
WD(nm)	C2	D1	D2
	612.5-615	615-617.5	617.5-620





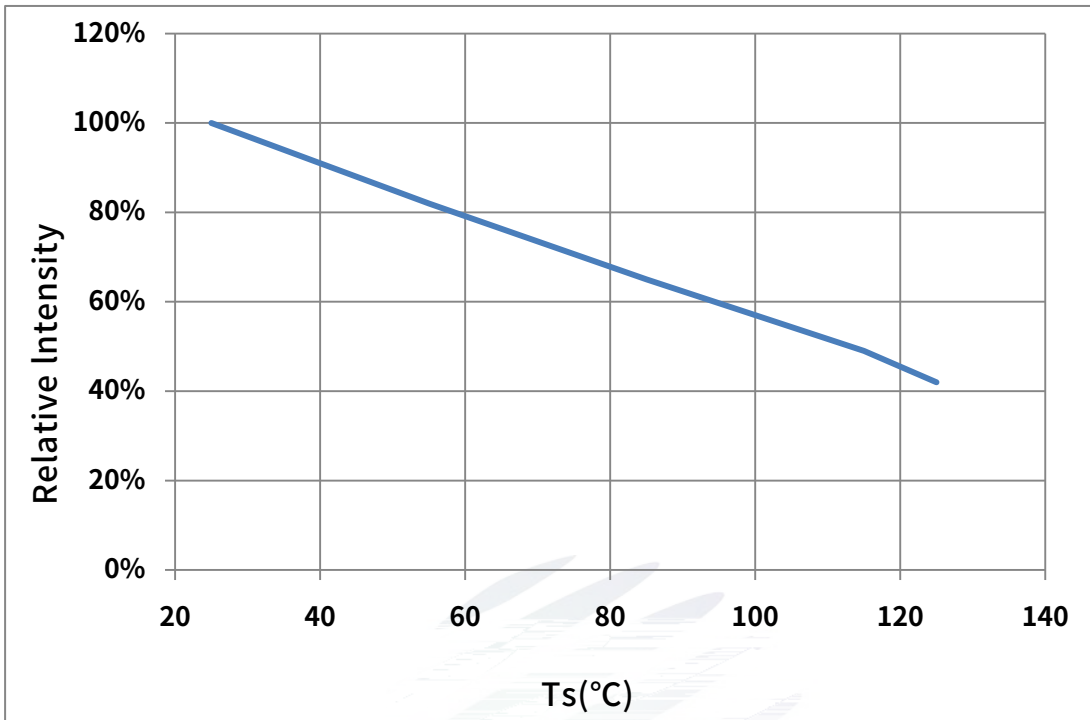


Fig. 1-9 Solder Temperature Vs Relative Intensity

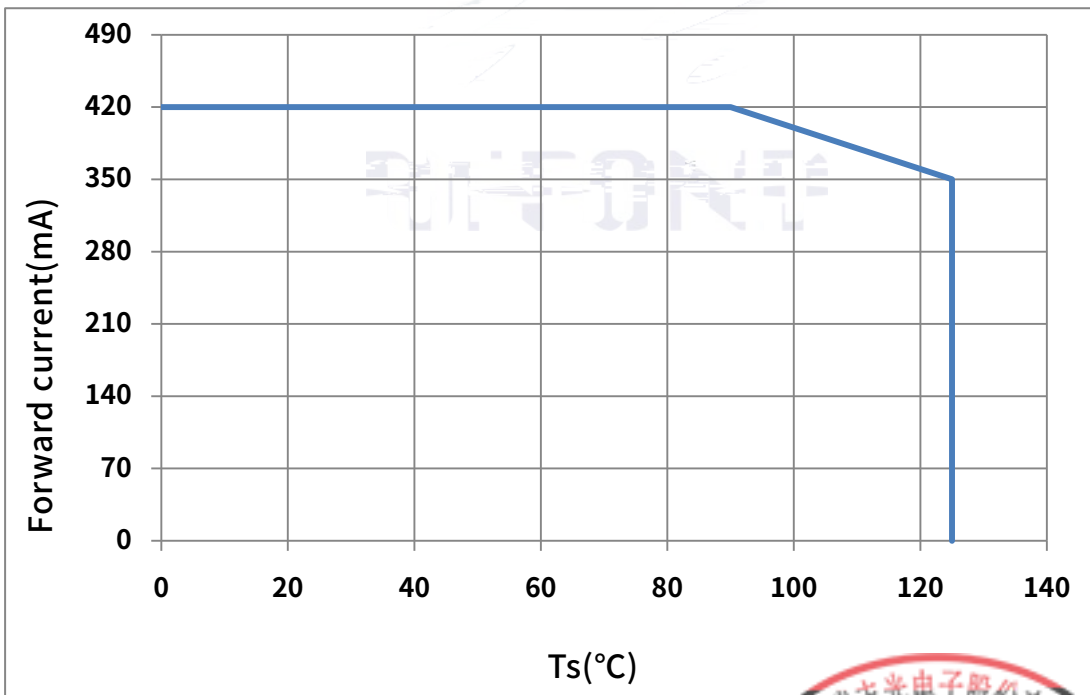
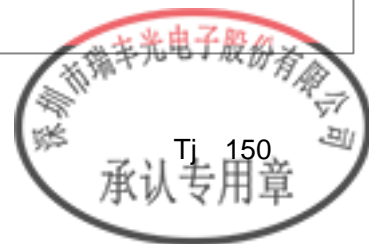


Fig. 1-10 Solder Temperature Vs Forward Current





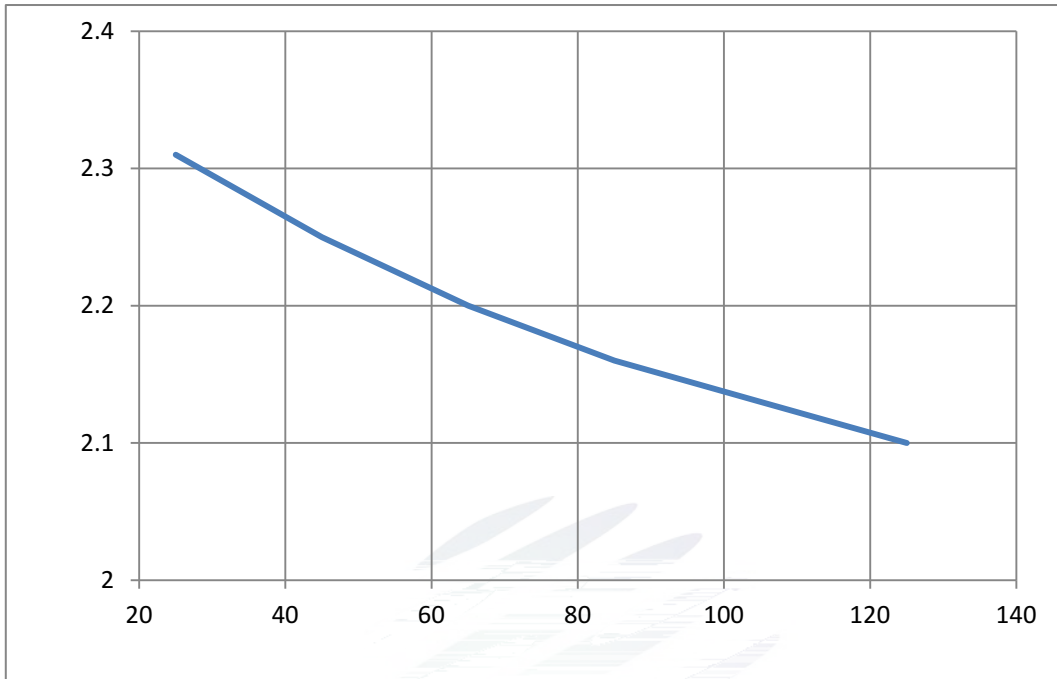


Fig. 1-11 Forward Voltage Vs Solder Temperature

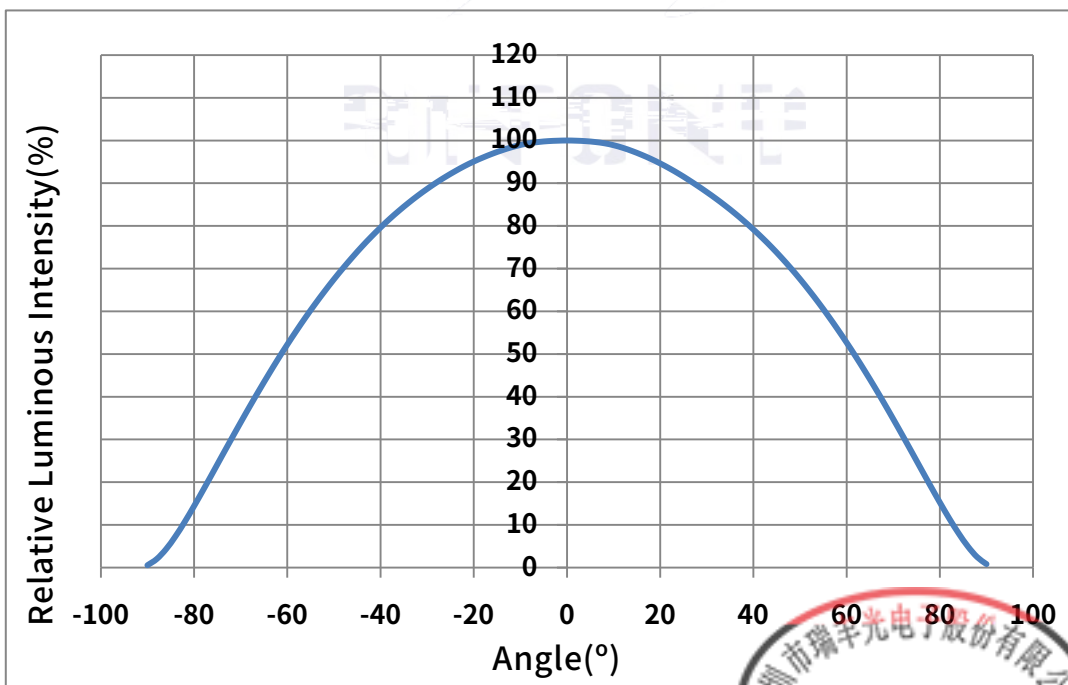
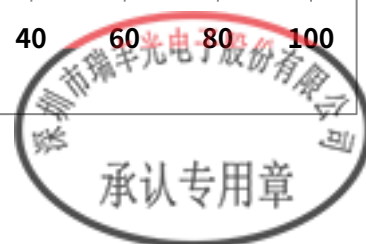


Fig. 1-12 Radiation diagram



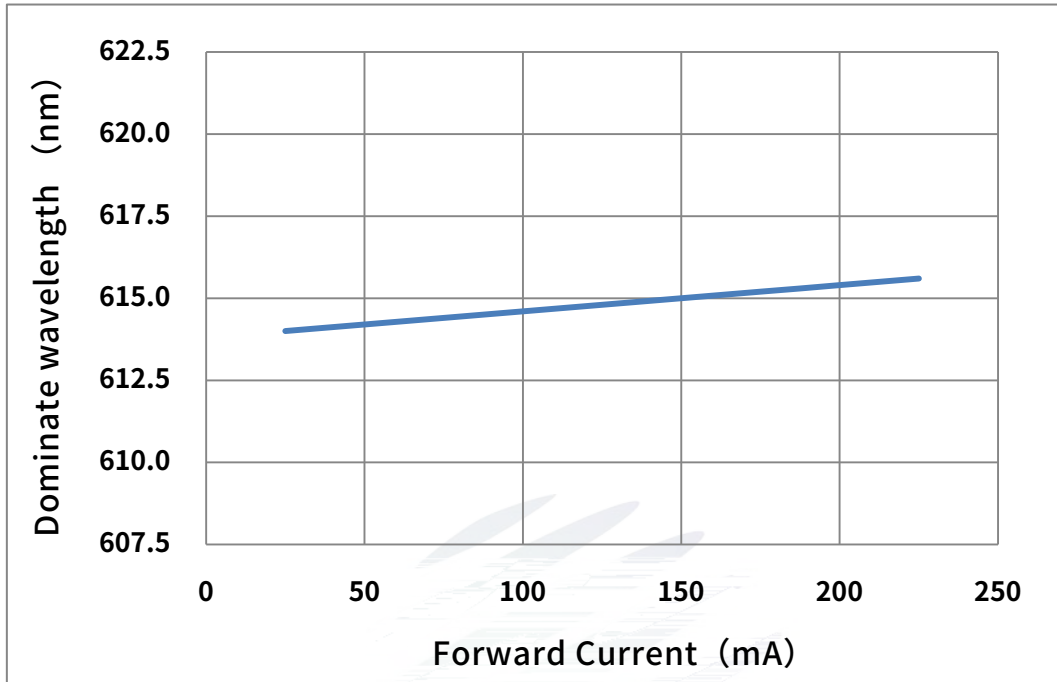


Fig. 1-13 Forward current vs. Dominate wavelength (Ts=25°C)

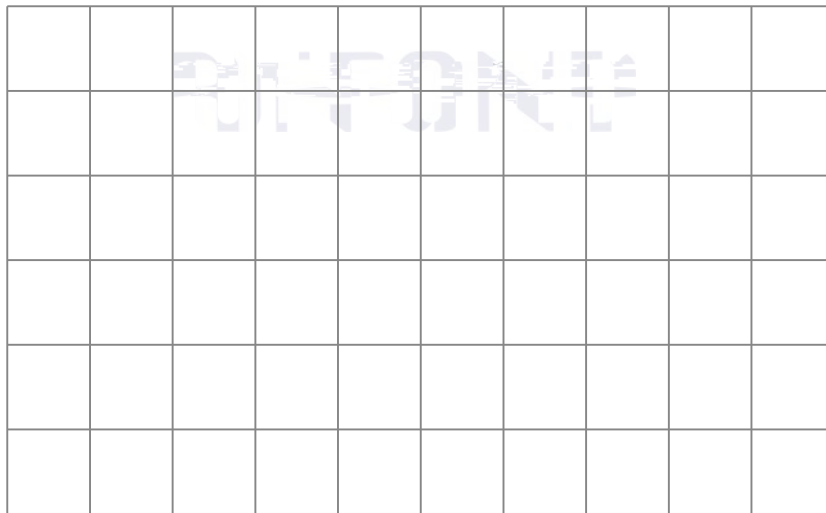


Fig. 1-14 Spectrum Distribution



## 2. Packaging

### 2.1 Packaging Specification

Package:4000pcs/reel.      4000pcs

#### 2.1.1 Carrier Tape Dimension

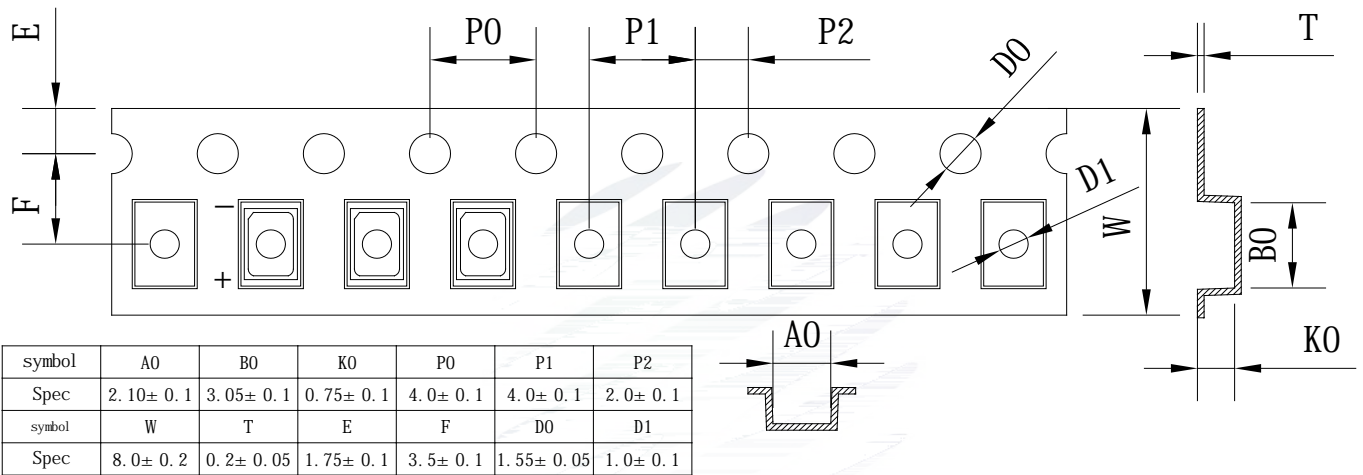


Fig.2-1 Carrier Tape Dimension

#### 2.1.2 Reel Dimension

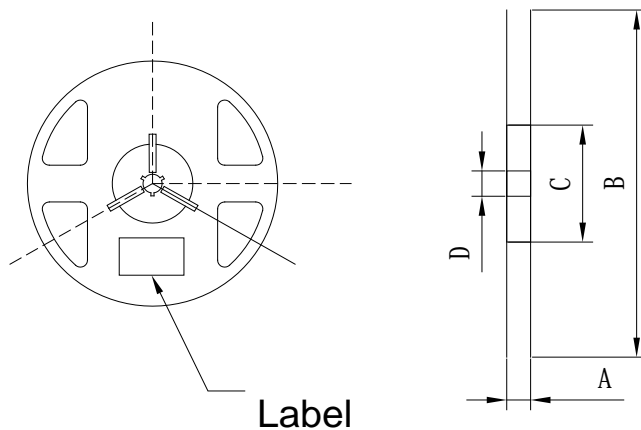


Fig.2-2 Reel Dimension

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
	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

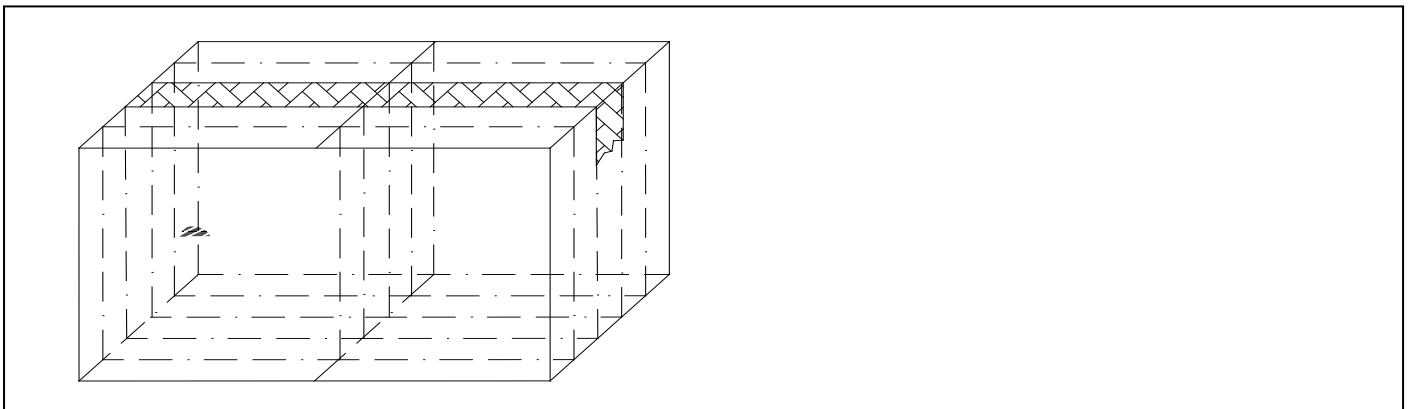


Fig.2-5 Cardboard Box

## 2.4 Reliability Test Items And Conditions



## 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	$V_F$	$I_F=350\text{mA}$	-	U.S.L*)x1.1
Reverse Current	$I_R$	$V_R = 5\text{V}$	-	U.S.L*)x2.0
Luminous Flux		$I_F=350\text{mA}$	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 the LED to the series and parallel circuit, should take consideration of all the factors such as the current, voltage distribution, heat dissipation and others. / LED  
LED
- 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

#### 3.1 SMT Reflow Soldering Instructions SMT

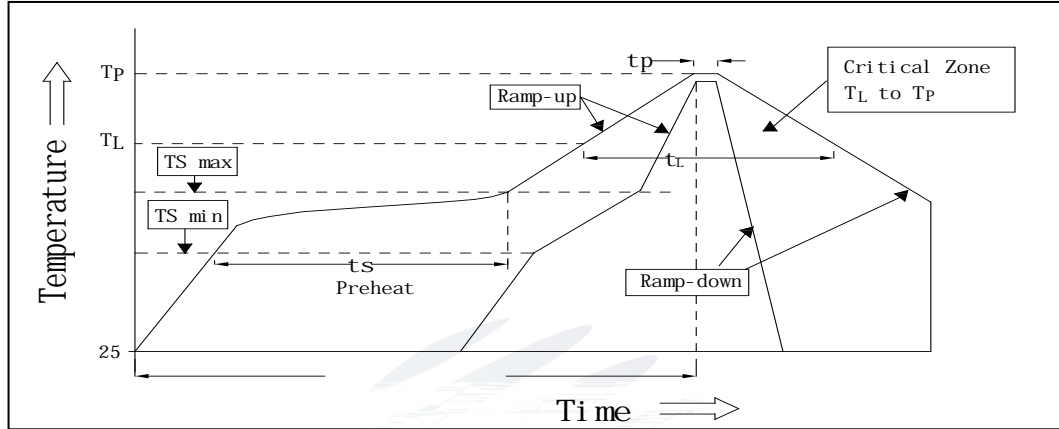
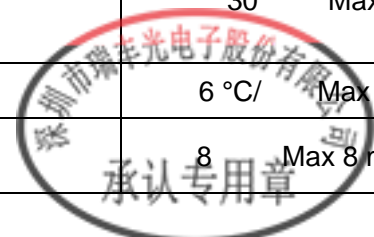


Fig.3-1 SMT Reflow Soldering Instructions SMT

Table 3-1 Reflow parameters

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	Max 60s
Peak /Classification of temperature:	/ ( $T_P$ )	260 °C	
Time limit classification of peak temperature time $t_p$		10	Max 10s
( $T_P$ ) 5 °C the actual peak temperature ( $T_P$ )	Hold time within 5 °C with	30	Max 30s
Cooling speed		6 °C/ s	Max 6 °C/ s
25 °C	Needed time from 25 °C to $T_p$	8	Max 8 minutes







## 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 purpose.



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

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%	Recommended for use within 24 hours  24
Baking		60± 5	-	24hours  24








Declare

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

