

# Specification

## 规格书

Customer Name : \_\_\_\_\_

客户名称

Customer P/N : \_\_\_\_\_

客户品号

Refond P/N : RF-W1SA15HS-A47

公司型号

Sending Date: \_\_\_\_\_

供货日期

<input type="checkbox"/> Technical Reference 技术参考		<input type="checkbox"/> Sample 样品		<input checked="" type="checkbox"/> Mass Product 量产供货	
Customer approval 客户审核			Refond approval 瑞丰审核		
Approval 核准	Audit 确认	Confirmation 制作	Approval 核准	Audit 确认	Confirmation 制作
			张国保		谢乐平
<input type="checkbox"/> Qualified 接受		<input type="checkbox"/> Disqualified 不接受		Date : 日期: 2018/08/15	

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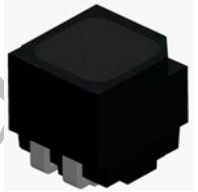
**Web/网址:** [www.refond.com](http://www.refond.com)

# LED SPECIFICATION



## REFOND RGB SMD LED(1515 RGB Outdoor)

### RF-W1SA15HS-A47



#### 产品描述 Product description

本产品采具有 IPX6 防水等级, **高对比度(全黑外观设计)**, 光型一致性好,可靠性高. 广泛运用于各类使用表面贴装结构的电子产品中, 如汽车仪表盘, 户外全彩显示屏, 室内外装饰照明。

This product it has an IPX6 grade of waterproof with high contrast(Designed on all black surface ), light type consistency, high reliability. it also be widely application for automobile dashboard, Outdoor full-Color video screen, decorative lighting and other electronic devices.

#### 产品特点

- 尺寸(mm): 1.6x1.7x1.6mm
- 表面不反光
- 光强度高、功耗低、可靠性好、寿命长
- 防水等级(IPX6)
- 潮湿敏感等级:5a
- 无铅回流焊
- 符合 RoHS
- 亚光表面

#### Features

- Size(mm):1.6x1.7x1.6mm
- Surface not reflective
- High luminous Intensity, Low power dissipation, Good reliability and Long life
- Water-resistant (IPX6)
- Moisture sensitivity level: 5a
- Pb-free reflow soldering application
- RoHS compliant
- Matte surface

#### 产品运用

- 户外全彩显示屏
- 汽车仪表盘
- 室内外装饰照明
- 娱乐产品

#### Applications

- Semi Outdoor full-color video screen
- The automobile dashboard
- Indoor and outdoor decorative lighting
- Amusement

**极限参数(引脚温度=25°C)**

**Absolute Maximum Ratings (PIN Ts = 25°C)**

参数名称 Parameter	符号 Symbol	极限参数 Absolute Maximum Rating			单位 Unit
		R	G	B	
正向电流 Forward Current	I <sub>F</sub>	20	15	15	mA
正向脉冲电流* Pulse Forward Current*	I <sub>FP</sub>	60	60	60	mA
反向电压 Reverse Voltage	VR	5	5	5	V
工作温度 Operating Temperature	T <sub>OPR</sub>	-30 ~ +85			°C
贮存温度 Storage Temperature	T <sub>stg</sub>	-40 ~ +100			°C
功耗 Power Dissipation	P <sub>D</sub>	48	51	51	mW
静电放电(人体模式) Electrostatic Discharge (HBM)	ESD	1000V			

\*备注：脉冲宽度 ≤0.1ms,占空比≤1/10      \*Note: Pulse width≤0.1msec, duty≤1/10.

**光电参数 (温度=25°C)**

**Typical Electrical & Optical Characteristics (Ts = 25°C)**

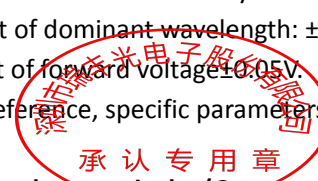
参数名称 Parameter	符号 Symbol	条件 Condition	参数 Value			单位 Unit
			R	G	B	
反向电流(最大) Reverse Current(max.)	I <sub>R</sub>	V <sub>R</sub> = 5V	6	6	6	μA
正向电压 Forward Voltage	V <sub>F (min)</sub>	R I <sub>F</sub> = 10mA G I <sub>F</sub> = 10mA B I <sub>F</sub> = 5mA	1.7	2.5	2.5	V
	V <sub>F (max)</sub>		2.4	3.3	3.3	V
主波长 Dominant Wavelength	λ <sub>D</sub>		618~ 628	518~528	464~474	nm
半波宽 Spectrum Radiation Bandwidth	Δλ		24	38	30	nm
光强 Luminous Intensity	I <sub>V(min)</sub>		142	340	40	mcd
	I <sub>V(avg)</sub>		185	440	52	mcd
视角 50% Power Angle	2θ <sub>1/2</sub>		110			deg

备注 note

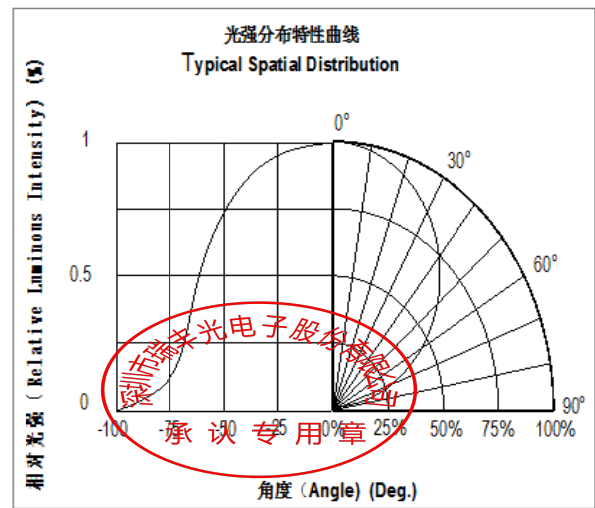
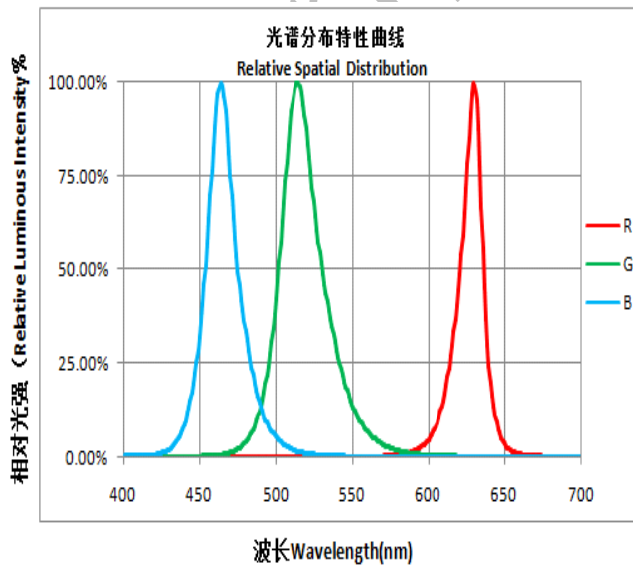
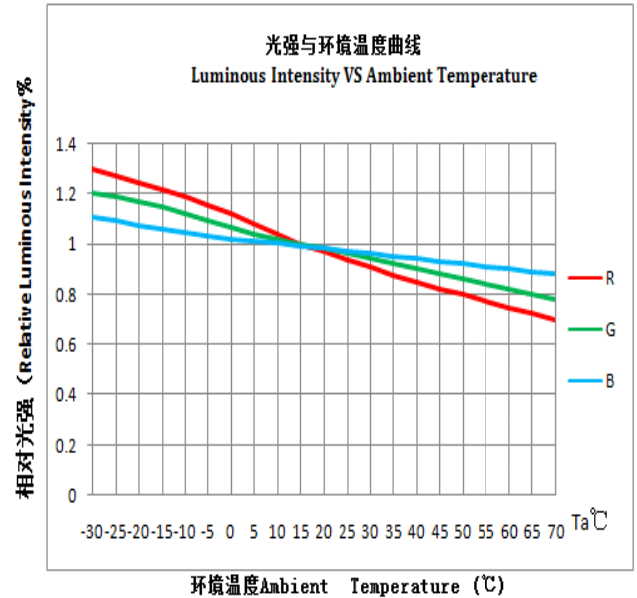
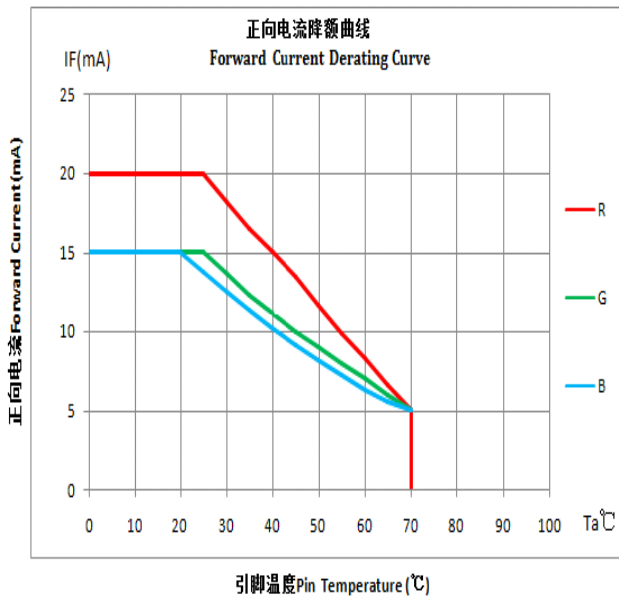
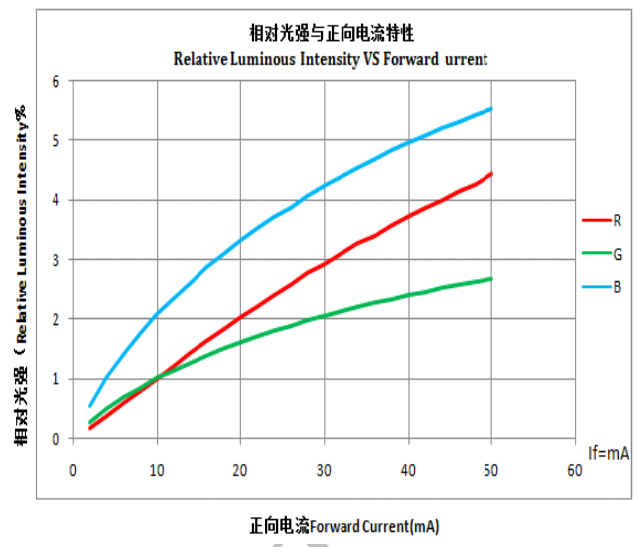
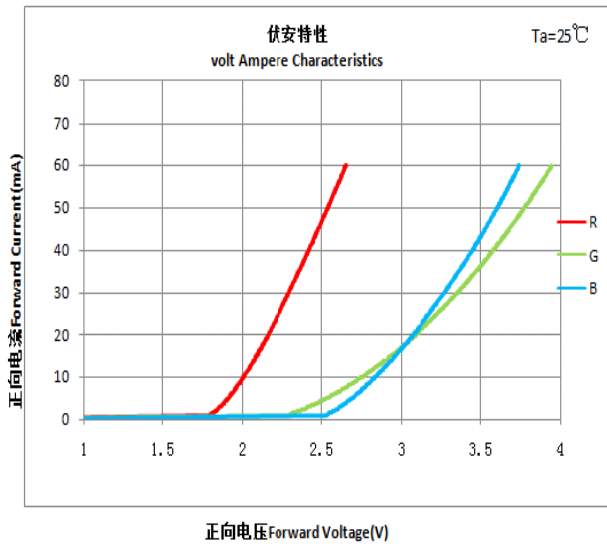
- 发光强度测量公差：±10%.
- 波长测量公差：±1nm
- 正向电压测量公差：±0.05V
- 以上参数仅供参考,请以实物标签为准
- 瑞丰以德国IS系统为量测标准

Tolerance of measurement of luminous intensity : ±10%.  
 Tolerance of measurement of dominant wavelength: ±1nm.  
 Tolerance of measurement of forward voltage: ±0.05V.  
 All the datas are just for reference, specific parameters please refer to the label.

**瑞丰以德国IS系统为量测标准**  
**Refond's measuring standard system is the (Germany) Instrument System( IS system) .**



**典型特性曲线 Typical Characteristics Curves**



可靠性试验 Reliability Test Items Conditions

实验项目 Test Items	参考标准 reference Criterion	实验条件 Test Conditions	时间 Time	样品数 Quantity	判定 Criterion
高温储存 High Temperature Storage	JEITA ED-4701 200 201	Ta=100°C	1000H	22	0/22
低温储存 Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40°C	1000H	22	0/22
常温寿命测试 Room Temperature Operating Life	JESD22-A108	Ta=25°C, IF=10mA	1000H	22	0/22
高温高湿寿命测试 High Temperature High Humidity Life Test	JESD22-A101	Ta=85°C, RH=85% IF=5mA	500H	22	0/22
冷热冲击 Thermal Shock	JEITA ED-4701 300 307	40°C(15min)←10s→100°C(15min)	500 cycles	22	0/22
低温寿命 Low Temperature Life Test	JESD22-A108D	Ta=-40°C, IF=10mA	1000H	22	0/22
高温高湿储存 High Temperature High Humidity Storage	JEITA ED-4701 100 103	Ta=85°C, RH=85%	1000H	22	0/22
耐焊接热 Resistance to Soldering Heat	JESD22-B106	Tsld=260°C, 10sec	3 times	22	0/22

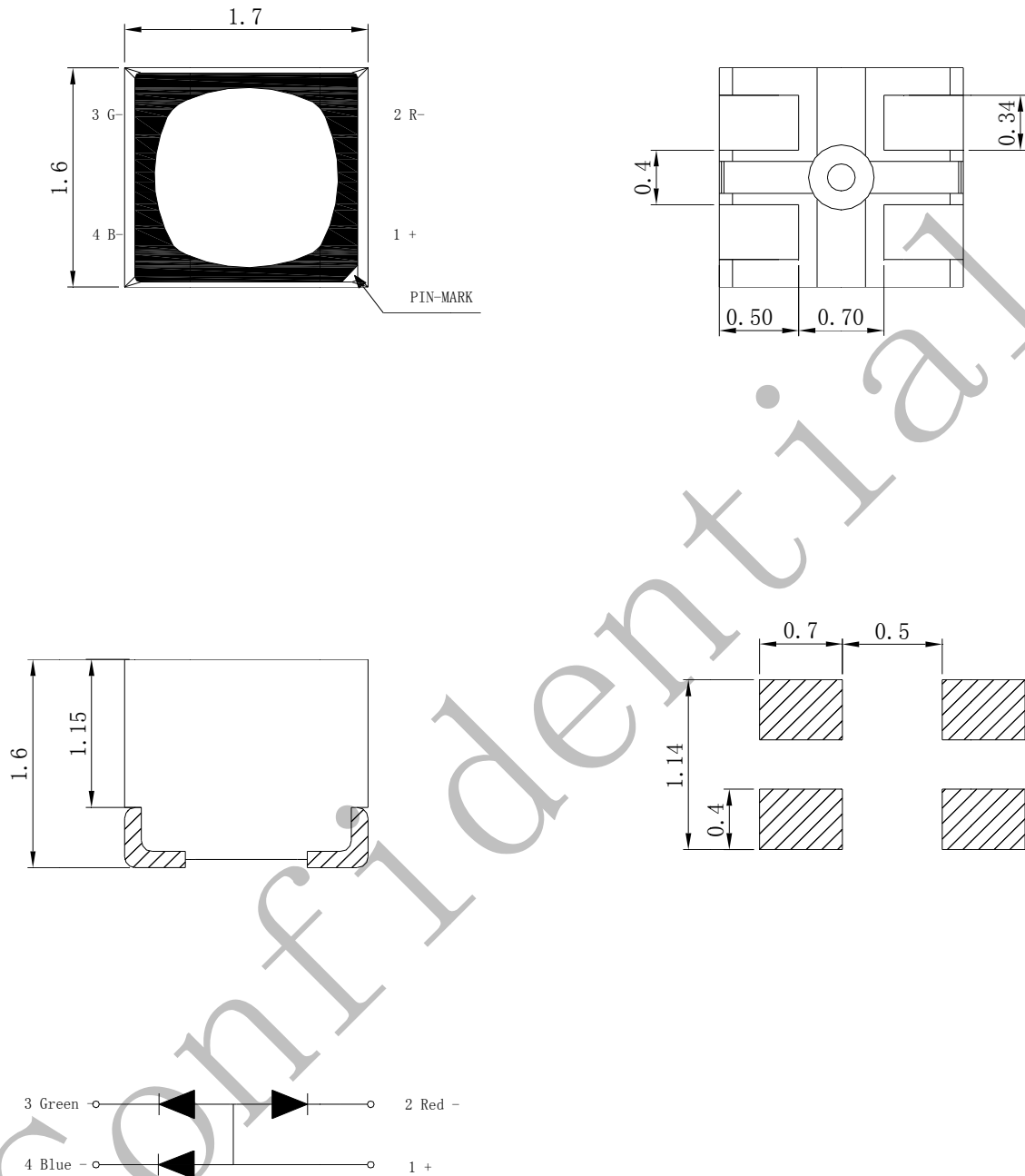
失效判断标准 Criteria for Judging Damage

测试项目 Test Items	符号 Symbol	测试条件 Test Conditions	判定标准 Criteria for Judgment
正向电压 Forward Voltage	V <sub>F</sub>	IF =20mA	初始值±10% Initial Data ± 10%
反向电流 Reverse Current	I <sub>R</sub>	VR=5V	IR≤10μA
光强 Luminous Intensity	I <sub>v</sub>	IF=20mA	平均 I <sub>v</sub> 衰减≤30% Average I <sub>v</sub> degradation rate≤30%
耐焊接热 Resistance to Soldering Heat			材料无内部裂痕、剥离、无死灯 No internal cracks, no material between stripped, no deaded light

Note: 备注

- The Reliability tests are based on Refond existing test platform. 可靠性测试基于瑞丰现有的测试标准。
- The technical information shown in the data sheets are 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. 以上技术数据仅为产品的典型值，只作为参考（以最终双方承认的规格为准），不作为任何应用条件及应用方式的保证。

**外型尺寸 Outline Dimension**



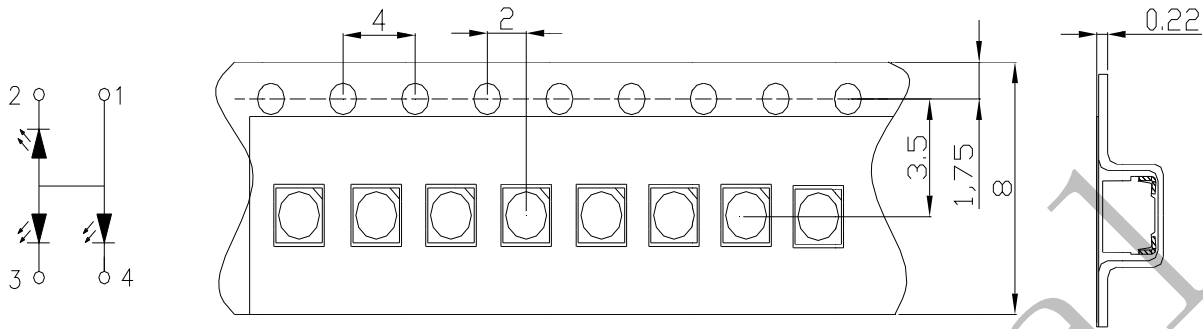
备注: 所有尺寸单位均为 mm,如无特殊说明误差范围为±0.1mm.

Note: All dimensions in mm ,tolerance is ±0.1mm unless otherwise noted.



**包装 Packaging**

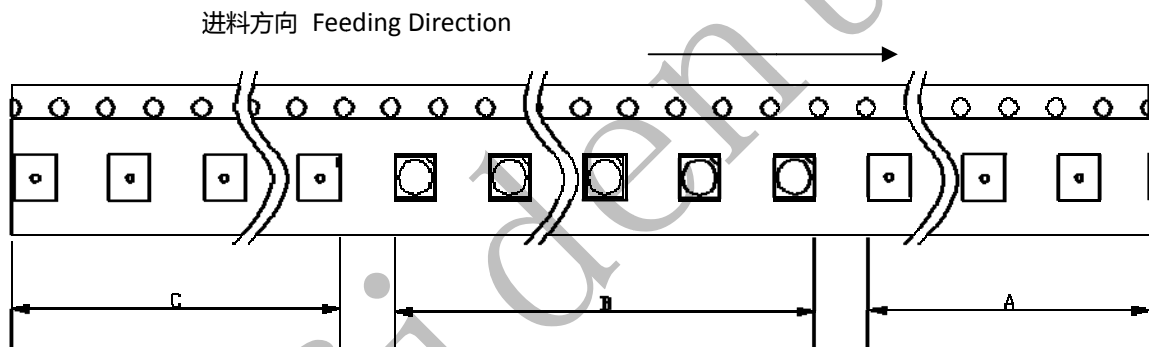
**1.载带 Carrier Tape**



备注: 单位: mm,未注公差±0.1mm.

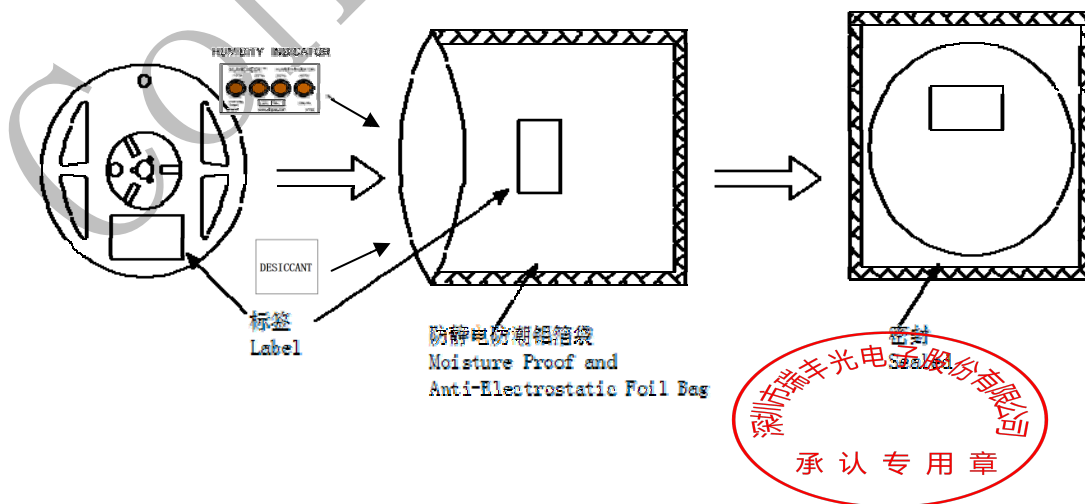
Note: All dimensions in mm, tolerances unless mentioned is±0.1mm.

**2.编带细节 Details Of Carrier Tape**

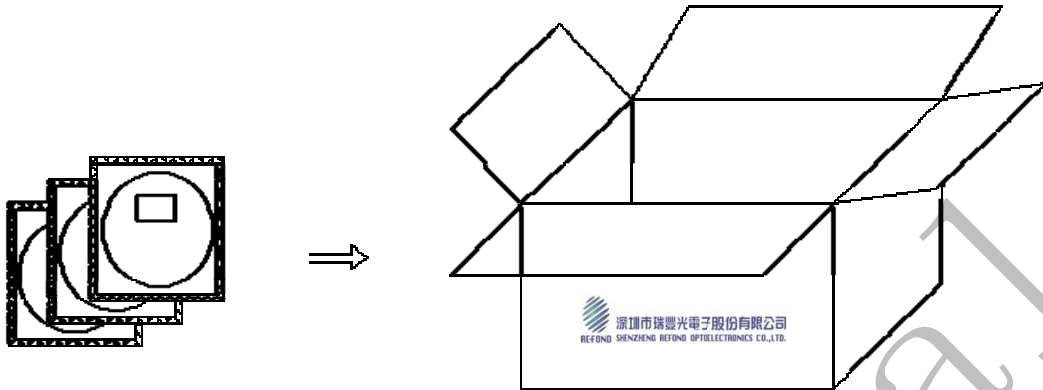


A:引导,空带,200mm B: 编带产品 10500 只 C:尾部,空带,200mm

A:Leader, Empty, 200mm; B: 10500 Lamps Loaded; C:Trailer, Empty,200mm



**3.外包装箱 Cardboard Box**



备注: 包装箱不防水,注意防水防潮.

Note: The boxes are not water resistant and they must be kept away from water and moisture.

**4.标签说明 Label Explanation**

PART NO.: 产品型号

QTY: 数量

BIN: 分档









LOT NO.: 批号

$\lambda$ D: 波长范围

IV: 光强范围

VF: 正向电压范围

QA DATE: QA 检验日期

 <b>REFOND</b>	<b>BIN CODE :</b>  <div style="display: flex; justify-content: space-around; width: 100px;"> <span>R</span> <span>G</span> <span>B</span> </div>
<b>PART NO. :</b> 	<b>IV(mcd):</b> 
<b>QTY:</b> 	<b><math>\lambda</math>D(nm):</b> 
<b>LOT NO. :</b> 	<b>VF(V):</b> 
<b>QA DATE:</b>	<b>ROHS</b>



**焊接指导 Guideline for Soldering**

**1. 使用烙铁焊接**

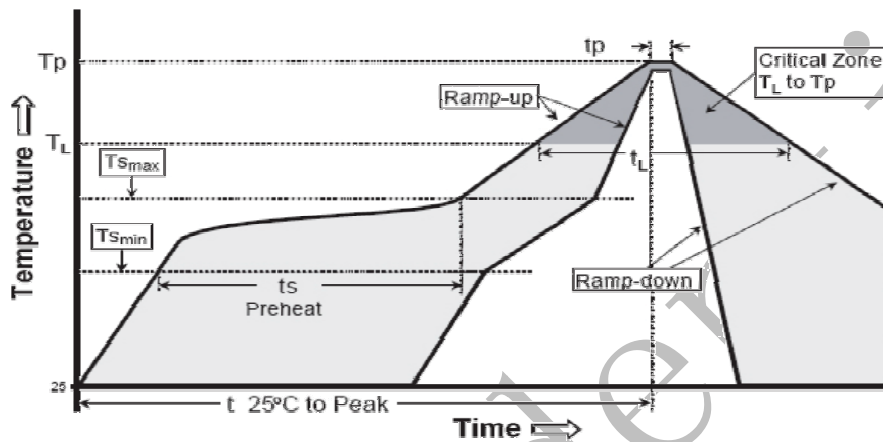
**Hand Soldering**

推荐使用功率低于 20W 的恒温烙铁,焊接时烙铁的温度必须保持在 300°C以下,且每个电极只能进行一次焊接,每次焊接的持续时间不得超过 3 秒.手动焊接过程中的不慎操作易引起 LED 产品的损坏,应当小心谨慎.

A soldering iron with Constant temperature of less than 20W is recommended to be used in Hand Soldering .Please keep the temperature of the soldering iron under 300°C while soldering. Each terminal of the LED is to go for less than 3 second and for one time only Be careful because the damage of the product is often started at the time of the hand soldering.

**2. 回流焊接:** 推荐使用以下无铅回流焊接温度图进行

**Reflow Soldering:** Use the conditions shown in the under Figure of Pb-Free Reflow Soldering.



平均升温速度= 4°C/s max	Average ramp-up rate = 4°C/s max
预热温度= 150°C ~200°C	Preheat temperature = 150°C ~200°C
预热时间= 120s max	Preheat time = 120s max
降温速度=6°C/s max	Ramp-down rate = 6°C/s max
峰值温度= 245°C max	Peak temperature = 245°C max
焊接时间= 10s max	Soldering time = 10s max
维持于高于此温度(217 °C)时间为 60s max	Duration above 217°C is 60s max

- 回流焊接最多只能进行一次。  
Reflow soldering should not be done more than one times.
- 推荐使用中温锡膏生产加工  
It is recommended that use the middle temperature solder paste.
- 在回流焊接过程中,不要对 LED 施加任何压力。  
Stress on the LEDS should be avoided during heating in soldering process.
- 在焊接完成后,待产品温度下降到室温后,再进行其它处理。  
After soldering ,do not deal with the product before its temperature drop down to room temperature.



### 3. 清洗 Cleaning

尽量使用“免清洗型”焊锡膏，这样，在回流焊后就不需要清洗焊剂。如果需要清洁PCB,焊接完成后推荐使用异丙醇(IPA)进行清洗。使用其它类似溶剂清洗前,请先确认使用的溶剂不会对LED造成损伤。

不推荐使用超声波清洗。

Try to use "no clean solder paste type", so, after reflow need not cleaning. If you need to clean the PCB, after the completion of welding recommended the use of isopropyl alcohol (IPA) cleaning. When using other solvents, it should be confirmed beforehand the solvents do not damage the LED.

Do not use ultrasonic cleaning.

## 使用注意事项 Using Guide

### 1. 贮存 Storage

- 本产使用密封防潮防静电袋包装,并附有干燥剂,未开封的产品保存时间一年。

Moisture proof and anti-electrostatic package with moisture absorbent material is used, Packaged products have one year to save time.

- 开封前,产品须存放在温度不高于30°C,湿度不高于60%RH的环境中。

Before opening the package, the product should be kept at 30°C or less and humidity less than 60%RH.

- 密封防静电袋内的湿度卡应在打开袋子后立即查看袋内的湿度指示卡来确定,湿度显示大于或等于30%时,使用前须进行烘烤。

Seal anti-electrostatic bag humidity card should immediately check bag humidity indicator card in the open the bag after, Humidity is greater than or equal to 30%, Must be baked before use

- 开封后,产品必须24小时内使用完(建议工作环境温度不高于30°C,湿度不高于60%),如未使用完,余料须存放在温度不高于30°C,湿度不高于10%的环境中。

After opening the package, the product should be soldered within 24 hours. If not, please store at 30°C or less and humidity less than 10%RH. It is recommended that the product be operated at the workshop condition of 30°C or less and humidity less than 60%RH.

- 对于尚未焊接的LED,如果吸湿剂或包装失效,或者产品没有符合以上有效存储条件,烘烤可以起到一定的性能恢复效果.烘烤条件:65±5°C,持续时间24H.

If the moisture absorbent material has fade away or the LEDs have exceeded the storage time, baking treatment should be performed based on the following condition : 65±5°C for 24 hours.

### 2. 静电

#### Static Electricity

以下操作可降低静电破坏的可能性

The following procedures may decrease the possibility of ESD damage.

- 将产品和外界之间的摩擦减到最低以避免静电产生。

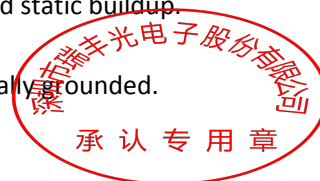
Minimize friction between the product and surroundings to avoid static buildup.

- 所有的产品设备和测试仪器必须接地。

All production machinery and test instruments must be electrically grounded.

- 操作人员必须配戴静电环。

Operators must wear anti-static bracelets.



- 进入带电设备工作区域时需穿防静电服。  
Wear anti-static suit when entering work areas with conductive machinery.
- 所有操作 IC 和 ESD 敏感器件元器件的工作台必须保持低于 150V 的静电保护。  
All workstations that handle IC and ESD-sensitive components must maintain an electrostatic potential of 150V or less.

### 3. 反压保护

#### Reverse voltage protection

通常 LED 的反向漏电流都会很小,不会影响正常使用. 如果长期遭受超过其所能承受的反向电压冲击时,LED 会损伤, 反向漏电流会迅速变大,引起显示屏零灰度下串光的发生. 在设计中, 要注意控制反向电压, 建议加在 LED 上的反向电压值不超过 10V.

In generally the reverse current of LED is very small, it can't effect using the component normally, but when it often suffered the reverse voltage which exceed the limits of the component than it will be damaged, the reverse current increases rapidly causing the string light display gray scale so when designing, please pay attention to control the reverse voltage we suggest the reverse voltage less than 10V.

### 4. 温度保护

#### The safe temperature for LEDs working

LED 在高温条件下, 衰减会加速,本身应力也会增大, 若长期处于高温环境下, 极容易出现失效. 对于高密度排列使用的情况,建议在使用过程中灯面温度不超过 55°C, 灯脚温度不超过 75°C.

The high temperature will make the LED's Luminous Intensity deceased radically, if LEDs worked in hot environment for a long time, they will be disabled easily. When LEDs are working in a closed array, we suggest that the LED's surface temperature should be lower than 55°C and the leg's temperature should be lower than 75°C.

### 5. 其它事项

#### Others

请勿直接触摸或操作环氧树脂表面, 这可能会损坏内部的电路, 拿取时用镊子或合适的工具夹在元件的侧边

Do not directly touch or handle the epoxy surface. It may damage the internal circuitry. Handle the component along the side surfaces by using forceps or appropriate tools.

## Declare 申明

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

此规格书以中英文方式书写, 若有冲突以中文版本为准.

Both the customers and Refond will agree on official specifications of supplied products before a customer's volume production. The specification is valid only after be signed. And Refond reserves the right to further modify the specification for technical reference and sample without noticing the customers.

在量产供货前, 瑞丰需与客户签署一份正式的产品规格书并各自备份. 规格书签核后为有效, 对于作为技术参考以及送样时提供的规格书, 瑞丰保留进一步修改而不需通知客户的权力.

