



## SPECIFICATIONS FOR REFOND SURFACE MOUNT LED

表面贴片发光二极管规格书

型号 Model:RF-W1S158TS-A12

**Company Name:**

公司名称:

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**Confirmed By**

**Customer:**

客户确认:

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**DATE:**

日期:

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**深圳市瑞豐光電子有限公司**

**SHENZHEN REFOND OPTOELECTRONICS CO.,LTD.**

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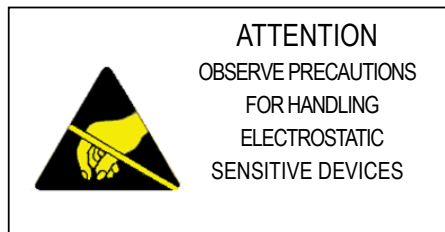
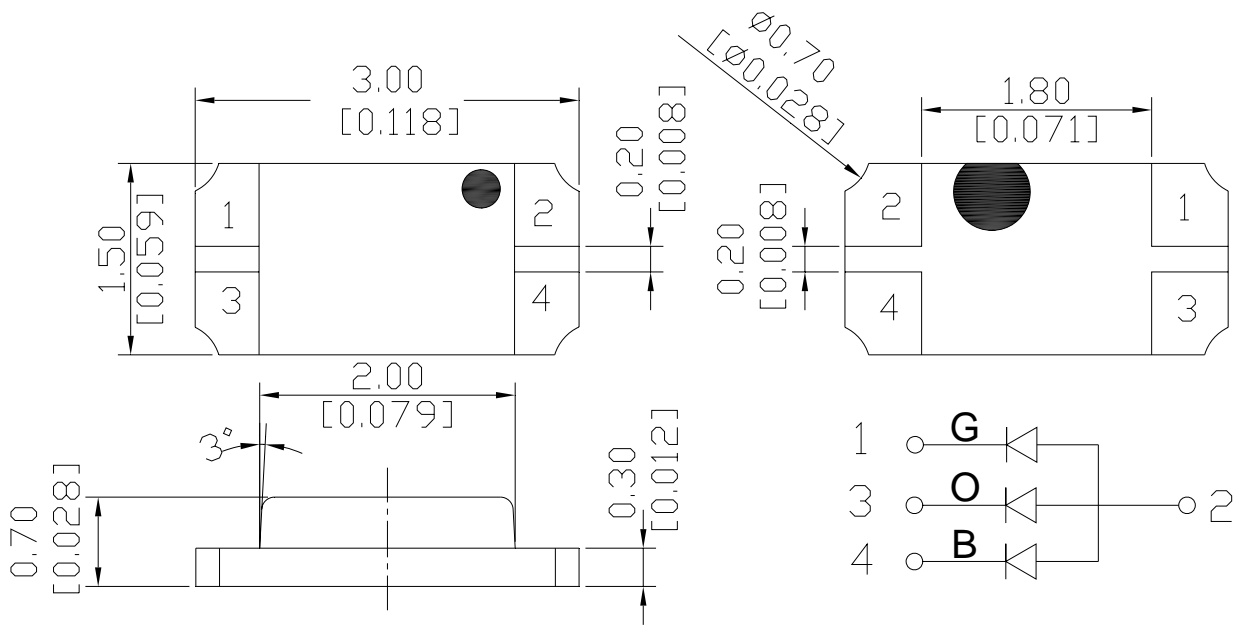
<http://www.refond.com>

## Feature 特性

- ◆ Viewing angle: 140 deg
- ◆ The materials of the LED dice is InGaP and AlGaInP
- ◆ 3.00mm×1.50mm×0.70mm SMT-LED
- ◆ RoHS compliant lead-free soldering compatible

发光角度：120 度  
 发光二极管所用芯片材料为铟镓氮铝磷  
 表面贴片器件尺寸为 3.00mm×1.50mm×0.70mm  
 符合 RoHS 标准无铅焊接

## Package Outline 封装外观图



## NOTES: 注释:

1. All dimensions are in millimeters;  
 所有尺寸单位为毫米;
2. Tolerances are  $\pm 0.2$ mm unless otherwise noted.  
 如果无其它注明, 公差范围通常采用 $\pm 0.2$ mm

APPROVED BY:		CHECKED BY:		PREPARED BY:	
DATE:		DATE:		DATE:	

**Absolute maximum ratings at 最大参数值**

**Ta=25°C**

Parameter 参数	Symbol 符号	Value 数值			Unit 单位
		O	G	B	
Power dissipation 消耗功率	Pd	50	70	70	mW
Forward current 正向电流	If	20			mA
Reverse voltage 反向电压	Vr	5			V
Operating temperature range 工作温度范围	Top	-40 ~+100			°C
Storage temperature range 储存温度范围	Tstg	-40~+100			°C
Pulse Forward Current 正向脉冲电流	Ifp	100			mA
Electrostatic Discharge 抗静电能力	ESD	1000(HBM)			V

**Electro-optical characteristics 光电参数**

**Ta=25°C**

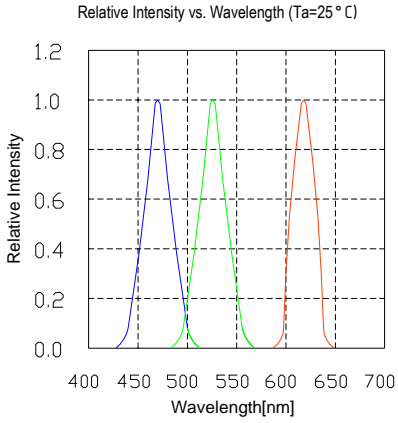
Parameter 参数	Test Condition 测试条件	Symbol 符号	Value 数值			Unit 单位	
			Min.最小	Typ.典型	Max.最大		
Wavelength at peak emission 峰值波长	If=20mA	$\lambda_{peak}$	O	--	--	nm	
			G	--	--		
			B	--	--		
Spectral Radiation bandwidth 半波宽	If=20mA	$\Delta\lambda$	O	--	15	nm	
			G	--	30		
			B	--	30		
Forward voltage 正向电压	If=20mA	Vf	O	1.8	--	2.4	V
			G	3.0	--	3.5	
			B	2.8	--	3.5	
Dominant wavelength 主波长	If=20mA	$\lambda_d$	O	620	--	630	nm
			G	520	--	530	
			B	465	--	475	
Luminous intensity 发光强度	If=20mA	Iv	O	--	90	120	mcd
			G	--	200	300	
			B	--	50	100	
Viewing angle at 50% Iv 半强角	If=20mA	2 $\theta$ 1/2	--	140	--	Deg	
Reverse current 反向电流	Vr=5V	Ir	--	--	10	$\mu$ A	

**NOTES 注释:**

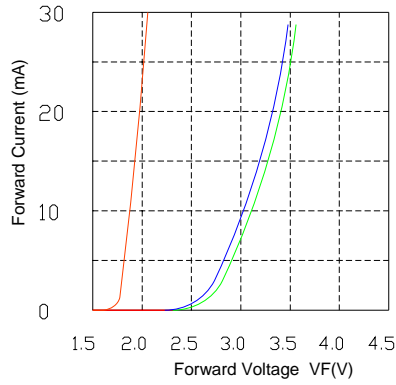
Tolerance: Iv  $\pm$ 10%,  $\lambda_d$   $\pm$ 2nm, Vf  $\pm$ 0.05V, X, Y  $\pm$ 0.01) (公差: 光强 $\pm$ 10%, 主波长 $\pm$ 2nm, 正向电压 $\pm$ 0.05V, 色坐标 $\pm$ 0.01)  
 IFP Conditions: Pulse Width  $\leq$  10msec and Duty  $\leq$  1/10. (最大脉冲电流条件: 脉冲宽度 $\leq$  10msec 和占空比 $\leq$  1/10)

## Typical optical characteristics curves 典型光电特性曲线

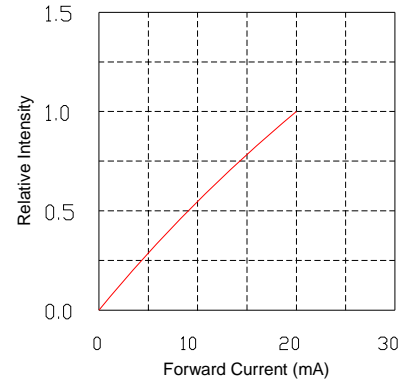
### Spectral Distribution



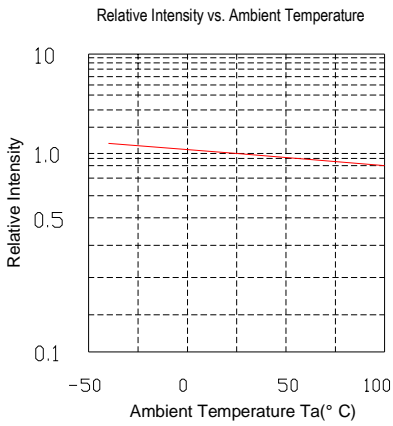
### Forward Voltage vs. Forward Current (Ta=25 °C)



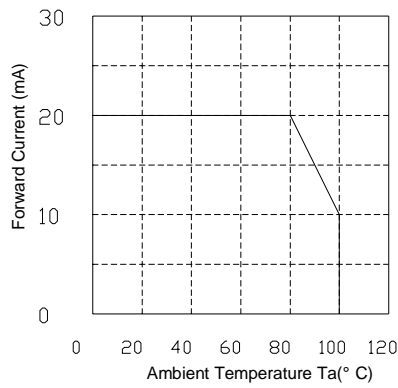
### Relative Intensity vs. Forward Current (Ta=25 °C)



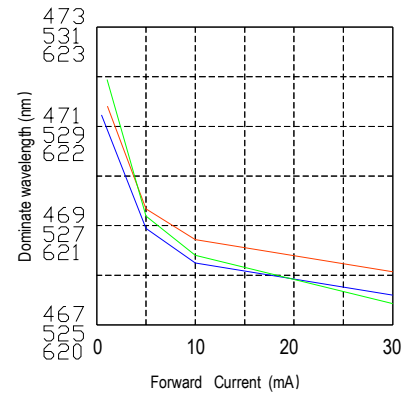
### Derating



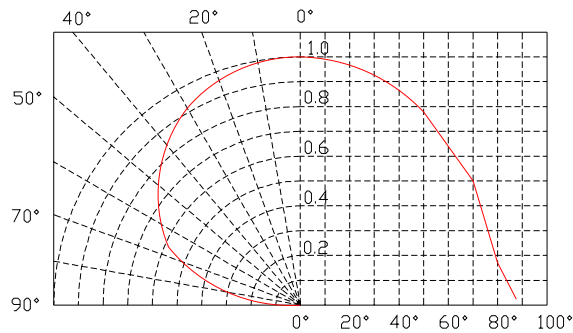
### Ambient Temperature vs. Maximum Forward Current



### Forward Current vs. Dominate wavelength (Ta=25 °C)



### Diagram characteristics of radiation



## Reflow profile 回流焊要求

### ■ Soldering condition 焊接条件

- Recommended soldering conditions 推荐焊接条件

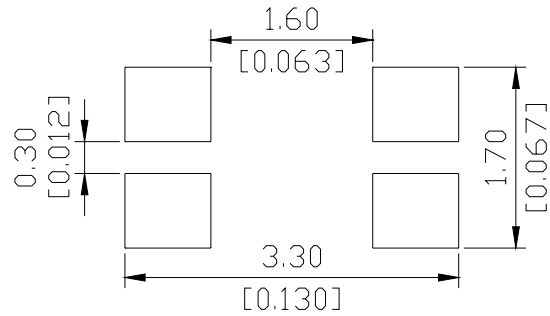
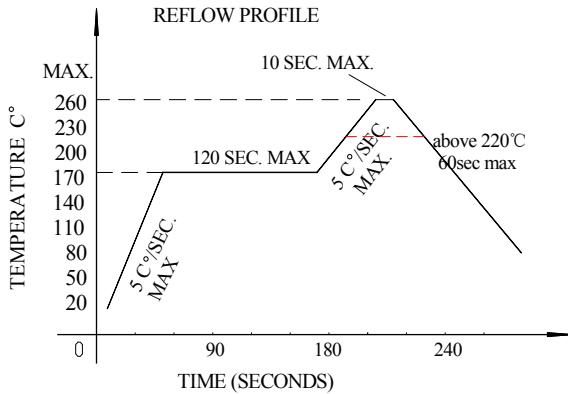
Reflow Soldering 回流焊		Hand Soldering 手工焊	
Pre-heat 预热温度	160~180°C	Temperature 温度	300°C Max.最高 300 摄氏度
Pre-heat time 预热时间	120 seconds Max.最多 120 秒	Soldering time 焊接时间	3 second Max.最多 3 秒 (one time only) 仅可手工焊接一次)
Peak temperature 峰值温度	260°C Max. 最高 260 摄氏度		
Soldering time 焊接时间	10 seconds Max.最多 10 秒		
Condition 条件	Refer to Temperature-profile 参考曲线图		

- After reflow soldering rapid cooling should be avoided 回流焊结束后避免快速冷却

### ■ Temperature-profile (Surface of circuit board) 温度要求 (电路板表面)

Use the following conditions shown in the figure.  
升温速率及时间条件设定如下图所示

RECOMMEND PAD DESIGN (Units: mm)  
推荐焊盘设计 (单位: 毫米)



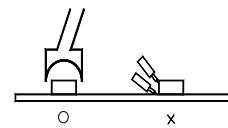
1. Reflow soldering should not be done more than two times 回流焊不可超过两次
2. When soldering ,do not put stress on the LEDs during heating 焊接加热过程中, 不可施加压力在 LED 表面

### ■ Soldering iron 手工焊接

1. When hand soldering, keep the temperature of the iron under 300°C, and at that temperature keep the time under 3 sec. 手工焊接时, 要保持电烙铁温度在 300 摄氏度以下, 并且焊接时间小于 3 秒。
2. The hand soldering should be done only a time 手工焊接只可进行一次
3. The basic spec is ≤5 sec. when the temperature of 260°C, do not contact the resin when hand soldering. 当电烙铁温度为 260 度时, 焊接时间不可超过 5 秒, 并且电烙铁不可接触胶体。

### ■ Rework 返工

1. Customer must finish rework within 5 sec under 260°C 客户端必须在 260 度条件下 5 秒内完成返工
2. The head of iron can not touch the resin 电烙铁头部分不可接触胶体
3. Twin-head type is preferred. 首选双头型电烙铁



### ■ CAUTIONS 注意事项:

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 influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when using the picking up nozzle, the pressure on the silicone resin should be proper

我司的 TOP(灌注型)产品均采用弹性型的硅胶封装, 胶体比较软。施加在胶体上的压力将影响到整颗产品的可靠性, 在使用过程或者装配完后都要采取措施避免压力对胶体的挤压。正因为胶体是软的, 在选取吸产品的吸嘴上要选择吸嘴的大小和压力以避免造成压力过大伤害产品。



Reliability 可靠性

(1)TEST ITEMS AND RESULTS 测试项目及判定

Type 类型	Test Item 测试项目	Ref. Standard 参考标准	Test Conditions 测试条件	Note 注释	Number of Damaged 死灯数量
Environmental 环境顺序 Sequence	Resistance to Soldering Heat(Reflow Soldering)回流焊耐热测试	JESD22-B106	Tsld (回流焊温度) =260°C,10sec	2 times 2次	0/22
	Temperature Cycle 温度循环	JESD22-A104	-40°C 30min ↑↓5min 100°C 30min	1000 cycle 1000周期	0/100
	Thermal Shock 冷热冲击	JESD22-A106	-40°C 15min ↑↓ 100°C 15min	1000 cycle 1000周期	0/100
	High Temperature Storage 高温储存	JESD22-A103	T <sub>a</sub> =100°C	1000 hrs 1000小时	0/100
	Low Temperature Storage 低温储存	JESD22-A119	T <sub>a</sub> =-40°C	1000 hrs 1000小时	0/100
	Power temperature Cycling 间断点亮测试	JESD22-A105	On 5min -40°C>15min ↑↓ ↑↓<15min Off5min 100°C>15min	100 cycle 100周期	0/100
Operation 操作顺序 Sequence	Life Test 老化寿命测试	JESD22-A108	T <sub>a</sub> =25°C I <sub>F</sub> =20mA	1000 hrs 1000小时	0/100
	High Humidity Heat Life Test 高温高湿老化测试	JESD22-A101	60°C RH=90% I <sub>F</sub> =20mA	1000 hrs 1000小时	0/100

(2)CRITERIA FOR JUDGING THE DAMAGE 失效判断标准

Item 项目	Symbol 符号	Test Conditions 测试条件	Criteria for Judgement 判断标准	
			Min.最小值	
Forward Voltage 正向电压	VF	IF=10mA	-	Forward Voltage 正向电压
Reverse Current 反向漏电流	IR	VR=5V	-	Reverse Current 反向漏电流
Luminous Intensity 发光强度	IV	IF=10mA.	L.S.L**)*0.7	Luminous Intensity 发光强度

U.S.L.: Upper Standard Level  
标准上限

L.S.L.: Lower Standard Level  
标准下限

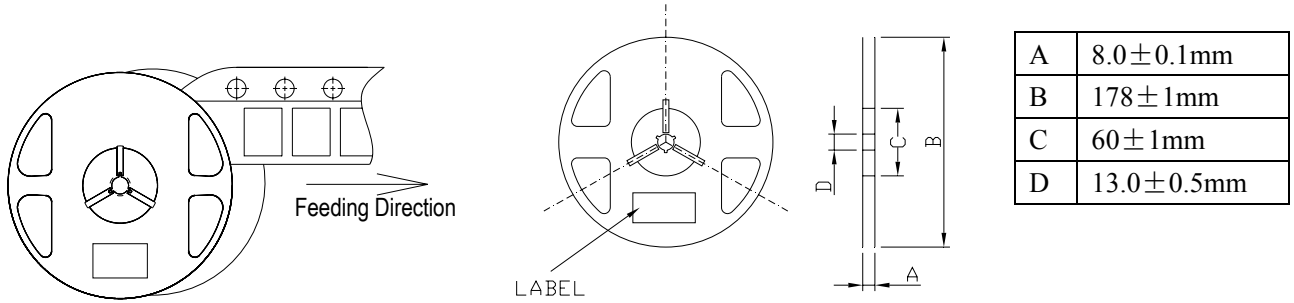


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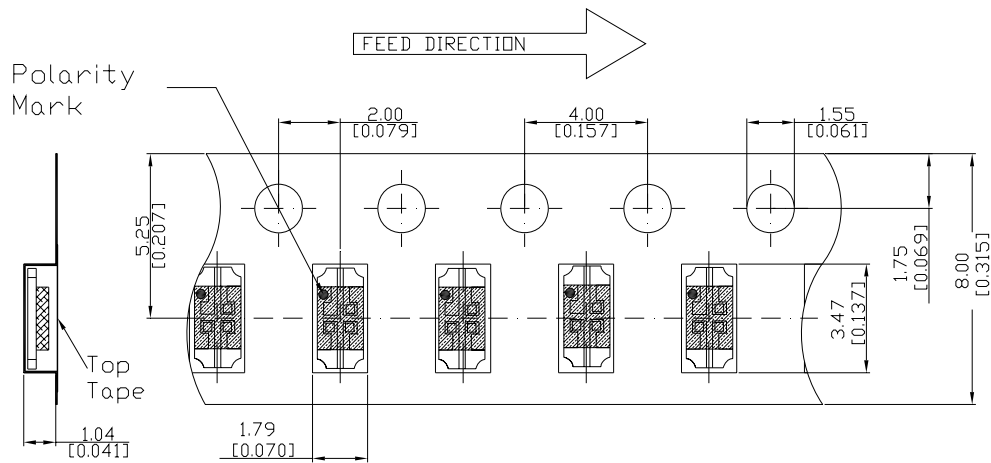
**Packaging Specifications 包装规格**

● Feeding Direction 卷带进料方向

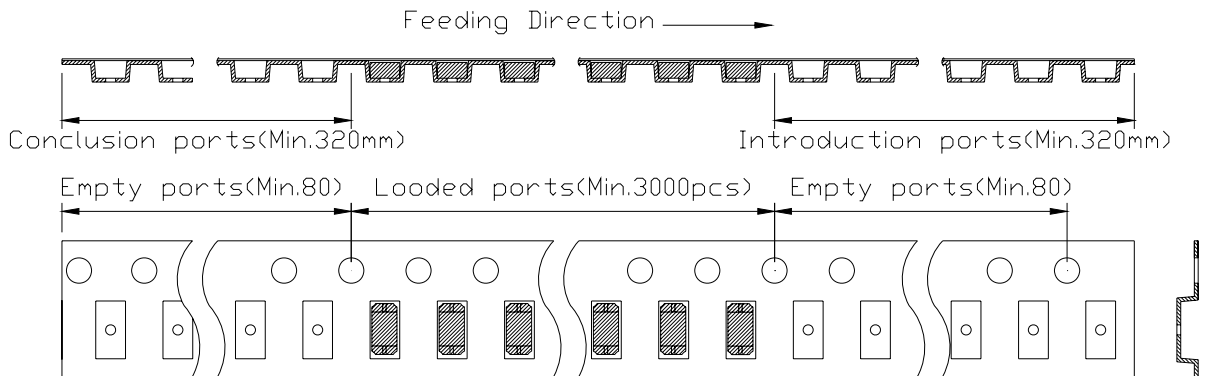
● Dimensions of Reel (Unit: mm) 卷盘尺寸(单位: mm)



● Dimensions of Tape (Unit: mm) 卷带尺寸



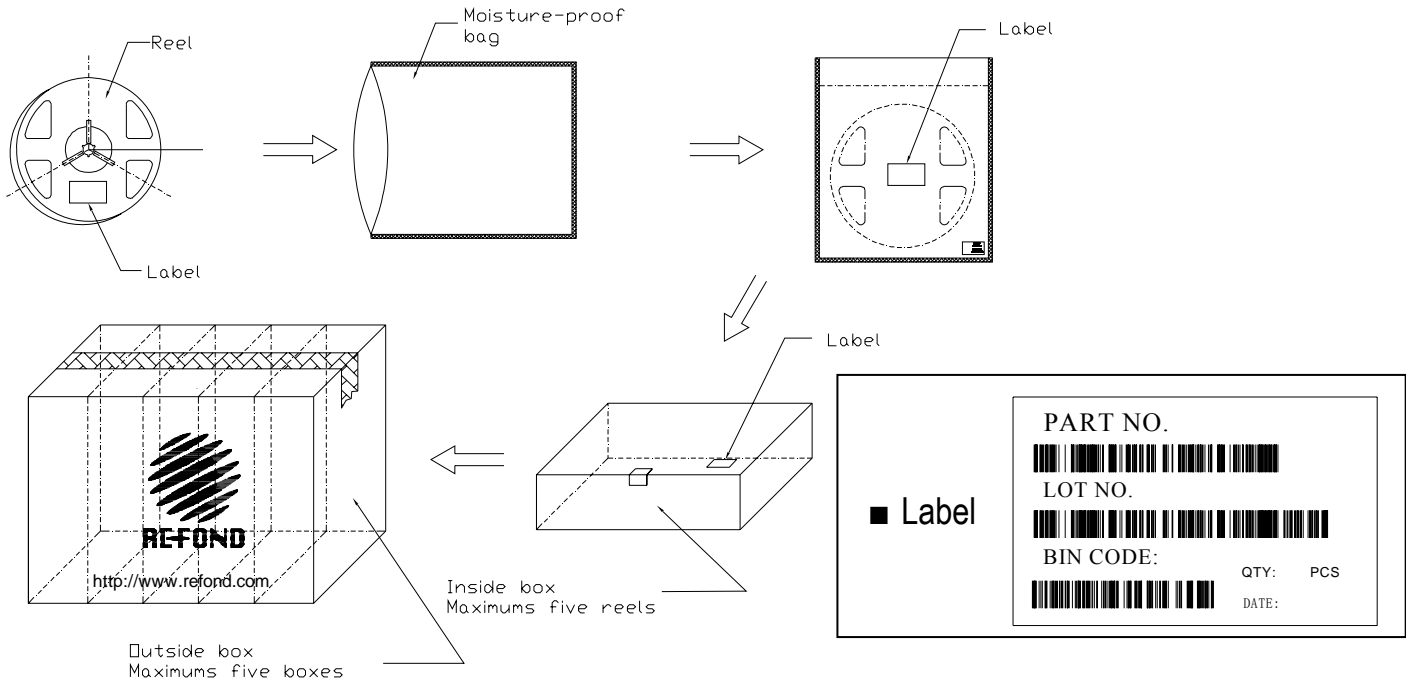
● Arrangement of Tape 产品排列图



**NOTES 注释:**

1. Empty component pockets are sealed with top cover tape;  
预留载带空位也应贴有上封带;
2. The maximum number of missing lamps is two;  
最大的连续空包数为 2pcs;
3. The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications.  
根据 ANSI/EIARS-481 规格要求 负极朝孔;
4. 3,000 pcs / Reel. 3000pcs/卷。

## Packaging specifications 包装规格



## CAUTIONS 注意

### Package specifications 包装规格

Reeled products (numbers of products are 3,000pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, Five moisture-proof bag of maximums (total maximum number of products are 15,000pcs) packed in an inside box (size: about 250mm x about 250 x about 68mm) and Five inside boxes of maximums are put the outside box (size: about 360mm x about 265mm x about 255mm) Together with buffer material, and it is packed. (Part No., Lot No., quantity should appear on the label on the moisture-proof bag, part No. And quantity should appear on the label on the cardboard box.)

卷包装好的产品（产品数量为3,000pcs）单独密封包装在一个装有干燥剂的防潮袋中，最多五个内防潮袋（产品数量最多为15,000pcs）装入一个内包装盒中（尺寸大约为250mm×250mm×68mm），最多五个内盒装入一个装有缓冲材料的外包装盒中（尺寸大约为：360mm×265mm×255mm），最后包装（产品名称和批号编码贴标签于防潮袋上，产品名称和产品数量贴标签于纸板盒上）。

### Storage conditions 储存条件

#### Before opening the package:打开包装前

The LEDs should be kept at 30°C or less and 90%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material (silica gel) is recommended.

在温度不超过 30°C 及湿度不超过 90%RH 条件下，LED 可以保存一年，在储存的时候，建议采用带干燥剂的防潮袋的包装方式。

#### After opening the package:打开包装后

The LEDs should be kept at 30°C or less and 70%RH or less. The LEDs should be soldered within 168 hours (7days) after opening the package. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel). It is also recommended to return the LEDs to the original moisture proof bag and to seal the moisture proof bag again.

LED 在 ≤30°C, ≤70%RH 相对湿度的条件下，我们强烈建议您从打开包装到完成贴片整个过程在 168 小时内完成。如果有未使用完的剩余 LED，我们建议重新使用防静电、防潮袋密封包装，并放置在一个密封容器中，同时必须使用干燥剂。我们推荐仍使用出厂时的防潮，并且需要重新密封。