

# SPECIFICATION 产品规格书

REFOND P/N 产品型号

RC35\*0-\*\*\*-FR

R&D 研发

Mass Product 量产供货

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## 1. Description 产品介绍

### 1.1 General Description 产品描述



This product uses the ceramics package, it has a high reliability. Available in Deep Red, Far Red, Royal Blue and Cool White.

Size(mm):3.45X3.45X1.95mm.

本产品采用陶瓷封装结构，可靠性高。有深红光，远红光，蓝光和白光

产品尺寸：3.45X3.45X1.95mm.

### 1.2 Features 产品特征

- ▶ CeramicsPackage.陶瓷封装
- ▶ Pb-free reflow soldering application. 无铅回流焊应用
- ▶ Moisture sensitive level:Level3. 防潮等级：Level 3
- ▶ RoHS compliant. 符合RoHS

### 1.3 Application 产品应用

- ▶ Horticulture lighting.农业照明
- ▶ General lighting. 常规照明
- ▶ Commercial lighting. 商业照明

### 1.4 Package Dimension 封装尺寸

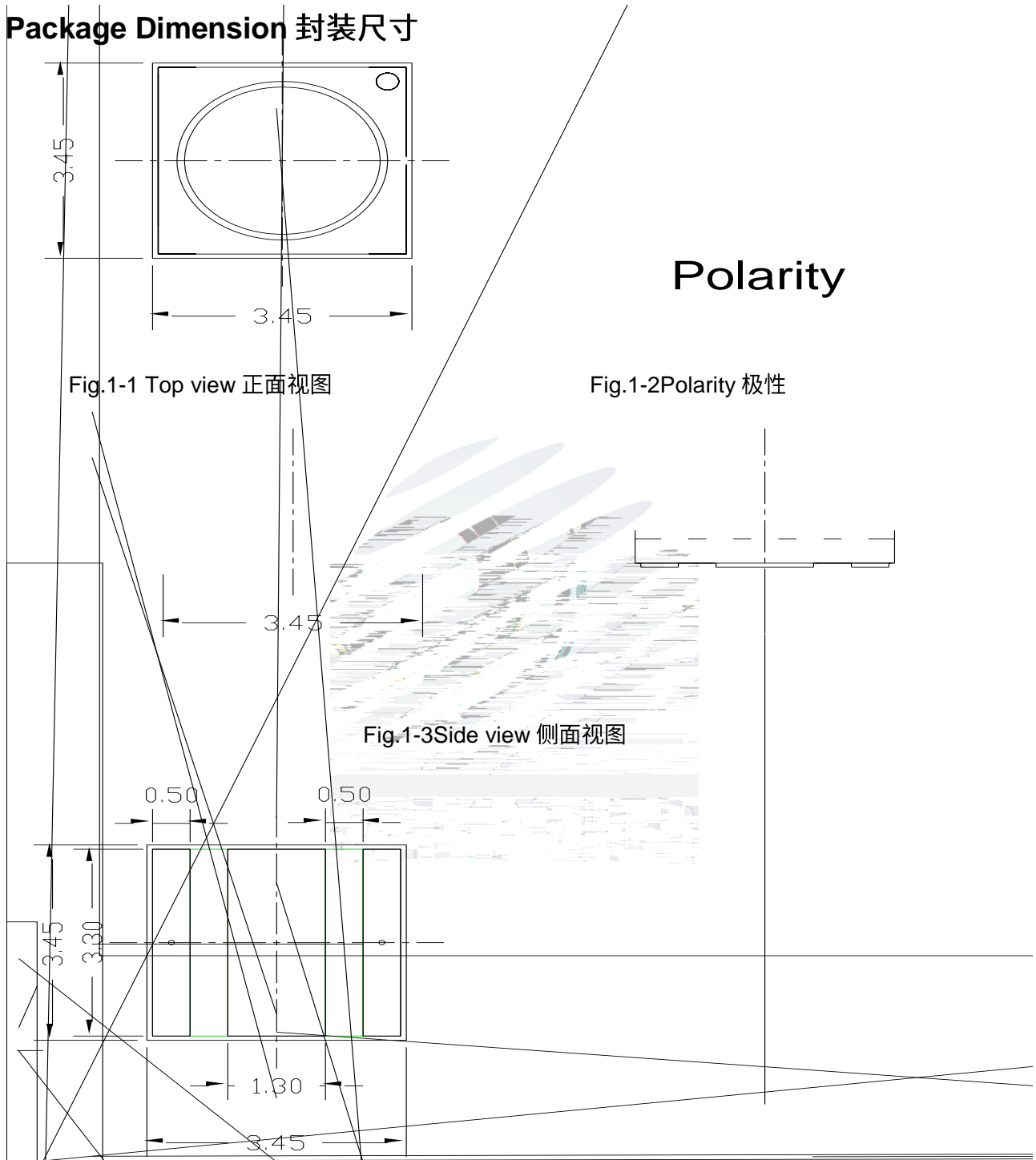


Fig.1-4 Bottom view 背面视图

Fig.1-5 Soldering patterns 推荐焊盘

#### Notes 备注

1. All dimensions units are millimeters. 所有尺寸标注单位为毫米

2. All dimensions tolerances are 0.2mm unless otherwise noted.除特别标注外,所有尺寸公差为±0.2 毫米
3. ESD Protection device(For InGaN dice only).仅 InGaN 加齐纳保护

## 1.5 Product Parameters 产品参数

Table 1-1 Electrical / Optical Characteristics at Ts=25°C 电性与光学特性

Item 项目	Symbol 符号	Test Condition 测试条件	Value			Unit 单位
			Min. (最小值)	Typ (典型值)	Max. (最大值)	
Reverse Current (漏电流)	$I_R$	$V_R=5V$	---	---	10	$\mu A$
Forward Voltage (正向电压) RC35A0-RBD-FR	$V_F$	$I_F=350mA$	1.5	---	2.5	V
Forward Voltage (正向电压) RC35A0-RUD-FR	$V_F$	$I_F=350mA$	1.5	---	2.5	V
Forward Voltage (正向电压) RC35Y0-BNE-FR	$V_F$	$I_F=350mA$	2.5	---	3.5	V
Forward Voltage (正向电压) RC35Y0-WME-FR	$V_F$	$I_F=350mA$	2.5	---	3.5	V
Peak Wavelength (峰值波长) RC35A0-RBD-FR	$\rho$	$I_F=350mA$	720	---	740	nm
Peak Wavelength (峰值波长) RC35A0-RUD-FR	$\rho$	$I_F=350mA$	650	---	670	nm
Peak Wavelength (峰值波长) RC35Y0-BNE-FR	$\rho$	$I_F=350mA$	445	---	460	nm
Total radiant flux 辐射功率 RC35A0-RBD-FR	$\Phi_e$	$I_F=350mA$	180	---	480	mW

Total radiant flux 辐射功率 RC35A0-RUD-FR	$\Phi_e$	$I_F=350\text{mA}$	280	---	610	mW
Total radiant flux 辐射功率 RC35Y0-BNE-FR	$\Phi_e$	$I_F=350\text{mA}$	380	---	705	mW
Luminous flux RC35Y0-WME-FR 5000-10000K	$\Phi_v$	$I_F=350\text{mA}$	47.7	---	154	lm
Viewing Angle (发光角度)	2 $\theta$ 1/2	$I_F=350\text{mA}$	---	130	---	deg
Thermal Resistance. (热阻)	$R_{THJ-S}$	$I_F=350\text{mA}$	---	15	---	/W

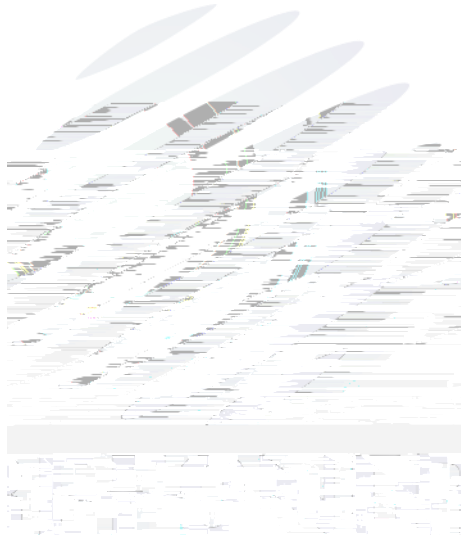
Table 1-2 Absolute Maximum Ratings at  $T_s=25^\circ\text{C}$  绝对最大值

Parameter (参数)	Symbol (符号)	Rating (值)	Units (单位)
Power Dissipation (功耗)	$P_D$	InGaN 2.45 AlInGaP 1.75	W
Forward Current (正向电流)	$I_F$	700	mA
Reverse Voltage (反向电压)	$V_R$	5	V
Electrostatic Discharge (HBM) (静电)	$E_{SD}$	5000	V
Operating Temperature (操作温度)	$T_{OPR}$	-40 ~ +85	
Storage Temperature (储存温度)	$T_{OPR}$	-40 ~ +100	
Junction Temperature (结温)	$T_J$	120	

Notes 备注

1.1/10 Duty cycle, 0.1ms pulse width. 脉宽0.1ms,占空比1/10.

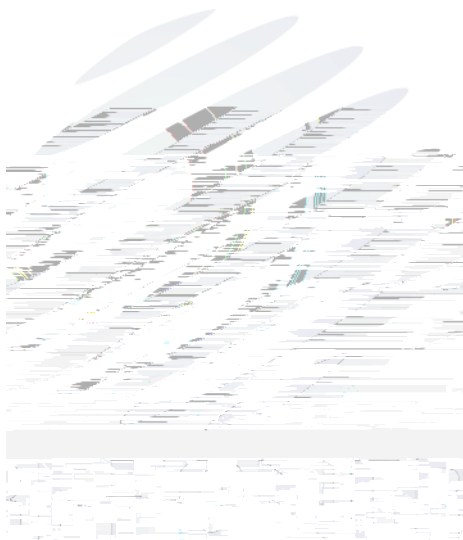
2. The above forward voltage measurement allowance tolerance is  $\pm 0.1V$ . 以上所示电压测量误差  $\pm 0.1V$ .
3. Tolerance of measurement of Total radiant flux/ Luminous flux:  $\pm 10\%$ . 辐射功率/强度测量公差:  $\pm 10\%$ .
4. The above wavelength measurement allowance tolerance is  $\pm 1nm$ . 以上所示波长测量误差  $\pm 1nm$ .
5. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product. 使用功率不能超过规定的最大值。
6. All measurements were made under the standardized environment of Refond. ....  
标准测试平台。
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 使用的最大电流需要根据散热  
条件确定, 结温不能超过最大值。



1.







3A	0.3215	0.3350	0.3290	0.3417	0.3290	0.3300	0.3222	0.3243
3B	0.3207	0.3462	0.3290	0.3538	0.3290	0.3417	0.3215	0.3350
3C	0.3290	0.3538	0.3376	0.3616	0.3371	0.3490	0.3290	0.3417
3D	0.3290	0.3417	0.3371	0.3490	0.3366	0.3369	0.3290	0.3300
3E	0.3196	0.3602	0.3290	0.3690	0.3290	0.3538	0.3207	0.3462
3F	0.3290	0.3690	0.3381	0.3762	0.3376	0.3616	0.3290	0.3538
3G	0.3222	0.3243	0.3290	0.3300	0.3290	0.3180	0.3231	0.3120
3H	0.3290	0.3300	0.3366	0.3369	0.3361	0.3245	0.3290	0.3180





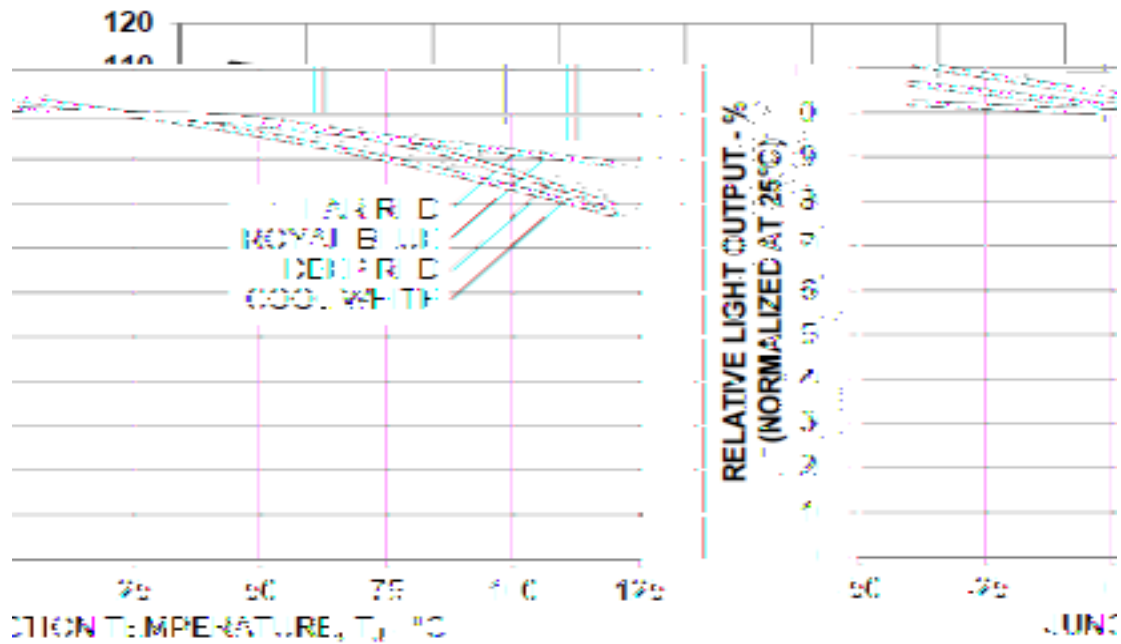


Fig 1-9 Tj Temperature Vs Relative Intensity 结温与相对光强特性曲线

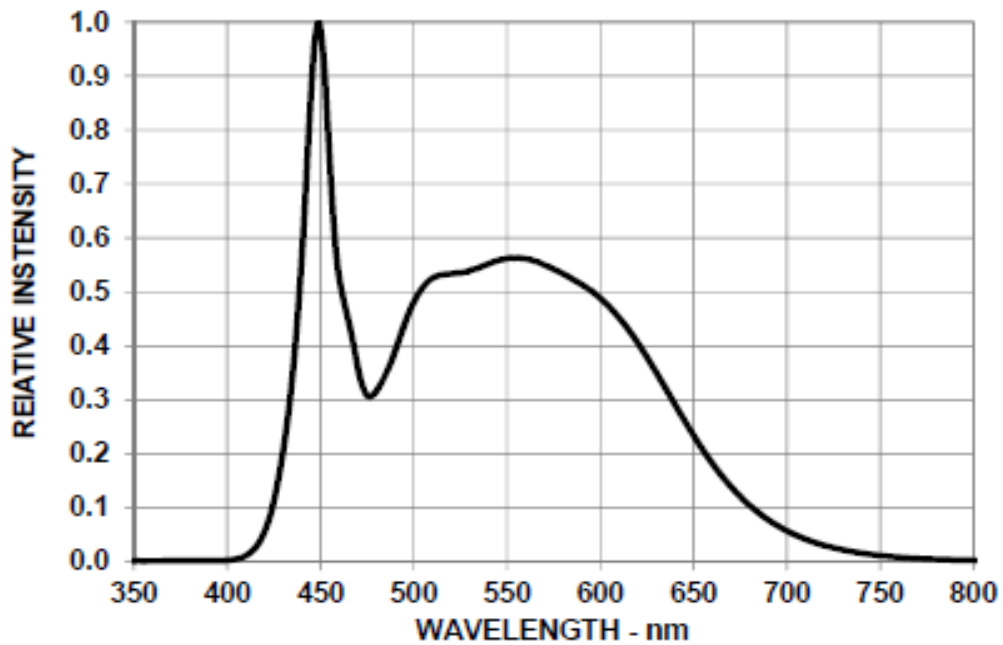


Fig 1-10 Spectrum Distribution 光谱分布特性曲线(白光)

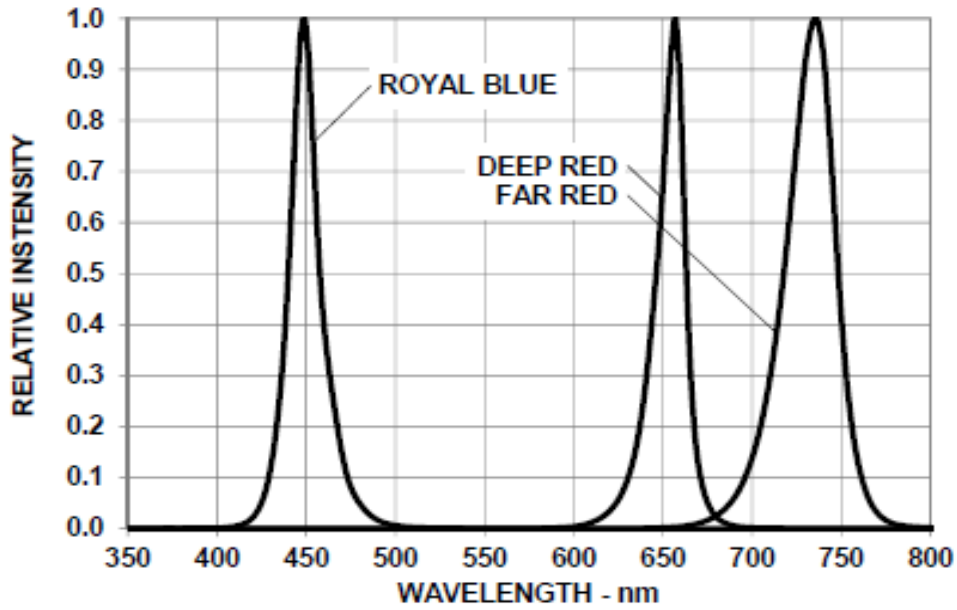


Fig 1-11 Spectrum Distribution 光谱分布特性曲线(单色光)

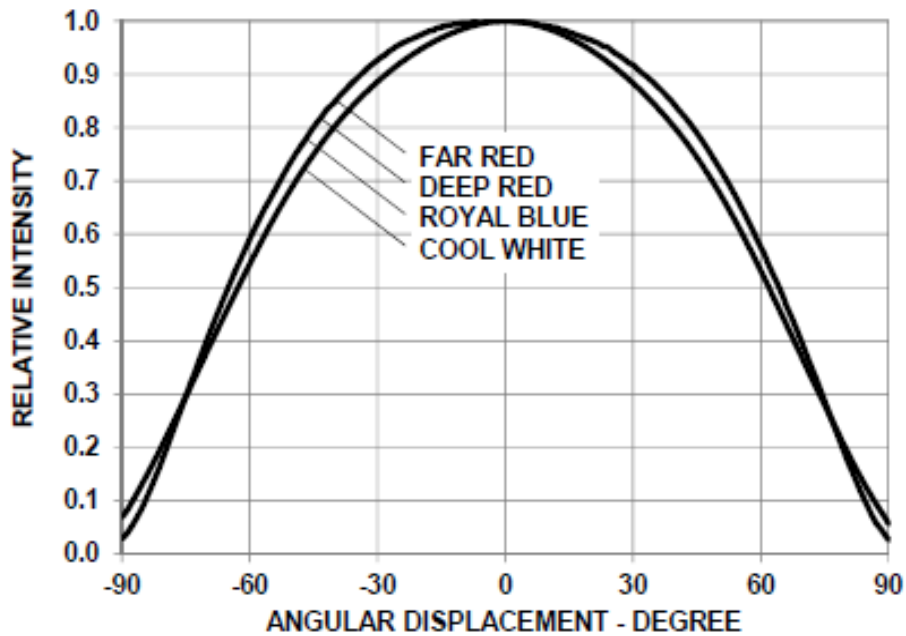


Fig 1-12 Radiation diagram 辐射特性曲线

## 2. Packaging 产品包装

### 2.1 Packaging Specification 包装规格

Package:1000pcs/reel.包装每卷 000pcs。

#### 2.1.1 Carrier Tape Dimension 载带尺寸

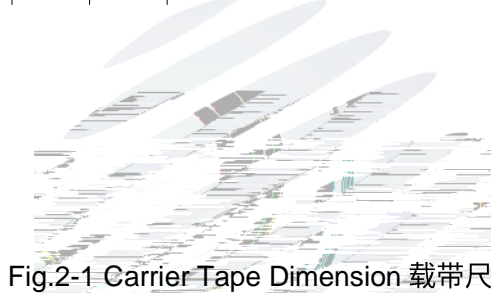


Fig.2-1 Carrier Tape Dimension 载带尺寸

#### 2.1.2 Reel Dimension 卷盘尺寸

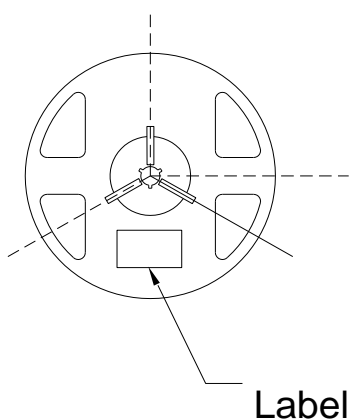


Table 2-1 Dimension 尺寸

A	15.8 ±1.0mm
B	178±1.0mm
C	59±1.0mm
D	13.3±0.3mm

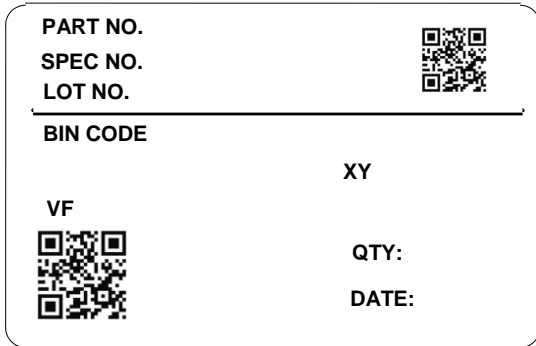
Fig.2-2 Reel Dimension 卷盘

#### Notes 备注:

The tolerances unless mentioned  $\pm 0.1$ mm. Unit : mm 注：未注公差为 $\pm 0.1$ 毫米，尺寸单位：毫米。

### 2.1.3 Label Form Specification 标签规格

Table 2-2 Label Form Specification 标签规格



PART NO	Part Number 品名
SPEC NO	Spec Number 规格
LOT NO	Lot Number 批次号
BIN CODE	Bin Code 色区
$\Phi_e$	Total radiant flu 辐射功率
$\Phi$	Luminous flux 光通量
WLP	Peak Wavelength 峰值波长
VF	Forward Voltage 正向电压
XY	Chromaticity Bin 色区
QTY	Packing Quantity 数量
DATE	Made Date 生产日期...

Fig 2-3 Label Form Specification 标签规格-白光

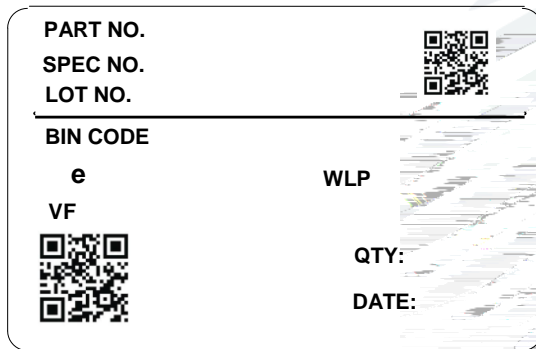


Fig 2-4 Label Form Specification 标签规格-单色光

### 2.2 Moisture Resistant Packing 防潮包装

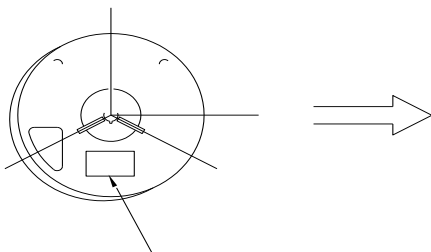


Fig.2-5 Moisture Resistant Packing 防潮包装

### 2.3 Cardboard Box 包装纸箱

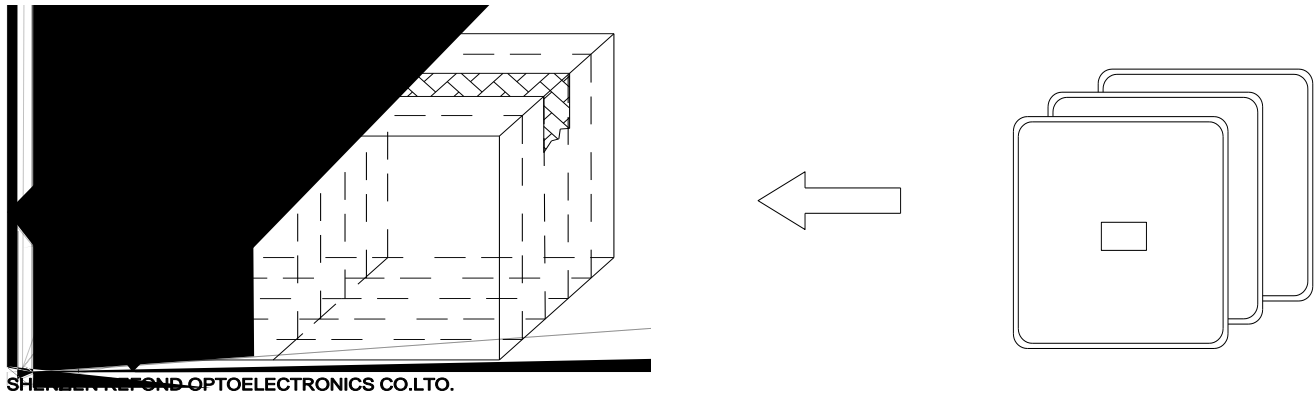


Fig.2-5 Cardboard Box 包装纸箱

### 2.4 Reliability Test Items And Conditions 信赖性测试项目及条件

Table 2-3 Reliability Test Items And Conditions 信赖性测试项目及条件

Test Items 项目	Ref. Standard 参考标准	Test Condition 测试条件	Time 时间	Quantity 数量	Ac/Re 接收/拒收
Reflow 回流焊	JESD22-B106	Temp:260°Cmax T=10 sec	3times.	10Pcs.	0/1
Thermal Shock 冷热冲击	JESD22-A104	-40°C 15min ↑↓10s 100°C 15min	100 cycles	10Pcs.	0/1
High Temperature Storage 高温保存	JESD22-A103	Temp:100°C	1000hrs.	10Pcs.	0/1
Low Temperature Storage 低温保存	JESD22-A119	Temp:-40°C	1000hrs.	10Pcs.	0/1
Life Test 常温通电	JESD22-A108	Ta=25°C If=350mA	1000hrs.	10Pcs.	0/1





3.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，仅供参考，不作为任何应用条件及应用方式的保证。

### 3. SMT Reflow Soldering Instructions SMT 回流焊说明

#### 3.1 SMT Reflow Soldering Instructions SMT 回流焊说明

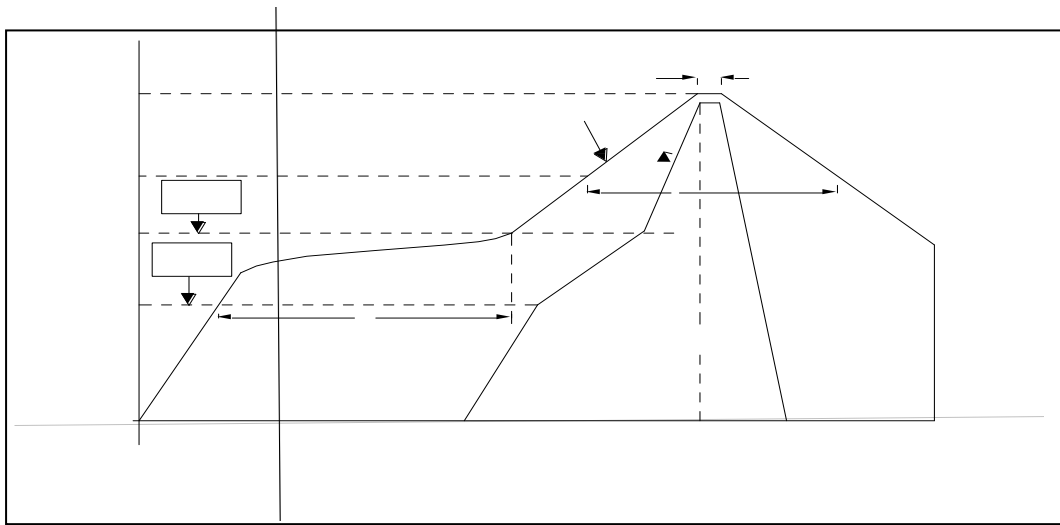
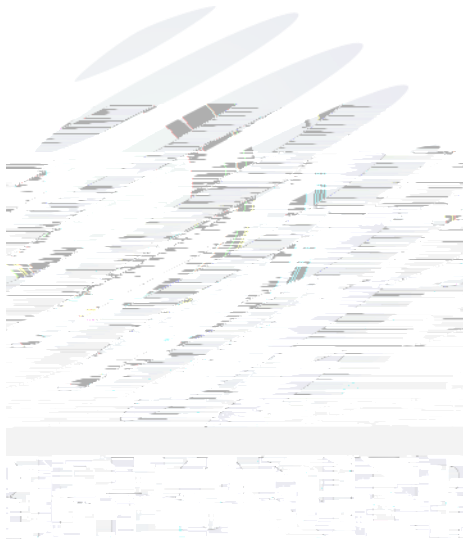


Fig.3-1 SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1 Parameter 参数

Average temperature rise speed 平均升温速度 (T <sub>smax</sub> 至 T <sub>P</sub> )	最高3 °C/秒 Max 3 °C/ s
Preheating: minimum temperature 预热：最低温度 (T <sub>smmin</sub> )	150 °C
Preheating: Max temperature 预热：最高温度 (T <sub>smmax</sub> )	200 °C
Preheating: Time 预热：时间 (T <sub>smmin</sub> 至T <sub>smmax</sub> )	60 - 120秒 60s-120s
Time limited to maintain high temperature: the temperature 限时维持高温：温度(T <sub>L</sub> )	217 °C
Time limited to maintain high temperature: The Time 限时维持高温：时间 (t <sub>L</sub> )	最多60秒 Max 60s
Peak /Classification of temperature:峰值 / 分类温度 (T <sub>P</sub> )	260 °C
Time limit classification of peak temperature time 限时峰值分类温度：时间 (t <sub>p</sub> )	最多10秒 Max 10s



(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.回流焊之后冷却过程中，不要对材料施加外力，也不要震动，回流焊后，不要采用激剧冷却的方式。

## 4. Handling Precautions 产品使用注意事项

### 4.1 Handling Precautions 产品使用注意事项

(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 工作环境及与 LED 适配的材料中硫元素及化合物成份不可超过 100PPM. 这只是一个建议，不作任何品质担保。

(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. 为了防止外界物质进入 LED 内部以造成 LED 的损伤，所处环境及所用套件等等，单一的溴元素含量要求小于 900PPM，单一氯元素含量要求小于 900PPM，溴元素与氯元素总含量必须小于 1500PPM. 这只是一个建议，不作任何品质担保。

(3) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of LEDs and discolor when exposed to heat and photonic energy. The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues. Refond advises against the use of any chemicals or materials that have been found or are suspected to have an adverse affect on device performance or reliability. To verify compatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended to be used. Attaching LEDs, do not use adhesives that outgas organic vapor. 应用套件中的挥发性物质会渗透到 LED 内部，在通电产生光子及热的条件下，会导致 LED 性能下降或产生有害的物质或材料。尽管这些材料早已适应了的产品环境，但是仍需谨慎对待。针对特定的应用和环境，瑞丰建议对所有的物质和材料进行相容性的测试。在组装 LED 时候，不要使用能产生有机挥发性气体的粘剂。

(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. 通过使用适当的工具从材料侧面夹取，不可直接用手或尖锐金属压胶体表面，它可能会损坏内部电路。

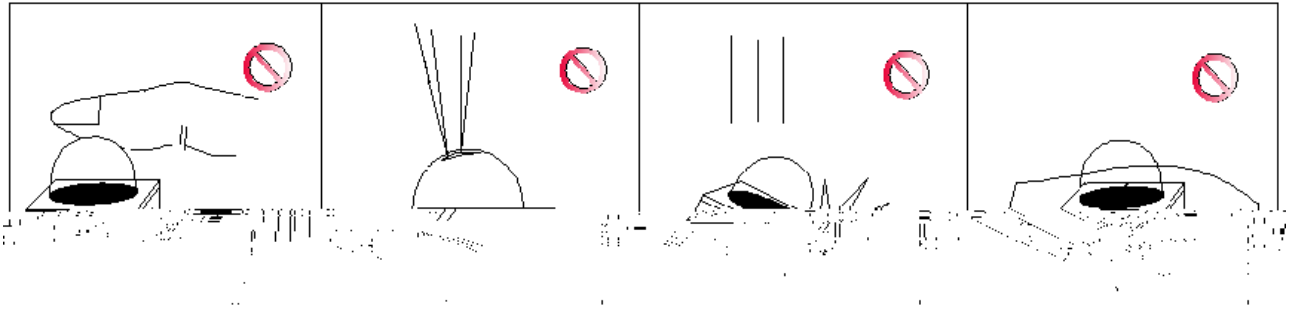


Fig 4-1

(5) In designing a circuit, the current through each LED can not be exceed the absolute maximum rating specified for each LED. In the meanwhile, 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. 设计电路时，通过 LED 的电流不能超过规定的最大值。同时，还需使用保护电阻，否则，微小的电压变化将会引起较大电流变化，可能导致产品损毁。电路设计必须保证只有在开启或者关闭的时候出现正向电压的变化，不要施加反压，否则会损坏 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 发光效率，影响发光颜色，所以在设计时应充分考虑散热问题。

(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. 与其他封装胶相比，硅胶通常较软，表面易吸附脏物，应用时应特别注意，当对产品洁净度要求较高时，回流焊以后需要采用恰当的清洗方式，我们推荐用异丙醇作清洗剂，如需要用到其他清洗剂，必须保证不会破坏封装体，超声清洗可能会对 LED 带来损害，不推荐这种清洗方式。

Table 4-1 Storage 储存

Conditions 种类		Temperature 温度	Humidity 湿度	Time 时间
Storage	Before Opening Aluminum Bag 拆包前	$\leq 30^{\circ}\text{C}$	$\leq 75\%$	Within 1 Year From Date 一年内
	After Opening Aluminum Bag 拆包后	$\leq 30^{\circ}\text{C}$	$\leq 60\%$	168hours 168小时
Baking 烘烤		$60 \pm 5^{\circ}\text{C}$	-	$\geq 24\text{hours}$ 大于24小时

(8) If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed after unpacking and based on the following condition ( $60 \pm 5$ )  $^{\circ}\text{C}$  for above 24 hours. 如果干燥剂失效或者产品不符合以上有效储存条件，需拆包后进行烘烤，烘烤条件： $60 \pm 5^{\circ}\text{C}$ ，大于 24 小时。

If the package is flatulence or damaged, please notify the sales staff to assist. 如果包装胀气或者破损，请通知销售人员协助处理。

(9) Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS). 像其他的半导体电子器件一样，LED 对静电过流击穿非常敏感，需要做好防护。

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

其它注意事项请参照瑞丰相关资料。

## Version History/修订历史

Date日期	Revisor修订者	Version版本	Verifier审核	Remarks备注
2020-06-12	徐恒	E/0	姚胜坚	RD:规格书



Declare 申明

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

产品规格书以中英文方式书写，若有冲突以中文版本为准。