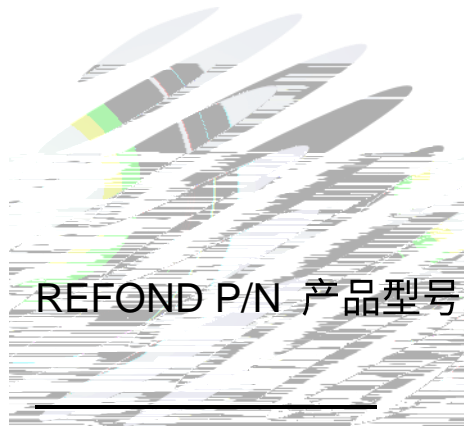


SPECIFICATION

产品规格书



REFOND P/N 产品型号

R&D 研发

Mass Product 量产供货



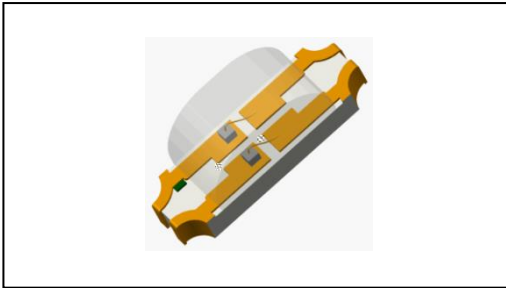
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1. Description 产品介绍

1.1 General Description 产品描述



The Colour LED which was fabricated using a yellow-green chip and amber chip, Package Dimension : 3.2mmX1.0mmX1.48mm.

该产品为双色光LED，是由黄绿光和琥珀光晶片封装形成,产品尺寸：3.2mmX1.0mmX1.48mm。

1.2 Features 产品特征

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

Moisture sensitivity level: Level 3. 防潮等级 Level3

RoHS compliant. 满足RoHS要求

1.3 Application 产品应用

Optical indicator. 光学指示

Switch and symbol, display. 开关和标志，显示器等

General use. 其他应用



1.4 Package Dimension 封装尺寸

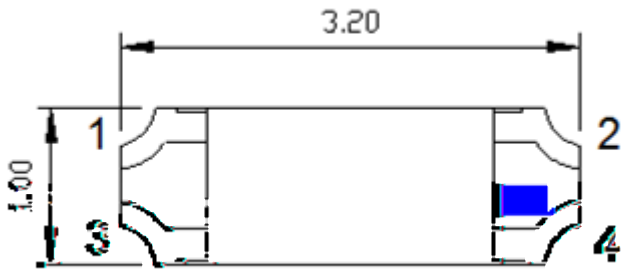


Fig.1-1 Top view 正面视图

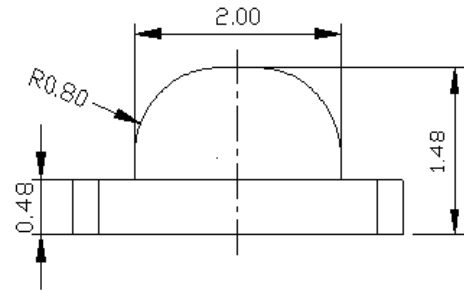


Fig.1-2 Side view 侧面视图

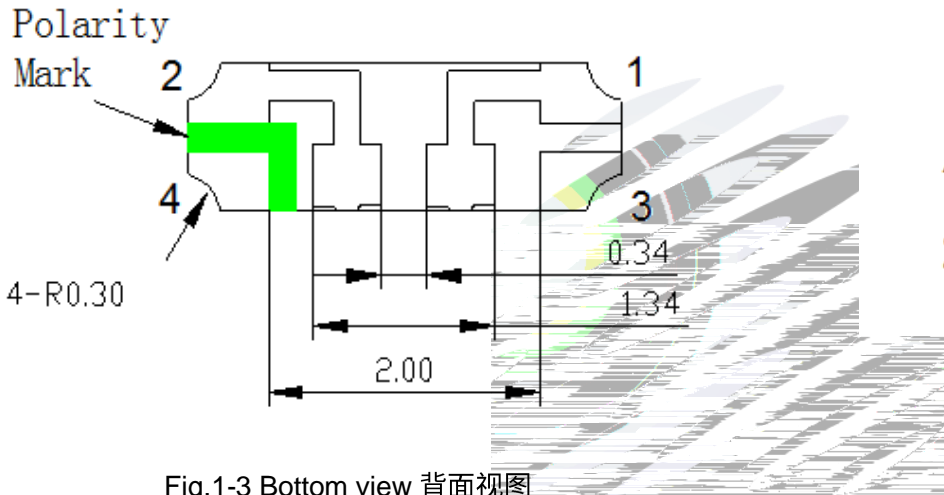


Fig.1-3 Bottom view 背面视图

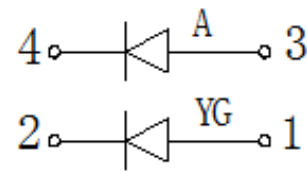


Fig.1-4 Polarity 极性

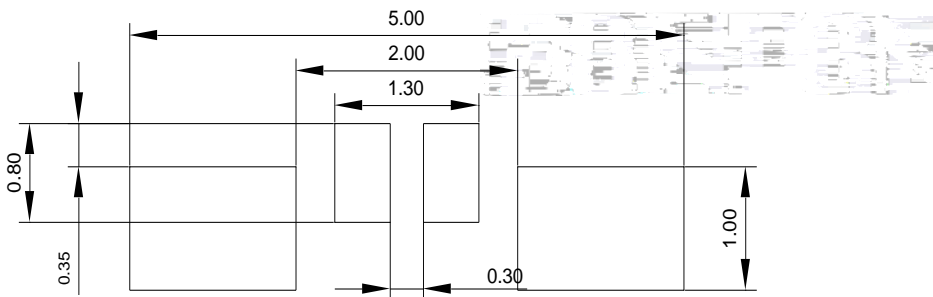


Fig.1-5 Soldering patterns 推荐焊盘

Notes 备注

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

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



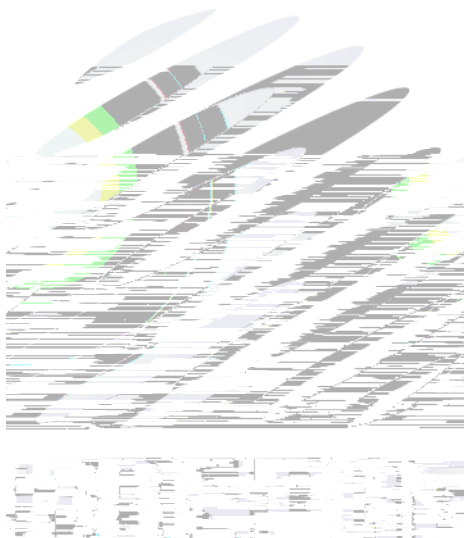
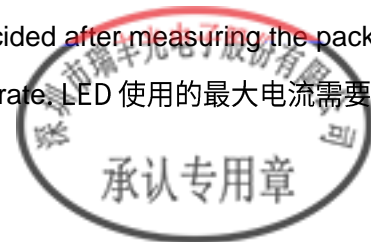


Table 1-2 Absolute Maximum Ratings at Ts=25°C 绝对最大值

Parameter (参数)	Symbol (符号)	Rating (值)		Units (单位)
		A	YG	
Power Dissipation (功耗)	P_d	48	48	mW
Forward Current (正向电流)	I_F	20		mA
Peak Forward Current Of Pulse (脉冲峰值电流)	I_{FP}	60		mA
Electrostatic Discharge (HBM) (静电)	E_{SD}	2000		V
Operating Temperature (操作温度)	T_{opr}	-40 ~ +85		
Storage Temperature (储存温度)	T_{stg}	-40 ~ +85		
Junction Temperature (结温)	T_j	95		

Notes 备注:

- 1/10 Duty cycle, 0.1ms pulse width. 脉宽0.1ms,占空比1/10.
- The above forward voltage measurement allowance tolerance is $\pm 0.1V$. 以上所示电压测量误差 $\pm 0.1V$.
- The above dominant wavelength measurement allowance tolerance is $\pm 2nm$. 以主波长测量误差 $\pm 2nm$.
- The above luminous intensity measurement allowance tolerance $\pm 10\%$. 上述发光强度的测试允许公差 $\pm 10\%$.
- 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。
- All measurements were made under the standardized environment of Refond. 所有的测试都是基于瑞丰现有标准测试平台。
- 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。



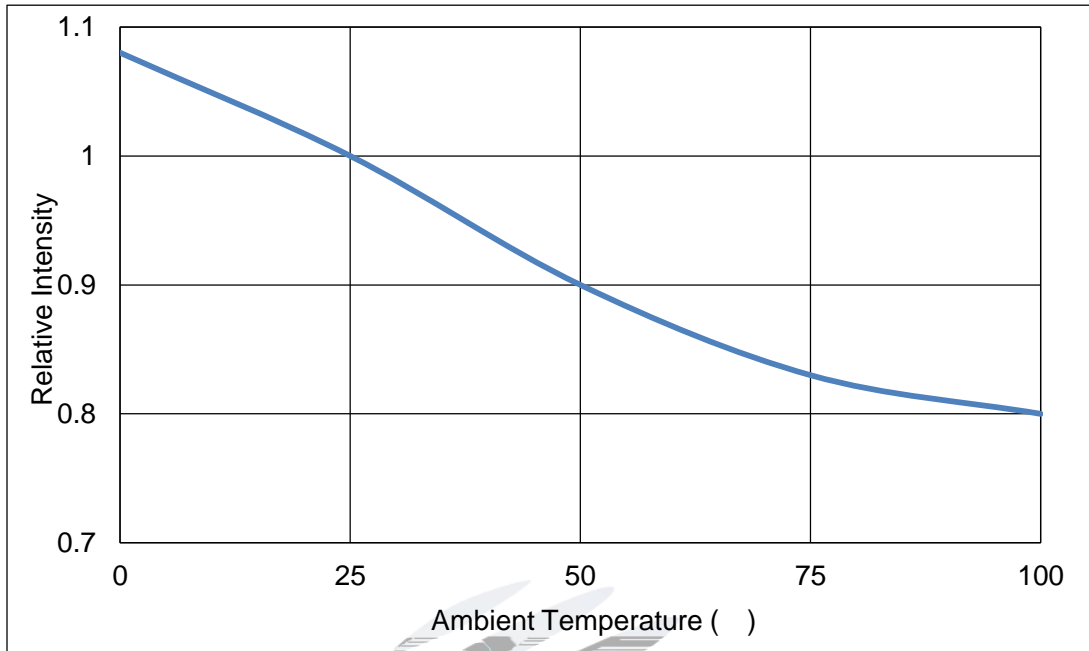


Fig.1-8 Pin Temperature Vs Relative Intensity 引脚温度与相对光强特性曲线

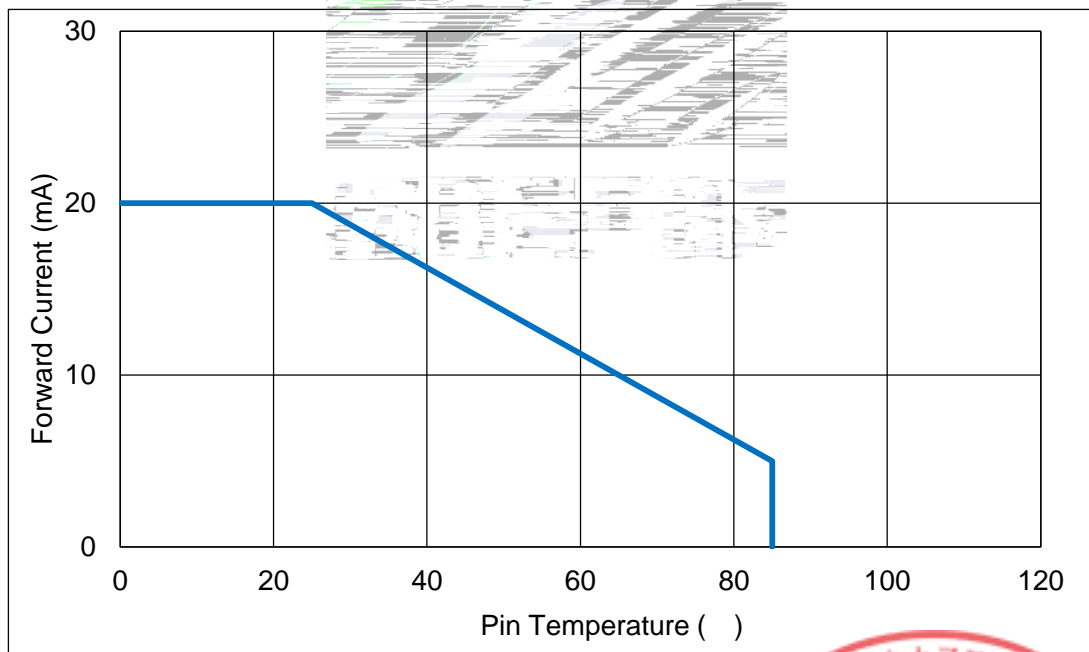


Fig.1-9 Pin Temperature Vs Forward Current 引脚温度与正向电流特性曲线



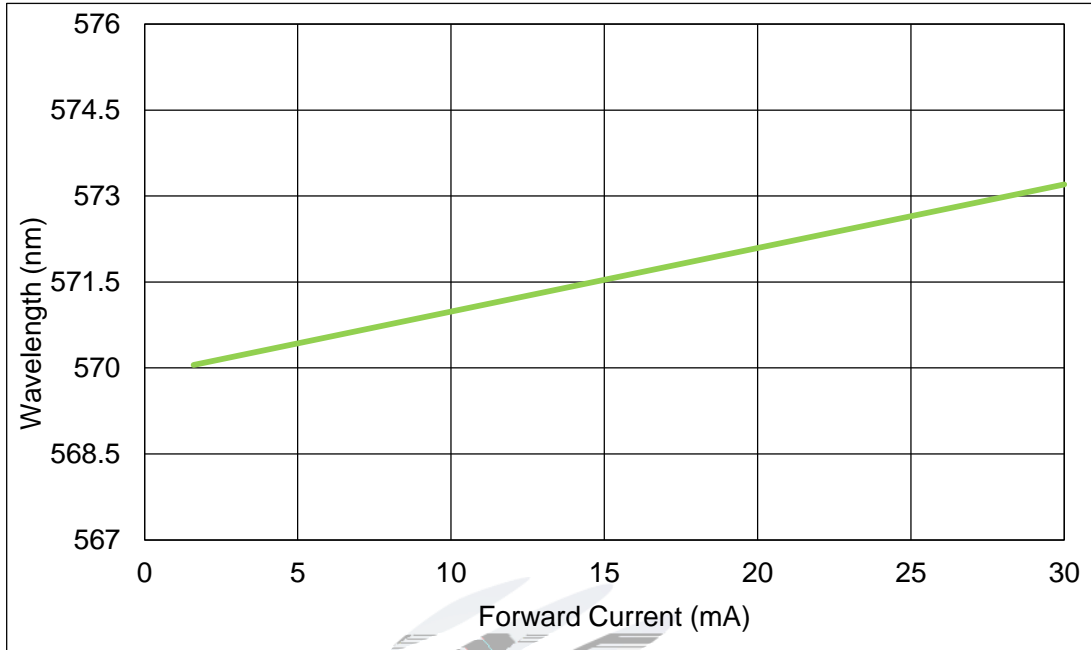


Fig.1-10 Forward Current Vs Dominate Wavelength (Ta=25°C) 正向电流与主波长关系曲线 (黄绿光)

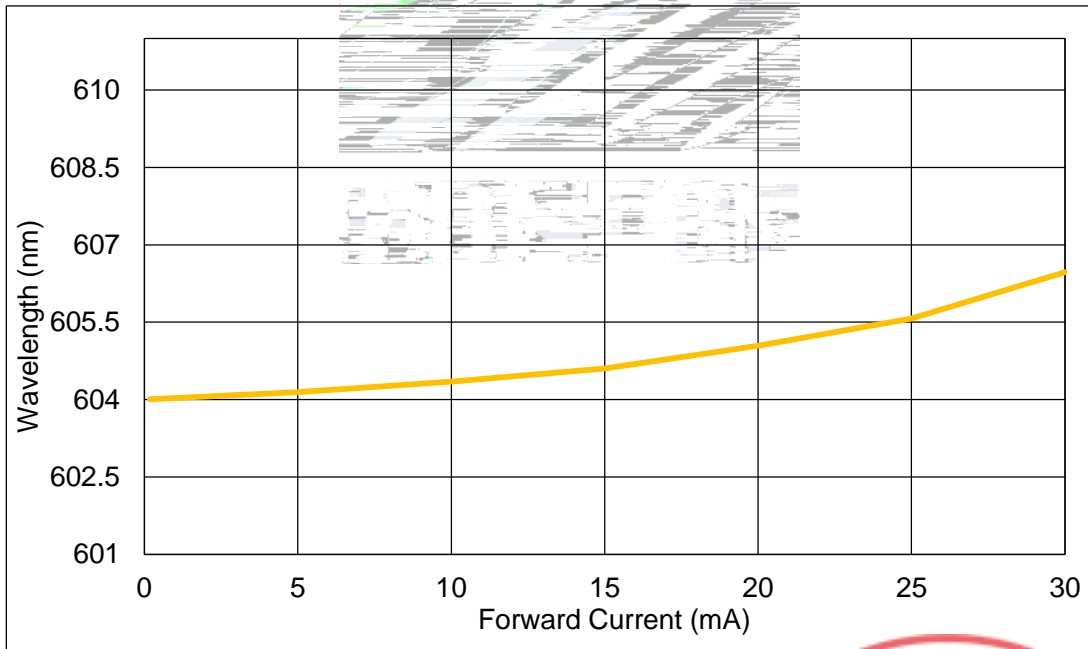


Fig.1-11 Forward Current Vs Dominate Wavelength (Ta=25) 正向电流与主波长关系曲线 (琥珀光)



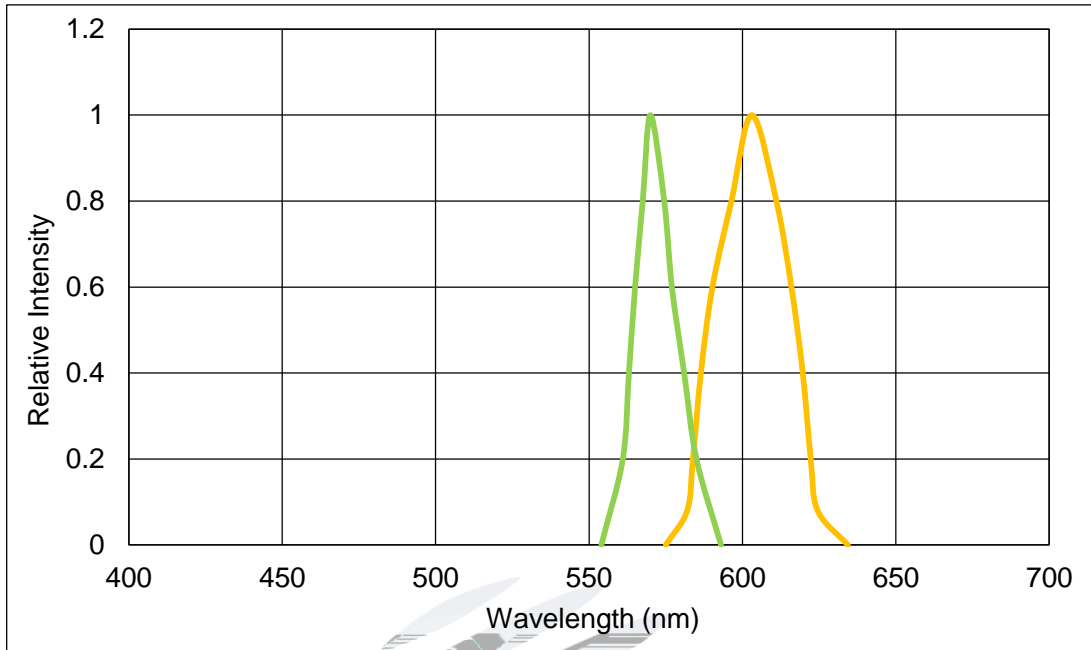


Fig.1-12 Relative Intensity Vs Wavelength (Ta=25) 相对光强与波长关系曲线

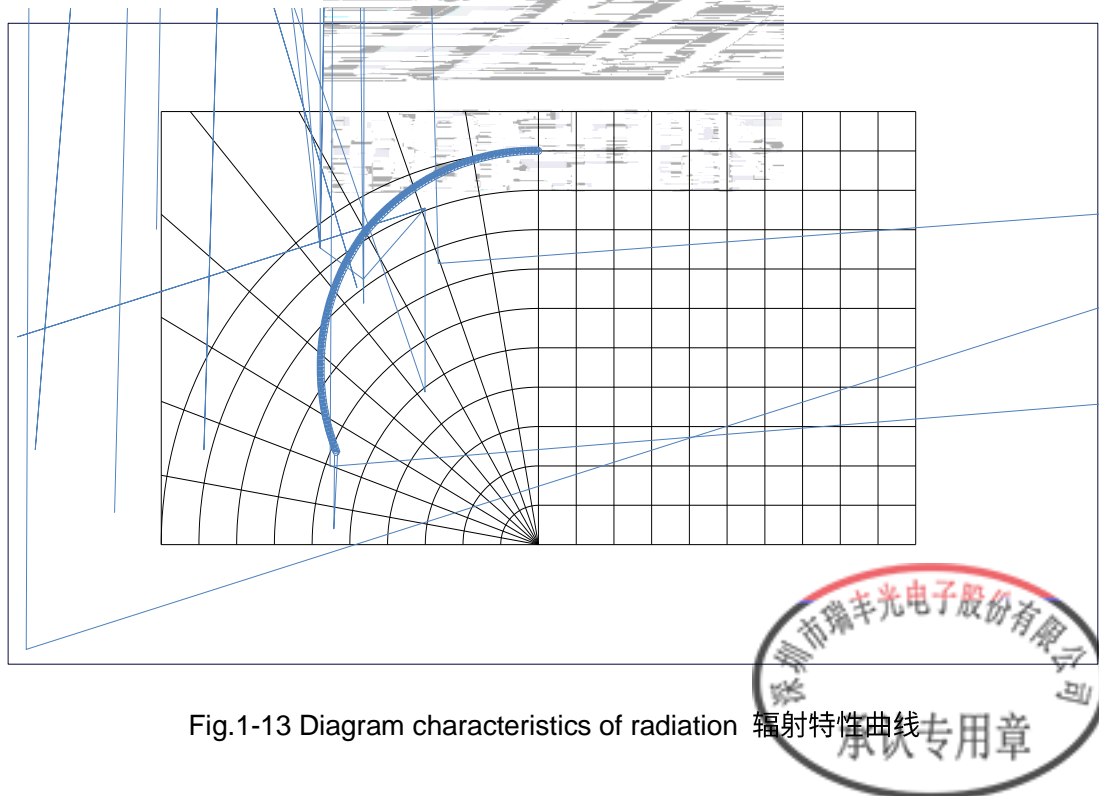


Fig.1-13 Diagram characteristics of radiation 辐射特性曲线



2. Packaging 产品包装

2.1 Packaging Specification 包装规格

Package:3000pcs/reel.包装每卷 3000pcs。

2.1.1 Carrier Tape Dimension 载带尺寸

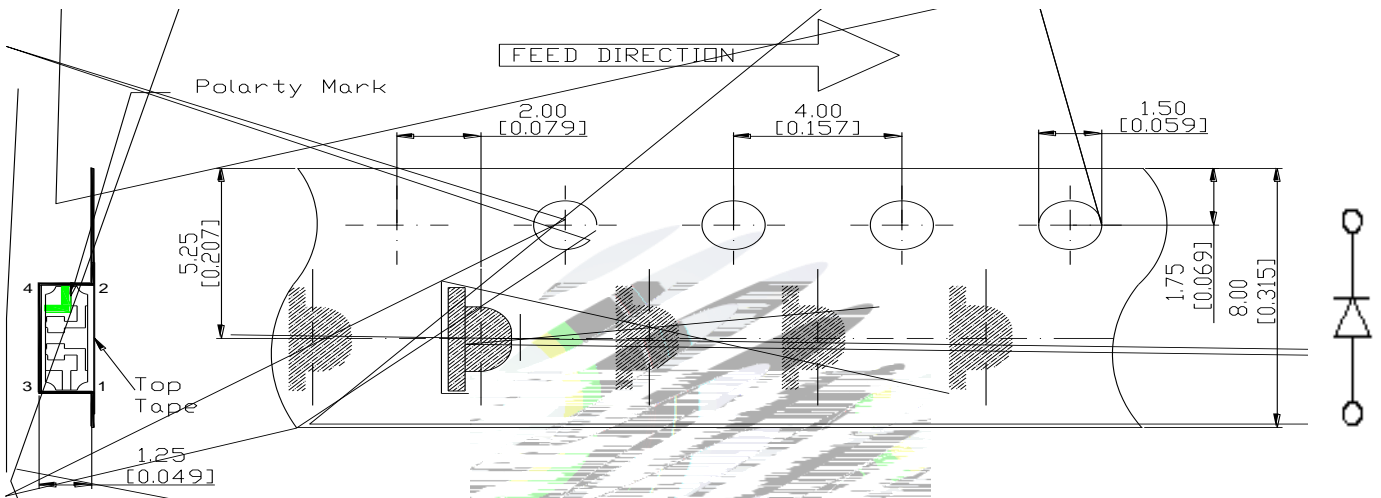


Fig.2-1 Carrier Tape Dimension 载带尺寸

2.1.2 Reel Dimension 卷盘尺寸

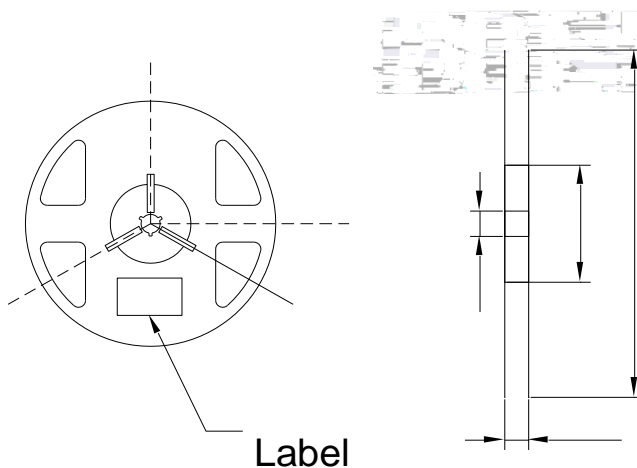


Table 2-1 Dimension 尺寸

A	8.0±0.1mm
B	178±1mm
C	60±1mm
D	13.0±0.5mm

Fig.2-2 Reel Dimension 卷盘尺寸

Notes 备注:

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



2.1.3 Label Form Specification 标签规格

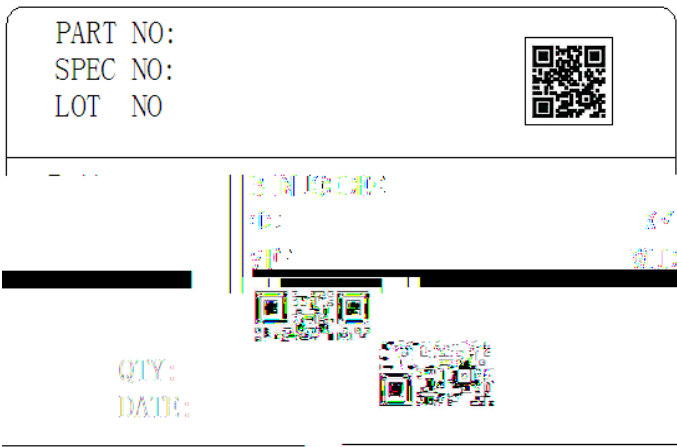


Table 2-2 Parameter 参数

PART NO.	Part Number 品名
SPEC NO.	Spec Number 规格
LOT NO.	Lot Number 批次号
BIN CODE	Bin Code 参数代码
	Luminous flux 光通量
XY	Chromaticity Bin 色区
V _F	Forward Voltage 正向电压
WLD	Wavelength 波长代码
QTY	Packing Quantity 数量
DATE	Made Date 生产日期

Fig. 2-3 Label Form Specification 标签规格

2.2 Moisture Resistant Packing 防潮包装

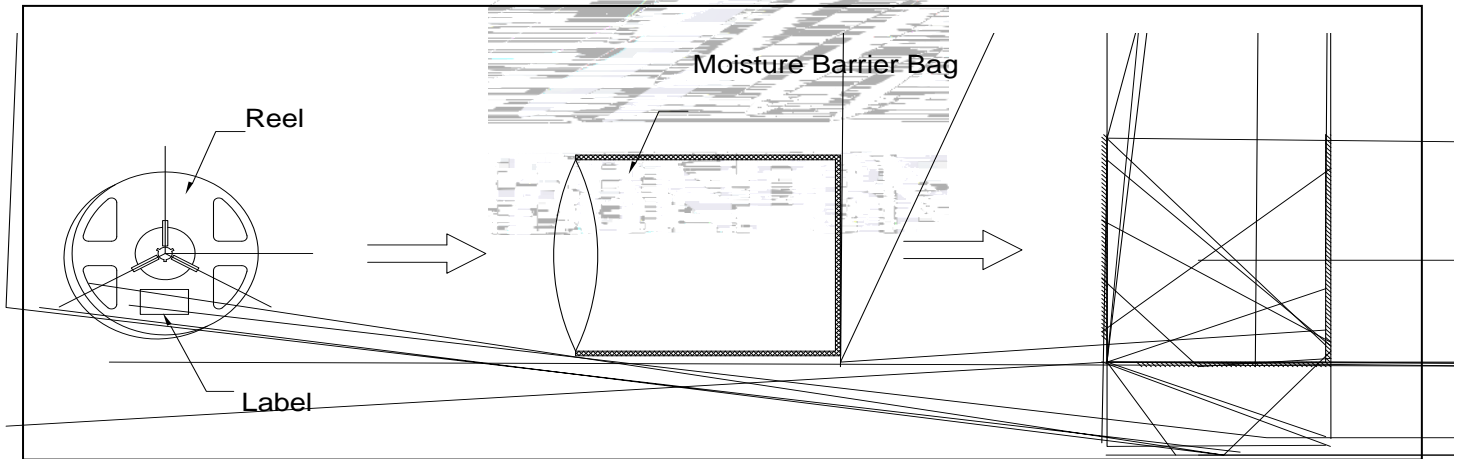
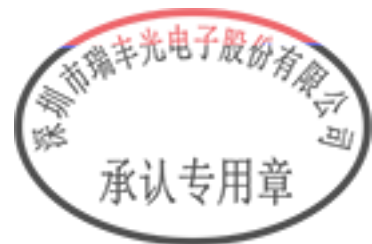


Fig.2-4 Moisture Resistant Packing 防潮包装



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
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2.5 Criteria For Judging Damage 失效判定标准

Table 2-4 Criteria For Judging Damage 失效判定标准

Test Items 项目	Symbol 符号	Test Condition 测试条件	Criteria For Judgement 判定标准	
			Min. 最小	Max. 最大
Forward Voltage 正向电压	V_F	$I_F=20mA$	-	U.S.L*)x1.1
Reverse Current 漏电流	I_R	$V_R= 5V$	-	U.S.L*)x2.0
Luminous Flux 光通量		$I_F=20mA$	L.S.L*)x0.7	-

Notes 备注

1.U.S.L: Upper standard level 规格上限 L.S.L: Lower standard level 规格下限

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. 以上可靠性测试是基于瑞丰现有实验平台单颗/条 LED 在良好散热条件验证下的结果。客户端将 LED 应用于串、并联线路时，需自行评估电流、电压分配、散热等问题。

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. 以上技术数据仅为产品的典型值，只作为参考，不作为任何应用条件及应用方式的保证。



3. SMT Reflow Soldering Instructions SMT

3.1 SMT Reflow Soldering Instructions SMT 回流焊说明

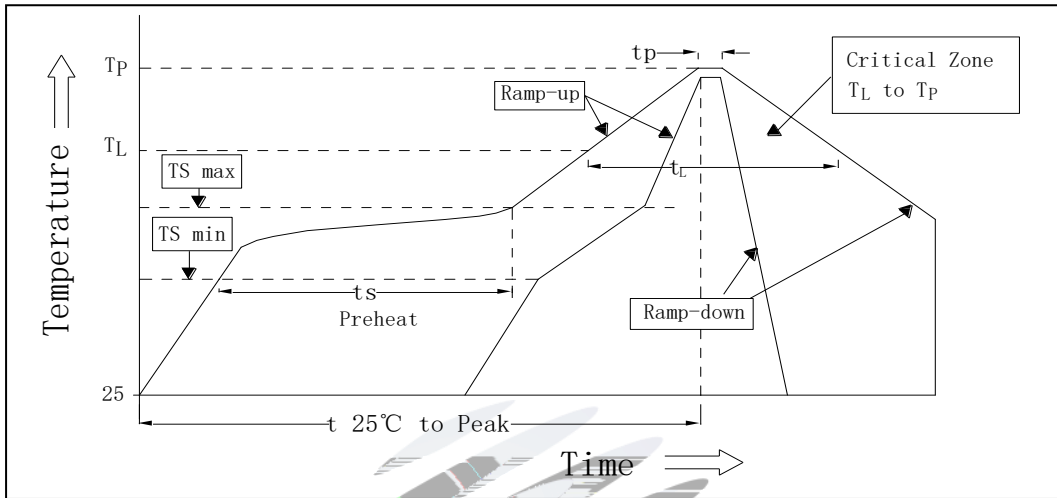
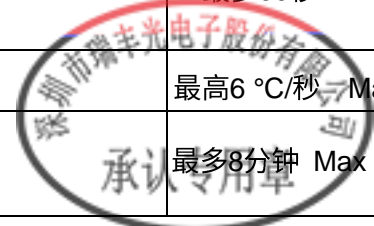


Fig.3-1 SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1 Parameters 参数

Average temperature rise speed平均升温速度 (Tsmax 至TP)	最高3 °C/秒 Max 3 °C/ s
Preheating: minimum temperature预热: 最低温度 (Tsm in)	150 °C
Preheating: Max temperature预热: 最高温度 (Tsm ax)	200 °C
Preheating: Time预热: 时间 (Tsm in 至Tsm ax)	60 - 120秒 60s-120s
Time limited to maintain high temperature: the temperature限时维持高温: 温度	217 °C
Time limited to maintain high temperature: The Time 限时维持高温: 时间 (tl)	60秒-150秒 60s-150s
Peak /Classification of temperature:峰值 / 分类温度 (TP)	260 °C
Time limit classification of peak temperature time限时峰值分类温度: 时间 (tp)	最多10秒 Max 10s
与实际峰值温度 (TP) 相差 5 °C 以内的保持时间 Hold time within 5 °C with the actual peak temperature (TP)	最多30秒 Max 30s
降温速度 Cooling speed	最高6 °C/秒 Max 6 °C/ s
25 °C 升至峰值温度所需时间 Needed time from 25 °C to Tp	最多8分钟 Max 8 minutes



Notes 备注

(1)Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings, LED will be damaged. 回流焊次数不可以超过两次, 两次回流焊的时间间隔如果超过24小时, LED可能由于吸湿而损坏。

(2)When soldering , do not put stress on the LEDs during heating. 焊接时, 不要在材料受热时用去压胶体表面。

3.1.1 Soldering Iron 烙铁焊接

(1) When do soldering by hand, keep the temperature of iron below less 300 less than 3 seconds 当手工焊接时,烙铁的温度必须小于300°C, 时间不可超过3秒。

(2) Soldering by hand should be done only one time.手工焊接只可焊接一次。

3.1.2 Repairing 维修

Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable,a double-head soldering iron should be used (as below figure). It should be confirmed in advance whether the characteristics of LEDs will or not be damaged by repairing.

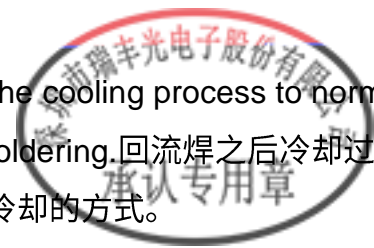
LED 封装胶为硅胶, 当手工焊接时, 烙铁的温度必须小于300°C, 时间不可超过3秒。如果维修, 会损坏LED本身的特性。

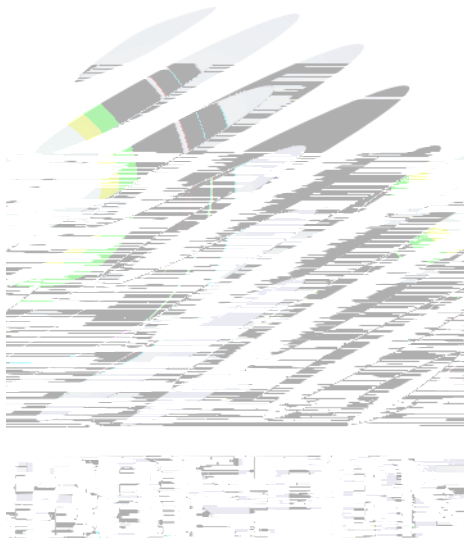
3.1.3 Cautions 注意事项

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 impacted on the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when use the picking up nozzle, the pressure on the silicone resin should be proper. LED封装胶为硅胶, 表面较软, 用力按压胶体表面会影响LED可靠性, 因此应有预防措施避免在按压器件, 当使用吸嘴时, 胶体表面的压力应是恰当的。

(2) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board. LED 灯珠不要焊接在弯曲的 PCB 板上, 焊接之后, 也不要弯折线路板。

(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) 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。

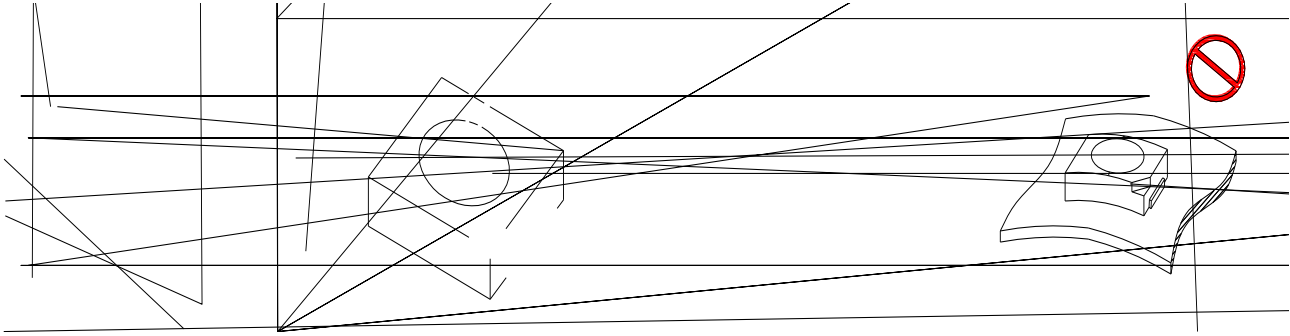


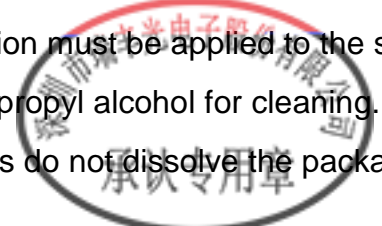
Fig 4-1

(5) In designing a circuit, the current through each LED can not 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，还应使用保护电阻，否则，微小的电压波动会引起电流变化，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 容易因为自身的发热和环境的温度改变而改变，温度升高会降低 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，应采用适当的清洗方式，不建议使用超声波清洗。如需使用超声波清洗，必须保证不会破坏封装体。超声波清洗可能会对 LED 造成损害，不建议这种清洗方式。

Table 4-1 Storage 储存

Conditions 种类		Temperature 温度	Humidity 湿度	Time 时间
Storage 储存	Before Opening Aluminum Bag 拆包前	≤30°C	≤75%	Within 1 Year From Date 一年内
	After Opening Aluminum Bag 拆包后	≤30°C	≤60%	168hours 168小时
Baking 烘烤		60±5°C	-	≥24hours 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 ± 5 for above 24 hours. 如果干燥剂或包装失效，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±5°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

(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





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。

