SPECIFICATION
产品规格书

REFOND P/N 产品型号

RF-P1S191TS-B59-E1

□R&D 研发

■Mass Product 量产供货

承 认 专 用 章

Contents 目录

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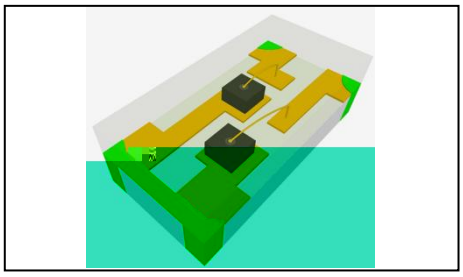
1. Description 产品介绍

1.1 General Description 产品描述



The Colour LED which was fabricated using a green chip and a orange chip，Package Dimension : 1.6mmX0.8mmX0.4mm.

该产品为双色光 LED，由绿光和橙光晶片封装形成，产品尺寸：1.6mmX0.8mmX0.4mm。

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

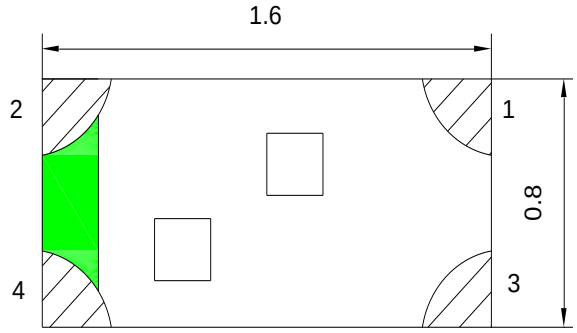


Fig.1-1 Top view 正面视图

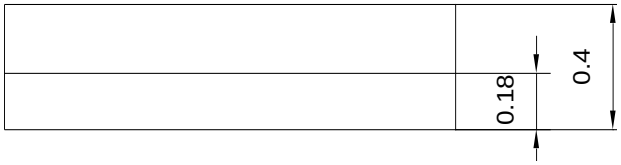


Fig.1-2 Side view 侧面视图

Fig.1-3 Bottom view 背面视图

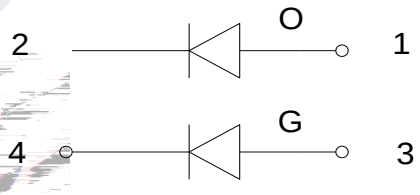


Fig.1-4 Polarity 极性

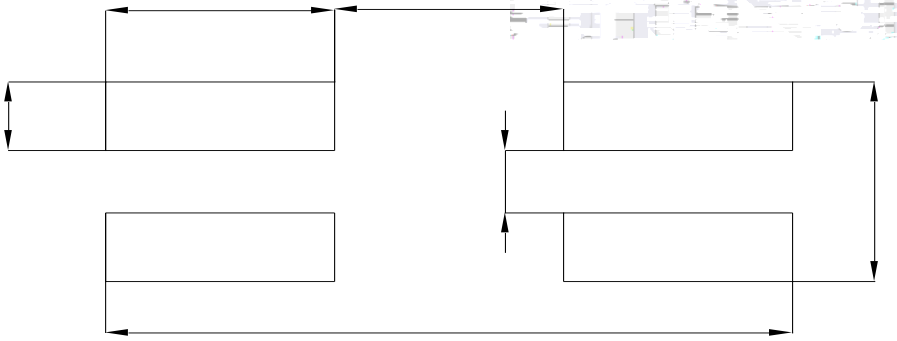


Fig.1-5 Soldering patterns 推荐焊盘

Notes 备注：

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

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	Test Condition 测试条件	Symbol 符号		Code 代码	Value			Unit 单位
					Min. (最小值)	Typ. (典型值)	Max. (最大值)	
Spectral Half Bandwidth 半波宽	I_F=20mA	Δ	O	/	--	15	--	nm
			G		--	30	--	
Forward Voltage 正向电压	I_F=20mA	V_F	O	2Q	1.6	--	2.2	V
			G	1V	2.6	--	3.6	
Dominant wavelength 主波长	I_F=20mA	$_d$	O	2P	620	--	630	nm
			G	5D	520	--	530	
Luminous Intensity 发光强度	I_F=20mA	I_V	O	1JL	100	--	300	mcd
			G	1JR	280	--	800	
Viewing Angle 发光角度	I_F=20mA				--	140	--	deg
Reverse Current 反向电流	V_R=5V	I_R			--	--	10	μA
Thermal Resistance. 热阻	I_F=20mA	R_{THJ-S}			--	--	450	°C/W

Notes 备注: V_R=5V For test conditions. V_R=5V 为测试分选条件。

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）
		O	G	
Power Dissipation（功耗）	P_d	44	72	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}	1000		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. 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 ±0.1V. 以上所示电压测量误差±0.1V.

3. The above dominant wavelength measurement allowance tolerance is±2nm. 以主波长测量误差±2nm.

4. The above luminous intensity measurement allowance tolerance ±10%. 上述发光强度的测试允许公差±10%.

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. 所有测试都是基于瑞丰现有的标准测试平台。

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。

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1.6 Typical Optical Characteristics Curves 典型光学特性曲线

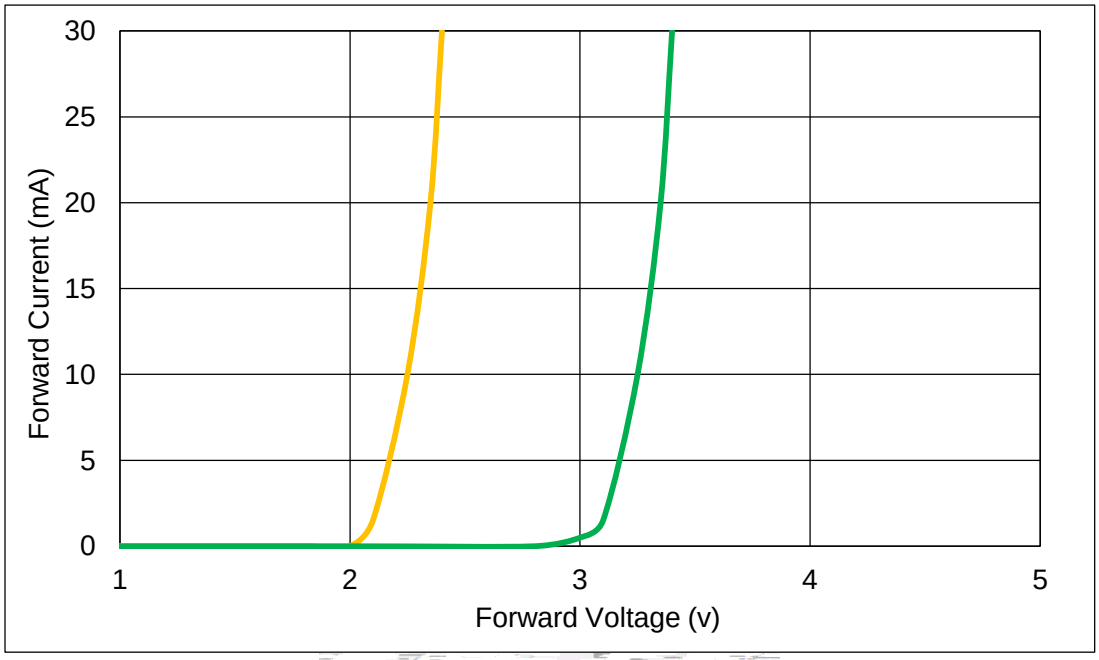

Fig.1-6 Forward Voltage Vs Forward Current 伏安特性曲线

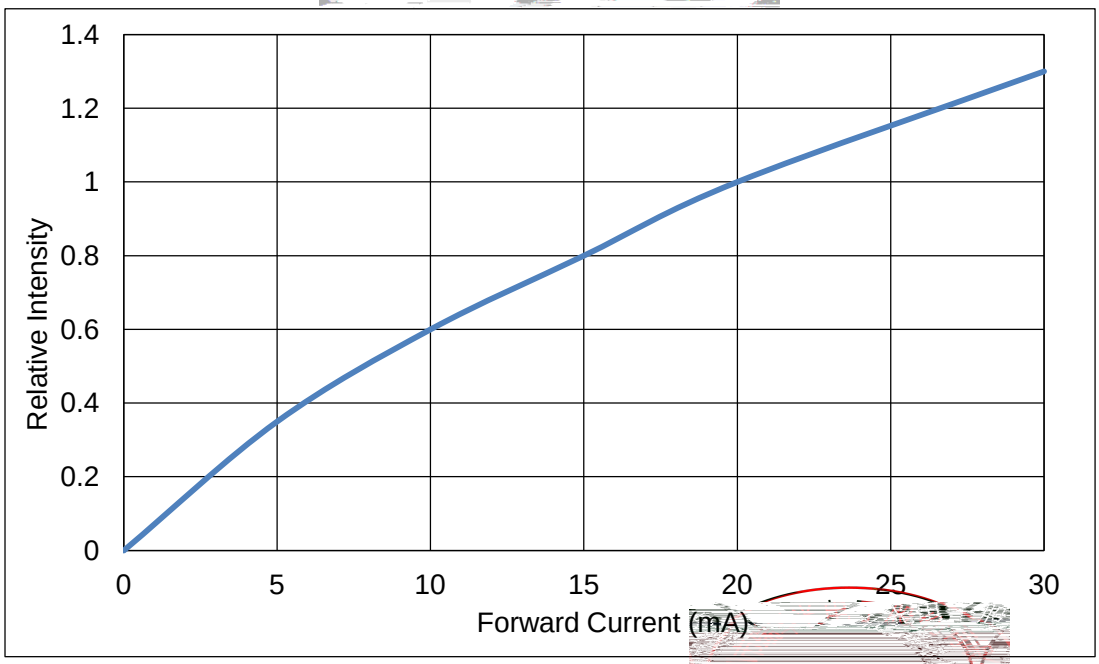

Fig.1-7 Forward Current Vs Relative Intensity 正向电流与相对光强特性曲线

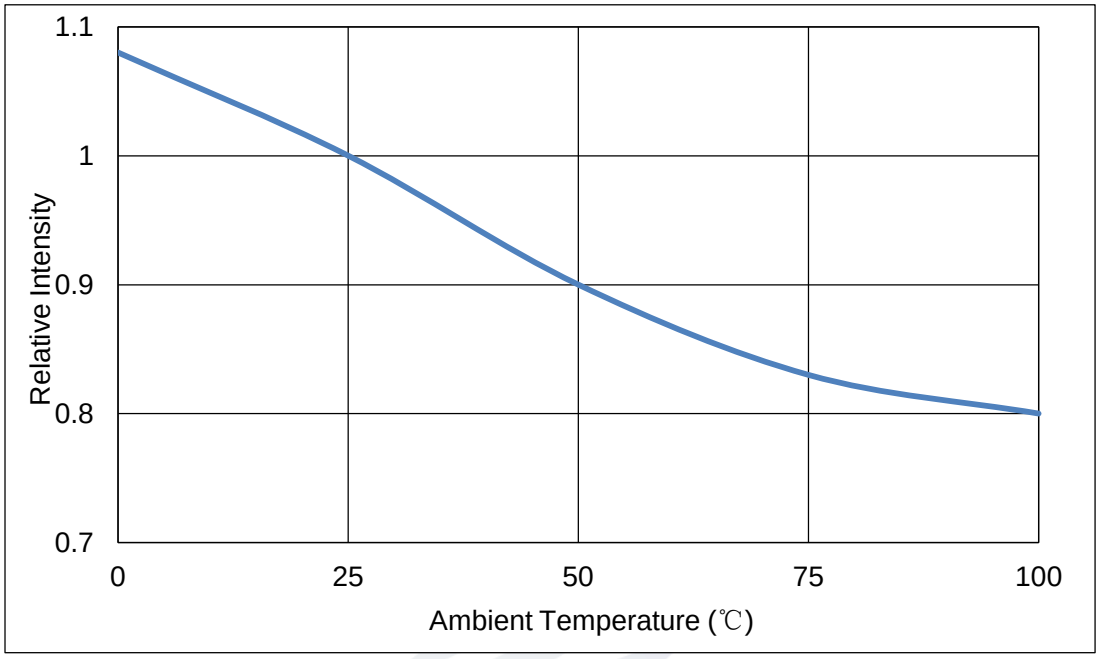

Fig.1-8 Pin Temperature Vs Relative Intensity 引脚温度与相对光强特性曲线

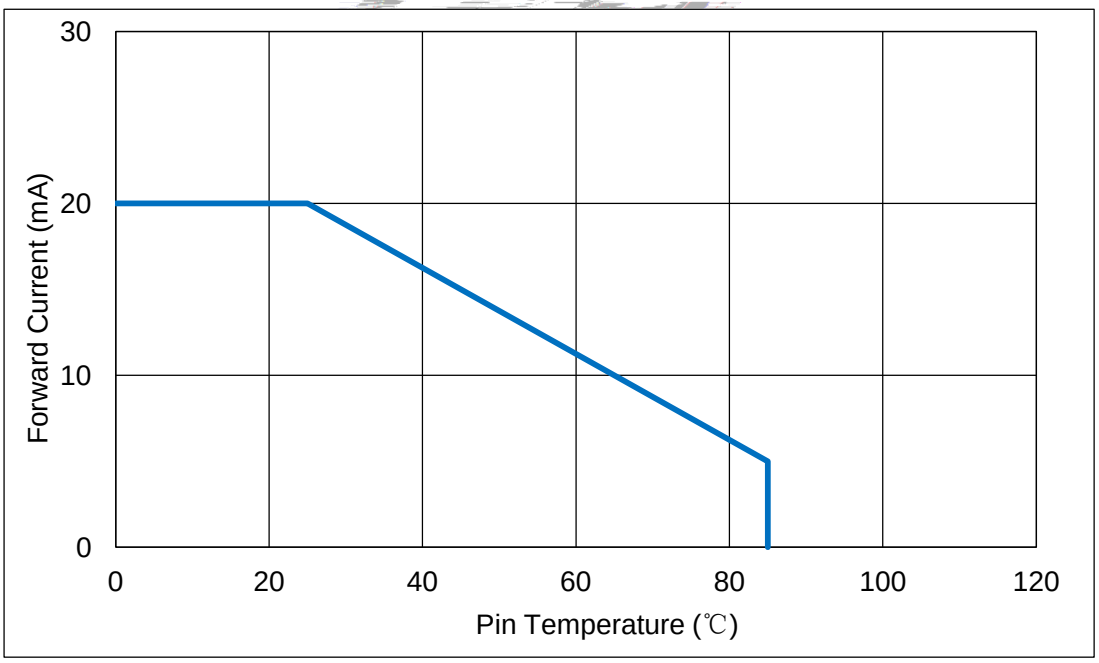

Fig.1-9 Pin Temperature Vs Forward Current 引脚温度与正向电流特性曲线

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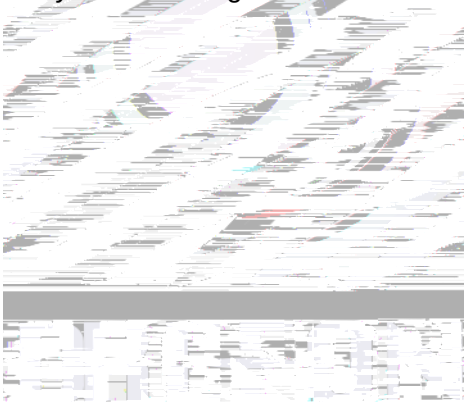
Fig.1-12 Relative Intensity Vs Wavelengtl om



2. Packaging 产品包装

2.1 Packaging Specification 包装规格

Package:4000pcs/reel.包装每卷 4000pcs。

2.1.1 Carrier Tape Dimension 载带尺寸

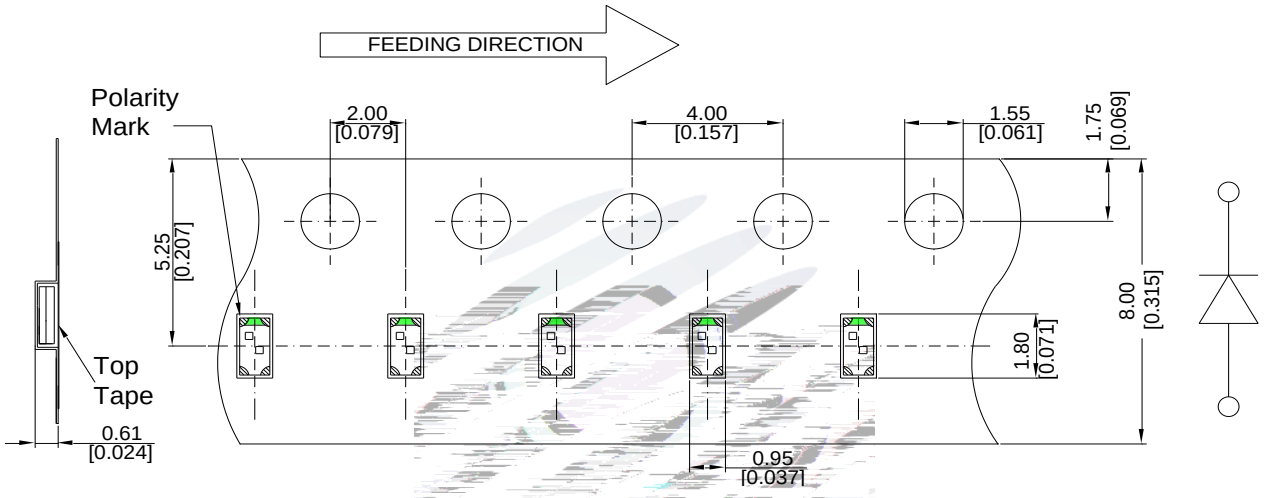


Fig.2-1 Carrier Tape Dimension 载带尺寸

2.1.2 Reel Dimension 卷盘尺寸

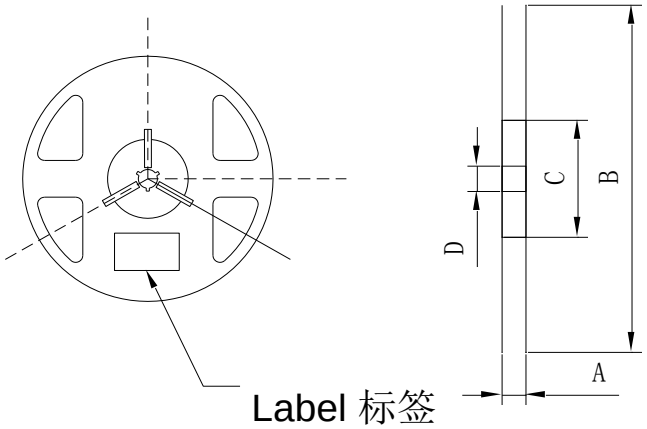


Fig.2-2 Reel Dimension 卷盘尺寸

Table 2-1 Dimension 尺寸

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

Notes 备注:

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

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2.1.3 Label Form Specification 标签规格

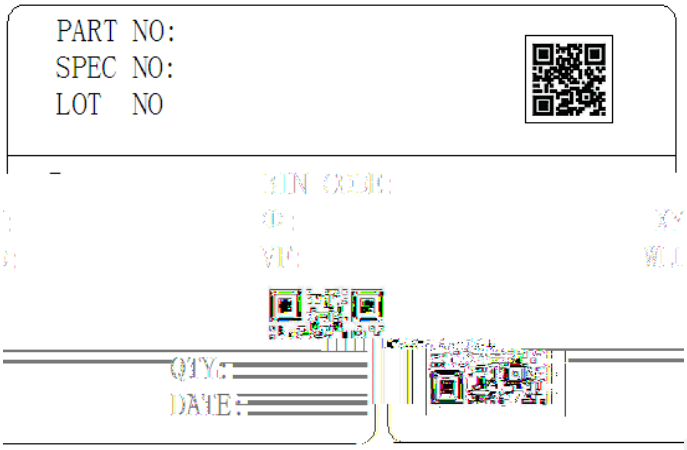

Fig. 2-3 Label Form Specification 标签规格

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

2.2 Moisture Resistant Packing 防潮包装

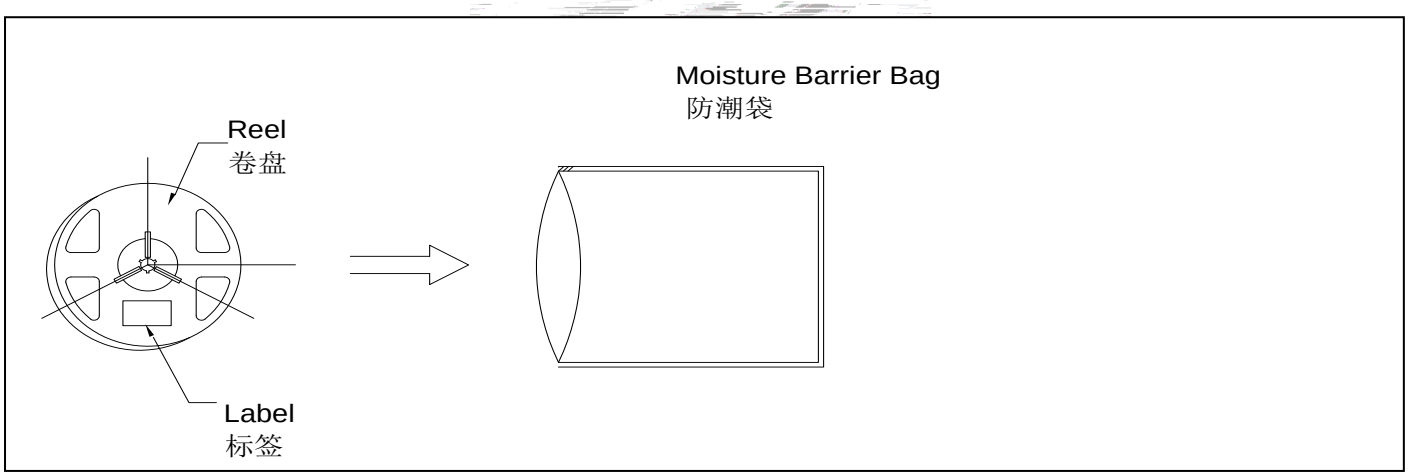

Fig.2-4 Moisture Resistant Packing 防潮包装

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2.3 Cardboard Box 包装纸箱

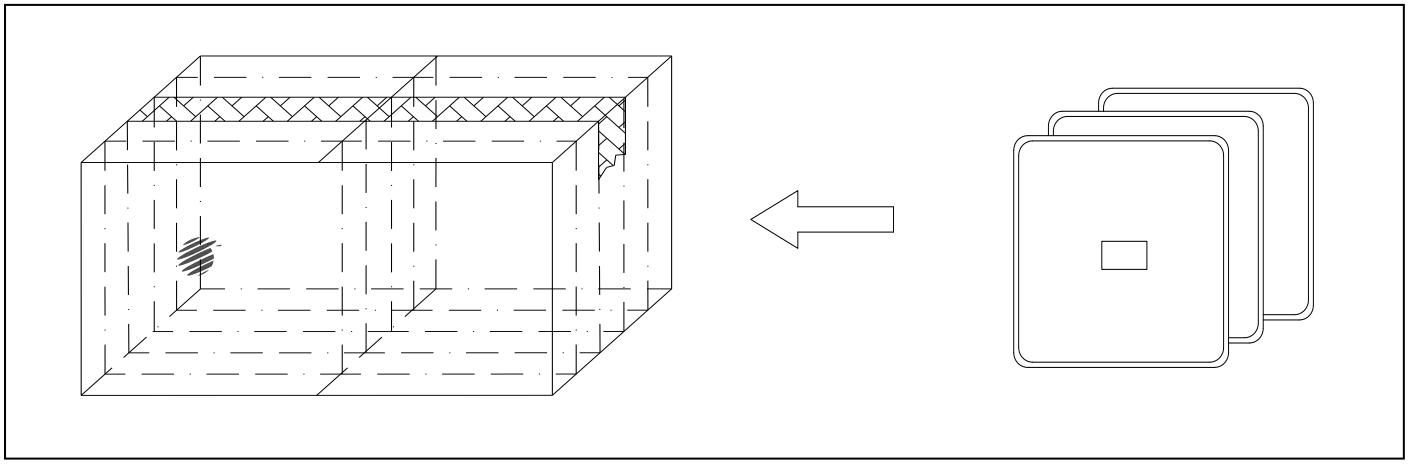

Fig.2-5 Cardboard Box 包装纸箱

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	T_{emp}:260℃max T=10 sec	2 times	22Pcs.	0/1
Temperature Cycle 温度循环	JESD22-A104	100℃ 30 min 5 min -40℃ 30 min	100 cycles	22Pcs.	0/1
Thermal Shock 冷热冲击	JESD22-A106	-40℃ 15min 100℃ 15min	300 cycles	22Pcs.	0/1
High Temperature Storage 高温保存	JESD22-A103	T_{emp}:100℃	1000 hrs.	22Pcs.	0/1
Low Temperature Storage 低温保存	JESD22-A119	T_{emp}:-40℃	1000 hrs.	22Pcs.	0/1
Life Test 常温通电	JESD22-A108	T_a=25℃ I_F=20mA	1000 hrs.	22Pcs.	0/1

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。

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3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1 SMT Reflow Soldering Instructions SMT

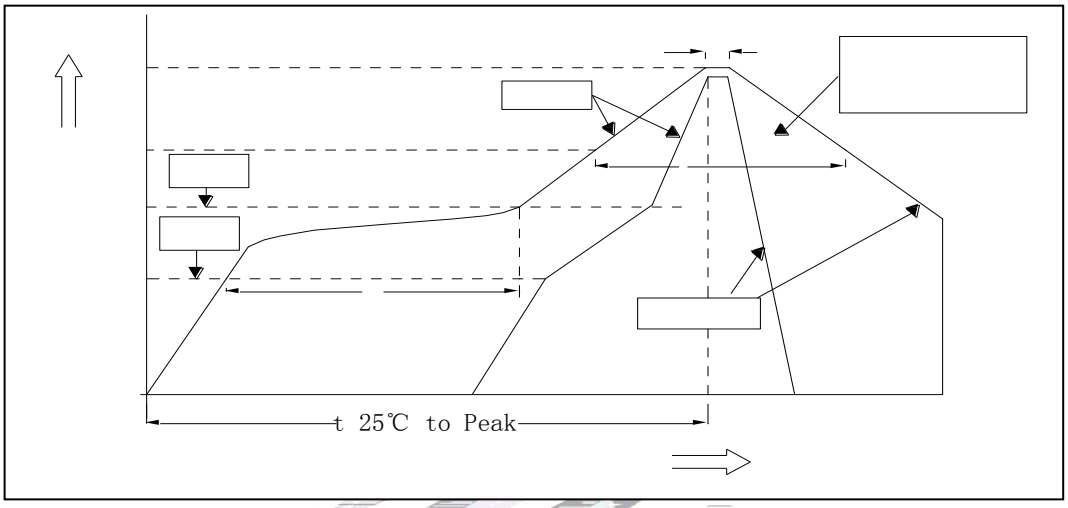

Fig.3-1 SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1 Parameter 参数

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

Notes 备注：

(4) 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 的电流不能超过每个 LED 规定的绝对最大额定值。同时，必须使用保护电阻。否则，轻微的电压变化会导致大电流变化，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。

(5) 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。

(6) Storage 储存

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℃	≤75%	Within 1 Year From Date 一年内
	After Opening Aluminum Bag 拆包后	≤30℃	≤60%	168hours 168小时
Baking 烘烤		60±5℃	-	≥24hours 大于24小时

(7) 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℃ 下，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。

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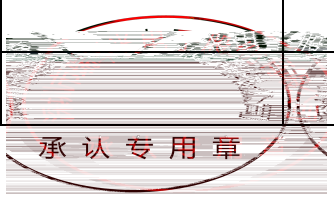
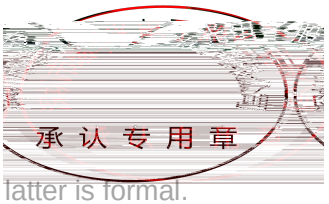
(8) Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS). 像其他的半导体电子器件一样，LED 对静电过流击穿非常敏感，需要做好防护。

(9) 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
2020.03.04	贾彬浩	E0	宋明	新版本制定





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。