

SPECIFICATION

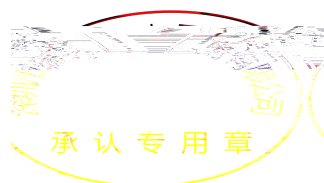
产品规格书

REFOND P/N 产品型号

RF-**MI35DS-EC-Y

☐ R&D 研发

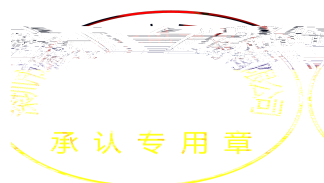
☒ Mass Product 量产供货



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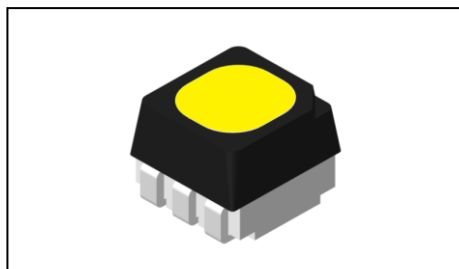
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1. Description 产品介绍

1.1 产品描述



The White LED, which was fabricated by using a blue chip and the phosphor. The product size: 3.5mmX3.7mmX2.8mm.

该产品为白光 LED 器件，是由蓝光芯片激发荧光粉而形成，产品尺寸 3.5mmX3.7mmX2.8mm。

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

Water-resistant (IPX6). 防水等级(IPX6)

Moisture sensitivity level: 5a. 潮湿敏感等级:5a

RoHS compliant. 满足RoHS要求

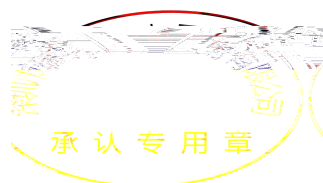
Pb-free reflow soldering application. 无铅回流焊

1.3 Application 产品应用

Indoor and outdoor decorative lighting. 室内外装饰照明

Amusement. 娱乐产品

General use. 其他应用



1.4 Package Dimension 封装尺寸

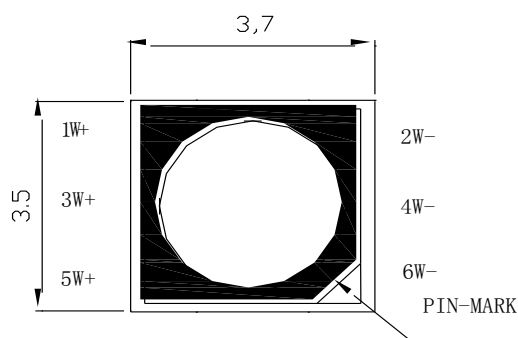


Fig. 1-1 Top view 正面视图

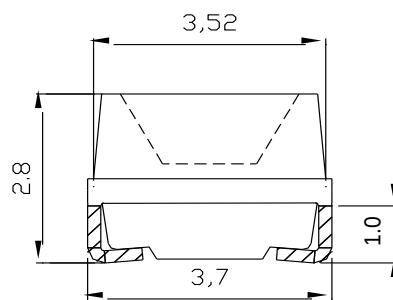


Fig. 1-2 Side view 侧面视图

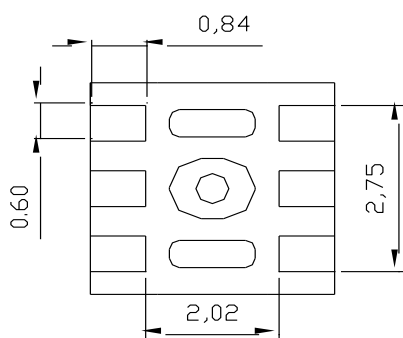


Fig. 1-3 Bottom view 背面视图

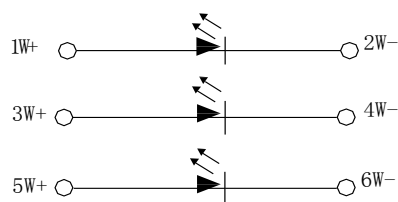


Fig. 1-4 Polarity 极性

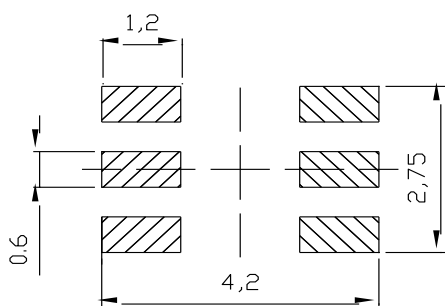
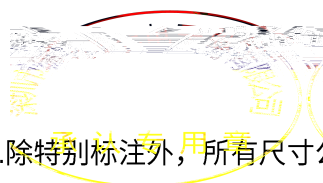


Fig. 1-5 Soldering patterns 推荐焊盘

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 $\pm 0.1\text{mm}$ unless otherwise noted. 除特别标注外, 所有尺寸公差为 ± 0.1 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	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)	
Forward Voltage (正向电压)	V_F	$I_F=20\text{mA}$	2.7	---	3.4	V
Reverse Current (反向电流)	I_R	$V_R=5\text{V}$	---	---	6	μA
Luminous Intensity 光强	I_V	$I_F=20\text{mA}$	5000	7000	---	mcd
Viewing Angle (发光角度)		$I_F=20\text{mA}$	---	110	---	deg

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)
Power Dissipation (功耗)	P_D	204	mW
Forward Current (正向电流)	I_F	20	mA
Peak Forward Current (峰值电流)	I_{FP}	80	mA
Reverse Voltage (反向电压)	V_R	5	V
Electrostatic Discharge (HBM) (静电)	E_{SD}	1000	V
Operating Temperature (操作温度)	T_{OPR}	-30 ~ +70	°C
Storage Temperature (储存温度)	T_{OPR}	-40 ~ +85	°C

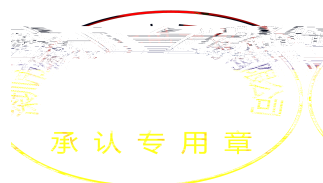


Table 1-3 The C.I.E Color coordinates CIE色坐标点

BIN	X1	Y1	X2	Y2	X3	Y3	X4	Y4
30A	0.4103	0.3904	0.4231	0.3684	0.4319	0.3765	0.4191	0.3904
30B	0.4191	0.3904	0.4319	0.3765	0.449	0.392	0.4362	0.406
30C	0.4362	0.406	0.449	0.392	0.4578			

3. The above luminous intensity measurement allowance tolerance $\pm 10\%$. 上述发光强度的测试允许公差为 $\pm 10\%$ 。
4. The above color coordinates measurement allowance tolerance is ± 0.005 . 以上所示坐标测量误差 ± 0.005 。
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. 瑞丰现有的所有测试都是基于标准测试平台。
7. All the datas are just for reference, specific parameters please refer to the label. 以上参数仅供参考, 请以实物标签为准。

1.6 Typical optical characteristics curves 典型光学特性曲线

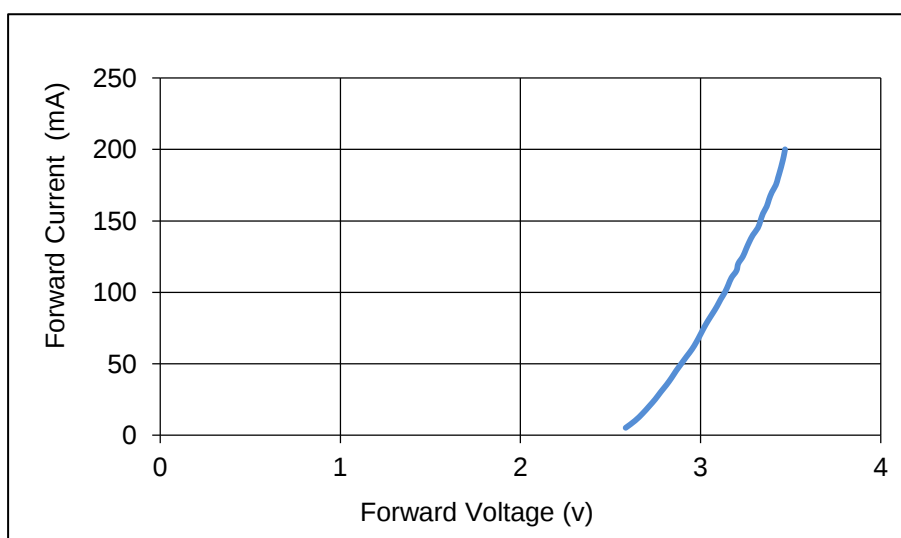
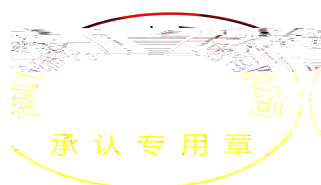


Fig 1-7 Forward Voltage Vs. Forward Current 伏安特性曲线



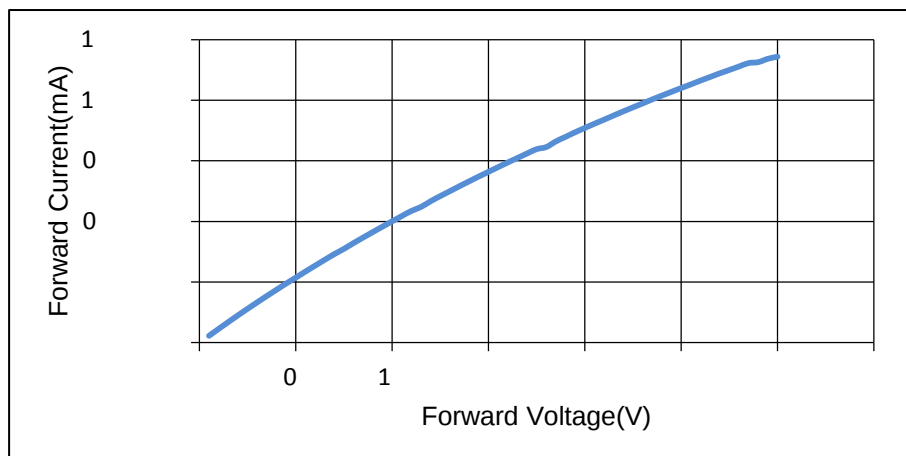


Fig 1-8 Forward Current Vs. Relative Intensity 正向电流与相对光强特性曲线

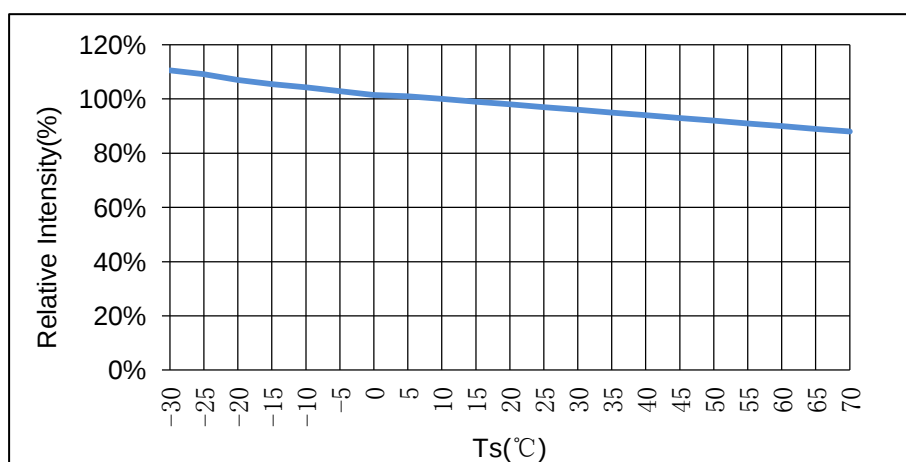


Fig 1-9 Luminous Intensity VS Ambient Temperature 光强与环境温度曲线

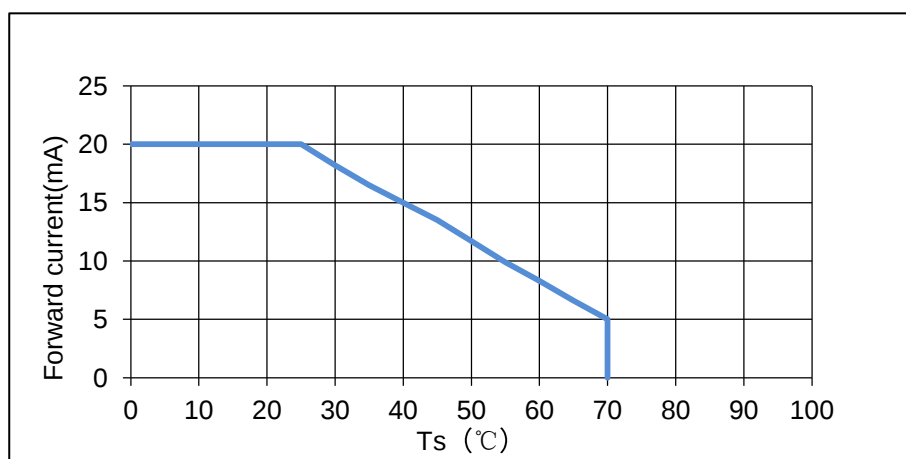


Fig 1-10 Solder Temperature Vs Forward Current 管脚温度与正向电流特性曲线



Fig 1-11 Spectrum Distribution 光谱分布特性曲线

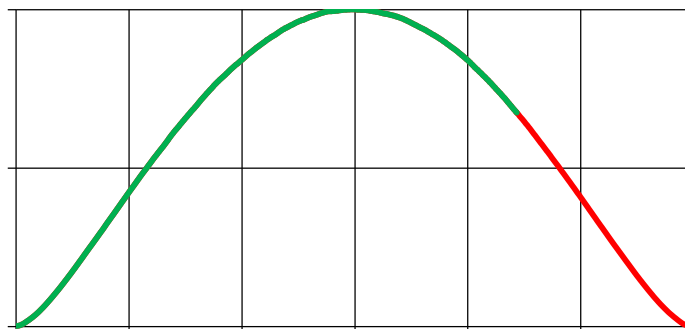
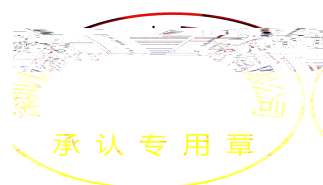


Fig 1-12 Radiation diagram 辐射特性曲线



2. Packaging 产品包装

2.1 Packaging Specification 包装规格

Package:3000pcs/reel.包装每卷 3000pcs。

2.1.1 Carrier Tape Dimension 载带尺寸

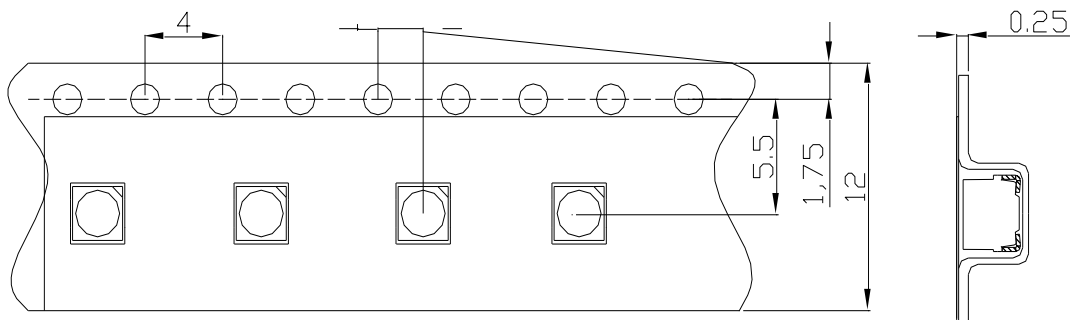


Fig.2-1 Carrier Tape Dimension 载带尺寸

2.1.2 Reel Dimension 卷盘尺寸

Table 2-1 Title 表名

A	320.2±2mm
B	79.5±0.2mm
C	14.3±0.2mm
D	2.5±0.2mm
E	15.5±0.2mm
F	12.7±0.3mm

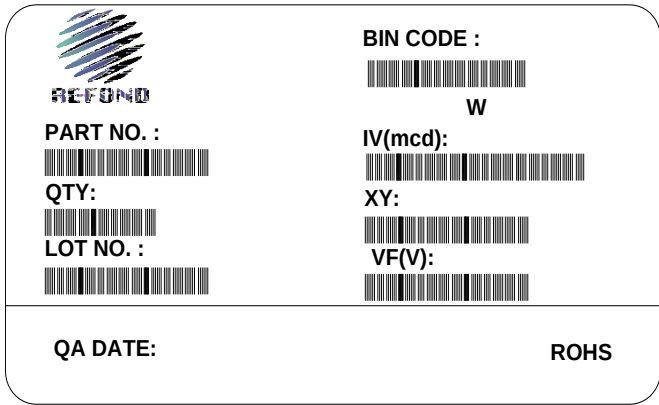
Fig.2-2 Title 图名

Notes 备注：

The tolerances unless mentioned ±0.1mm. Unit : mm ±0.1 , 。

2.1.3 Label Form Specification 标签规格

Table 2-2 Title 表名



PART NO.	Part Number	品名
LOT NO.	Lot Number	批次号
BIN CODE	Bin Code	参数代码
IV	Llight intensity	光强
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 Title 图名

2.2 Moisture Resistant Packing 防潮包装

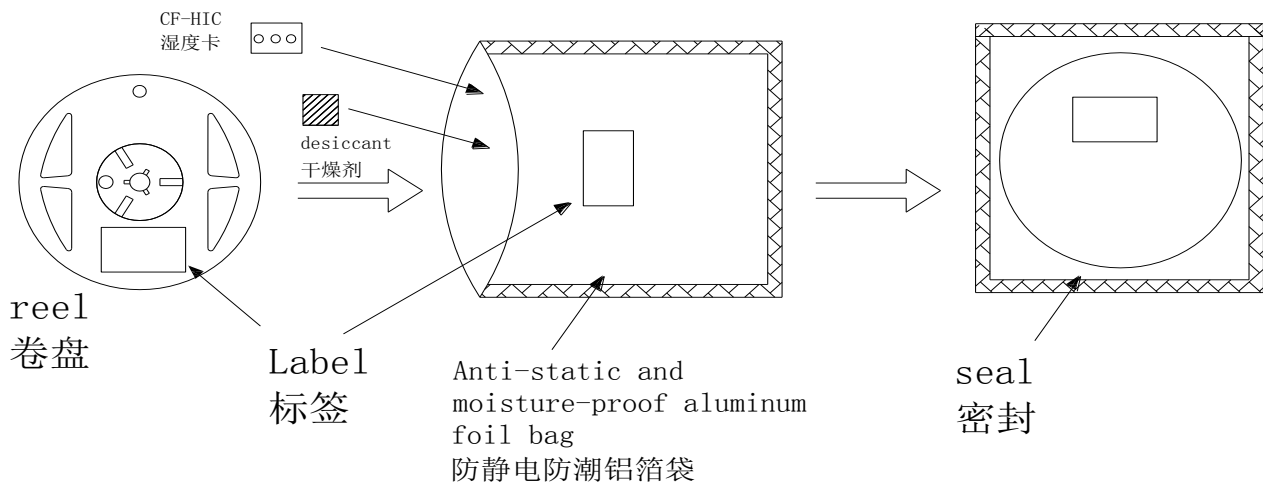
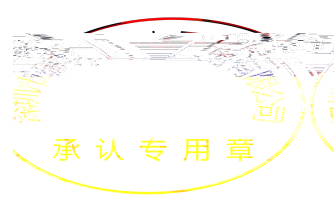


Fig.2-4 Title 图名



2.3 Cardboard Box 包装纸箱

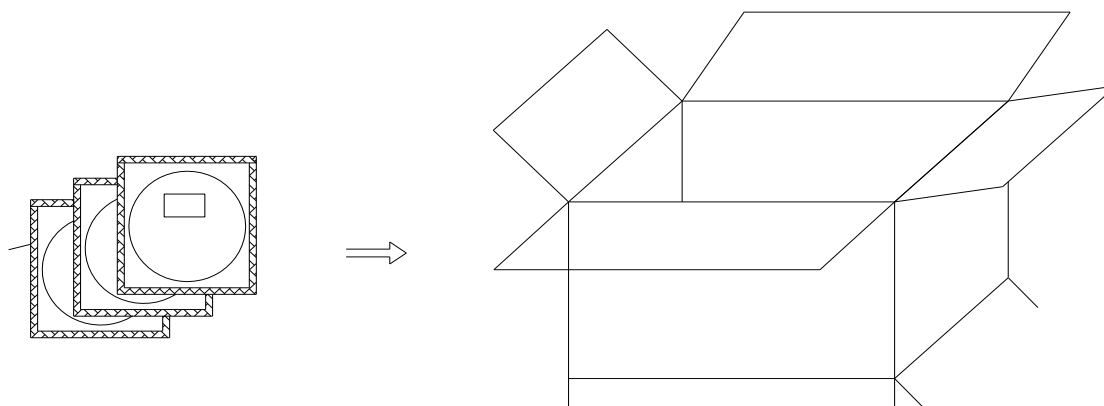
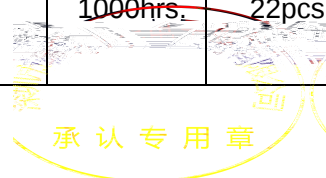


Fig.2-5 Title 图名

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

Table 2-3 Title 表名

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
Resistance to Soldering Heat 耐焊接热	JESD22-B106	Temp:260°Cmax T=10 sec	3times	22pcs.	0/1
Thermal Shock 冷热冲击	JEITAED-4701 300 307	-40°C 15min 10s 100°C 15min	500cycle	22pcs.	0/1
High Temperature Storage 高温保存	JEITAED-4701 200 201	Temp:100°C	1000hrs.	22pcs.	0/1
Low Temperature Storage 低温保存	JEITA ED-4701 200 202	Temp:-40°C	1000hrs.	22pcs.	0/1



Room Temperature Operating Life 常温寿命测试	JESD22-A108	$T_A=25^{\circ}\text{C}$ $I_F=20\text{mA}$	1000hrs.	22pcs.	0/1
High Temperature High Humidity Life Test 高温高湿寿命测试	JESD22-A101	$85^{\circ}\text{C}/85\%\text{RH}$ $I_F=10\text{mA}$	500hrs.	22pcs.	0/1
Temperature Humidity Storage 高温高湿储存	JEITA ED-4701 100 103	$T_A=85^{\circ}\text{C}$ $\text{RH}=85\%$	1000hrs.	22pcs.	0/1
Low Temperature Life Test 低温寿命	JESD22-A108D	$T_A=-40^{\circ}\text{C}$, $I_F=20\text{mA}$	1000hrs.	22pcs.	0/1

2.5 Criteria For Judging Damage 失效判定标准

Table 2-4 Title 表名

Test Items 项目	Symbol 符号	Test Condition 测试条件	Criteria For Judgement 判定标准
Forward Voltage 正向电压	V_F	$I_F=20\text{mA}$	Initial Data $\pm 10\%$ 初始值 $\pm 10\%$
Reverse Current 反向电流	I_R	$V_R = 5\text{V}$	I_R
Luminous Intensity 光强	I_V	$I_F=20\text{mA}$	Average I_V degradation rate 平均 I_V 衰减 $\leq 30\%$
Resistance to Soldering Heat 耐焊接热	/	/	No internal cracks, no material between stripped, no dead light 材料无内部裂痕、剥离、无死灯

Notes 备注:

1. The Reliability tests are based on Refond existing test platform. 可靠性测试基于瑞丰现有的测试平台。
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 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。

3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1 SMT Reflow Soldering Instructions SMT 回流焊说明

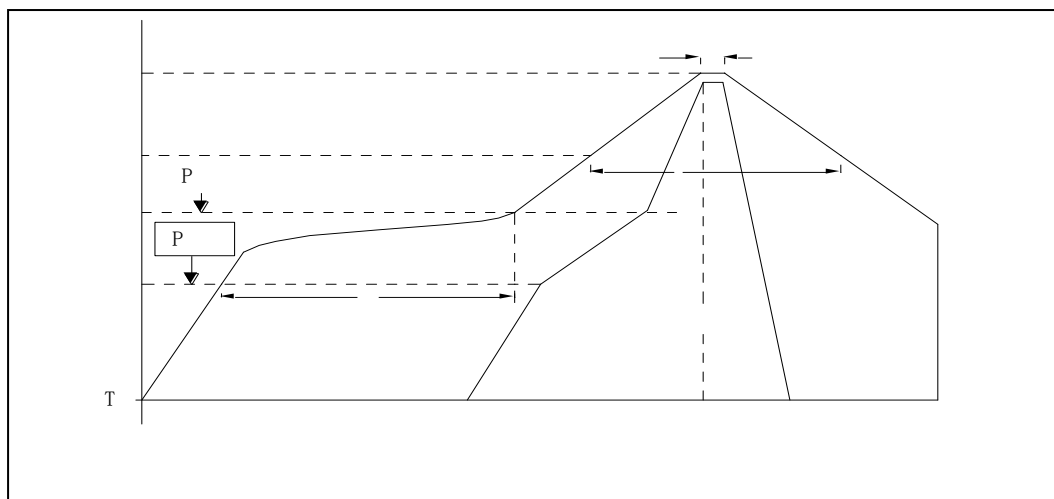


Fig.3-1 Title 图名

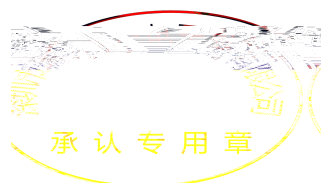
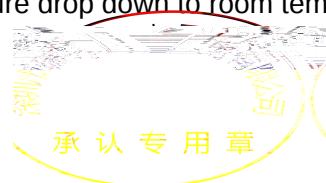


Table 3-1 Title 表名

Average temperature rise speed平均升温速度 (T _{smax} 至T _P)	Max 4 °C/ s 最高4 °C/秒
Preheating: minimum temperature预热：最低温度 (T _{smin})	150 °C
Preheating: Max temperature预热：最高温度 (T _{smax})	200 °C
Preheating: Time预热：时间 (T _{smin} 至T _{smax})	60s-120s 60 - 120秒
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)	Max 60s 最多60秒
Peak /Classification of temperature: 峰值 / 分类温度 (T _P)	250 °C
Time limit classification of peak temperature time 限时峰值分类温度：时间 (t _p)	Max 10s 最多10秒
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	Max 30s 最多30秒
Cooling speed 降温速度	Max 6 °C/ s 最高6 °C/秒
Needed time from 25 °C to T _p 25 °C 升至峰值温度所需时间	Max 8 minutes 最多8分钟

Notes 备注：

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



4.Handling Precautions 产品使用注意事项

4.1Handling Precautions 产品使用注意事项

4.1.1 Storage 贮存

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

本产使用密封防潮抗静电袋包装,并附有干燥剂,未开封的产品保存时间一年.

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

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.

(3) 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

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.

(4) 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.

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.

(5) 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 for 24 hours.

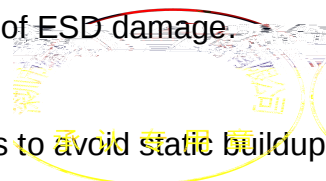
对于尚未焊接的LED,如果吸湿剂或包装失效,或者产品没有符合以上有效存储条件,烘烤可以起到一定的性能恢复效果, 烘烤条件:65±5°C,持续时间24H.

4.1.2 Static Electricity 静电

(1) The following procedures may decrease the possibility of ESD damage.

以下操作可降低静电破坏的可能性

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



4.1.5 Others 其它事项

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.

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来在元件

4.1.6 Declare 申明

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

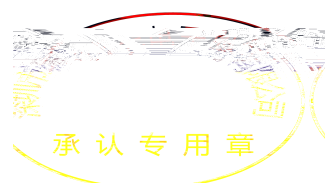
此规格书以中英文方式书写，若有冲突以中文版本为准.

(2) Both the customers and Refond will agree on official specifications of supplied products before

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。



[illegible]

承认专用章



Declare 申明

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