SPECIFICATION
产品规格书

REFOND P/N 产品型号

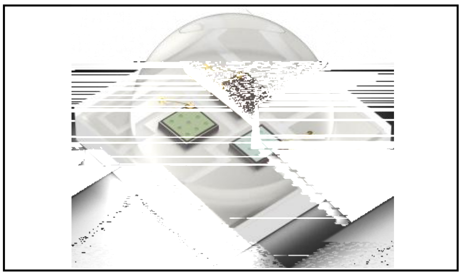
RF-ARC50RGB-L8-K0-A120

□R&D 研发

■ Mass Product 量产供货

1. Description 产品介绍

1.1General Description 产品描述



The Red source color devices are made with AlGaInP on Substrate Light Emitting Diode

红光 LED 由 AlGaInP 四种元素芯片激发而成

The Green source color devices are made with InGaN on Substrate Light Emitting Diode

绿光 LED 由 InGaN 三种元素芯片激发而成

The Blue source color devices are made with InGaN on Substrate Light Emitting Diode

蓝光 LED 由 InGaN 三种元素芯片激发而成

The LED package dimension: 5.00mmX5.00mmX3.00mm.

产品尺寸：5.00mmX5.00mmX3.00mm。

1.2 Features 产品特征

Ceramics Package.陶瓷封装

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.

Available on tape and reel.适用于载带及卷轴

Moisture sensitive level:Level1. 防潮等级：Level 1

RoHS compliant.满足RoHS要求

1.3Application 产品应用

Article color lamp, lamp belt. 彩色灯条、灯带

Landscape lighting，Trademark logo.景观照明，招牌字

Hotels, markets, offices, household and other indoor uses.酒店、商场、办公室、家用及其它室内用途

General use.其他应用

1.4Package Dimension 封装尺寸

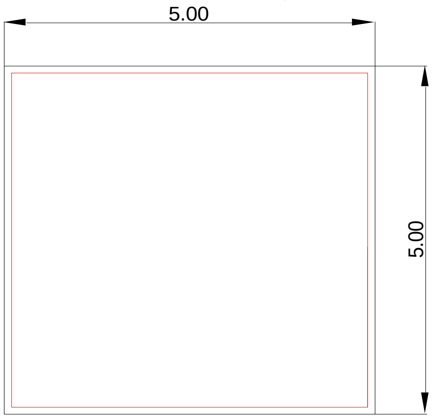


Fig.1-1 Top view 正面视图

Fig.1-2 Side view 侧面视图

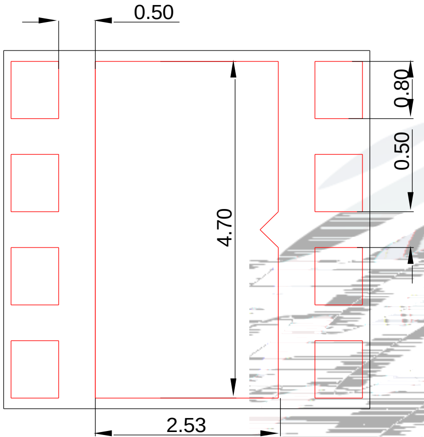


Fig.1-3 Bottom view 背面视图

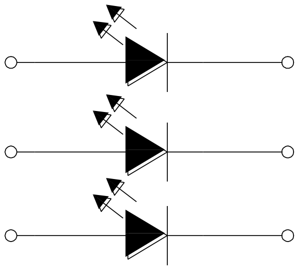


Fig.1-4 Polarity 极性

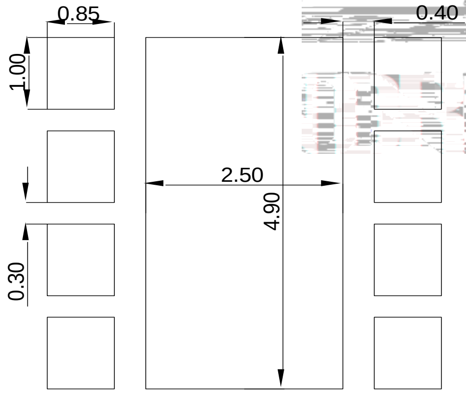


Fig.1-5 Soldering patterns 推荐焊盘

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

Reverse Voltage （反向电压）	V_R	5	V
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_{OPR}	-40 ~ +85	
Junction Temperature （结温）R	T_J	125	
Junction Temperature （结温）G	T_J	150	
Junction Temperature （结温）B	T_J	150	

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±1nm. 以上所示波长测量误差±1nm.

4. The above luminous intensity measurement allowance tolerance ±10%. 上述发光强度的测试允许公差为±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. 丰现有的[illegible]所有测试都是基于瑞丰标准测试平台。

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。

1.5.1 Bin Range Of Forward Voltage and Luminous Intensity (IF=350mA)

BIN (IF=350mA)

Table 1-3

V_F V R	B0	C0	D0	
	1.8-2.0	2.0-2.2	2.2-2.4	
V_F V G&B	G0	H0	I0	
	2.8-3.0	3.0-3.2	3.2-3.4	
R	FB7	FB8	FB9	FC0
	50-60	60-70	70-80	80-90
G	FC5	FC6	FC7	FC8
	130-140	140-150	150-160	160-170
B	FB5	FB6		
	30-40	40-50		
WLD-R (nm)	E00	F00		
	620-625	625-630		
WLD-G (nm)	E00	F00		
	520-525	525-530		
WLD-B (nm)	C00	D00	E00	
	460-465	465-470	470-475	

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

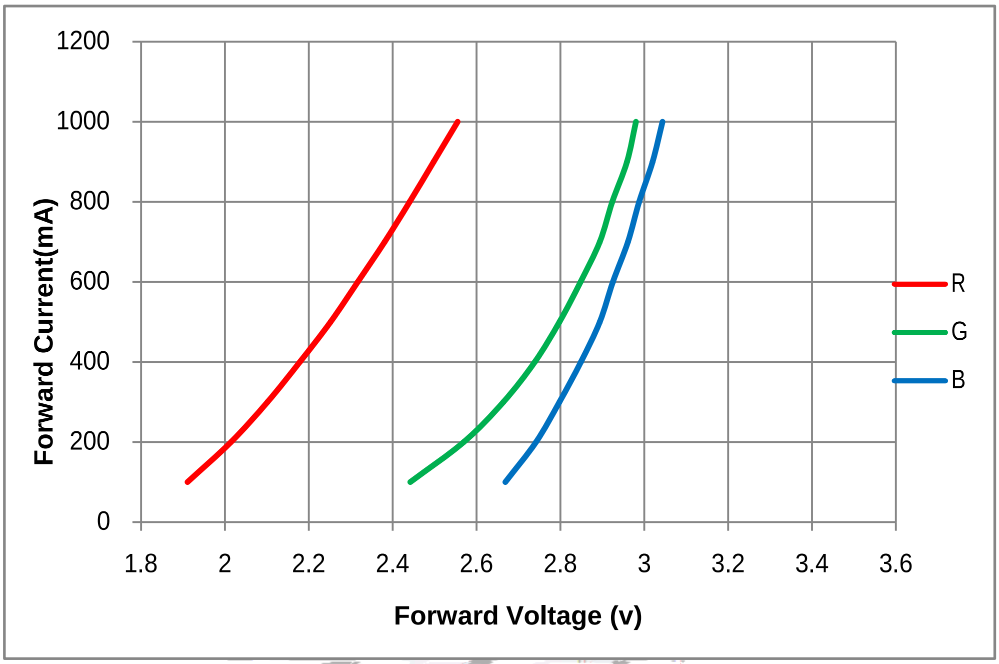


Fig 1-6 Forward Voltage Vs. Forward Current伏安特性曲线

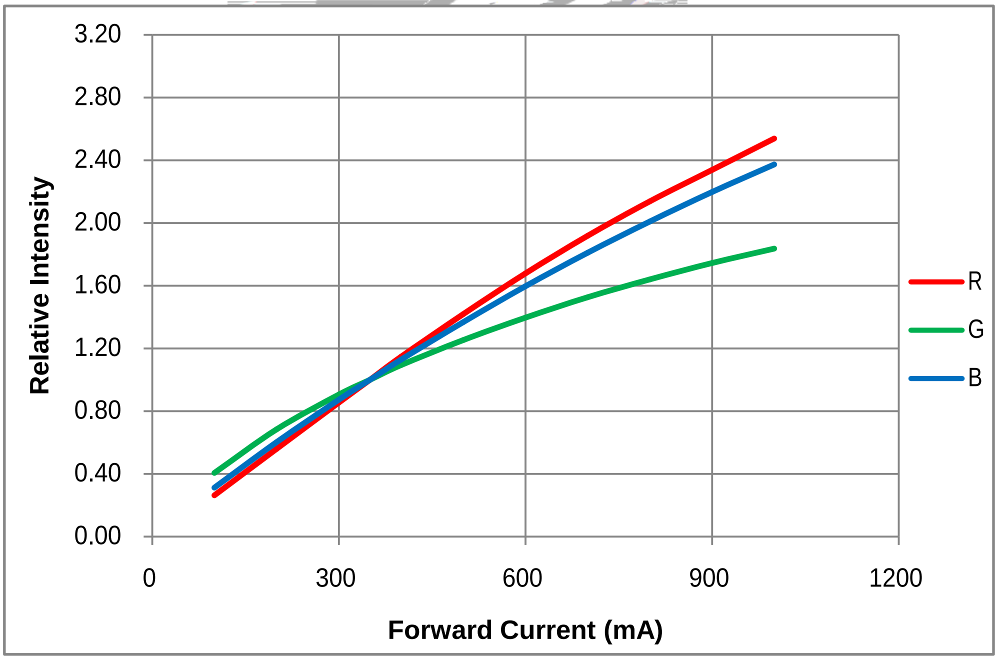


Fig 1-7 Forward Current Vs. Relative Intensity正向电流与相对光强特性曲线

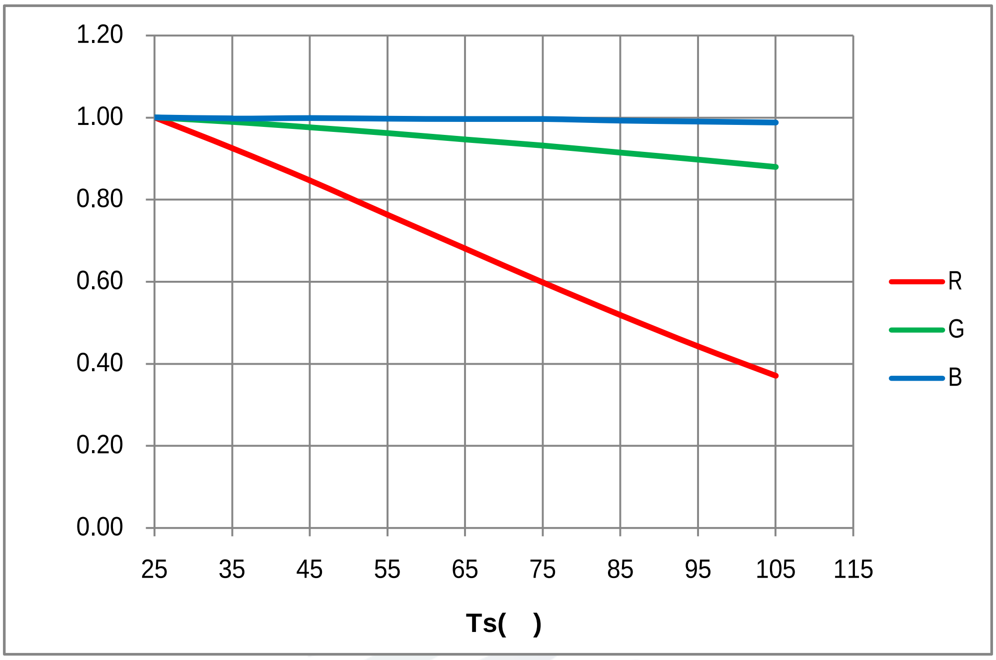


Fig.1-8 Temperature Vs. Relative Intensity 引脚温度与相对光强特性曲线

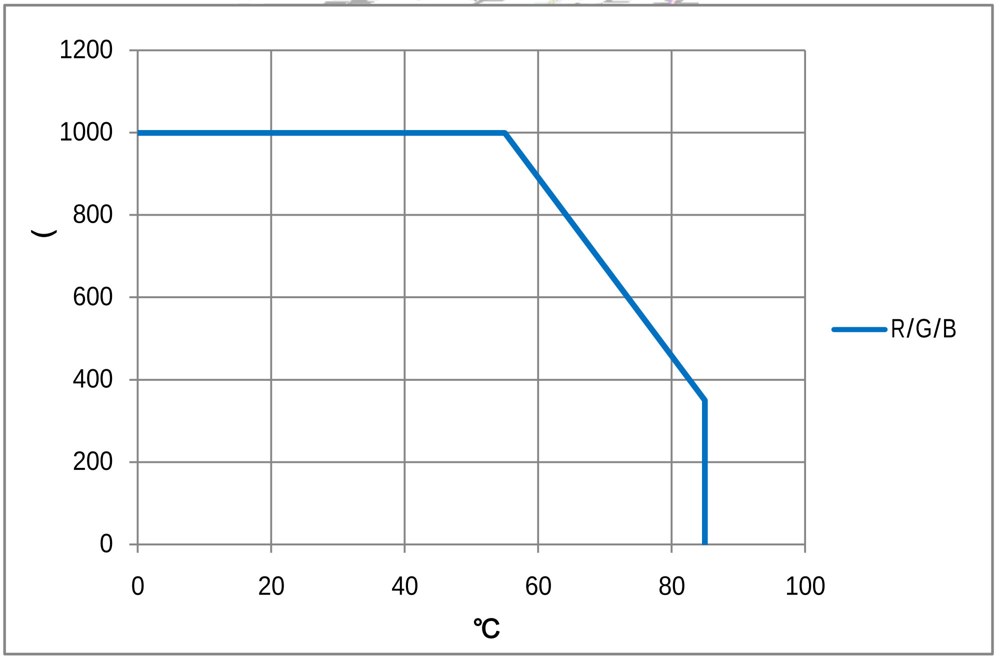
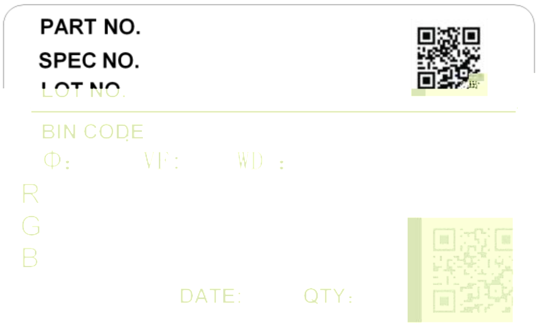


Fig 1-9 Ts Temperature Vs Forward Current 管脚温度与正向电流特性曲

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

Fig 1-11 Radiation diagram

2.1.3Label Form Specification 标签规格



PART NO.
SPEC NO.
LOT NO.
BIN CODE
Φ: VF: WD:
R
G
B
DATE: QTY:

Fig 2-3 Label Form 标签模板

Table 2-2 Title

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
V_F	Forward Voltage 正向电压
WD	Dominant Wavelength 主波长
QTY	Packing Quantity 数量
DATE	Made Date 生产日期

2.2Moisture Resistant Packing 防潮包装

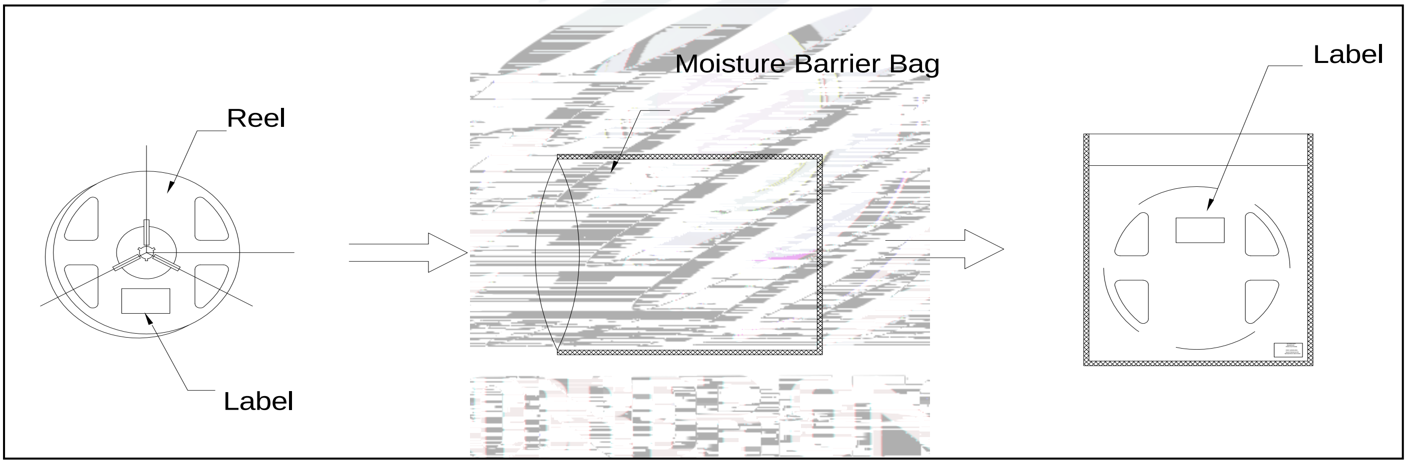


Fig.2- Packing specification 包装说明

2.3Cardboard Box 包装纸箱

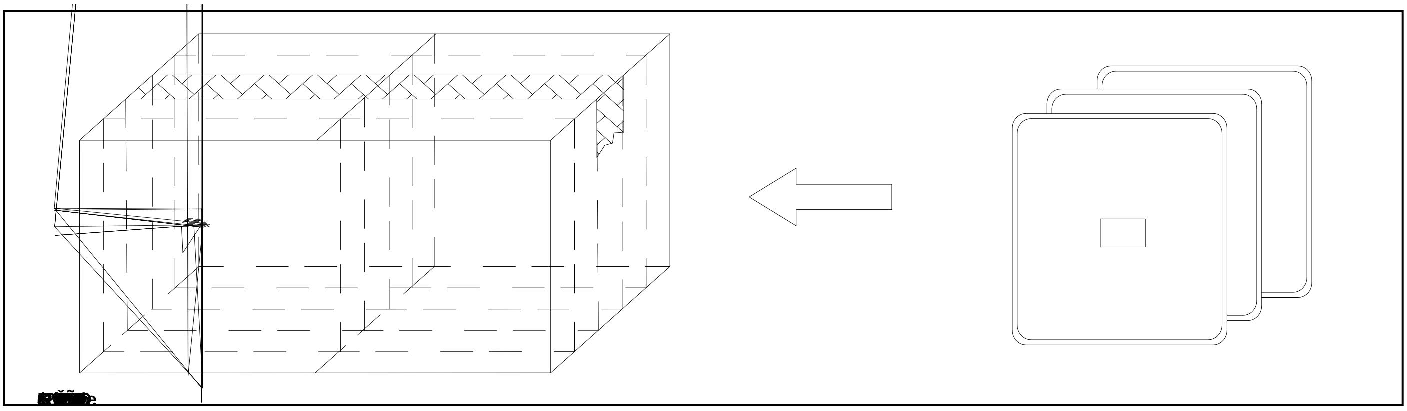


Fig.2- Cardboard Box 包装纸箱

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

Table 2-3 Test items and conditions 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	2times.	10pcs.	0/1
Thermal Shock 冷热冲击	JEITAED-4701 300307	-40℃ 15min 10s 100℃ 15min	300 cycle.	10pcs.	0/1
High Temperature Storage 高温保存	JEITAED-4701 200 201	T_{emp}:100℃	1000hrs.	10pcs.	0/1
Low Temperature Storage 低温保存	JEITA ED-4701 200 202	T_{emp}:-40℃	1000hrs.	10pcs.	0/1
Life Test 常温通电	JESD22-A108	T_A=25℃ I_F=350mA	1000hrs.	10pcs.	0/1
High Temperature High Humidity Life Test 高温高湿通电	JESD22-A101	60℃/ 90%R_H I_F=350mA	1000hrs.	10pcs.	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	Applicable project 适用项目
Forward Voltage 电压	V_F	I_F=350mA	≤±10%	Reflow

Luminous Flux R	Φv	I_F=350mA	Maintenance≥70% 光通量维持率	Thermal Shock High and Low Temperature Storage Life Test
Luminous Flux G			Maintenance≥70% 光通量维持率	
Luminous Flux B			Maintenance≥50% 光通量维持率	
Luminous Flux W			Maintenance≥80% 光通量维持率	
Lamp Bead Light Test 灯珠点亮测试	/	I_F=350mA	No open circuit short circuit or flicke 无开路、短路、闪变	High Temperature High Humidity Life Test

Notes 备注：

1.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。

2.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 回流焊说明

3.1SMT Reflow Soldering Instructions SMT 回流焊说明

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

Table 3-

Hold time within 5 °C with the actual peak temperature (TP) 与实际峰值温度 (TP) 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 Tp 25 °C 升至峰值温度所需时间	Max 8 minutes 最多8分钟

Notes 备註[illegible]

(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)Whensoldering , do not put stress on the LEDs during heating.当焊接时，不要在材料受热时用力压胶体表面[illegible]

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℃，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 修[illegible]

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[illegible]会损坏LED本身的特性。

3.1.3 Cautions 注意事项

(1) 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 usethe 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[illegible]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，不要对材料实加外力，也不要有震动，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 ex- ternal 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 elementis 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 tobe used. Attaching LEDs, do not use adhesives that outgas organic vapor. LED 内部，在通电产生光子及热的条件下，会导致 LED 变色，进而造成严重光衰，提前了解套件材料能够避免产生这些问题。瑞丰反对使用任何对 LED 器件的性能或者可靠性有害的物质或材料，不管这些材料是已经证实了的还是仅仅怀疑有害。针对特定的用途和使用环境，瑞丰建议对所有的物质和材料进行相容性的测试。在贴装 LED 时候，不要使用能产生有机挥发性气体的粘结剂

(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，一定可能会损坏内部电路。

Fig 4-1Misoperation 错误操作

(5) In designing a circuit,the current through each LED must 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，可能导致产品烧毁。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

Version History/修订历史

Date日期	Revisor修订者	Version版本	Verifier审核	Remarks备注
2022-08-30	刘明	E0	姚胜坚	

瑞豐光電
REFOND

www.refond.com

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。