Specification
规格书

Customer name : _____
客户名称

Customer P/N : _____
客户品号

Refond P/N : RA32A1-RUT-FR
公司型号

Sending Date: _____
供货日期

☐Technical Reference 技术参考		☐Sample 样品	☐Mass Product 量产供货		
Client approval 客户审核			**Refond approval** 瑞丰审核		
Approval 核准	**Audit** 确认	**Confirmation** 制作	**Approval** 核准	**Audit** 确认	**Confirmation** 制作
☐**Qualified** 接受	☐**Disqualified** 不接受		**Date** ： 日期：		

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注：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 a customer’ s volume production. The specification is valid only after be signed. 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。规格书签核后方有效，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。

3. Consult Refond’ s sales staff in advance for information on the applications in which exceptional quality and reliability are required. 如产品需要用在有特殊质量要求及可靠性要求的地方，请提前咨询瑞丰的销售人员以取得相关信息。

4.The customer shall not disassemble or analyse the LEDs without having consent from Refond. When defective LEDs are found, the customer shall inform Refond in writing directly before disassembling or analysis.在取得瑞丰的同意前，客户不应该对产品进行拆解分析，如发现失效产品，请直接书面通知瑞丰。

REFOND PG LED
RA32A1-RUT-FR

产品描述 Product description

本产品采用 PLCC-2 封装, 具有发光角度大,可靠性高. 广泛运用于各类植物灯照明中 ,如花卉生产 ,组织培养 ,植物工厂 , 温室蔬菜与水果 , 冰箱保鲜。

This product uses the PLCC-2 Package, it has a wide viewing angle, high reliability. it also be widely application for Grow Lamps , Such as Flower production ,tissue culture ,plant factory ,Greenhouse and refreshment.

产品特征

- 尺寸(mm) : 2.8×3.5×0.7
- 半角±60°
- 高可靠性
- 峰值波长660nm
- 无铅回流焊
- 符合RoHS
- 包装每卷4000pcs

Features

- Size(mm): 2.8×3.5×0.7
- Half angle:±60 deg
- High reliability
- Peak wavelength λp=660nm
- Pb-free reflow soldering application
- RoHS compliant
- Package:4000pcs/reel

产品运用

- 花卉生产
- 组织培养
- 植物工厂
- 冰箱保鲜

Applications

- Flower production
- tissue culture
- plant factory
- refreshment

极限参数(温度=25°C)　　Absolute Maximum Ratings (Ta = 25℃)

参数名称 Parameter	符号 Symbol	极限参数 Absolute Maximum Rating	单位 Unit
正向电流 Forward Current	I_F	100	mA
反向电压 Reverse Voltage	VR	5	V
工作温度 Operating Temperature	T_{OPR}	-40 ~ +85	℃
贮存温度 Storage Temperature	T_{stg}	-40 ~ +100	℃
功耗 Power Dissipation	P_D	0.2	W
静电放电(人体模式) Electrostatic Discharge (HBM)	ESD	2000	V

光电参数 (温度=25°C)　　Typical Electrical & Optical Characteristics (Ta = 25℃)

参数名称 Parameter	符号 Symbol	条件 Condition	参数 Value			单位 Unit
			Min	Max	Typ	
反向电流(最大) Reverse Current(max.)	I_R	V_R = 5V	---	10	---	μA
正向电压 Forward Voltage	V_F	I_F = 60mA	1.8	---	2.1	V
峰值波长 Peak Wavelength	λ_d	I_F = 60mA	655	---	658	nm
半波宽 Spectrum Radiation Bandwidth	Δ λ	I_F = 60mA	---	---	17	nm
光强 Photometric	IV	I_F = 60mA	560	---	1000	mcd
半角 Half Angle	φ	I_F = 60mA	±60			deg

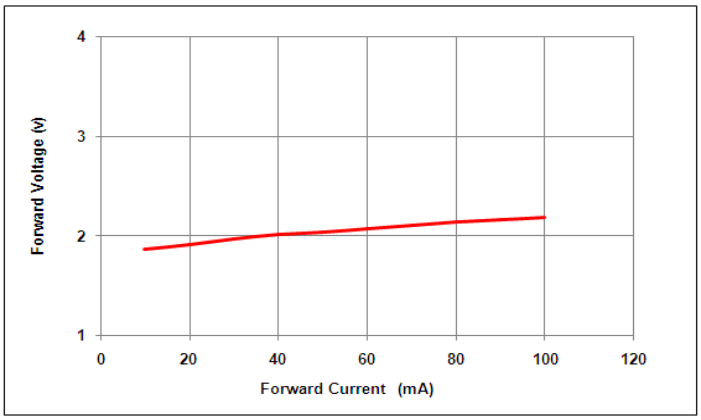
备注　note

- 光强测量公差：±10%　　Tolerance of measurement of Photometric：±10%.
- 波长测量公差　　：　±2nm　　Tolerance of measurement of dominant wavelength: ±5nm.
- 正向电压测量公差　：　±0.05V　　Tolerance of measurement of forward voltage±0.05V.
- 以上参数仅供参考,请以实物标签为准　　All the datas are just for reference, specific parameters please refer to the label.

典型特性曲线 Typical Characteristics Curves

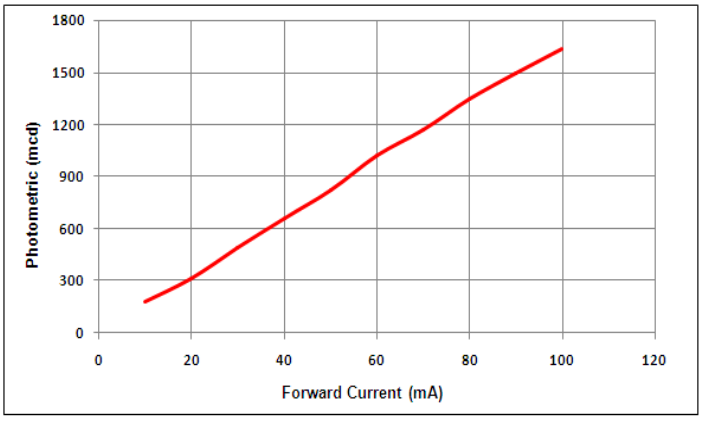
伏安特性曲线

Forward Voltage Vs. Forward Current



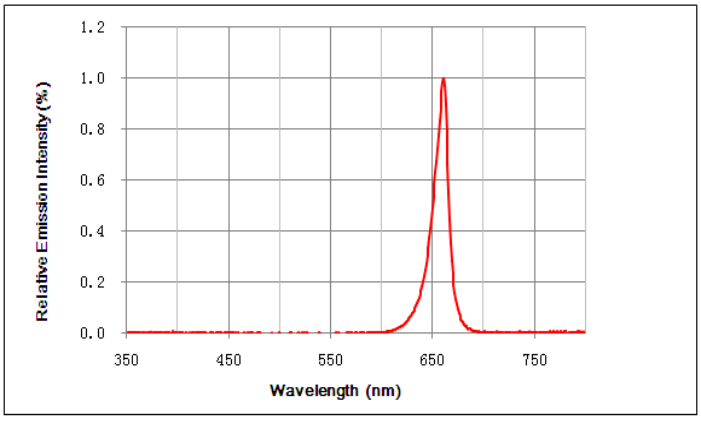
正向电流与光强特性曲线

Forward Current Vs. Photometric



光谱分布特性曲线

Spectrum Distribution



备注: Note:

所有测试都是基于瑞丰现有的标准测试平台.

All measurements were made under the standardized environment of Refond.

可靠性试验 Reliability Test Items Conditions

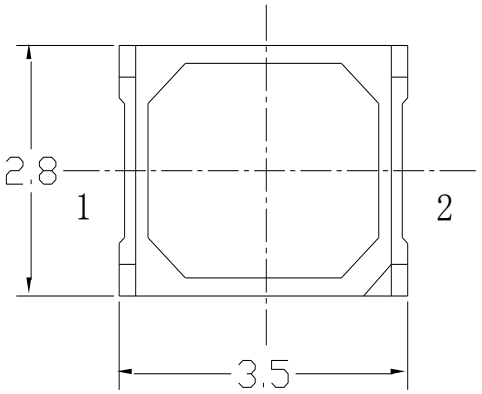
实验项目 Test Items	参考标准 reference Criterion	实验条件 Test Conditions	时间 Time	样品数 Quantity	判定 Criterion
高温储存 High Temperature Storage	JESD22-A103	Ta=100°C	1000H	11	0/11
低温储存 Low Temperature Storage	JESD22-A119	Ta=-40°C	1000H	11	0/11
常温寿命测试 Room Temperature Operating Life	JESD22-A108	Ta=25°C, IF=100mA	1000H	11	0/11
高温高湿寿命测试 High Temperature High Humidity Life Test	JESD22-A101	Ta=60°C,RH=90% IF=100mA	1000H	11	0/11
冷热冲击 Thermal Shock	JESD22-A104	-40°C(15nin)←→100°C(15 min)	300 cycles	11	0/11
温度循环 Temperature Cycle	JESD22-A104	-40°C(30nin)←(5min)→100 °C(30min)	100 cycles	11	0/11
耐焊接热 Resistance to Soldering Heat	JESD22-B106	Tsld=260℃,10sec	3 times	11	0/11

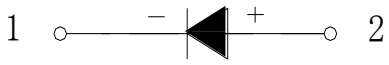
失效判断标准 Criteria for Judging Damage

测试项目 Test Items	符号 Symbol	测试条件 Test Conditions	判定标准 Criteria for Judgment
正向电压 Forward Voltage	V_F	IF =100mA	初始值±10% Initial Data±10%
反向电流 Reverse Current	I_R	VR=5V	IR≤10μA
光强 Photometric	IV	IF=100mA	平均 IV 衰减≤30% AverageΦe degradation rate≤30%

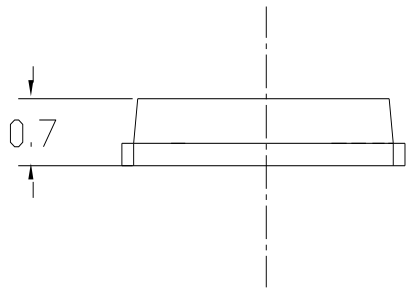
数据工作表中所示的技术信息仅限于典型特征和电路实例引用的产品.它既不构成工业特性的保证,也不构成任何许可的授权。
The technical information shown in the data sheets are limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license.

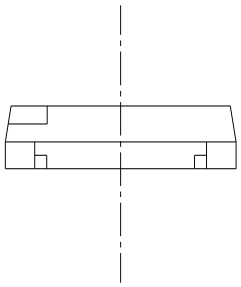
外型尺寸 Outline Dimension

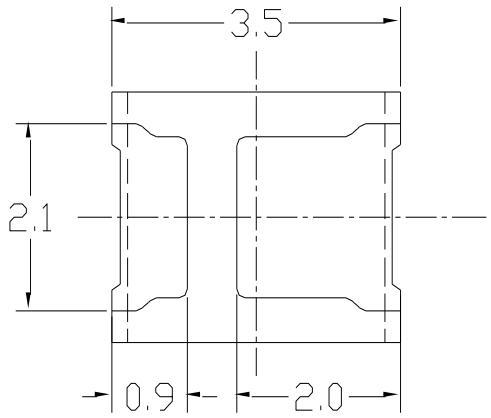




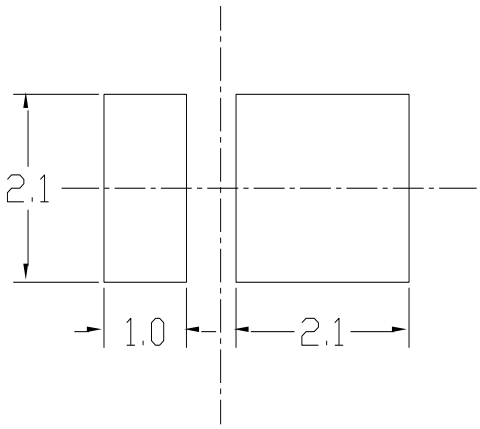
Polarity







View



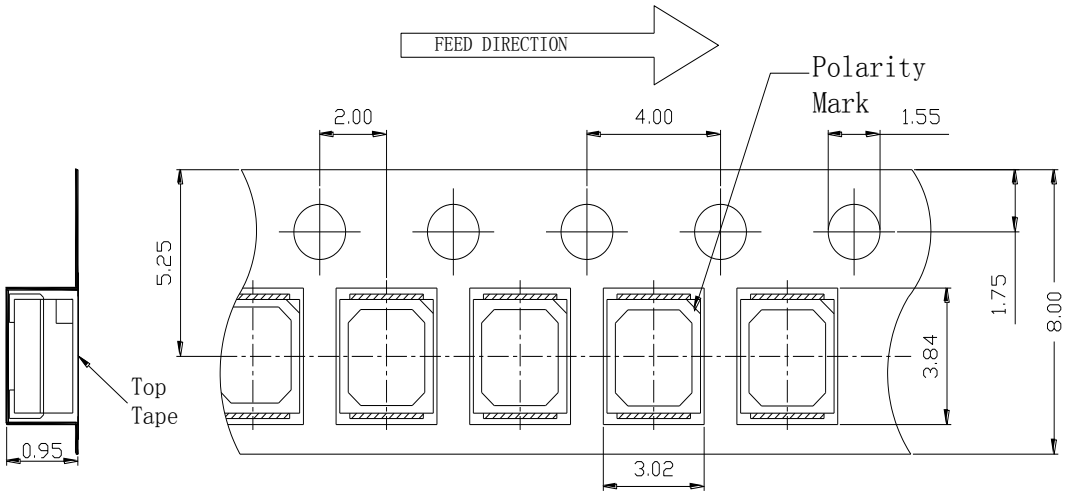
Soldering Patterns

备注: 所有尺寸单位均为 mm,如无特殊说明误差范围为±0.02mm.

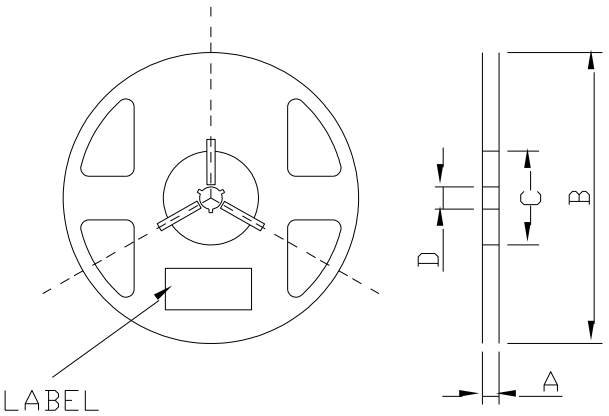
Note: All dimensions in mm ,tolerance is ±0.02mm unless otherwise noted.

包装规格 Packaging Specifications

1. 载体尺寸 Carrier Tape Dimensions



2. 卷材尺寸 Reel Dimension



备注 Note:

标注公差为±0.1毫米，单位：毫米。

The tolerances unless mentioned ±0.1mm. Unit : mm

3. 标签格式规范 Label Form Specification

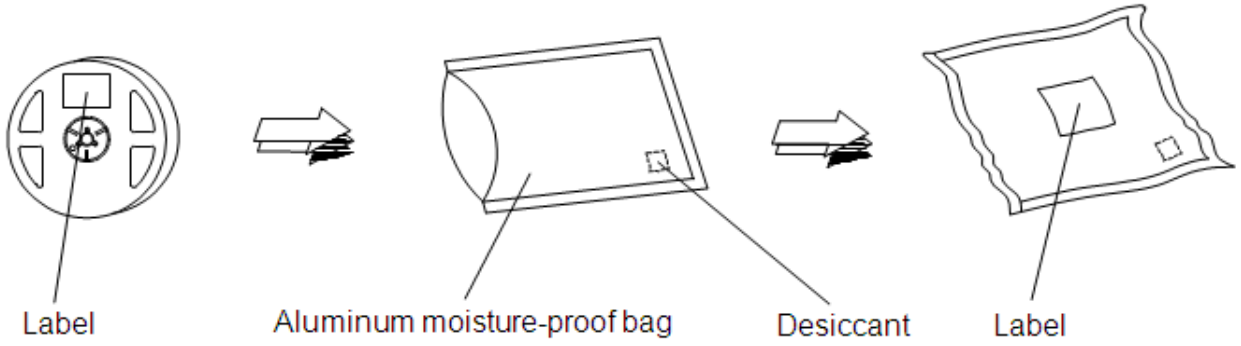
PART NO.
SPEC NO.
LOT NO.

BIN CODE
IV:
WLP :
VF:

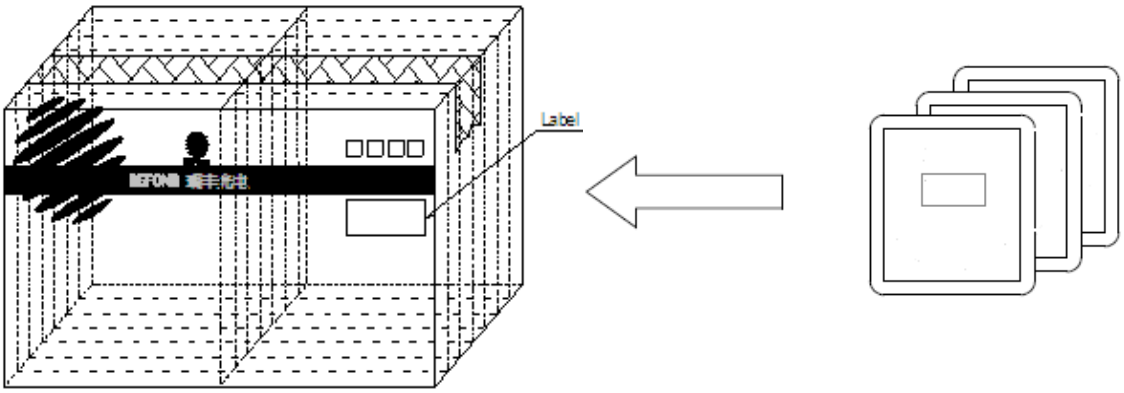
QTY:
DATE:

PART NO.	Part Number
SPEC NO.	Spec Number
LOT NO.	Lot Number
BIN CODE	Bin Code
IV	Photometric
WLP	Peak Wavelength
VF	Forward Voltage
QTY	Packing Quantity
DATE	Made Date

4. **防潮包装过程 Moisture Resistant Packing Process**



5. **装箱 Cardboard Box**



焊接指导 Guideline for Soldering

1. 使用烙铁焊接 Hand Soldering

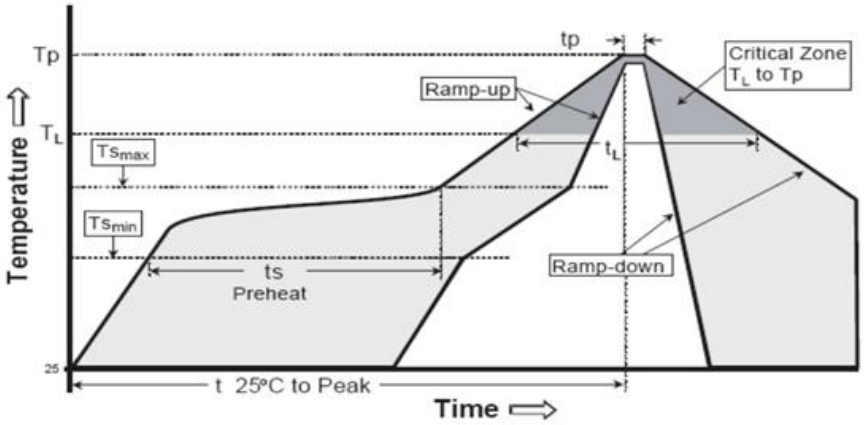
推荐使用功率低于 20W 的恒温烙铁,焊接时烙铁的温度必须保持在 300℃以下,且每个电极只能进行一次焊接,每次焊接的持续时间不得超过 3 秒.

手动焊接过程中的不慎操作易引起 LED 产品的损坏,应当小心谨慎.

A soldering iron with Constant temperature of less than 20W is recommended to be used in Hand Soldering .Please keep the temperature of the soldering iron under 300℃ while soldering. Each terminal of the LED is to go for less than 3 second and for one time only Be careful because the damage of the product is often started at the time of the hand soldering.

2. 回流焊接: 推荐使用以下无铅回流焊接温度图进行

Reflow Soldering: Use the conditions shown in the under Figure of Pb-Free Reflow Soldering.



平均升温速度（Tsmax 至 Tp）	最高 3 °C/ 秒	最高 3 °C/ 秒
预热：最低温度 (Tsmin)	100 °C	150 °C
预热：最高温度 (Tsmax)	150 °C	200 °C
预热：时间（tsmin 至 tsmax）	60 - 120 秒	60 - 180 秒
限时维持高温：温度 (TL)	183 °C	217 °C
限时维持高温：时间 (tL)	60 - 150 秒	60 - 150 秒
峰值 / 分类温度 (Tp)	215 °C	260 °C
与实际峰值温度 (tp) 相差 5 °C 以内的保持时间	10 - 30 秒	20 - 40 秒
降温速度	最高 6 °C/ 秒	最高 6 °C/ 秒
25 °C 升至峰值温度所需时间	最多 6 分钟	最多 8 分钟

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

3. 修补 Repairing

LED回流焊后不应该修复，当修复是不可避免时，必须使用双头烙铁，但必须事先确认此种方式会或不会 损坏LED本身的特性。

Repair 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 will not be damaged by repairing.

4. 注意事项 Cautions

LED封装为硅胶，故LED胶体表面较软，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封装的零件上的 强大压力，当使用吸嘴时，胶体表面的压力应是恰当的。

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 influence to 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.

使用注意事项 Using Guide

1. 贮存 Storage

- 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.
  Moisture proof and anti-electrostatic package with moisture absorbent material is used, Packaged products have one year to save time.
- 开封前,产品须存放在温度不高于30℃,湿度不高于60%RH的环境中.
  Before opening the package, the product should be kept at30℃ or less and humidity less the60%RH.
- 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,湿度显示小于或等于30%时,使用前须进行烘烤.
  Seal anti-electrostatic bag humidity card should immediately check bag humidity indicator card in the open the bag after, Humidity is less than or equal to 30%, Must be baked before use
- 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℃,湿度不高于60%),如未使用完,余料须存放在温度不高于30℃,湿度不高于10%的环境中.
  After opening the package, the product should be soldered within 24 hours. If not, please store at 30℃or less and humidity less than 10%RH. It is recommended that the product be operated at the workshop condition of 30℃ or less and humidity less than 60%RH.
- 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℃,持续时间24H.
  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.

2. 静电 Static Electricity

以下操作可降低静电破坏的可能性

The following procedures may decrease the possibility of ESD damage.

- 将产品和外界之间的摩擦减到最低以避免静电产生.
  Minimize friction between the product and surroundings to avoid static buildup.

- 所有的产品设备和测试仪器必须接地.
  All production machinery and test instruments must be electrically grounded.
- 操作人员必须配戴静电环.
  Operators must wear anti-static bracelets.
- 进入带电设备工作区域时需穿防静电服.
  Wear anti-static suit when entering work areas with conductive machinery.
- 所有操作 IC 和 ESD 敏感器件元器件的工作台必须保持低于 150V 的静电保护.
  All workstations that handle IC and ESD-sensitive components must maintain an electrostatic potential of 150V or less.

3. 反压保护 Reverse voltage protection

通常 LED 的反向漏电流都会很小,不会影响正常使用. 如果长期遭受超过其所能承受的反向电压冲击时,LED 会损伤, 反向漏电流会迅速变大,引起显示屏零灰度下串光的发生. 在设计中, 要注意控制反向电压, 建议加在 LED 上的反向电压值不超过 10V.

In generally the reverse current of LED is very small, it can' t effect using the component normally, but when it often suffered the reverse voltage which exceed the limits of the component than it will be damaged, the reverse current increases rapidly causing the string light display gray scale so when designing, please pay attention to control the reverse voltage we suggest the reverse voltage less than 10V.

4. 温度保护 The safe temperature for LEDs working

LED 在高温条件下, 衰减会加速,本身应力也会增大, 若长期处于高温环境下, 极容易出现失效. 对于高密度排列使用的情况,建议在使用过程中灯面温度不超过 55℃, 灯脚温度不超过 75℃.

The high temperature will make the LED's Luminous Intensity deceased radically, if LEDs worked in hot environment for a long time, they will be disabled easily. When LEDs are working in a closed array, we suggest that the LED's surface temperature should be lower than 55℃ and the leg's temperature should be lower than75℃.

5. 其它事项 Others

请勿直接触摸或操作硅胶透镜表面，这可能会损坏内部的电路, 拿取时用镊子或合适的工具夹在元件的侧边

Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry. Handle the component along the side surfaces by using forceps or appropriate tools.