SPECIFICATION
产品规格书

REFOND P/N 产品型号

RF-AL-E3030L2K0RB-00

R&D 研发

Mass Product 量产供货

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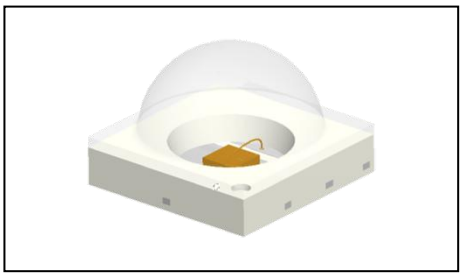
1. Description 产品介绍

1.1General Description 产品描述



This product uses the EMC Molding package, it has a high reliability. it also be widely application for Grow Lamps,such as flower production,tissue culture,plant factory,greenhouse and refreshment.

Size(mm): 3.00mmX3.00mmX2.10mm.

本产品采用EMC Molding封装结构，可靠性高. 广泛应用于各类植物灯照明中，例如：开花生产，组织培养，植物工厂，温室蔬菜与水果，冰箱保鲜。

产品尺寸：3.00mmX3.00mmX2.10mm.

1.2Features 产品特征

Size(mm): 3. 00×3. 00×2.10mm. 尺寸(mm): 3. 00×3. 00×2.10mm

450nm. 峰值波长 450nm

Pb-free reflow soldering application. 无铅回流焊应用

Package:3000pcs/reel. 包装:每卷3000pcs

Moisture sensitive level:Level3. 防潮等级：Level 3

RoHS compliant. 符合RoHS

1.3 Application 产品应用

Flower production.

Tissue culture.

Plant factory.

Refreshment.

1.4 Package Dimension

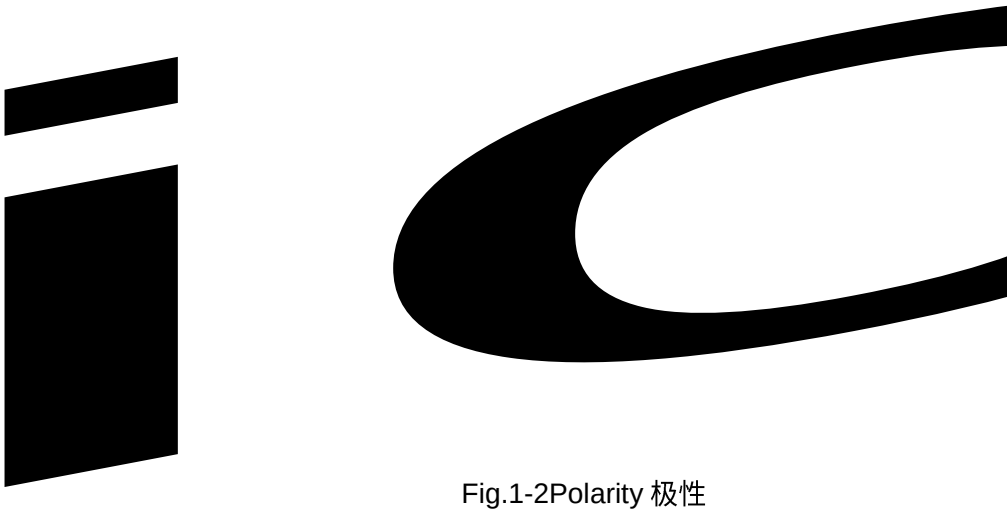


Fig.1-1 Top view 正面视图

Fig.1-2Polarity 极性

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）	
Reverse Current （漏电流）	I_R	V_R=5V	---	---	10	uA
Forward Voltage （正向电压）	V_F	I_F=350mA	2.6	---	3.2	V
Peak Wavelength (峰值波长)	p	I_F =350mA	440	450	460	nm
Total radiant flux 辐射功率	e	I_F =350mA	380	---	705	mW
Viewing Angle （发光角度）	4	I_F=350mA	---	120	---	deg
Thermal Resistance. （热阻）	R_{THJ-S}	I_F=350mA	---	14	---	/W

8. ESD yield is over 90% at 2000V ESD (HBM). ESD protection during products handing is needed.90%的LED通过人体模式ESD2000V 测试。在操作时请注意静电防护。

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

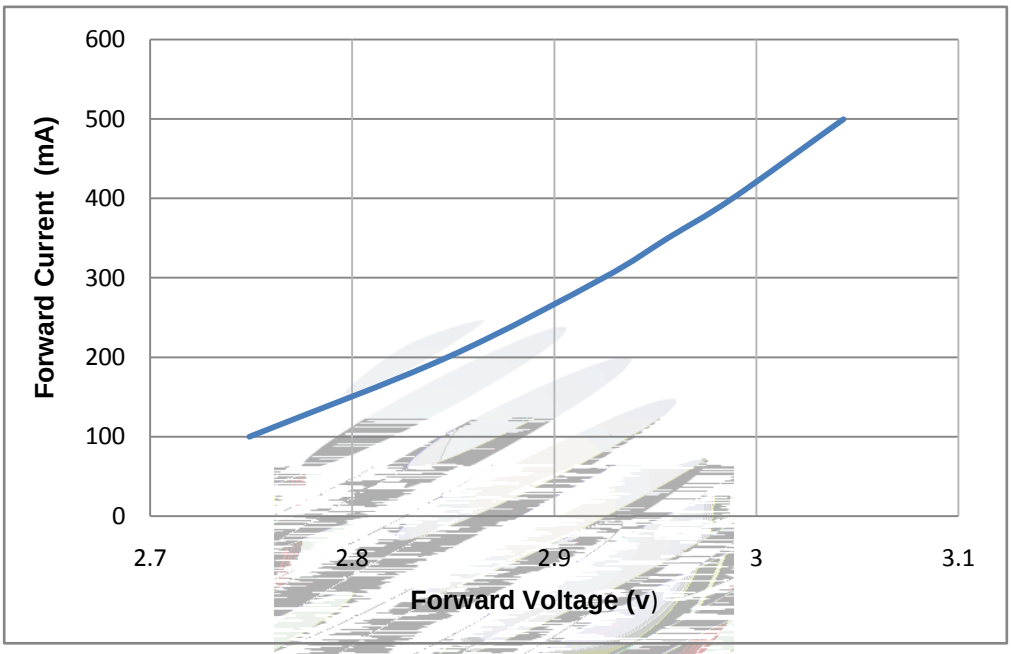


Fig 1-6 Forward Voltage Vs. Forward Current伏安特性曲线

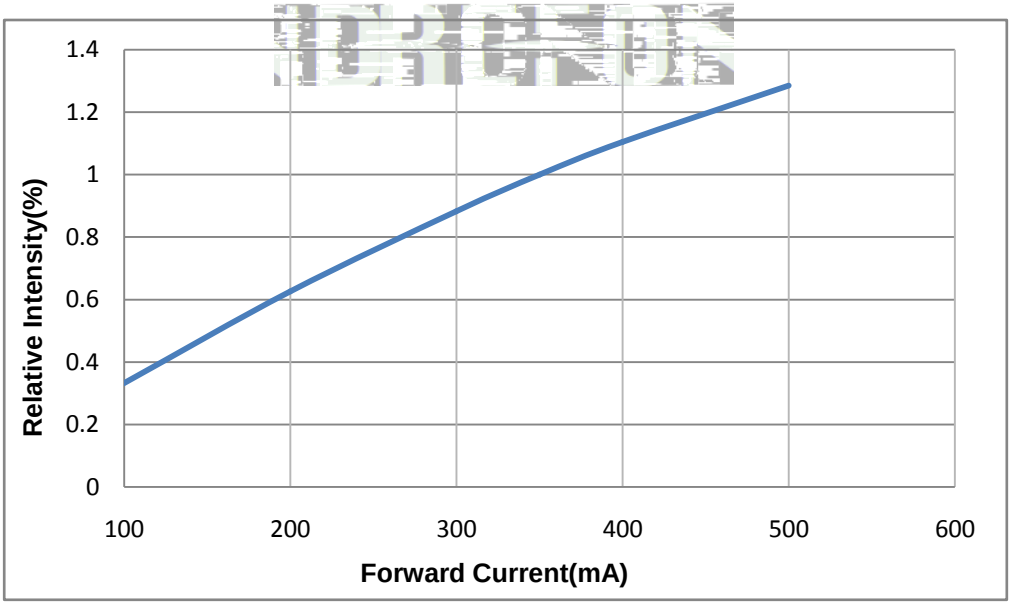


Fig 1-7 Forward Current Vs. Relative Intensity正向电流与相对光强特性曲线

Fig 1-8 Ts

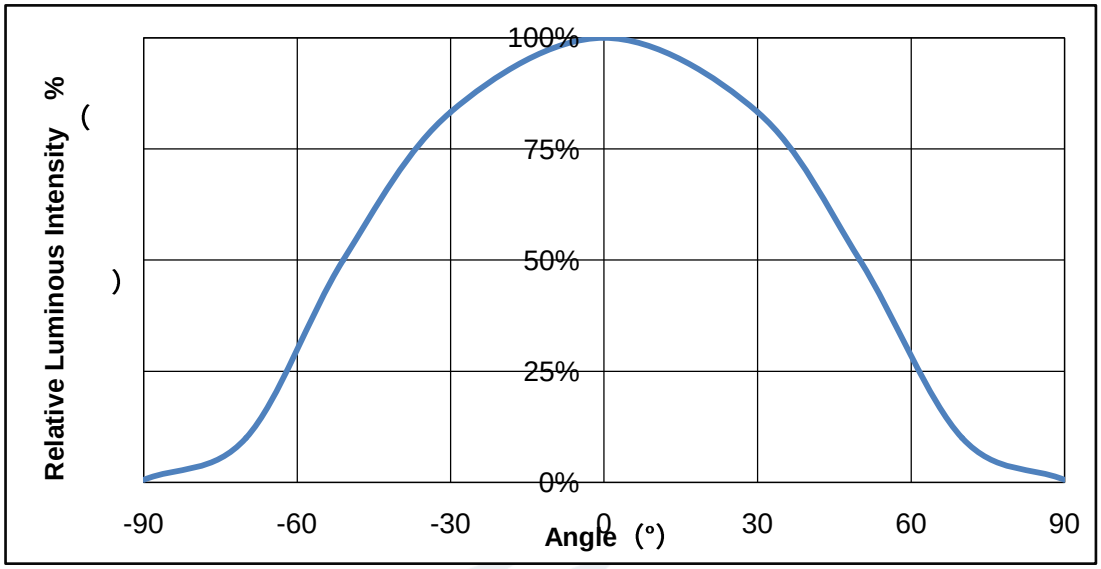


Fig 1-10 Radiationdiagram辐射特性曲线

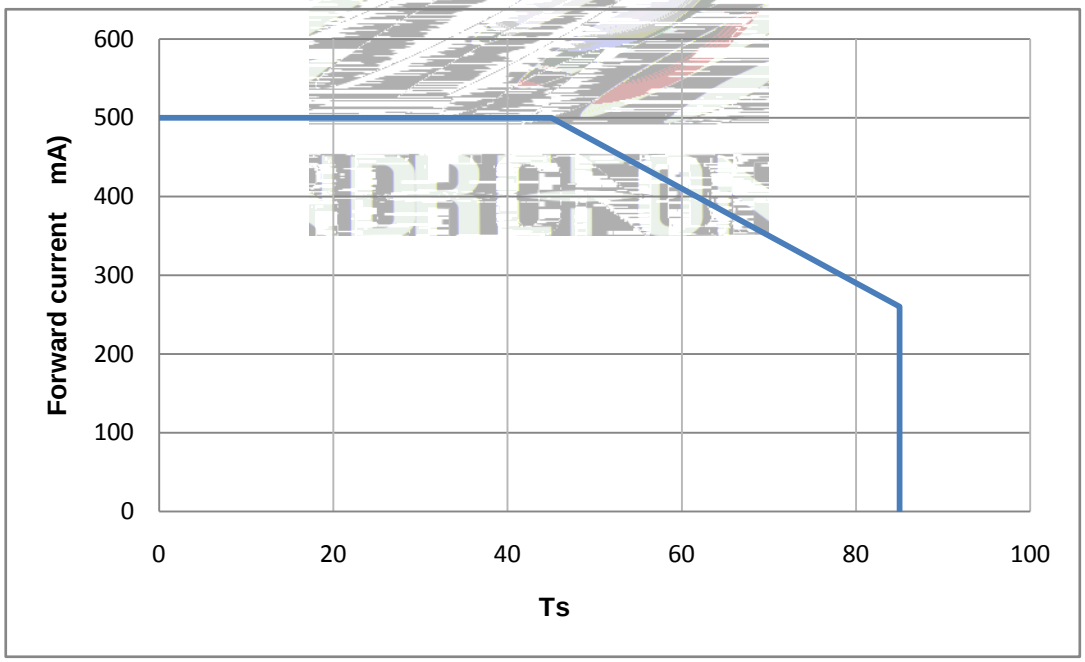


Fig 1-11 Ts Temperature VsForward Current管脚温度与正向电流特性曲线

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

The tolerances unless mentioned ± 0.1mm. 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 Label Form Specification标签规格

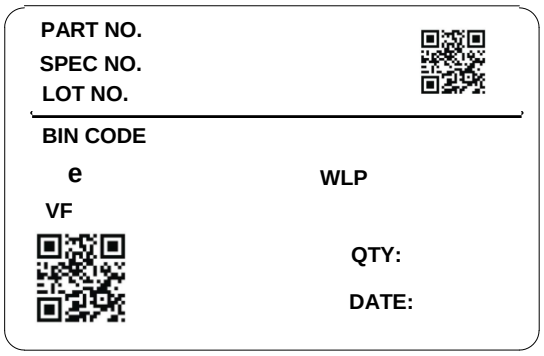


Fig 2-3 Label Form Specification标签规格

PART NO	Part Number 品名
SPEC NO	Spec Number 规格
LOT NO	Lot Number 批次号
BIN CODE	Bin Code 色区
	Total radiant flu 辐射功率
WLP	Peak Wavelength 峰值波长
VF	Forward Voltage 正向电压
QTY	Packing Quantity 数量
DATE	Made Date 生产日期

2.2 Moisture Resistant Packing 防潮包装

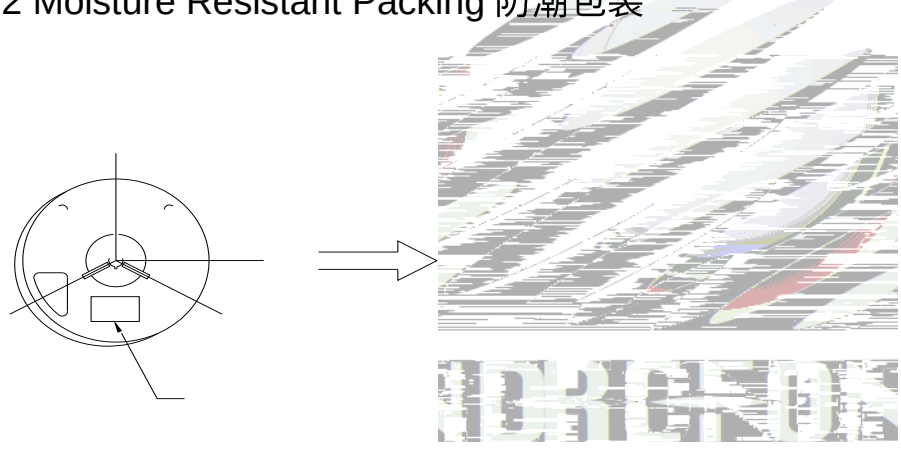


Fig.2-4Moisture Resistant Packing 防潮包装

2.3 Cardboard Box 包装纸箱

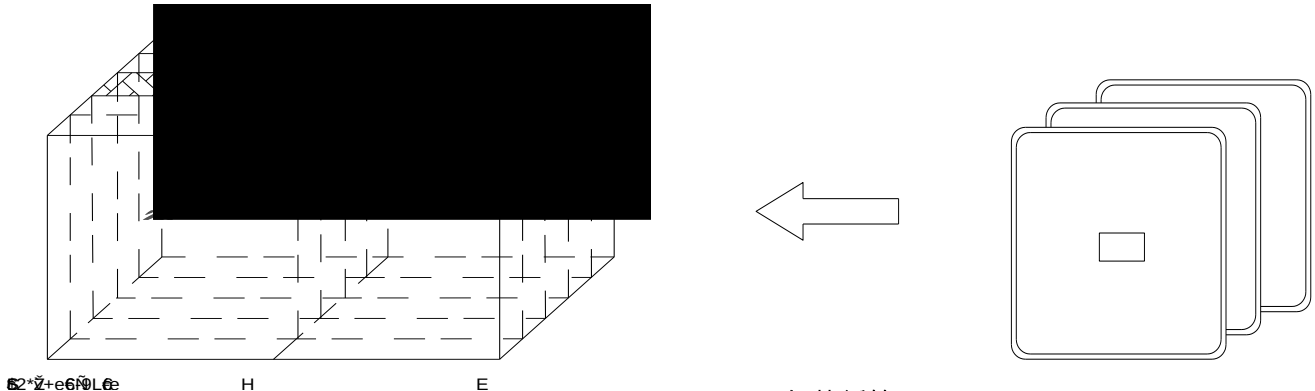


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Fig.2-5 Cardboard Box 包装纸箱

2.5 Criteria For Judging Damage 失效判定标准

Table Criteria For Judging Damage 失效判定标准

Test Items 项目	Symbol 符号	Test Condition

3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1SMT Reflow Soldering Instructions SMT 回流焊说明

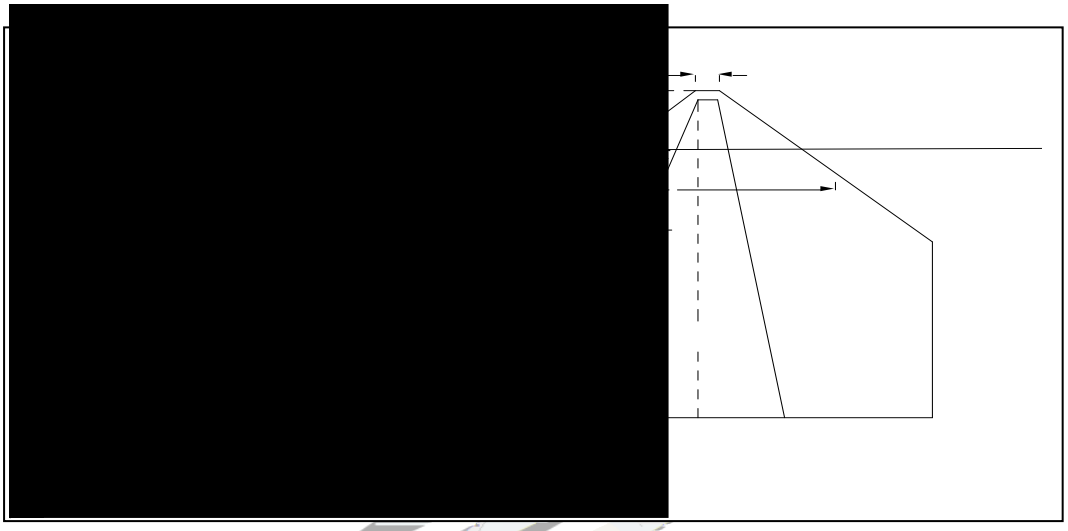


Fig.3-1 SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1Parameter 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 ：温度(T_L)	217 °C
Time limited to maintain high temperature: The Time 限时维持高温：时间 (t_L)	最多60秒 Max 60s
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 Tp25 °C 升至峰值温度所需时间	最多8分钟 Max 8 minutes

Notes 备注：

(1)Reflow soldering should not be done more than two times. In the case of more than 24 hours passed soldering after first, LEDs 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.当焊接时，不要在材料受热时用力压胶体表面。

3.1.1 Soldering Iron 烙铁焊接

(1) When hand soldering, keep the temperature of iron below less 300℃ less than 3 seconds

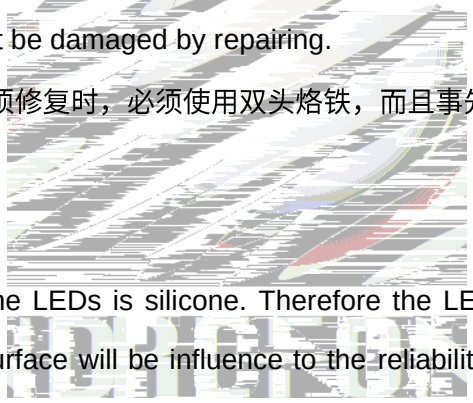
手工焊接时，烙铁的温度应低于300℃，时间不可超过3秒。

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

3.1.2 Repairing 维修

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.

LED回流焊后不应该修复，当必须修复时，必须使用双头烙铁，而且事先应确认此种方式会不会损坏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 influence to 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，因此应避免在按压胶体表面的部位有预防措施避免在按压器件，当使用吸嘴时，胶体压力应是恰当的。

(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 上，焊接后不要弯曲电路板。

(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。

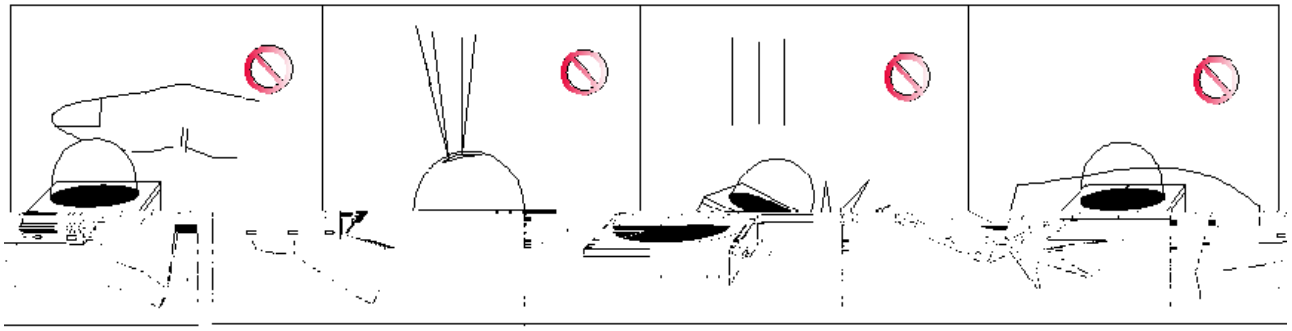


Fig 4-1

(5) In designing a circuit,the current through each LED can not 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 点亮时，会发热，如果热量不能及时散发，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，回流焊以后需要采用恰当的清洗方式，我们推荐用异丙醇作清洗剂，如需要用到其他清洗剂，必须保证不会破坏封装体，超声清洗可能会对 LED 带来损害，不推荐这种清洗方式。

Table 4-1 Storage 储存

Conditions 种类		Temperature 温度	Humidity 湿度	Time 时间
Storage	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%	24hours 24小时
Baking 烘烤		60±5℃	-	≥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存放储存条件，需拆包后进行烘烤，烘烤条件：60±5℃，大于 24 小时。

If the package is flatulence or damaged,please notify the sales staff to assist.如果包装胀气或者破损，请通知销售人员协助处理。

(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关资料。

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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。