

SPECIFICATION 产品规格书

REFOND P/N 产品型号

RF-AL-C3535L2K1DR-06

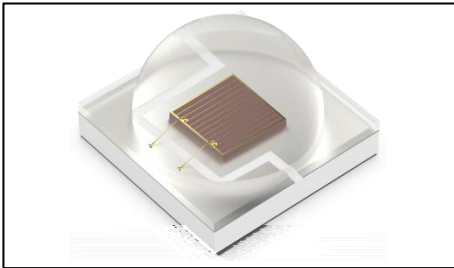
R&D 研发

Mass Product 量产供货



1. Description 产品介绍

1.1 General Description 产品描述



This product uses the ceramics package, it has a high reliability. The Deep Red source color devices are made with AlInGaP on Substrate Light Emitting Diode.

Size(mm):3.45mmX3.45mmX2.20mm.

本产品采用陶瓷封装结构，可靠性高。深红光LED由AlInGaP四种元素芯片激发而成。

产品尺寸：3.45mmX3.45mmX2.20mm.

1.2 Features 产品特点

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

1.3 Application 产品应用

Plant factory.植物工厂

Tissue culture.组织培养

医疗美容

General use.其他适合的应用

1.4 Package Dimension 封装尺寸

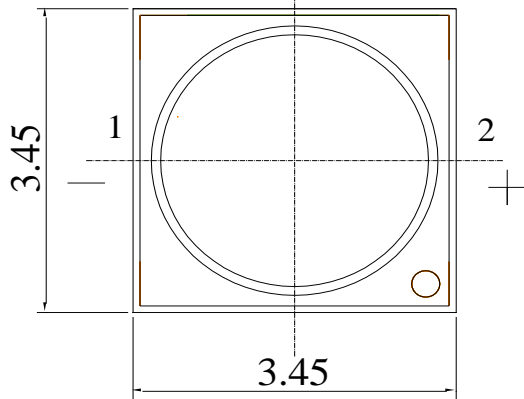


Fig.1-1 Top view 正面视图

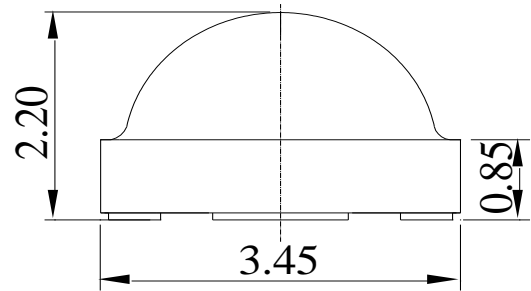


Fig.1-2 Side view 侧面视图

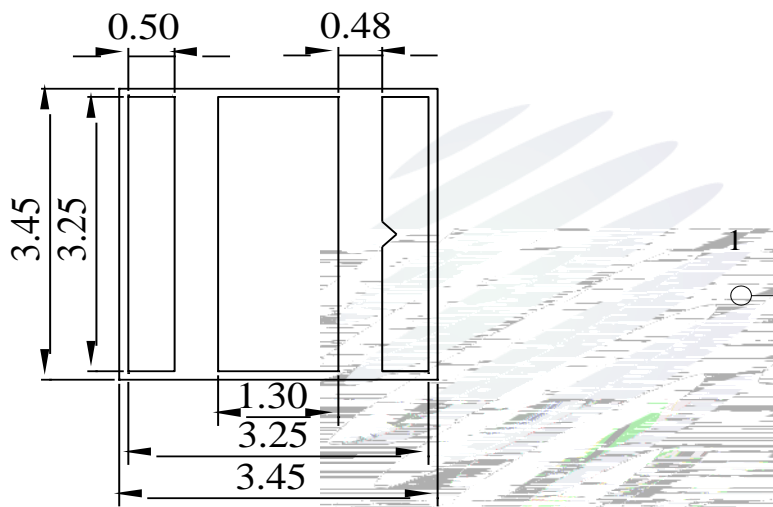


Fig.1-3 Bottom view 背面视图

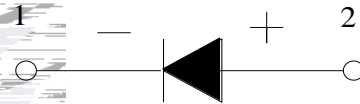


Fig.1-4 Polarity 极性

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 $\pm 0.2\text{mm}$ 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	Symbol	Test Condition	Value			Unit
			Min.	Typ	Max.	
Reverse Current (漏电流)	I_R	$V_R=5V$	---	---	10	μA
Forward Voltage (正向电压)	V_F	$I_F=350mA$	1.8			



Table 1-2 Absolute Maximum Ratings at Ts=25°C 绝对最大值

Storage Temperature (储存温度)	T _{OPR}	-40 ~ +100	
Junction Temperature (结温)	T _J	125	

Notes 备注:

- 1/10 Duty cycle, 0.1ms pulse width. 脉宽0.1ms,占空比1/10.
- The above forward voltage measurement allowance tolerance is $\pm 0.1V$. 以上所示电压测量误差 $\pm 0.1V$.
- The above Dominant Wavelength measurement allowance tolerance is $\pm 1nm$. 以上所示波长测量误差 $\pm 1nm$.
- The above luminous intensity measurement allowance tolerance $\pm 10\%$. 上述发光强度的测试允许公差为 $\pm 10\%$.
- 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。
- All measurements were made under the standardized environment of Refond. 所有测试都是在基于瑞丰的
标准测试平台。
- 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。
- ESD yield is over 80% at 2000V ESD (HBM). ESD protection during products handing is needed. 80%的LED
通过人体模式ESD2000V 测试, 在操作时请注意静电防护。

1.5.1 Bin Range Of Forward Voltage and Luminous Intensity (IF=350mA)电压与光强分 BIN 范围(IF=350mA)

Table 1-3

V _F V	B1	B2	C1	C2
	1.8-1.9			



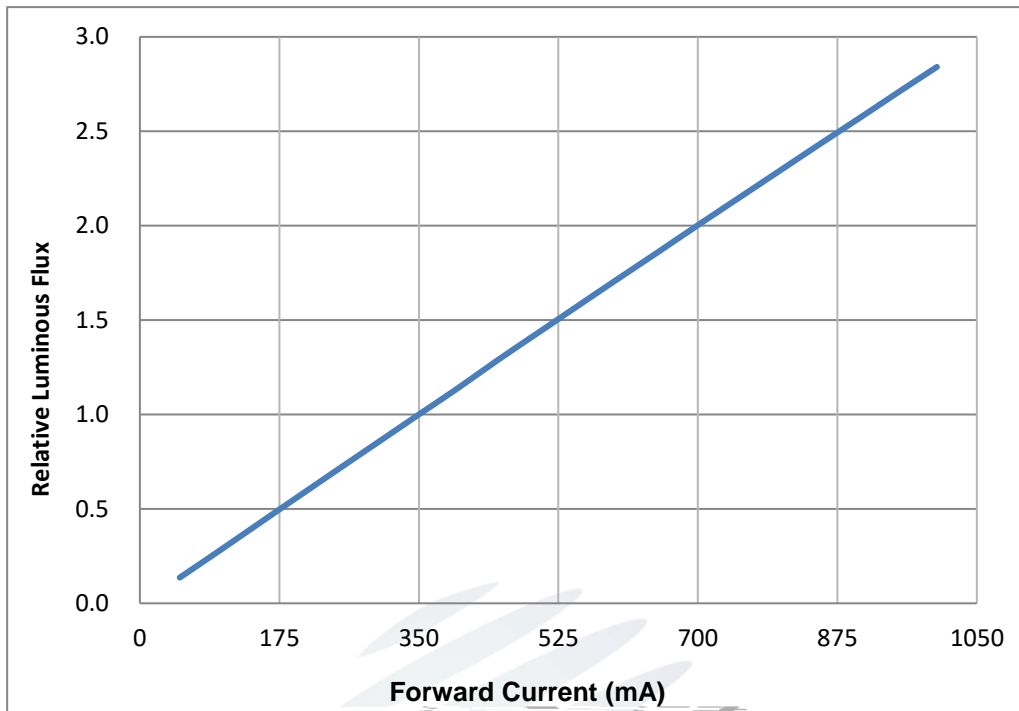


Fig 1-7 Forward Current Vs. Relative Intensity正向电流与相对光强特性曲线

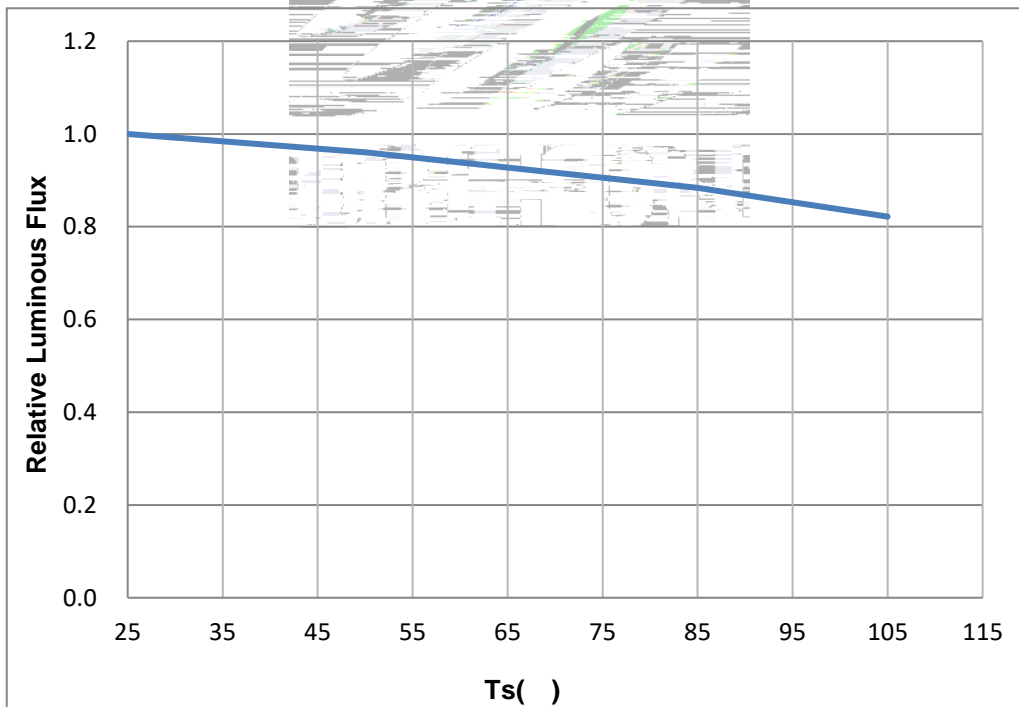


Fig 1-8 Ts Temperature Vs Relative Intensity管脚温度与相对光强特性曲线



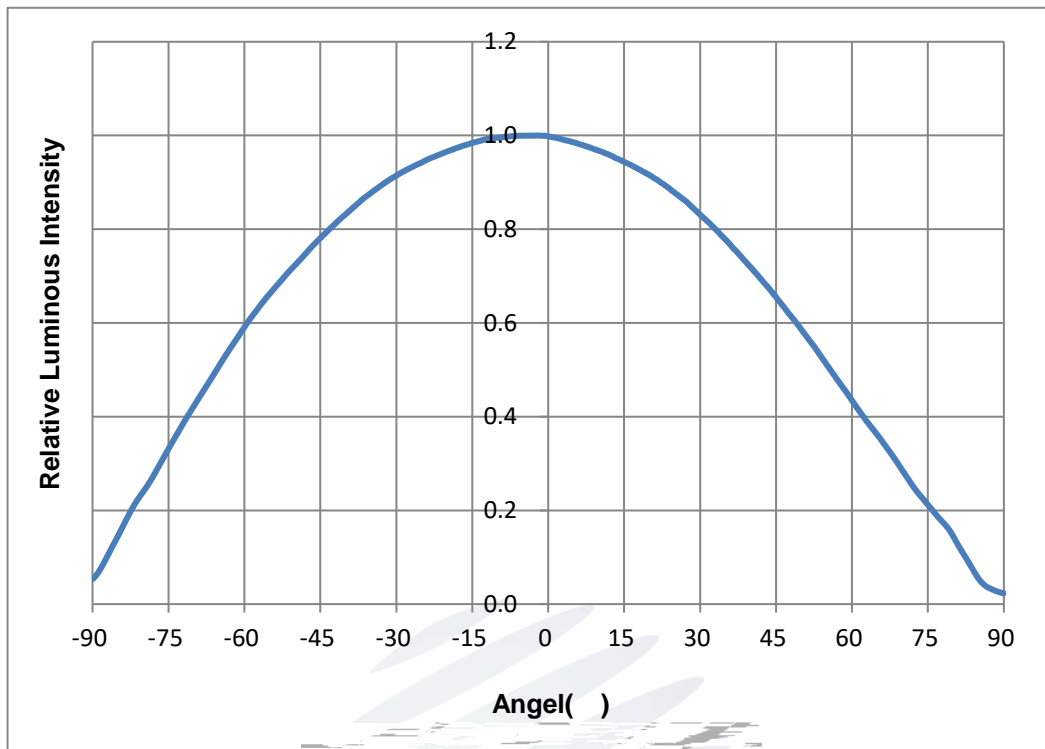
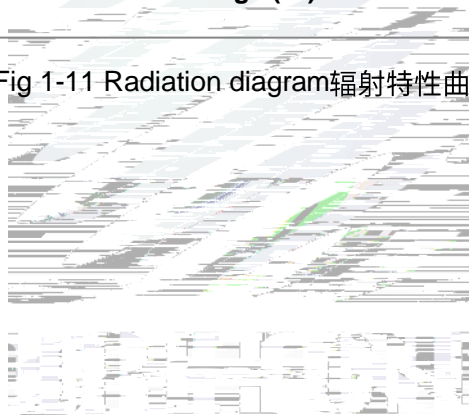


Fig 1-11 Radiation diagram 辐射特性曲线



2.1.3 Label Form Specification 标签规格

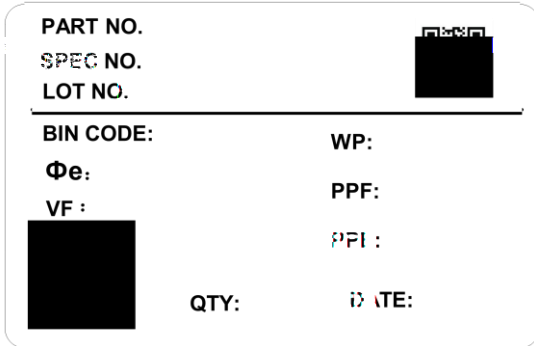


Fig 2-3 Label Form Specification 标签规格

Table 2-2 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
N	Total radiant flux 辐射功率
WP	Peak Wavelength 峰值波长
PPF	光合光子通量
PPE	有效光合光子通量
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

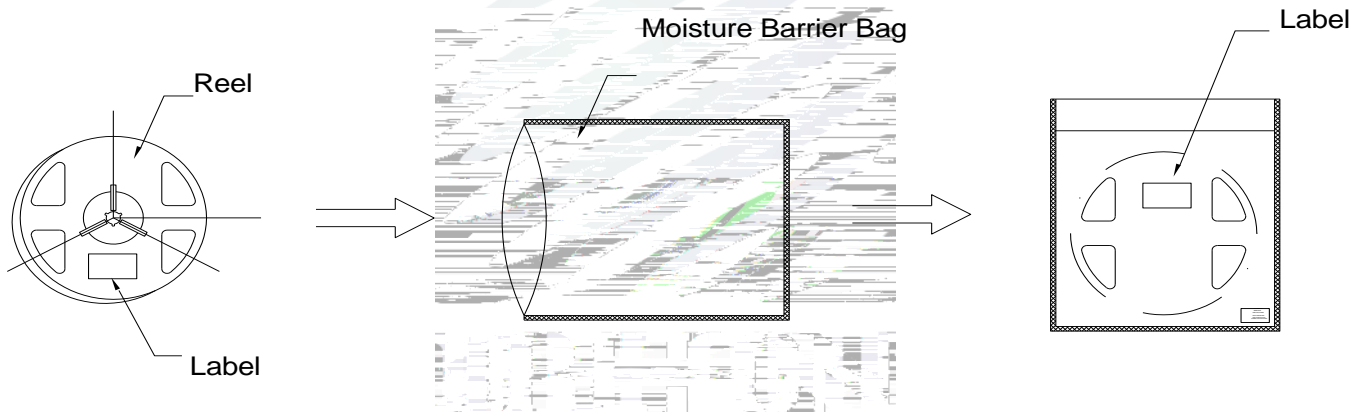


Fig.2- Moisture Resistant Packing 防潮包装

2.3 Cardboard Box 包装纸箱

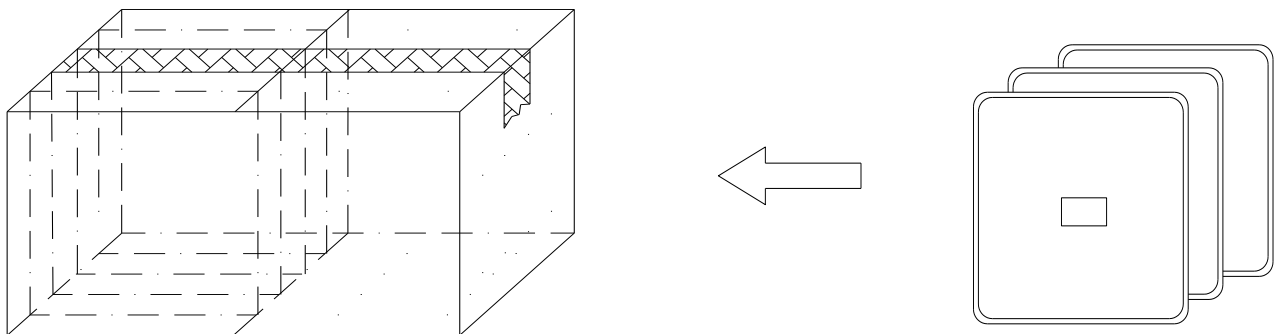
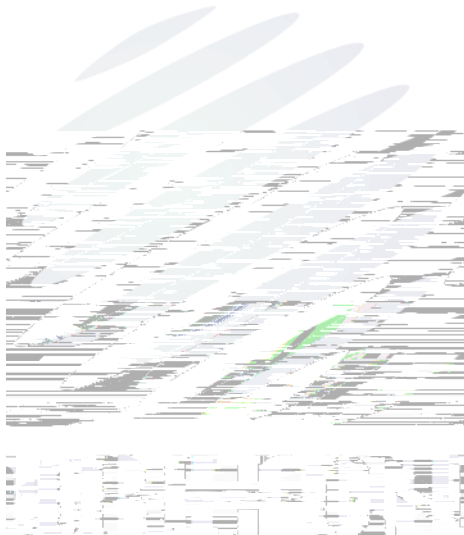


Fig.2-5 Cardboard Box 包装纸箱

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

Table 2-3 Test items and conditions 测试项目及条件

Test Items	Ref. Standard	Test Condition	Time	Quantity	Ac/Re /
Reflow 回流焊	JESD22-B106	T _{emp} :260°Cmax T=10 sec	2times.	10pcs.	0/1
Thermal Shock 冷热冲击	JEITAED-4701300307	-40°C 15min 10s 100°C 15min	500 cycles.	10pcs.	0/1
High Temperature Storage 高温保存	JEITAED-4701200201	T _{emp} :100°C	1000hrs.	10pcs.	0/1
Low Temperature Storage 低温保存	JEITA ED-4701200202	T _{emp} :-40°C	1000hrs.	10pcs.	0/1
Life Test 常温通电	JESD22-A108	T _A =25°C I _F =350mA	1000hrs.	10pcs.	0/1
High Temperature High Humidity Life Test 高温高湿通电					



3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1 SMT Reflow Soldering Instructions SMT 回流焊说明

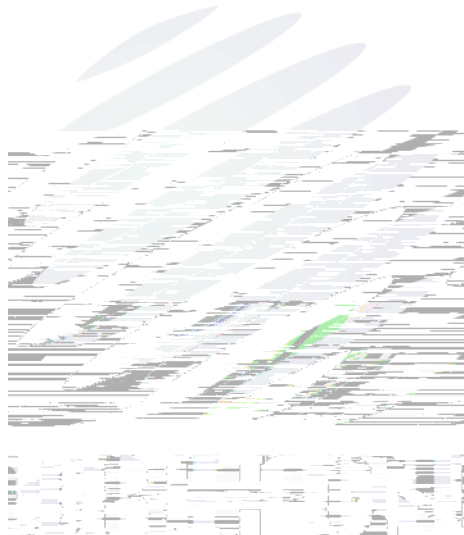
Fig.3-1 SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1 SMT Reflow Soldering Parameter SMT 回流焊参数

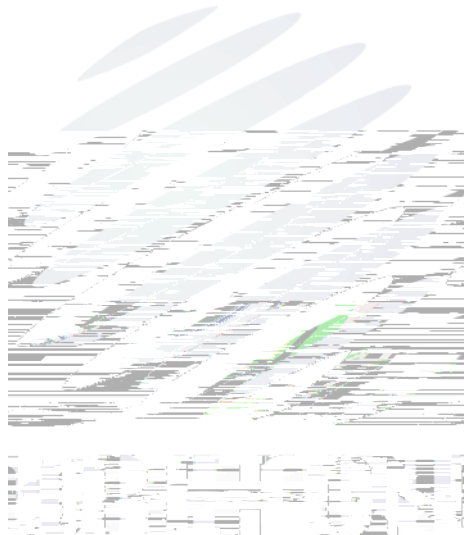
平均升温速度 (T_{smax} 至 T_P)	最高 3 °C/ 秒
预热: 最低温度 (T_{smin})	150 °C
预热: 最高温度 (T_{smax})	200 °C
预热: 时间 (T_{smin} 至 T_{smax})	60 - 120 秒
限时维持高温: 温度 (T_L)	217 °C
限时维持高温: 时间 (t_L)	最多60 秒
峰值 / 分类温度 (T_P)	260 °C
限时峰值分类温度: 时间 (t_p)	最多

Notes 备注:

(1) Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings,



(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，不要对材料施加外力，也不要震动，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 external 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 element is 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 to be used. Attaching LEDs, do not use adhesives that outgas organic vapor. 应用套件中的挥发性物质会渗透到 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 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，它可能会损坏内部电路。

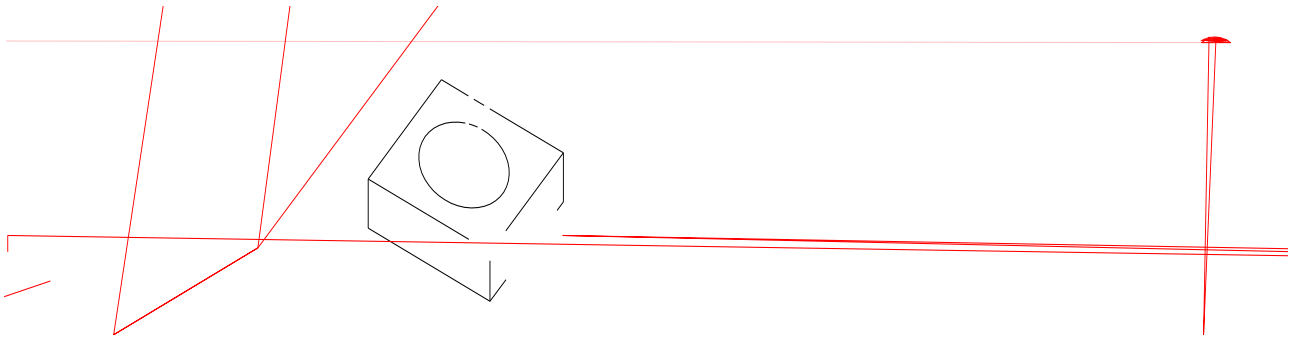


Fig 4-1 Misoperation 错误操作

(5) In designing a circuit, the current through each LED must 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 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 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

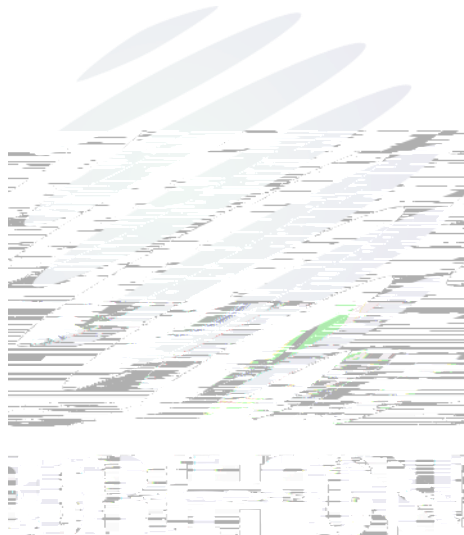
Conditions		Temperature	Humidity	Time
Storage	Before Opening Aluminum Bag 拆包前	$\leq 30^{\circ}\text{C}$	$\leq 5\%$	Within 1 years From Date 1年内
	After Opening Aluminum Bag 拆包后	$\leq 30^{\circ}\text{C}$	$\leq 60\%$	168hours 168小时
Baking 烘烤		$60 \pm 5^{\circ}\text{C}$	$< 5\%$	$\geq 24\text{hours}$ 大于24小时

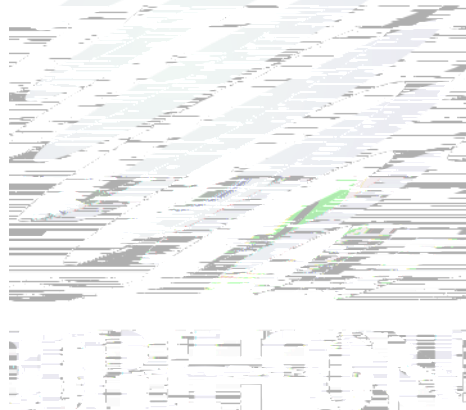
(8) If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed after unpacking and based on the following condition (60 ± 5) and less than 5%RH for above 24 hours. 若干燥剂或包装失效，或如
或者产品不符合以上有效储存条件，需拆包后进行烘烤。烘烤条件： $60 \pm 5^{\circ}\text{C}$ ，小于 5%RH，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). LED 对静电过流击穿非常敏感，需要
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。





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，以中文为准。