

# SPECIFICATION 产品规格书

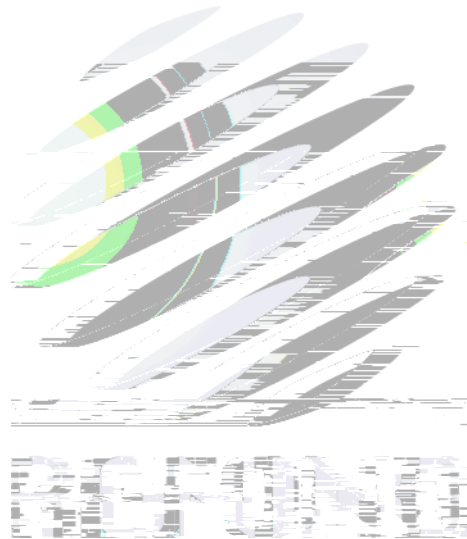


REFOND P/N 产品型号

RF-AL-C3535L2K1DR-06

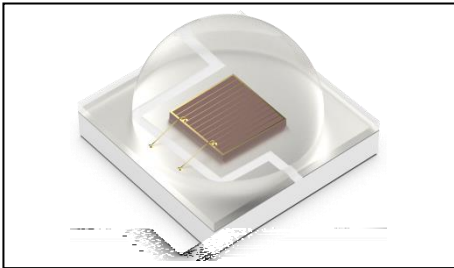
R&D 研发

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

### 1.3 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

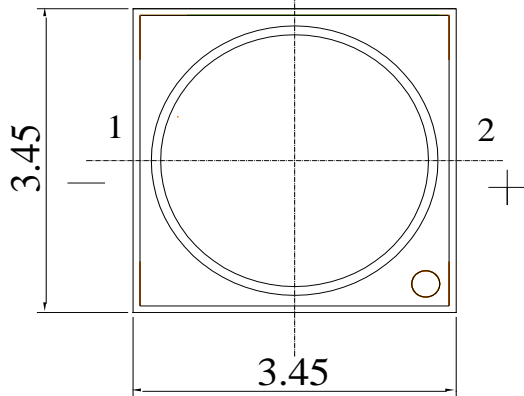


Fig.1-1 Top view 正面视图

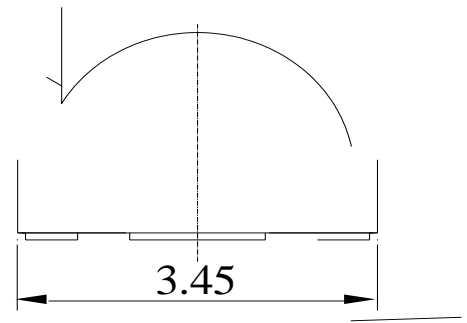


Fig.1-2 Side view 侧面视图

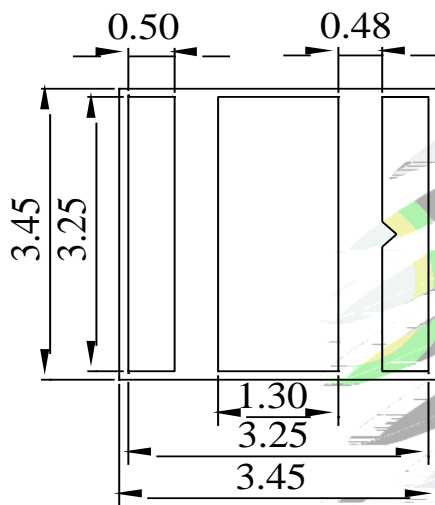


Fig.1-3 Bottom view 背面视图

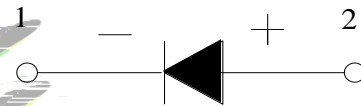


Fig.1-4 Polarity 极性

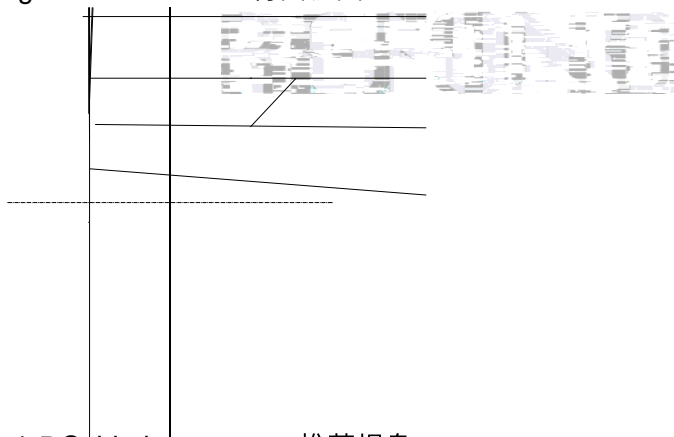


Fig.1-5 Soldering patterns 推荐焊盘

### 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  $\pm 0.2$  毫米

## 1.5 Product Parameters

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	$\mu A$
Forward Voltage (正向电压)	$V_F$	$I_F=350mA$	1.8	---	2.4	V

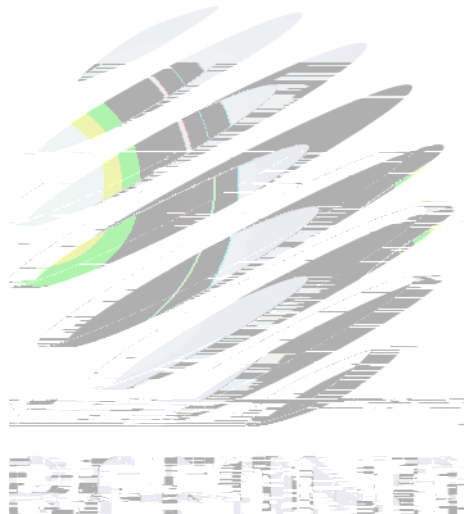


Table 1-2 Absolute Maximum Ratings at Ts=25°C 绝对最大值

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自有标准测试平台。
- 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 <sub>F</sub> V	B1	B2	C1	C2
	1.8-1.9	1.9-2.0	2.0-2.1	2.1-2.2
e(mW)	P	Q	R	S
	400-450	450-500	500-550	550-600
WP(nm)	R00	R10	R11	
	650-655	655-660	660-665	

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

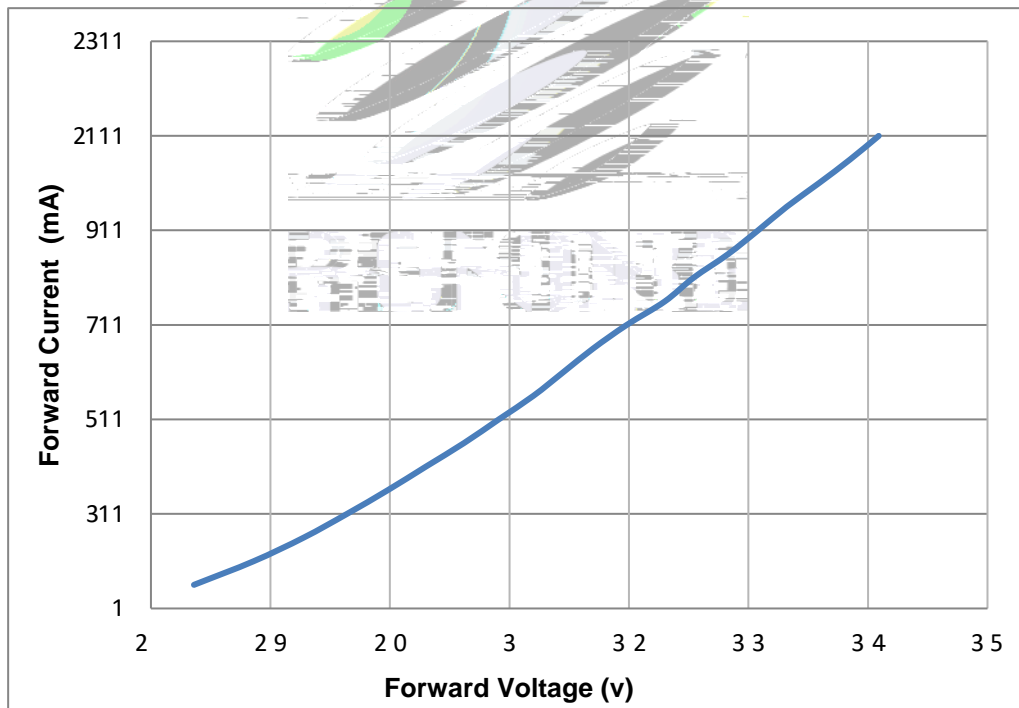


Fig 1-6 Forward Voltage Vs. Forward Current伏安特性曲线

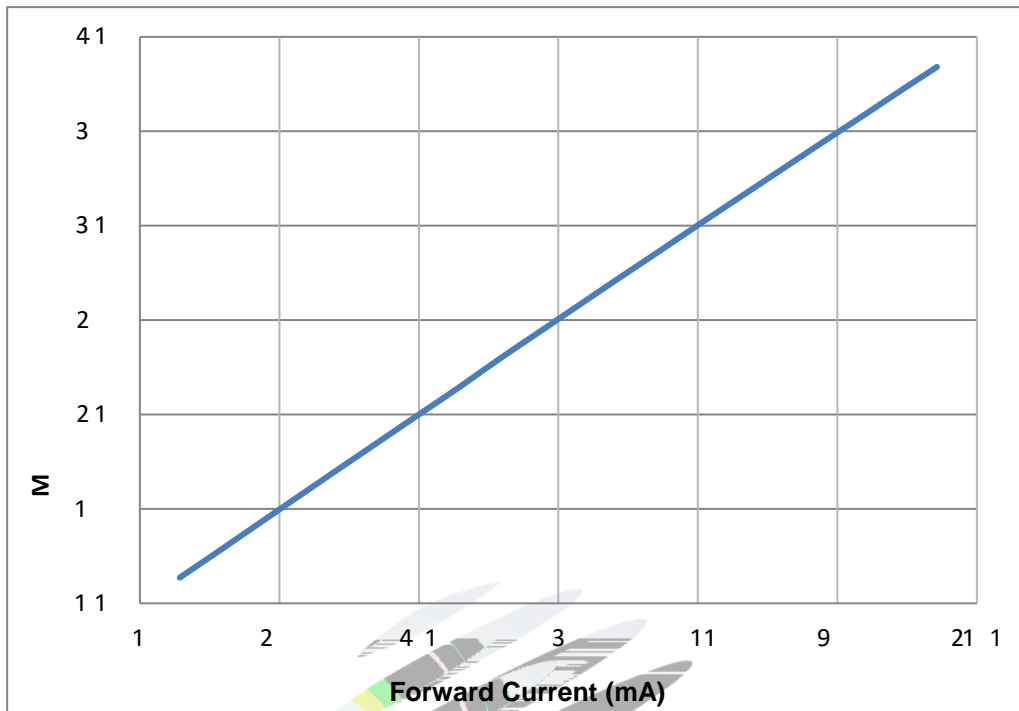


Fig 1-7 Forward Current Vs. Relative Intensity 正向电流与相对光强特性曲线

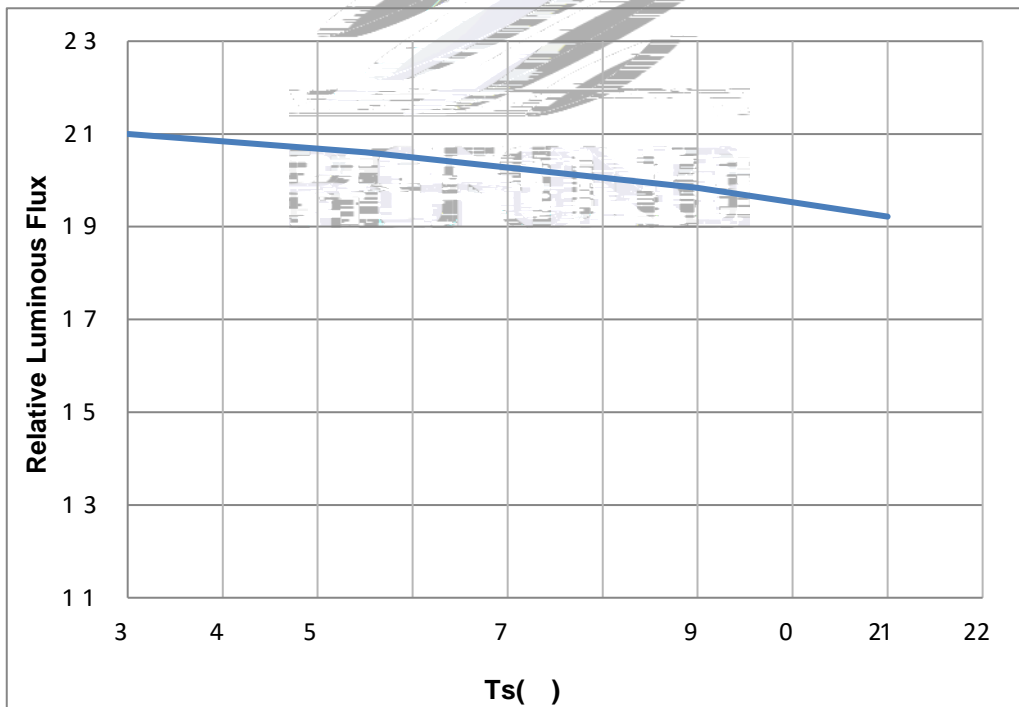
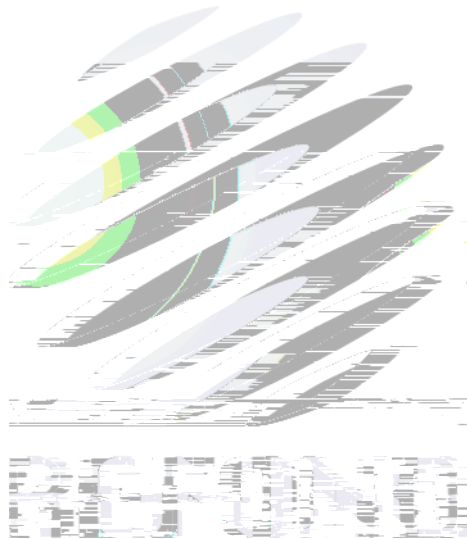


Fig 1-8 Ts Temperature Vs Relative Intensity 管脚温度与相对光强特性曲线





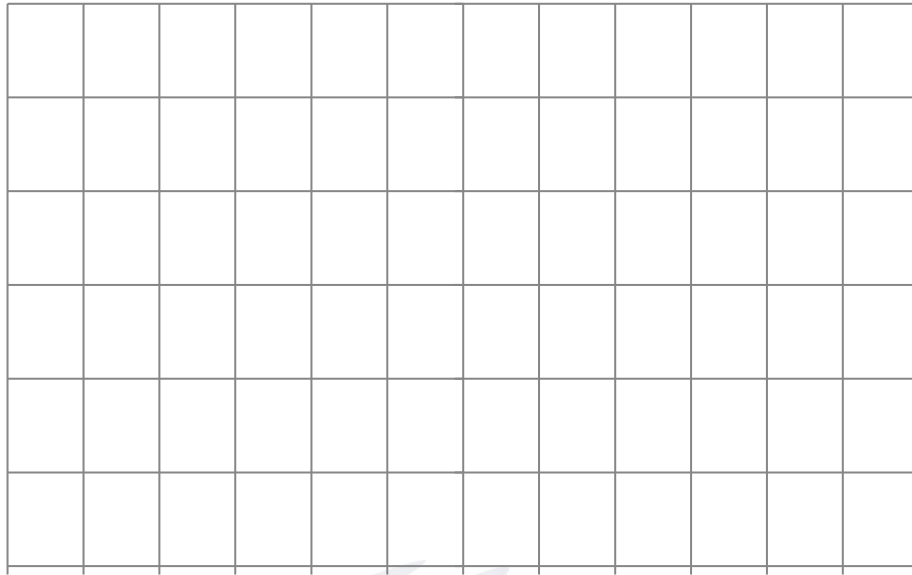
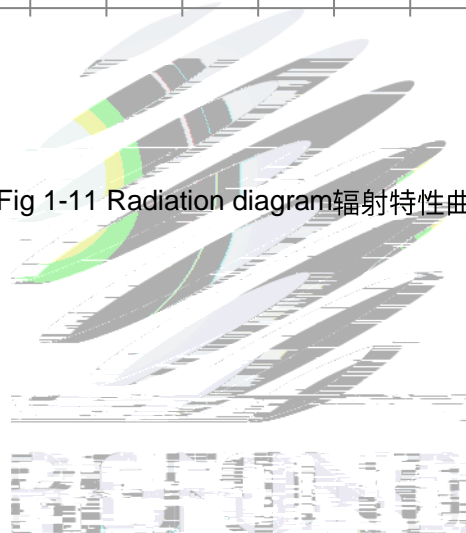


Fig 1-11 Radiation diagram 辐射特性曲线



## 2. Packaging 产品包装

### 2.1 Packaging Specification 包装规格

Package: Max 1000pcs/reel. 包装每卷最多 1000pcs。

#### 2.1.1 Carrier Tape Dimension 载带尺寸

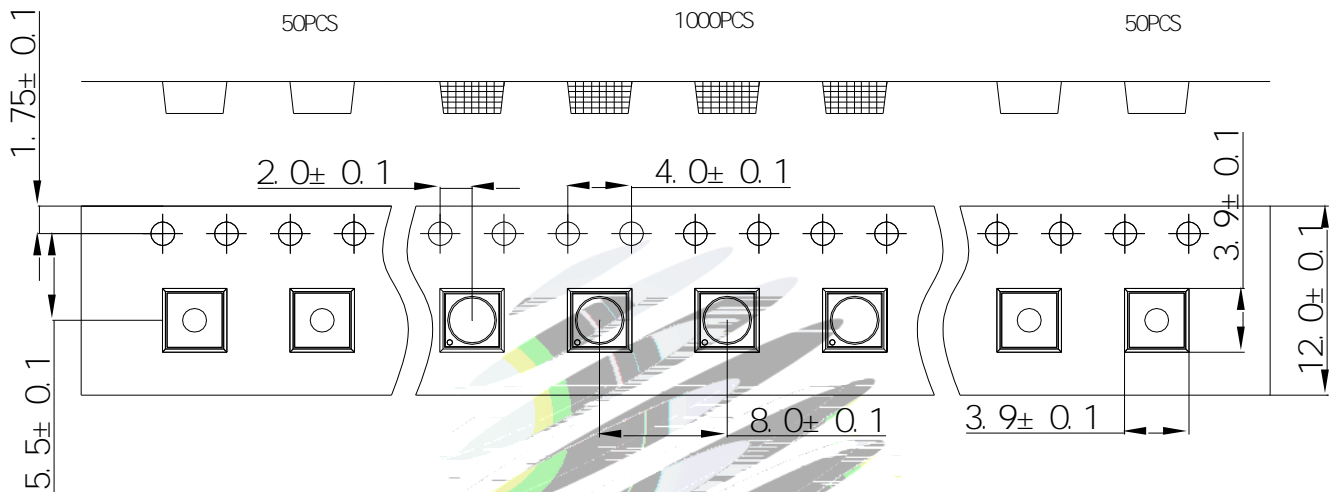


Fig.2-1 Carrier Tape Dimension 载带尺寸

#### 2.1.2 Reel Dimension 卷盘尺寸

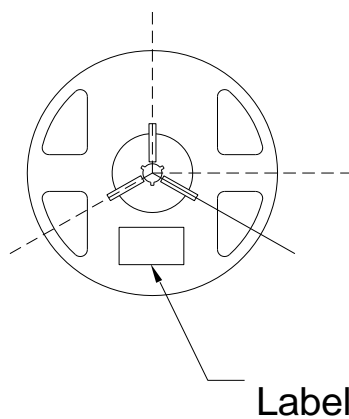


Fig.2-2 Reel 卷盘



Table 2-1 Reel Dimension 卷盘尺寸

A	14.0±0.5mm
B	178±1mm
C	59±1mm
D	13.9±0.5mm

#### Notes 备注:

The tolerances unless mentioned  $\pm 0.1$ mm. Unit : mm 注: 未注公差为  $\pm 0.1$ 毫米, 尺寸单位: 毫米。

### 2.1.3 Label Form Specification 标签规格

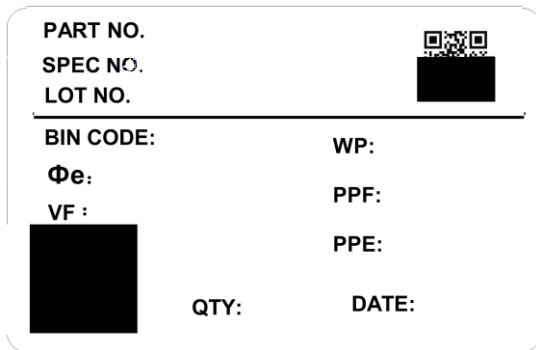


Fig 2-3 Label Form Specification 标签规格

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
	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

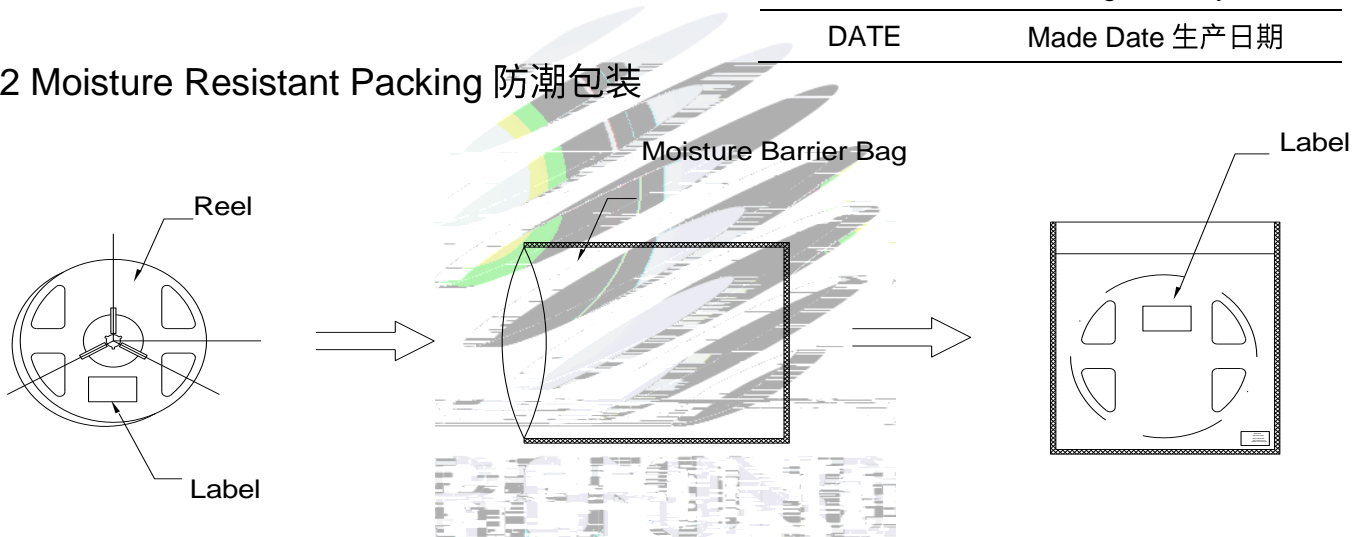


Fig.2-4 Moisture Resistant Packing 防潮包装

### 2.3 Cardboard Box 包装纸箱

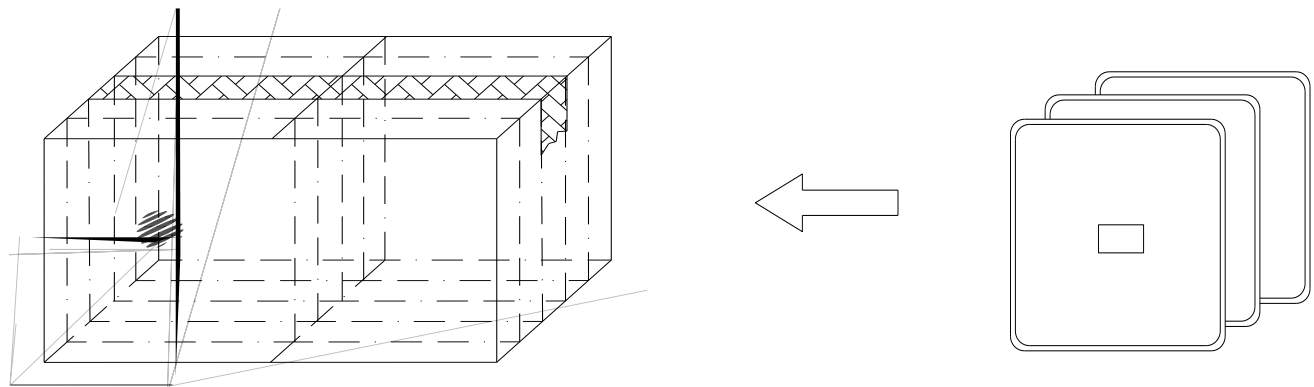
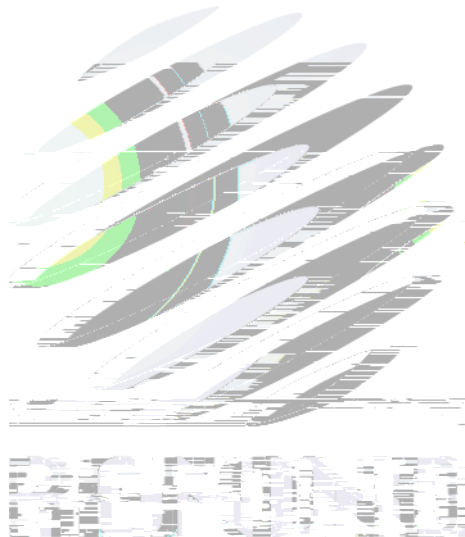


Fig.2-5 Cardboard Box 包装纸箱

## 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 <sub>emp</sub> :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 <sub>emp</sub> :100°C	1000hrs.	10pcs.	0/1
Low Temperature Storage 低温保存	JEITA ED-4701200202	T <sub>emp</sub> :-40°C	1000hrs.	10pcs.	0/1
Life Test 常温通电	JESD22-A108	T <sub>A</sub> =25°C I <sub>F</sub> =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10 秒
与实际峰值温度 ( $T_P$ ) 相差 5 °C 以内的保持时间	最多30秒
降温速度	最高 6 °C/ 秒
25 °C 升至峰值温度所需时间	最多 8 分钟

## Notes 备注:

(1) Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings, LED will be damaged. 回流焊接次数不可超过两次, 两次回流焊接时间间隔不可超过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

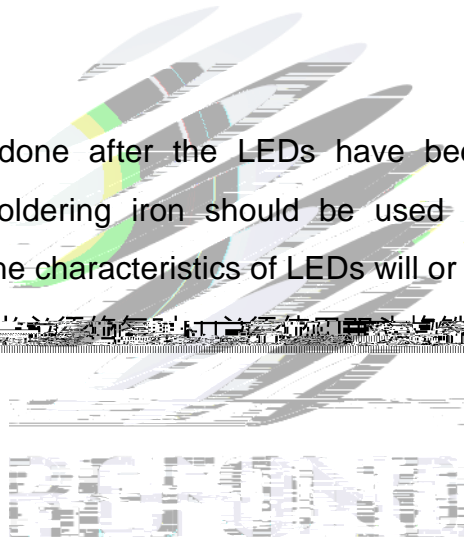
(1) When do soldering by hand, keep the temperature of iron below less 300 less than 3 seconds. 当手工焊接时, 烙铁的温度必须小于300°C, 时间不可超过3秒。

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

### 3.1.2 Repairing 修补

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 封装胶为硅胶, 当进行修补时, 应使用双头烙铁, 且应事先确认修补是否会损坏 LED 本身的特性。



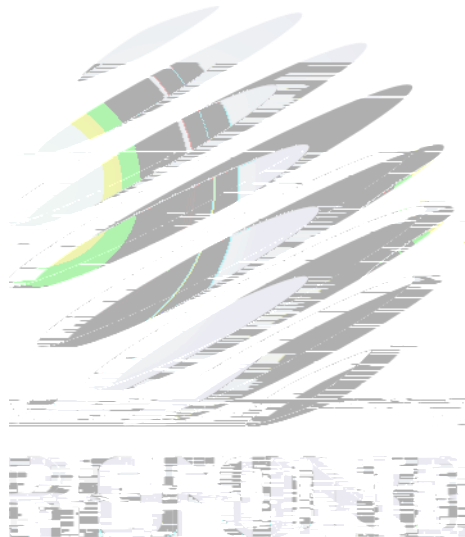
### 3.1.3 Cautions 注意事项

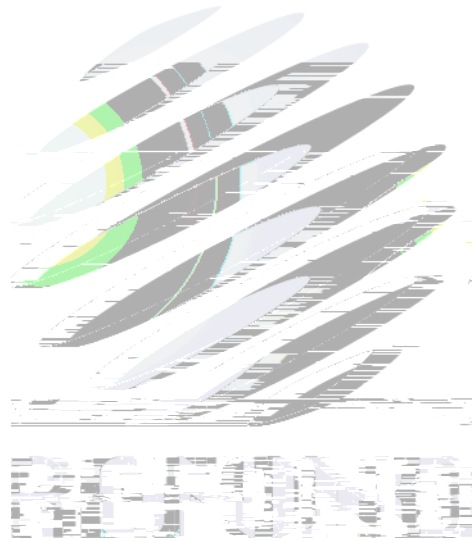
(1) The encapsulated material of the LEDs is silicone. Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be impacted on the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when use the picking up nozzle, the pressure on the silicone resin should be proper. LED 封装胶为硅胶, 表面较软, 受力过大时会影响 LED 可靠性, 因此应有预防措施避免在按压器件, 当使用吸嘴时, 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, 焊接完成后, 也不要弯折电路板。



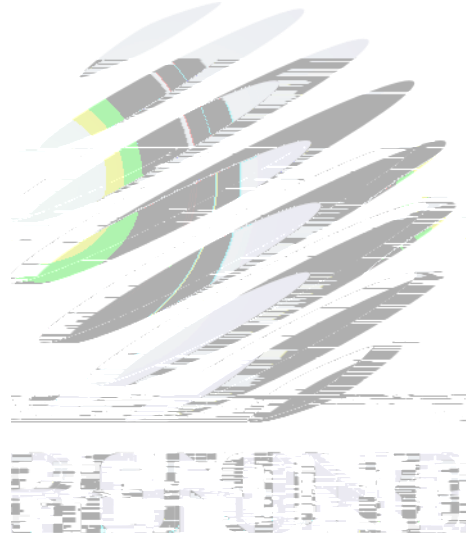
(3) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.回流焊之后冷却过程中，不要对材料施加外力，也不要震动，回流焊后，不要采用激剧冷却的方式。





(4) 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



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，当用异丙醇作清洗剂时，如对产品洁净度要求较高时，回流焊以后需要采用恰当清洗方式。我们通常不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	30°C	75%	Within 1 years From Date 1年内
	After Opening Aluminum Bag 拆包后	30°C	60%	168hours 168小时
Baking 烘烤		60±5°C	<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 and less than 5%RH for above 24 hours. 如果干燥剂或封装失效，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±5°C，小于 5%RH，大于 24 小时。

If the package is flatulence or damaged, please notify the sales staff to assist. 如包装胀气或者

(9) Similar to most Solid state devices; LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS). 像其他的固态半导体器件一样，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

