SPECIFICATION
产品规格书

REFOND P/N 产品型号

RF-Q30SARW-FD-R

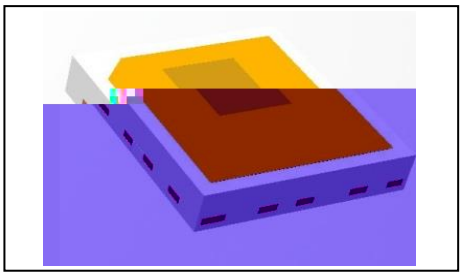
[redacted]研发

Mass Product 量产供货

Contents 目录

1. Description 产品介绍

1.1General Description 产品描述



The Red LED which was fabricated using a red chip

红光 LED 是由红光芯片激发而成

The White LED which was fabricated using a blue chip and the phosphor

该产品为白光 LED，是由蓝光芯片激发荧光粉而形成

The LED package dimension:3.0mmX3.0mmX0.65mm

产品尺寸：3.0mmX3.0mmX0.65mm。

1.2Features 产品特征

EMC Package.EMC.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

Package:5000pcs/reel.包装每卷5000pcs

Moisture sensitivity level: Level 3.防潮等级 Level 3

RoHS compliant.满足RoHS要求

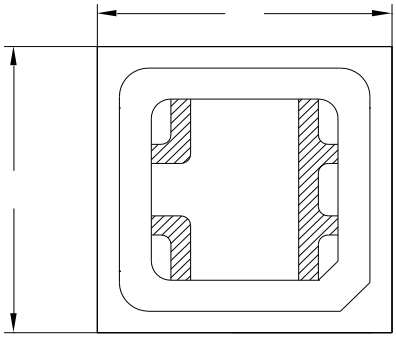
1.3Application 产品应用

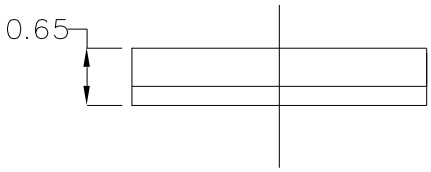
Smart bulb lighting.智能球泡灯

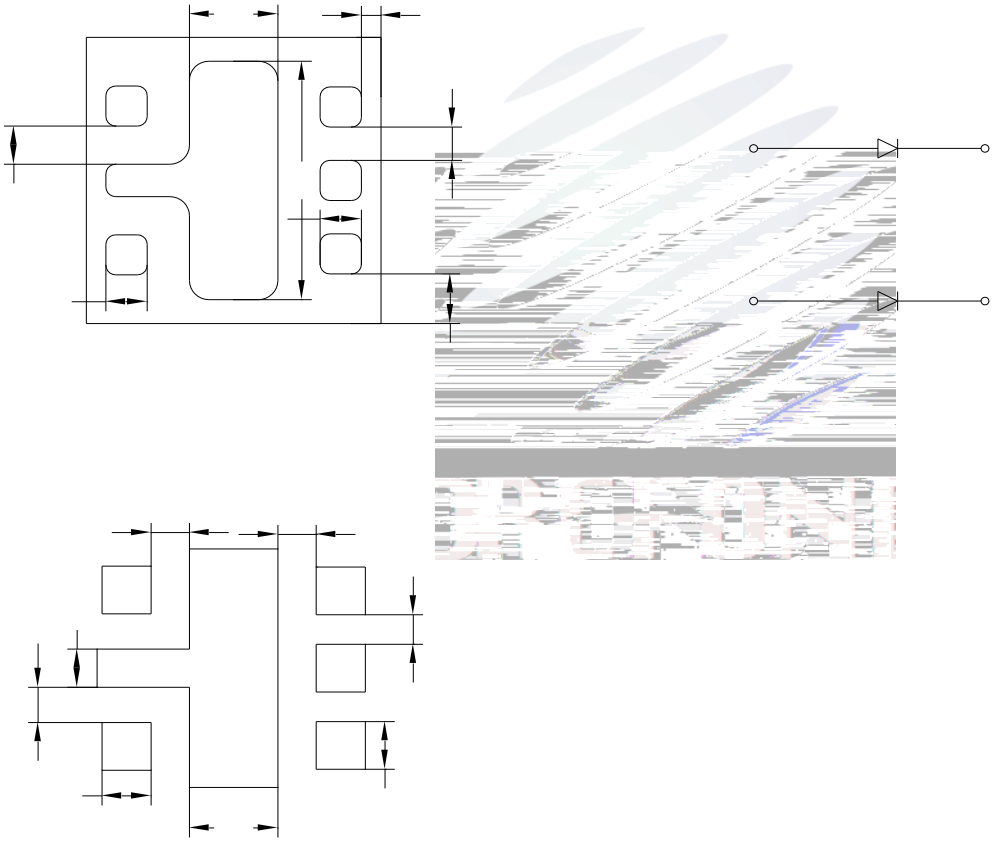
Indoor lighting.室内照明

Landscape lighting.景观照明

1.4Package Dimension封装尺寸







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 ±0.05mm unless otherwise noted.除特别标注外，所有尺寸公差为±0.05 毫米

1.5Product Parameters 产品参数

Table 1-1 Electrical / Optical Characteristics at Ts=25°C 电性与光学特性

Product 产品型号	Symbol 符号	test condition 测试条件	Value			unit 单位
			Min.	Typ.	Max.	
Forward Voltage IR	Vf	I_F =1000mA	2.4	---	2.8	V
total radiant flux IR		I_F =1000mA	500	---	700	mw
Peak Wavelength IR	D	I_F =1000mA	730	---	760	nm
Forward Voltage W	Vf	I_F =50mA	2.6	---	3.0	V
luminous flux W		I_F =50mA	16	---	18	lm
Color Rendering Index W	Ra	I_F =50mA	80	---	85	---
Reverse Current	Vr=5	IR	---	---	10	uA
Viewing Angle		I_F =1000mA (IR) I_F =50mA (W)	---	---	120	Deg

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

Parameter（参数）	Symbol（符号）	Rating（值）		Units（单位）
Power Dissipation（功耗）	P_D	IR	2600	mW
		W	140	mW
Forward Current（正向电流）	I_F	IR	1000	mA
		W	50	mA
Peak Forward Current （峰值电流）	I_{FP}	IR	1500	mA
		W	240	mA
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）	T_J	IR	125	
		W	125	

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 ±0.05V. 以上所示电压测量误差 ±0.05V.

3. The above wavelength measurement allowance tolerance is ±2nm 以上所示波长测量误差 ±2nm.

4. The above color coordinates measurement allowance tolerance is ±0.005. 以上所示坐标测量误差 ±0.005.

5. The above luminous intensity measurement allowance tolerance ±10%. 上述发光强度的测试允许误差为 ±10%.

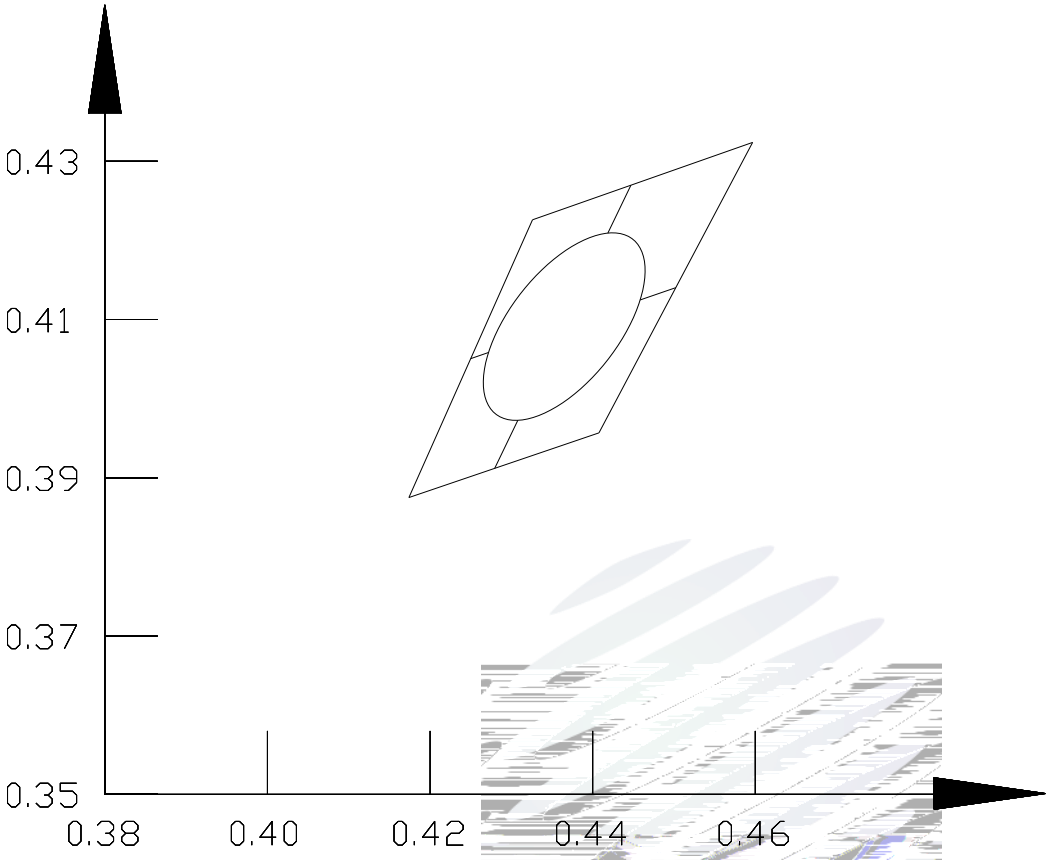
6. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product. 使用功率不能超过规定的最大值。

7. All measurements were made under the standardized environment of Refond. 所有测试都是基于瑞丰现有的标准测试平台。

8.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。

9. 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。

1.6The C.I.E Chromaticity Diagram CIE 色度图



Bin data

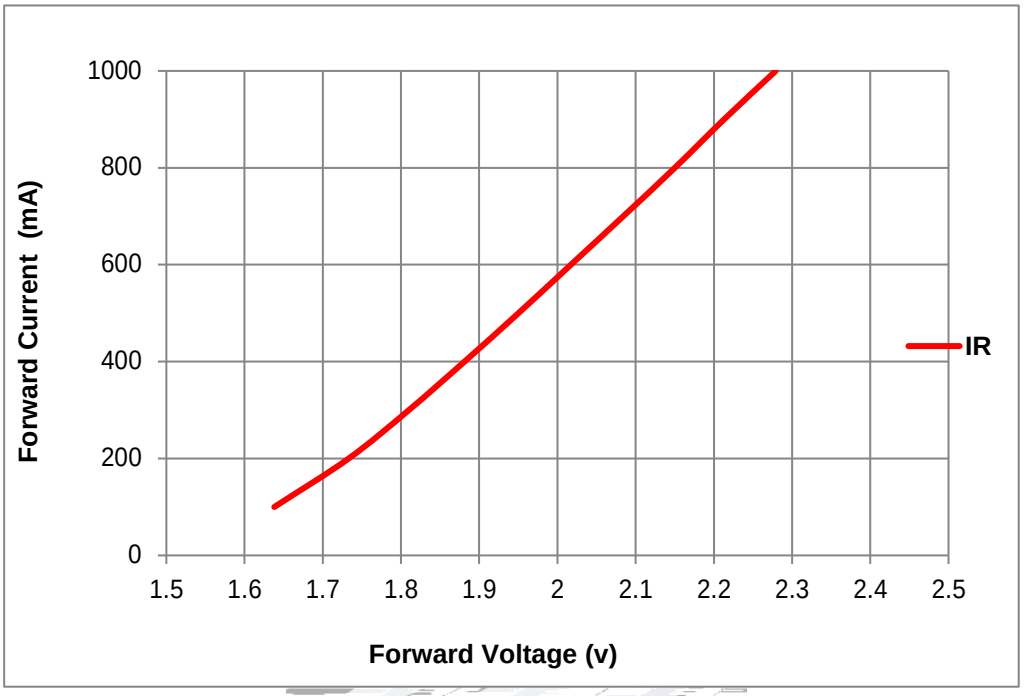
ANSI 5-Step										
Bin Code	X		Y		a		b			
30H5	0.4365		0.4091		0.0139		0.0068		53°13	
ANSI 7-Step										
Bin Code	X1	Y1	X2	Y2	X3	Y3	X4	Y4	X5	Y5
30HA	0.4597	0.4324	0.4447	0.4270	0.4419	0.4209	0.4458	0.4125	0.4502	0.4140
30HB	0.4326	0.4226	0.4250	0.4051	0.4272	0.4058	0.4419	0.4209	0.4447	0.4270
30HC	0.4174	0.3875	0.4279	0.3912	0.4308	0.3973	0.4272	0.4058	0.4250	0.4051
30HD	0.4408	0.3957	0.4502	0.4140	0.4458	0.4125	0.4308	0.3973	0.4279	0.3912

1.7Bin Range Of Forward Voltage and Luminous Flux 电压与光通量分 BIN 范围

Table 1-3

IR(IF=1000mA)	VF(V)	E0	F0	
		2.4-2.6	2.6-2.8	
	mw)	T5		
		500-700		
	WLD(nm)	RD3	RD4	RD5
		730-740	740-750	750-760
W(IF=50mA)	VF(V)	F0	G0	
		2.6-2.8	2.8-3.0	
		PCH		
		16-18		

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



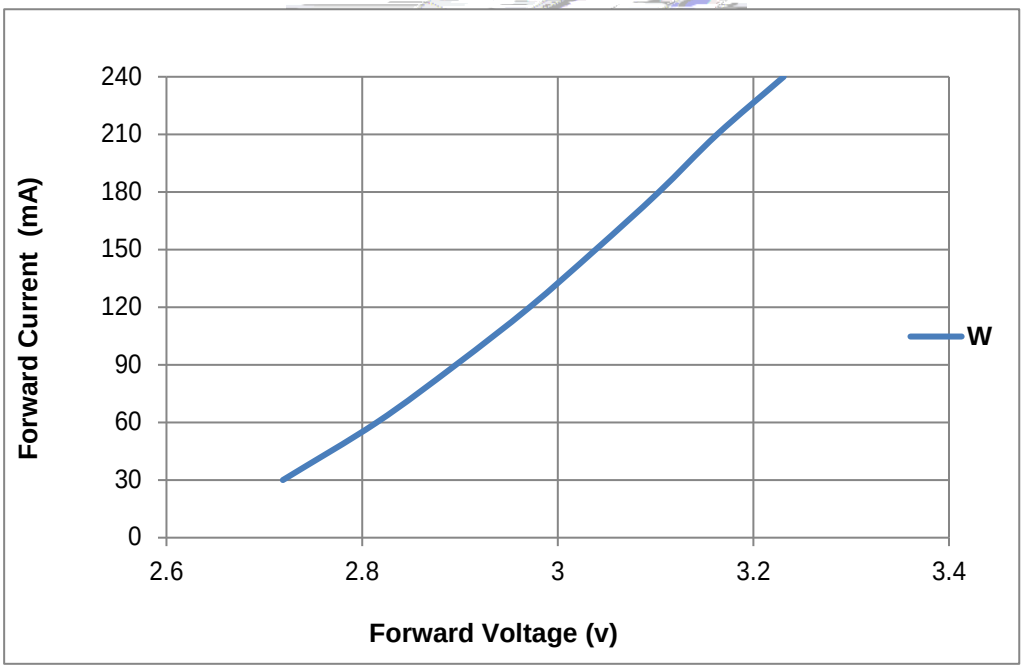
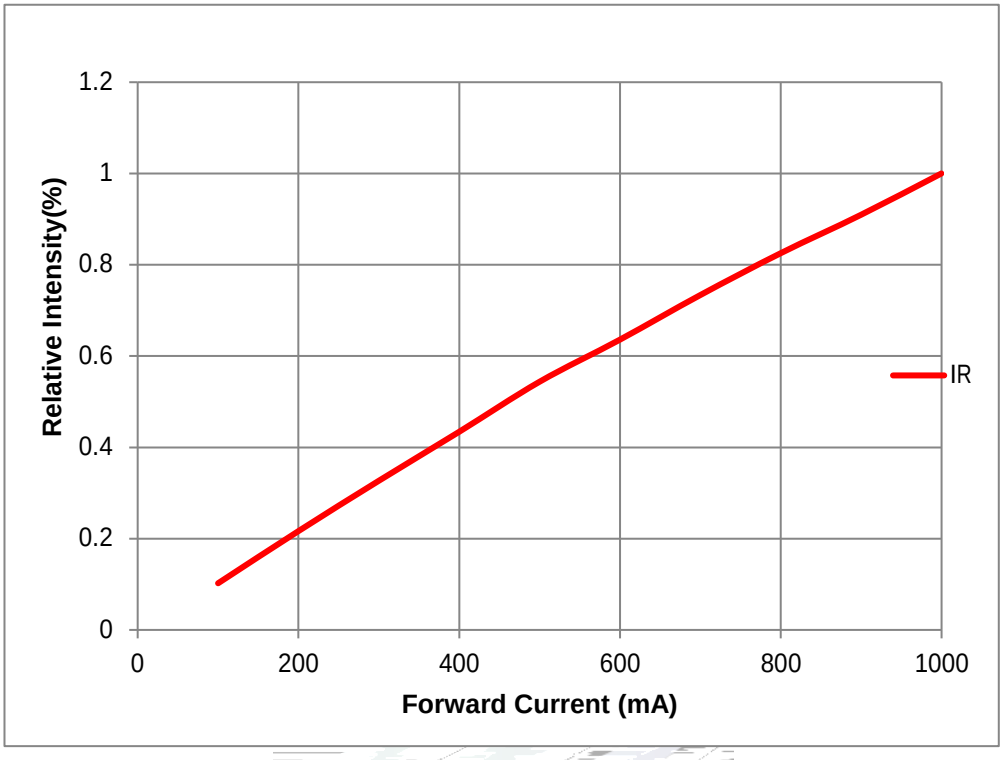


Fig 1-6 Forward Voltage Vs. Forward Current伏安特性曲线



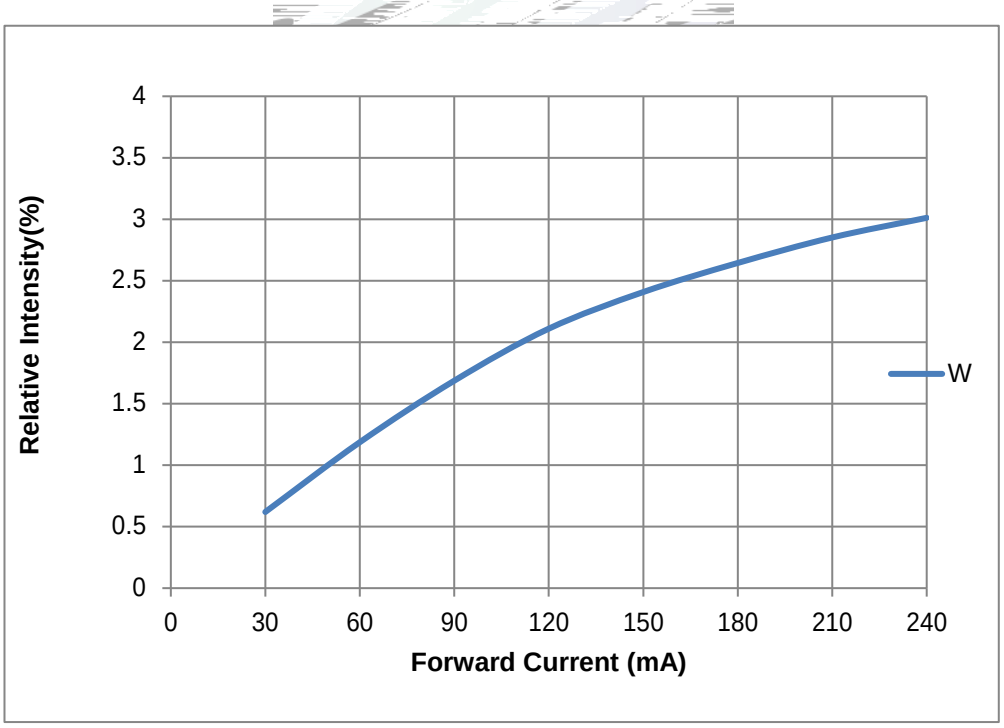


Fig 1-7 Forward Current Vs. Relative Intensity正向电流与相对光强特性曲线

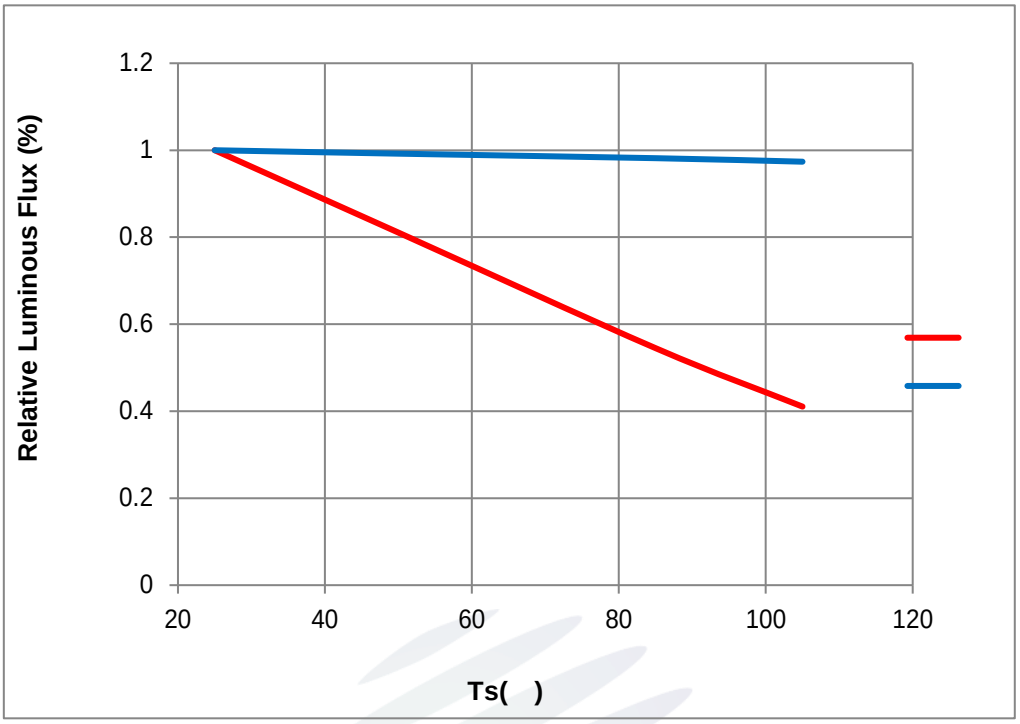


Fig 1-8 Solder Temperature Vs Relative Intensity管脚温度与相对光强特性曲线

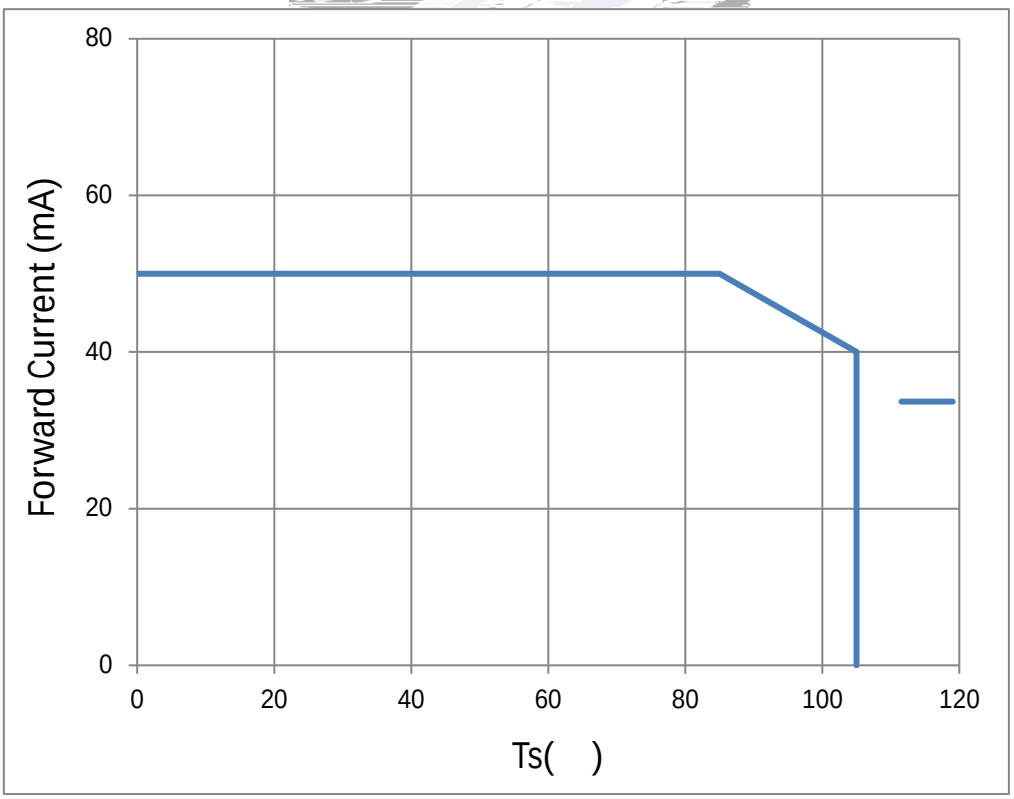


Fig 1-9 Solder Temperature Vs.Forward Current管脚温度与正向电流特性曲线

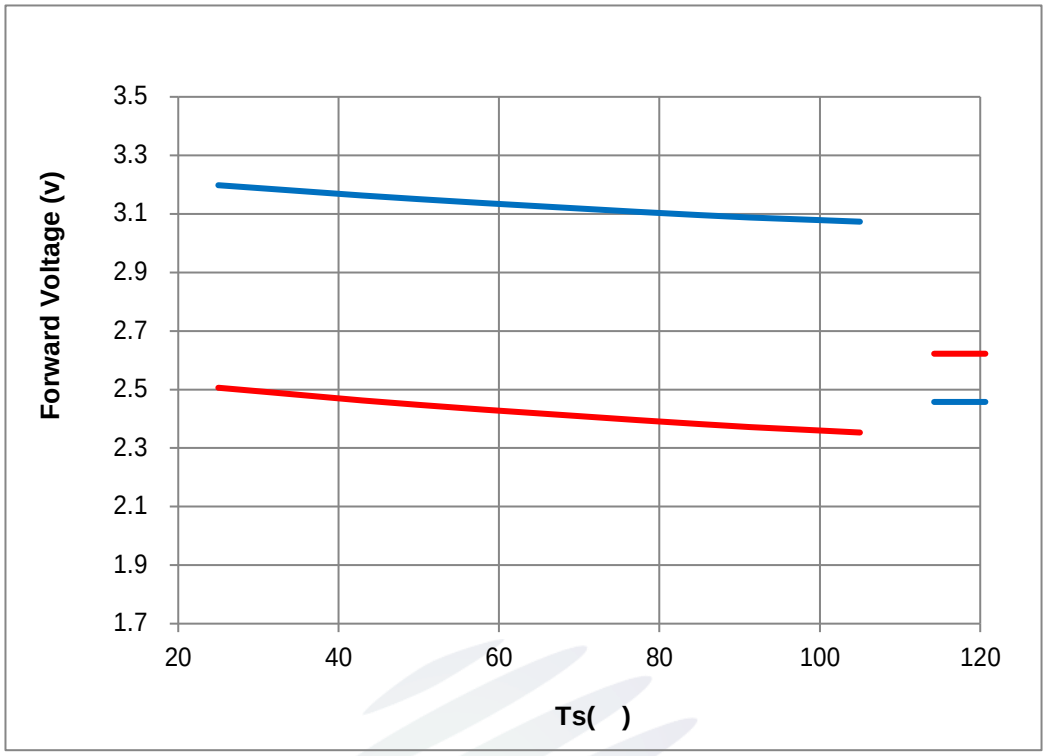


Fig 1-10 Forward Voltage Vs Solder Temperature电压与管脚温度特性曲线

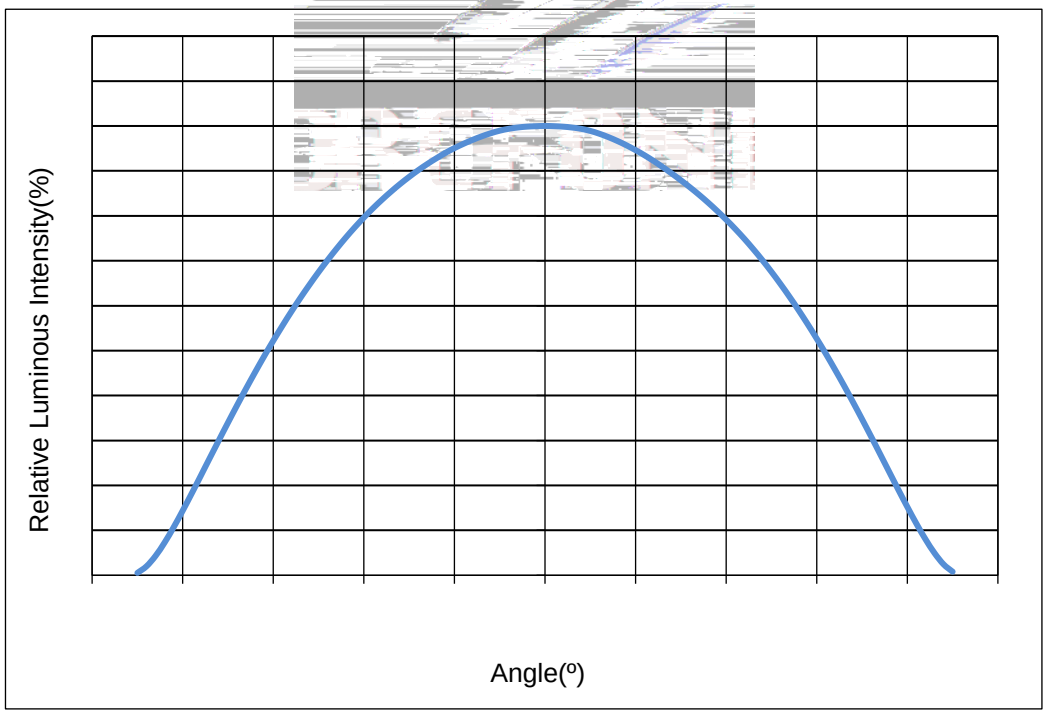
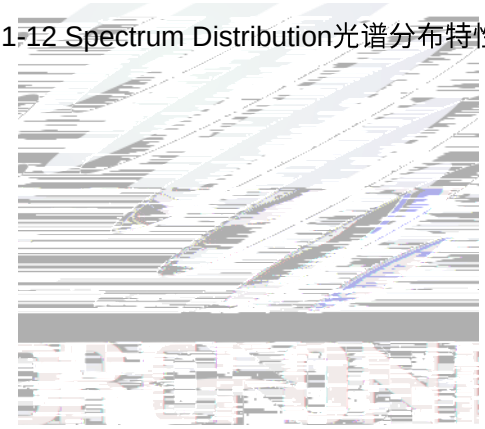
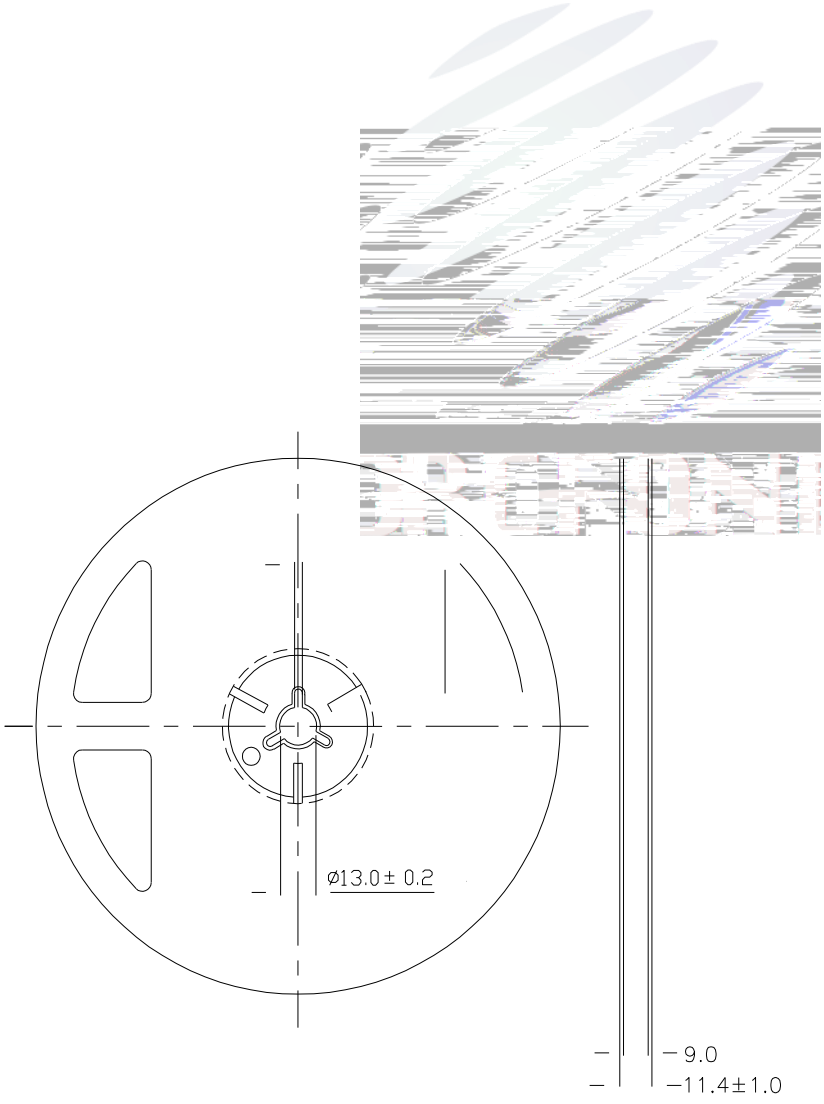


Fig 1-11 Radiation diagram辐射特性曲线

Fig 1-12 Spectrum Distribution光谱分布特性曲线




ø13.0± 0.2
9.0
11.4±1.0

2.1.3Label Form Specification 标签规格

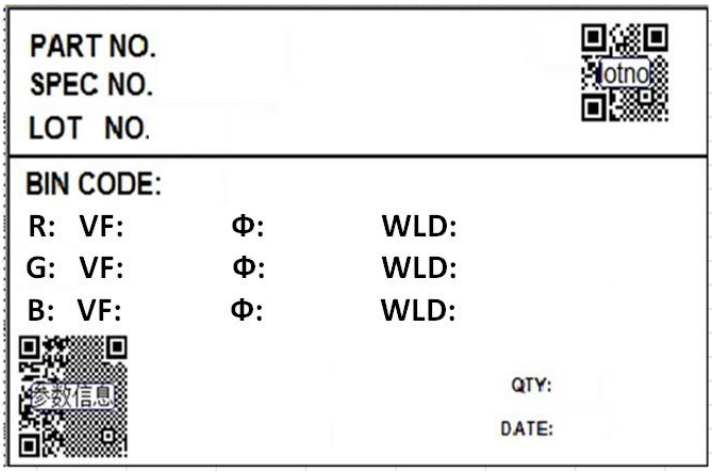


Fig 2-3 Title

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
WLD	Dominant Wavelength 波长
QTY	Packing Quantity 数量
DATE	Made Date 生产日期

2.2Moisture Resistant Packing 防潮包装

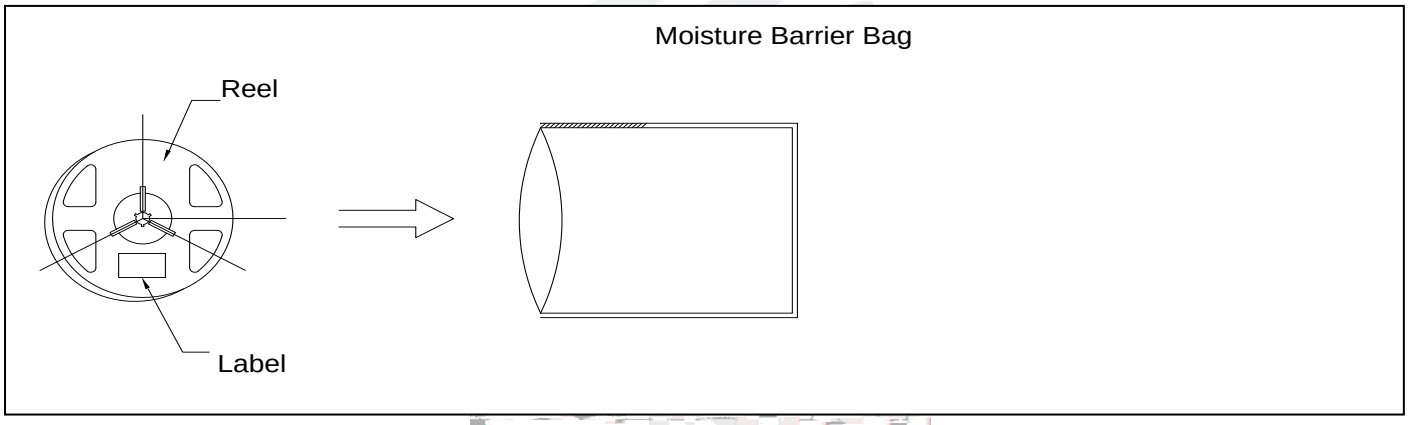


Fig.2- Title

2.3Cardboard Box 包装纸箱

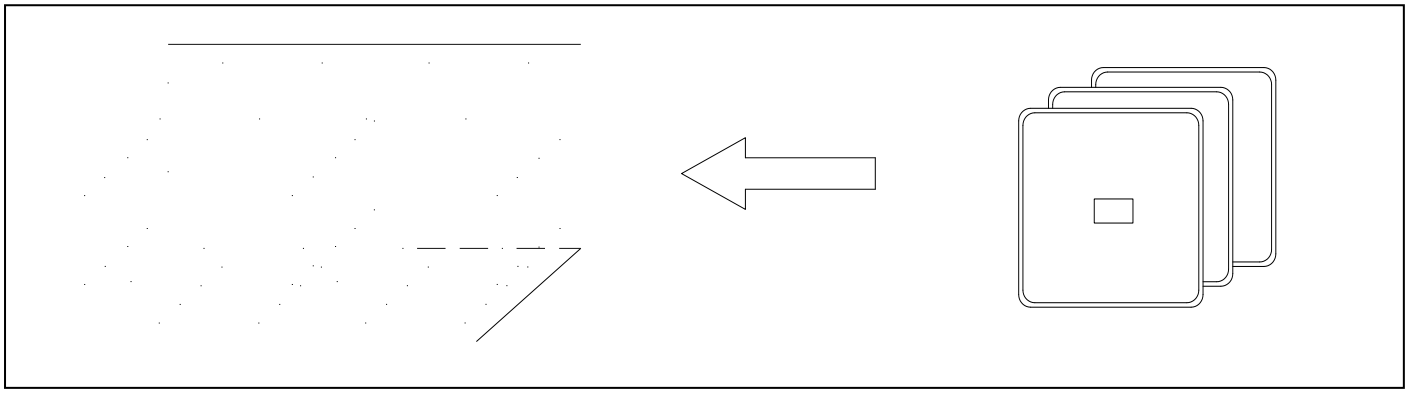


Fig.2- Title

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

Table 2-3 Title

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	Temp:260 max T=10 sec	2times.	10Pcs.	0/1
Temperature Cycle 温度循环	JESD22-A104	100 30 min. -40 30 min.	300Cycles	10Pcs.	0/1
Thermal Shock 冷热冲击	JESD22-A106	-40 15min 10sec 100 15min	300Cycles	10Pcs.	0/1
High Temperature Storage 高温保存	JESD22-A103	Temp.:105	1000Hrs.	10Pcs.	0/1
Low Temperature Storage 低温保存	JESD22-A119	Temp.:-40	1000Hrs.	10Pcs.	0/1
Life Test 常温老化	JESD22-A108	Ta=25 I_F =50mA	1000Hrs.	10Pcs.	0/1
High Temperature High Humidity Life Test 高温高湿老化	JESD22-A101	60 / 90%RH I_F=50mA	1000Hrs.	10Pcs.	0/1

2.5 Criteria For Judging Damage 失效判定标准

Table 2-4 Title

Test Items 项目	Symbol 符号	Test Condition 测试条件	Criteria For Judgement 判定标准	
			Min. 最小	Max. 最大
Forward Voltage 正向电压	V_F	I_F=50mA	-	(U.S.L*)x1.1
Reverse Current 反向电流	I_R	V_R =5V	-	(U.S.L*)x2.0
Luminous Flux 光通量		I_F=50mA	(L.S.L*)x0.7	-

Table 3-1Title

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限时维持高温：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 Tp 25 °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
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) The hand solder should be done only one time.手工焊接只可焊接一次。

3.1.2 Repairing 修补

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

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. 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 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 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 directlytouch 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。

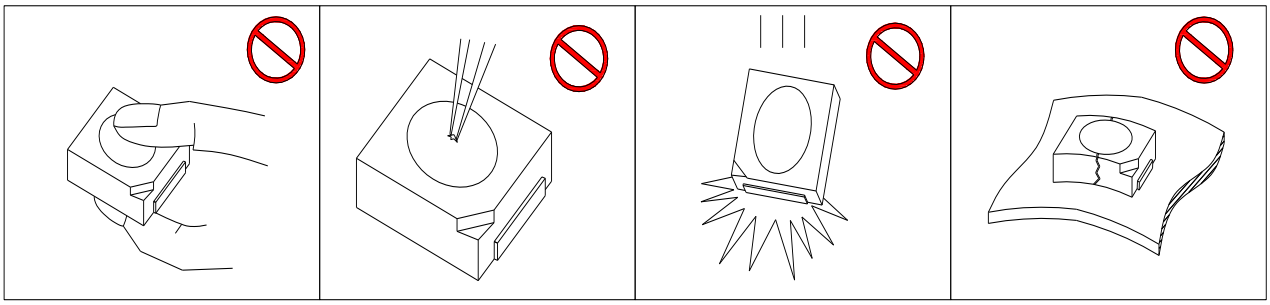


Fig 4-1 Title

	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 65 5 for above 24 hours.如果干燥剂或包装失效，或者产品不符合以上有效储存条件，零拆包后进行烘烤，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。

ples hff

Version History/修订历史

Date日期	Revisor修订者	Version版本	Verifier审核	Remarks备注
2021-08-05		E/0