SPECIFICATION
产品规格书

REFOND P/N 产品型号

RF-AL-C3535L2K1**-*1-S-I

□R&D 研发

■Mass Product 量产供货

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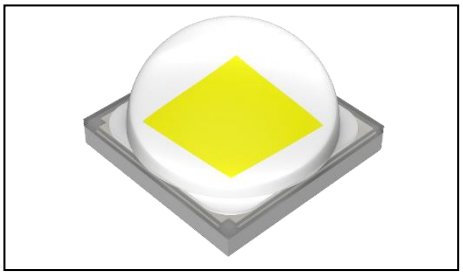
1. Description 产品介绍

1.1General Description 产品描述



The White LED which was fabricated by using a blue chip and phosphors.

白光 LED，是由蓝光芯片激发荧光粉而形成

The LED package dimension: 3.50mmX3.50mmX2.33mm.

产品尺寸：3.50mmX3.50mmX2.33mm。

1.2Features 产品特征

► Ceramics Package.陶瓷封装

► viewing angle:120°.发光角度120°

► Moisture sensitivity level: Level 1.防潮等级 Level 1

►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

►RoHS compliant.满足RoHS要求

1.3Application 产品应用

► Warning lights, Downlights, Wash wall lights, Spot lights, Street lights, Visual lights, Photographic fill lights. 警报器、筒射灯、洗墙灯、天花灯、路灯、视觉照明、摄影补光

►Plant lighting, Landscape lighting, Stage photography light. 植物照明、景观照明、舞台摄影

►Hotels, markets, offices, household and other indoor uses.酒店、商场、办公室、家用及其它室内用途

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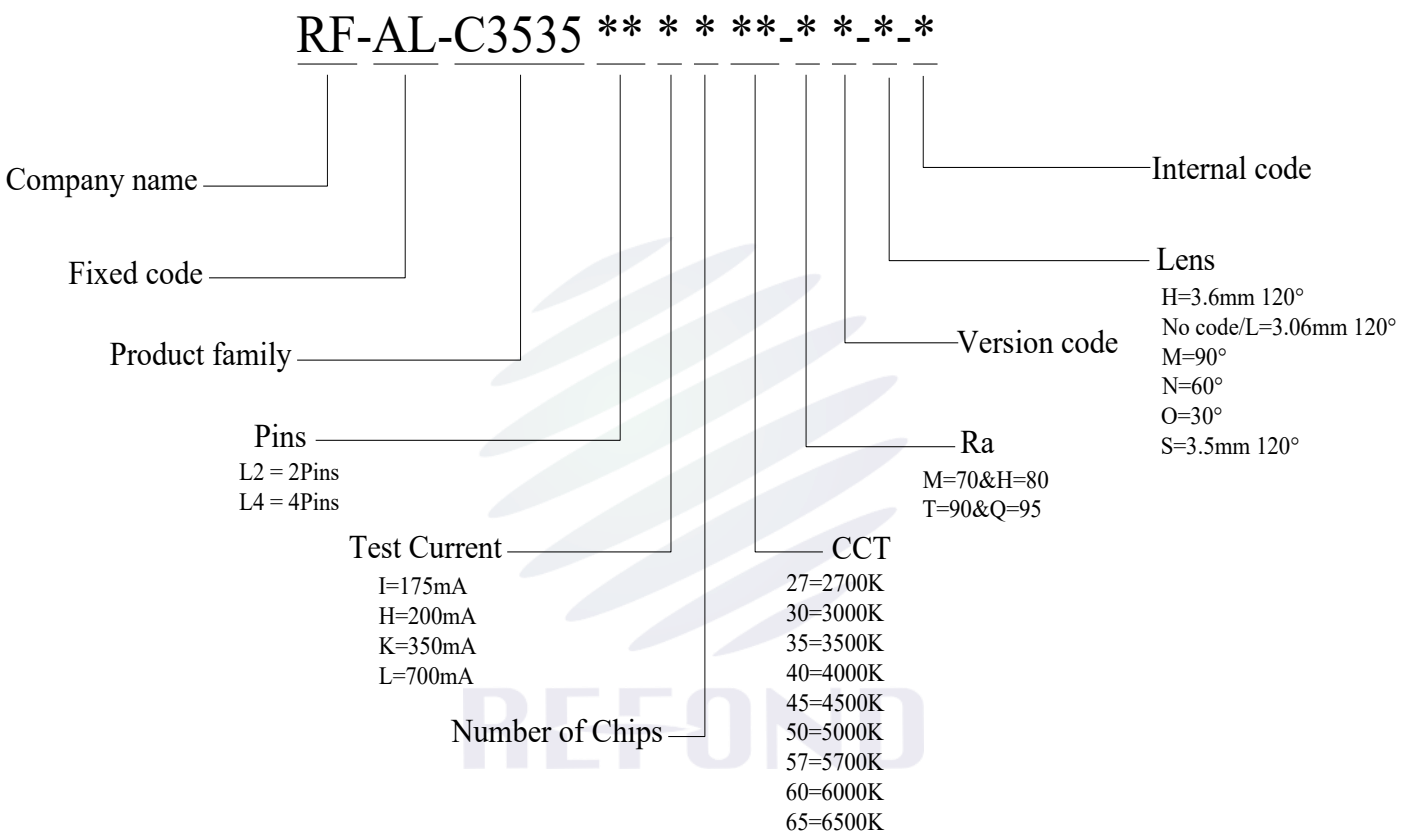
►General use.其他应用

1.4 Product Nomenclature 产品命名规则

The part number designation for Ceramic 3535 is explained as follows:



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1.5Package Dimension 封装尺寸

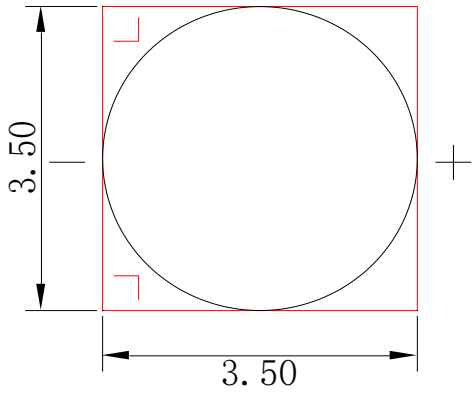

Fig.1-1 Top view 正面视图

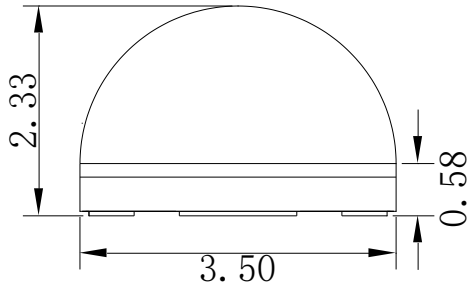

Fig.1-2 Side view 侧面视图

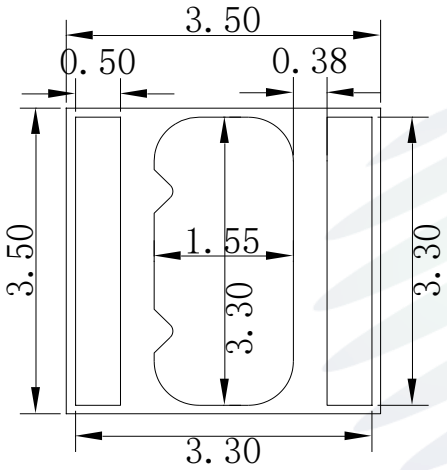

Fig.1-3 Bottom view 背面视图

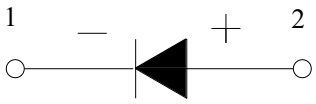

Fig.1-4 Polarity 极性

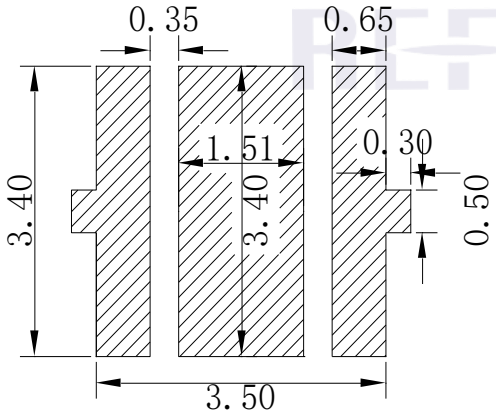

Fig.1-5 Soldering patterns 推荐焊盘

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 ±0.2mm unless otherwise noted.除特别标注外，所有尺寸公差为±0.2 毫米

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1.6Product 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）	
Forward Voltage (正向电压)	V_F	I_F=700mA	2.6	---	3.4	V
Reverse Current (漏电流)	I_R	V_R=5V	---	---	10	uA
Viewing Angle (发光角度)	2θ1/2	I_F=700mA	---	120	---	deg
Thermal Resistance. (热阻)	R_{THJ-S}	I_F=700mA Ta=85℃	---	1.41	---	℃/W

Table 1-2 Luminance Characteristics亮度特性

测试条件（700mA Tj=25° C）		计算值（Tj=85° C）		
亮度代码	亮度范围/lm	350mA	700mA	1000mA
GC6	260-280	124	234	322
GC7	280-300	133	252	347
GC8	300-320	143	270	371
GC9	320-340	152	288	396
GD1	340-360	162	306	421
GD2	360-380	171	325	446
GD3	380-400	181	343	471
GD4	400-420	190	361	495
GD5	420-440	200	379	520

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Table 1-3 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	6800	mW
Forward Current (正向电流)	I_F	2000	mA
Peak Forward Current (峰值电流)	I_{FP}	2500	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 ~ +125	℃
Storage Temperature (储存温度)	T_{OPR}	-40 ~ +85	℃
Junction Temperature (结温)	T_J	150	℃

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 ±0.1V. 以上所示电压测量误差 ±0.1V.

3. The above Dominant Wavelength measurement allowance tolerance is±1nm.以上所示波长测量误差±1nm.

4. The above luminous flux measurement allowance tolerance ±7%. 上述亮度的测试允许公差为±7%.

5. 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。

6. 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。

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7.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。

8. 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。

1.6.1 Bin Range Of Forward Voltage and Luminous Intensity (IF=700mA Tj=25°C)电压与光强分 BIN 范围(IF=700mA Tj=25°C)

Table 1-4 VF Bins

V_F（V）	F0	G0	H0	I0
	2.6-2.8	2.8-3.0	3.0-3.2	3.2-3.4

Table 1-5 Luminous Flux Bins

CRI	CCT(K)	Flux Bin(lm)							
		320	340	360	380	400	420	440	460
70	2700		RF-AL-C3535L2K127-M1-S-I						
	3000			RF-AL-C3535L2K130-M1-S-I					
	3500			RF-AL-C3535L2K135-M1-S-I					
	4000				RF-AL-C3535L2K140-M1-S-I				
	5000					RF-AL-C3535L2K150-M1-S-I			
	5700					RF-AL-C3535L2K157-M1-S-I			
	6500				RF-AL-C3535L2K165-M1-S-I				

Table 1-6 Luminous Flux Bins

CRI	CCT(K)	Flux Bin(lm)							
		280	300	320	340	360	380	400	420
80	2700		RF-AL-C3535L2K127-H1-S-I						
	3000			RF-AL-C3535L2K130-H1-S-I					
	3500			RF-AL-C3535L2K135-H1-S-I					
	4000				RF-AL-C3535L2K140-H1-S-I				
	5000					RF-AL-C3535L2K150-H1-S-I			
	5700					RF-AL-C3535L2K157-H1-S-I			
	6500				RF-AL-C3535L2K165-H1-S-I				

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Table 1-7 Luminous Flux Bins

CRI	CCT(K)	Flux Bin(lm)							
		240	260	280	300	320	340	360	380
90	2700		RF-AL-C3535L2K127-T1-S-I						
	3000			RF-AL-C3535L2K130-T1-S-I					
	3500			RF-AL-C3535L2K135-T1-S-I					
	4000				RF-AL-C3535L2K140-T1-S-I				
	5000					RF-AL-C3535L2K150-T1-S-I			
	5700					RF-AL-C3535L2K157-T1-S-I			
	6500				RF-AL-C3535L2K165-T1-S-I				

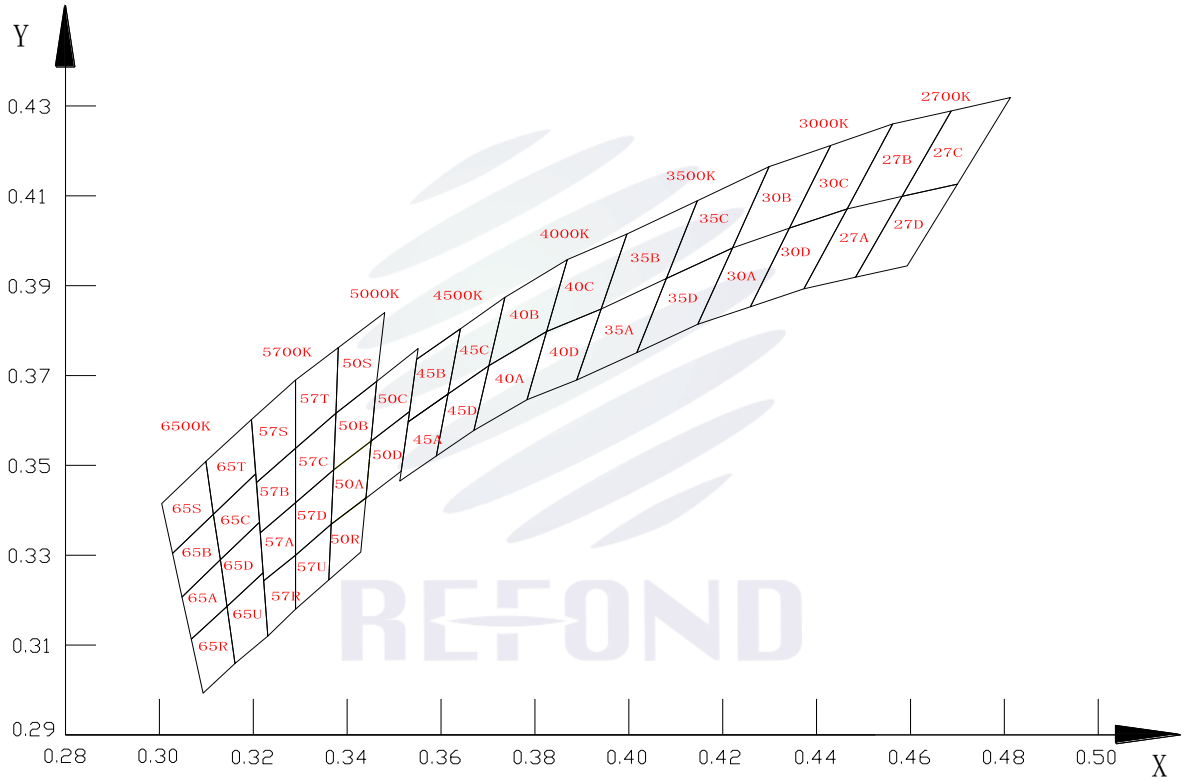

Fig.1-6 Chromaticity Coordinates 色坐标图

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Table 1-8 Chromaticity Region & Coordinates

Region	CIE-X	CIE-Y	Region	CIE-X	CIE-Y	Region	CIE-X	CIE-Y	Region	CIE-X	CIE-Y
2700K			3000K			3500K			4000K		
27A	0.4373	0.3893	30A	0.4147	0.3814	35A	0.3889	0.3690	40A	0.3670	0.3578
	0.4465	0.4071		0.4221	0.3984		0.3941	0.3848		0.3702	0.3722
	0.4582	0.4099		0.4342	0.4028		0.4080	0.3916		0.3825	0.3798
	0.4483	0.3919		0.4259	0.3853		0.4017	0.3751		0.3783	0.3646
27B	0.4465	0.4071	30B	0.4221	0.3984	35B	0.3941	0.3848	40B	0.3702	0.3722
	0.4562	0.4260		0.4299	0.4165		0.3996	0.4015		0.3736	0.3874
	0.4687	0.4289		0.4430	0.4212		0.4146	0.4089		0.3869	0.3958
	0.4582	0.4099		0.4342	0.4028		0.4080	0.3916		0.3825	0.3798
27C	0.4582	0.4099	30C	0.4342	0.4028	35C	0.4080	0.3916	40C	0.3825	0.3798
	0.4687	0.4289		0.4430	0.4212		0.4146	0.4089		0.3869	0.3958
	0.4813	0.4319		0.4562	0.4260		0.4299	0.4165		0.4006	0.4044
	0.4700	0.4126		0.4465	0.4071		0.4221	0.3984		0.3950	0.3875
27D	0.4483	0.3919	30D	0.4259	0.3853	35D	0.4017	0.3751	40D	0.3783	0.3646
	0.4582	0.4099		0.4342	0.4028		0.4080	0.3916		0.3825	0.3798
	0.4700	0.4126		0.4465	0.4071		0.4221	0.3984		0.3950	0.3875
	0.4593	0.3944		0.4373	0.3893		0.4147	0.3814		0.3898	0.3716
Region	CIE-X	CIE-Y	Region	CIE-X	CIE-Y	Region	CIE-X	CIE-Y	Region	CIE-X	CIE-Y
4500K			5000K			5700K			6500K		
45A	0.3530	0.3597	50A	0.3371	0.3490	57A	0.3215	0.3350	65A	0.3048	0.3207

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	0.3615	0.3659		0.3451	0.3554		0.3290	0.3417		0.3130	0.3290
	0.3590	0.3521		0.3440	0.3427		0.3290	0.3300		0.3144	0.3186
	0.3512	0.3465		0.3366	0.3369		0.3222	0.3243		0.3068	0.3113
45B	0.3548	0.3736	50B	0.3376	0.3616	57B	0.3207	0.3462	65B	0.3028	0.3304
	0.3641	0.3804		0.3463	0.3687		0.3290	0.3538		0.3115	0.3391
	0.3615	0.3659		0.3451	0.3554		0.3290	0.3417		0.3130	0.3290
	0.3530	0.3597		0.3371	0.3490		0.3215	0.3350		0.3048	0.3207
45C	0.3641	0.3804	50C	0.3463	0.3687	57C	0.3290	0.3538	65C	0.3115	0.3391
	0.3736	0.3874		0.3551	0.3760		0.3376	0.3616		0.3205	0.3481
	0.3702	0.3722		0.3533	0.3620		0.3371	0.3490		0.3213	0.3373
	0.3615	0.3659		0.3451	0.3554		0.3290	0.3417		0.3130	0.3290
45D	0.3615	0.3659	50D	0.3451	0.3554	57D	0.3290	0.3417	65D	0.3130	0.3290
	0.3702	0.3722		0.3533	0.3620		0.3371	0.3490		0.3213	0.3373
	0.3670	0.3578		0.3515	0.3487		0.3366	0.3369		0.3221	0.3261
	0.3590	0.3521		0.3440	0.3427		0.3290	0.3300		0.3144	0.3186
			50R	0.3366	0.3369	57R	0.3222	0.3243	65R	0.3068	0.3113
				0.3440	0.3428		0.3290	0.3300		0.3144	0.3186
				0.3429	0.3307		0.3290	0.3180		0.3161	0.3059
				0.3361	0.3245		0.3231	0.3120		0.3093	0.2993
			50S	0.3381	0.3762	57S	0.3196	0.3602	65S	0.3005	0.3415
				0.3480	0.3840		0.3290	0.3690		0.3099	0.3509
				0.3463	0.3687		0.3290	0.3538		0.3115	0.3391

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				0.3376	0.3616		0.3207	0.3462		0.3028	0.3304
						57T	0.3290	0.3690	65T	0.3099	0.3509
							0.3381	0.3762		0.3196	0.3602
							0.3376	0.3616		0.3205	0.3481
							0.3290	0.3538		0.3115	0.3391
						57U	0.3290	0.3300	65U	0.3144	0.3186
							0.3366	0.3369		0.3221	0.3261
							0.3361	0.3245		0.3231	0.3120
							0.3290	0.3180		0.3161	0.3059

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

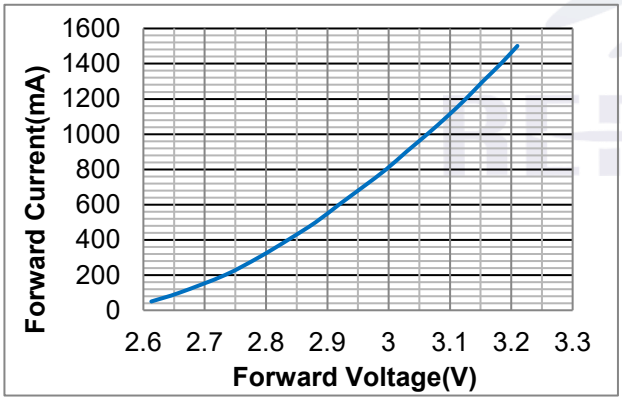

Fig 1-7 Forward Voltage Vs Forward Current
伏安特性曲线（Ts=25°C）

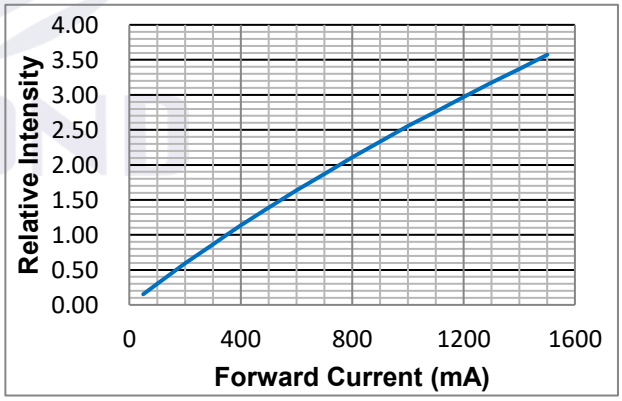

Fig.1-8 Forward Current Vs Relative Intensity
正向电流与相对光强特性曲线（Ts=25°C）

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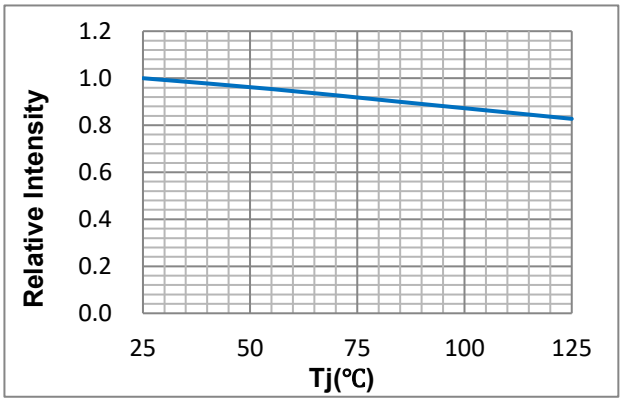

Fig.1-9 Tj Vs Relative Intensity
结温与相对光强特性曲线（IF=700mA）

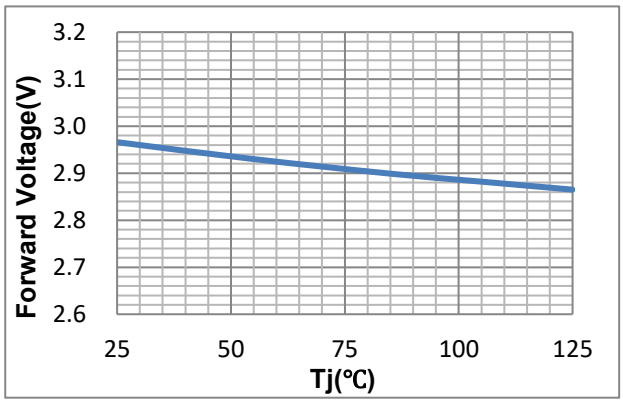

Fig.1-10 Tj Vs Forward Voltage
结温与电压特性曲线（IF=700mA）

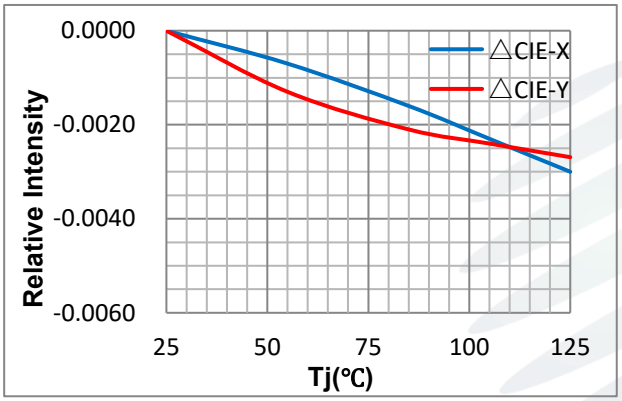

Fig.1-11 Tj Vs △CIE-X/Y
结温与色坐标偏移特性曲线（IF=700mA）

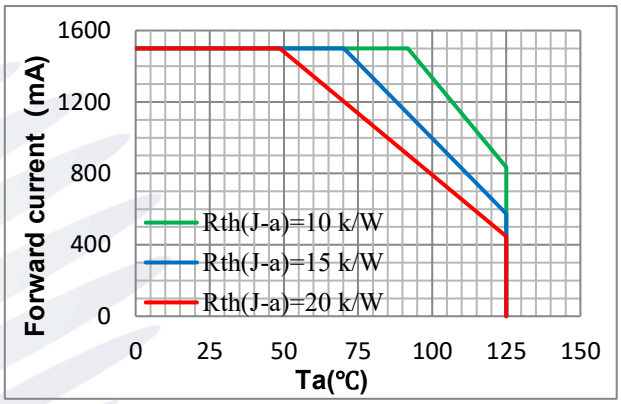

Fig.1-12 Ta Vs Forward Current
结温与正向电流特性曲线（IF=700mA）
Tj≤150℃

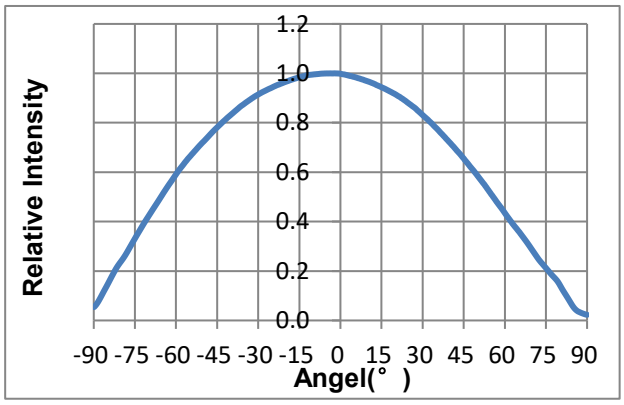

Fig.1-13 Radiation diagram
辐射特性曲线（IF=700mA）

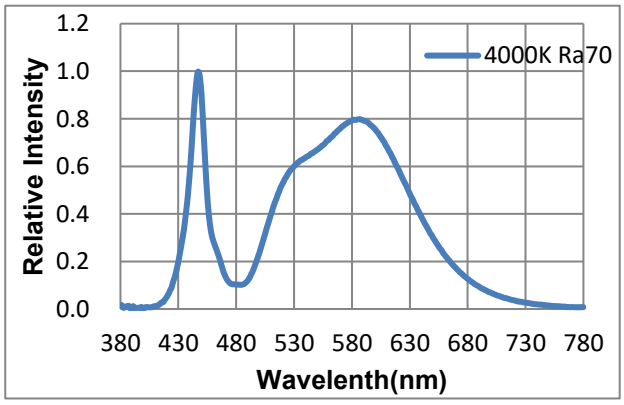

Fig.1-14 Spectrum Distribution
光谱分布特性曲线（IF=700mA）

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2. Packaging 产品包装

2.1 Packaging Specification 包装规格

Package: Max 1000pcs/reel.包装每卷最大包 1000pcs

2.1.1Carrier Tape Dimension 载带尺寸

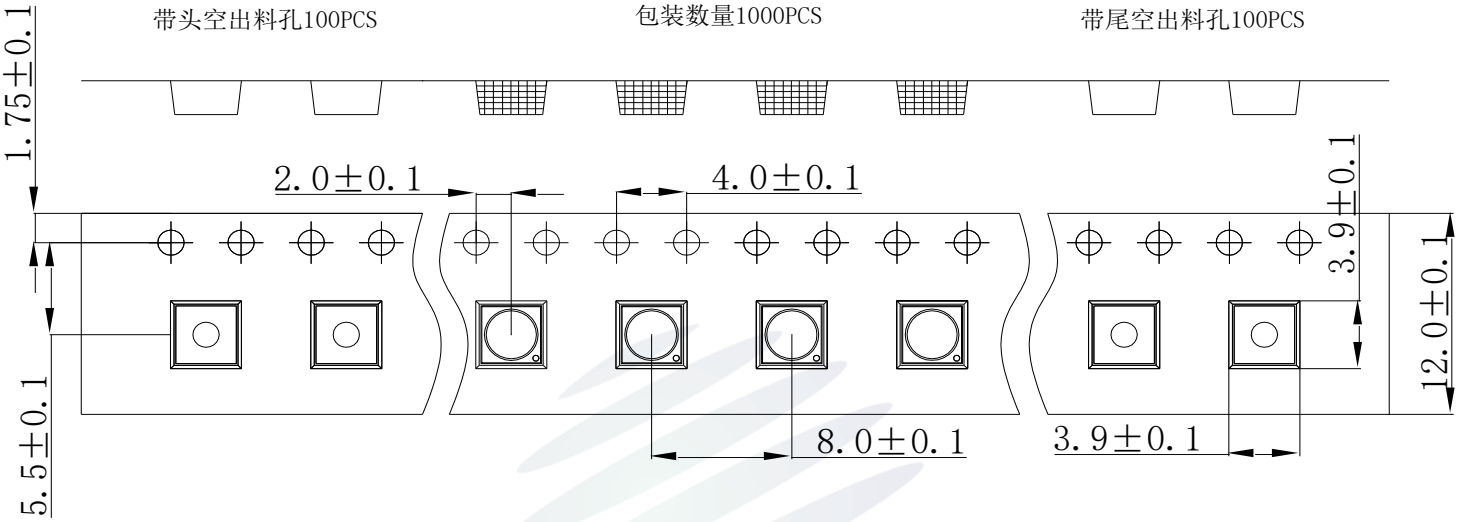

Fig.2-1 Carrier Tape Dimension 载带尺寸

2.1.2Reel Dimension 卷盘尺寸

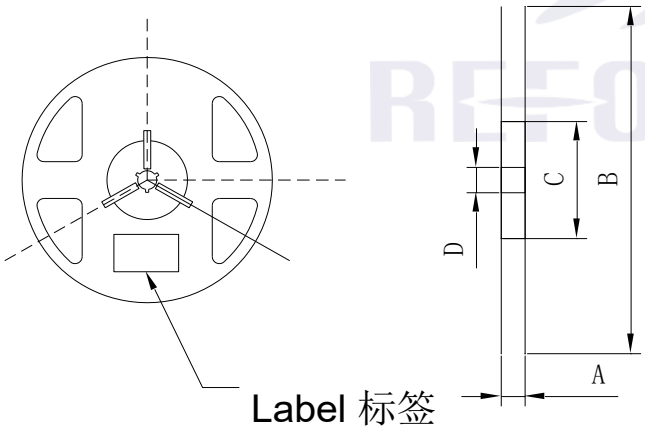

Fig.2-2Reel 卷盘

Table 2-1Reel 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 ±0.1mm. Unit : mm注：未注公差为±0.1毫米，尺寸单位：毫米。

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2.1.3Label Form Specification 标签规格

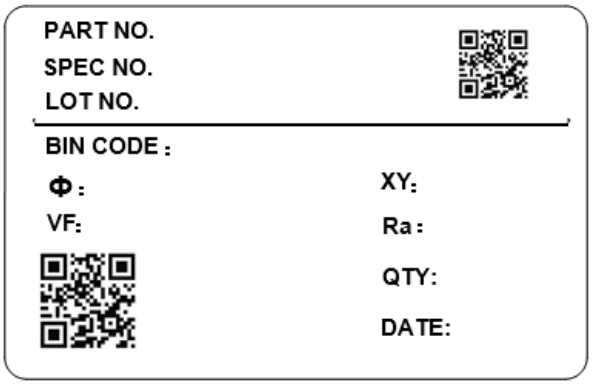

Fig 2-3 Label Form 标签模板

Table 2-2 Label Parameter 标签参数

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
Φ	Luminous flux 光通量
Ra	Color Rendering Index显指
XY	Chromaticity Bin 色区
VF	Forward Voltage 正向电压
QTY	Packing Quantity 数量
DATE	Made Date 生产日期

2.2Moisture Resistant Packing 防潮包装

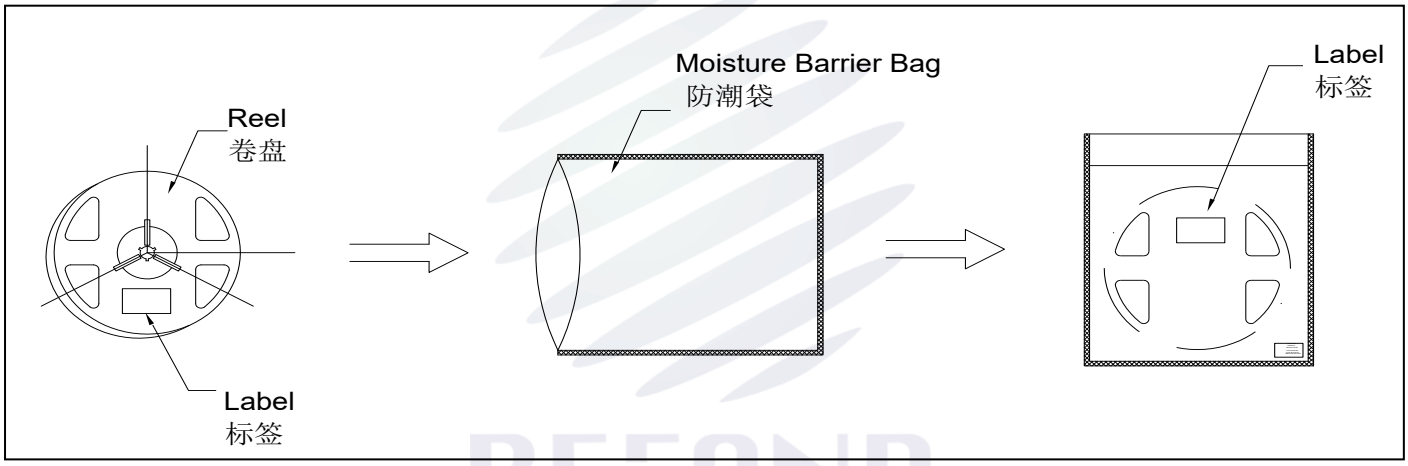

Fig.2-4Packing specification 包装说明

2.3Cardboard Box 包装纸箱

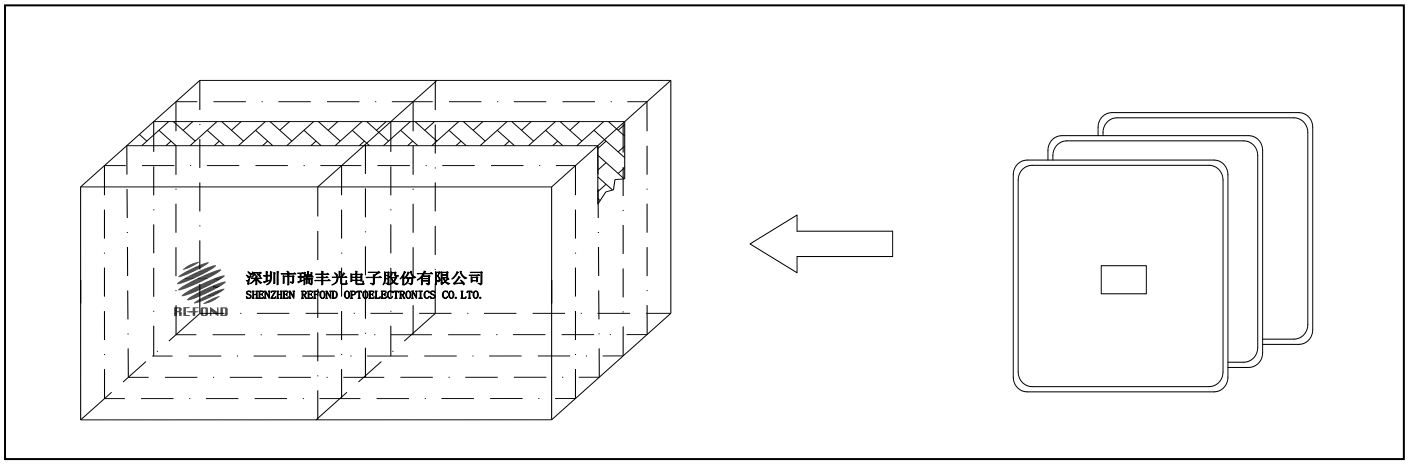

Fig.2-5Cardboard Box 包装纸箱

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3.Reliability 可靠性

3.1 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 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	T_{emp}:260℃max T=10 sec	2times.	10pcs.	0/1
Thermal Shock 冷热冲击	JEITAED-4701300307	-40℃ 15min ↑↓10s 100℃ 15min	500 cycles.	10pcs.	0/1
Normal Temperature Life Test 常温通电	JESD22-A108	T_A=25℃ I_F=1300mA	1000hrs.	10pcs.	0/1
High Temperature Life Test 高温通电	JESD22-A108	T_A=105℃ I_F=700mA	1000hrs.	10pcs.	0/1

3.2 Criteria For Judging Damage 失效判定标准

Table 2-4Criteria for judging damage 失效判定标准

Test Items 项目	Symbol 符号	Test Condition 测试条件	Criteria For Judgement 判定标准	Applicable project 适用项目
Forward Voltage 电压	V_F	I_F=350mA	≤±10%	Reflow Thermal Shock High and Low Temperature Storage Life Test
Luminous Flux W	Φ	I_F=350mA	Maintenance≥85% 光通量维持率	
Lamp Bead Light Test 灯珠点亮测试	/	I_F=350mA	No open circuit short circuit or flicke 无开路、短路、闪变	High Temperature High Humidity Life Test

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Notes 备注:

1.The above reliability tests is based on the verification of a single/strip LED of Refond's existing experimental platform, the reliability experiment was taken under good heat dissipation conditions. when customers applies the LED to the series and parallel circuit, should take consideration of all the factors such as the current, voltage distribution, heat dissipation and others.以上可靠性测试是基于瑞丰现有实验平台单颗/条 LED 在良好散热条件验证下的结果。客户端将 LED 应用于串、并联线路时，需自行评估电流、电压分配、散热等问题。

2.The technical information shown in the data sheets is 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. 以上技术数据仅为产品的典型值，只作为参考，不作为任何应用条件及应用方式的保证。

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4. Handing Notes 产品使用说明

4.1SMT Reflow Soldering Instructions SMT 回流焊说明

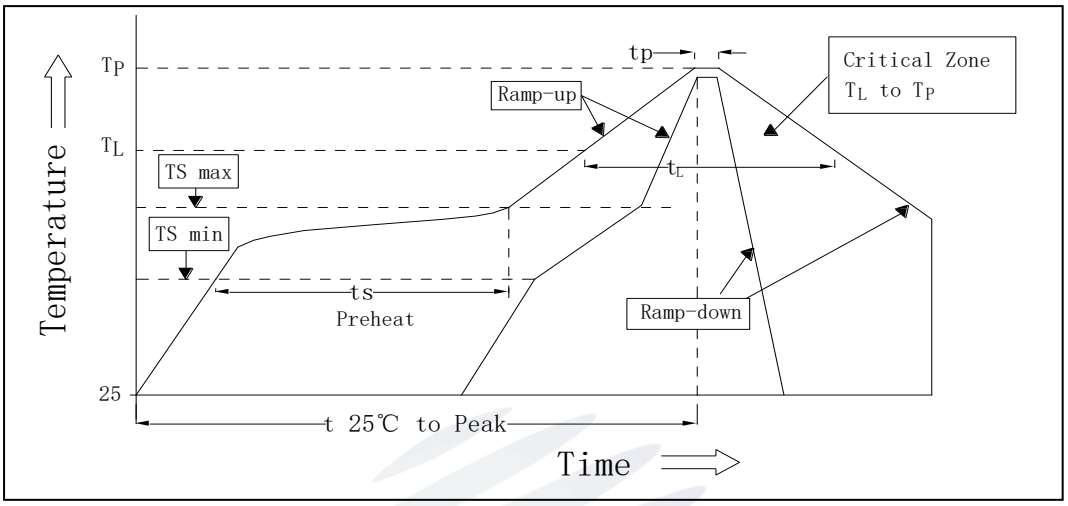

Fig.3-1SMT Reflow Soldering Instructions SMT 回流焊说明

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

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Notes 备注:

1.The number of reflow soldering should not exceed two times. If the time interval between two reflow soldering times exceeds 4 hours, the LED may be damaged due to moisture absorption. 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 4 小时，LED 可能因吸湿而损坏。

2.Do not press the light emitting surface while soldering in high temperature. 高温焊接时不要用力压产品胶体发光面。

4.1.2 Soldering Iron 烙铁焊接

1. When manually soldering, the soldering iron temperature must be less than 300℃ and the time must not exceed 3s. 手工焊接时，烙铁温度必须小于300℃，时间不超过3秒。
2. Manual soldering can only be done once. 手工焊接只可焊接一次。

4.1.3 Repairing 修补

LED cannot be repaired after reflow soldering. If repair is necessary, a double-ended soldering iron must be used, and it should be confirmed in advance whether this method will damage the characteristics of the LED itself. LED 回流焊后不可修补，当必须修补时，必须使用双头烙铁，且应事先确认此种方式会不会损坏 LED 本身的特性。

4.1.4 Cautions 注意事项

1. The LED light emitting surface is a soft silicone, pressing the surface hard will affect the reliability of the LED. Therefore, precautions should be taken to avoid pressing the device. When using a nozzle, ensure that the pressure applied to the surface will not damage the LED. LED发光面为软的硅胶，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，应确保施加到胶体表面的压力不会损坏LED。
2. Do not solder LED on a curved PCB board, and do not bend the PCB after soldering. 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。

During the cooling process after reflow soldering, do not apply external force to the material, do not vibrate it, and do not use drastic cooling methods. 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，不要采用激剧冷却的方式。

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4.2 Handling Precautions 产品使用注意事项

1. It is recommended that the sulfur element and compound content in the LED working environment and LED auxiliaries should not exceed 100PPM, but Refond does not provide quality guarantee. 建议 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，但瑞丰不作品质担保。
2. To prevent foreign substances from entering the LED and causing damage to the LED, the LED environment and the auxiliaries used, etc., require that the single bromine content is less than 900PPM, the single chlorine content is less than 900PPM, and the total content of bromine and chlorine must be less than 1500PPM. This is Refond suggestion and does not provide any quality guarantee. 为防止外界物质进入 LED 内部造成 LED 的损伤，LED 所处环境及所用套件等，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. 这是瑞丰的建议，不作任何品质担保。
3. The volatile substances in the application auxiliaries will penetrate into the interior of the LED. When the power is on, photons and heat are generated, which will cause the LED to change color and then cause light decay. Knowing the auxiliaries materials in advance can avoid these problems. Refond opposes the use of any substances or materials that are harmful to the performance or reliability of LED devices, whether these materials have been confirmed or are only suspected of being harmful. For specific uses and use environments, Refond recommends compatibility testing of all substances and materials. When mounting LEDs, do not use adhesives that can produce organic volatile gases. 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. Use appropriate tools to clamp the material from the side. Do not press the LED light emitting surface directly with your hands or sharp metal, as it may damage the internal circuit. 应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产品发光面，它可能会损坏内部电路。

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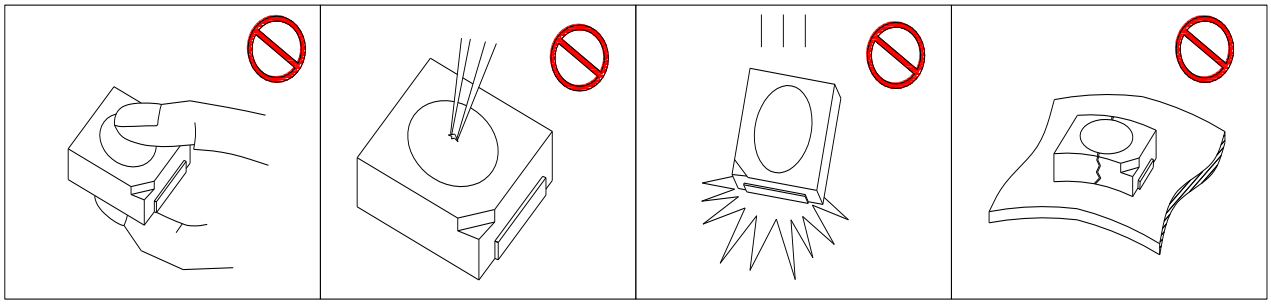

5. When designing a circuit, the current through the LED cannot exceed the specified maximum value. At the same time, a protective resistor must be used. Otherwise, a small voltage change will cause a large current change, which may cause product damage. The circuit design must ensure that only when the forward voltage changes when turning on or off, do not apply reverse voltage, otherwise it will damage the LED. 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. LED characteristics are prone to heat changes due to their own heat and changes in ambient temperature. Temperature increases will reduce LED efficacy and result in color shift, so heat dissipation issues should be fully considered during design. LED 特性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 with other encapsulating glues, silicone is a soft material and its surface easily absorbs dirt. Special attention should be paid when using the LED. When the cleanliness of the LED is required, appropriate cleaning methods are required after reflow soldering. We recommend using isopropyl alcohol as a cleaning agent. If other cleaning agents are needed, it must be ensured that the package will not be damaged. Ultrasonic cleaning may damage the LED and is not recommended. 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。
8. Recommended storage and baking condition. 建议的储存及烘烤条件。

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Table 4-1Storage 储存

Conditions 种类		Temperature 温度	Humidity 湿度	Time 时间
Storage 储存	Before Opening Aluminum Bag 拆包前	≤30℃	≤75%	Within 1 years From Date 1年内
	After Opening Aluminum Bag 拆包后	≤30℃	≤60%	168hours 168小时
Baking 烘烤		60±5℃	< 5%	≥24hours 大于24小时

9. If the package bag is bloated or damaged, please contact sales staff for assistance. 如果包装胀气或者破损，请联系销售人员协助处理。
10. LEDs are easily broken down by static electricity overcurrent, so static electricity protection is required. LED 极易被静电过流击穿，需要做好静电防护。
11. For other matters needing attention, please refer to the relevant information of Refond. 其它注意事项请参照瑞丰相关资料。

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Version History/修订历史

Date日期	Revisor修订者	Version版本	Verifier审核	Remarks备注
2025-08-13	刘明	E/0	任艳艳	初版发行

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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。

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