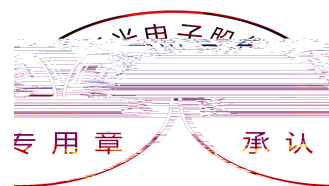
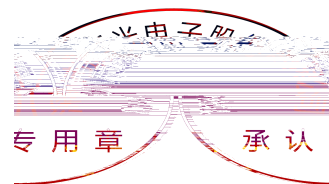


SPECIFICATION 产品规格书



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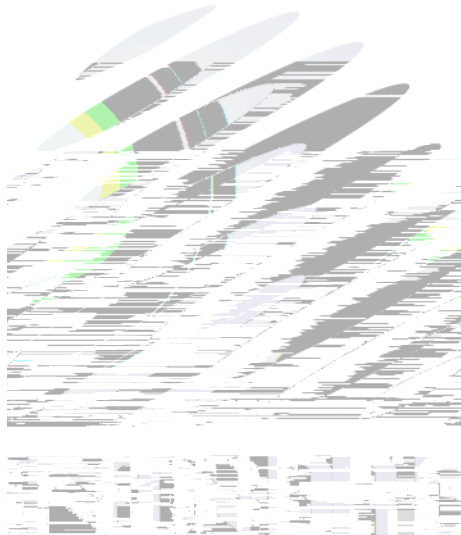
1. Description 产品介绍	
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4.1 Handling Precautions 产品使用注意事项	



1. Description

1.1 产品描述

This product uses the PPA package, it has a high reliability. it also be widely application for



1.4 Package Dimension 封装尺寸

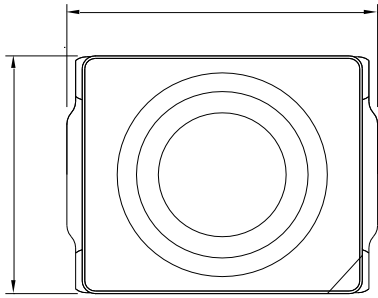


Fig.1-1 Top view 正面视图

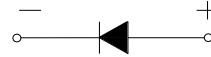


Fig.1-2 Polarity 极性

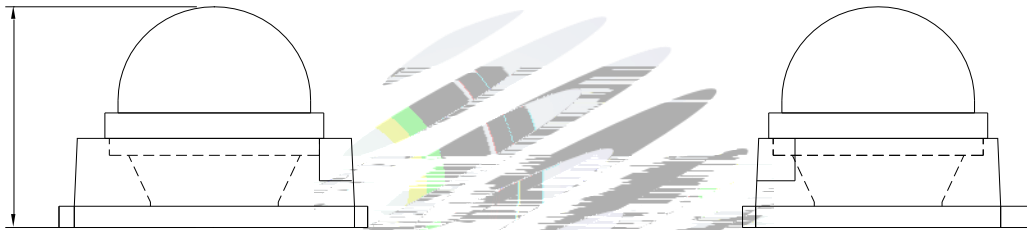


Fig.1-3 Side view 侧面视图

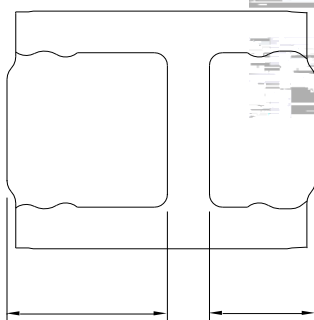


Fig.1-4 Bottom view 背面视图

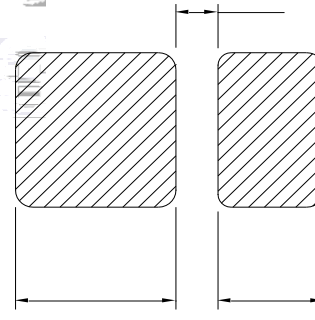
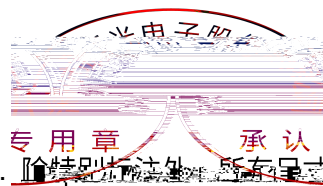


Fig.1-5 Soldering patterns 推荐焊盘

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 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	μA
Forward Voltage (正向电压)	V_F	$I_F=50mA$	1.4	1.6	---	V
Peak Wavelength (峰值波长)	λ_p	$I_F=50mA$	---	850	---	nm
Spectrum Radiation Bandwidth 半波宽		$I_F=50mA$	---	30	---	nm
Total radiant flux 辐射功率	e	$I_F=50mA$	14	28	---	mW
Viewing Angle (发光角度)	2	$I_F=50mA$	---	17	---	deg
Thermal Resistance. (热阻)	R_{THJ-S}	$I_F=50mA$	---	50	---	$^{\circ}W$

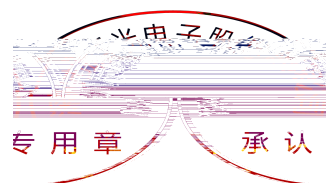


Table 1-2 Absolute Maximum Ratings at Ts=25°C 绝对最大值

Parameter (参数)	Symbol (符号)	Rating (值)	Units (单位)
Power Dissipation (功耗)	P_D	80	mW
Forward Current (正向电流)	I_F	50	mA
Reverse Voltage (反向电压)	V_R	5	V

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 $\pm 0.1V$. 以上所示电压测量误差 $\pm 0.1V$.
3. Tolerance of measurement of Total radiant flux/ Radiant Intensity: $\pm 10\%$. 辐射功率/强度测量公差: $\pm 10\%$.
4. 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。
5. All measurements were made under the standardized environment of Refond. 所有的LED测试都是在标准测试平台。
6. 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。
7. 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

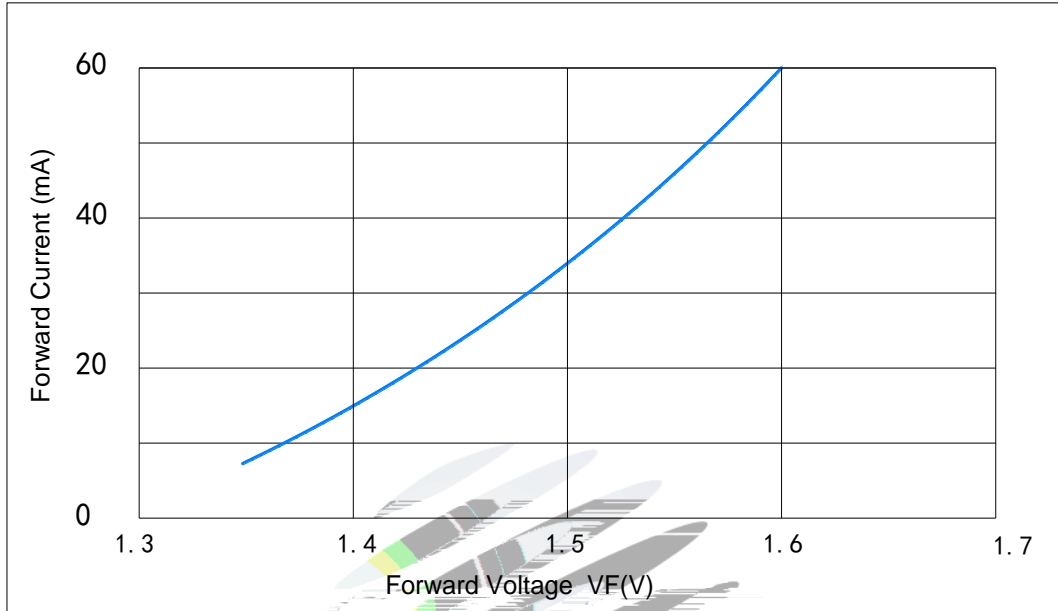


Fig 1-6 Forward Voltage Vs. Forward Current 伏安特性曲线

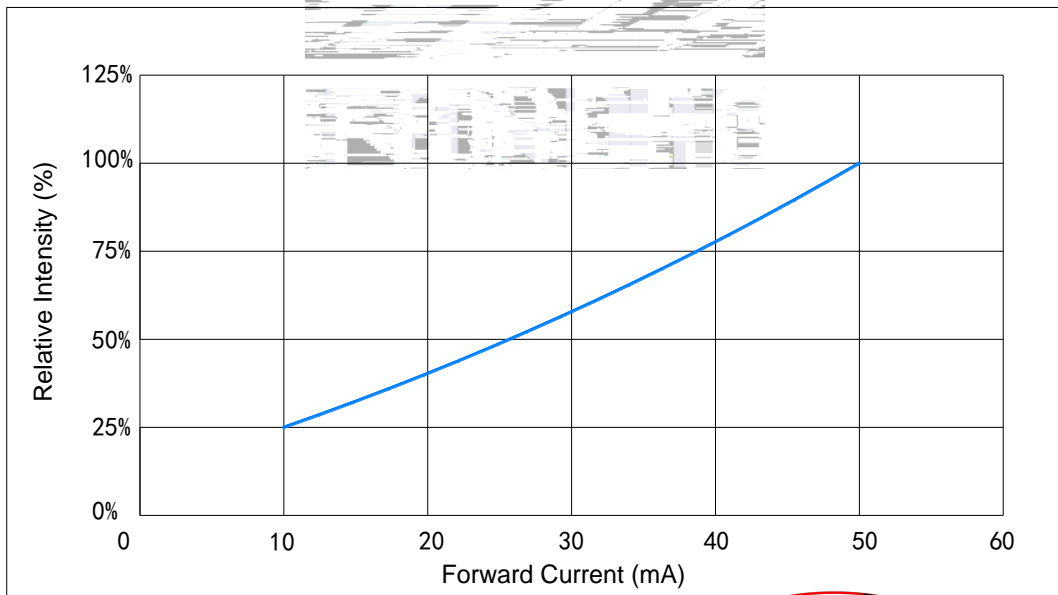
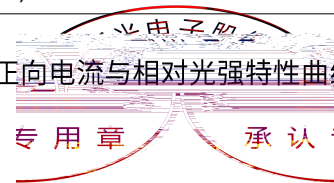


Fig 1-7 Forward Current Vs. Relative Intensity 正向电流与相对光强特性曲线



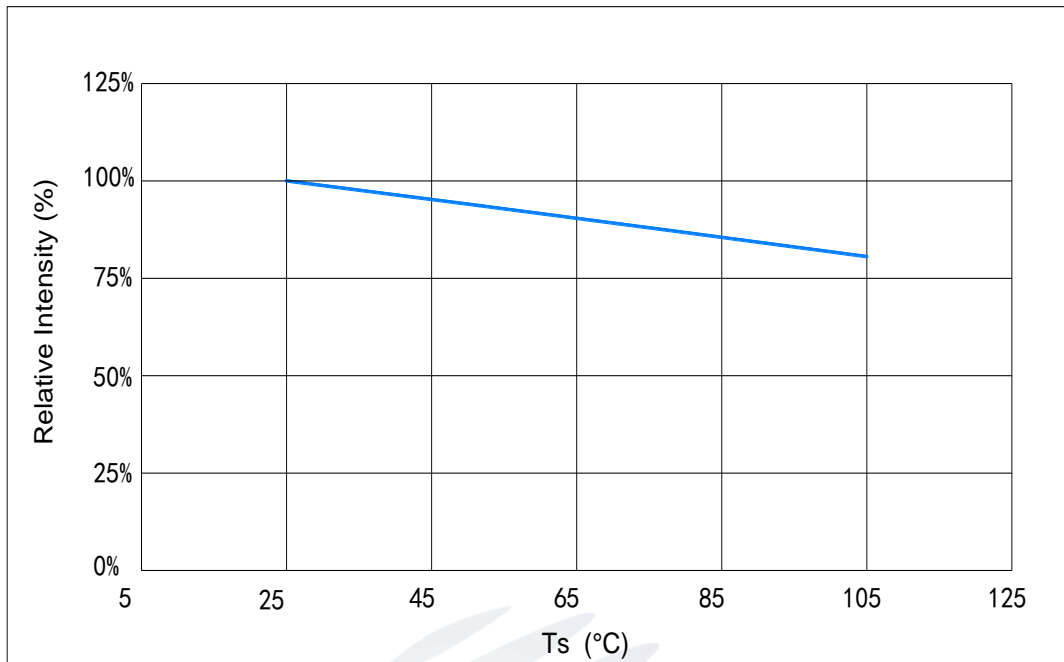


Fig 1-8 Ts Temperature Vs Relative Intensity 管脚温度与相对光强特性曲线

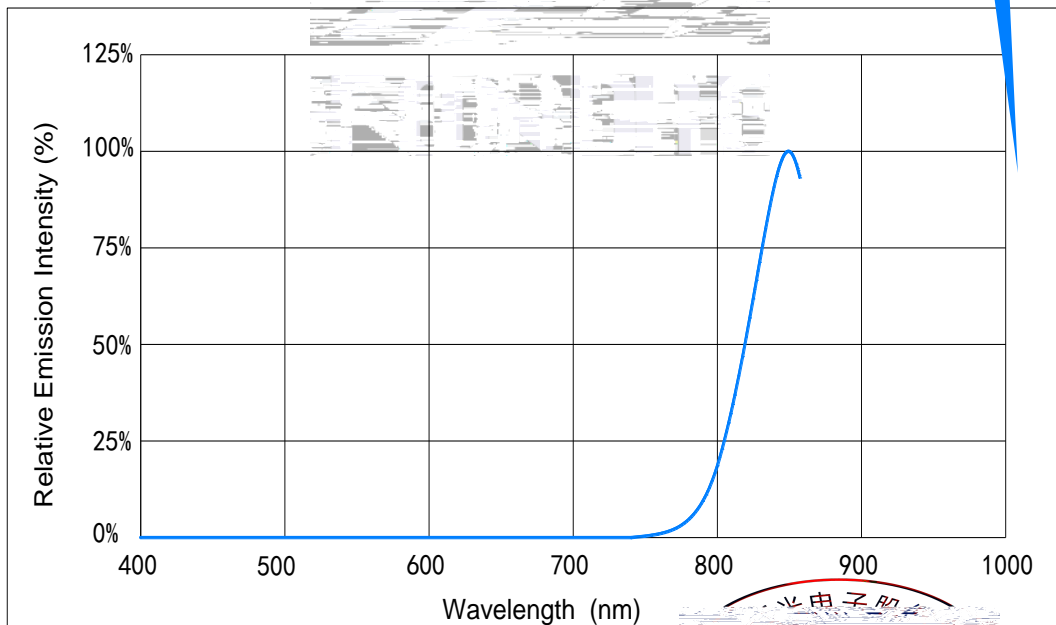


Fig 1-9 Spectrum Distribution 光谱分布特性曲线

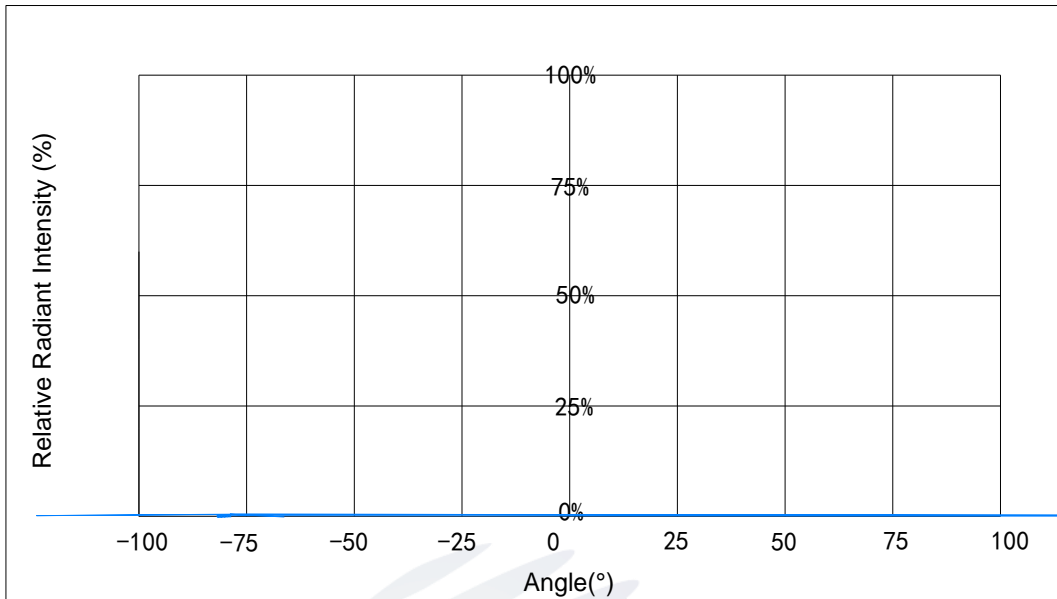


Fig 1-10 Radiation diagram 辐射特性曲线

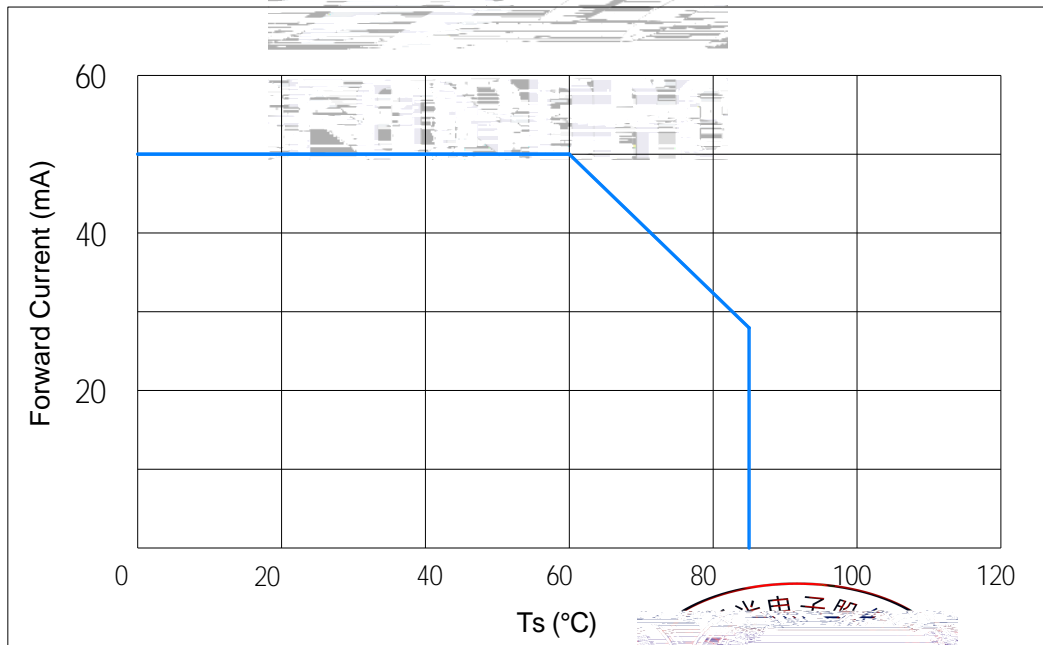
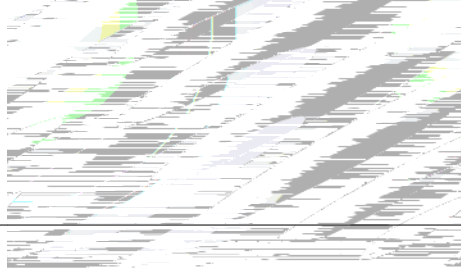
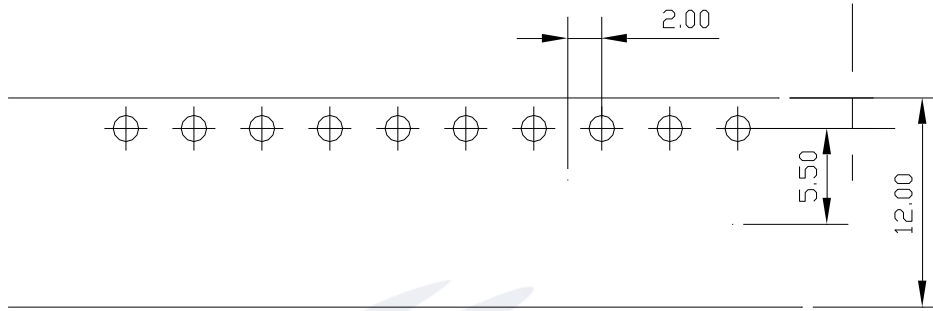


Fig 1-11 Ts Temperature Vs Forward Current 管脚温度与正向电流特性曲线

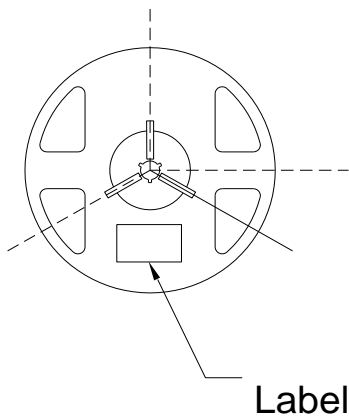
2. Packaging 产品包装

2.1 Packaging Specification 包装规格

Package:3000pcs/reel.包装每卷 3000pcs。



2.1.2 Reel Dimension 卷盘尺寸



Label

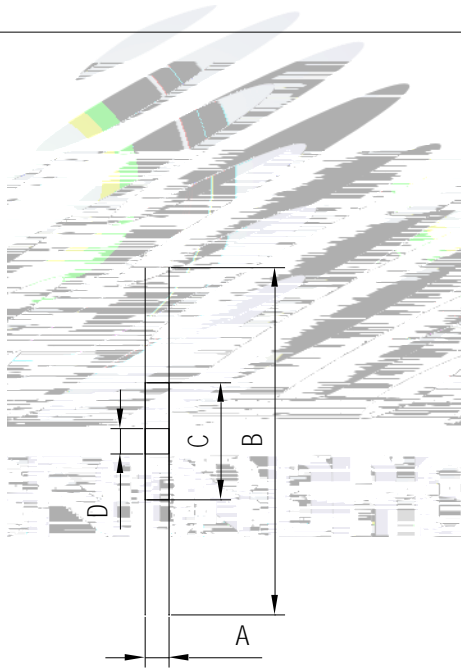


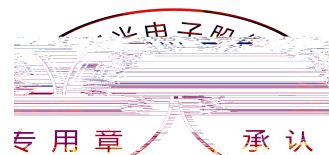
Table 2-1 Dimension 尺寸

A	12.7±0.3mm
B	330.2±2mm
C	79.5±1mm
D	14.3±0.2mm

Fig.2-2Reel Dimension 卷盘

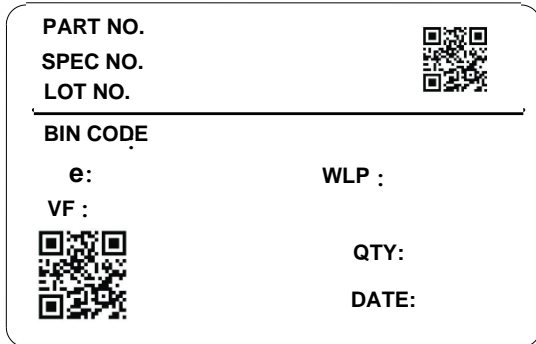
Notes 备注:

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



2.1.3 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
WLP	Peak Wavelength 峰值波长
V _F	Forward Voltage 正向电压
QTY	Packing Quantity 数量
DATE	Made Date 生产日期

Fig 2-3 Label Form Specification 标签规格

2.2 Moisture Resistant Packing 防潮包装

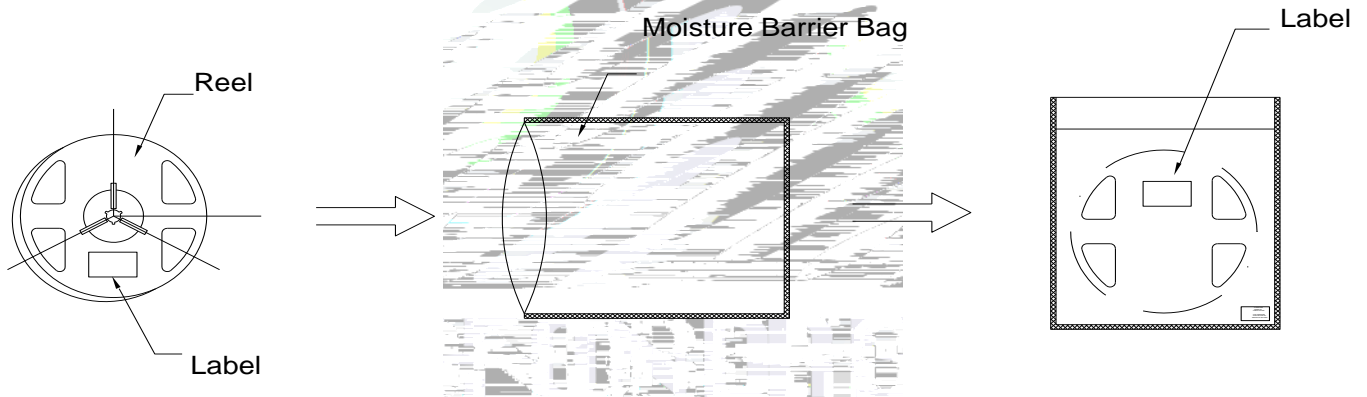


Fig.2-4 Moisture Resistant Packing 防潮包装

2.3 Cardboard Box 包装纸箱

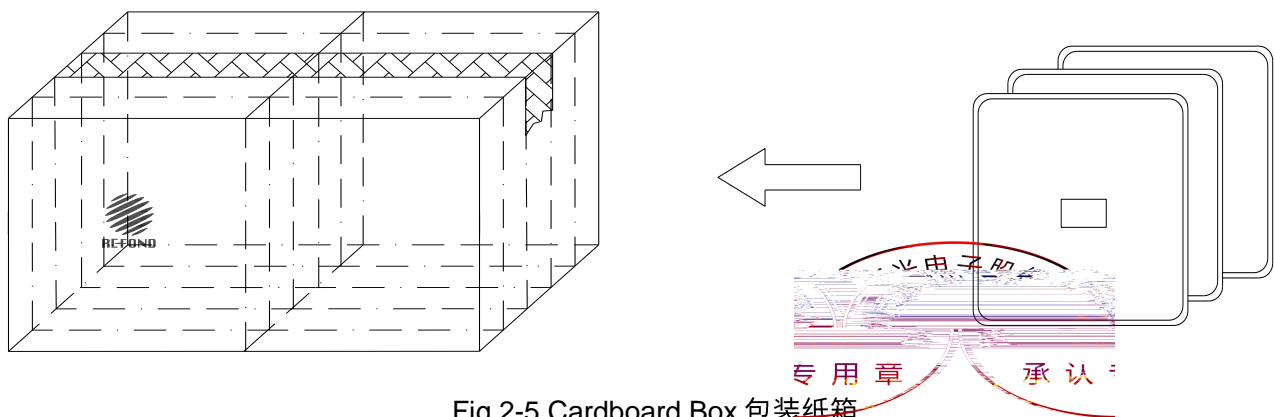
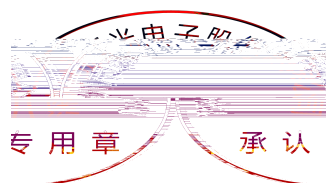


Fig.2-5 Cardboard Box 包装纸箱

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

Table 2-3 Reliability Test Items And Conditions 信赖性测试项目及条件

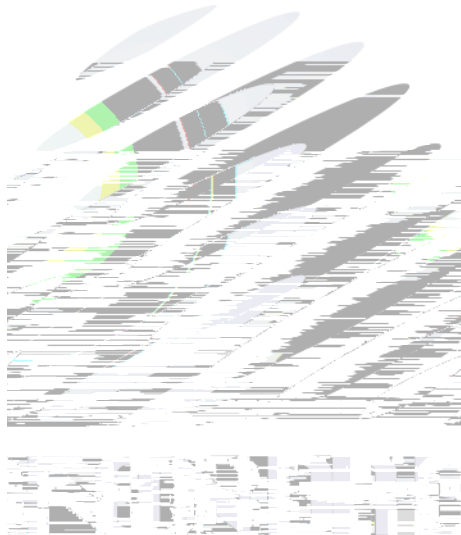
Test Items 项目	Ref.Standard 参考标准	Test Condition 测试条件	Time 时间	Quantity 数量	Ac/Re 接收/拒收
Reflow 回流焊	JESD22-B106	Temp:260°Cmax T=10 sec	3times.	10Pcs.	0/1
Temperature Cycle 温度循环	JESD22-A106	100°C 30 min. -40°C 30 min.	100 cycles	10Pcs.	0/1
Thermal Shock 冷热冲击	JESD22-A104	-40°C 15min 10s 100°C 15min	300 cycles	10Pcs.	0/1
High Temperature Storage 高温保存	JESD22-A103	Temp:100°C	1000 hrs.	10Pcs.	0/1
Low Temperature Storage 低温保存	JESD22-A119	Temp:-40°C	1000 hrs.	10Pcs.	0/1
Life Test 常温通电	JESD22-A108	Ta=25°C If=50mA	1000 hrs.	10Pcs.	0/1



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 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	$I_F=50mA$	-	$U.S.L^*) \times 1.1$
Reverse Current 反向电流	I_R	$V_R = 5V$	-	



3. SMT Reflow Soldering Instructions SMT 回流焊说明

3.1 SMT Reflow Soldering Instructions SMT 回流焊说明

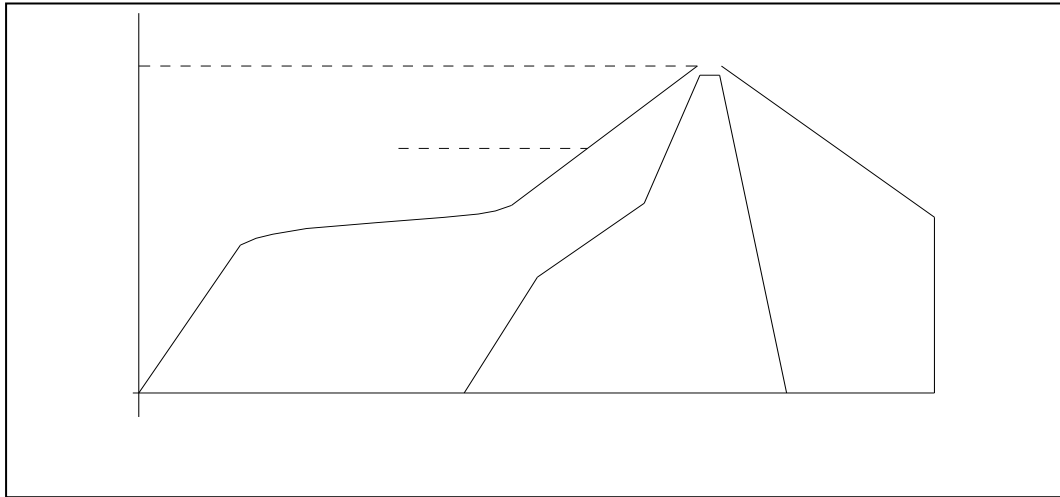


Fig.3-1 SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1 Parameter 参数

Average temperature rise speed 平均升温速度 (T _{smax} 至 T _p)	最高3 °C/秒 Max 3 °C/ s
Preheating: minimum temperature 预热: 最低温度 (T _{smi} n)	160 °C
Preheating: Max temperature 预热: 最高温度 (T _{smax})	180°C
Preheating: Time 预热: 时间 (T _{smi} n 至 T _{smax})	60 - 120秒 60s-120s
Time limited to maintain high temperature: the temperature 限时维持高温: 温度(T _L)	200°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)	220 °C
Time limit classification of peak temperature time 限时峰停分类温度: 时间 (t _p)	最多5秒 Max 5s
Hold time within 5 °C with the actual peak temperature (TP) 与实际峰值温度 (TP) 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 T _p 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°C 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) 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

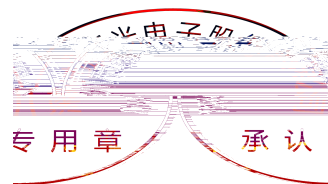
Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed in advance whether the characteristics of LEDs will or will not be damaged by repairing.

LED 流焊后不可再进行修补，如必须修补时，应使用双头烙铁，而且事先应确认此种方法是否会损坏LED本身的特性。

3.1.3 Cautions 注意事项

(1) 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。

(2) 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。



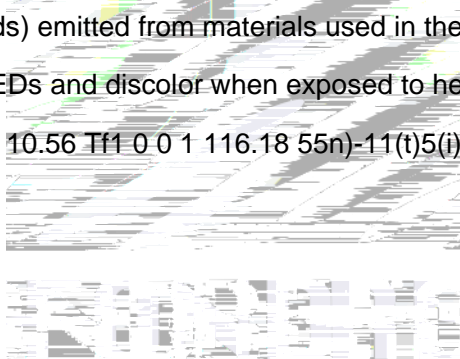
4. Handling Precautions 产品使用注意事项

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 s an 0(T/F2 10.56 Tf1 0 0 1 116.18 55n)-11(t)5(i)-4(on)4(o)-11(f)-5()-5(f)5(i)-4(xtn3(e)-11(c9[



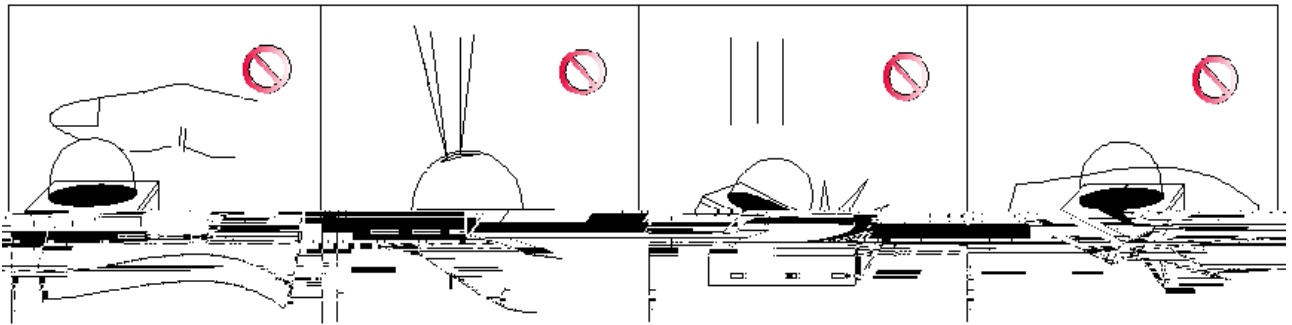


Fig 4-1

(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。

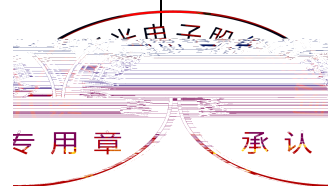
(6) Thermal Design is paramount importance because heat generation may result in the Characteristics decline, such as brightness decreased, Color change and so on. Please consider the heat generation of the LEDs when making the system design. LED 容易因为自身的发热和环境的温度改变而改变，温度升高会降低 LED 发光效率，影响使用寿命。所以在设计时需要考虑散热问题。

Table 4-1 Storage 储存

Conditions 种类		Temperature	Humidity 湿度	Time 时间
Storage	Before Opening Aluminum Bag 拆包前	30°C	75%	Within 1 Year From Date
	After Opening Aluminum Bag 拆包后	30°C	60%	48hours 48小时

Baking
烘烤

60±5°C

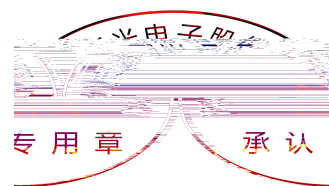
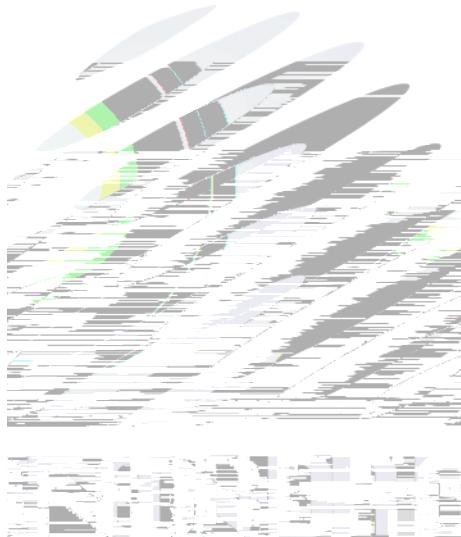


(7) If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed after unpacking and based on the following condition (60 ± 5) °C for above 24 hours. 如果干燥剂或包装失效, 或者产品不符合以上有效储存条件, 需拆包后进行烘烤, 烘烤条件: $60\pm 5^{\circ}\text{C}$, 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。

(8) 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。

(9) Other points for attention, please refer to our relevant information.



Date日期	Revisor修订者	Version版本	Verifier审核	Remarks备注
2019-8-12	刘旭阳	E/0	王华建	新版发行



Declare 申明

TtEETQf5 518h d C518hi(o)9(mTJse)4Eind