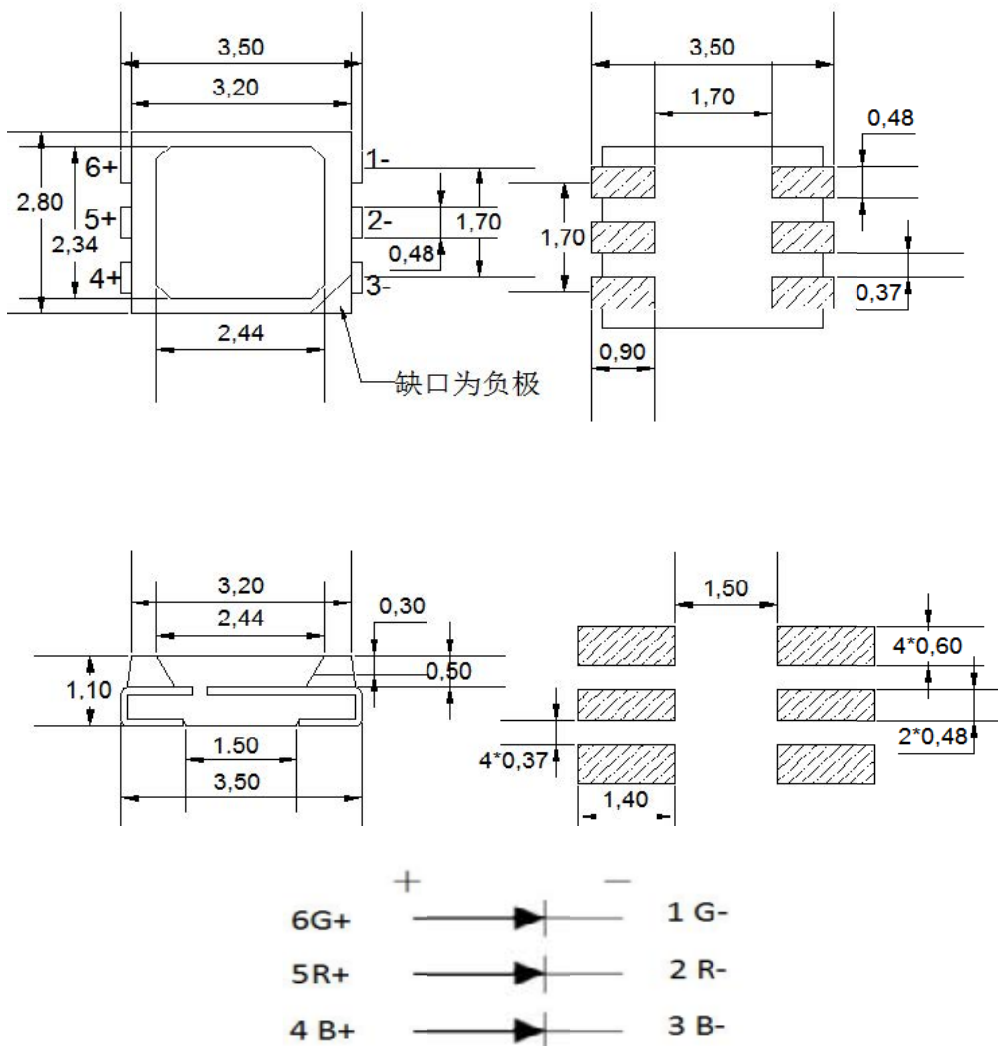


## 1、产品描述/Feature

- 外观尺寸: 3.5\*2.8\*1.1mm/Package: 3.5\*2.8\*1.1mm
- 颜色/ Color: 高亮红光、蓝光、绿光/ Ultra Bright Red\Green\Blue Color
- 胶体/ Lens: 透明平面胶体/ Water Clear Flat Mold
- 焊接方法: 无铅回流焊/Soldering methods: Pb-Free reflow soldering
- 环保产品, 符合 RoHS 要求/ Meet RoHS, Green Product
- 宽角度全彩 LED/Wide angle full-color LED

## 2、外形尺寸及建议焊盘尺寸/ Package Profile & Soldering PAD Suggested



### 注解/Notes:

- 所有尺寸以毫米为单位/All dimensions are in millimeters.
- 未标注公差为: X.X ±0.10mm, X.XX ±0.05mm/Unmarked tolerances: X.X ±0.10 mm, X.XX ±0.05

3、光电参数 (TA=25° C) /Electrical/Optical Characteristics (At TA=25° C):

Parameter 参数	Symbol 符号	Conditions 条件	Min. 最小值	Typ. 典型值	Max. 最大值	Units 单位
DC Forward Voltage 正向压降	V <sub>F</sub>	R	I <sub>F</sub> =20mA	1.8	2.0	V
		G	I <sub>F</sub> =20mA	2.8	3.0	
		B	I <sub>F</sub> =20mA	2.8	3.0	
Viewing Angle 发光角度	2 $\Theta_{1/2}$	I <sub>F</sub> =20*3mA	--	120	--	Deg
Main wavelength 波长	$\lambda_D$	R	I <sub>F</sub> =20mA	620	--	nm
		G	I <sub>F</sub> =20mA	515	--	
		B	I <sub>F</sub> =20mA	460	--	
Luminous flux 光通量	$\Phi$	R	I <sub>F</sub> =20mA	1.5	--	Lm
		G	I <sub>F</sub> =20mA	4.0	--	
		B	I <sub>F</sub> =20mA	0.8	--	

4、极限参数 (TA=25° C) /Absolute Maximum Rating(At TA=25° C):

Parameter 参数	Symbol 符号	Value 数值	Units 单位
Operating current range 正向电流范围	I <sub>F</sub>	20*3	mA
Junction Temperature 结点温度	T <sub>J</sub>	125	° C
Operating Temperature Range 工作温度	TOPR	-20° C To +85° C	
Storage Temperature Range 储存温度	T <sub>stg</sub>	-20° C To +60° C	
Manual Soldering Temperature 手工焊接温度	TSOL	250° C ± 20° C For 3-5 Seconds	
Electrostatic protection 静电防护	ESD	2000	V
Reflow welding maximum temperature 回流焊最高温度	T <sub>sol</sub>	245 ± 5	° C

5、信赖性测试项目与条件/Reliability TEST ITEMS AND RESULTS:

产品的可靠性应满足于下列项目:

信任级别: 90%

LTPD: 10%

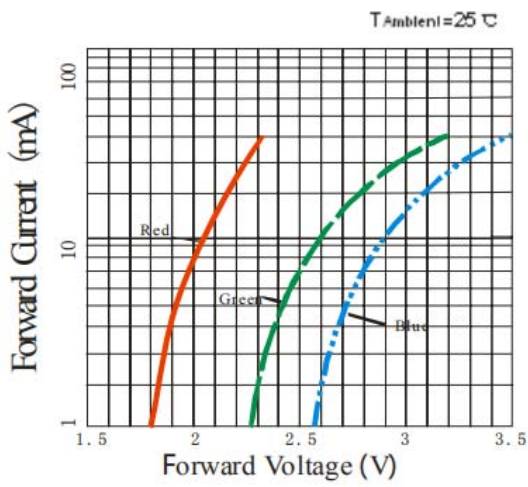
Test Items 测试项目	Reference Standard 参考标准	Test Condition 实验条件	Test Duration 实验时间	Failure Criteria 判定标准	Units Failed/Tested 判据
Temperature Cycle 温度循环	JEITA ED-4701 100 105	-40°C(30min) ~ 25°C(5min) ~ 100°C(30min)	100cyces	Failure determination criteria/失效判定标准	0/22
High Temperature Storage 高温储存	JEITA ED-4701 200 201	T <sub>A</sub> =100°C	1000hours		0/22
High Temperature High Humidity Storage 高温高湿储存	JEITA ED-4701 100 103	T <sub>A</sub> =85°C RH=85%	1000hours		0/22
Low Temperature Storage 低温储存	JEITA ED-4701 200 202	T <sub>A</sub> =-40°C	1000hours		0/22
Room Temperature Life Test 常温寿命		T <sub>A</sub> =25°C, I <sub>F</sub> =20*3mA	1000hours		0/22

6、失效判定标准/Failure determination criteria:

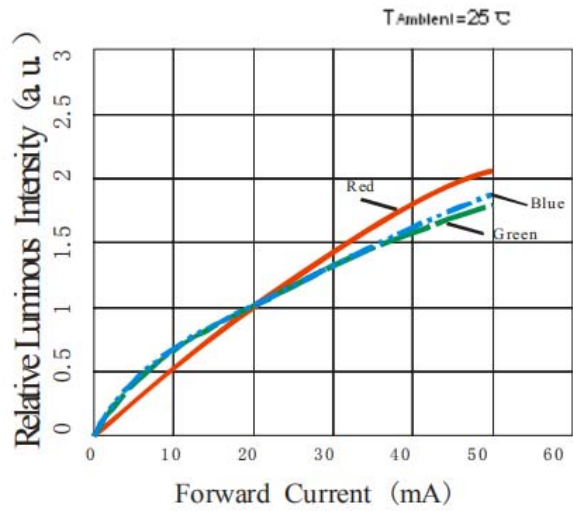
测试项目 Forward Voltage	符号 Symbol	测试条件 Test Conditions	判定标准 Criteria For Judging Damage
正向电压 Forward Voltage	VF	IF=IFT	初始值±10% Initial Data±10%
反向电流 Reverse Current	IR	VR=5V	IR≤10uA
光强 Luminous Intensity	IV	IF=IFT	平均 IV 衰减≤30%, 单个 IV 衰减≤50% Average IV degradation≤30%, Single LED IV degradation≤50%
耐焊接热 Resistance To Soldering Heat			产品无死灯 No dead light exists

7、典型特性曲线/Typical characteristics curves:

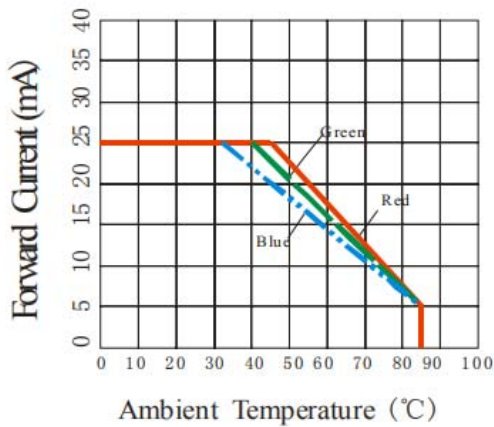
Volt-Ampere Characteristics



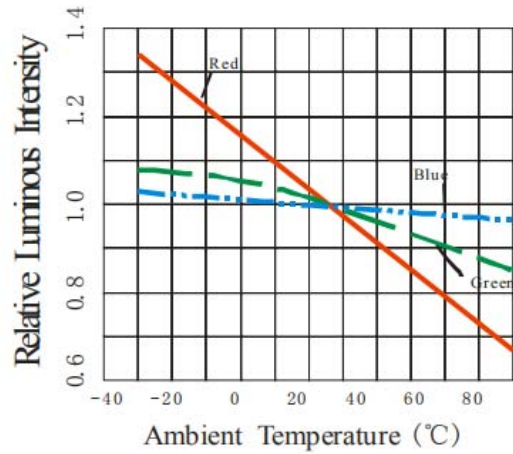
Relative Luminous Intensity VS Forward Current



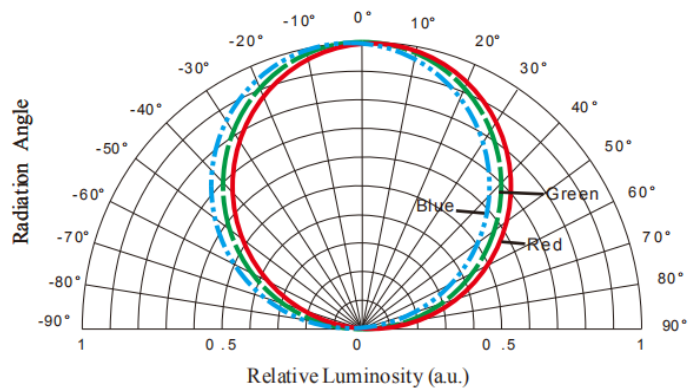
Forward Current Derating Curve



Luminous Intensity VS Ambient Temperature



Typical Spatial Distribution



## 8、使用注意事项/Precautions:

8.1、存储要求:1.1 推荐储存环境: 温度:  $5^{\circ}\text{C} - 30^{\circ}\text{C}$  ; 湿度: 相对湿度 60%以下; /Storage requirements: 1.1 Recommended storage environment: temperature:  $5^{\circ}\text{C} - 30^{\circ}\text{C}$ ; Humidity: Relative humidity below 60;

8.2、防潮袋密封包装储存时间为 15 天, 起始时间以包装标签日期为准, 包装袋封口良好并无漏气现象, 如超过 15 天的 LED 需放进  $65 \pm 5^{\circ}\text{C}$ ; 相对湿度 $\leq 10\%RH$  的烤箱烘烤, 烘烤时间: 24小时; /The storage time of the waterproof bag sealed packaging is 15 days. The starting time is based on the date of the packaging label. The packaging bag has a good sealing and no leakage. For example, LEDs over 15 days need to be put into  $65 \pm 5^{\circ}\text{C}$ ; Relative humidity  $\leq 10\% RH$  oven baking time: 24 hours;

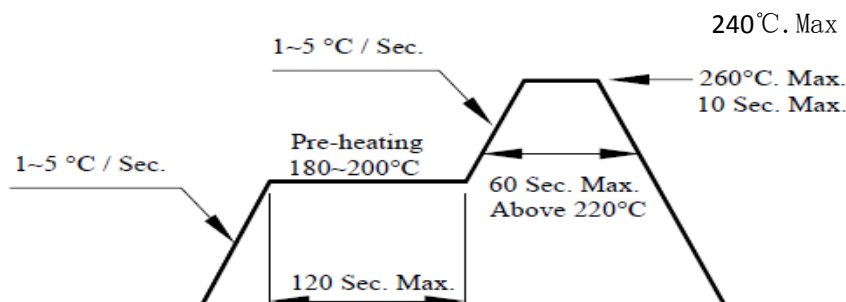
8.3、表面贴装器件(SMDs)属于潮湿敏感性元件, 空气中的湿气通过扩散渗透到产品中。当 SMD 元件焊接到电路板上的过程是将其通过温度为  $150^{\circ}\text{C} - 260^{\circ}\text{C}$  的回流焊, 在高温状态下, 渗入其中的湿气快速膨胀产生足够的蒸汽压力损伤或毁坏 LED 元件, 从而出现材料内胶裂、分层或金线损失等可靠性失效问题; /Surface mount devices(SMDs) are moist sensitive elements, and moisture in the air penetrates the product through diffusion. When the SMD component is welded to the circuit board, it is welded through a return welding at a temperature of  $150^{\circ}\text{C} - 260^{\circ}\text{C}$ . At a high temperature, the moisture that infiltrates it rapidly expands to produce enough steam pressure damage or damage to the LED component. Therefore, there are reliability failure problems such as internal cracking, delamination or gold wire loss;

8.4、除潮烘烤条件: 低温除湿, 即去除铝箔袋后将料盘放置在柜式干燥箱内进行  $65 \pm 5^{\circ}\text{C}$  / 相对湿度 $\leq 10\%RH$ , 烘烤时间 $\geq 12$  小时的除湿作业(如属热风烤箱则建议除湿时关闭烤箱进风口开关, 关键确保箱内相对湿度 $\leq 10\%RH$ )! 且回温过程必须在干燥的环境下进行! 建议产品除湿后在 4 个小时内完成贴片固焊作业; /Dehumidification baking conditions: low temperature dehumidification, that is, after removing aluminum foil bags, the tray is placed in a cabinet drying box for  $65 \pm 5^{\circ}\text{C}$  / relative humidity of  $10\% RH$ , The baking time is a 12-hour dehumidification(in the case of a hot air oven, it is recommended to close the oven inlet switch when dehumidifying, and the key is to ensure that the relative humidity in the box is  $10\% RH$ )! And the warming process must be carried out in a dry environment! Recommends that the product be dehumidified and finished within 4 hours;

8.5、产品拆封后, LED 在温度 $\leq 30^{\circ}\text{C}$ , 相对湿度 $\leq 60\%RH$  的条件下, 请在 12H 内使用完, 若没有使用完的产品需以  $65 \pm 5^{\circ}\text{C} / 24H$  除潮后密封, 建议放入干燥柜中存放; /After the product is unsealed, the LED is used within 12H under conditions of temperature  $\leq 30^{\circ}\text{C}$  and relative humidity  $\leq 60\% RH$ . If the product is not used, it must be sealed after dehumidification with  $65 \pm 5^{\circ}\text{C} / 24H$ . Suggestions for storage in drying cabinets;

## 8.6、回流焊注意事项: /Attention to Reflow Welding:

8.6.1、无铅锡膏的温度曲线建议, 作业前检查回流焊设备的峰值温度/时间是否控制在  $240 \pm 5^{\circ}\text{C} / \leq 10$  秒! /The temperature curve of lead-free solder paste is recommended. Before operation, check whether the peak temperature / time of the reflux welding equipment is controlled at  $240 \pm 5^{\circ}\text{C} / \leq 10$  seconds!



8. 6. 2、建议检查终端产品是否需要经历二次回流焊工艺，二次回流焊工艺具有一定品质风险性，如需请自行评估并尽量缩短二次回流焊间隔时间（建议不超过 4 小时）； /It is recommended to check whether the terminal product needs to undergo secondary reflux welding process. The secondary reflux welding process has certain quality risks. If you need to evaluate yourself and shorten the secondary reflux welding interval as much as possible(recommended not to exceed 4 hours);

8. 6. 3、焊接期间，加热时不要在 LEDs 上添加任何压力； /Do not add any pressure to the LEDs when heated during welding;

8. 6. 4、焊接后，正常回温至 40°C 以下后才可过电流。 /After welding, the normal return temperature is below 40 °C before the current can be passed。

8. 7、 防护措施： /Protection measures:

8. 7. 1、LED 器件封装胶水采用的是硅树脂系原材，终端产品如需户外使用需对器件做二次防护措施并请特别注意： /The packaging glue for LED devices is made of silicone. If the end product needs to be used outdoors, the device must be protected twice. Please pay special attention to it:

A、建议检查各个工艺流程环节应规避产品有堆叠及不规则棱角物伤及产品胶体； /It is recommended that the inspection of various process links should avoid products with stacking and irregular angular injuries and product colloids;

B、建议检查各个工艺流程环节应规避产品与硫、卤、酸、醇、碱、酮类强氧化物、塑化剂等腐蚀性物质接触； /It is recommended to avoid contact with corrosive substances such as sulfur, halogen, acid, alcohol, alkali, ketone strong oxide and plasticizer;

C、建议检查终端产品是否需要封盖、灌胶、裸板高温挤出、超声等二次封装工艺，如需请评估可能伤及 LED 器件的风险；是否需要刷胶、涂油、抹漆等二次涂装工艺，如需请评估可能导致器件胶体表面凹凸、污垢等因素影响发光、导热的风险。 /recommends checking whether the terminal product needs to cover, glue, bare plate high temperature extrusion, ultrasound and other secondary packaging process, if necessary, please assess the risk of possible damage to LED devices; If need brush glue, oil, paint and other secondary painting process, if you need to assess the device glue surface bump, dirt and other factors may affect the light emission, heat conductivity risk.

8. 8、其他注意事项： /Other points of note:



8.8.1、 电路设计时，建议使用定电流驱动设计，如以定电压设计，请考虑不同电压所造成的影响； /When designing a circuit, it is recommended to use a constant current drive design. If you design with a constant voltage, consider the impact of different voltages;

8.8.2、 LED 产品为单向导通性，使用安装前请确认产品极性，一般产品缺口边为产品负极，若反向安装，不能正常点亮，且在施加电压时容易造成 LED 芯片损伤或失效； /LED products are simple guides, please confirm the polarity of the product before using the installation. The general product gap edge is the negative electrode of the product. If it is installed in the opposite direction, it can not be lit normally, and it is easy to cause LED chip damage or failure when voltage is applied;

8.8.3、 注意正确的电路设计，不当之设计与电流控制，易造成 LED 失效，如电流过大引起寿命问题甚至烧毁，电流过小引起亮度不足等； /Pay attention to the correct circuit design, improper design and current control, it is easy to cause LED failure, such as excessive current causing life problems or even burning, too small current causing insufficient brightness, etc.;

8.8.4、 不同 BIN 号之 LED 建议分开使用，若需安装在同一个组件时，请先确认是否可满足相关电气及光学特性要求，如电流是否均衡，光色、亮度的一致性。 /The LEDs of different BIN numbers are recommended to be used separately. If you need to install on the same component, please first confirm whether the relevant electrical and optical characteristics can be met, such as whether the current is balanced, the consistency of light color, brightness, etc.

### 其他/ Others

1. 本规格所描述的 LED 定义应用在普通的电子设备范围(例如办公设备、通讯设备等等)。如果有更为严苛的信赖度要求，特别是当元件失效或故障时可能会直接危害到生命和健康时(如航天、运输、交通、医疗器械、安全保护等等)，请事先知会敝司业务人员。 /The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). Consult Sales in advance for the applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health. (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).

2. 高亮度 LED 产品点亮时可能会对人眼造成伤害，应避免从正上方直视。 /The light output from the high luminous intensity LEDs may cause injury to human eyes when viewed directly.

3. 出于持续改善的目的，产品外观和参数规格可能会在没有预先通知的情况下作改良性变化。 /The appearance and specifications of the product may be modified for improvement without prior notice.