Supplier Name: SHENZHEN SMALITE SEMICONDUCTOR CO LTD

供应商名称：深圳市斯迈得半导体有限公司

Approval Sheet number 承认书编号：

Product Approval Sheet

产品承认书

Customer Name 客户名称：

Product Name 产品名称： SL-EF50-0204*70-CL

Supplies number of customer side 客户物料编号：

Supplies number of supplier side 供方物料编号：

Date 承认书生效日期：

Manufacturer 制造商		Customer confirmation（Quality） 客户确认（品质）		Customer confirmation（Quality） 客户确认（研发）	
Prepared 拟制		Qualified 合 格 □ Unqualified 不合格□		Qualified 合 格 □ Unqualified 不合格□	
Checked 审核		Checked 审核		Checked 审核	
Approved 批准		Approved 批准		Approved 批准	

Both sides must sign and seal the approval sheet after confirming it is qualified

双方确认承认书合格后必须签字盖章

Supplier:Shenzhen Smalite Semiconductor Co., Ltd

供方： 深圳市斯迈得半导体有限公司

Address:Shenzhen Smalite Semiconductor Co., Ltd

8-9/F, 6th Block, Zhongyuntai Hi-Tech Industrial zone, Songbai Road, Shiyan Office, Bao'an District, Shenzhen

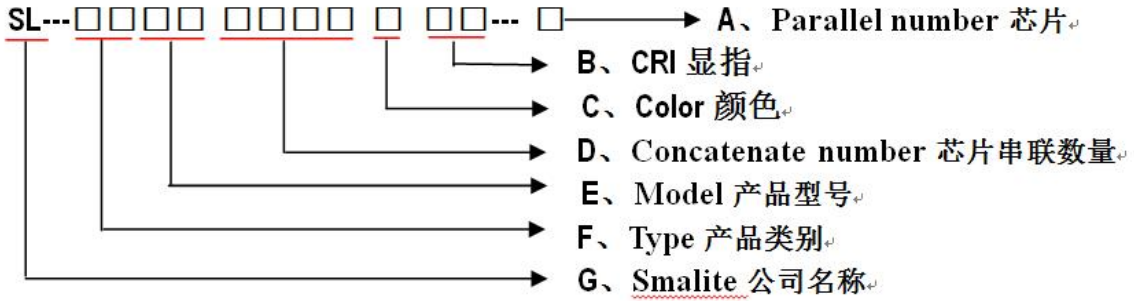
Smalite 深圳市斯迈得半导体有限公司
SHENZHEN SMALITE SEMICONDUCTOR CO., LTD.
地址：广东省深圳市宝安区石岩街道松白路中运泰科技工业厂区厂房 6 栋 8、9 楼

Tel 联系电话：　　Fax 传　　真:

Product pictures

产品图片

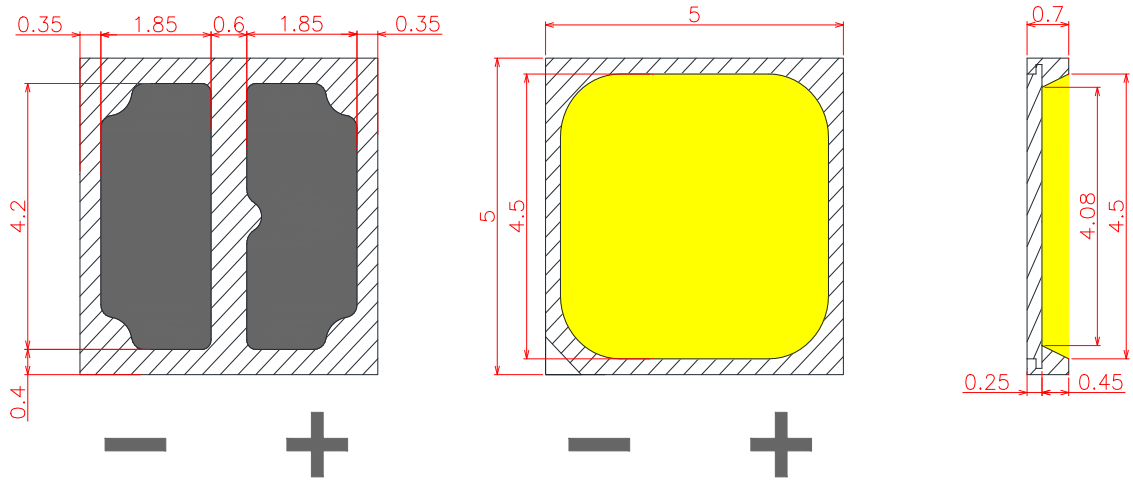
Kit number system 产品编码规则：



Feature:

- Viewing angle:120 deg
- The materials of the LED dice is GaN
- 5.0mm*5.0mm*0.7mm　EMC-LED
- RoHS compliant lead-free soldering compatible

Package Outline



NOTES 注释

1. All dimensions are in millimeters 所有尺寸单位为毫米
2. Tolerances are ±0.05 mm unless otherwise noted. 如果无其它标准，公差范围通常采用±0.05

◆ Mass Production list(Ta=25℃) ：

	Order model 订货型号	Current 电流(ma)	CCT 色温(K)	CRI 显指			Flux 光通量(lm)		
				min	avg	max	min	avg	max
2 串 4 并	SL-EF50-0204N70-CL	800	2700	70	73		760	810	860
	SL-EF50-0204I70-CL	800	3000	70	73		800	850	900
	SL-EF50-0204I70-CL	800	3500	70	73		820	870	920
	SL-EF50-0204S70-CL	800	4000	70	73		840	890	940
	SL-EF50-0204S70-CL	800	4500	70	73		840	890	940
	SL-EF50-0204W70-CL	800	5000	70	73		840	890	940
	SL-EF50-0204W70-CL	800	5700	70	73		840	890	940
	SL-EF50-0204W70-CL	800	6000	70	73		840	890	940
	SL-EF50-0204W70-CL	800	6500	70	73		840	890	940

◆ Typical Electrical & Optical Characteristics at Ta = 25°C

Parameter 项目名称	Symbol 项目符号	TestCondition 测试条件	Value(参数)			Unit 单位
			Min.	Typ.	Max.	
Forward Voltage 正向电压	Vf	If=800mA	6.4		7.0	V
Reverse Current 反向电流	Ir	Vr =10V	---	10	----	u A
Electrostatic Discharge 抗静电能力	ESD	HBM			2000	V
Viewing angle at 50% Iv 半强角	2 θ1/2	If=800mA	----	120	---	deg

◆ Absolute maximum ratings at Ta=25℃

Parameter 参数	Symbol 符号	Value 参数	Unit 单位
Power Dissipation 功率	Pd（If=800mA）	5.6	W
Forward current 正向电流	IF	800	mA
Power dissipation Reverse voltage 功耗反向电压	Vr	10	V
Pulse Forward Current 正向脉冲电流	IPF	900	mA
Operating Temperature Range 工作温度	Topr	- 35 ～ + 100	℃
Storage Temperature Range 储存温度	Tstg	- 35 ～ + 100	℃
Thermal Resistance Junction to Board 热阻	RΘjc	5	°C/W / ℃
Junction Temperature 结温	Tj	125	℃

NOTES 注释：

1. The test was carried out at Tc =25℃ 测试是在T_c=25℃下进行
2. It is recommended that the temperature of the substrate should not be higher than 105℃

建议基板的温度不要高于100℃

3. The measurement tolerance of forward voltage is 正向电压的测量公差是：±2%
4. The measurement tolerance of the luminous flux is 光通量的测量公差是±10%
5. The tolerance of CRI Ra is 显色指数Ra的测量公差是：±2
6. The measurement tolerance of the color coordinates is 色坐标的测量公差是：±0.01

Pulse width≤0.1msec Duty Ratio ≤1/10

RΘjc= Heat resistance from dice to Tc measuring point

Tj=Tc+ RΘjc * W W=If * Vf Tj=Dice Temperature: ℃ Tc=Case Temperature: ℃

CIE Chromaticity of our EMC series products 我司 EMC 系列产品色区：

TY4000-5			TY5000-5		
中心点	0.3904	0.3892	中心点	0.3557	0.3712
角度	54		角度	59.62	
	短半轴	长半轴		短半轴	长半轴
5-step	0.006724617	0.015643875	5-step	0.005999582	0.016183121

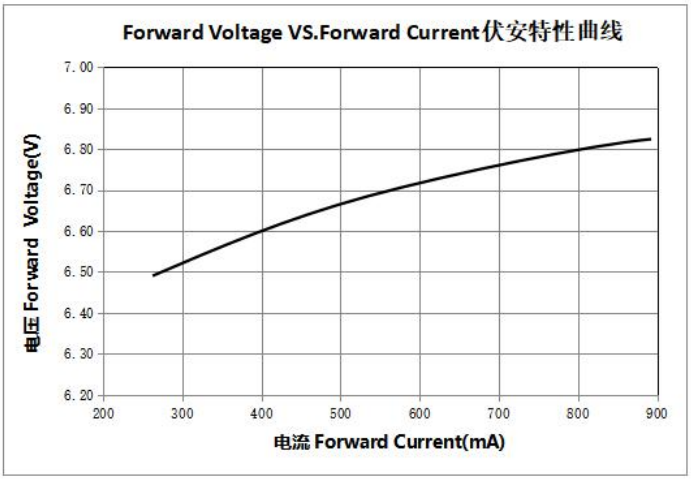
Reliability Test Items And Conditions 信赖性测试项目及条件

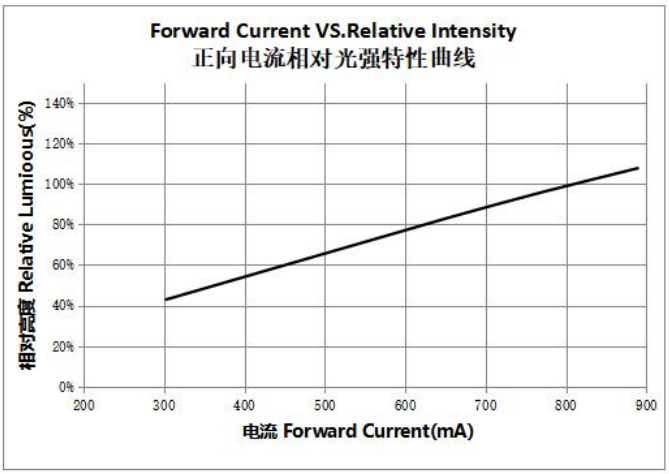
Test Items 测试项目	Test condition 测试条件	Time 时间	Quantity 数量	Ac/Re 接受、拒收
Reflow Soldering 回流焊	Temp. :260℃/10sec.	6Min.	22pcs	0/1
Thermal Shock 冷热冲击	-40~125C, 15min dwell, 10sec transfer	300cles	22pcs	0/1
High Temperature High Humidity life Test 高温高湿通电	85℃,85%RH, If=800mA	1000Hrs.	10pcs	0/1
Low Temperature Storage 低温保存	Ta=-40℃	1000Hrs.	10pcs	0/1
High Temperature Storage 高温保存	Ta=100℃	1000Hrs.	10pcs	0/1
High Temperature Operation Life Test 高温通电	Ta=105℃, If=800mA	1000Hrs.	10pcs	0/1

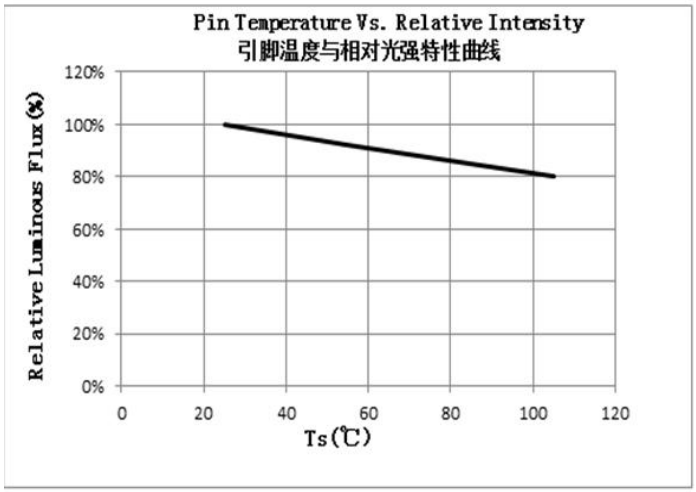
Failure Criteria 失效判断标准

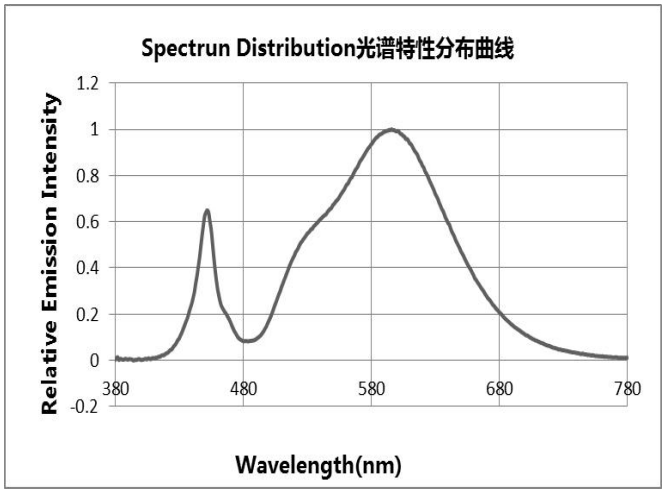
Item 项目	Symbol 符号	Failure Criteria 判断标准
Luminous Flux 光通量	Lm	≧90%
Forward voltage 正向电压	VF	±10%
Colour 坐标点	CIE_X CIE_y	±0.01

Typical optical characteristics curves 光电特性曲线

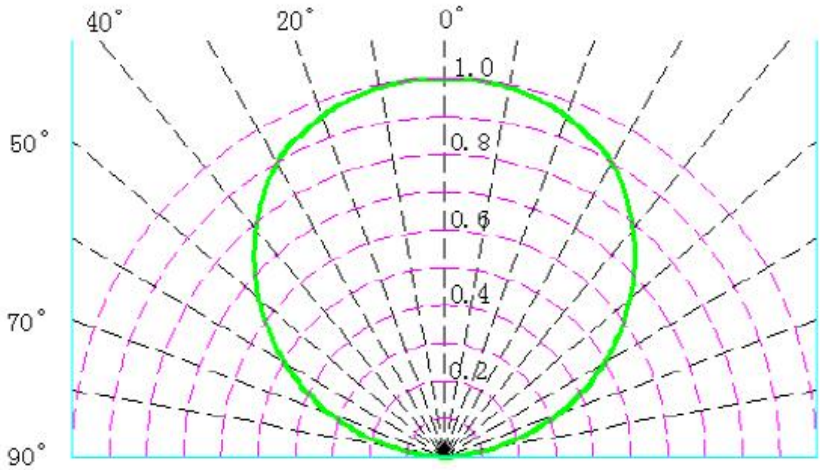




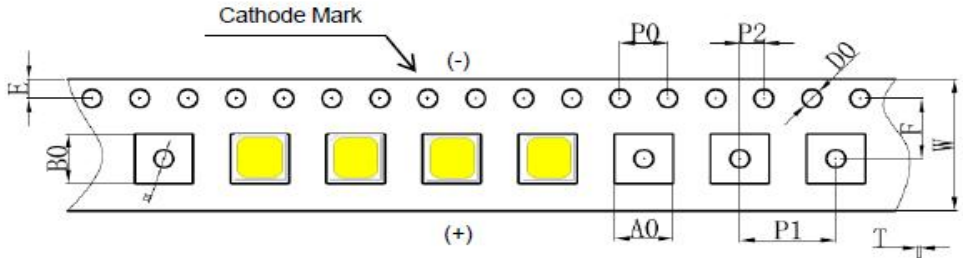




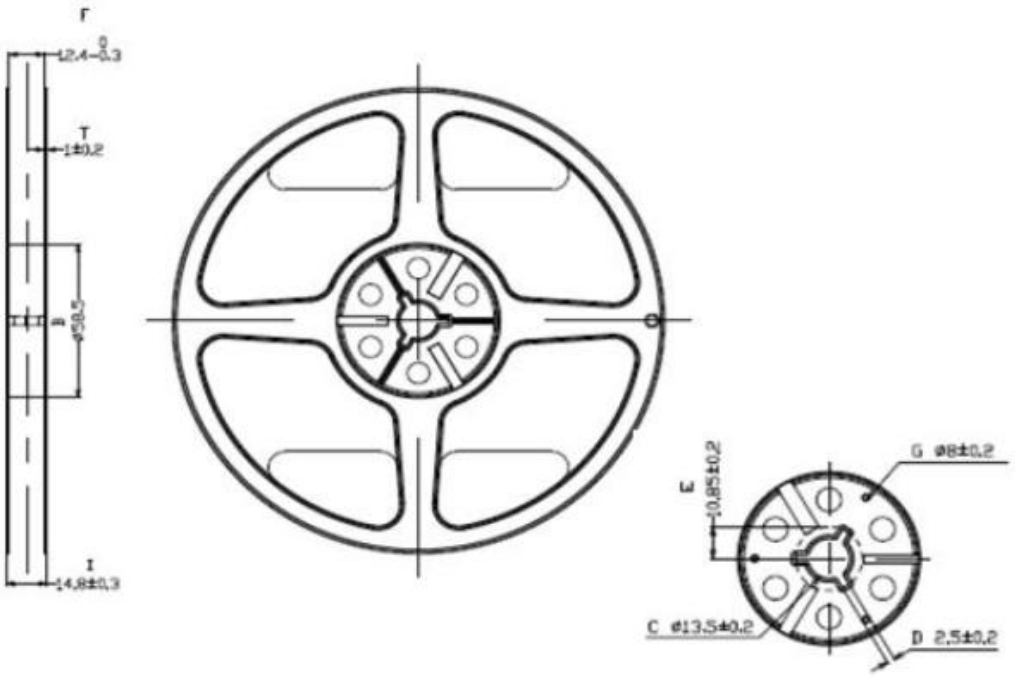
Curves of beam angel and relative brightness
角度图



Reel Packaging(包装)



Symbol	W	T	K0	A0	B0	E
Dimension (mm)	12.00 ±0.10	0.30 ±0.30	0.95 ±0.10	5.30 ±0.10	5.30 ±0.10	1.75 ±0.10
Symbol	F	D0	D1	P0	P1	P2
Dimension (mm)	5.50 ±0.10	1.60 ±0.10	1.60 ±0.10	4.00 ±0.10	8.00 ±0.10	2.00 ±0.10



2. The maximum number of missing lamps is two;
   最多缺失的 LED 不能超过两颗
3. The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications.
   根据 ANSI/EIA RS-481 的规格,产品的负极指向卷带的导孔.
4. Packge for5050,2KPCS/roll
   5050 包装，2K/卷

Smalite 深圳市斯迈得半导体有限公司
SHENZHEN SMALITE SEMICONDUCTOR CO., LTD.

Announcements

使用注意事项

一、Instruction for handling 拿放说明：

The colloid of the product is encapsulated by silica gel, which has a large luminous area, soft colloid and is easily damaged by mechanical external force. Therefore, precautions should be taken for the silica gel encapsulation material in terms of treatment. It is not allowed to directly press the colloid surface by hand or sharp metal, which may damage the internal circuit or cause damage or pollution to the colloid.

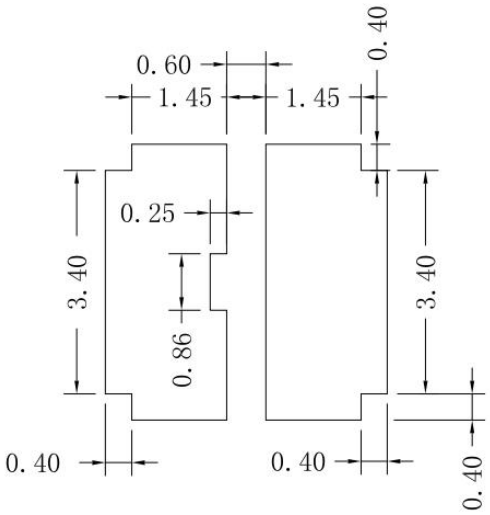
产品胶体为硅胶封装，发光面积较大，胶体较软，易受机械外力损坏，因此在处理方面须要对硅胶封装材料做预防措施，通过使用适当的工具或手从材料侧面夹取，不可直接用手或尖锐金属压胶体表面，它可能会损坏内部电路或造成胶体的破坏或污染。

Pay attention to using tweezers carefully

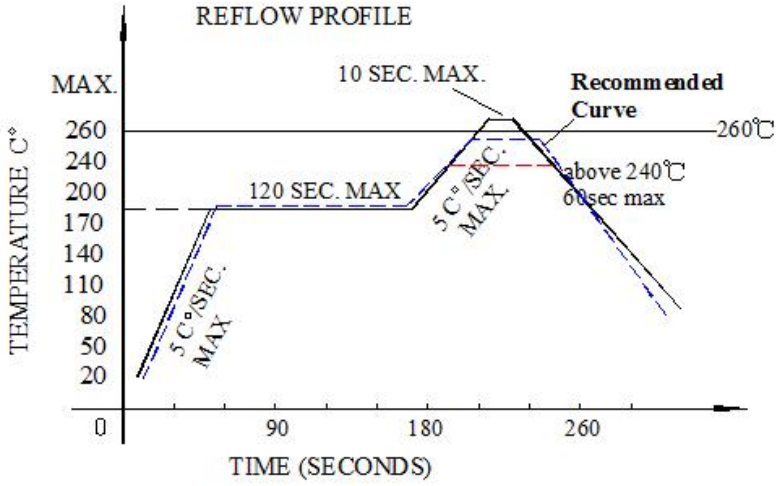
注意小心使用镊子

二、Requirement for soldering 焊接要求：

1. 1. For reflow soldering 建议焊盘尺寸：



1. Reflow soldering 回流焊



TIMESECONDS 回流焊曲线图

Reflow Soldering Curve Diagram（The recommended maximum temperature is 240℃）（建议最高温度设为 240℃）

Notes 备注

1.1. .No more than twice for reflow soldering注意回流焊不可超过两次。

1.2. .In the selection of suction nozzles, it is necessary to select a suction nozzle with appropriate size and pressure (the suction nozzle absorbs the plastic part of the product as much as possible), so as to avoid damaging the product due to excessive pressure.

在吸嘴的选取上要选择吸嘴的大小和压力合适的吸嘴（尽量吸取产品的塑胶部分），以避免造成压力过大伤害产品。

2. Manual soldering 手工焊接：

2.1. During the manual soldering process, the electronic soldering iron must be kept under the temperature of 300℃ and the soldering time must not be beyond 3 seconds. No touch between the electronic soldering iron and colloid

手工焊接时，要保持加热台或烙铁温度在 300 摄氏度以下，并且焊接时间小于 3 秒，注意铁不可接触胶体。

2.2. Manual soldering can only be carried out once, repeated operation does not guarantee that the product is in good condition

手工焊接只可进行一次，重复焊接不保证产品是否完好。

2.3. Avoid using sharp objects directly to contact the colloid part of the product

避免使用尖锐的物体直接接触产品胶体部分。

2.4. During the soldering process,rosin, tin slag and related unknown chemical impurities should not fall on the

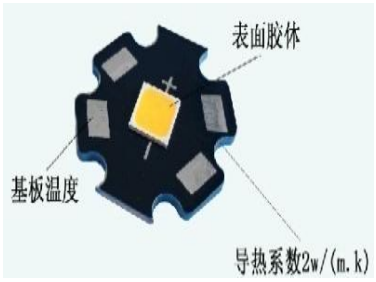
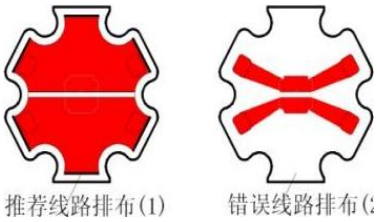
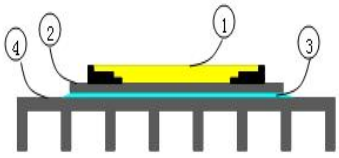
colloid surface, otherwise the optical properties will be affected by long-term lighting

焊接过程，松香、锡渣及相关不明化学杂物不可落到胶体表面，否则长时间点亮影响其光学性能.

三. Requirement for heat dissipation 散热要求：

Product characteristics are easy to change due to its own heat generation and the change of ambient temperature. When the temperature is high, the luminous efficiency of the product decreases, and at the same time, it affects the luminous color of the product and accelerates the failure of the product. Therefore, the heat dissipation must be fully considered during the design process, and the following parameters should be properly controlled

产品特性容易因为自身的发热及环境温度的改变而发生改变，温度高时，产品发光效率下降，同时影响产品发光颜色，加速产品失效，所以，在设计时必须充分考虑散热问题，以下参数请把好关：

<table>
<tr><th>Parts fig
部件图片</th><th>Parts content
部件内容</th><th>Design control
设计控制</th></tr>
<tr><td rowspan="2"> 
</td><td>Surface colloid
表面胶体</td><td>Do not press the surface of the colloid,the temperature is not controlled
不可压胶体表面，温度不控</td></tr>
<tr><td>Thermal conductivity of substrate
基板导热系</td><td>Thermal conductivity of substrate 基板导热系:≥2.0W/MK</td></tr>
<tr><td rowspan="2"> 
</td><td>Circuit arrangement of the substrate
载板线路排布</td><td>Recommended circuit
推荐线路（1）</td></tr>
<tr><td>Heat dissipation area of the substrate
载板导热面积</td><td>Heat dissipation area per watt
每瓦散热面积≥0.5cm²/w</td></tr>
<tr><td rowspan="3"> 
</td><td>②PKG substrate
灯珠载板</td><td>Substrate temperature
基板温度：≤85℃</td></tr>
<tr><td>③Heat-conducting glue
导热胶</td><td>Uniform coating,thickness
均匀涂覆，厚度≤0.15MM</td></tr>
<tr><td>④Radiator 散热器</td><td>Temperature difference with ② substrate
与②基板温差 T＜8℃</td></tr>
</table>

四. Prevention of vulcanization 硫化预防：

Vulcanization phenomenon means that sulfur in the environment enters the colloid and reacts with +1-valent silver to form AgS2, which will lead the silver-plated glue to blacken and reduce the reflective ability, thus affecting the luminous color and light-emitting efficiency of the product and greatly affecting the product performance. Therefore, during use, it must be prevented in advance to avoid approaching objects with high sulfur content (such as rubber bands, rubber products, chemical solvents, etc.). The vulcanization reaction equation is2Ag+s==Ag2s

硫化现象是指环境中硫进入胶体内部，与+1 价银反应，形成 AgS2，该物质会导入镀银胶发黑，反光能力下降，从而影响产品的发光颜色及出光效率，极大影响产品性能，因此，在使用过程中，必须提前预防，避免接近含硫高的物体(比如说橡皮筋，橡胶类制品，化学溶剂等)，硫化反应方程式：2Ag+s==Ag2s.

In addition to sulfur, bromine, chlorine and other elements should also be avoided. When these contents are high, they will also lead to similar vulcanization phenomenon

除硫元素外，溴、氯等元素同样须避免，含量较高时，同样导致类似硫化现象。

五. Cleanliness of product 产品清洁：

Do not use unknown chemical liquid to clean the product, which may damage the appearance and performance of the product. When a small number of products need to be cleaned, use cotton swabs to dip in electronic alcohol and gently wipe the parts to be cleaned. Wipe the colloid surface with light force, do not squeeze the colloid surface, and dry naturally for more than 15 minutes after wiping

不要使用不明化学液体清洗产品，不明的化学液体可能会损坏产品外观性能，少量产品必要清洁时，使用棉签沾电子酒精，轻轻擦拭需要清洁的部位，在擦拭胶体表面时力度要轻，不允许挤压胶体表面，擦拭完毕后自然干燥 15 分钟以上，然后才开始使用

六. Electrostatic protection 静电防护：

1. LED is an electrostatic sensitive material, so the personnel who come into contact with the product must take electrostatic protection, wear electrostatic clothes, shoes, wrist strap and gloves.

LED 是静电敏感材料，接触产品的人员必须做好静电防护，穿静电服、静电鞋，戴静电环、静电手套.

2. All production, testing, turnover instruments and equipment and racks should be well grounded and checked regularly. If necessary, ion fans should be used to eliminate static electricity

所有生产、检测、周转仪器设备及料架都要良好接地，并定期检查，必要时使用离子风机来消除静电.

七. Protection of eyesight 眼睛保护：

When the product are lighting please don't look directly at the light source. Strong light may cause damage to your eyes; It can be confirmed by lighting with low current (10MA/ parallel) and low voltage (2.5V/ string), or by lighting with translucent objects

产品发光时，请不要直视发光源，强光可能会对您的眼睛造成伤害；可用小电流（10MA/并）、低电压（2.5V/串）点亮确认,或用半透明物体档住后点亮确认.

八. Storage conditions 储存条件

1. Before opening the package 打开包装袋前：

The LEDs can be preserved for 1 year in condition of temperature no more than 30℃ and humidity no more than 60%RH. Recommended for moisture-proof foil bag with desiccant packaging methods and stored in the constant temperature and humidity box. Can not reach the requirements under the environment of the guarantee as far as possible in six months after use

在温度不超过 30℃及湿度不超过 60%RH 条件下，LED 可以保存一年，建议采用带干燥剂的防潮铝箔袋的包装方式，存放在恒温恒湿箱中。达不到要求的环境下，尽量保证在 6 个月内使用完毕。

2. After opening the package 打开包装后：

2.1. The LEDs should be run out within 12hours in condition of temperature no more than 30℃ and humidity no more than 60%RH after opening the package . The rest products should be pressurized in vacuum condition with desiccants and placed in an airtight container

开封后，LED 在≤30℃,≤60%RH 相对湿度的条件下，12 小时内完成贴片作业，未用完的产品放入干燥剂重新真空密封，并放置在一密闭容器中。

2.2. The storage products stock in the drying cabinet more than 7 days, then must be dehumidified before next use, and the dehumidified conditions is 70℃ 12 hours.

如果存储超过7 天，下次使用时同样需要除湿操作，除湿条件为70℃ 12 小时。

2.3. If the product does not vacuum sealed packaging, and in the air for more than 40hours, this product must be removed from the tape of reel and put into the steel plate to dehumidify at 150℃ for 2 hours, and then reflow soldering to ensure the quality of the product

如果产品且在空气中放置超过48小时，没有真空包装密封保存，此产品必须从载带中拆出，放入钢盘进行150℃2小时的除湿，之后进行回流焊作业才能保证产品品质。

九. **Others** 其它：

1. Please read the product specifications carefully before use to understand the use conditions and relevant limit parameters

使用前请仔细阅读产品对应规格书，了解使用条件和相关极限参数.

2. LED is sensitive to voltage fluctuation, so customers are advised to use a constant current source driver

LED 对电压波动比较敏感，建议客户使用恒流源驱动.

3.PKG of different specification parameter levels cannot be mixed together

不同规格参数级别的灯珠不能一起混合使用.

4.In case of any unknown matters in other production applications, please communicate with SMA after-sales service engineers for further understanding

应用中如有不明事项时，请与 SMA 售后服务工程人员沟通、了解.

修订履历						
序号	修订日期	版次	修订内容	编制	审核	批准
A0	2023.9.4	A/0	首次修订	张友生	王文金	左明鹏