



连云港美华电子科技有限公司  
Lianyungang Meihua Electronics Technology Co.,Ltd

# 产品规格书

## DATA SHEET

Part No: MHP5050RGCT  
REV.2

本产品符合 ROHS 指令有关限制有害物质的环保要求.

日期 DATE	拟制 PREPARED	审核 VERIFIED	批准 APPROVED
2019-06-13	John		Sunny
客户签回 CUSTOMER'S APPROVAL			

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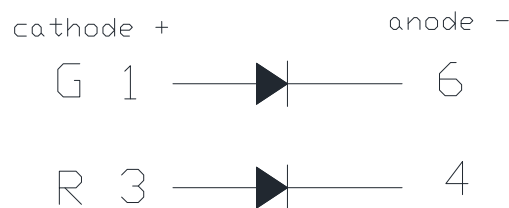
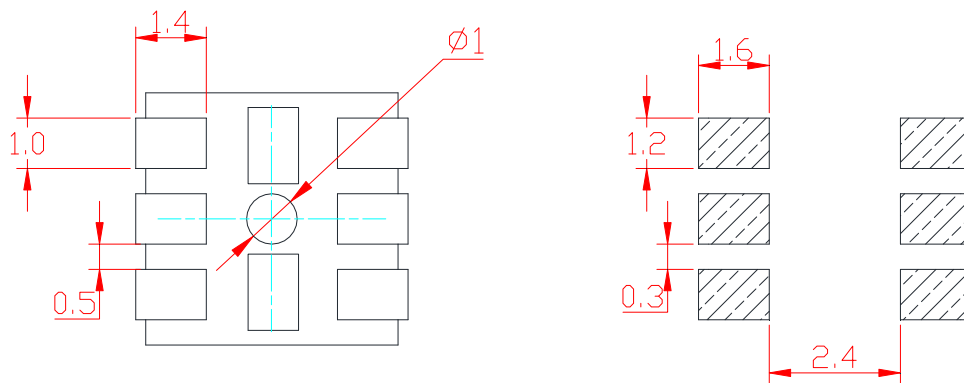
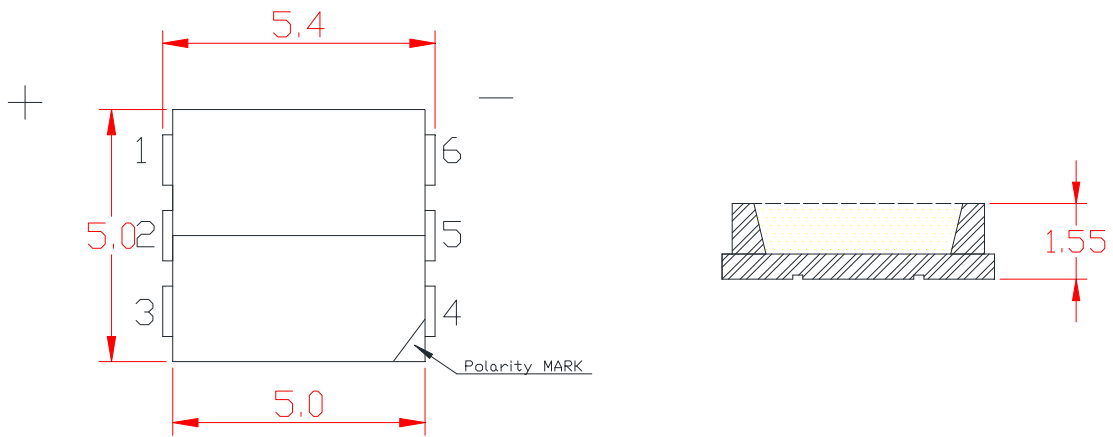


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P/N: MHP5050RGCT

LED SMD

### 产品外观尺寸 PACKAGE DIMENSIONS



#### 注意 NOTES :

1. 所有尺寸均为 mm(英寸)

All dimensions are in millimeters. (inches)

2. 如无特殊说明, 公差为 0.15mm(0.006")

Tolerance is  $\pm 0.15\text{mm}(0.006\text{"})$  unless otherwise specified.



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## 产品特性 FEATURES

- 高可靠性和高稳定性  
High intensity and reliability
- 宽的发光角度  
Extremely wide viewing angle
- 适用于所有的 SMT 组装和焊接工艺  
Suitable for all SMT assembly and solder process
- 符合 RoHS 指令要求  
ROHS COMPLIANC
- 防潮等级 Level 4  
Moisture sensitivity level: Level 4
- 适用于载带及卷轴  
Available on tape and reel.

## 产品特征 Description

- 5050 规格封装  
5050 package
- 顶部发光  
Top view LED
- 胶体颜色: 无色透明  
Lens Color: Water Clear
- 发光颜色 Emitted color:
  1. 红 RED
  2. 绿 GREEN
  - 3.
  - 4.
  - 5.
- 晶片材质 Chips materials:
  1. AlGaInP
  2. InGaN
  - 3.
  - 4.
  - 5.



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**极限参数 Absolute Maximum Ratings(Ta=25℃)**

参数 Parameter	符号 Symbol	极限值 Rating	单位 Unit
功耗 Power Dissipation	PAD	R:60 G:95	mW
最大峰值电流 Peak Forward Current Per Segment (1/10 duty cycle, 0.1ms pulse width)	IFP	R:60 G:60	mA
正向使用电流 Continuous Forward Current	IF	R:20 G:20	mA
反向电压 Reverse Voltage	VR	R:5 G:5	V
Electrostatic Discharge Threshold(HBM)	ESD	R:2000/G:150	V
工作温度 Operating Temperature Range	TOPR	-40℃ to +85℃	
储藏温度 Storage Temperature Range	TSTG	-40℃ to +100℃	

**光电特性 Optical-Electrical Characteristic(Ta=25℃)**

符号 Symbol	参数 Parameter	测试条件 Test Condition	最小 Min	标准 Typ	最大 Max	单位 Unit
VF	正向压降 Forward Voltage	R:IF = 20mA	2.0	-	2.2	V
		G:IF = 20mA	2.7	-	3.6	
IR	反向漏电流 Reverse Current	R:VR=5V	-	-	50	uA
		G:VR=5V	-	-	50	
λp	峰值波长 Peak Wavelength	R:IF = 20mA	-	632	-	nm
		G:IF = 20mA	-	518	-	
λd	主波长 Dominant Wavelength	R:IF = 20mA	-	622	-	nm
		G:IF = 20mA	520	-	535	
2θ1/2	发光角度 Viewing Angle	R:IF = 20mA	-	120	-	deg
		G:IF = 20mA	-	120	-	
Iv	发光强度 Luminous Intensity	R:IF = 20mA	500	-	800	mcd
		G:IF = 20mA	1200	-	1500	

Notes:

1. 波长测量误差±1nm。Dominate wavelength measurement allowance tolerance is ±1nm.
2. 正向压降公差为±0.1V。Tolerance of Forward Voltage : ±0.1V.



光电特性图 Typical Electrical Characteristic Curves(Ta=25°C)RED

Fig.1-Forward Voltage Shift vs. Junction Temperature

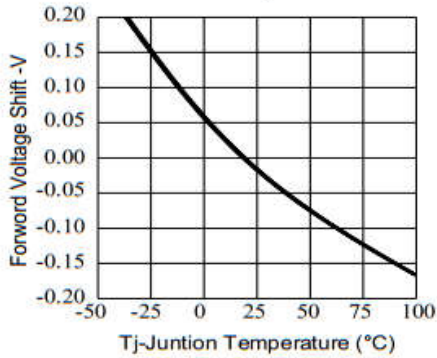


Fig.2-Relative Luminous Intensity vs. Forward Current Ts=25°C

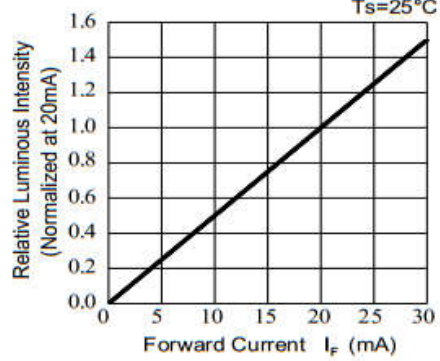


Fig.3-Relative Luminous Intensity vs. Junction Temperature

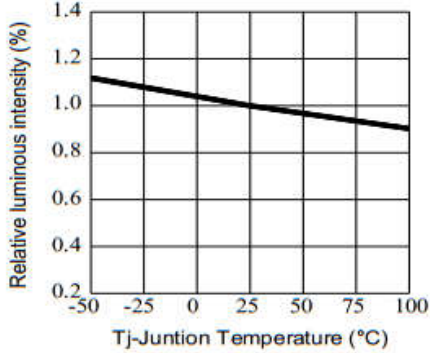


Fig.4-Forward Current vs. Forward Voltage Ta=25°C

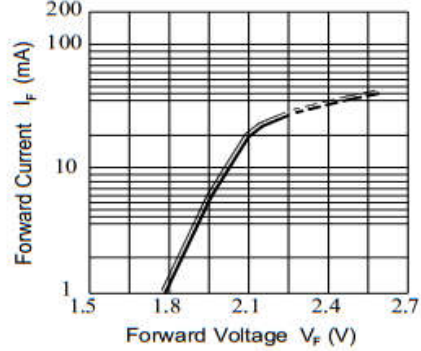


Fig.5-Max. Driving Forward Current vs. Soldering Temperature

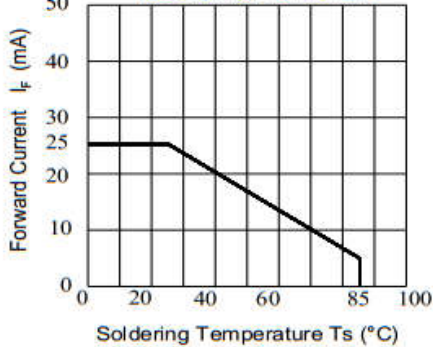
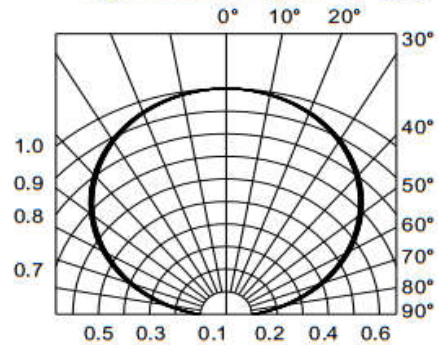


Fig.6-Radiation Diagram Ta=25°C

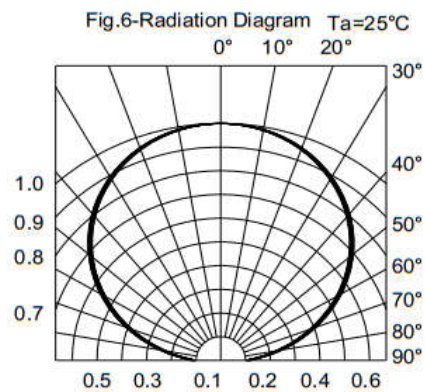
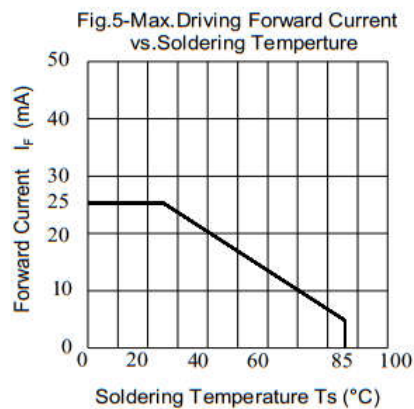
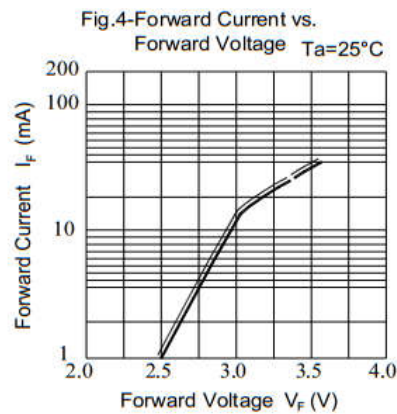
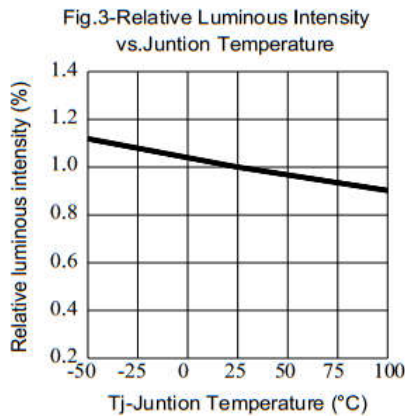
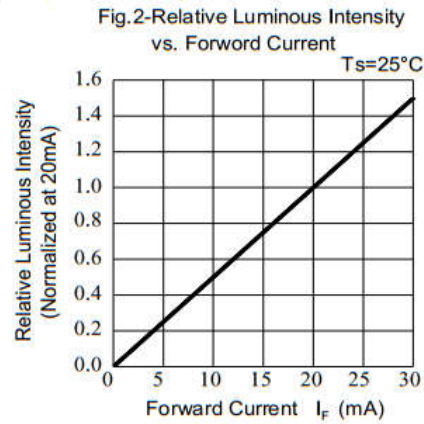
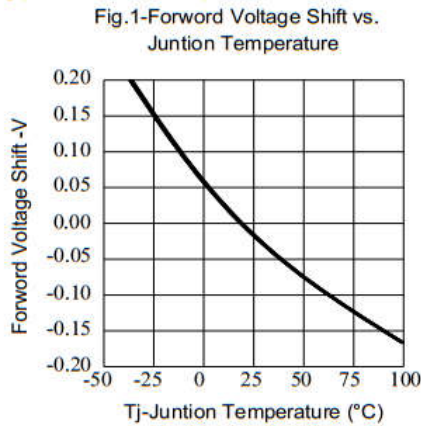


Note:

1. 发光强度取平均值。 Luminous Intensity is a average value
2. 发光强度公差:  $\pm 10\%$ 。 Tolerance of Luminous Intensity:  $\pm 10\%$
3. 正向电压公差:  $\pm 0.1V$ 。 Tolerance of Forward Voltage:  $\pm 0.1V$



### 光电特性图 Typical Electrical Characteristic Curves( $T_a=25^\circ\text{C}$ )GREEN



Note:

1. 发光强度取平均值。 Luminous Intensity is a average value
2. 发光强度公差:  $\pm 10\%$ 。 Tolerance of Luminous Intensity:  $\pm 10\%$
3. 正向电压公差:  $\pm 0.1\text{V}$ 。 Tolerance of Forward Voltage:  $\pm 0.1\text{V}$



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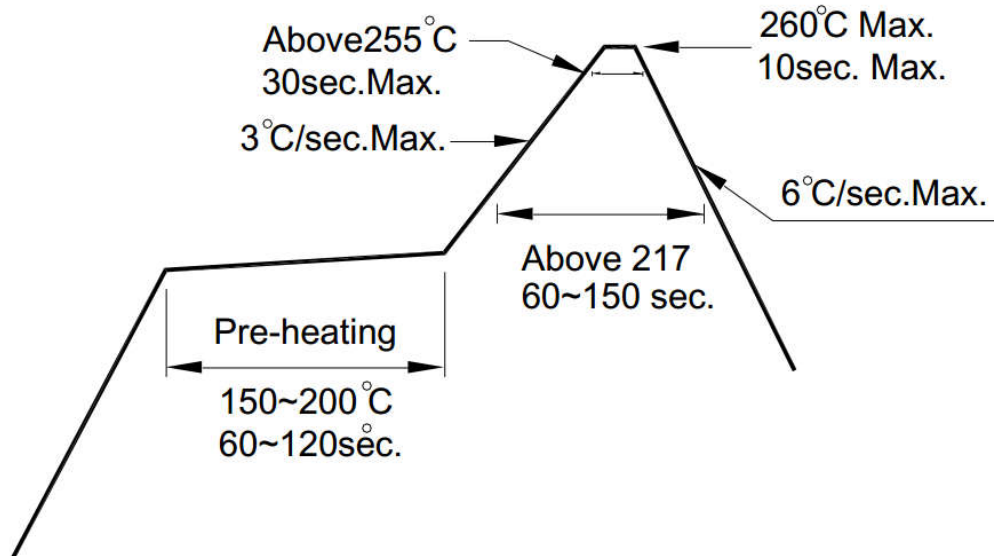
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### 焊接条件 Soldering Condition

方法 METHOD	焊接条件 SOLDERING CONDITIONS	备注 REMARK
回流焊 Reflow Soldering	260°C for 10 sec.	
烙铁焊 Soldering Iron	300°C for 3 sec.	使用 25W 以下功率的电烙铁 the soldering iron capacity 25W

### 无铅制程炉温曲线 Pb-free solder temperature profile



#### Notes:

- 不应做两次以上回流焊或烙铁焊  
Reflow soldering or Soldering Iron should not be done more than two times.
- 不应在已加热的发光二极管上施加压力  
When soldering, do not put stress on the LEDs during heating.
- 不应在焊接发光二极管后弯曲 PCB 板  
After soldering, do not warp the circuit board
- 客户在设计使用时需串联保护电阻，避免电压波动烧毁发光二极管。  
Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen)



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可靠度测试及条件 Reliability Test Items and Conditions

编号 No.	项目 Items	测试条件 Test Condition	测试时间 Test Hours/Cycles	样品数量 Sample Size	判定标准 Ac/Re
1	回流焊 Reflow Soldering	260°C/10sec.	3times.	22pcs	0/1
2	温度循环 Temperature Cycle	H : +120±5°C 30min ∩ 5 min L : -40±5°C 30min	100 Cycles	22pcs	0/1
3	低温贮藏 Low Temperature Storage	Ta=-40±5°C	1000 Hrs.	11pcs	0/1
4	高温贮藏 High Temperature Storage	Ta=100±5°C	1000 Hrs.	11pcs	0/1
5	寿命测试 DC Operation Life	Ta=25±5°C, If = 20 mA*2	1000 Hrs.	11pcs	0/1
6	高温高湿测试 High Temperature/Humidity Reverse Bias	Ta=60±5°C 90%RH If = 20 mA*2	1000 Hrs.	11pcs	0/1





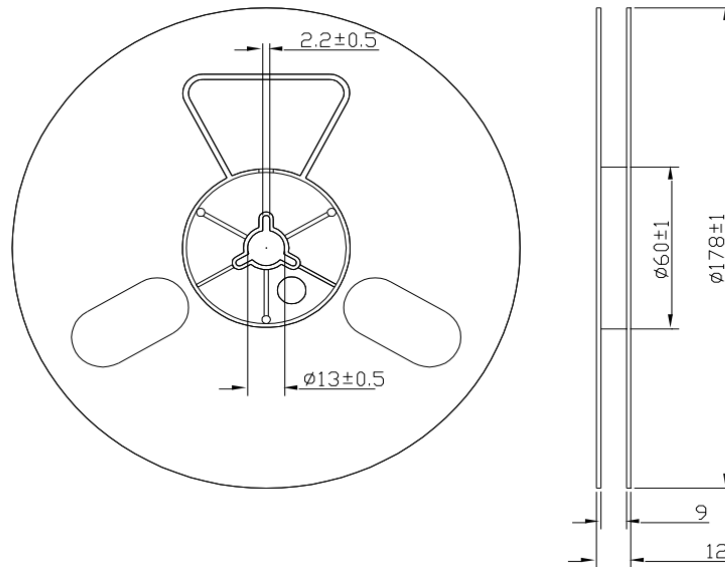
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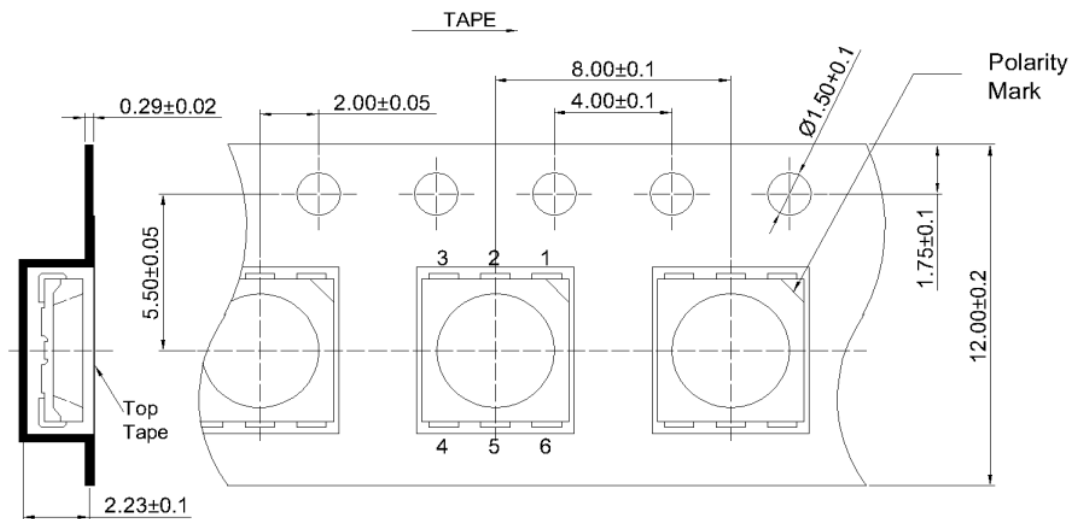
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## 包装 Packing

### 1. 卷轴尺寸 Reel Dimensions



### 2. 载带尺寸 Carrier Tape Dimensions



#### Notes:

1. 量测公差为 $\pm 0.1$ mm, 单位是毫米。

Tolerances unless mentioned  $\pm 0.1$ mm, Unit = mm

2. 防潮袋包装, 最小包装数量为每卷 1000pcs

Moisture Resistant Packaging, Minimum packing amount is 1000 pcs per reel



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## 储藏和使用 STORAGE

1. 发光二极管在出厂后可在温度 30 度以下，湿度 90% 以下的环境内保存 1 年。 The Led's should be stored at 30°C or less and 70% RH or less after being shipped from MH and the storage life limits are 1 year.

2. 在产品准备使用前请不要打开防潮袋。 Do not open moisture proof bag before the products are ready to use.

3. 打开包装后：产品暴露在温度 30 度以下湿度 60% 以下的 3 个月内用完，若仍然有剩余，请一定要放到防潮柜内储存。 After opening the package: The LED's floor life is 3 months under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

4. 如果吸湿性材料（硅胶）已用完或发光二极管已超过存储时间，应使用以下条件进行烘烤处理，处理：60±5°C 烘烤 24 小时。 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: 60±5°C for 24 hours.

3. 请避免保存在温度变化明显，尤其是高湿度的地方 Please avoid rapid transitions in ambient temperature, especially, in high humidity environments where condensation can occur.

4. 相对环氧树脂较脆较硬而言，硅胶封装较柔软且有弹性，虽然它的特性大大减少了热应力，但易受机械外力损坏，因此在手工处理方面须要对硅胶封装材料做预防措施，若未按要求操作，可能会导致 LED 损坏和光衰 Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more prone to damage by external mechanical force . As a result, Special handling precautions must be observed during assembling using silicone encapsulated LED products, Failure to comply might leads to damage and premature failure of the LED.

5. 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 Handle the component along the side surface by using forceps or appropriate tools; do not directly touch or Handle the silicone lens surface, it may damage the internal circuitry.

6. 为防止气压泄漏， SMD 吸咀外径不可以超过 LED 尺寸，吸咀内径尺寸应尽可能大，吸咀顶端材质建议采用柔软材料以防在吸取期间刮伤或损坏 LED 胶体表面，元件的尺寸必须在取放机里准确的编程好，以确保精确的吸取和避免生产过程中的损害。 The outer diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks. The inner



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diameter of the nozzle should be as large as possible. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.

7. 不可将模组材料堆积在一起，它可能会损坏内部电路。Do not stack together assembled PCBs containing Led's. Impact may scratch the silicone lens or damage the internal circuitry.

8. 不可用在 PH<7 的酸性场所 Not suitable to operate in acidic environment, PH<7.

9. 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。LED operating environment and sulfur element composition cannot be over 100PPM in the LED mating usage material.

10. 当我们需要使用外封胶涂抹 LED 产品时，应确保外封胶与 LED 封装胶水相匹配，因为大多数 LED 的封装胶水为硅胶，它有较强的氧化性和较强的吸湿性，必须防止外封材质进入 LED 内部以造成 LED 的损伤，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，在涂抹 LED 产品时要求外封胶溴元素与氯元素总含量必须小于 1500PPM。When we need to use external glue for LED application products, please make sure that the external glue matches the LED packaging glue. Additionally ,as most of LED packaging glue is silica gel, and it has strong Oxygen permeability as well as strong moisture permeability; 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 glue of the application products is required to be less than 1500PPM.

## 使用注意事项 Application Restrictions

1. 本文档中所描述的规范。上述规格可变更不通知。美华有对上述规格的材料更改的保留权。specification described in this document. Above specification may be changed without notice. Meihua will reserve authority on material change for above specification.

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#### 4. 静电放电（静电放电）ESD (Electrostatic Discharge)

产品敏感的静电或冲击电压。当使用产品时静电放电会损坏模具及其可靠性。对静电放电的措施强烈推荐：The products are sensitive to static electricity or surge voltage. ESD can damage a die and its reliability. When handling the products, the following measures against electrostatic discharge are strongly recommended:

消除电荷 Eliminating the charge

接地的手环，防静电鞋，衣服和地板 Grounded wrist strap, ESD footwear, clothes, and floors

接地的工作站设备和工具 Grounded workstation equipment and tools

导电材料的防静电工作台/架子 ESD table/shelf mat made of conductive materials

正确的接地用于所有装置、设备和机器生产过程所必须。在产品设计时应考虑冲击保护。

Proper grounding is required for all devices, equipment, and machinery used in product assembly. Surge protection should be considered when designing of commercial products.

如果工具或设备含有绝缘如玻璃或塑料材料，需要做下列静电放电预防措施：If tools or equipment contain insulating materials such as glass or plastic, the following measures against electrostatic discharge are strongly recommended:

用导电材料耗散静电电荷 Dissipating static charge with conductive materials

保持环境的湿度 Preventing charge generation with moisture

使用离子风扇中和静电 Neutralizing the charge with ionizers

5. 发光二极管正向电流方向使用，驱动电路的设计必须使 LED 在关闭的状态下不经受正向或反向电压，如果反向电压不断应用于发光二极管，它可以导致 LED 损坏。The Led's should be operated with forward bias. The driving circuit must be designed so that the Led's are not subjected to forward or reverse voltage while it is off. If reverse voltage is continuously applied to the Led's, it may cause migration resulting in LED damage.