

Spec. No.: HL2121-4PC11B-A

Issued Date: 2022-08-01

SPECIFICATION

Model Name: Point Source Red Sensor

Model NO. : HL2121-4PC11B-A

Customer No.:

Prepared by: Xiezongwu

Approved by: Judy. Zhu

Customer approved by:



Add: 7F, Bldg B, JinKe Industrial Park WuHe Road, LongHua District,
Shenzhen, Guangdong Prov., China PostCode: 518110

Tel: 86-0755-28147404

Fax: 86-0755-28149249

E-mail: xwjma@163.com

<http://www.szwhaley.com/>

Detector

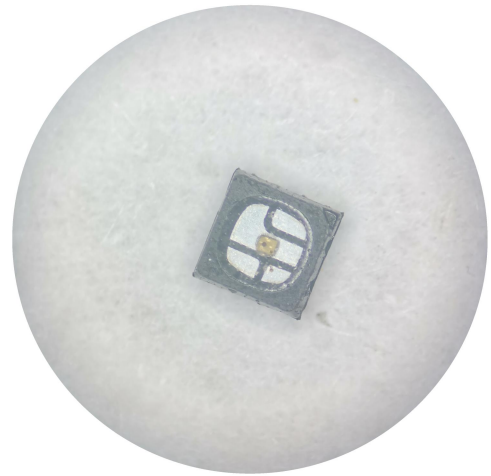
HL2121-4PC11B-A

■Features

- 655 nm wavelength range
- Emission area: 80um in diameter
- 2000pcs/Reel
- The LED has the advantages of small size, good power consumption, long packaging life, etc.

■Applications

- Data communication
- Sensors
- Dot sights
- Industrial applications



■Absolute Maximum Ratings at Ta=25℃ 绝对最大额定值在Ta = 25° C

Parameter 参数	Symbol 符号	Max. 最大值	Unit 单位
DC Forward Current 正向电流	I _F	20	mA
Peak Forward Current 瞬间脉冲电流	I _{FM}	100	mA
Reverse Voltage 反向电压	V _R	5	V
Power Dissipation 消耗功率	PD	100	mW
Electrostatic Discharge Threshold (HBM) 静电释放等级(人体模式)	ESD	Class I	V
Operation Temperature 工作温度范围	Top	-40 To~+85	°C
Storage Temperature 存放温度范围	Tstg	-40 To~+100	°C
Lead Soldering Temperature 最高焊接温度	Tsol	260 °C for 5sec Max.	

Notes

1.1/10 Duty Cycle,0.1ms Push Width

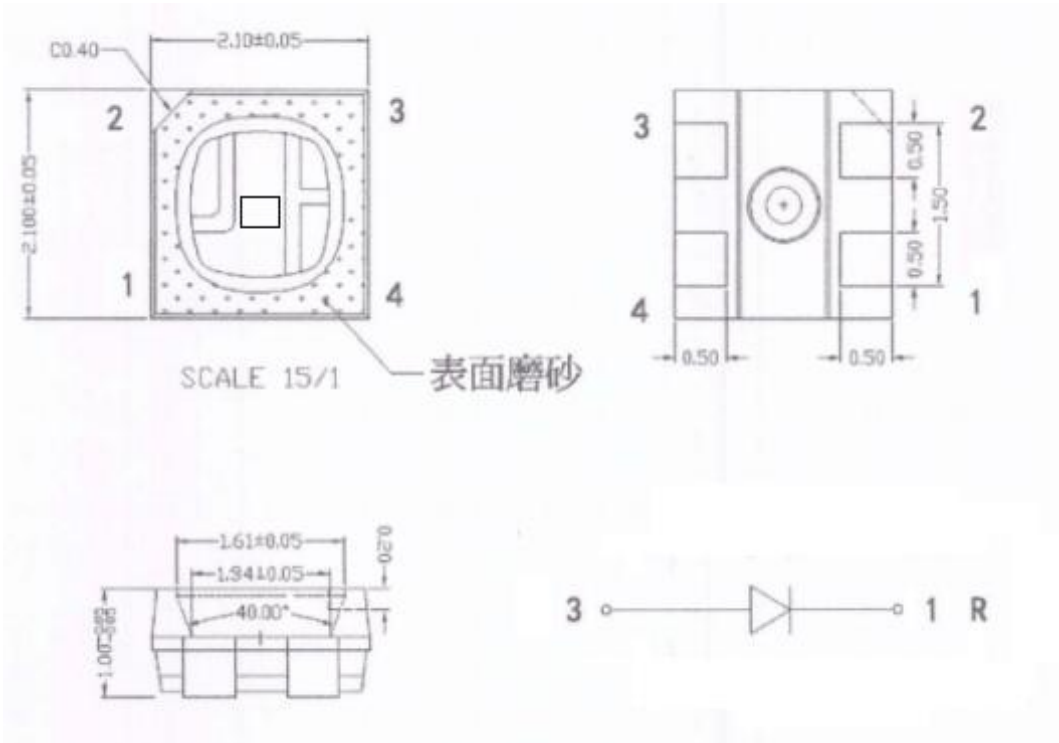
2.3mm below package bash

3.ESD(HBM) : Class I:0-1999V ; Class II:2000-3999V; Class III:4000-8000V

Typical Electrical & Optical Characteristics 典型电气和光学特性 (Ta = 25°C)

Item 项目	Symbol 代号	Condition 测试条件	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
Forward Voltage 正向电压	VF	IF=20mA	--	2.4	2.6	V
Reverse Current 逆向电流	IR	VR=10V	--	--	10	uA
Radiant Power 发光功率	Po	IF=20mA	2.4	2.5	2.6	mW
Viewing Angle 2 θ 1/2 发光角度	θ	IF=20mA	120	140	--	deg
Peak Wavelength 峰值波长	WD	IF=20mA	665.38	665.73	665.73	nm
Spectral Line Half-width 半波宽	Δ λ	IF=20mA	24.85	25.19	25.19	nm

Dimension:



- Notes:** 1.All dimensions are in millimeters
2. Tolerances unless dimensions ±0.1mm

■Reliability Test

1.测试项目和结果:

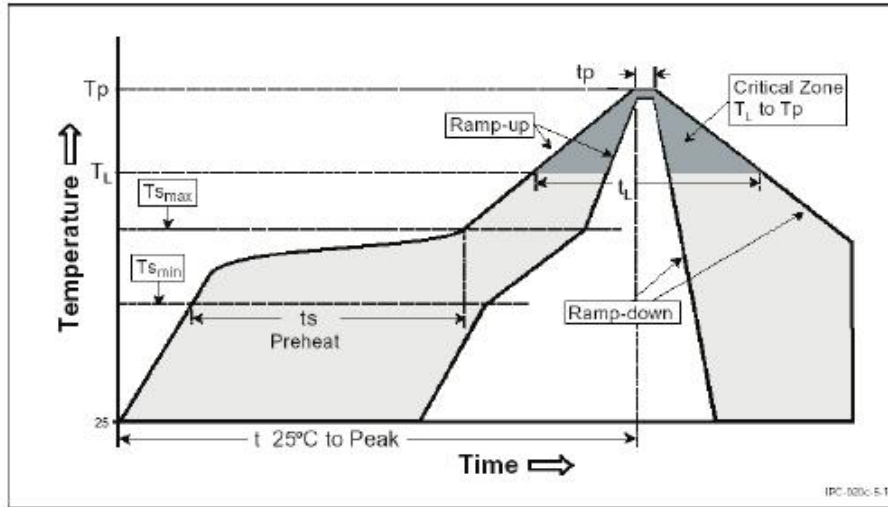
类别	试验项目	参考标准	试验条件	持续时间	取样数	损坏数量
环境试验	温度循环	JEITA ED-4701 100 105	-40℃→25℃→100℃→25℃ 30 分钟 5 分钟 30 分钟 5 分钟	循环 100 回合	100	0/100
	冷热冲击	MIL-STD-202G	-40℃←→100℃ 15 分钟 15 分钟	循环 300 回合	100	0/100
	高湿热循环	JEITA ED-4701 200 203	30℃←→65℃ RH=90% 24 小时/1 回合	循环 50 回合	100	0/100
	高温储存	JEITA ED-4701 200 201	Ta=100℃	1000 小时	100	0/100
	低温储存	JEITA ED-4701 200 202	Ta=-40℃	1000 小时	100	0/100
	高温高湿储存	JEITA ED-4701 100 103	Ta=60℃ RH=90%	1000 小时	100	0/100
寿命试验	常温寿命试验	--	Ta=25℃ IF=20mA(R)	1000 小时	100	0/100
	高温高湿寿命试验	--	Ta=60℃ RH=90% IF=20mA(R)	1000 小时	100	0/100
	低温寿命试验	--	Ta=-30℃ IF=20mA(R)	1000 小时	100	0/100
破坏性试验	耐焊性	JEITA ED-4701 300 302	Tsld=260±5℃,10 秒离胶体 3mm 距离	焊接一次	20	0/20
	可焊性	JEITA ED-4701 300 303	Tsld=235±5℃,5 秒 使用助焊剂	焊接一次	20	0/20
静电	静电放电试验	JEITA ED-4701 300 304	人体放电模式 1000V	正反向各 3 次	10	0/10
机械试验	振动试验	JEITA ED-4701 400 403	20G 20-2000HZ 4 分钟 X,Y,Z 三个方向	每个方向循环 4 次	10	0/10
	跌落试验	--	75 厘米	3 次	10	0/10

2.判定标准:

项目	标示	测试条件	判定标准
正向电压	VF	IF=20mA	初始值±10%
反压电流	IR	VR=5V	≤10uA
可焊性	--	--	浸锡面积达 95%以上
振动试验	--	IF=20mA	没有死灯及明显损坏
跌落试验	--	IF=20mA	没有死灯及明显损坏

备注:RH:环境湿度; Ta:环境温度; Tsld:锡液温度; IF:正向电流; VR:反向电压

■Reflow Soldering Characteristics 回流焊特征曲线图



ProfileFeature 分布特征	Lead Free Assembly 无铅装配
Average Ramp-Up Rate (T _{smax} to T _p) 平均升温速度 (T _{smax} 到 T _p)	3°C / second max 最快 3° C / 秒
Average Ramp-Up Rate (T _{smax} to T _p) 最低预热温度 (T _{smin})	150°C
PreheatTemperature Max (T _{smax}) 最高预热温度 (T _{smax})	200°C
PreheatTime (t _{smin} to t _{smax}) 预热时间 (t _{smin} 到 t _{smax})	60 - 180 seconds 60 - 180 秒
Temperature (T _L) 温度 (T _L)	217°C
Time Maintained AboveTemperature (T _L) 保持在此温度以上的时间 (T _L)	60 - 150 seconds 60 - 150 秒
Peak / ClassificationTemperature (T _P) 峰值 / 分类温度 (T _P)	260°C
Time Within 5°C of Actual PeakTemperature (t _P) 保持与实际峰值温度相差 5° C 以内的时间 (t _P)	20 - 40 seconds 20 - 40 秒
Ramp - Down Rate 降温速度	6°C / second max 最快 6° C / 秒
Time 25°C to PeakTemperature 从 25° C 到峰值温度的时间	8 minutes max 最快 8 分钟

Notes for Table :上图说明:

- All temperatures refer to the application Printed Circuit Board (PCB), measured on the surface adjacent to the package body.
- For additional information on thermal measurement guidelines please refer to Application Brief AB33.

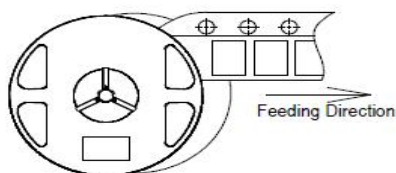
所有温度都是指应用印刷电路板 (PCB) 的情况, 在与封装体邻接的表面测定。

TOP LED manual TOP LED使用手册

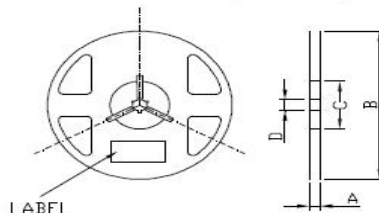
1. TOP of the packaging LED TOP LED的包装

Packaging Specifications

• Feeding Direction

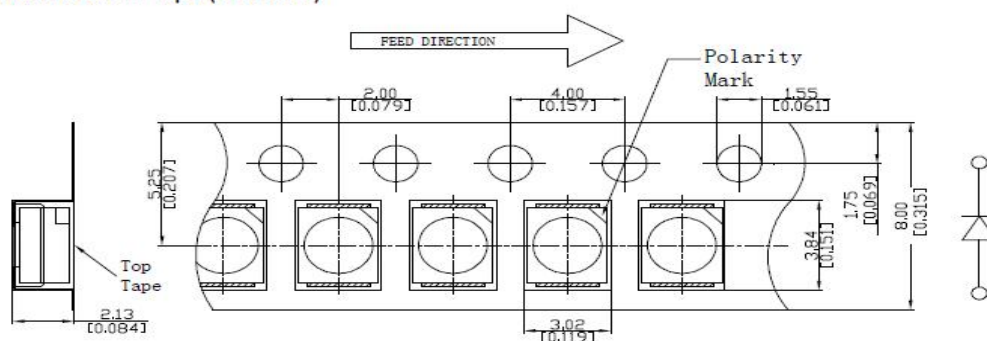


• Dimensions of Reel (Unit: mm)

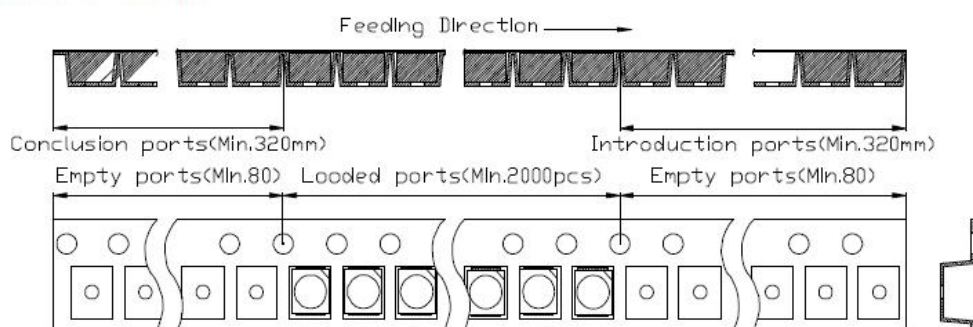


A	$8.0 \pm 0.1\text{mm}$
B	$178 \pm 1\text{mm}$
C	$60 \pm 1\text{mm}$
D	$13.0 \pm 0.5\text{mm}$

• Dimensions of Tape (Unit: mm)

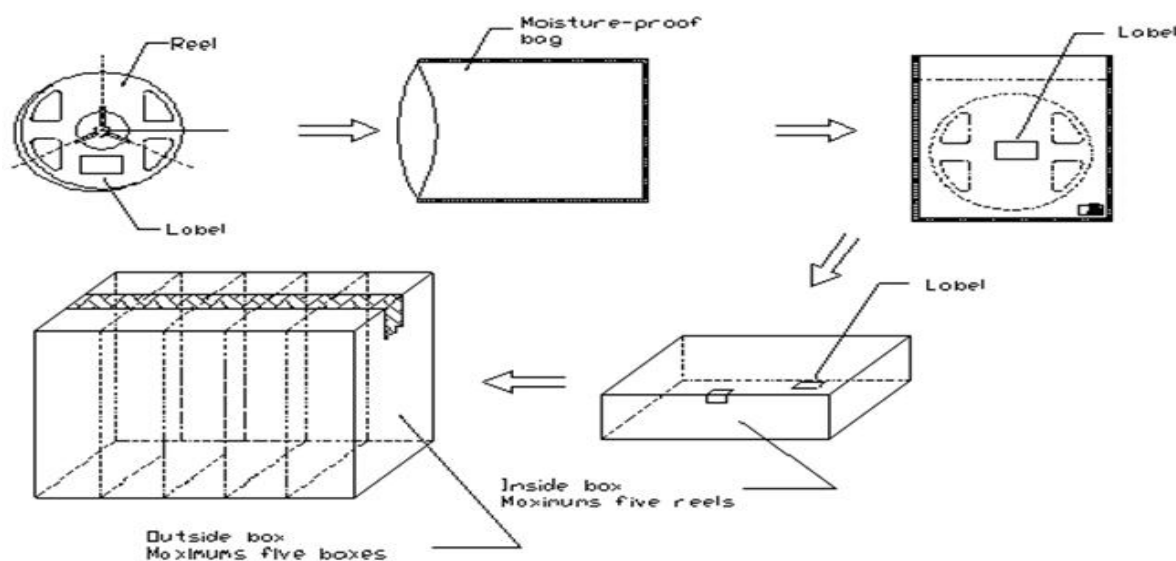


• Arrangement of Tape



the
and

2.TOP of
shipment
the



preservation LED . TOP LED的装运与保存

Surface mount devices (SMDs) usually belongs to damp sensitivity components, moisture from the atmosphere by diffusion through to the packing material in. SMD components to the process of welding circuit board is to through the temperature of 150 °C 260 °C, the reflow soldering under high temperature, the rapid expansion of infiltration moisture to produce enough steam pressure damage or destroy the LED components, thus presents materials, layering, or inner\rubber crack golden line injury failure problem reliability. 表面贴装器件 (SMDs) 通常都属于潮湿敏感性元件, 大气中的湿气通过扩散渗透到包装材料之中。SMD元件焊接到电路板上的过程是将其通过温度为 150°C-260°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、分层或金线损伤等可靠性失效问题。

2.1 TOP LED the shipment TOP LED的装运

This series product has LED the moistureproof prevent electrostatic aluminum foil bag bag seal, handling should avoid extrusion, Pierce bags, and need to be done to happen the static electricity protective measures necessary. As indicated line before operation already exist a flat or LED bags damaged, please stop using the direct, the packing products with high temperature dehumidification performance test photoelectric otolaryngologist action use. 此系列LED产品采用具有防潮防静电铝箔袋包封, 搬运过程中应避免挤压、刺穿包装袋的情形发生, 同时需做好必要的静电防护措施。如上线作业前LED包装袋已存在漏气或破损, 请直接停止使用, 将该包装产品进行光电性能检测与高温除湿动作后再行使用。

TOP mounted process, the LED turn material processes, as well as application of finished goods delivery, installation process should be paid attention to in the external force to prevent directly or indirectly ACTS on the LED lights, or may lead to external body damage caused by light, LED to death, so need to be done to happen semi-finished products, delivery way outside force protection work. TOP LED的贴装过程、转料过程, 以及应用成品出货、安装过程中应注意防止外力直接或间接作用于LED灯体, 不然可能导致外力损伤LED, 造成死灯现象发生, 故需做好半成品、成品搬运途中的外力防护工作。

2.2 TOP of the storage. Before LED Kaifeng TOP LED开封前的储存

To avoid moisture absorption of reliability caused by failure problem, need to be done to LED products before welding to storage and moisture-proof measures. If the moisture bag not open, the TOP of components of the storage time of 30 °C for < / 60% RH 3 months (note: start computing time to label as a benchmark, need to date in bags and good sealing without leakage phenomenon, and humidity indicator CARDS moistureproof bead not into pink premise use. According to different level or packaging materials moistureproof keep aging have different specific save time, in specification or bags tip accurate), the preservation of the CHIP components for up to six months. Suggested that in the assembly should not arbitrarily before open moisture bag (feeding sampling except), if cannot avoid, components must be immediate and desiccant and new humidity indicator CARDS together with the appropriate sealing packing, and kept at the moistureproof ark (< 30 °C / 60% RH). 为避免由吸湿引发的可靠性失效问题, 需做好LED产品焊接前的储存与防潮措施。如果防潮袋未打开, TOP元件的保存时间为<30°C/60%RH下3个月 (注: 起始计算时间以标签日期为基准, 需在包装袋封口良好并无漏气现象, 且湿度指示卡防潮珠未变为粉红色前提下使用。针对不同防潮等级材料或包装保存时效有一定差异, 具体保存时间以规格书或包装袋提示为准), CHIP元件的保存时间为6个月。建议在装配之前不要随意打开防潮袋 (进料抽检除外), 如无法避免, 元件必须立即与干燥剂和新的湿度指示卡一起进行恰当的密封包装, 并保存于防潮柜中 (<30°C/60%RH)。

2.3 Bags after unpacking control 包装袋拆封后的控制

Open the moisture bag immediately after the moisture indicator CARDS humidity to check whether the red to confirm whether the moisture out of the moisture bag too much. Assembly environment must be strictly controlled by the table below the maximum temperature and humidity and operation time limits. As long as SMD exposed to the surrounding environment, it is required to use time, the workshop accumulated except when baking. 打开防潮袋后，立即查看湿度指示卡中的防潮珠是否变红以确认防潮袋中的湿气是否过多。装配环境必须严格控制在下表所规定的最大温湿度及操作时间允许范围内。只要SMD暴露在周围环境中，则需累积其车间使用时间，烘烤时除外。

防潮等级	包装拆封后车间寿命	
	时间	条件
LEVEL1	无限制	$\leq 30^{\circ}\text{C}/85\%\text{RH}$
LEVEL2	1年	$\leq 30^{\circ}\text{C}/60\%\text{RH}$
LEVEL2a	4周	$\leq 30^{\circ}\text{C}/60\%\text{RH}$
LEVEL3	168小时	$\leq 30^{\circ}\text{C}/60\%\text{RH}$
LEVEL4	72小时	$\leq 30^{\circ}\text{C}/60\%\text{RH}$
LEVEL5	48小时	$\leq 30^{\circ}\text{C}/60\%\text{RH}$
LEVEL5a	24小时	$\leq 30^{\circ}\text{C}/60\%\text{RH}$
LEVEL6	取出即用	$\leq 30^{\circ}\text{C}/60\%\text{RH}$

2.4 Has not used up volume/plate material storage 未使用完的卷/盘中材料保存

If a roll of SMDs materials not use up, and once in a limited amount of temperature and humidity workshop ($< 30^{\circ}\text{C}$ / conditions under $60\%\text{RH}$), SMDs components exposed to air time not beyond "table a" standard, the remaining part can be preserved by the following conditions: 如果一卷SMDs材料未一次性用完，且车间温湿度在限定之条件 ($< 30^{\circ}\text{C}/60\%\text{RH}$) 下，SMDs元件暴露在空气中时间未超出“表一”标准，则剩余部分可按以下条件保存：

- (1). And desiccant together to seal storage; 与干燥剂一起进行密封存放；
- (2). If not and desiccant together, can deposit in $5\%\text{RH}$ this drying oven. The workshop life calculated for: after package is opened reflow soldering SMD components is exposed to the air before the time. Not used up according to the above materials such as the way to be saved, workshop service life can pause, to accumulate time calculation for calculating the benchmark. If workshop life has more than "form a" within the time stipulated, the components are roasted dehumidification can start again after calculation. Such as feeding, already found before moistureproof prevent electrostatic aluminum foil bag unpacking, damaged, perforation can timely return again original dehumidification. 若未与干燥剂一起密封，可存放于 $5\%\text{RH}$ 的干燥箱内。其车间寿命计算方式为：包装拆封后回流焊前SMD元件暴露在空气中的时间。未使用完的材料如按上述的方式进行保存时，车间使用寿命可暂停计算，以累加的时间为计算基准。如果车间寿命已超过“表一”所规定的时间，则元件经过烘焙除湿后可重新开始计算。如进料前，已发现防潮防静电铝箔袋拆封、破损、穿孔可及时退回原厂重新进行除湿。



铝箔袋褶皱，有穿孔



铝箔袋拆封后，采用透明胶带封口



铝箔袋用订书针封口

In the package is opened after, to not use up to the TOP products stored in sealed, dry environment, avoid using scotch tape, crucify book the simple sealing needle. If the product not strict seal moisture preservation, the use of high temperature must again before dehumidification. 在包装拆封后，对未用完的TOP产品需保存于密封、干燥的环境下，避免采用透明胶带、钉书针进行简单的封口。如果产品未作严格的密封防潮保存，则再次使用前必须进行高温除湿。

1.6 Already on the PCB assembly to SMD components moistureproof control 已装配到PCB上的SMD元件的防潮控制

If the moisture sensitive SMD PCB assembly to after don't need to after reflow soldering or high temperature process, will not be special processing requirements. However, if the SMT needs after after reflow soldering or any other high temperature process (including man), because, in the solder paste contains a large number of moisture, should pay attention to in the reflow soldering action to ensure that prior to the completion of LED products exposed to air time control in 2 hours. 如果对湿气敏感的SMD装配至PCB后不需再经过回流焊或者高温工序，将不作特殊处理要求。然而，如果SMT后需要经过回流焊或任何其他的高温工序（包括返工在内），由于锡膏内含有大量水份，需注意在回流焊动作完成之前确保LED产品暴露在空气中时间控制在 2 小时内。

1.7 SMD dehumidification method of components SMD 元件的除湿方法

(1)Low temperature baking: will materials plate (not overlap) placed tile within 60 °C oven, 24 hours can use the baking. 低温烘焙：将料盘平铺放置（不可重叠）烤箱内进行60℃、24小时烘烤方可使用。

(2)High temperature baking: 5050 RGB, TOP LED puguang products for 120 °C, 12 hours; TOP LED the white light products for 150 °C, 6 hours dehumidification finish can be used, and the process of cooling must be after roasting in dry environment, avoid instant cooling rapidly. 高温烘焙：5050RGB、TOP LED普光产品为120℃、12小时；TOP LED白光产品为150℃、6小时除湿完成方可使用，且烘焙后的冷却过程须在干燥环境下进行，避免瞬间急速降温。

Tip: the roasting process for the products should be labeled and differentiate, avoid mixed file phenomenon.

High temperature baking should be placed in the dry environment will materials (such as in the oven the cooling or placed on the oven) after an hour around cooling again use; At the same time to note: for materials plate, carrier belt, cover with high temperature, can only be unable to withstand demolished in bands, the take in high temperature oven LED components. If the user do high temperature baking dehumidification, limited to manual mounted. 提示：烘焙过程中应进行产品档次标示和区分，避免发生混档现象。高温烘焙后需将材料放置于干燥环境（例如在烤箱内逐渐降温或放置在烤箱周围）冷却1小时后再进行使用；同时要注意的是：因料盘、载带、盖带无法承受高温，只能拆除载带后，取下LED元件放入高温烤箱。如用户自行做高温烘焙除湿，仅限于手工贴装。



用于 TOP 普光系列产品的高温除湿

用于 TOP 白光系列产品的高温除湿



光电烤箱



低温除湿必须取下包装袋



低温除湿必须取下包装袋包装材料无法承受高温必须取出来，不同的材料要做区分，避免混料

2.1 The preparing work before operation 作业前的准备工作

For the whole process (production, testing, packaging, etc) and LED the direct contact with all employee would have to do to prevent and eliminate static measures, the official production need before do the following the tally action: 对于整个工序（生产、测试、包装等）所有与LED直接接触的员工都要做好防止和消除静电措施，正式生产前需做以下点检动作：

- a: Check the machine equipment, the ground is normal or not. 检查机台设备、工作台接地线是否正常。
- b: Inspection personnel wearing electrostatic ring is normal, confirm whether the electrostatic ring and the metal skin contact closely. 检查人员佩戴静电环是否正常，确认静电环的金属是否与人的皮肤接触紧密。
- c: In a plugin best requirement with operators electrostatic gloves or electrostatic fingertip. 在插件时最好要求作业员戴好静电手套或静电手指套。
- d: Homework mesa requirements laid the static electricity, taping tape between each other should be connected grounded. 作业台面要求铺好静电胶布，胶布之间应互相连接接地。
- e: Check test instrument, driving power whether there is any leakage or electrostatic release. 检查测试仪器、驱动电源是否存在漏电或静电荷释放之情形。
- f: Check the machine parameters, power supply output in qualified state. If debugging. 检查机台参数、电源输出是否调试在合格状态。

2.2 Workshop environment, and material safety control. 车间环境、及物料安全的管控

(1) Workshop environment that best in 30 degrees below/temperature humidity 40% RH-60% RH limits (can use temperature and humidity monitoring environment change), project and contact should wear gloves LED check or fingertip, packing bag after opening should be sealed to prevent foot, a oxidation. Avoid exposure to partial acid LED (PH < 7) workshop environment, the other LED to the purchasing of materials, assembling complete may require manufacturers to provide the raw material of the MSDS report (material safety data sheet), confirm whether one containing sulphur (such as PCB board, rubber gloves, rubber band, the sulfur in the soap all contains sulfur), halogen kind material (such as glass glue, low-end two-component resin glue) to prevent its and LED material produce chemical or physical reaction, such as the LED and sulfur, including physical contact or stored in brine acidic conditions, is caused extremely easily LED products silver layer corrosion, LED the silica gel, the phosphor material properties change, which can lead to the failure of the photoelectric performance LED. 车间环境最好保证在温度30度以下/湿度40%RH-60%RH范围内（可采用温湿度计监测环境变化），并且接触LED检查时需戴手套或手指套，包装袋开口后应及时封口，防止

脚位氧化。避免LED暴露在偏酸性 (PH<7) 的车间环境中, 对于采购的其他LED组装配套的物料, 可要求生产厂家提供原物料的MSDS报告(物质安全数据表), 确认其中是否含硫(如PCB板材、橡胶手套、橡皮筋、硫磺香皂中均含有硫)、卤素类物质(如玻璃胶、低端的双组分树脂胶), 以防止其与LED材料发生化学或物理反应, 例如LED与含硫、含卤物质接触或存于酸性环境下, 极易造成LED产品镀银层腐蚀、LED硅胶、荧光粉物料性能发生变异, 从而导致LED光电性能的失效。

3 Different materials and feet take take a processing methods.不同材料取拿及脚位加工方式

3.1 TOP LED take take way TOP LED取拿方式



3.2 TOP LED the SMT TOP LED表面贴装工艺

a. Automatic machine mounted自动机台贴装 b. Semi-automatic manual suck pen mounted半自动手工吸笔贴装



c. The tweezers mounted采用镊子贴装

(1)TOP LED by silica white light as encapsulation glue main, because there are certain viscous silicone gel, and a soft, colloid in by external extrusion or scratch the influence of the external force to a short deformation, colloid in the process of deformation stress will strain or pulled products the internal structure of the gold line in line, arc damaged or disconnected.TOP LED白光主要采用硅胶作为封装胶, 由于硅胶存在一定的粘性, 且胶体较软, 胶体在受到外力挤压或者划伤的情况下易受外力影响有短暂的形变, 胶体在变形的过程中应力释放会拉伤或拉断产品内部结构的金线, 导致线弧受损或断线。

(2)To avoid for sealing colloid sticky suction nozzle of SMT table caused by bad, such as materials and can't stick from normal, and cast material (especially the phenomenon not appropriate suction nozzle, the trip not set properly, air pressure setting partial large easy cause LED structure damage, lead to function failure). In this connection, user can choose according to the product specification SMD size appropriate suction nozzle (when suction nozzle can learn from normal encapsulation colloid outside follow or PPA part of the internal force LED minimum), which can effectively prevent or reduce a series of problems caused by the poor.为避免因封胶体粘吸嘴造成的SMT表贴不良, 如材料无法正常吸取、抛料现象(特别是采用不合适的吸嘴、机台行程设置不当、气压设置偏大时易造成LED结构损伤, 导致功能失效)。针对此, 用户可根据SMD产品规格选用尺寸合适吸嘴(当吸嘴能正常吸取封装胶体外沿或PPA部位对LED内部受力最小), 可有效防止或降低由此引发的一系列不良问题。

(3)The semi-automatic manual suck pen in mounted SMD, should avoid material mounted to the PCB process, suction nozzle metal parts apply too pressure (artificial force has irregular) damage internal gold thread, advice LED the way with the user to assembly, metal suction nozzle in front of the increase necessary rubber protective set for the proper pressure buffer.在采用半自动手工吸笔贴装SMD时, 应避免将材料贴装至PCB过程中, 吸嘴金属部位施加过大压力(人工施力具有不规则性)损伤LED内部金线, 建议用户用此方

式贴装时，在金属吸嘴前端增加必要的橡胶防护套，以作适当的压力缓冲。

(4)The LED application process should avoid have pointed to the scene LED encapsulation colloid, may cause damage to the LED to poor functioning.LED应用制程中应避免有尖状物体对LED封装胶体造成损伤，可能导致LED功能不良。

4. TOP of the LED welding conditions TOP LED的焊接条件

a. A way to have a: soldering iron welding welding; Reflow soldering.焊接方式有：烙铁焊；回流焊

b. Unpacking material immediately after the index card observation humidity compliance with requirements, such as requirements please click "2.1.4" demanding homework, the proposal is less than 60% humidity conditions used in the 12 H. To avoid the adverse impact environment humidity, the proposal after unpacking, if the storage time more than 24 H, then the next time before use should be based on conditions and products for state take high temperature (or low temperature) dehumidifier. The product after unpacking not according to requirements assignments may be the adverse.拆封材料后，立即观察湿度卡的指标是否符合要求，如不符合要求请按“2.1.4”点要求作业,建议湿度小于60%情况12H内用完。为避免环境湿度造成不良影响，建议拆封后，如果存放时间超过24H，则下次使用前需根据存放条件和产品状态采取高温（或低温）除湿。产品拆封后未按要求作业可能会产生的不良：

①. Materials to produce dissection, white gel coordinate and flux produce offset and can lead to death the lamp.材料胶体产生剥离，导致白光坐标及光通量产生偏移并有可能导致死灯。

②. Materials produced, causing crack glue colloidal material produces death lamp.材料胶体产生裂胶，导致材料产生死灯。

c. The welding temperature and time requirements of the way:各焊接方式的温度与时间要求：

(1)Soldering iron welding:烙铁焊：

TOP LED up to 300 °C, solder iron temperature welding time the longest 2 S. Welding position at least distance white shell or colloid 0.15 mm, DianLaoTie power should be less than 30 W.TOP LED烙铁温度最高300℃、焊接时间最长2S。焊接位置至少距离白壳或胶体0.15mm，电烙铁的功率宜低于 30W。

(2) Reflow soldering: 回流焊：

Divided into the lead and lead-free soldering welding.分为有铅焊接和无铅焊接。

(3) Note: 注意事项：

①Use first temperature measuring instrument measuring the temperature zone backflow welding temperature whether accord with and even.先用温度测量仪器测量回流焊机各温区温度是否符合并均匀。

②TOP of lead-free soldering advice LED the temperature curve as page 7 reflow soldering graph, no matter how set the highest 260 °C, no more than 10 seconds, 220 °C can't more than 60 seconds, or high temperatures may lead to failure LED products.TOP LED的无铅回流焊建议的温度曲线如第七页回流焊曲线图，不管如何设定，最高的260℃不能超过10秒，220℃不能超过60秒，否则高温下可能导致LED产品功能失效。

③Different types of SMDs (TOP, CHIP LED collectively) products peak temperature should be set up, with the difference between general categories, the greater the stress release me, the greater the resistance to high temperature ability relative decrease.不同类型的SMDs（TOP、CHIP LED的统称）产品峰值温度设置应有所差异，一般同类别Size越大，应力释放越大，耐高温能力相对减弱。

5. TOP LED cleaning TOP LED的清洗

Avoid the use of unknown liquid chemical or acidic solvent, as cleaning, using in the solvent (such as washing board before water), please first confirm that contains the chemical composition of epoxy resin,

whether organic silicon, silicon resin, support of silver cause corrosion, and thus lead to the LED properties change or function damage. Usually recommend using ethanol as solvent, first patch LED clean the body surface will light impurity wipe gently clean (to prevent excessive force package colloid or destroy a scratch light body internal structure), placed under normal temperature natural drying, again begin to use. And should also pay attention to avoid will patch LED dipping in ethanol solution.避免使用不明化学液体、或酸性溶剂作为清洗液，在使用溶剂前（如洗板水），请先确认其所含化学成份是否会对环氧树脂、有机硅、硅树脂、支架镀银层等造成腐蚀，并由此导致LED特性改变或功能损坏。通常推荐使用乙醇作为贴片LED清洁溶剂，先将灯体表面的杂质轻轻擦拭干净后（防止用力过度擦伤封装胶体或破坏灯体内部结构），放置常温下自然干燥，再开始使用。同时应注意避免将贴片LED浸渍于乙醇溶液中。