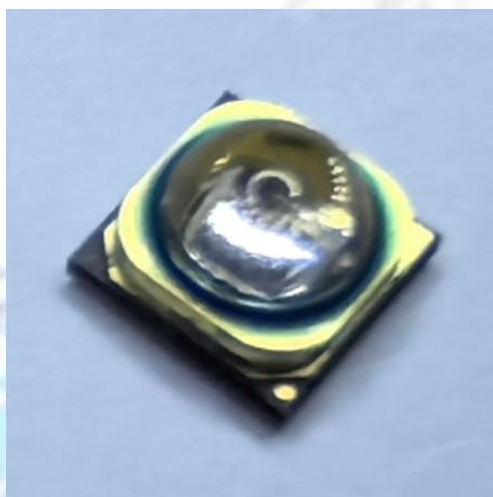




至芯半导体
BeyondUV

产 品 规 格 书

紫外发光器件



ZXS39E

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1. 产品介绍

特性 FEATURES

- 陶瓷基板 + LENS

Ceramic substrate with LENS

- 尺寸 (长 x 宽 x 高) 3.9 x 3.9 x 3.1 毫米

Dimension (L x W x H) 3.9 x 3.9 x 3.1 mm

- 颜色: 峰值 275 nm (UVC)

Color: λ_{peak} 275 nm (UVC)

- 典型辐射功率 110 mW@350 mA

Typical radiation power 110 mW@350 mA

- 典型出光: 60°

Typ. Radiation: 60°

- 内置 ESD 保护装置

Built in ESD Protection device

- 标准 SMD 工艺

Standard SMD Process

- 符合 RoHS 和 REACH

RoHS and REACH compliant

应用 APPLICATIONS

- UV-C 空气消毒杀菌

Air sterilization and disinfection

- UV-C 表面消毒杀菌

Surface sterilization and disinfection

- UV-C 水消毒杀菌

Water sterilization and disinfection

- 光疗

Phototherapy

- 化学和生物分析

Chemical and Biological analysis

- 荧光光谱

Fluorescent Spectroscopy

- 食品药品加工

Food & Pharmaceutical Processing

2.光电参数 Photoelectric parameters [Ta=25°C]

1) 电学和光学特性 Electrical and Optical Characteristics

波长 wavelength	参数 Parameter	符号 Symbol	电流 If	最小 Min	典型 Typ	最大 Max	单位 Unit
UV	峰值波长 ^{*1} Peak wavelength ^{*1}	λ_p	350mA	260	-	280	nm
	辐射通量 ^{*2} Radiant Flux ^{*2}	Φ_e		100	-	140	mW
	正向电压 ^{*3} Forward voltage ^{*3}	Vf		5.0	-	6.2	V
	半波宽 ^{*1} FWHM ^{*1}	$\Delta\lambda$		8	-	16	nm
	视角 ^{*4} Viewing angle ^{*4}	2 θ 1/2		-	60	-	deg

备注 Notes:

*1 峰值波长 (λ_p) 测量公差为 ± 3 nm; Peak Wavelength(λ_p) Measurement tolerance is ± 3 nm.

*2 辐射通量 (Φ_e) 测量公差为 $\pm 10\%$; Radiant Flux(Φ_e) Measurement tolerance is $\pm 10\%$.

*3 正向电压 (Vf) 测量公差为 $\pm 3\%$; Forward Voltage(Vf) Measurement tolerance is $\pm 3\%$.

*4 视角 (度) 测量公差为 ± 5 度; Viewing angle(deg) Measurement tolerance is ± 5 deg.

2) 极限条件 Absolute maximum ratings

参数 Parameters	符号 Symbol	数值 Value	单位 Unit
正向电流 Forward current	If	500	mA
功耗 Power dissipation	Pd	3.75	W
抗静电能力 Electrostatic Discharge	ESD(HBM)	8000	V
结温 Junction Temperature	Tj	85	°C
工作温度 Operating temperature	Topr	- 40 ~ +80	°C
储存温度 Storage temperature	Tstg	- 40 ~ +100	°C
焊接温度 Soldering temperature	Tsolder	245	°C

备注 Notes:

• 本产品在使用时建议提供良好的散热环境或散热系统,以获得最佳使用效果。

It is recommended to provide a good cooling environment or a good cooling system for the best use.

3.分档规格 Bin Structures [Ta=25°C]

1) 分档规格 Bin Structures

项目 Item	最小 Min	最大 Max	Bin 规格	单位 Unit
峰值波长 Peak Wavelength	260	280	10nm 分档	nm
辐射通量 Radiant Flux	100	140	10mW 分档	mW
正向电压 Forward Voltage	5.0	6.2	0.2V 分档	V

2) 主要档位 Primary Bin

参数 Parameter		Min	Max
UVC	Vf (V) If=350mA	5.4	5.6
		5.6	5.8
		5.8	6.0
	Φe (mW) If=350mA	100	110
		110	120
		120	130
		130	140
	λp (nm) If=350mA	260	270
		270	280

备注 Notes:

*1 峰值波长 (λp) 测量公差为±3nm; Peak Wavelength(λp) Measurement tolerance is ± 3nm.

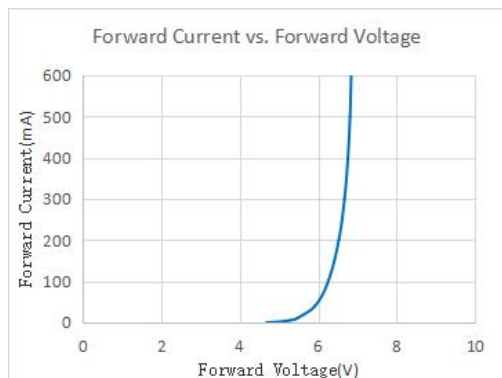
*2 辐射通量 (Φe) 测量公差为±10%; Radiant Flux(Φe) Measurement tolerance is ± 10%.

*3 正向电压 (Vf) 测量公差为±3%; Forward Voltage(Vf) Measurement tolerance is ± 3%.

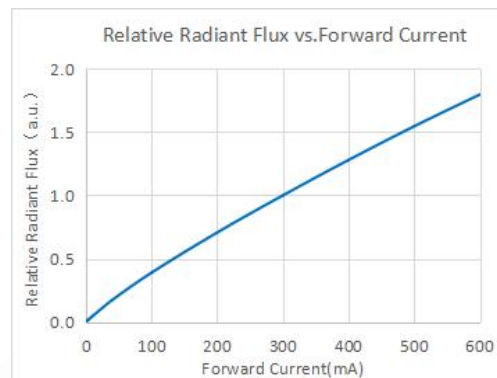
***4 以上参数分档规格可客制化.**

4.特性曲线 Typical Characteristics Graphs [Ta=25°C]

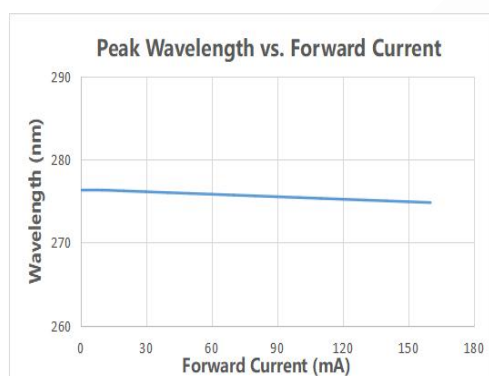
1) 伏安特性曲线



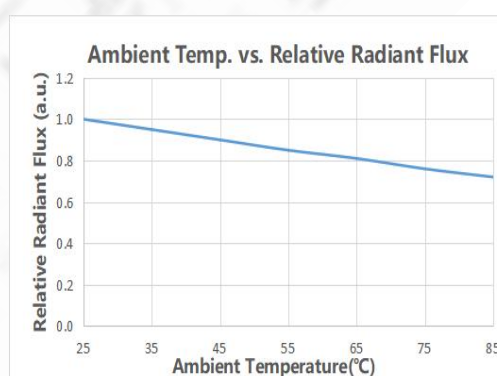
2) 正向电流与相对辐射通量特性曲线



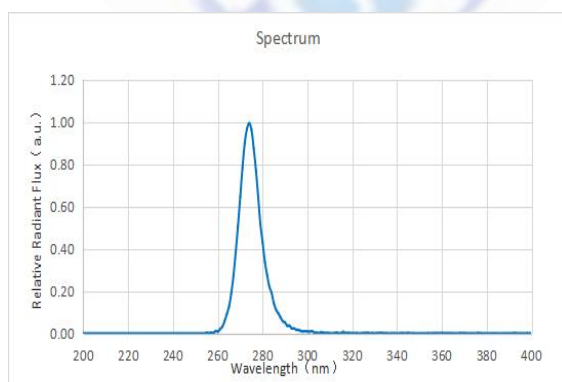
3) 正向电流与峰值波长特性曲线



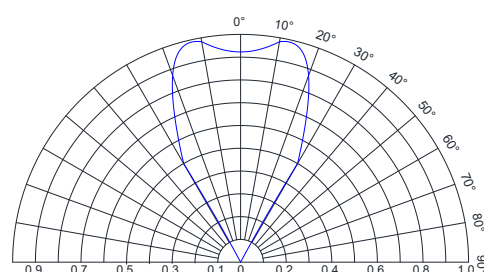
4) 环境温度与相对辐射通量特性曲线



5) 光谱分布特性曲线



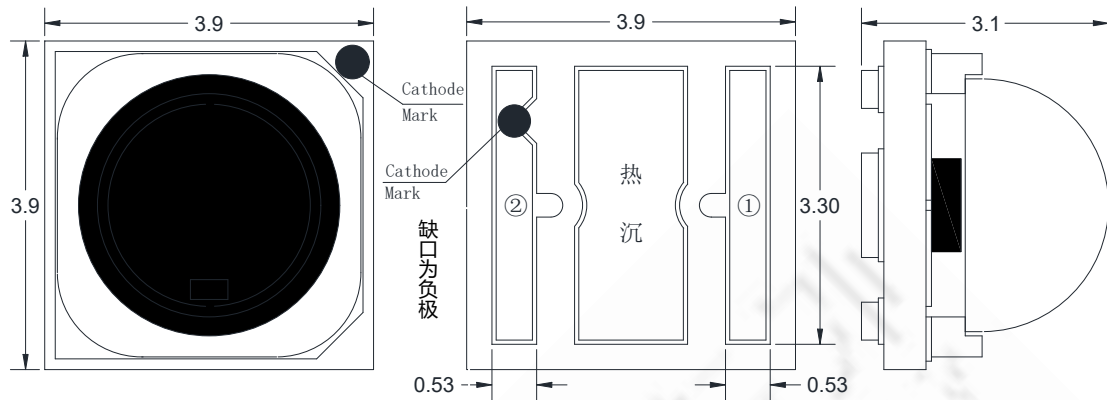
6) 典型空间分布



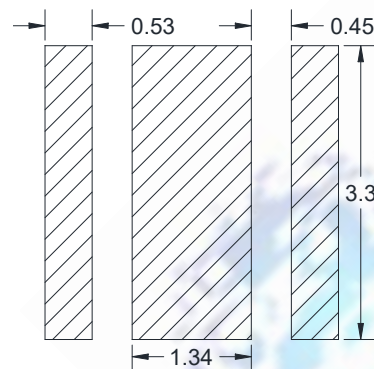
5. 外形尺寸 Outline Dimensions [单位 Unit : mm]

1) 器件尺寸 PKG Dimensions

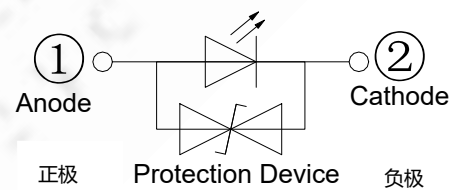
- 尺寸 Dimensions: 3.9 x 3.9 x 3.1 (L x W x H)
- 公差 tolerance: $\pm 0.2\text{mm}$



2) 焊盘 Solder Pad



3) 内部电路 Internal Circuit

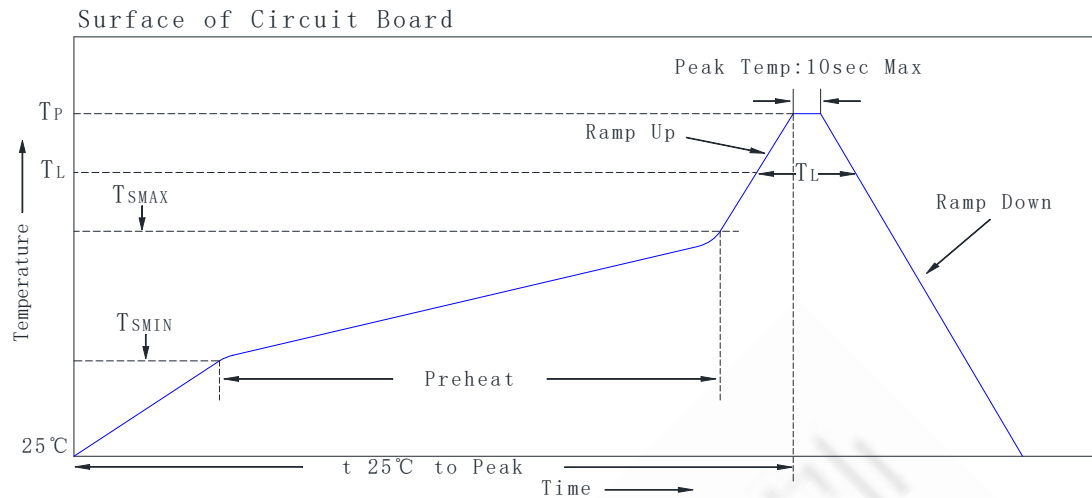


备注 Notes:

因基板支架批次不同，器件实物外观上可能存在轻微差异，不同外观的产品互相兼容，不影响使用

Due to the different batches of substrate support, slight differences may exist among the appearance of the devices. The products with different appearance are compatible with each other which do not affect the use.

6.回流焊接 Reflow Soldering Profile



Classification Reflow Profiles

Profile Feature	Pb-free Assembly
Average ramp-up rate(T _{smax} to T _p)	2°C/second max
Preheat:	
Temperature Min (T _{smin})	130°C
Temperature Max (T _{smax})	180°C
Time(T _{smin} to T _{smax}) (ts)	60-120 seconds
Time maintain above:	
Temperature (T _L)	200°C
Time(t _L)	60 seconds max
Peak Temperature(T _p)	245°C
Time within 5°C of actual Peak Temperature (tp) ²	10 seconds max
Ramp-down Rate	4°C/second max
Time 25°C to Peak Temperature	5 minutes max

备注 Notes:

•所有温度均指在器件表面测量的器件表面温度。

All temperatures are measured on the package surfaces.

•使用中低温锡膏回流焊接，峰值温度不应大于 245°C，时间控制在 10 秒以内

When reflow soldering with medium to low temperature solder paste, the peak temperature is suggested not to exceed 245 °C and the time is suggested to be controlled within 10 seconds

•LED 封装设计为回流焊接至 PCB。如果浸焊或手工焊接，将不能保证其可靠性。

The LED package is designed to be reflow soldered to a PCB. Reliability will not be guaranteed with dip solder or hand solder,

•回流焊不应超过一次。

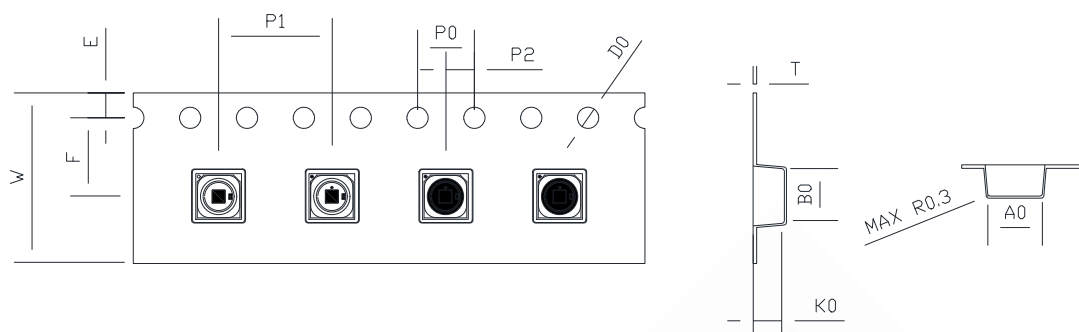
Reflow soldering is suggested to be executed just one time.

•当 LED 组件在最高温度下冷却时，不建议快速降温。

A rapid temperature ramp is not recommended.

7. 包装规格 Package specification [Unit : mm]

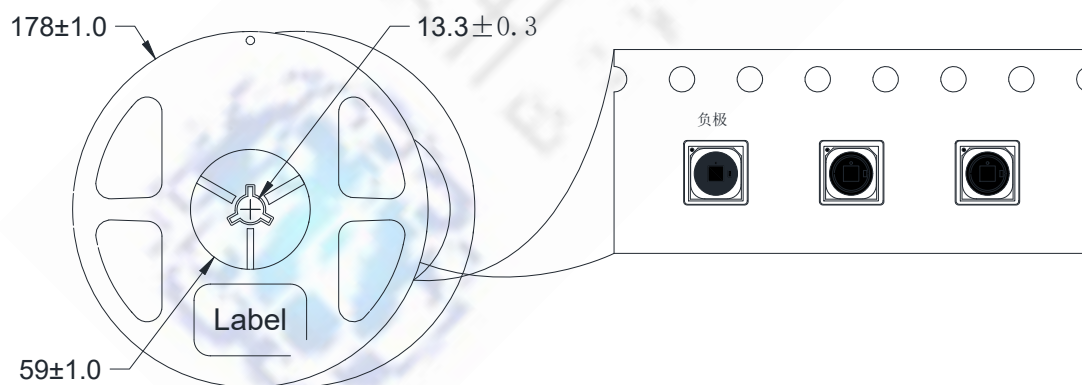
1) 卷带 Tape



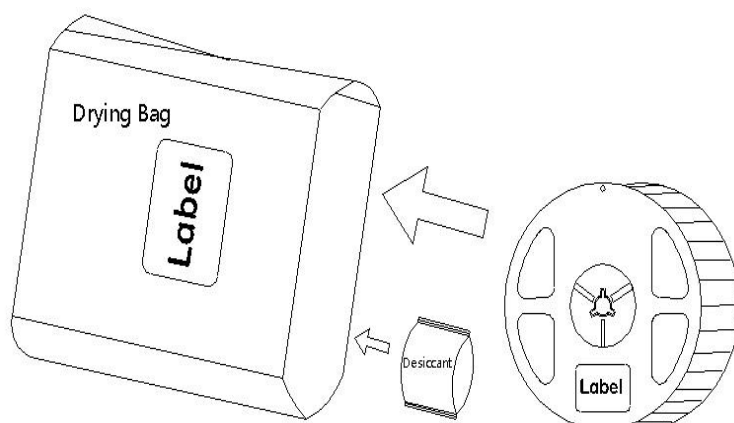
符号 symbol	AO	BO	KO	PO	P1	P2
规格 spec	4.2±0.10	4.2±0.10	3.25±0.10	4.00±0.10	8.0±0.1	2.0±0.10
符号 symbol	W	T	E	F	DO	D1
规格 spec	12.0±0.30	0.4±0.05	1.75±0.10	5.50±0.1	1.5 ^{+0.10} ₀	1.5 ^{+0.10} ₀

2) 卷盘 Reel

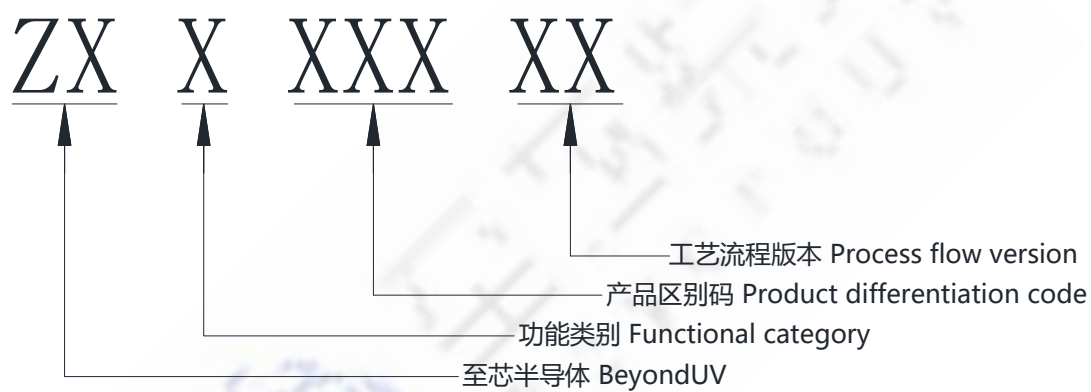
- PKG 数量 : 600 PCS/卷 PKG Quantity : 600 PCS/Reel



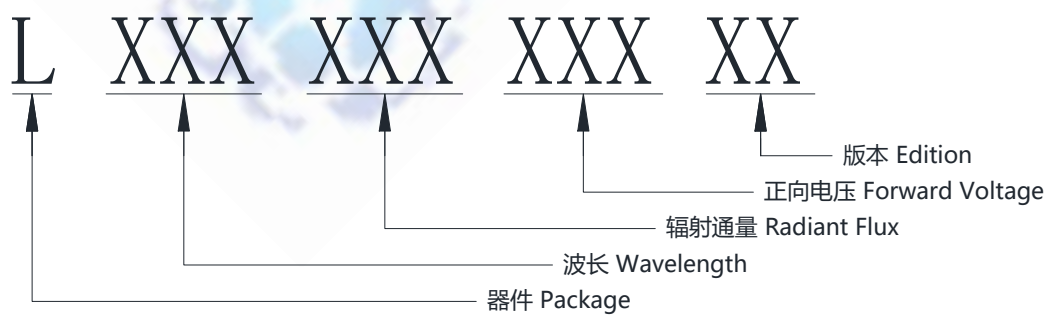
3) 铝箔袋 Aluminum foil bag



4) TYPE



5) SPEC



8. 使用注意事项 Precautions on use

1) 储存条件 Storage condition

a、UV-LED 器件是真空包装在一个含有干燥剂的铝袋内，如果储存环境不良时，可以起到一定的防护作用。

Each UV-LED device is vacuum packed in an aluminum foil bag with desiccant, Which will provide some necessary protections when the storage condition is poor.

b、UV-LED 器件建议存储在温度 $5^{\circ}\text{C} \sim 30^{\circ}\text{C}$ 、湿度小于 50%，密封保存：铝箔袋未打开，建议自交货之日起 1 年内使用完毕；铝箔袋打开后，建议自打开时间起 24H 内使用完毕，超过 24H 需要密封保存，下次使用前请重新先除湿，温度 $65 \pm 5^{\circ}\text{C}$ ，湿度小于 10%，时间 24H。

UV-LED devices are recommended to be stored at the temperature of $5^{\circ}\text{C} \sim 30^{\circ}\text{C}$, the humidity of less than 50% and a Sealed storage condition: if the aluminum foil bag is not opened, the device is recommended to be used within 1 year from the date of delivery;

Once the aluminum foil bag is opened, the device is recommended to be used within 24h, otherwise it needs to be stored sealed If it is exposed in the air for more than 24h. Please dehumidify it again before next use at the temperature of $65 \pm 5^{\circ}\text{C}$, and the humidity of less than 10% for 24h.

c、当 UV-LED 器件吸收水分后进行焊接时，水分会蒸发，内部空气会膨胀。这可能导致透镜剥落或其光学性能恶化。

If the UV-LED devices are welded after absorbing moisture, the moisture will evaporate which may cause peeling off of the lens and deterioration of its optical properties.

2) 电路设计 Circuit design

a、设计电路时，确保不超过每个 UV-LED 的最大额定值。

Please ensure that the maximum rating of each UV-LED is not exceeded.

b、设计电路工作与器件正向电压对应。如果施加反向电压，UV-LED 芯片和齐纳二极管可能会损坏。

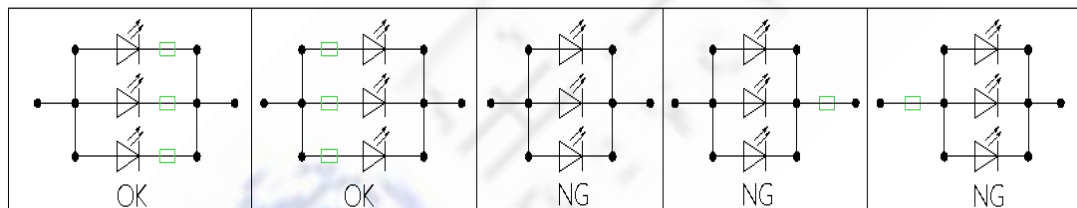
The circuit works on the forward voltage, otherwise, UV-LED chip and zener diode may be damaged.

c、对于电流驱动方法，建议在恒流模式下运行。

It is recommended to operate with constant current mode.

d、对于电路，建议为每个 LED 增加额外的恒流调节器

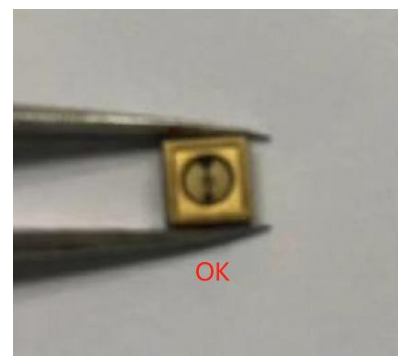
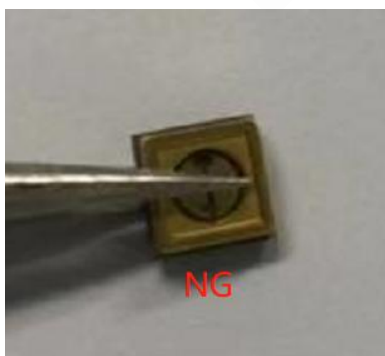
It is recommended to add an additional constant current regulator for each LED.



3) 搬运注意事项 Handling precautions

a、当使用镊子拿取 UV-LED 器件时，按照与器件侧边平行的方向搬运，如下图所示。

Please carry the UV LED device in the direction parallel to the side of the device, as shown in the figure below when pick up it with tweezers.



b、焊接后不要立即进行快速冷却。它可能导致 LED 组件故障。

It will cause the failure of the LED PKG if cooling rapidly after soldering.

c、用手拿取 UV-LED 器件时可能会污染 LED 表面，从而导致光输出下降。

The light output power will drop as a result of surface contamination by handling the UV-LED PKG with hands.

d、UV-LED 从包装掉落可能导致 LED 损坏。

Dropping down will damage the UV-LED PKG.

4) 静电放电 Electrostatic Discharge

a、UV-LED 使用工作场所的所有物品和材料进行防静电措施。

Electrostatic protection should be adopted at all the objects and materials in the workplace.

b、接地

Grounding

c、工人应穿防静电服，并通过腕带或脚后跟接地。接地时应连接接地环，并每天检查是否断开。

Workers should wear antistatic clothing and ground through a wrist strap or heel ground.

Earth ring should be connected when grounding, and should be checked for connection every day.

d、工作台的工作面设有导电垫并接地。定期测量和检查导电状态。

The working surface of the work table is provided with a conductive mat and grounded.

Please measure and check the conductivity state periodically.

e、除一般情况外，使用湿度控制或局部加湿器来抑制静电的产生。

Humidity control and partial humidifier are used to suppress the generation of static electricity.

5) 热管理 Thermal Management

a、热管理与 UV-LED 的寿命密切相关。

Thermal management is closely related to the lifetime of UV-LED.

b、运行期间 UV-LED 的温度不得超过结温温度 (T_j) 。

The temperature of the UV-LEDs during operation must not exceed the junction temperature (T_j).

c、对于 UV-LED 器件的温度管理，必须考虑 PCB 的热阻和 UV-LED 器件之间的间距。

For temperature management of the UV-LEDs, the thermal resistance of the PCB and the spacing between the UV-LEDs must be considered

d、对于 PCB，建议使用铜基金属 PCB，应连接散热器以管理 UV-LED 器件温度。

A Cu based metal PCB is recommended and a heat sink is suggested to manage the UV-LEDs temperature.

6) 眼睛安全 Eye Safety

a、暴露在强紫外线下会对人眼和皮肤造成损害。

Exposure in strong UV light will hurt the human eye and skin.

b、不要直接或间接地看紫外线。

Do not look at UV light directly or indirectly.

c、如果不可避免地暴露在紫外线下，应使用护目镜和衣物等适当的防护装置保护身体。

If it is unavoidable to exposure in UV light, the body should be protected by suitable protection devices such as goggles and clothing.

以下警告标签，贴在使用了紫外器件的产品/系统上。

The following warning labels are attached to UV products / systems.

