

江西省晶能半导体有限公司  
JiangXi LatticePower Semiconductor Corporation

产 品 规 格 书  
Specification

产品名称 Product Name: HEL2  
产品型号 Product P/N: E2  
客 户 Client name: \_\_\_\_\_  
客户料号 Client P/N: \_\_\_\_\_  
版 本 号 Version No.: A03  
日 期 Sending Date: 2023.12

| 客户承认栏<br>Client Approval |             |
|--------------------------|-------------|
| 核准<br>Approval           | 确认<br>Audit |
|                          |             |

制定 Confirmation: \_\_\_\_\_ 审核 Approval: \_\_\_\_\_

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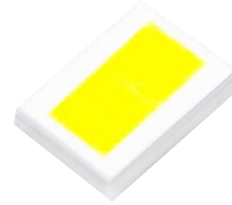
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## 1、特点 Features

- ◆ 陶瓷封装，高亮度，高可靠性  
Ceramic Substrate package , High brightness ,High reliability
- ◆ 尺寸：2.90mm\*2.00mm\*0.7mm  
Size: 2.90mm\*2.00mm\*0.7mm
- ◆ 根据白光标准分档  
According to standard white color gamut
- ◆ 适于 SMT 贴片  
Compatible with SMT
- ◆ 发光角度：120°  
Viewing Angle: 120°
- ◆ 包装：最大 3000 颗/卷  
Package: Max: 3000pcs /reel
- ◆ 建议额定使用电流为 700mA  
Recommended current 700mA



## 2、应用 Applications

|       |                       |
|-------|-----------------------|
| 汽车照明  | Automobile            |
| 摩托车照明 | Motorcycle            |
| 非机动车  | Non-motorized vehicle |



### 3、性能 Performance

#### a) 绝对最大额定值 Absolute Maximum Ratings

| 参数<br>Parameter                                 | 符号<br>Symbol | 最大参数值<br>Maximum Rating | 单位<br>Unit |
|---|--------------|-------------------------|------------|
| 电流<br>DC (Video Mode) Forward Current           | $I_F$        | 1000                    | mA         |
| 功率<br>Power Dissipation                         | P            | 7                       | W          |
| 脉冲电流<br>Pulsed(Flash Mode) Forward Current      | $I_{FP}$     | 1200                    | mA         |
| 结温 (DC 模式)<br>LED Junction Temperature(DC mode) | $T_j$        | 150                     | °C         |
| 工作温度<br>Operating Temperature Range             | $T_{opr}$    | -40~105                 | °C         |
| 存储温度<br>Storage Temperature                     | $T_{stg}$    | -40~120                 | °C         |

备注 Notes :

- ◇ 绝对最大额定值环境温度  $T_a=25^{\circ}\text{C}$   
Absolute Maximum Ratings at  $T_a=25^{\circ}\text{C}$
- ◇  $I_{FP}$  脉冲时间 $\leq 10\text{ms}$ , 宽度 $\leq 10\%$   
 $I_{FP}$  Conditions with pulse width  $\leq 10\text{ms}$  and duty cycle $\leq 10\%$

## b) 光电参数

### Electro-Optical Characteristics (T solder pad =25 °C, I<sub>F</sub> =700mA)

| 项目<br>Item                     | 符号<br>Symbol   | 最小值<br>Min. | 典型值<br>Typ. | 最大值<br>Max. | 单位<br>Unit |
|--------------------------------|----------------|-------------|-------------|-------------|------------|
| 光通量<br>Luminous Flux           | Φ              | 440         | 560         | 800         | Lm         |
| 正向电压<br>Forward Voltage        | VF             | 5.6         | 6.5         | 7.2         | V          |
| 显指<br>Ra                       | ----           | 60          | ----        | ----        | ----       |
| 热阻<br>Thermal Resistance       | ----           | ----        | 4.5         | ----        | °C/W       |
| 发光角度<br>Viewing Angle          | 2θ1/2          | ----        | 120         | ----        | °          |
| 结温<br>LED Junction Temperature | T <sub>j</sub> | ----        | 150         | ----        | °C         |

备注 Notes :

- ◇ 光通量测量误差范围±6%  
Luminous flux measurement tolerance: ±6%
- ◇ 光电参数测试是瞬态时间为 20ms  
Electric and optical data is tested at 20 ms pulse condition

c) 亮度分布特性

**Luminous Flux Characteristics** (T solder pad = 25 °C, I<sub>F</sub> =700mA)

| 产品号<br>Product | 最低显指<br>Min. Ra | 常规色温<br>Normal CCT | 色区块<br>Chromaticity | 最小光通量<br>Minimum Luminous Flux |              | 出货代码 (例)<br>Order Code (e. g.) |
|----------------|-----------------|--------------------|---------------------|--------------------------------|--------------|--------------------------------|
|                |                 |                    |                     | 代码<br>Code                     | 亮度值<br>Value |                                |
| HEL2           | 60              | 5300~5700          | 2C                  | B02                            | 440          | E2-B-2C-B03-BC4                |
|                |                 |                    |                     | B03                            | 500          |                                |
|                |                 |                    |                     | B04                            | 560          |                                |
|                |                 |                    |                     | B05                            | 630          |                                |
|                |                 | 5700~6000          | 2B                  | B02                            | 440          | E2-B-2B- B03-BC4               |
|                |                 |                    |                     | B03                            | 500          |                                |
|                |                 |                    |                     | B04                            | 560          |                                |
|                |                 |                    |                     | B05                            | 630          |                                |
|                |                 | 6000~6500          | 1D                  | B02                            | 440          | E2-B-1D- B03-BC4               |
|                |                 |                    |                     | B03                            | 500          |                                |
|                |                 |                    |                     | B04                            | 560          |                                |
|                |                 |                    |                     | B05                            | 630          |                                |
|                |                 | 6500~7000          | 1A                  | B02                            | 440          | E2-B-1A- B03-BC4               |
|                |                 |                    |                     | B03                            | 500          |                                |
|                |                 |                    |                     | B04                            | 560          |                                |
|                |                 |                    |                     | B05                            | 630          |                                |

## 4. 产品代码 Product Order Code

E2 - B - 1D - B04 - BC4  
①                    ②                    ③                    ④                    ⑤

- ① 产品型号      Product Type (E2: HEL2)
- ② 显色指数      Ra level
- ③ 色温区块      Color Area
- ④ 亮度等级      Brightness Level
- ⑤ 电压等级      VF Level

### 出货标签(例) Shipping label (e.g.)



**LatticePower Corporation Limited**

Item: E2-B-1D-B04-BC4 HEL2



Reel ID: AE2C00000001



Qty: 2000



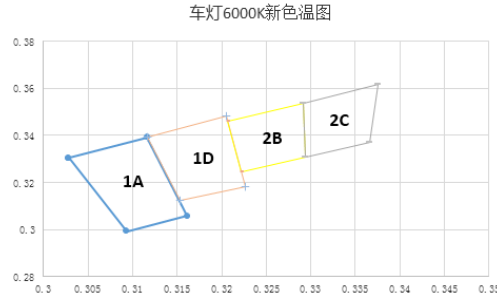
6E2TDHCA

Date: 2023-12-14

## 5. 分档规则 Bin Regulations

### a) 色度区域 Chromaticity Regions

Cool White



| Color Chromaticity Groups |         |         |                   |         |         |
|---------------------------|---------|---------|-------------------|---------|---------|
| Color Bin                 | x       | y       | Color Bin         | x       | y       |
| 1A<br>6500K~7000K         | 0.3028  | 0.3304  | 1D<br>6000K~6500K | 0.31165 | 0.33925 |
|                           | 0.31165 | 0.33925 |                   | 0.3205  | 0.3481  |
|                           | 0.3161  | 0.3059  |                   | 0.32264 | 0.31814 |
|                           | 0.3093  | 0.2993  |                   | 0.31527 | 0.3123  |
| 2B<br>5700K~6000K         | 0.32912 | 0.35387 | 2C<br>5300K~5700K | 0.32912 | 0.35387 |
|                           | 0.32064 | 0.34615 |                   | 0.33760 | 0.36160 |
|                           | 0.32220 | 0.32430 |                   | 0.33660 | 0.33690 |
|                           | 0.32940 | 0.33060 |                   | 0.32940 | 0.33060 |

备注 Notes :

◇ 色度坐标 (x, y) 来自 CIE1931 色度图

The chromaticity coordinates(x,y)is derived from the CIE 1931 chromaticity diagram

◇ PT86 测试设备用于光通量 (lm) 和 CIE1931 色度坐标 (x, y) 测试。

PT86 is for the luminous flux(lm) and the CIE1931 chromaticity coordinates(x,y) testing.

◇ 色度坐标 (x, y) 存在±0.006 公差。

The chromaticity coordinates(x,y) guarantee should be added ±0.006 tolerance.



## b) 亮度分档

### Luminous Flux Groups (T solder pad = 25°C, I<sub>F</sub> = 700 mA)

| 代码<br>Group Code | 最小值<br>Min. | 最大值<br>Max. |
|------------------|-------------|-------------|
| B02              | 440         | 500         |
| B03              | 500         | 560         |
| B04              | 560         | 630         |
| B05              | 630         | 710         |
| B06              | 710         | 800         |

## c) 电压分档 Voltage Groups

| 代码<br>Group Code | 范围<br>Range |
|------------------|-------------|
| BC2              | 5.6~6.0     |
| BC3              | 6.0~6.4     |
| BC4              | 6.4~6.8     |
| BC5              | 6.8~7.2     |

## d) 显指分档 Ra Groups

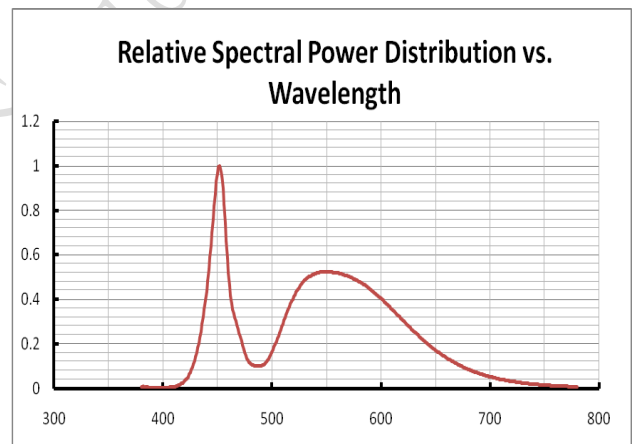
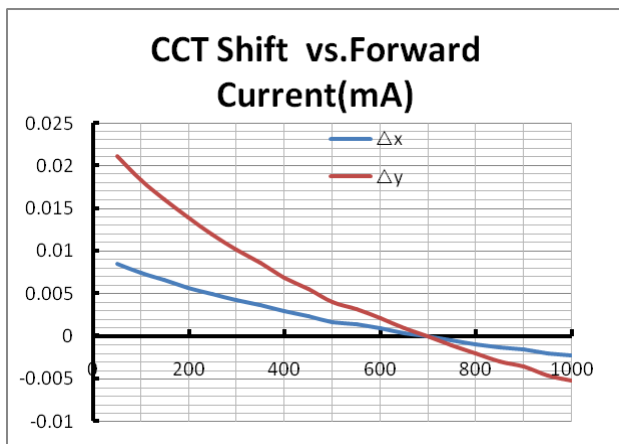
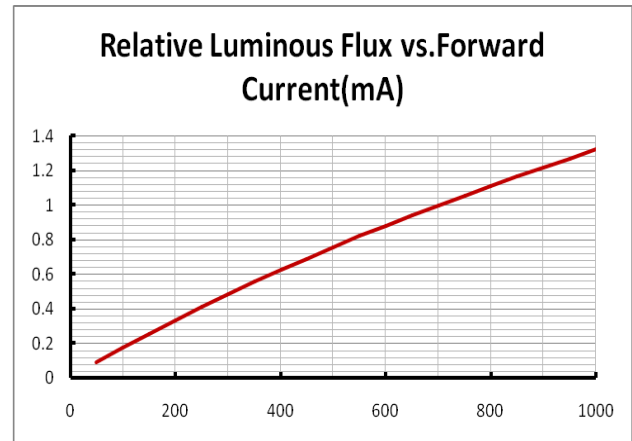
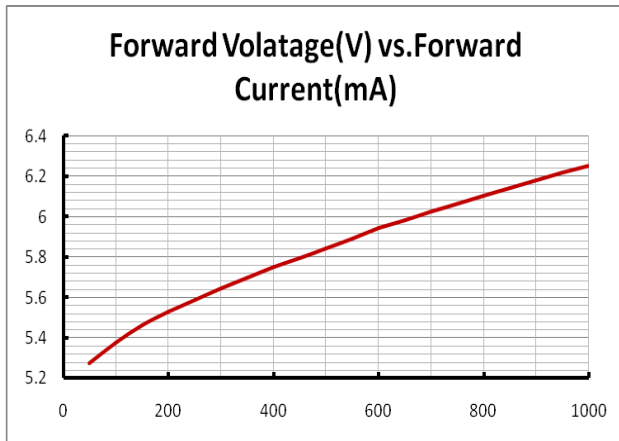
| 代码<br>Group Code | 范围<br>Range |
|------------------|-------------|
| B                | 60~100      |

备注 Notes :

- ◇ 亮度测试存在±6%的公差  
It maintains a tolerance of ±6% on luminous flux measurements.
- ◇ 显指测试存在±2的公差  
It maintains a tolerance of ±2 on CRI measurements

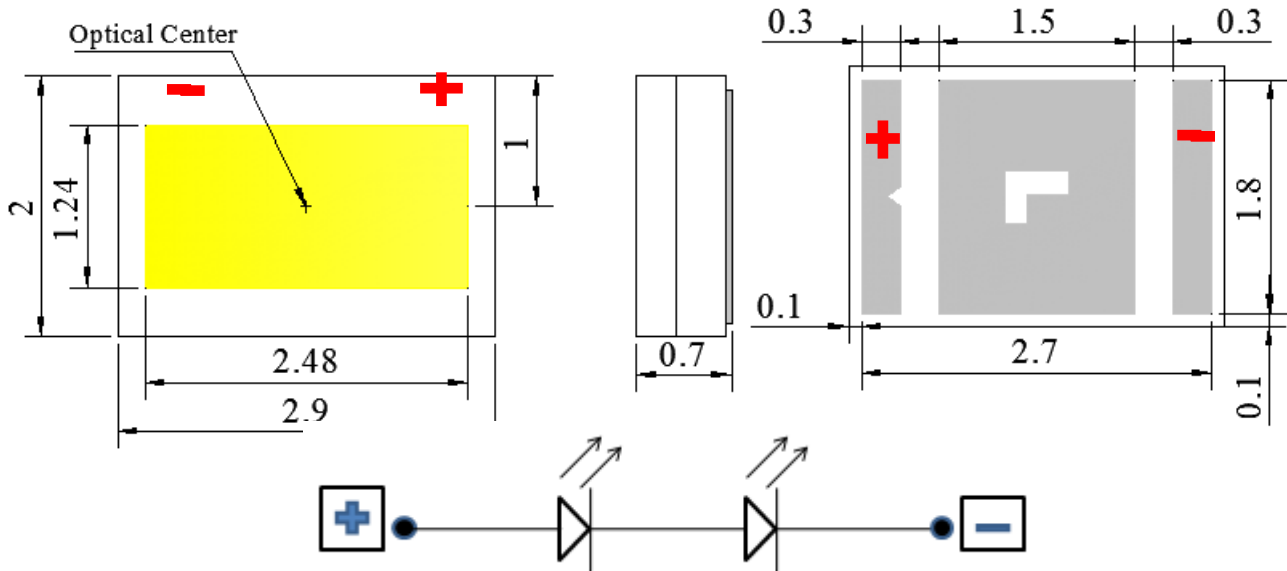
## 6、光电特性图

### The Photoelectric Characteristics Graph (Ta= 25 °C,6000K)

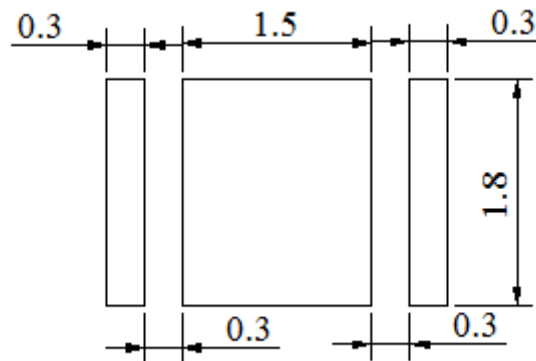


## 7. 产品及 PCB 尺寸 Product and PCB Pad Dimensions

### Product Dimensions:



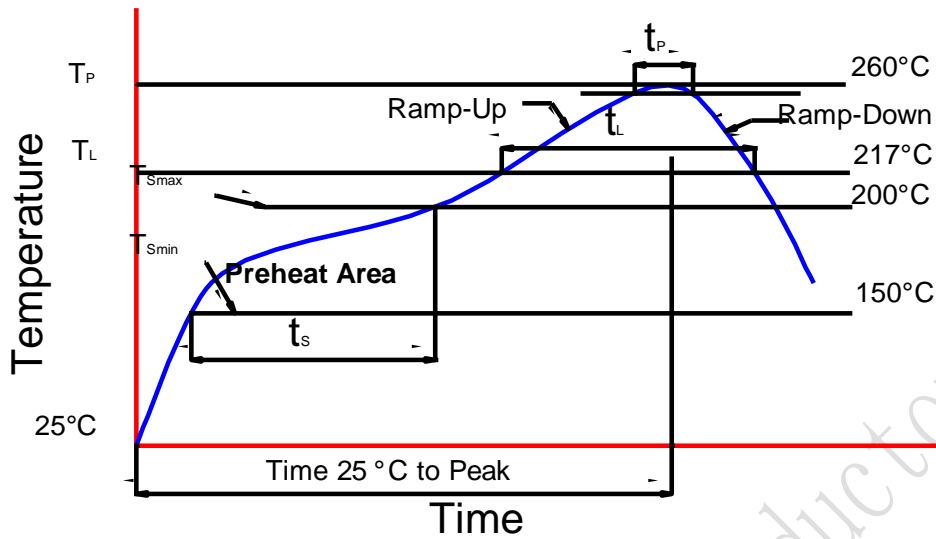
### PCB Pad Dimensions:



#### 备注 Notes:

- ◇ 所有尺寸均以 mm 为单位  
All dimensions are in millimeters
- ◇ 尺寸未按照公差±0.1mm 标记的，按照图纸标记  
Size is not marked in accordance with tolerance  $\pm 0.1\text{mm}$  and dimension tolerances in accordance with drawings

## 8、回流焊特性 Reflow Soldering Characteristics

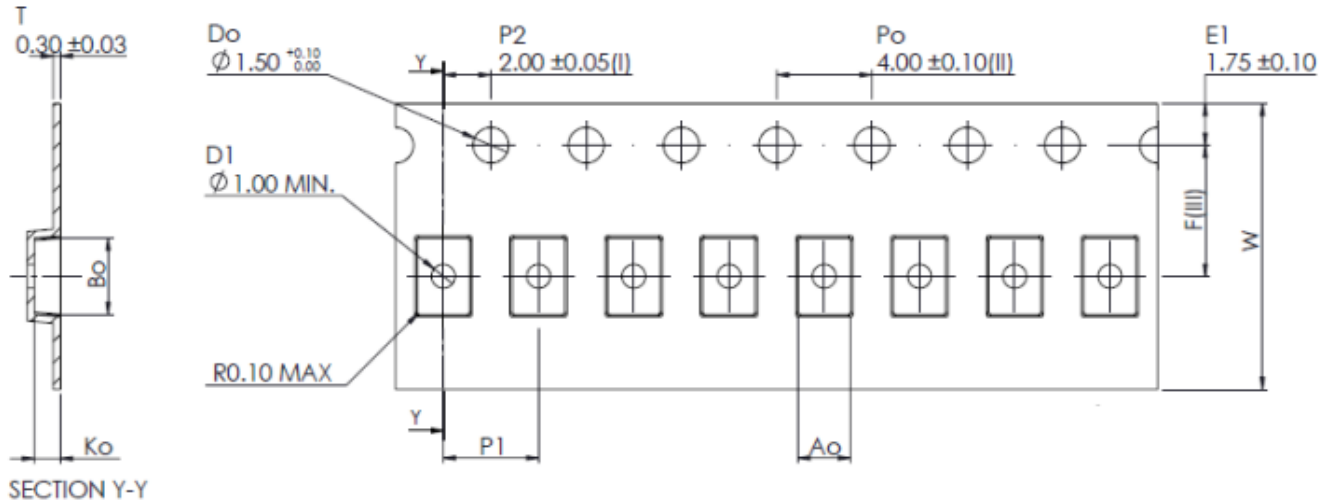


根据 EDEC-J-STD-020E 内容，参考以下内容。

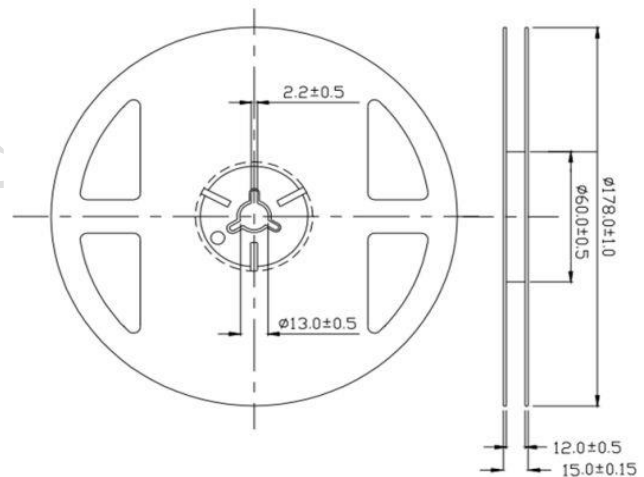
Compatible with the JEDEC-J-STD-020E, using the parameters listed below.

| 特制参数 Profile Feature  | 无铅焊料 Lead-Free Solder |
|---|-----------------------|
| 平均上升速率 (T <sub>Smax</sub> 至 T <sub>p</sub> )<br>Average Ramp-Up Rate (T <sub>Smax</sub> to T <sub>p</sub> ) | 3 °C/sec max.         |
| 预热: 温度最小值 (T <sub>Smin</sub> )<br>Preheat: Temperature Min (T <sub>Smin</sub> )                             | 150                   |
| 预热: 最高温度 (T <sub>Smax</sub> )<br>Preheat: Temperature Max (T <sub>Smax</sub> )                              | 200                   |
| 预热: 时间 (t <sub>Smin</sub> 到 t <sub>Smax</sub> )<br>Preheat: Time (t <sub>Smin</sub> to t <sub>Smax</sub> )  | 60-180 secs           |
| 回流温度 (T <sub>L</sub> )<br>Time Maintained Above: Temperature (T <sub>L</sub> )                              | 217°C                 |
| 回流时间 (t <sub>L</sub> )<br>Time Maintained Above: Time (t <sub>L</sub> )                                     | 60-150 secs           |
| 峰值/分类温度 (T <sub>p</sub> )<br>Peak/Classification Temperature (T <sub>p</sub> )                              | 255 ± 5°C             |
| 实际峰值温度 (t <sub>p</sub> ) 在 5°C 以内的时间<br>Time Within 5°C of Actual Peak Temperature (t <sub>p</sub> )        | 20~40 secs            |
| 降低速率<br>Ramp-Down Rate  | 4°C/sec max.          |

## 9、载带及卷轴 Reel Dimensions



|    |                    |
|----|--------------------|
| Ao | 2.20 +/- 0.05      |
| Bo | 3.20 +/- 0.05      |
| Ko | 1.10 +/- 0.05      |
| F  | 5.50 +/- 0.05      |
| P1 | 4.00 +/- 0.10      |
| W  | 12.00 +0.30/- 0.10 |



### 备注 Notes:

- ◇ 卷轴包装 3000pcs  
Reel:3000pcs.
- ◇ 卷轴包装方法符合 IJSC0806 (连续胶带上的电子元件包装)  
The tape packing method complies with IJSC0806(Packing of Electronic Components on Continuous Tapes).
- ◇ 当卷轴由于工作中断而重绕时, 载带上压力不应超过 10N, 否则 LED 可能会粘在盖带上  
When the tape is rewound due to work interruptions, no more than 10N should be applied to the embossed carrier tape.  
The LEDs may stick to the cover tape.

## 10、可靠性 Reliability

### a) 测试和结果 Tests and Results

| 测试项目<br>Test Item                              | 标准<br>Reference<br>Standard | 测试条件<br>Test Conditions   | 测试周期 Test<br>Duration |
|--|-----------------------------|---|-----------------------|
| 回流焊<br>Solderability(Reflow Soldering)         | JESD22-B102                 | Tsld=255±5°C,5sec,Lead-free Solder<br>(Sn-3.0Ag-0.5Cu)          | 3 times               |
| 高低温循环<br>Temperature Cycle                     | JESD22-A105                 | I <sub>F</sub> =700mA , -40°C(30min)~85°C(30min)                | 200cycles             |
| 冷热冲击<br>Thermal Shock                          | JESD22-A106                 | -40°C(15min)~125°C(15min)                                       | 200cycles             |
| 低温存储<br>Low Temperature Storage                | JESD22-A119                 | T <sub>A</sub> =-40°C   | 1000H                 |
| 高温老化<br>High Temperature Operating<br>Life     | JESD22-A108                 | T <sub>j</sub> =150°C, I <sub>F</sub> =700mA                    | 1000H                 |
| 高温高湿<br>Temperature Humidity<br>Operating Life | JESD22- A101                | T <sub>a</sub> =85°C, RH=85%, I <sub>F</sub> =700mA             | 1000H                 |
| 震动<br>Vibration                                | JESD22-B103                 | 10m/s <sup>2</sup> ,100~20000~100Hz,4cycles,4min,<br>each X,Y,Z | 3 times               |

## 11、注意事项 Cautions

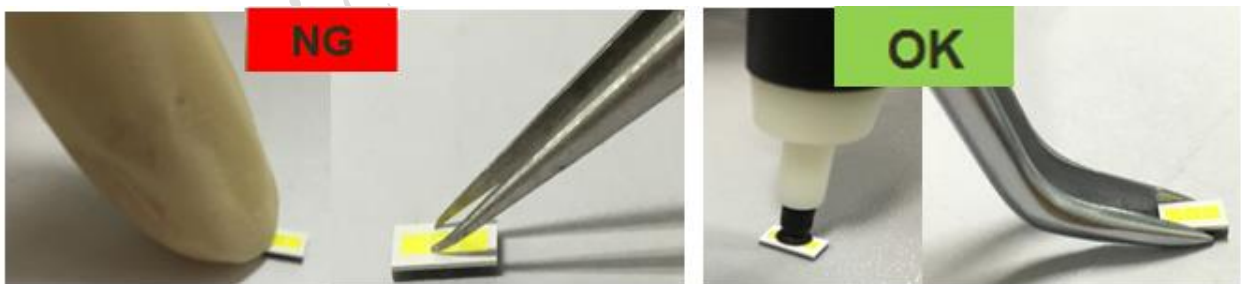
### a) 存储 Storage

- 不要将芯片放在潮湿的地方，存放温度在 5°C~30°C之间，相对湿度在 30%以下。  
Do not place the chips in damp places, Storage temperature between 5 °C and 30 °C, Relative humidity under 30%.
- 开包后建议在 24 小时内过完回流焊，车间条件≤30°C/60%RH。  
After opening the package, it is recommended to finish the reflow within 24 hours. The workshop conditions are ≤30°C/60%RH
- 如果受潮，需将贴片卷盘放入 60°C烤箱烘烤 24 小时；打开后，LED 灯可重新密封在原始真空袋中。  
If it is wet, the patch reel should be baked in a 60 ° C oven for 24 hours; after opening, the LED light can be resealed in the original vacuum bag.
- 不要接触任何未知的液体，特别是丙酮。  
Don't touch any unknown liquid, In particular, acetone.
- 防止静电死亡，手动操作需要戴橡胶手套并佩戴静电环。  
Prevent electrostatic killed, Manual operation is required to wear rubber gloves and wear electrostatic ring.

### b) 清洗 Cleaning

- 通常，LED 不建议对部件进行湿式清洁处理，因为封装不是密封的。  
In general, LED does not recommend a wet cleaning process for component as the package is not hermetically sealed.
- 由于采用开放式设计，所有类型的清洁液都可能渗透到封装中，导致 LED 退化或完全失效。  
Due to the open design, all kind of cleaning liquids can infiltrate the package and cause a degradation or a complete failure of the LED.

### c) 操作注意 Handling Precautions



- 在处理过程中，还应注意确保组件顶面没有压力。  
During the handling, care should be taken as well to ensure no pressure on the top surface of component.
- 应避免使用尖锐物体（例如镊子，指甲等），以防止对硅树脂造成压力，因为这会导致部件损坏。  
All types of sharp objects(e.g. forceps, fingernail, etc) should be avoided in order to prevent stress to the silicone, since this can lead to damage of the component.

## 12、文件履历表 Document Resume

| 序号 | 变更日期       | 变更人 | 版本  | 变更内容   |
|----|------------|-----|-----|--|
| 01 | 2020.11.23 | 袁丁  | Y00 | 1. 未量产，重新定义 Y00 研发版本；<br>2. 新增文件编号；<br>3. 新增 PCB 建议尺寸；<br>4. 满卷灯珠颗粒数由 2000pcs 变更为 3000pcs； |
| 02 | 2020.12.04 | 袁丁  | A01 | 1. 已量产，重新定义 A01 量产版本；<br>2. 无新增其他内容；   |
| 03 | 2022.04.22 | 袁丁  | A02 | 1. 修正灯珠背部缺口标识；   |
|    |            |     |     |  |
|    |            |     |     |  |
|    |            |     |     |  |
|    |            |     |     |  |
|    |            |     |     |  |
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|    |            |     |     |  |