



# 深圳市中顺半导体照明有限公司

—ShenzhenZhongshunSemiconductorLightingCo.,Ltd.—

## Specification

## 规格书

Customer Name: \_\_\_\_\_

客户名称

Customer P/N: \_\_\_\_\_

客户品号

Factory Model: \_\_\_\_\_ Z-L3528RGB01P3

公司型号

Sending Date: \_\_\_\_\_

呈送日期

☐ R&D 研发规格书

☒ Sample 样品规格书

☐ Product 产品规格书

Customer Approval

客户审核

ZS Approval

中顺审核

Approval

核准

Audit

确认

Confirmation

制作

Approval

核准

Audit

确认

Confirmation

制作

黄山虎



☐ Qualified

授受

☐ Disqualified

不接受

Date:

日期: 2022.12.09

Address: Meixun digital technology factory district, 19 Jinxiu Middle Road, Pingshan district, Shenzhen, China.

地址: 广东省深圳市坪山区锦绣中路 19 号美讯科技园

Tel/联系电话: 400-088-2835 Web/网址: [www.zsled.com.cn](http://www.zsled.com.cn)





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## Version History 修订履历

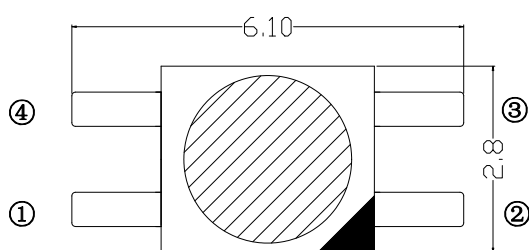
[illegible]

**Features (特征)**

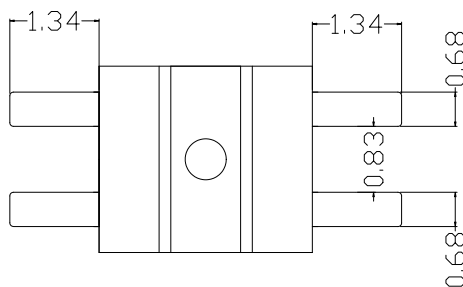
1. PLCC-6 package (PLCC-6 封装)
2. Top view RGB LED (平面式全彩 LED)
3. Wide viewing angle (大角度发光)
4. RoHS compliant (符合 RoHS 标准)
5. Package:1000pcs/reel. (包装每卷 1000PCS)

**Application (应用)**

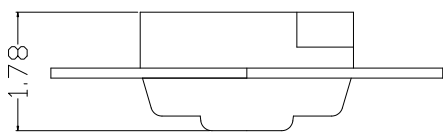
1. keyboard Backlight (键盘背光)
2. Optical indicator (光学指示)
3. Switch Lights (开关照明)
4. Decorative and Entertainment Lighting (装饰与娱乐照明)

**Package Dimension (封装尺寸)**

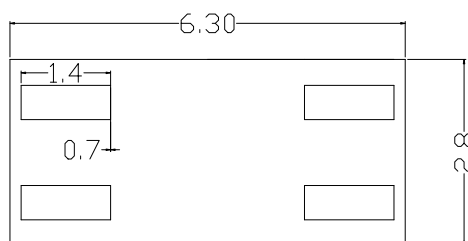
1-1 Top view 正视图



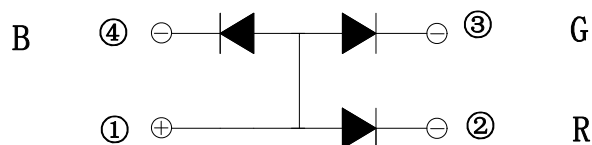
1-3 Bottom view 背视图



1-2 Side view 侧视图



1-4 Soldering patterns 推荐焊盘



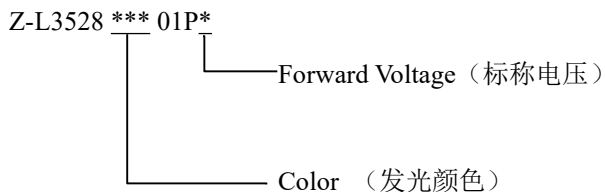
1-5 Polarity 极性

**Notes (备注) :**

1. All dimensions are in millimeters (所有标注尺寸单位为毫米)
2. Tolerances are  $\pm 0.15\text{mm}$  unless otherwise noted (除特别标注外, 允许公差为  $\pm 0.15\text{mm}$ )



## Product Number Explanation (产品编码说明)



## Table of Specifications (规格表)

| NO. | P/N | Model          | Color | Rendering Wavelength | Min.Light intensity |
|-----|-----|----------------|-------|----------------------|---------------------|
|     |     | Z-L3528RGB01P3 | R     | 617.5-625            | 140                 |
|     |     |                | G     | 520-527.5            | 355                 |
|     |     |                | B     | 464.5-472            | 71                  |

Absolute maximum ratings @ T<sub>a</sub>=25℃ (绝对最大额定值)

|                                | Symbol<br>(符号)   | Absolute Maximum Rating<br>(数值) | Unit<br>(单位) |
|--------------------------------|------------------|---------------------------------|--------------|
| Forward Current (正向电流)         | I <sub>F</sub>   | R 50                            | mA           |
|                                |                  | G 30                            |              |
|                                |                  | B 30                            |              |
| Pulse Forward Current (脉冲正向电流) | I <sub>FP</sub>  | 100                             | mA           |
| Reverse Voltage (反向电压)         | V <sub>R</sub>   | R 10                            | V            |
|                                |                  | G / B 5                         |              |
| Power Dissipation (功率消耗)       | P <sub>D</sub>   | R 115                           | mW           |
|                                |                  | G 93                            |              |
|                                |                  | B 93                            |              |
| Operating Temperature (工作温度)   | T <sub>opr</sub> | -40~+85                         | ℃            |
| Storage Temperature (储存温度)     | T <sub>stg</sub> | -40~+90                         | ℃            |
| Junction Temperature (结温)      | T <sub>J</sub>   | 115                             | ℃            |
| Thermal Resistance (热阻)        | R <sub>th</sub>  | 60                              | ℃/W          |
| Electrostatic Discharge (静电)   | ESD              | 2000 (HBM)                      | V            |

**Electrical-Optical characteristics @T<sub>a</sub>=25℃** (电性与光学特性)

| Item<br>(项目)           | Symbol<br>(符号)  | Color<br>(颜色) | Test Condition<br>(测试条件) | Min<br>(最小) | Typ<br>(平均) | Max<br>(最大) | Unit<br>(单位) |
|------------------------|-----------------|---------------|--------------------------|-------------|-------------|-------------|--------------|
| Forward voltage (正向电压) | VF              | R             | IF=5mA                   | 1.5         | -           | 2.3         | V            |
|                        |                 | G             | IF=5mA                   | 2.4         | -           | 3.1         | V            |
|                        |                 | B             | IF=5mA                   | 2.4         | -           | 3.1         | V            |
| Light intensity (亮度)   | $\phi_v$        | R             | IF=5mA                   | 140         | -           | 335         | mcd          |
|                        |                 | G             | IF=5mA                   | 355         | -           | 900         | mcd          |
|                        |                 | B             | IF=5mA                   | 70          | -           | 180         | mcd          |
| Wavelength (波长)        | WLD             | R             | IF=5mA                   | 617.5       | -           | 625         | nm           |
|                        |                 | G             | IF=5mA                   | 520         | -           | 527.5       | nm           |
|                        |                 | B             | IF=5mA                   | 464.5       | -           | 472         | nm           |
| Reverse Current (反向电压) | IR              |               | VR=5V                    | -           | -           | 1           | $\mu A$      |
| View Angle (角度)        | $2\theta_{1/2}$ |               | IF=5: 5: 5mA             | -           | 120         | -           | deg          |

Notes (备注):

1. Tolerance of Forward voltage (VF) :  $\pm 0.1V$ 正向电压允许公差:  $\pm 0.1V$ 2. Tolerance of Light intensity ( $\phi_v$ ) :  $\pm 3\%$ 亮度允许公差:  $\pm 3\%$ 3. Tolerance of Wavelength (WLD) :  $\pm 1nm$ 波长允许公差:  $\pm 1nm$ **Luminous Intensity Rank @T<sub>a</sub>=25℃** (亮度等级)

| Model          | Color | Min. | Max. | Unit | Condition |
|----------------|-------|------|------|------|-----------|
| S-L3528RGB01P3 | R     | 140  | 250  | mcd  | IF=5mA    |
|                |       | 250  | 335  |      |           |
|                | G     | 355  | 600  |      |           |
|                |       | 600  | 900  |      |           |
|                | B     | 70   | 120  |      |           |
|                |       | 120  | 180  |      |           |

**Forward Voltage Rank @T<sub>a</sub>=25℃** (电压等级)

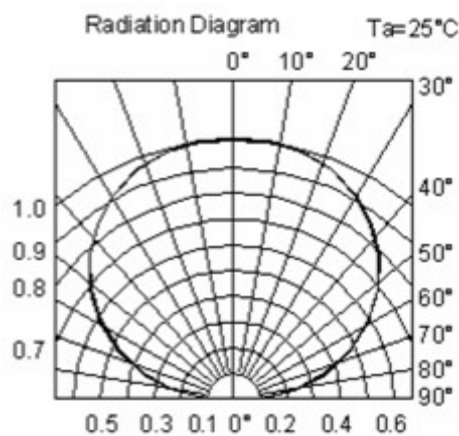
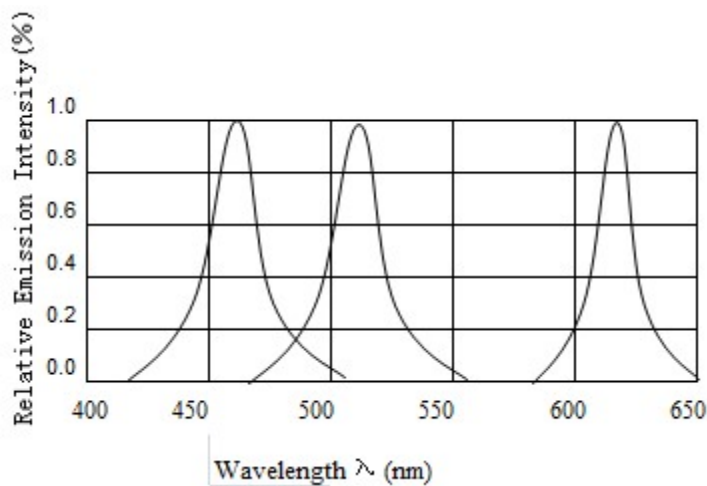
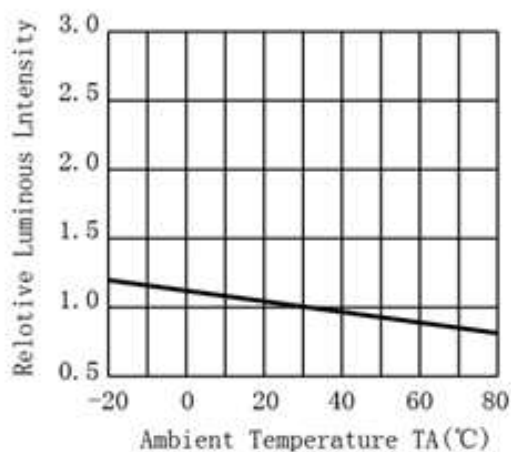
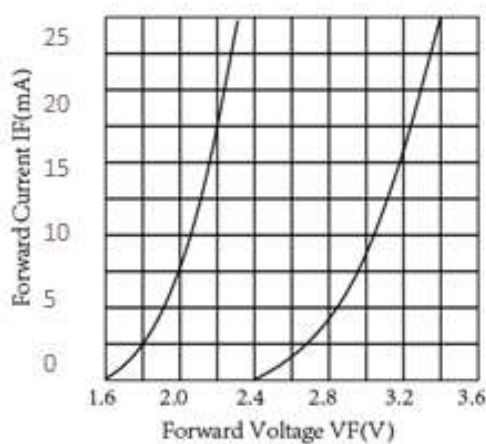
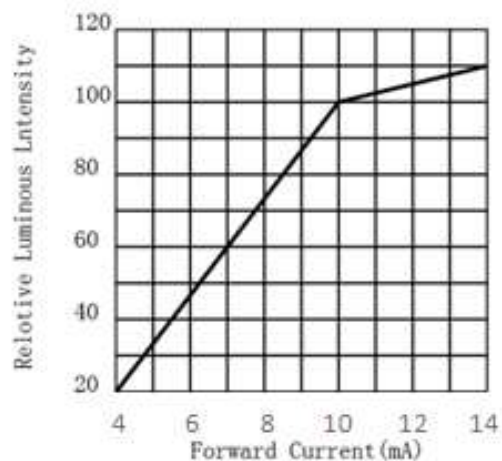
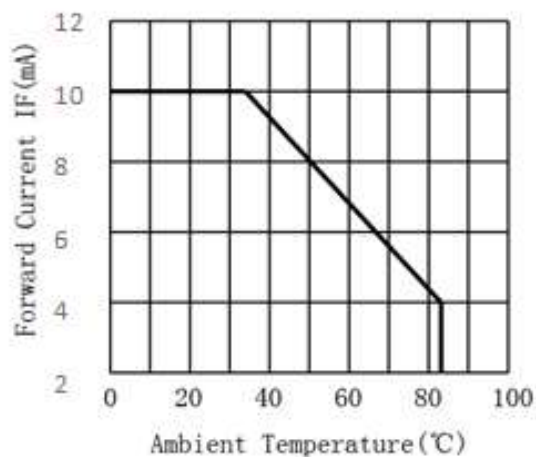
| NO. | Color | Min. | Max. | Unit | Condition |
|-----|-------|------|------|------|-----------|
| 1   | R     | 1.8  | 2.3  | V    | IF=5mA    |
| 2   | G     | 2.6  | 3.1  |      |           |
| 3   | B     | 2.6  | 3.1  |      |           |

Wavelength Rank @T<sub>a</sub>=25℃ (波长等级)

| NO. | Color | Min.  | Max.  | Unit | Condition           |
|-----|-------|-------|-------|------|---------------------|
| 1   | R     | 617.5 | 620   | V    | I <sub>F</sub> =5mA |
| 2   |       | 620   | 622.5 |      |                     |
| 3   |       | 622.5 | 625   |      |                     |
| 4   | G     | 520   | 522.5 |      | I <sub>F</sub> =5mA |
| 5   |       | 522.5 | 525   |      |                     |
| 6   |       | 525   | 527.5 |      |                     |
| 7   | B     | 465   | 467.5 |      | I <sub>F</sub> =5mA |
| 8   |       | 467.5 | 470   |      |                     |
| 9   |       | 470   | 472.5 |      |                     |

Typical optical characteristics curves @ $T_a=25^{\circ}\text{C}$  (典型光学特性曲线)

Ambient Temperature VS. Forward Current





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

| Test Item<br>(项目)                                       | Ref.Standard<br>(参考标准) | Test Conditions (测试条件)                      | Time<br>(时间) | Quantity (pcs)<br>(数量) |
|---------------------------------------------------------|------------------------|---------------------------------------------|--------------|------------------------|
| High Temperature Storage<br>(高温储存)                      | JESD22-A103            | Temp:100°C±5°C                              | 1000 hrs     | 22                     |
| Low Temperature Storage<br>(低温储存)                       | JESD22-A119            | Temp:-40°C±5°C                              | 1000 hrs     | 22                     |
| Thermal Shock<br>(冷热冲击)                                 | JESD22-A104            | 100°C±5°C 30min<br>↓↑15S<br>-40°C±5°C 30min | 200 cycle    | 22                     |
| Reflow (回流焊)                                            | JESD22-B106            | Temp:max260°C<br>Time:10sec 8min/cycle      | 3 cycle      | 22                     |
| Life Test (常温老化)                                        | JESD22-A108            | Ta=25°C±5°C<br>IF=10: 10: 10mA              | 1000 hrs     | 22                     |
| High Temperature Life Test<br>(高温老化)                    | JESD22-A108            | Ta=85°C±5°C<br>IF=10: 10: 10mA              | 1000 hrs     | 22                     |
| High Temperature<br>High Humidity Life Test<br>(高温高湿老化) | JESD22-A101            | 85°C±5°C/85%RH<br>IF=10: 10: 10mA           | 1000 hrs     | 22                     |

## Criteria For Judging Damage (失效判定标准)

| Item<br>(项目)             | Symbol<br>(符号) | Test Conditions<br>(测试条件) | Criteria for Judgement (判定标准) |                |
|--------------------------|----------------|---------------------------|-------------------------------|----------------|
|                          |                |                           | Min. (最小)                     | Max. (最大)      |
| Forward Voltage (正向电压)   | VF             | IF=10: 10: 10mA           | —                             | (U.S.L*) × 1.1 |
| Luminous Intensity (光通量) | ΦV             | IF=10: 10: 10mA           | (L.S.L*) × 0.7                | —              |

Note (备注):

U.S.L.:Upper Standard Level (规格上限)

L.S.L.:Lower Standard Level (规格下限)

## Label Explanation (标签说明)

|                |          |        |         |
|----------------|----------|--------|---------|
| P/N:*****      |          |        |         |
| Model: *****   |          |        |         |
|                | IV (mcd) | WD(nm) | VF(V)   |
| R:             | ***      | **_**  | **_**   |
| G:             | ***      | **_**  | **_**   |
| B:             | ***      | **_**  | **_**   |
| x/y : **       |          |        |         |
| QTY: **K EA    |          |        |         |
| Lot No.: ***** |          |        | BIN: ** |



P/N:Part number (产品料号)

Model:Product model (产品型号)

IV:Light intensity rank (亮度)

WLD:Wavelength BIN (波长)

VF:Forward Voltage (电压)

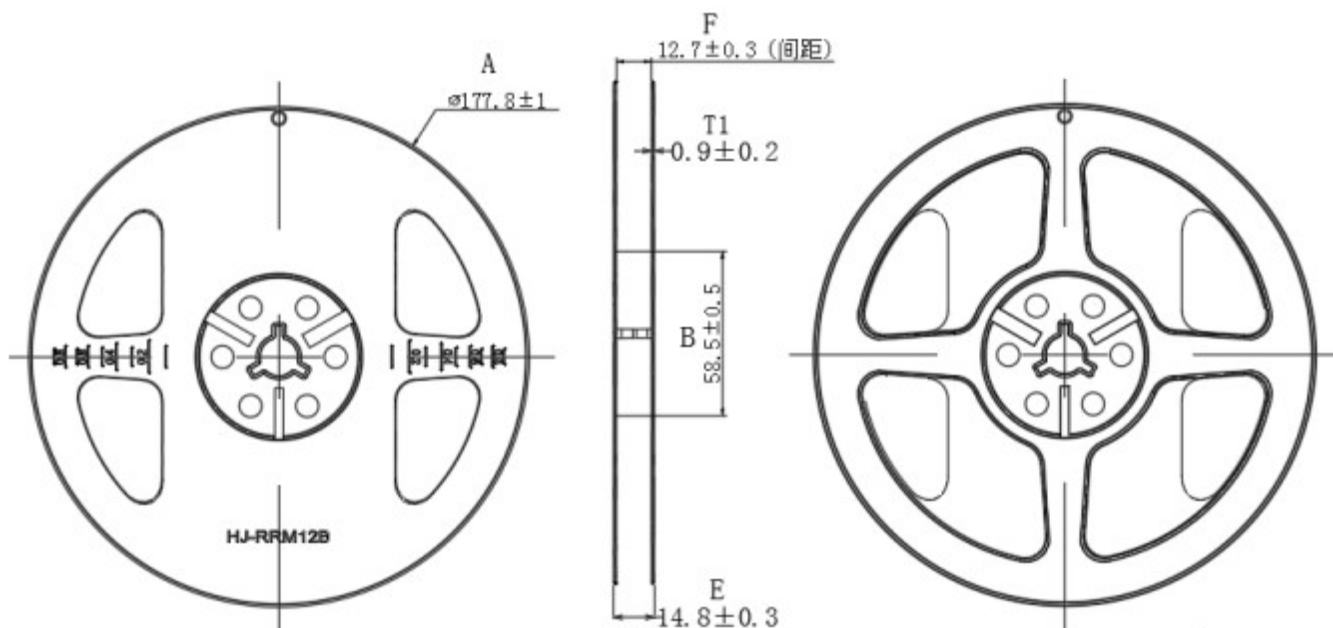
x/y: Color

QTY:Number of packages (数量)

Date: Production date (生产日期)

Lot NO.:Lot number (批号)

## Reel Dimensions (卷盘尺寸)

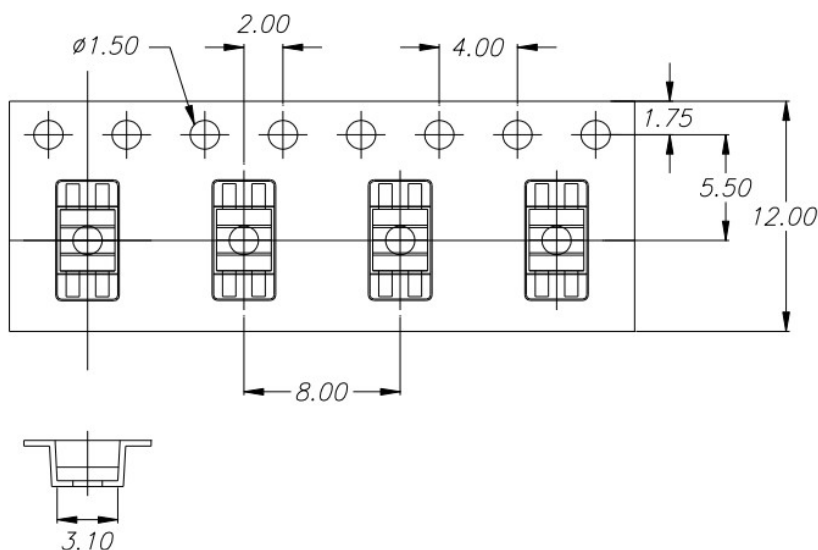


Note (备注):

1. Tolerance unless mentioned is  $\pm 0.3\text{mm}$ ; unit=mm

未标注公差为 $\pm 0.3\text{mm}$ ，尺寸单位：mm

### Carrier Tape Dimensions (载带尺寸)

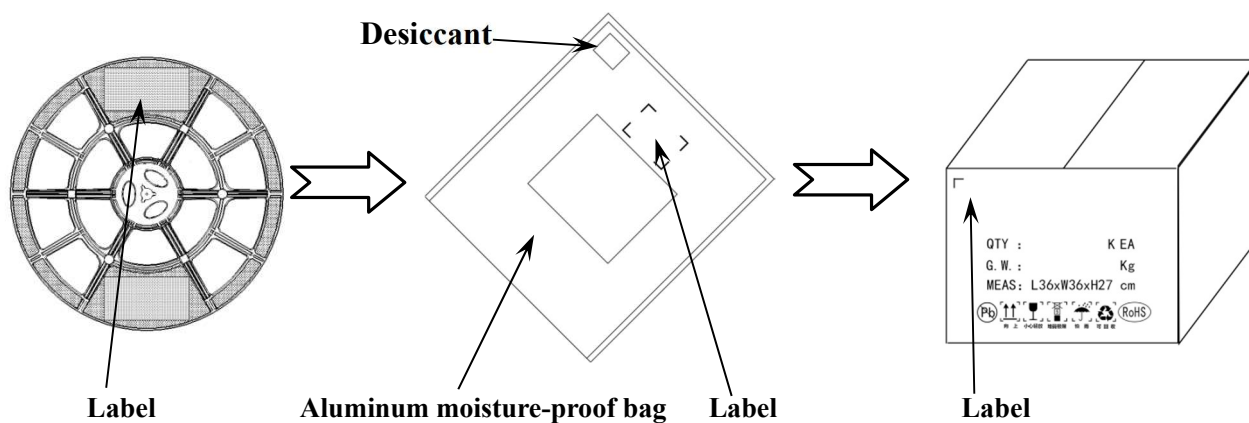


Note (备注) :

1. Tolerance unless mentioned is  $\pm 0.1\text{mm}$ ; unit=mm.

允许公差为  $\pm 0.1\text{mm}$ ，单位 mm

### Moisture Resistant Packing Process (防潮包装过程)



Note (备注) :

1. The cathode is oriented towards the tape sprocket hole in accordance with ANSI/ELARS-481 specifications  
 负极朝向定位孔，符合 ANSI/ELARS-481 规格。

### Precautions for use Over-current-proof (通电使用时的注意事项)

Customer must apply resistors for protection otherwise slight voltage shift will cause big current change (burn out will happen) .

客户必须使用电阻进行保护，否则轻微的电压变化会引起大电流变化（会发生烧坏）。

### Storage (存储)

1. Do not open moisture proof bag before the products are ready to use.

在使用之前禁止打开防潮包装。

2. Storage conditions prior to uncapping : 5 - 30 °C , maximum relative humidity of 60%.

开封前的贮藏条件：5-30℃，最大相对湿度为 60%。

3. After opening the package, The LEDs should be soldered within 4 hours after opening the package.

打开包装之后,应在 4hrs 内焊接完毕。

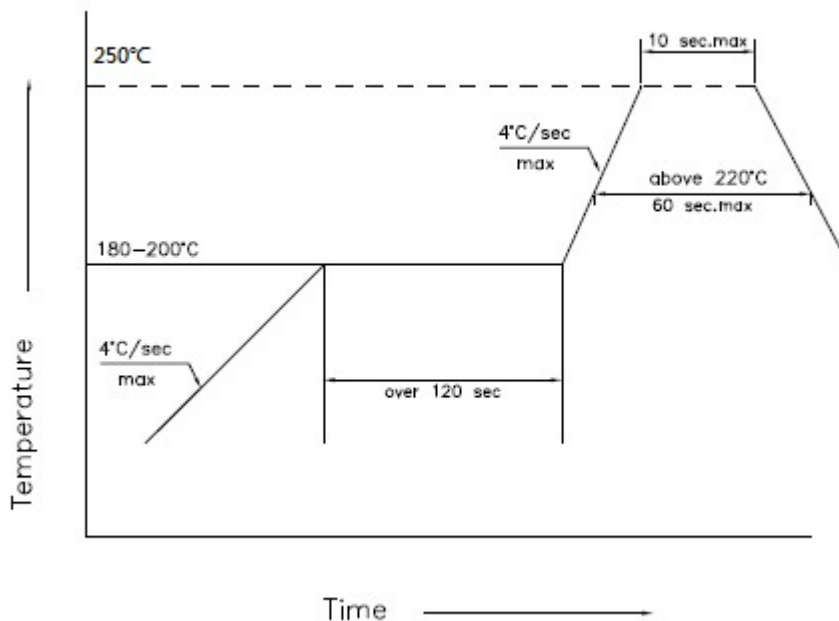
### Soldering Condition (焊接条件)

1. Number of reflow process shall be less than 2 times and cooling process to normal temperature is required between first and Second soldering process.

本产品最多只可回流焊两次,且在首次回焊后须冷却至室温之后方可进行第二次回流焊。

2. Recommended soldering conditions:

推荐焊接条件:



3. LED operating environment and sulfur element composition cannot be over 25 PPM in the LED mating usage material.

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 25PPM。

### Soldering Iron (烙铁焊接)

1. When hand soldering, keep the temperature of iron below less 250℃ less than 10 seconds.

当手工焊接时，烙铁的温度必须小于 250℃，时间不可超过 10 秒。

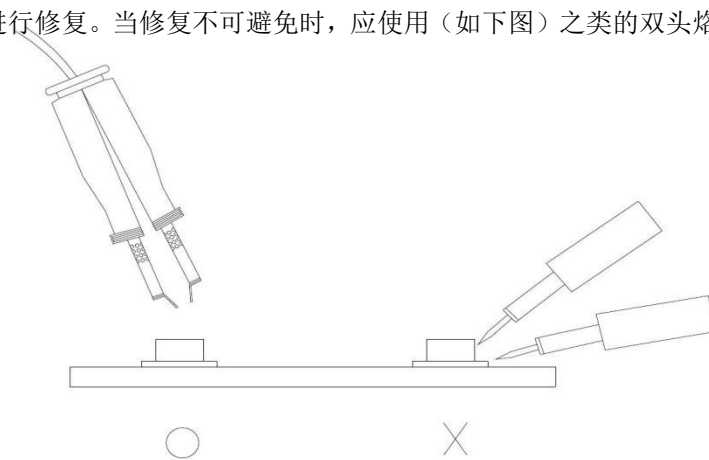
2. The hand solder should be done only one time.

手工焊接只可焊接一次。

### Repairing (返修)

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

不应在 LED 焊接后进行修复。当修复不可避免时，应使用（如下图）之类的双头烙铁，应事先确认此种修补方法会不会损坏 LED 本身。



### Cautions: (使用注意事项)

1. Please check if there is air leak before opening the package, if so, please return the goods back to take drying process for later using.

在开包装之前，请先检查包装袋有无漏气，如果有漏气现象，请退回我司重新烘烤除湿包装后再使用

2. Products can be used within 6 months after packaging, after that, they must be:

抽真空包装材料未超过 6 个月可正常使用，包装袋开启后,产品必须:

A.Soldered within 4 hrs;

A.在 4hrs 内焊接完毕;

B.Used in the condition: 30℃ within and 60%RH below.

B.使用条件需: 温度:30℃ 以内, 湿度:60%RH 以下。

3. The vacuum packaging material is not used for more than 6 months after being packaged unless opening the package and take drying our process in 70℃/12H.

抽真空包装材料超过 6 个月未使用，再使用时需重新拆铝箔袋取出烘烤 70℃/12H 除湿后才可使用。

