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DATA SHEET

PART NO.: LC191WZDT-GN-D-5A

REV: A/0

CUSTOMER'S APPROVAL: \_\_\_\_\_

DCC: \_\_\_\_\_

DRAWING NO.: DS-51-21-074

DATE: 2021-11-16

PAGE 1

1.6×0.8×0.6 mm SMD LED

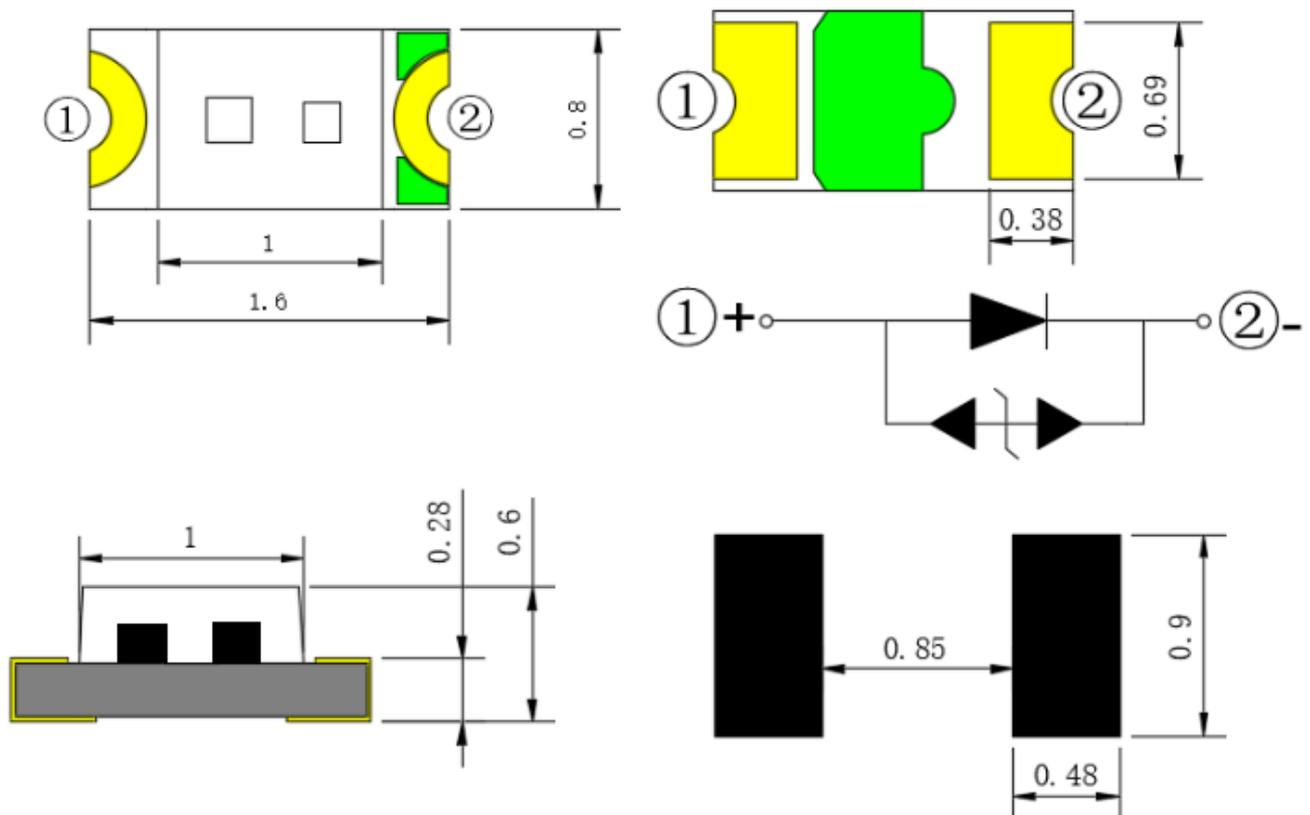
LC191WZDT-GN-D-5A

REV:A/0

### • Features

- .Appearance size(L/W/H) : 1.6×0.8×0.6mm
- .Colour : White light
- .colloid : Yellow flat colloid
- .EIA standard packaging
- .Environmental protection products, in line with ROHS requirements
- .Suitable for automatic placement machine
- .Suitable for infrared reflow soldering process

### • Package Dimensions



#### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.15$ mm unless otherwise specified.
3. The colors of the lines are specified in the specification unless otherwise specified.

1.6×0.8×0.6 mm SMD LED

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• **Absolute Maximum Ratings At Ta=25°C**

| Parameter                    | Symbol | Rating                                                            | Unit |
|------------------------------|--------|-------------------------------------------------------------------|------|
| Power Dissipation            | Pd     | 80                                                                | mW   |
| Maximum pulse current        | IFP    | 90                                                                | mA   |
| DC Forward Current           | IF     | 30                                                                | mA   |
| Reverse Voltage              | VR     | 5                                                                 | V    |
| Electrostatic Discharge(HBM) | ESD    | 10000                                                             | V    |
| Operating Temperature Range  | Topr   | -30°C ~ + 85°C                                                    |      |
| Storage Temperature Range    | Tstg   | -40°C ~ + 90°C                                                    |      |
| Soldering Condition          | Tsol   | Reflow soldering : 255°C for 10s<br>Manual welding : 300°C for 3s |      |

• **Electrical and optical characteristics(Ta=25°C)**

| Parameter                  | Symbol | Min.  | Typ. | Max.  | Unit | Test    |
|----------------------------|--------|-------|------|-------|------|---------|
| Luminous Flux              | IV     | 120   | 190  | 230   | mcd  | IF =5mA |
| Forward Voltage            | VF     | 2.6   | 2.8  | 2.9   | V    | IF =5mA |
| Relative Color Temperature | Tc     | 10000 | --   | 30000 | K    | IF =5mA |
| Reverse Current            | IR     | ---   | ---  | 10    | uA   | VR=5V   |
| Viewing Angle              | 2θ1/2  | 120   |      |       | deg  | ---     |

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●Bin Code List

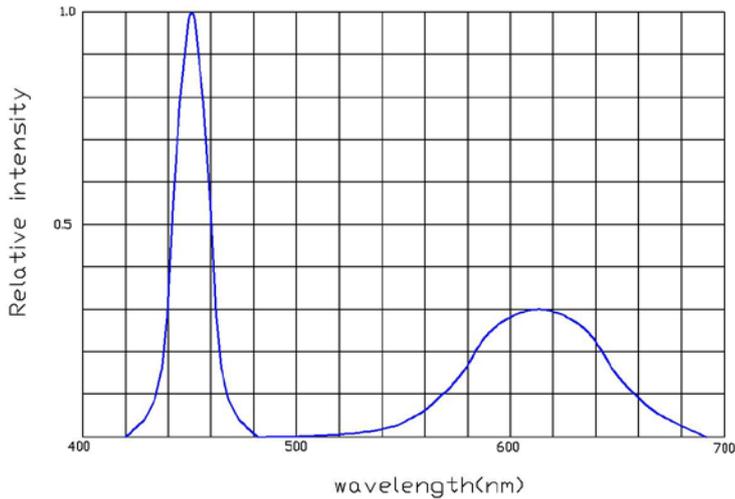
| classification    | Symbol | min   | max   | Company | Conditions |
|-------------------|--------|-------|-------|---------|------------|
| Luminous Flux     | IV     | 120   | 160   | mcd     | IF =5mA    |
|                   |        | 160   | 190   |         |            |
|                   |        | 190   | 230   |         |            |
| Voltage grading   | VF     | 2.6   | 2.7   | V       | IF =5mA    |
|                   |        | 2.7   | 2.8   |         |            |
|                   |        | 2.8   | 2.9   |         |            |
| Color temperature | Tc     | 10000 | 12000 | K       | IF =5mA    |
|                   |        | 12000 | 15000 |         |            |
|                   |        | 15000 | 20000 |         |            |
|                   |        | 20000 | 30000 |         |            |

● Electrical tolerance

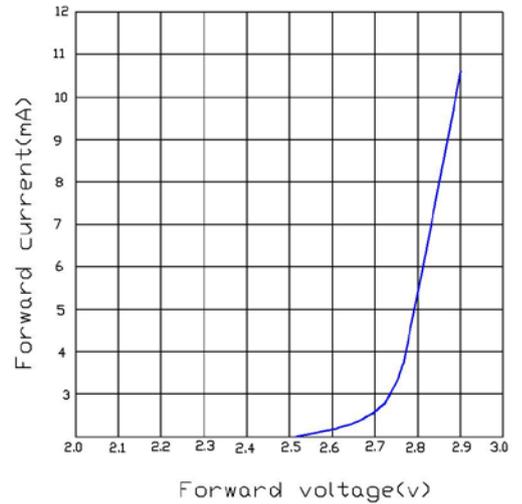
| Parameter             | Symbol | Company | Error  |
|-----------------------|--------|---------|--------|
| Radiant flux          | IV     | mcd     | ± 20%  |
| Wavelength            | Tc     | K       | ±500K  |
| Voltage               | VF     | V       | ± 0.1V |
| Chromatic coordinates | X/Y    | /       | ±0.01  |

•Typical electro-optical characteristics curves

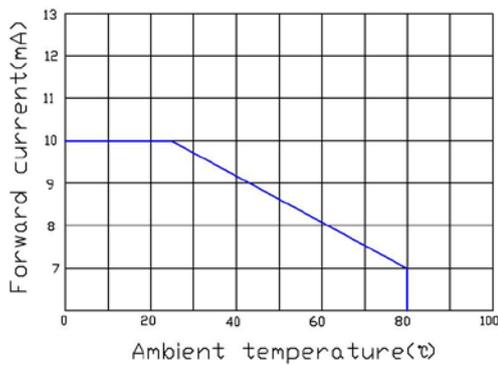
Relative intensity VS wavelength



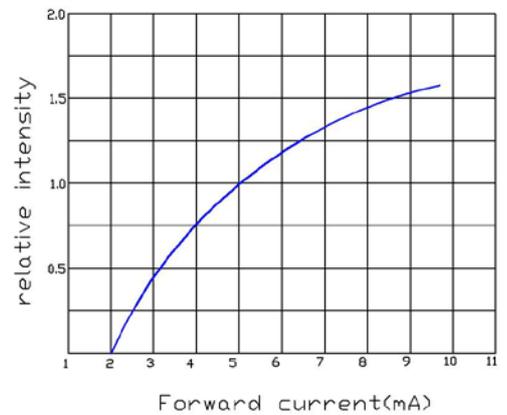
Voltage current relationship



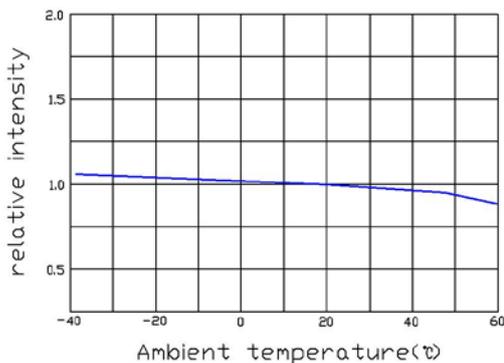
Current and ambient temperature



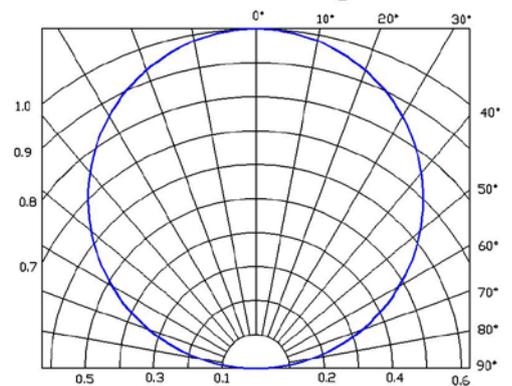
Relative light intensity vs current



Relative light intensity vs ambient temperature



Radiation angle



# 1.6×0.8×0.6 mm SMD LED

## LC191WZDT-GN-D-5A

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### ●Reliability experiment

| Test items               | Test conditions                                                                                                                                         | Number    | Standard                  | Failure criteria | Number (PCS) |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------|------------------|--------------|
| Damp proof grade         | 1. Maximum reflow temperature = 260 °C, 10 seconds, reflow twice<br>2. Storage conditions before reflow soldering: 30 °C, relative humidity = 70%, 168h | -         | JEITA ED-4701<br>300.301  | # 1              | 0/22         |
| Welding reliability      | The maximum reflow temperature is 245 ± 5 °C for 5 seconds                                                                                              | -         | JEITA ED-4701<br>303 303A | # 2              | 0/22         |
| Thermal cycling          | -40 °C for 30 minutes ~ 25 °C for 5 minutes ~ 100 °C for 30 minutes ~ 25 °C for 5 minutes                                                               | 300cycles | JESD22-A104               | # 1              | 0/22         |
| Thermal Shock            | -35 °C 15 min conversion time<br>3 min 85 °C 15 min                                                                                                     | 300cycles | JESD22-A106               | # 1              | 0/22         |
| High temperature storage | Ta=100°C                                                                                                                                                | 1000H     | JESD22-A103               | # 1              | 0/22         |
| Low temperature storage  | Ta=-40°C                                                                                                                                                | 1000H     | JESD22-A119               | # 1              | 0/22         |
| Room temperature aging   | Ta=25°C<br>IF=5mA                                                                                                                                       | 1000H     | JESD22-A108               | # 1              | 0/22         |

### Failure Criteria

| Standard # | project             | Test conditions | Failure criteria                    |
|------------|---------------------|-----------------|-------------------------------------|
| # 1        | Forward voltage(VF) | IF=5mA          | >U.S.L*1.1                          |
|            | Radiant flux        | IF=5mA          | <L.S.L*0.7                          |
|            | Reverse current     | VR=5V           | >U.S.L*2.0                          |
| # 2        | Welding reliability | /               | Solder paste covering less than 95% |

★ U.S.L : Upper specification limit

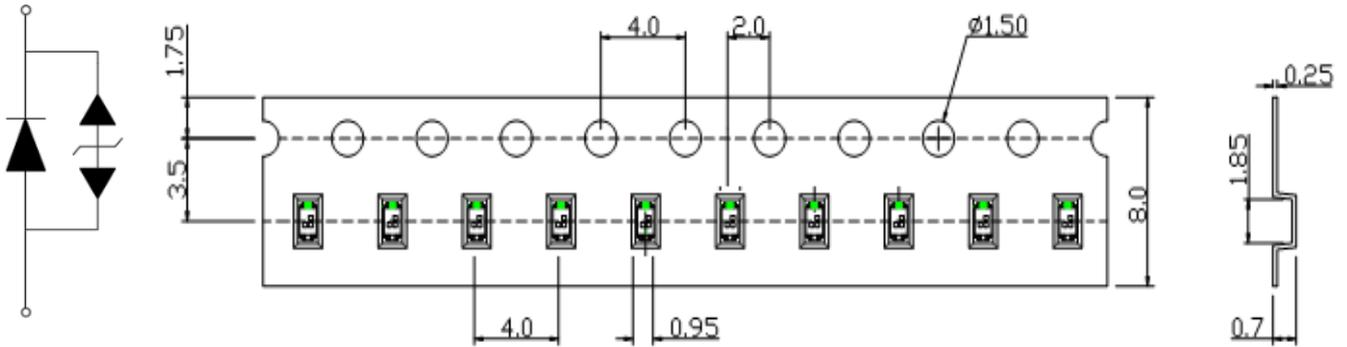
★ L.S.L : Lower specification limit

1.6×0.8×0.6 mm SMD LED

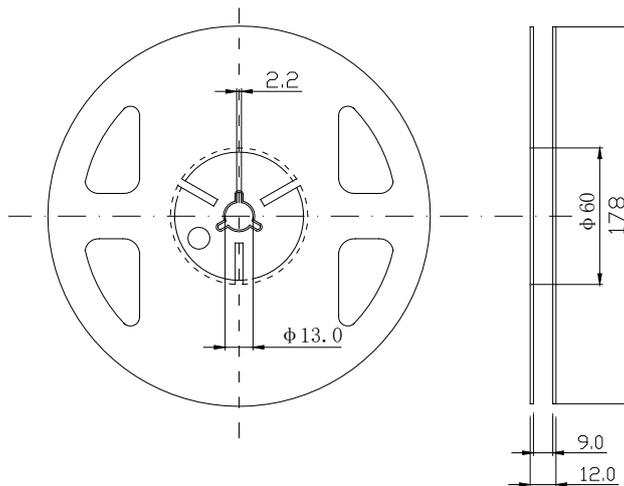
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● Packaging

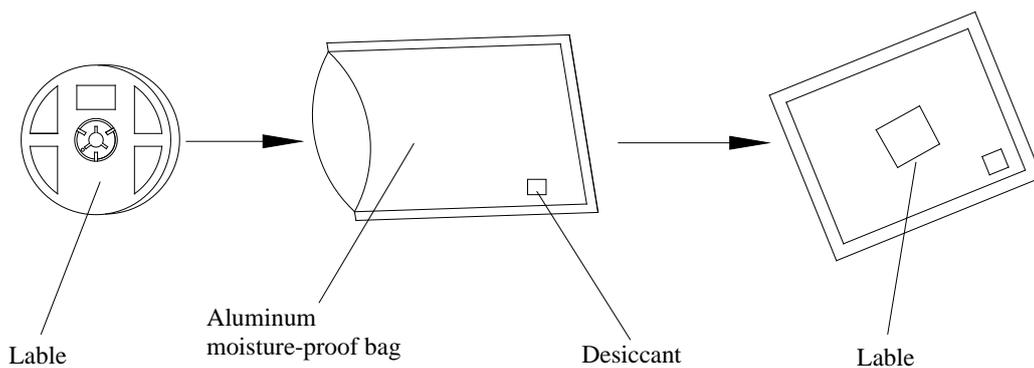


Note: Tolerance unless mentioned is  $\pm 0.1$ mm; Unit = mm



Carrier Tape Dimensions: Loaded Quantity 5000 pcs Per Reel.

● Moisture Resistant Packaging

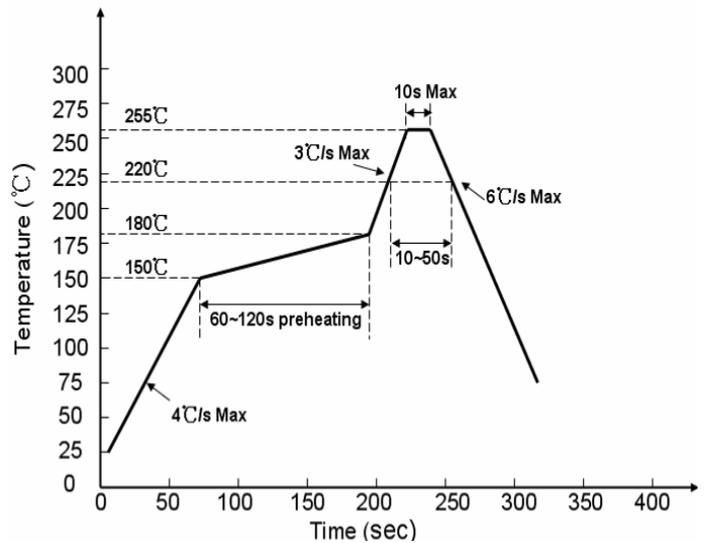
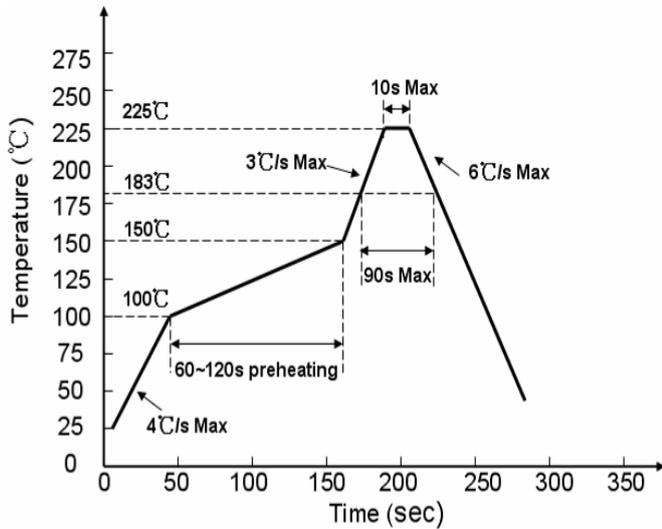


• Precautions for Use

• SMT Reflow Soldering Instructions

<Pb-free solder>

<Lead solder>



■ Precautions for use

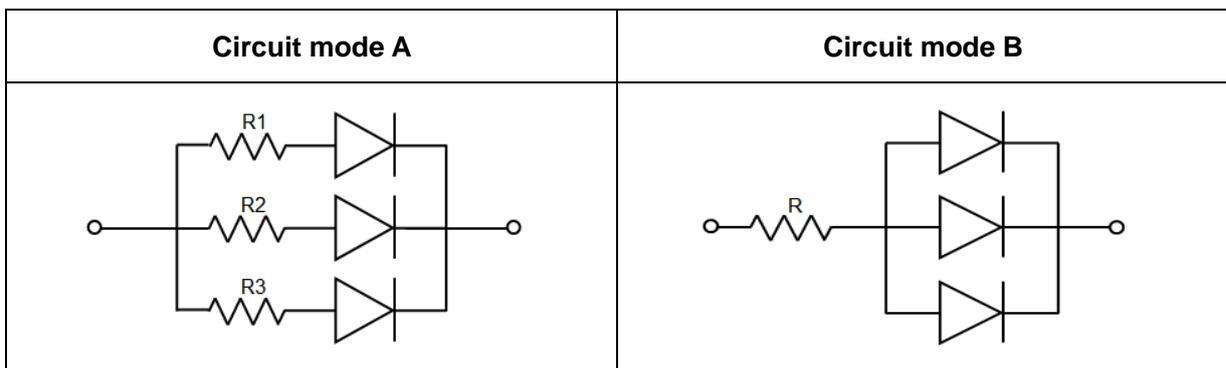
◆ use

● LED is a current driven component, the slight change of voltage will produce large current fluctuation, which will lead to component damage.

The customer should use resistance series as current limiting protection.

● In order to ensure the color consistency of multiple LEDs in parallel, it is recommended to use a separate resistor for each branch, as shown in mode a below;

If the circuit shown in mode B below is used, the LED light color may be different due to the different volt ampere characteristics of each LED



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● Too high temperature will affect the brightness and other performance of LED, so in order to make the LED have better performance, we should keep the led away from heat source

## ◆ storage

● Without opening the original package, the recommended storage environment is: temperature 5 °C ~ 30 °C, humidity below 85% RH. When inventory exceeds two months, Dehumidification should be carried out before use at 60 °C / 8 hours

● After opening the original package, the recommended storage environment is: temperature 5 ~ 30 °C, humidity below 60%

● LED is a humidity sensitive element. In order to avoid moisture absorption, it is recommended to store the LED in a sealed container with desiccant or in a nitrogen moisture-proof cabinet after opening the package

● After unpacking, the components should be used within 168 hours (7 days); and the welding should be completed as soon as possible after placement

● If the desiccant fails or the element is exposed to air for more than 168 hours (7 days), dehumidification should be performed

## ◆ Electrostatic protection

LED (especially the blue, turquoise, purple, white and pink LEDs with InGaN structure chip) are electrostatic sensitive components. Electrostatic or current overload will damage the LED structure. Led static damage or current overload may lead to abnormal performance, such as large leakage, low VF, or unable to light up, etc. So please pay attention to the following

● Wear anti-static wrist strap or anti-static gloves when touching led;

● All machines and equipment, tools, work table, material rack, etc. should be properly grounded (grounding impedance value less than 10 Ω);

● Storage or handling of LED should use anti-static bag, anti-static box and anti-static turnover box. It is strictly prohibited to use ordinary plastic products;

● It is suggested that ion fans should be used to suppress static electricity during operation.

## ◆ clean

It is recommended to use alcohol solution such as isopropanol to clean led, and corrosive solution is strictly prohibited.

## ◆ Welding

● Refer to the temperature curve on page 1 for reflow soldering conditions;

● The number of reflow soldering shall not exceed two times;

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- Manual welding is only recommended in case of repair and rework. The maximum welding temperature should not exceed 300 degrees and should be completed within 3 seconds. The maximum power of soldering iron should not exceed 30W;
- During the welding process, it is strictly forbidden to touch the colloid at high temperature; after welding, it is forbidden to exert external force on the colloid and bend the PCB to avoid the components from being impacted.
- ◆ Other
- The definition of LED described in this specification applies to the range of common electronic equipment (such as office equipment, communication equipment, etc.). If there are more stringent reliability requirements, especially when the failure or failure of components may directly endanger life and health (such as aerospace, transportation, transportation, medical devices, safety protection, etc.), please inform our business personnel in advance
- High brightness LED products may cause harm to human eyes when they are lit, so it is necessary to avoid looking directly from the top;
- For the purpose of continuous improvement, product appearance and specifications may be changed without prior notice

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