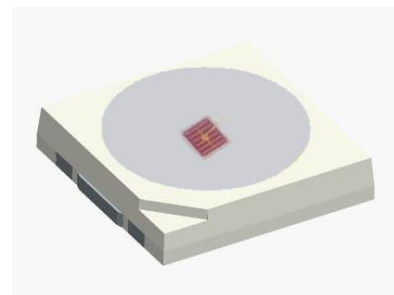


# 3030 Automotive LED Datasheet

## WR-3030C09-QCRT-WH



### 1.Features 特性

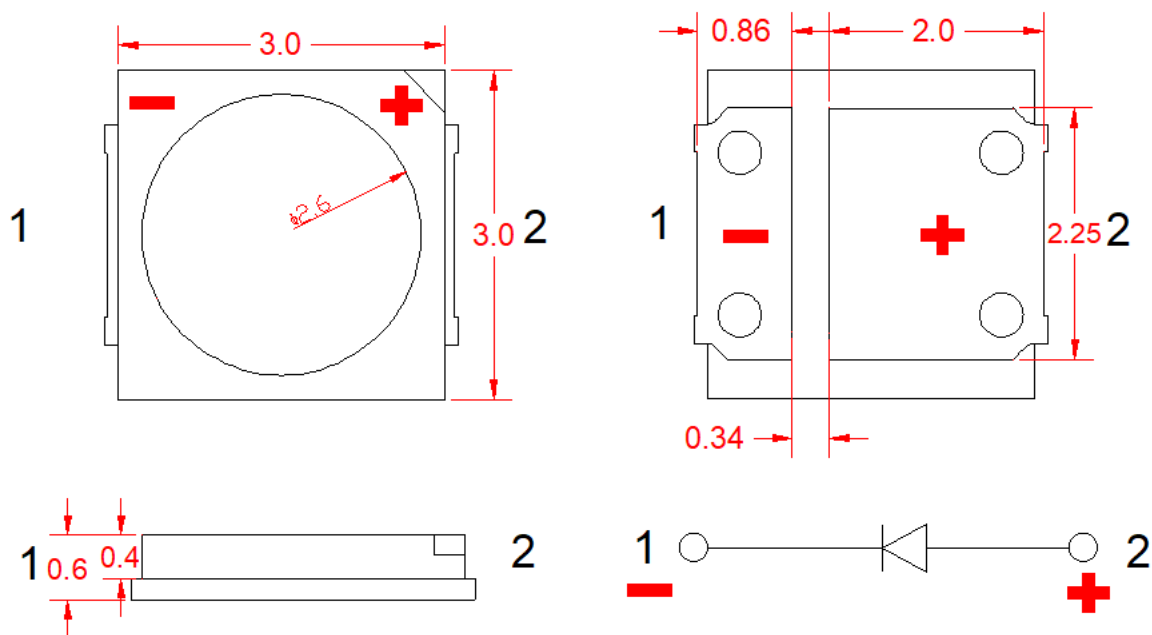
- Wide viewing angle 120°.发光角度 120°
- Inner reflector and white package.内反射器和白色封装
- EMC Package.EMC 封装
- Qualification according to AEC-Q102 .符合 AEC-Q102 标准认证
- Moisture sensitivity level: Level 2a.防潮等级 Level2a
- RoHS compliant.满足 RoHS 要求



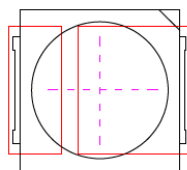
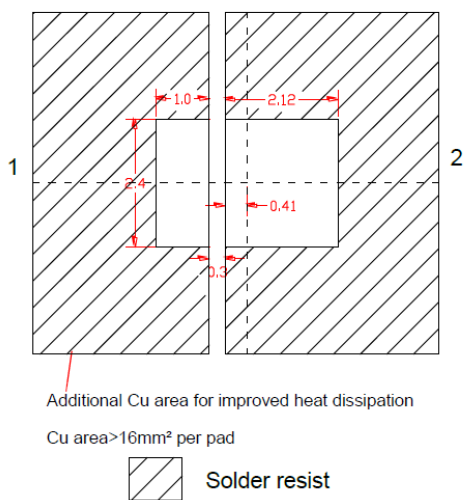
### 2.Applications 应用

- Autonomous Signaling

### 3.Package outline 封装尺寸



Improved Design For Better Heat Dissipation



#### Notes 注释 :

- 1.All dimensions are in millimeters.所有尺寸单位为毫米
- 2.Tolerances are  $\pm 0.1$ ; 公差是 $\pm 0.1$
3. Approximate Weight 18mg 颗粒重量为 19mg

#### 4.Absolute maximum ratings at Ta=25°C在 25°C时的绝对最大额定值

| Parameter 参数                                               | Symbol 符号   | Absolute Maximum Rating<br>绝对最大额定值 | Unit<br>单位 |
|------------------------------------------------------------|-------------|------------------------------------|------------|
| Forward current 正向电流                                       | If          | Min:5 Max:400                      | mA         |
| Power Dissipation 功耗                                       | PD          | 1120                               | mW         |
| Pulse Forward Current 脉冲正向电流                               | Ifp         | 700                                | mA         |
| Operating Temperature 工作温度                                 | Topr        | -40 ~+110                          | °C         |
| Storage temperature range 储存温度范围                           | Tstg        | -40 ~+110                          | °C         |
| Junction Temperature 结温                                    | Tj          | 125                                | °C         |
| Real Thermal Resistance Junction / solder point实际热阻 /焊点    | Rth JS real | Typ.14<br>Max. 20                  | K/W        |
| Electrical thermal resistance junction/solderpoint 电热阻 /焊点 | Rth JS elec | Typ:11<br>Max:14                   | K/W        |
| ESD withstand voltage(HBM) ESD 耐受电压                        | ESD         | H2<br>(ANSI/ESDA/JEDECJS-001)      | V          |

Notes 注释 :

[1]tp ≤ 10μs, Duty cycle = 0.005; Ts= 25 °C.

[2]Mounting on MC PCB, pad size ≥ 16mm<sup>2</sup> per pad. 安装在 MC PCB 上 , 每个焊盘尺寸 ≥ 16 毫米<sup>2</sup>

#### 5.Electro-optical characteristics at Ta=25°C温度为 25°C时的电光特性

| Parameter 参数                              | Symbol<br>符号                           | MIN<br>最小值 | TYP<br>典型值 | MAX<br>最大值 | Unit<br>单位 | Test<br>Condition<br>测试条件 |
|-------------------------------------------|----------------------------------------|------------|------------|------------|------------|---------------------------|
| Forward Voltage 正向电压                      | V <sub>F</sub>                         | 2.0        | ---        | 2.8        | V          | IF=350mA                  |
| Luminous Flux 光通量                         | Φ <sub>v</sub>                         | 55         | ---        | 80         | lm         | IF=350mA                  |
| Dominant Wavelength 主波长                   | λ <sub>d</sub>                         | 614        | ---        | 626        | nm         | IF=350mA                  |
| View Angle 发光角度                           | 2θ <sub>1/2</sub>                      | ---        | 120        | ---        | °          | IF=350mA                  |
| Reverse voltage 反向电压;<br>Ir<br>max = 10μA | Not designed for reverse bias 不适用于反向偏置 |            |            |            |            | /                         |

Notes 注释:

1. Tolerance of Luminous flux 光通量公差:±7%.
2. Tolerance of Forward Voltage 正向电压公差:±0.1V.
3. Tolerance of Dominant Wavelength:±1nm 主波长公差:±1nm

## 6. Bin Range of Luminous Flux 光通量分档

| Bin Code | Min. | Max. | Unit | Condition |
|----------|------|------|------|-----------|
| NBF      | 55   | 60   | LM   | IF=350mA  |
| NBG      | 60   | 65   |      |           |
| NBH      | 65   | 70   |      |           |
| NCC      | 70   | 80   |      |           |

Note 注释:

Tolerance of Luminous flux:  $\pm 7\%$  光通量公差:  $\pm 7\%$ .

## 7. Bin Range of Forward Voltage 电压分档

| Bin Code | Min. | Max | Unit | Condition |
|----------|------|-----|------|-----------|
| VA3      | 2.0  | 2.2 | V    | IF=350mA  |
| VA4      | 2.2  | 2.4 |      |           |
| VA5      | 2.4  | 2.6 |      |           |
| VAA      | 2.6  | 2.8 |      |           |

Note 注释:

Tolerance of Forward Voltage:  $\pm 0.1V$  正向电压公差:  $\pm 0.1V$ .

## 8. Bin Range of Dominant wavelength 主波长分档

| Bin Code | Min. | Max | Unit | Condition |
|----------|------|-----|------|-----------|
| WRA      | 614  | 618 | nm   | IF=350mA  |
| WRB      | 618  | 622 |      |           |
| WRC      | 622  | 626 |      |           |

Note 注释:

Tolerance of Dominant Wavelength:  $\pm 1nm$  主波长公差:  $\pm 1nm$

## 9.SpectrumDistribution 光谱分布

$$\Phi_{\text{rel}} = f(\lambda); \text{ IF} = 350 \text{ mA}; T_s = 25^\circ \text{ C}$$

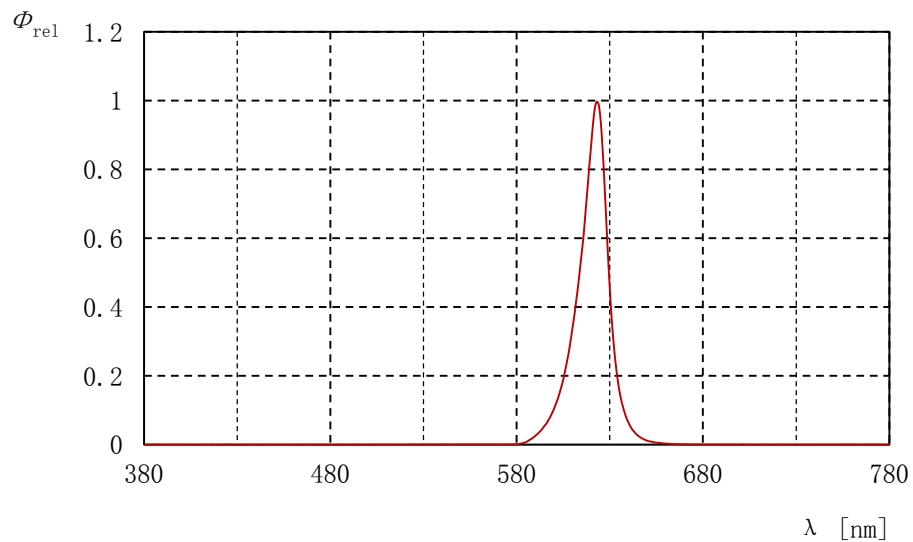
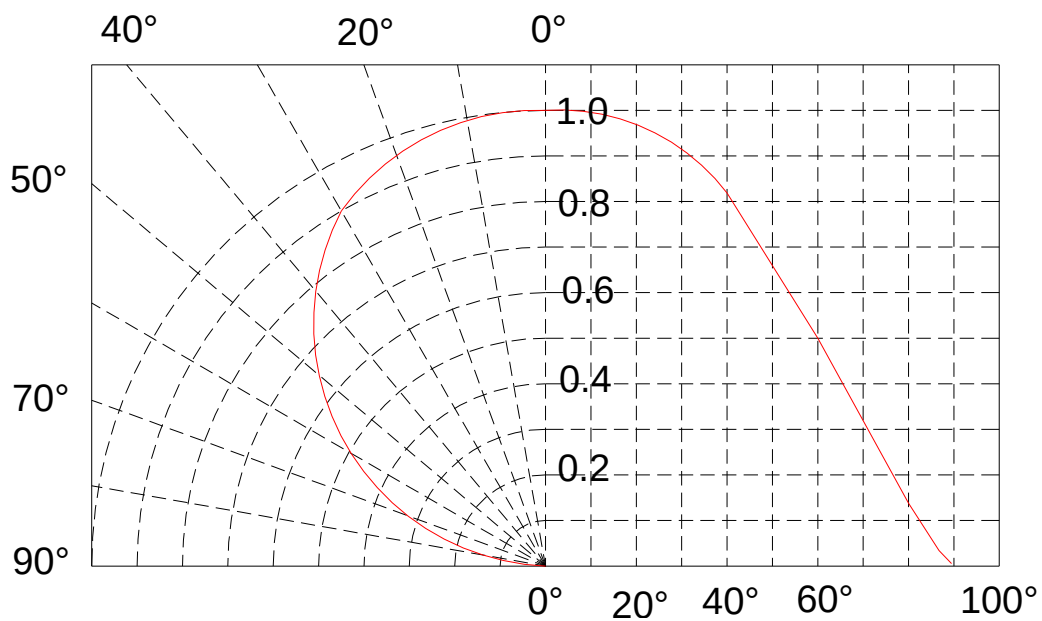


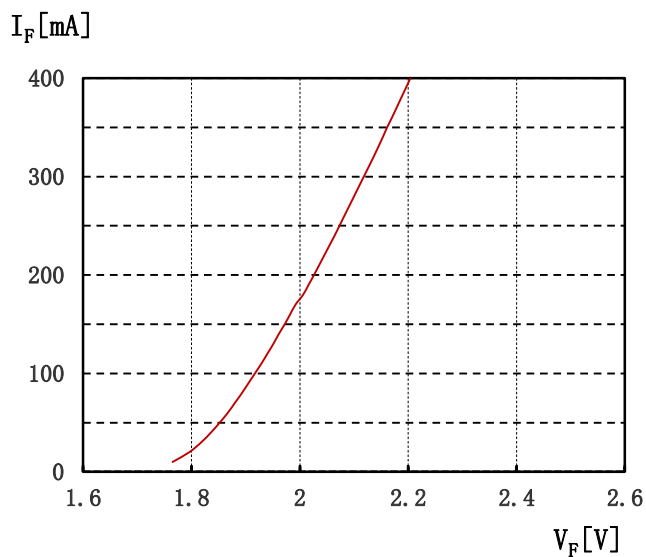
Diagram characteristics of radiation



## 10. Typical optical characteristics curves 光学特性曲线

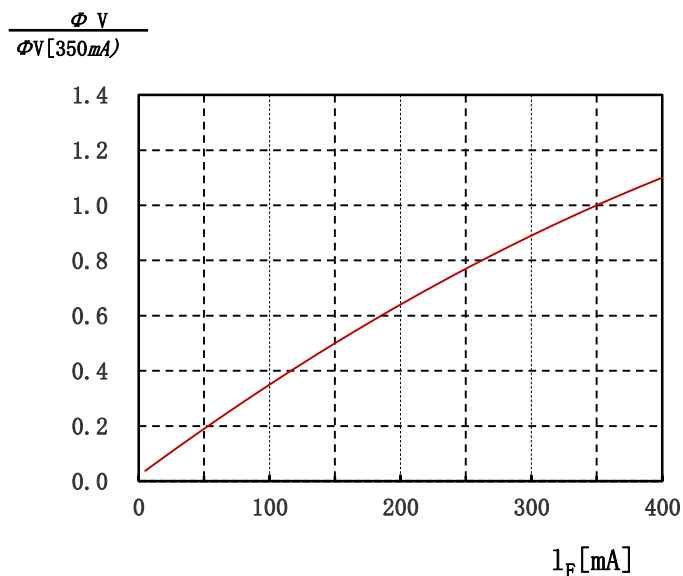
### Forward Current

$$I_F = f(V_F); T_S = 25^\circ \text{C}$$



### Relative Intensity

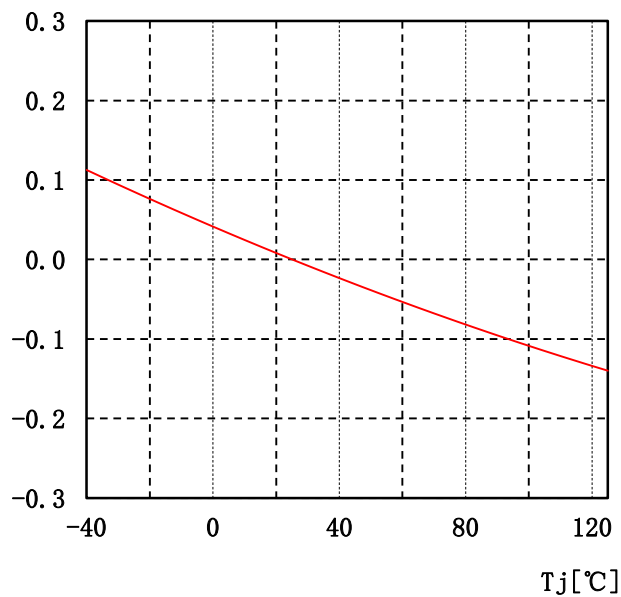
$$\Phi_V / \Phi_V(350\text{mA}) = f(I_F); T_S = 25^\circ \text{C}$$



### Forward Current

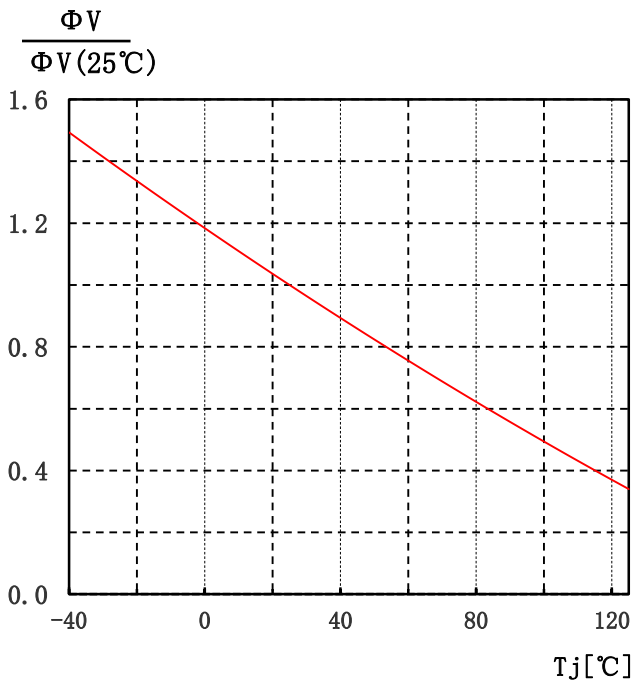
$$\Delta V_F = V_F - V_F(25^\circ \text{C}) = f(T_J); I_F = 350\text{mA}$$

$$\Delta V_F \text{ [V]}$$



## Relative Intensity

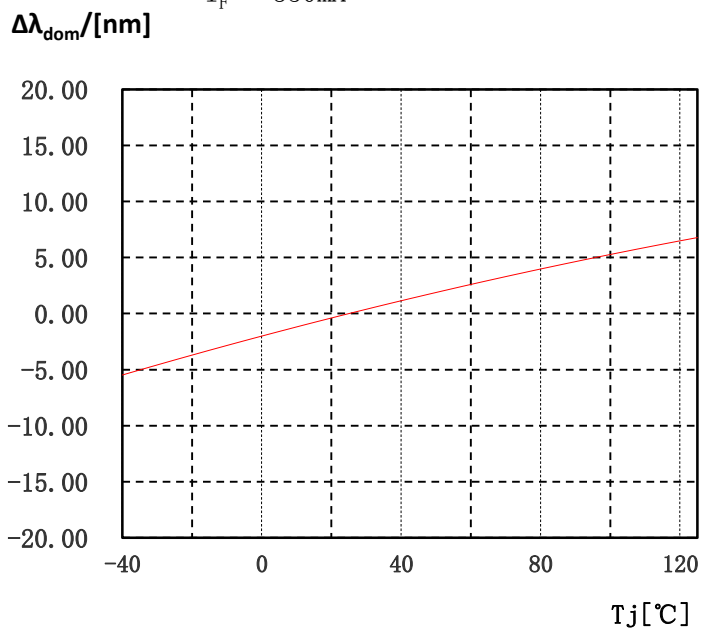
$$\Phi_V / \Phi_V(25^\circ\text{C}) = f(T_j); I_F = 350\text{mA}$$



## Dominant Wavelength

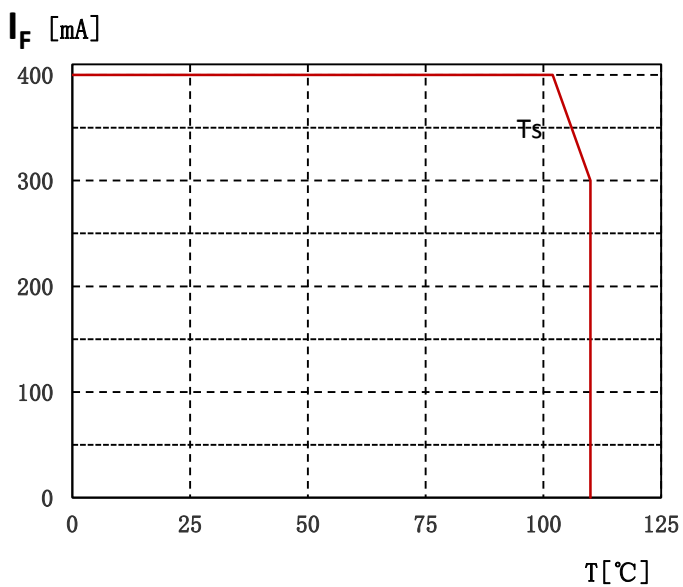
$$\Delta \lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25^\circ\text{C}) = f(T_j);$$

$$I_F = 350\text{mA}$$



## Maximum Forward Current

$$I_F = f(T)$$



## 11.Reflow profile 回流曲线

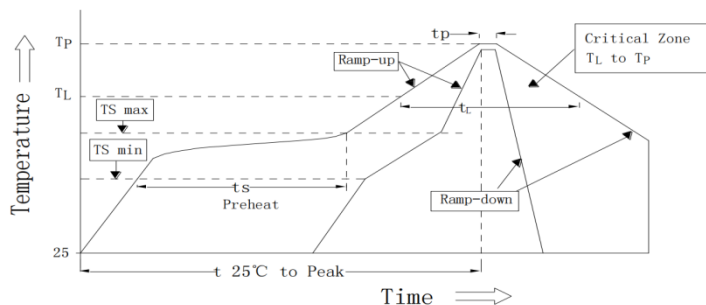
### ■Soldering condition 焊接条件(JEDEC-020D)

Suggestion IR Reflow Profile For Pb Free Process 无铅工艺红外回流焊温度曲线建议

| Profile Feature 功能介绍                                                                                                                                                                                                                                                                                                        | Pb-Free Assembly                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Preheat & Soak 预热&恒温<br>Temperature min (T <sub>smin</sub> )温度最小值<br>Temperature max(T <sub>smax</sub> )温度最大值<br>Time (T <sub>smin</sub> to T <sub>smax</sub> )(t <sub>s</sub> )温度区间持续时间                                                                                                                                    | 150°C<br>200°C<br>60-180seconds |
| Average ramp –up rate 平均升温速率<br>(T <sub>smax</sub> to T <sub>p</sub> )                                                                                                                                                                                                                                                      | 3°C/second max                  |
| Liquidous temperature (T <sub>L</sub> )液相线温度<br>Time above liquidous temperature(t <sub>L</sub> )<br>超过液相线温度的时间                                                                                                                                                                                                             | 217°C<br>60-150 seconds         |
| Peak package body temperature 箱体峰值温度 (T <sub>p</sub> )                                                                                                                                                                                                                                                                      | 260°C                           |
| Time within 5°C of actual Peak Temperature(tp) 实际峰值温度 ±5°C范围内的持续时间                                                                                                                                                                                                                                                          | 20-40 seconds                   |
| Average ramp-down rate 平均降温速率 (T <sub>p</sub> to T <sub>smax</sub> )                                                                                                                                                                                                                                                        | 6°C/second max                  |
| Time 25°C to peak temperature 25°C<br>从 25°C升温至峰值温度的时长                                                                                                                                                                                                                                                                      | 8 minutes max                   |
| <p>*Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.<br/>峰值温度 ( T<sub>p</sub> ) 的公差定义为供应商最小值和用户最大值。</p> <p>**Tolerance for time at peak profile temperature (tp) is defined as a supplier minimum and a user maximum.<br/>峰值温度 ( tp ) 下的时间容差定义为供应商最小值和用户最大值。</p> |                                 |

### Pb-Free Process-Classification Temperatures ( T<sub>c</sub> ) 无铅工艺分类温度

| Package Thickness<br>封装厚度 | Volume 体积 mm <sup>3</sup><br><350 | Volume 体积 mm <sup>3</sup><br>350-2000 | Volume 体积 mm <sup>3</sup><br>>2000 |
|---------------------------|-----------------------------------|---------------------------------------|------------------------------------|
| <1.6mm                    | 260°C                             | 260°C                                 | 260°C                              |
| 1.6mm-2.5mm               | 260°C                             | 250°C                                 | 245°C                              |
| >2.5mm                    | 250°C                             | 245°C                                 | 245°C                              |

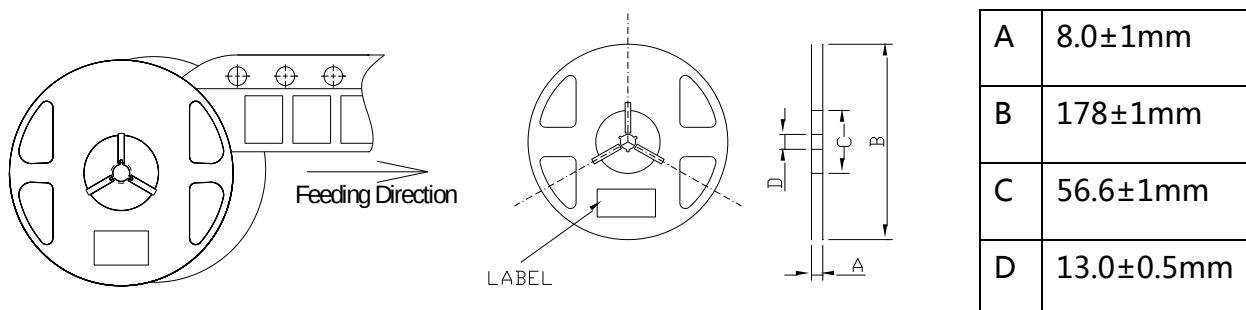


- 1.Reflow soldering should not be done more than three times.过回流焊的次数不超过三次
- 2.When soldering ,do not put stress on the LEDs during heating.焊接时，在加热过程中不要对 LED 施加应力

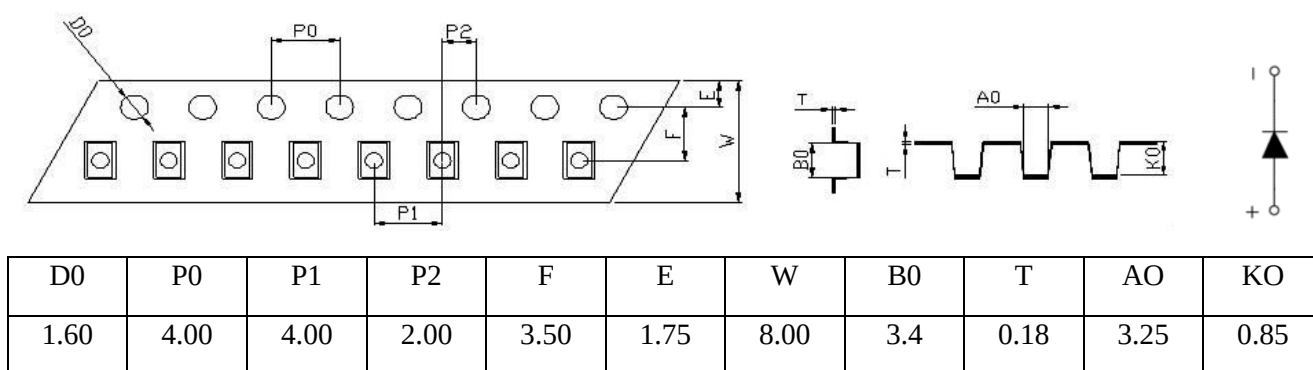


## 12. Packaging specifications 包装规格

- Feeding direction 卷盘方向
- Dimensions of reel (unit: mm) 卷轴尺寸



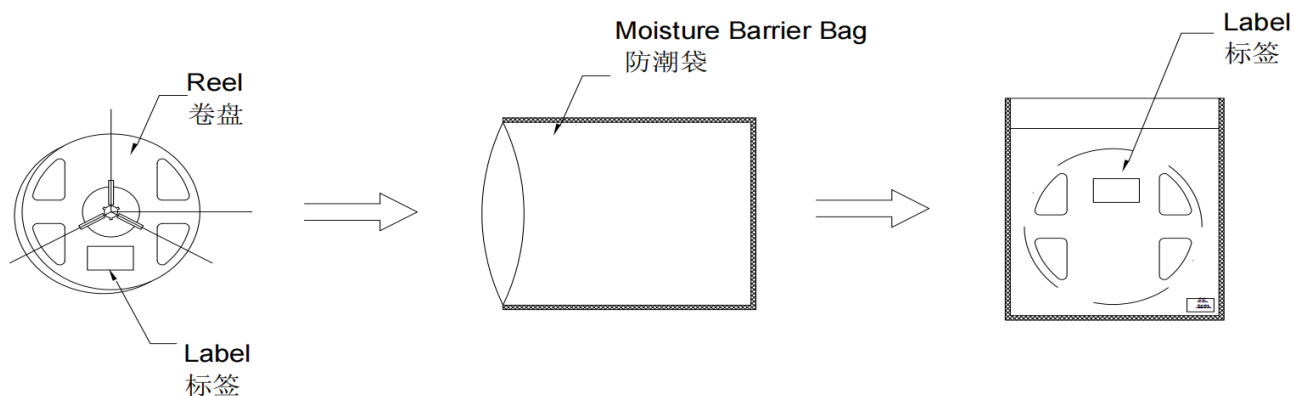
- Arrangement of tape 载带排列



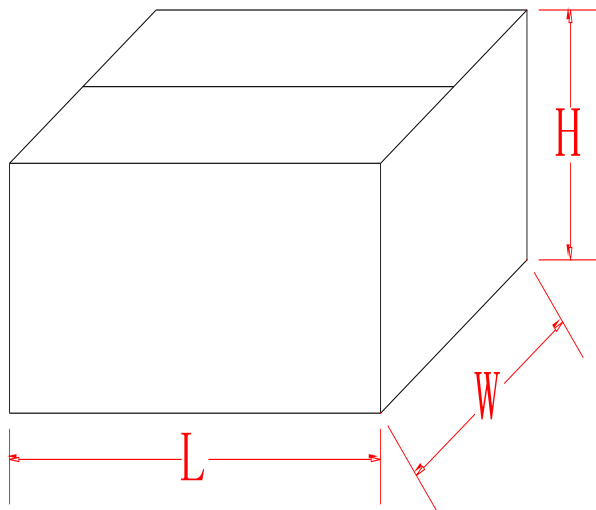
### Notes 注释:

- The belt size tolerance is :  $T: \pm 0.05\text{mm}$  ,  $A0/B0/K0: \pm 0.20\text{mm}$  ,  $D0/P0/P1/P2/F/E/W: \pm 0.10\text{mm}$   
载带尺寸公差为 :  $T: \pm 0.05\text{mm}$  ,  $A0/B0/K0: \pm 0.20\text{mm}$  ,  $D0/P0/P1/P2/F/E/W: \pm 0.10\text{mm}$
- Empty component pockets are sealed with top cover tape. 空元件槽需用顶封带密封
- The maximum number of missing lamps is two. 缺失灯珠数量最多为 2 个
- The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications. 按照 ANSI/EIA RS-481 标准, 负极朝向编带链轮孔方向。
- 5.5000pcs/Reel 每卷 5000pcs

## 13.Packaging specifications 包装规格



size1:L/W/H-365\*310\*390



### ■ Label

安徽锐拓电子有限公司

客户料号: \_\_\_\_\_

客户单号: \_\_\_\_\_

产品名称: \_\_\_\_\_

生产单号: \_\_\_\_\_

VF: \_\_\_\_\_ IF: \_\_\_\_\_  $\Phi$ v: \_\_\_\_\_

BIN: \_\_\_\_\_ CIE: \_\_\_\_\_ CCT: \_\_\_\_\_

QTY: \_\_\_\_\_ PCS DATE: \_\_\_\_\_

RoHS MSL 2a

QR Code

Barcode

- VF: Forward VoltageRank
- IF: Forward Current
- $\Phi$ v: Luminous IntensityRank
- CIE:XYRank
- QTY: PackingQuantity
- DATE:

## 14.Cautions 注意事项

### ●Package specifications 包装规格

Reeled products (numbers of products are 5,000pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, 50 moisture-proof bag of maximums are put the outside box (size: about 365mm x about 310mm x about 390mm) Together with buffer material, and it is packed. (Pare No., Lot No., quantity should appear on the label on the moisture-proof bag, part No. And quantity should appear on the label on the cardboard box.) The number of the loading steps of outside box (cardboard box) has two steps.

编带产品（每卷 5000 件）逐卷装入密封防潮袋，袋内放置干燥剂；每个外箱（尺寸约 365mm×310mm×390mm）最多装入 50 个防潮袋，箱内放置缓冲材料后封装。（防潮袋标签需标注零件号、批次号及数量；外箱标签需标注零件号及数量。）外箱（纸箱）采用两层堆叠装载方式。

### ●Storage conditions 储存条件

Before opening the package: 拆开包装前

The LEDs should be kept at 25°C or less and 60%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material (silica gel) is recommended.

LED 产品应在温度≤25°C、相对湿度≤60% 的环境下存放，且需在一年内使用。存放时，建议采用含吸湿材料（硅胶）的防潮包装。

After opening the package: 拆开包装后

The LEDs should be kept at 25°C or less and 50%RH or less. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel). It is also recommended to return the LEDs to the original moisture proof bag and to reseal the moisture proof bag again.

LED 产品应在温度≤25°C、相对湿度≤50% 的环境下存放。若有未使用的剩余 LED 产品，需密封存放于防潮包装中，例如含吸湿材料（硅胶）的密封容器。建议将产品放回原防潮袋并重新密封。

### ●Cleaning 清洁

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED if necessary.

如需清洁 LED 产品，可使用异丙醇等醇类清洁溶剂。

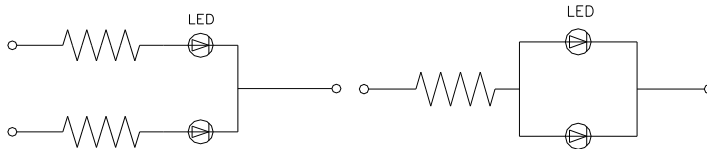
## ● Drive method 驱动方法

An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

LED 为电流驱动型器件。在应用中，若多个 LED 并联连接，为确保其发光强度均匀，建议在驱动电路中为每个 LED 串联一个限流电阻，具体如以下电路 A 所示。

Circuit model A

Circuit model B



(A) Recommended circuit

推荐电路

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

由于各 LED 的伏安 (I-V) 特性存在差异，其发光亮度可能会有所不同。

## ● Reflow profile 回流曲线

The encapsulated material of the LEDs is silicone. Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when using the picking up nozzle, the pressure on the silicone resin should be proper.

LED 的封装材料为硅胶，因此其封装顶部表面质地较软。顶部表面所承受的压力会影响 LED 的可靠性，需采取防护措施避免封装部位承受过大压力。因此在使用吸嘴拾取时，应对硅胶表面施加适当压力。

Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board.

LED 灯珠不得安装在 PCB 的翘曲（非共面）部位。焊接完成后，请勿使电路板翘曲。

Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.

焊接后冷却至常温的过程中，请勿施加机械力或过度振动。焊接后请勿对器件进行快速冷却。

15.Change history 变更记录

| Ver.版本 | MM.YYYY 日期 | Item / Change 项目/内容 | Revised by 修订人 |
|--------|------------|---------------------|----------------|
| A0     | 2023.11    | 新编                  | 张世界            |
| A1     | 2024.4     | 更新模版                | 张世界            |
| A2     | 2025.11    | 版本页面优化更新            | 任伟             |

