



产品规格书

SPECIFICATION

|                          |                  |                   |                        |               |                   |
|--------------------------|------------------|-------------------|------------------------|---------------|-------------------|
| 客户 Customer Name         |                  |                   |                        |               |                   |
| 客户编码 Customer No.        |                  |                   |                        |               |                   |
| 产品类型 Product Description |                  |                   | 光电开关 Photo Interrupter |               |                   |
| 产品型号 Product Model       |                  |                   | ORTR-8307              |               |                   |
| 规格书版本 Datasheet Version  |                  |                   | V2                     |               |                   |
| 奥伦德确认 Orient Confirm     |                  |                   | 客户确认 Customer Confirm  |               |                   |
| 批准<br>Approved by        | 确认<br>Checked by | 制作<br>Prepared by | 批准<br>Approved by      | 品质<br>Quality | 工程<br>Engineering |
| 李松林                      | 邱晨               | 郑达贵               |                        |               |                   |
| 判断结果<br>Judge outcome:   |                  | OK                | 判断结果<br>Judge outcome: |               |                   |



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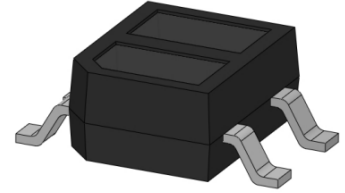


## 1、产品特征 Features

- 响应速度快 Fast response time.
- 高灵敏度 High sensitivity.
- 截至可见光 Cut-Off visible wavelength.
- 无铅 Pb free.
- 产品本身将保持在 RoHS 合规版本内

This product itself will remain within RoHS compliant version.

- 符合欧盟 REACH 规定
- Compliance with EU REACH.



## 2、应用 Applications

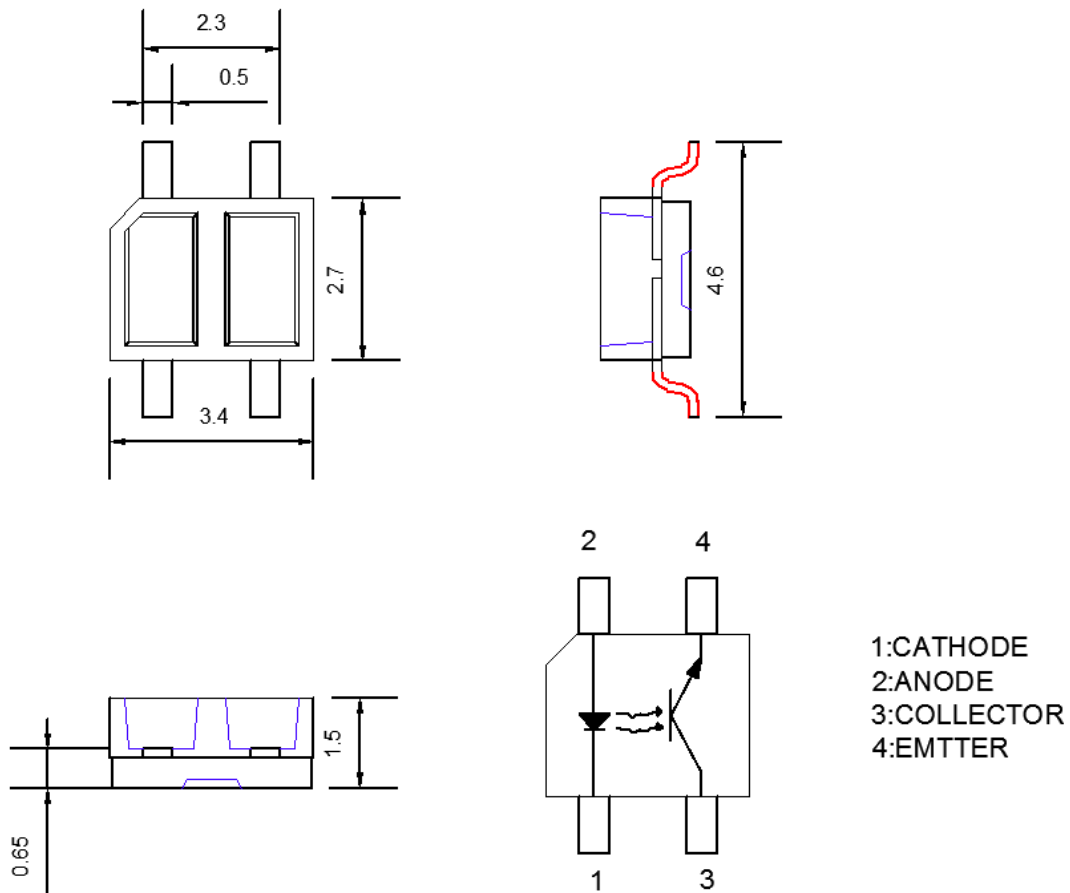
- 照相机 Camera.
- 打印机 Printer
- 扫描仪 Scanner.
- 各种微机控制设备 Various microcomputer control equipment

## 3、描述 Description

- ORTR-8307是一种光反射开关，包括砷化镓红外发射器和NPN光电晶体管，具有短距离高光敏接收器，在红外范围内工作。发射端和接收端并排封装在塑料支架中。

ORTR-8307 is a light reflection switch which includes a GaAs IR-LED transmitter and a NPN photo-transistor with a high photosensitive receiver for short distance, operating in the infrared range. Both components are mounted side-by-side in a plastic package.

#### 4、外部封装尺寸 Package Outline Dimensions



注:

Notes:

- 1).所有尺寸以毫米为单位。All dimensions are in millimeters (mm).
- 2).公差:  $\pm 0.15\text{mm}$  General Tolerances :  $\pm 0.15\text{mm}$  .



5、最大额定值 Ta=25℃ Absolute maximum ratings at Ta=25℃

| 参数 Parameter                                |                                        | 符号<br>Symbol | 额定值<br>Rating | 单位<br>Unit |
|---------------------------------------------|----------------------------------------|--------------|---------------|------------|
| 输入<br>Input                                 | 功耗<br>Power Dissipation                | $P_D$        | 75            | mW         |
|                                             | 正向电流<br>Forward Current                | $I_F$        | 50            | mA         |
|                                             | 反向电压<br>Reverse Voltage                | $V_R$        | 5             | V          |
|                                             | 正向峰值电流<br>Peak Forward Current         | $I_{FP}$     | 1             | A          |
| 输出<br>Output                                | 集电极功耗<br>Collector Power Dissipation   | $P_C$        | 100           | mW         |
|                                             | 集电极电流<br>Collector Current             | $I_C$        | 50            | mA         |
|                                             | 集电极-发射极电压<br>Collector-Emitter Voltage | $BV_{CEO}$   | 30            | V          |
|                                             | 发射极-集电极电压<br>Emitter-Collector Voltage | $BV_{ECO}$   | 5             | V          |
| 工作温度范围<br>Operating Temperature Range       |                                        | $T_{opr}$    | -25~+85       | ℃          |
| 存储温度范围<br>Storage Temperature Range         |                                        | $T_{stg}$    | -30~+90       | ℃          |
| 焊接温度<br>Soldering Temperature <sup>*1</sup> |                                        | $T_{sld}$    | 260           | ℃          |

注：<sup>\*1</sup>焊接时间小于5秒。

Notes: <sup>\*1</sup> Soldering time ≤ 5 seconds.



## 6、光电特性 Ta=25℃ Electrical-optical characteristics at Ta=25℃

| 参数<br>Parameter                     | 符号<br>Symbol                          | 条件<br>Condition                                            | 最小值<br>Min. | 标准值<br>Typ. | 最大值<br>Max. | 单位<br>Unit |
|-------------------------------------|---------------------------------------|------------------------------------------------------------|-------------|-------------|-------------|------------|
| 输入<br>Input                         | 正向电压<br>Forward Voltage               | $V_F$<br>$I_F=20\text{mA}$                                 | -           | 1.2         | 1.6         | V          |
|                                     | 反向电流<br>Reverse Current               | $I_R$<br>$V_R=5\text{V}$                                   | -           | -           | 10          | uA         |
|                                     | 峰值波长<br>Peak Wave Length              | $\lambda_P$<br>$I_F=10\text{mA}$                           | -           | 940         | -           | nm         |
| 输出<br>Output                        | 集电极暗电流<br>Collector Dark Current      | $I_{CEO}$<br>$V_{CE}=10\text{V}$<br>$E_e=0\text{mW/cm}^2$  | -           | -           | 100         | nA         |
|                                     | 集电极-发射极饱和电压<br>C-E Saturation Voltage | $V_{CE(sat)}$<br>$I_C=2\text{mA}$<br>$E_e=1\text{Mw/cm}^2$ | -           | -           | 0.4         | V          |
| 传输特性<br>Transfer<br>Characteristics | 光电流<br>Light Current                  | $I_{C(ON)}$<br>$V_{CE}=5\text{V}$<br>$I_F=10\text{mA}$     | 0.18        | -           | 0.90        | mA         |
|                                     | 上升时间<br>Rise Time                     | $t_r$<br>$I_{FP}=20\text{mA}$<br>$V_{CE}=5\text{V}$        | -           | 15          | -           | us         |
|                                     | 下降时间<br>Fall Time                     | $t_f$<br>$R_L=1\text{K}\Omega$                             | -           | 15          | -           | us         |

注：光电流公差为±10%

Notes: Tolerance of Light Current is ±10%.



## 7、档位 Bin Limits

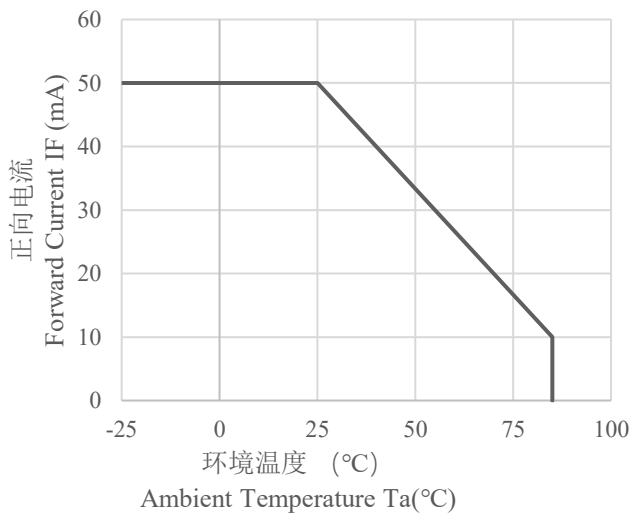
光电流分档（10mA） Light Current bin limits(At 10mA)

| 分档代码<br>BIN CODE | 最小值（uA）<br>Min.(uA) | 最大值（uA）<br>Max.(uA) |
|------------------|---------------------|---------------------|
| A                | 50                  | 200                 |
| B1               | 180                 | 250                 |
| B2               | 230                 | 300                 |
| C1               | 260                 | 370                 |
| C2               | 340                 | 440                 |
| D                | 400                 | 900                 |

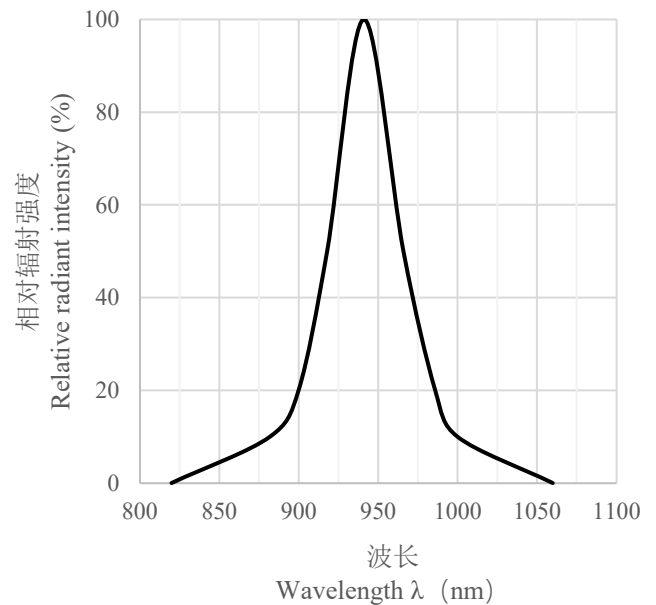


## 8、光电特性曲线图 Typical Electro-Optical characteristics curves

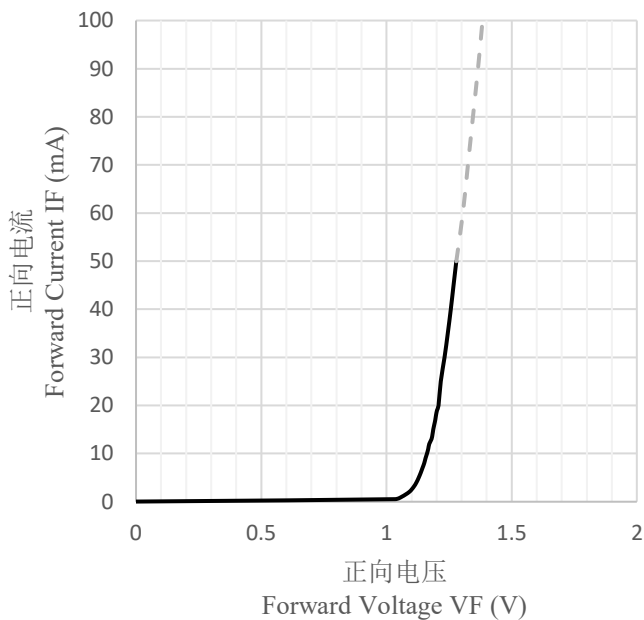
正向电流与环境温度关系  
Forward Current vs. Ambient  
Temperature



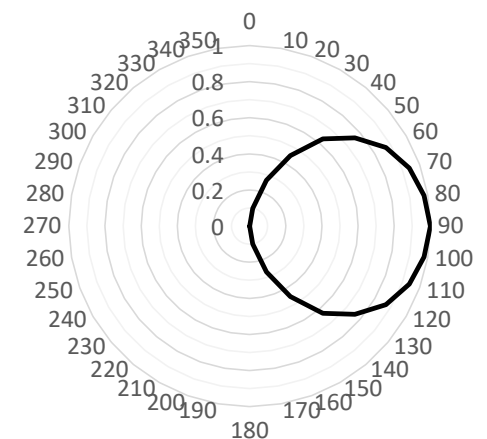
相对辐射强度与波长关系  
Spectral Distribution



正向电流与正向电压关系  
Forward Current vs. Forward Voltage

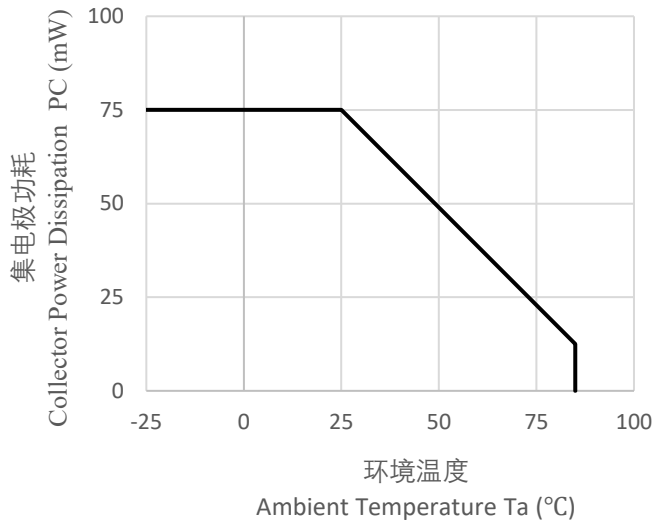


相对发射强度与发射角度关系  
Relative Radiant Intensity vs. Angular Displacement

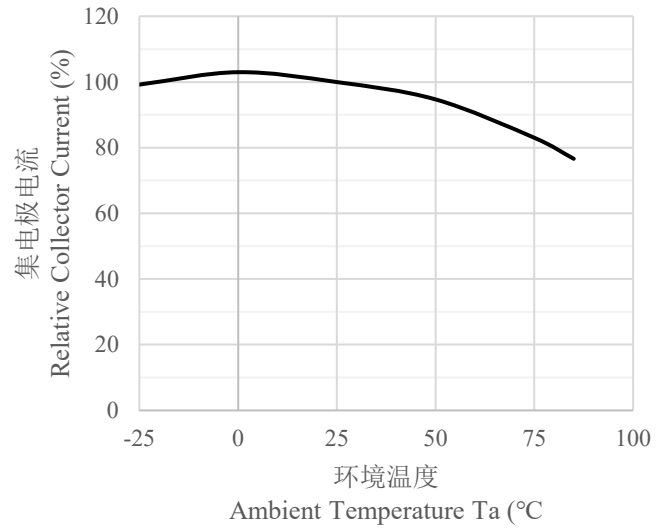




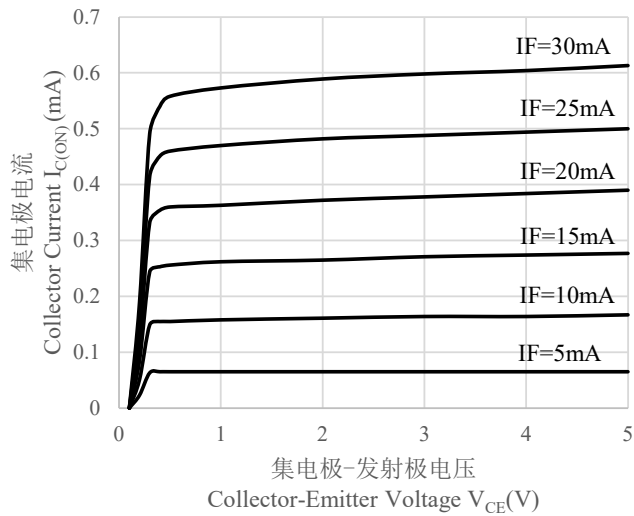
集电极功耗与环境温度关系  
Collector Power Dissipation vs. Ambient Temperature



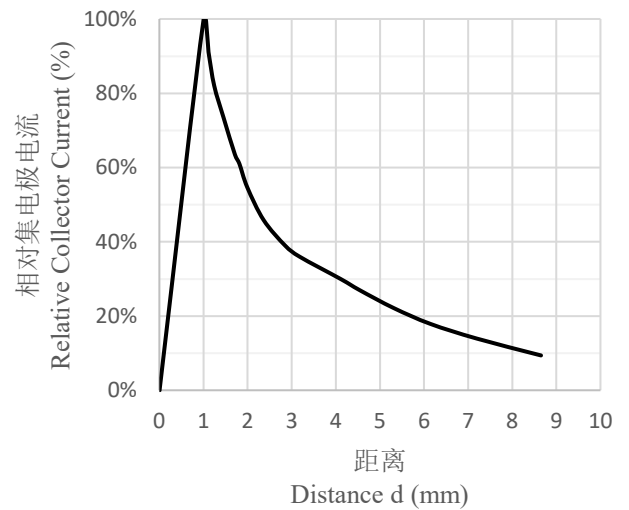
集电极电流与环境温度关系  
Collector Current vs. Ambient Temperature



集电极电流与集电极-发射极电压关系  
Collector Current vs. Collector-Emitter Voltage



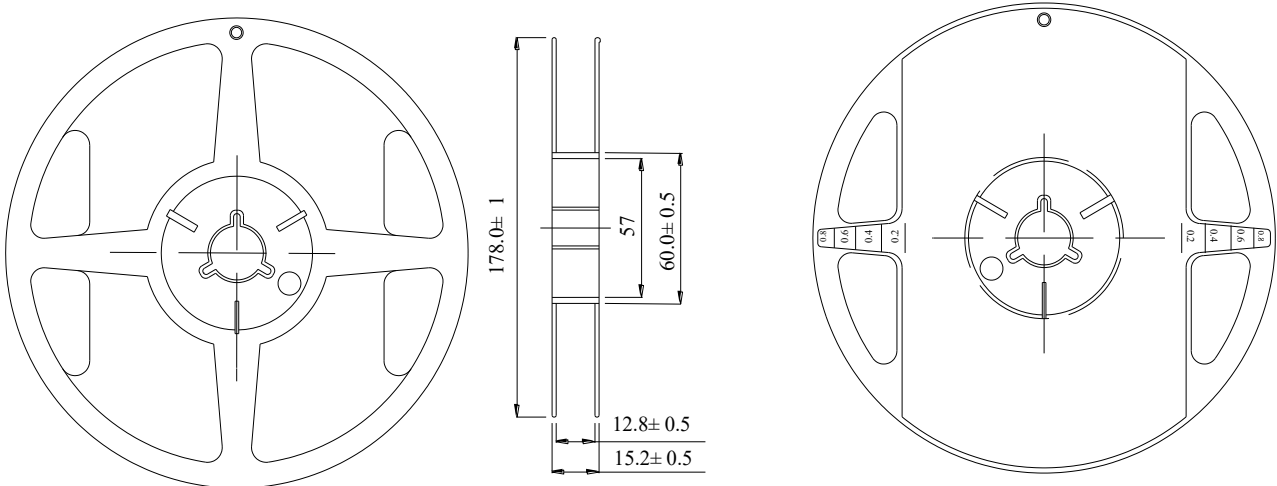
集电极电流与距离关系  
Collector Current vs. Distance



## 9、包装标准 Packaging Specification

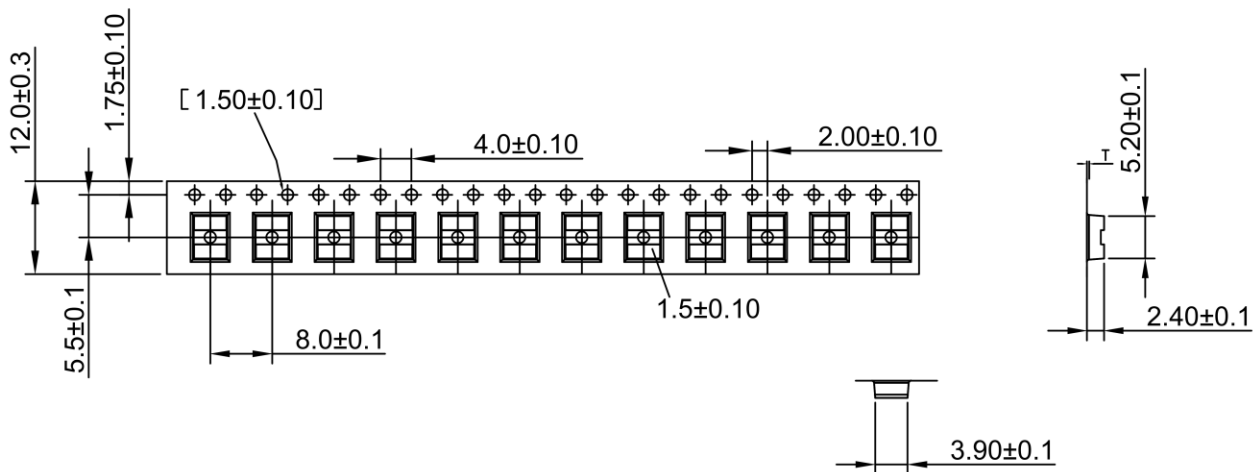
- 卷盘尺寸 (单位: 毫米)

Dimensions for Reel (Unit: mm)



- 载带尺寸 (单位: 毫米)

Dimensions of Tape (Unit: mm)



注:

1、所有尺寸均以mm为单位, 除非另有说明, 公差为 $\pm 0.1$ mm。

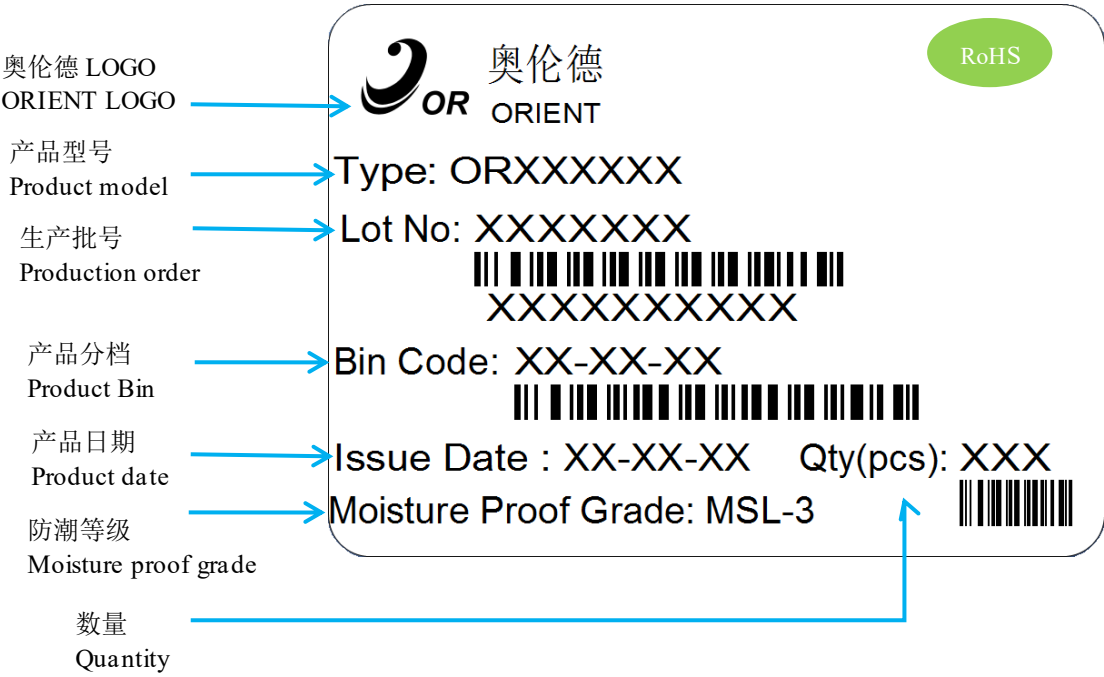
All dimensions are in mm, tolerance is  $\pm 0.1$  mm unless otherwise noted.

2、装载数量: 1000个/盘

Loaded quantity: 1000 pcs/reel.



10、产品标签 Label of Products





## 11、可靠性实验项目和条件 Reliability Test Items and Conditions

| 实验项目<br>Test Item                                         | 实验条件<br>Test Conditions                                             | 实验时间<br>/频率<br>Test<br>Hours /<br>Times | 不良数量/<br>抽样<br>Units<br>Failed/Teste<br>d | Ac/Re | 判定标准<br>Criteria             |                          |
|-----------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------|-------------------------------------------|-------|------------------------------|--------------------------|
|                                                           |                                                                     |                                         |                                           |       | I <sub>C(ON)</sub> @<br>10mA | V <sub>F</sub> @<br>10mA |
| 回流焊<br>Reflow<br>Soldering                                | 260°C(Max.),<br>within<br>10seconds.<br>(Max.)                      | 3 times                                 | 0/20                                      | 0/1   | <±10%                        | <±10%                    |
| 温度循环<br>Temperature<br>cycle                              | -40°C 30min<br>↑↓25°C(5min)<br>100°C 30min                          | 10<br>cycles                            | 0/20                                      | 0/1   |                              |                          |
| 常温寿命<br>Operation Life                                    | I <sub>F</sub> =20mA<br>V <sub>ce</sub> =5V<br>T <sub>a</sub> =25°C | 1000<br>hours                           | 0/20                                      | 0/1   |                              |                          |
| 高温高湿存储<br>High<br>Temperature<br>High Humidity<br>Storage | T <sub>a</sub> =85°C<br>RH=85%                                      | 1000<br>hours                           | 0/20                                      | 0/1   | > 70%                        | < 110%                   |
| 高温存储<br>High<br>Temperature<br>Storage                    | T <sub>a</sub> =100°C                                               | 1000<br>hours                           | 0/20                                      | 0/1   |                              |                          |
| 低温存储<br>Low<br>Temperature<br>Storage                     | T <sub>a</sub> =-40°C                                               | 1000<br>hours                           | 0/20                                      | 0/1   |                              |                          |

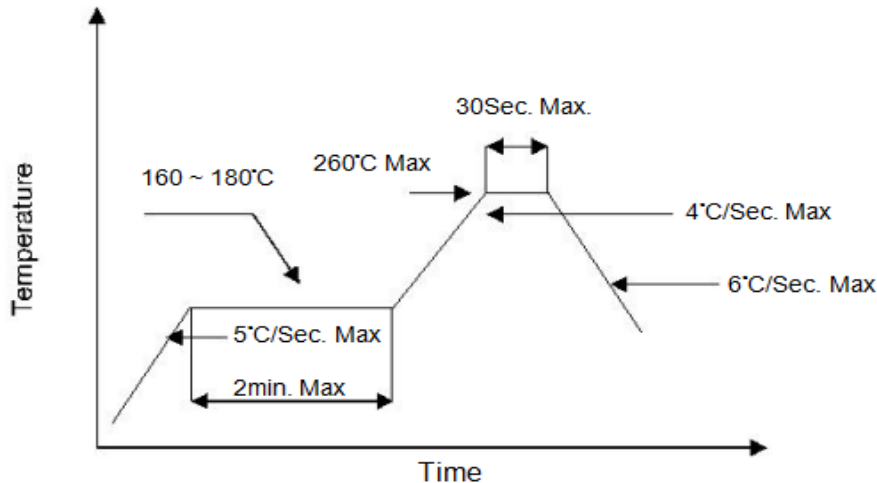


## 12、注意事项 Precautions for use

### 1、焊接 Soldering

- 1.1、无铅焊锡温度剖面。Pb-free solder temperature profile
- 1.2、在高温焊接时，避免对引线框架施加任何压力。 Avoiding applying any stress to the lead frame while the Photo Interrupter are at high temperature particularly when soldering.
- 1.3、焊接时应特别注意。焊接时，焊点与环氧胶体距离应大于 3mm 且焊接处要在支架 bar 以下。Careful attention should be paid during soldering. When soldering, leave more then 3mm from solder joint to epoxy bulb, and soldering beyond the base of the tie bar is recommended.
- 1.4、焊接完成后，在光电开关恢复常温前，避免受到外力冲击和振动。 After soldering the Photo Interrupter, the epoxy bulb should be protected from mechanical shock or vibration until the Photo Interrupter return to room temperature.
- 1.5、不得快速将光电开关从峰值温度冷却。 A rapid-rate process is not recommended for cooling the Photo Interrupter down from the peak temperature.
- 1.6、虽然在表中已指定了推荐的焊接条件,但对于光电开关来说浸锡或手工焊接尽可能在最低温度下进行。 Although the recommended soldering conditions are specified in the above table, dip or hand soldering at the lowest possible temperature is desirable for the Photo Interrupter.

建议焊接曲线 Recommended soldering profile:



### 2、清洗 Cleaning

- 2.1、 不要用超声波清洗。建议使用异丙基擦拭酒精或纯酒精，擦拭时间不应超过一分钟。器件在使用前必须在室温下放置15分钟。清洁后，必须确保辐射面清洁。否则，异物会影响辐射颜色。 Don't be cleaned with ultrasonic. Recommended to be wiped with isopropyl alcohol or pure alcohol, wiping time should not be more than one minute. components must be placed at room temperature for fifteen minutes before using. After cleaning, you must insure clean on the radiant surface. Otherwise, foreign objects can affect radiant color.



2.2、器件不能与醋酸异戊酯、三氯乙烯、丙酮、硫化物、氮化物、酸、碱、盐接触。这些物质会破坏器件。Components can not be in contact with isoamyl acetate, trichloroethylene, acetone, sulfide, nitride, acid, alkali, salt. These matter can destroy components.

### 3、修复 Repairing

设备焊接后不应进行修理。不可避免的修理时，应使用双头烙铁。应事先确认设备的特性是否会因修理而受损。Repair should not be done after the device 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 device will or will not be damaged by repairing.

### 4、存储 Storage

4.1. 在产品准备使用之前，不要打开防潮袋。Do not open moisture proof bag before the products are ready to use.

4.2. 打开包装前，元件应保持在30°C及90%RH以下。Before opening the package, the components should be kept at 30°C or less and 90% RH or less.

4.3. 该设备应在一年内使用。The device should be used within a year.

4.4. 打开包装后，元件应保存在30°C及70%RH以下。After opening the package, the components should be kept at 30°C or less and 70% RH or less.

4.5. 元件应在打开包装后的168小时(7天)内使用。The components should be used within 168 hours (7 days) after opening the package.

4.6. 如果吸湿材料(硅胶)已经褪色或设备已经超过储存时间，应在以下条件下进行烘烤处理。If the moisture absorbent material (silica gel) has faded away or the components have exceeded the storage time, baking treatment should be performed using the following conditions.

烘烤处理:60±5°C烘烤 24 小时。 Baking treatment : 60±5°C for 24 hours.

### 5、静电 Static

5.1. 静电和峰值浪涌电压会破坏元件，避免开关灯时产生瞬时电压。Static and Peak surge voltage can destroy components, avoiding Instantaneous voltage when turn on or turn off the lights.

5.2. 操作时请佩戴防静电腕带、防静电手套、防静电鞋，设备必须接地。Please wear Anti-static wrist band, Anti-static glove, Anti-static shoes in the course of operation, and the equipment must be grounded.

### 6、测试 Test

6.1. 用户须在电路中使用限流电阻，以便在额定电流范围内驱动元器件。否则轻微的电压移动可能会引起大的电流变化，烧坏。Customer must apply the current limiting resistor in the circuit



so as to drive the components within the rated current. Otherwise slight voltage shift maybe will cause big current change and burn out will happen.

6.2. 此外，应注意不要在电路的打开和关闭时使元器件具有瞬时高电压过载。否则会损坏元器件。 Also, caution should be taken not to overload the components with instantaneous high voltage at the turning ON and OFF of the circuit. Otherwise, The components will be destroyed.

6.3. 点亮或测试LED时，反向电压不能超过5V，否则会损坏LED。The reverse voltage mustn't exceed 5V when lighting on or testing the LED, otherwise, the LEDs will be damaged.