



洲光源
CHAULIGHT

产品规格书 SPECIFICATION

客户名称: _____

Customer Name

产品类型: _____ 对射式光电开关

Product Name

产品型号: _____ ZSOS-T0502-02

Part No.

<input type="checkbox"/> 技术参考 Technical Reference		<input type="checkbox"/> 样品 Sample		<input type="checkbox"/> 量产供货 Mass Product	
客户审核 (加盖公章) Client approval (Stamp)			洲光源审核 Chaulight approval		
核准Approval	确认Checked	核准Approval	确认Checked	制作Edited	
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<input type="checkbox"/> 接收 Qualified			<input type="checkbox"/> 不接收 Disqualified		日期 Date: 2021-1-12

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ZSOS-T0502-02 由红外发射二极管和NPN 硅光晶体管组成，它们并排封装在黑色热塑性外壳中的汇聚光轴上。光电晶体管只接收来自 IR 的辐射。这是正常情况。但当物体在中间时，光电晶体管不能接收辐射。有关更多组件信息，请参阅 IR 和 PT。

The ZSOS-R0502-02 consist of an infrared emitting diode and an NPN silicon phototransistor, encased side-by-side on converging optical axis in a black thermoplastic housing. The phototransistor receives radiation from the IR only. This is the normal situation. But when an object is in between, phototransistor could not receives the radiation. For additional component information, please refer to IR and PT.



特性 Feature

- 可靠性高、辐射强度高、低电压驱动
High reliability、High radiant intensity、Low forward voltage、
- 感应速度快、感光度强
Fast response time、High photo sensitivity
- 截止感应波长 940nm
Cut-off visible wavelength $\lambda_p=940\text{nm}$
- 无铅材料、Rosh 认证
Pb.Free、RoHS compliant version

应用 Application

- 打印机、非接触开关
Printer、Non-contact Switching
- 智能电子产品
Intelligent Electronic Products
- 工业机械设备
Industrial Intelligent Equipment
- 安防防护应用
Safety Application Products

最大额定值 Absolute Maximum Ratings

测试项目	Parameter (Ta=25°C)	符合Symbol	范围 Ratings	单位 Unit
输入端发射极 Input Emitter	功率Power Dissipation *1	Pd	75	mW
	反向电压Reverse Voltage	V _R	5	V
	持续正向电流Forward Current	I _F	50	mA
	脉冲正向电流Peak Forward Current *2	I _{FP}	1	A
输出端接收极 Output Detector	功率Power Dissipation *1	Pd	75	mW
	集电极-发射极电压Collector-Emitter Voltage	V _{CEO}	35	V
	发射极-集电极电压Emitter-Collector Voltage	V _{ECO}	5	V
	集电极电流Collector Current	I _{C(ON)}	20	mA
工作温度Operating Temperature	Topr	-25~+85	°C	
储存温度Storage Temperature	Tstg	-40~+85	°C	
焊接温度Lead Soldering Temperature*3	Tsol	260	°C	
湿敏等级 Wet sensitivity level	MSL	4		

*1、在 25 摄氏度的环境中测试 below 25 Free Air Temperature

*2、脉宽少于等于 100us, 占空比 1% Pulse width ≤ 100μs, Duty cycle= 1%

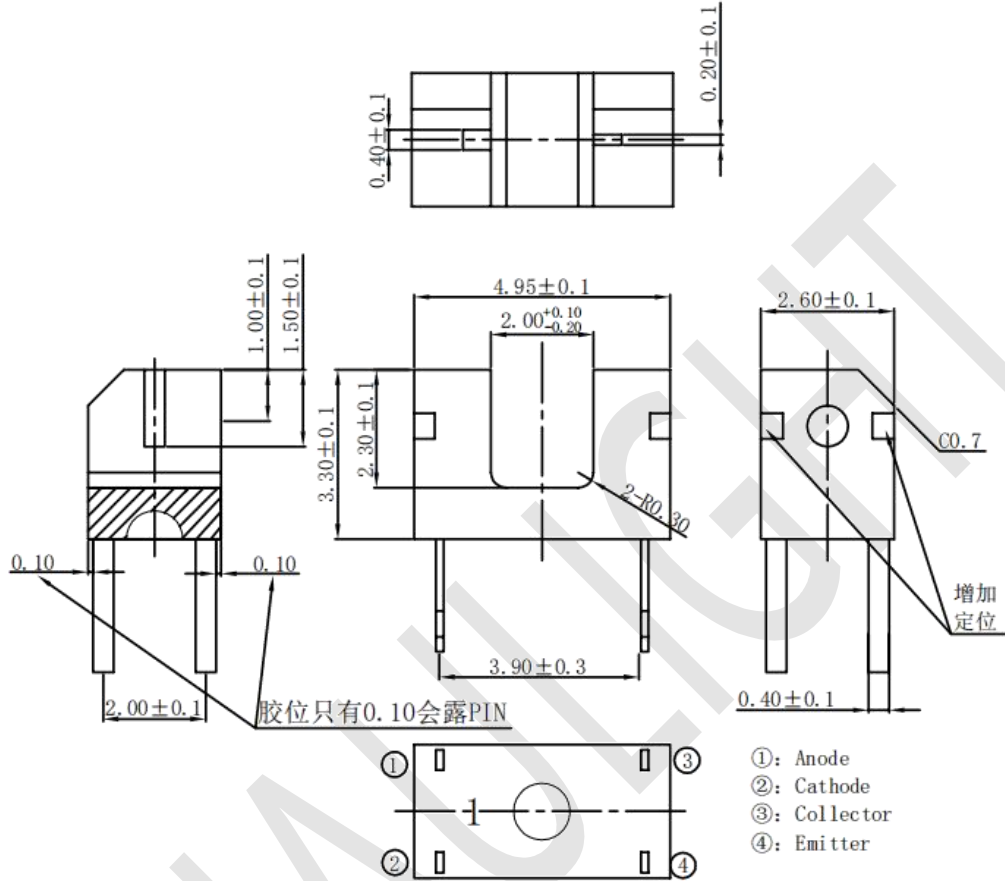
*3、离胶体 2mm 以上焊接 5s 内 2mm form body for 5 seconds

光电特性 Electro-Optical Characteristics

电性参数 (温度=25°C)	符号	条件	最小值	典型值	最大值	单位	
Parameter (Ta=25°C)	Symbol	Condition	Min.	Typ.	Max.	Units	
输入端 Input	正向电压Forward Voltage	I _F =20mA	--	1.2	1.5	V	
		I _F =100mA*2	--	1.4	1.85		
		I _F =1A*2	--	2.6	4.0		
峰值波长Peak Wavelength	λ _p	I _F =20mA	--	940	--	nm	
反向电流Reverse Current	I _R	V _R =5V	--	--	10	μA	
输出端 Output	暗电流 Dark Current	I _{CEO}	E _e =0mW/cm ² V _{CE} =20V	--	--	100	nA
	集电极-发射极的工作电压 C-E Saturation Voltage	V _{CE(SAT)}	I _C =2mA E _e =1mW/cm ²	--	--	0.4	V
转换特性 Transfer Characteristics	上升时间Rise Time	t _r	V _{CE} =5V I _C =1mA	--	15	--	μS
	下降时间Fall Time	t _f	R _L =1000Ω	--	15	--	
	光电流 Collector Current	I _{C(ON)}	I _F =10mA V _{CE} =5V	0.18	0.8	1.6	mA

*2、脉宽少于等于 100us, 占空比 1% Pulse width ≤ 100μs, Duty cycle= 1%

产品尺寸 Package Dimension



备注Notes:

--所有尺寸为毫米标识

All dimensions are in millimeters

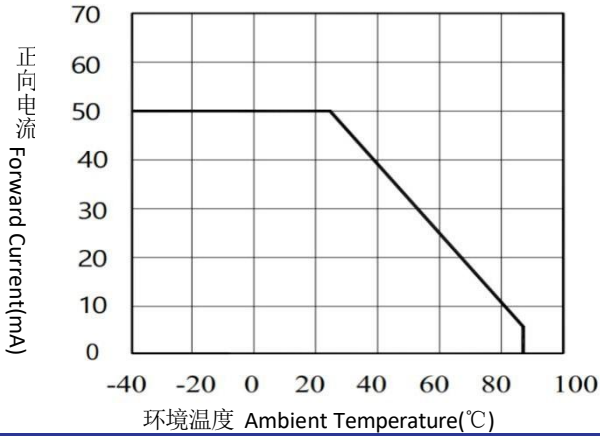
--未标识尺寸正负公差为 0.3mm

Tolerances unless dimensions $\pm 0.3\text{mm}$

发射管特性曲线图 Typical Electro-Optical Characteristics Curves-IR

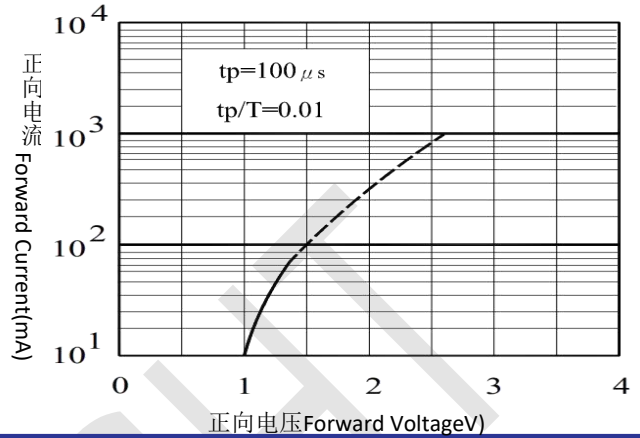
正向电流与环境温度的关系

Forward Current vs. Ambient Temperature



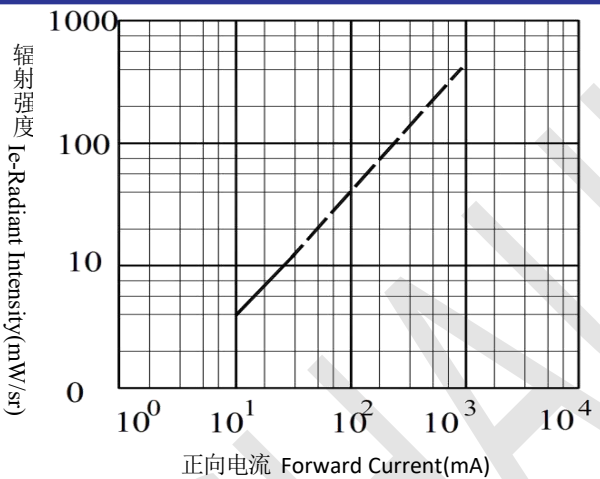
正向电流与正向电压的关系

Forward Current vs. Forward Voltage



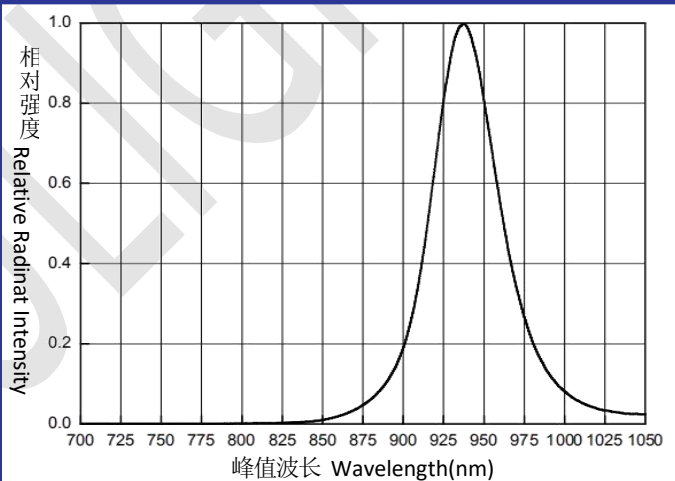
辐射强度与正向电流的关系

Radiant Intensity vs. Forward Current



波长曲线图

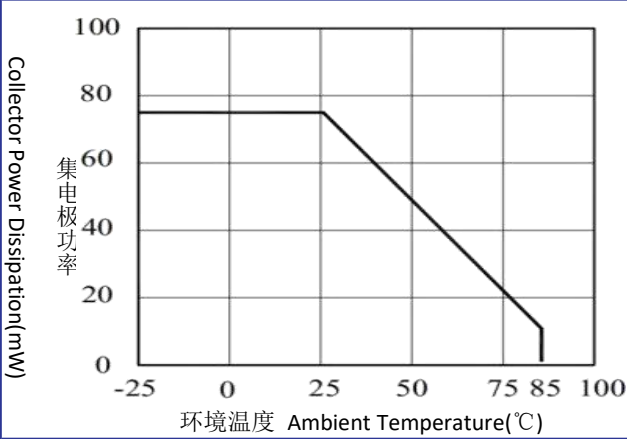
Spectral Distribution



接收管特性曲线图 Typical Electro-Optical Characteristics Curves-PT

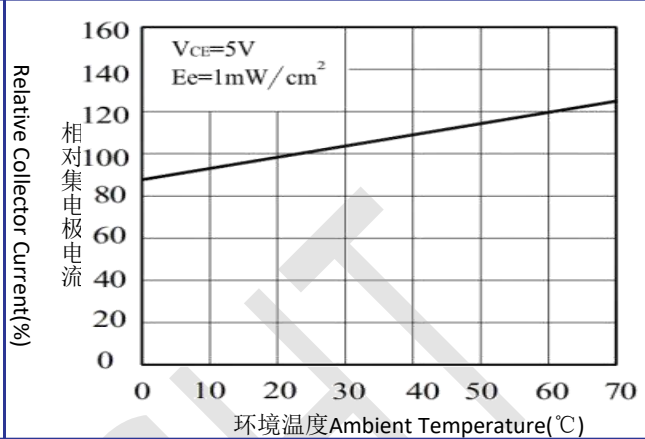
集电极功率与环境温度的关系

Collector Power Dissipation vs. Ambient Temperature



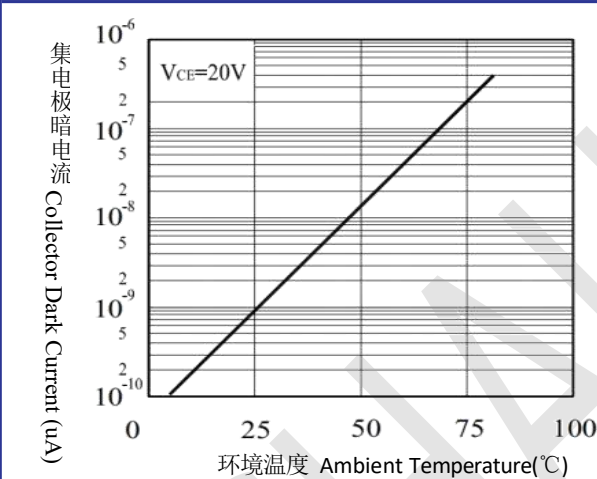
相对集电极电流与环境温度的关系

Relative Collector Current vs. Ambient Temperature



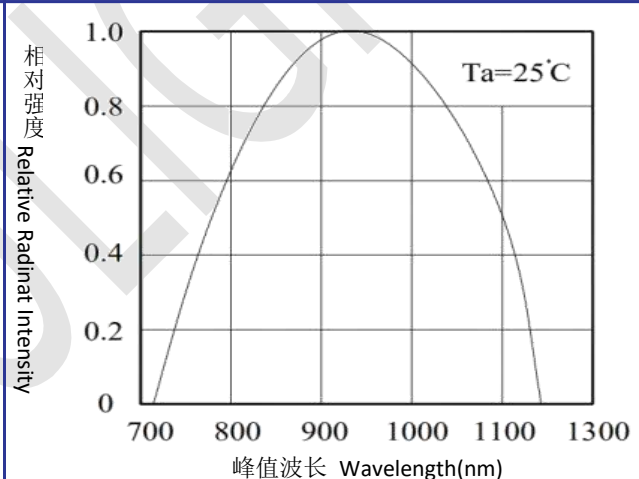
集电极暗电流与环境温度的关系

Collector Dark Current vs. Ambient Temperature



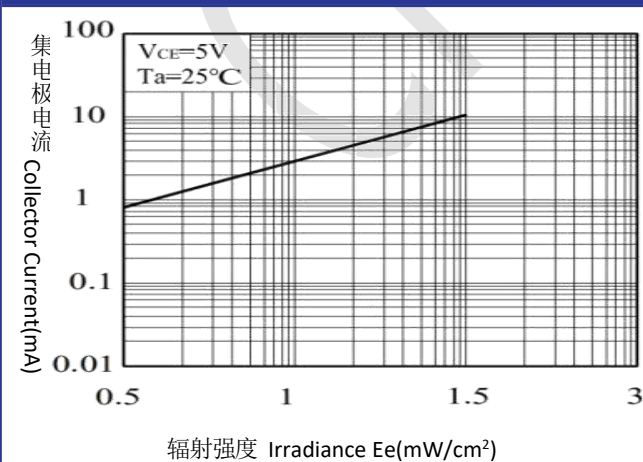
感应波长曲线图

Spectral Sensitivity



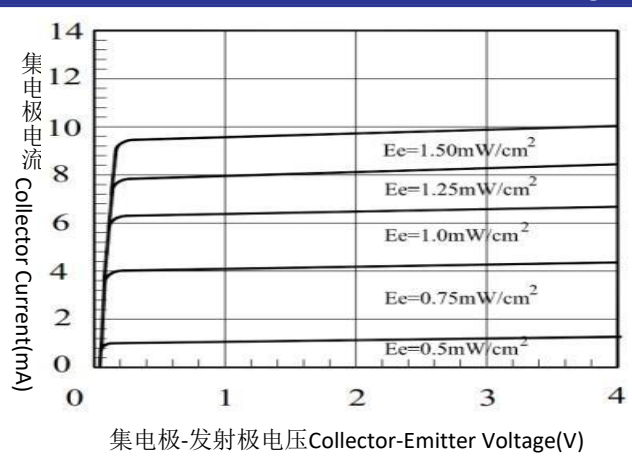
集电极电流与辐射强度的关系

Collector Current vs. Irradiance



集电极电流与集电极-发射极电压的关系

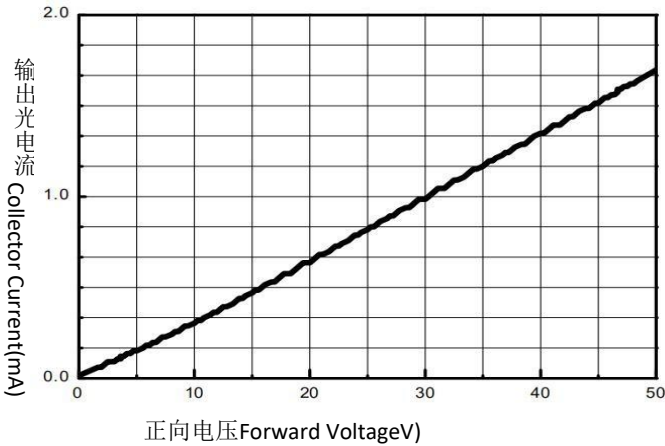
Collector Current vs. Collector-Emitter Voltage



光电开关特性曲线图 Typical Electro-Optical Characteristics Curves-ITR

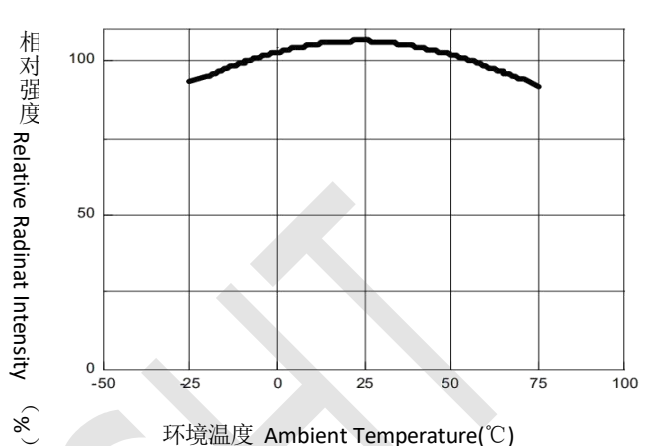
光电流与正向电压的关系

Collector Current vs. Forward Voltage



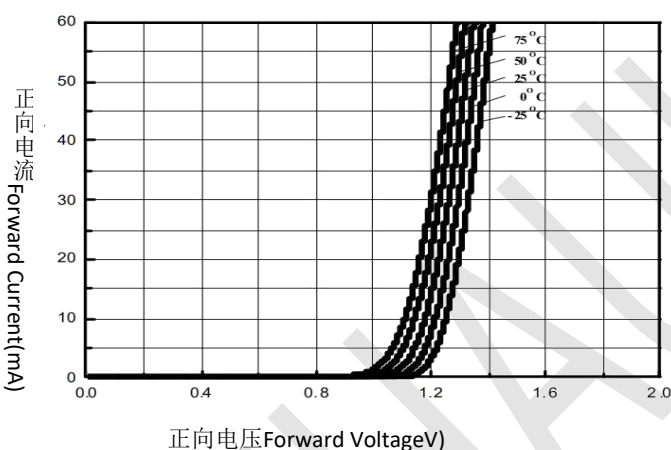
输出强度与环境温度的关系

Relative Output vs. Ambient Temperature



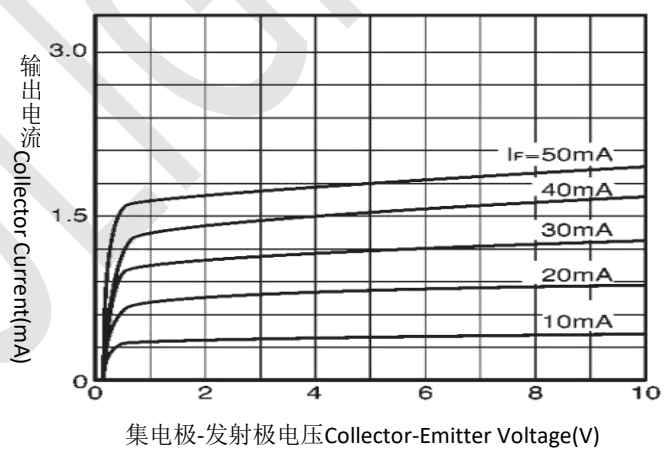
正向电流和正向电压的关系

Forward Current vs. Forward Voltage



输出特性

Output Characteristics



注意事项 Note

--其他 Other

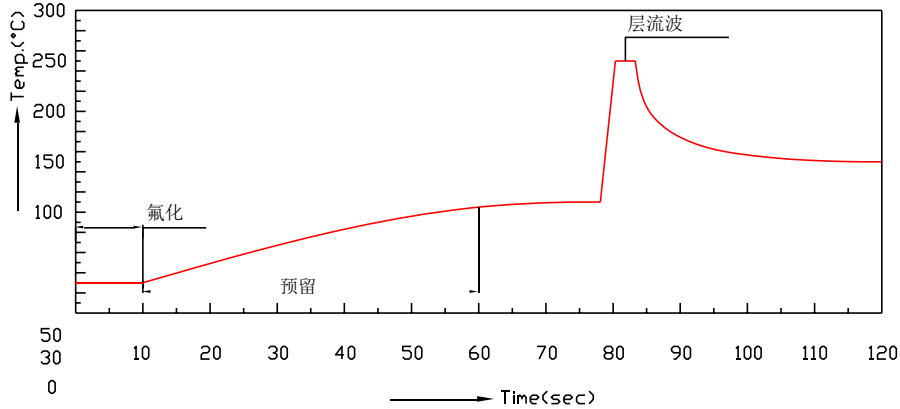
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焊接条件 Soldering Condition

1. 焊接时应小心注意。焊接时，从焊缝到环氧树脂球泡的间距应超过3mm，并建议在拉杆底座之外进行焊接。
2. 推荐的焊接条件：

手工焊接； Hand Soldering		DIP焊接； DIP Soldering	
焊接温度 welding temperature	最大300° C。（最大30W） 300°C Max. (30W Max.)	预热温度。 Preheat temp.	100° C。（最长60秒） 100°C Max. (60 sec Max.)
焊接时间 Welding time	最大3秒。 3 sec Max.	浴的温度。&时间 Bath temp. & time	最大260秒，最长5秒 260 Max., 5 sec Max
距离 distance	最小为3毫米。（从焊缝到环氧树脂灯泡） 3mm Min.(From solder joint to epoxy bulb)	距离 Distance	最小为3毫米。（从焊缝到环氧树脂灯泡） 3mm Min. (From solder joint to epoxy bulb)

3. 推荐的焊接轮廓



4. 当光中断器处于高温状态时，避免对铅架施加任何应力，尤其是在焊接时。Avoid applying any stress to the lead frame, when the optical interruptor is at high temperature, especially during welding
5. 浸渍和手工焊接不得超过一次。Impregnation and manual welding shall not be performed more than once
6. 焊接断光器后，应保护环氧树脂灯泡免受机械冲击或振动，直到断光器恢复到室温。After welding the breaker, the epoxy bulb shall be protected from mechanical shock or vibration until the breaker is restored to room temperature
7. 不建议采用快速速率工艺将光干扰器从峰值温度冷却下来。A fast speed process is not recommended to cool the optical distractor from the peak temperature.
8. 尽管上表中规定了推荐的焊接条件，但隔光干扰器需要在最低的温度下倾斜或手工焊接。Although the recommended welding conditions are specified in the table above, the diaphragm jammer needs to be tilted or manually welded at the lowest temperature.
9. 焊线参数必须根据推荐温度和焊波停留时间设置和维护。Wding parameters must be set and maintained according to recommended temperature and wave residence time.

清洁**cleaning**

不要用超声波清洗断光器。

Do not clean the optical breaker with ultrasonic waves

热管理**heat management**

1. 在断光器应用的设计阶段，必须考虑到断光器的热管理。应参照每个产品规范中的降级曲线适当降低电流。In the design phase of the light breaker application, the thermal management of the light breaker must be considered. The current shall be appropriately reduced with reference to the degradation curve in each product specification
2. 应控制应用程序中断光器周围的温度。

The temperature around the application interrupt light device should be controlled

--储存 Storage

- 1、产品准备使用前不要打开防潮袋。Do not open moisture proof bag before the products are ready to use.
- 2、在打开包装之前，二极管应保持在 10°C~30°C 和 90%RH 或以下。Before opening the package, the LED should be kept at 10°C~30°C and 90%RH or less.
- 3、二极管建议在一年内使用。The LED suggested be used within one year.
- 4、打开包装后，设备必须存储在 10°C~30°C 和 60%RH，并在 72 小时内使用（地板寿命）。如果未使用的二极管仍然存在，它应储存在防潮包装中，除湿条件烘烤 $60\pm 5^{\circ}$ 24小时。
After opening the package, the devices must be stored at 10°C~30°C and 60%RH, and used within 168 hours (floor life). If unused LED remain, it should be stored in moisture proof packages.
- 5、如果吸湿材料（干燥剂材料）已褪色或未打开的袋子已超过保质期或设备（袋外）已超过地板寿命，需要烘焙处理。If the moisture absorbent material (desiccant material) has faded or unopened bag has exceeded the shelf life or devices (out of bag) have exceeded the floor life, baking treatment is required.
- 6、如果需要烘焙，请参阅 IPC/JEDECJ-STD-033 进行烘焙程序或建议以下条件：在 $60^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 和 $5\%\text{RH}<96$ 小时（筛/管/套单位）If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure or recommend the following conditions: 96 hours at $60^{\circ}\text{C}\pm 5^{\circ}\text{C}$ and $< 5\% \text{RH}$ (reeled/tubed/loose uni--

更改记录表 Engineering Change Notice-Record

版本 Edition	更改日期 Date	主要更改内容 Main Content	拟制 Prepared	确认 Checked
1.1	2021-1-12	新产品发布New Production	王乐	郝三强