

# 惠州市鑫永诚传感科技有限公司

## Huizhou Newopto Sensor Technology Co., Ltd.

### 产品承认书

### SPEC FOR APPROVAL

客户名称 Customer		
产品名称 Model Name	热释电红外传感器 pyroelectric infrared sensor	
产品型号 Model No	XYC-PIR203B-D0	
承认编号 Approval No		
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核准(Approved by)	审核(Checked by)	编制(Edited by)
Wei Wu	Hongjian Wang	Jiahui Liu
客户确认(Customer Signatures)		

地址：惠州市惠城区仲恺高新区潼湖镇三和村联东 U 谷数字科创产业园 9 栋

电话(Tel):0752—7987222

网址(Web site):<http://www.xycgd.com>

传真(Fax):0752—7987000

邮箱(E-mail):[wuwei@xycgd.com](mailto:wuwei@xycgd.com)



**XYC-PIR203B-D0** 热释电红外传感器是利用温度变化的特征来探测红外线的辐射,采用双元补偿的方法抑制温度变化产生的干扰,提高了传感器的工作稳定性。采用阻容滤波电路、阻容选频电路,增强了传感器的电磁兼容性,使传感器对射频干扰(RFI)的抗扰度高,产品应用广泛,例如防盗报警器、感应门、自动灯具、智能玩具、安防监控摄像机等。The XYC-PIR203B-D0 pyroelectric infrared sensor uses the characteristic of temperature change to detect the infrared radiation,it uses the binary compensation method to suppress the interference caused by the temperature change, thereby improving the

working stability of the sensor. The resistance-capacitance filtering circuit and the resistance-capacitance frequency selective circuit are used to enhance the electromagnetic compatibility of the sensor, so that the sensor has higher immunity to radio frequency interference (RFI). The product can be used in burglar alarms, induction doors, automatic lamps,intelligent toys and security surveillance cameras, etc.

## 特性 Feature

- 高灵敏度和优越的信噪比 High sensitivity and superior signal to noise ratio
- 采用双元补偿结构,有效抵抗外界环境干扰 Adopting binary compensation structure to resist external environmental interference effectively
- 干涉滤光片截止深度高,抗白光能力强 Interference filter has high cut-off depth and strong white light resistance
- 采用阻容滤波电路,增强抗射频干扰能力 Using resistance-capacitance filtering circuit,increase anti RFI abilities.

## 应用 Application

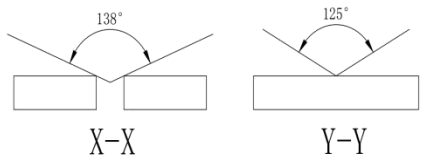
- 适用于各类自动照明开关 Applicable to all types of automatic lighting switches
- 适用于各类防盗报警用入侵探测器 Applicable to all kinds of intrusion detectors for burglar alarms
- 适用于各类智能玩具 Applicable to all kinds of smart toys
- 适用于各类智能家用电器 Applicable to all kinds of smart household appliances

## 优势 Advantages

- 品种齐全,生产周期短,小批量库存备货 Complete varieties, short production cycle,Prepared small batch inventory
- 严格的品质保障体系,让您使用无忧 Strict quality assurance system
- 提供全方位的技术支持服务 Provide a full range of technical support

技术指标 Specification

表 1 Chart 1

封装 Package	TO-5
窗口尺寸 Window size	5*3.8mm
红外接收电极 IR Receiving Electrode	2*1mm, 2 个灵敏元
接收波长 Spectral Response	5.5—14 $\mu$ m
透过率 Transmittance	$\geq 75\%$
输出信号峰值[Vp-p]Peak Output Signal(Vp-p)	$\geq 3500\text{mV}$
灵敏度 Sensitivity	$\geq 3300\text{V/W}$
噪声峰值[Vp-p]Noise(Vp-p)	$<80\text{mV}$
输出平衡度 Output Balance	$<10\%$
源极电压 Offset Voltage	0.4~1.0V
电源电压 Supply Voltage	2~15V
工作电流 Working current	2 $\mu$ A
工作温度范围 Operating Temp	-30~70 $^{\circ}\text{C}$
保存温度范围 Storage Temp	-40~80 $^{\circ}\text{C}$
入射视角图 Field of View	
等效电路图 Equivalent circuit diagram	

测试方法 Testing Method

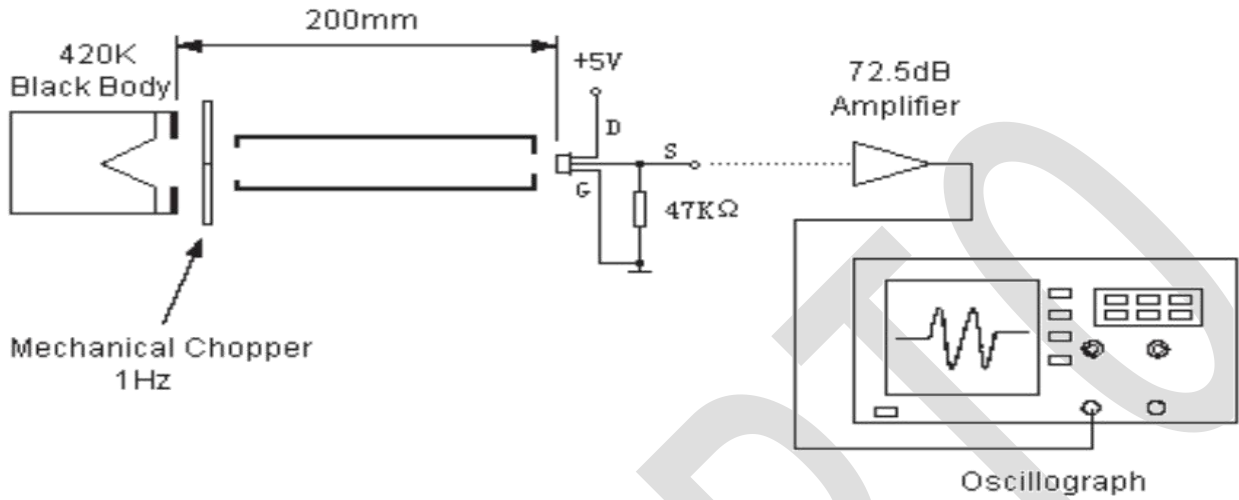


图 2 测试示意图 Test diagram

测试条件 Testing condition

- 环境温度 25°C

Ambient temperature 25 degree

- 黑体温度 420K

Black body temperature 420k

- 调制频率 1 赫兹, 0.3~3.5 赫兹 $\Delta f$

Modulation frequency 1 Hz, 0.3~3.5Hz $\Delta f$

- 放大增益 72.5dB

Amplification gain 72.5dB

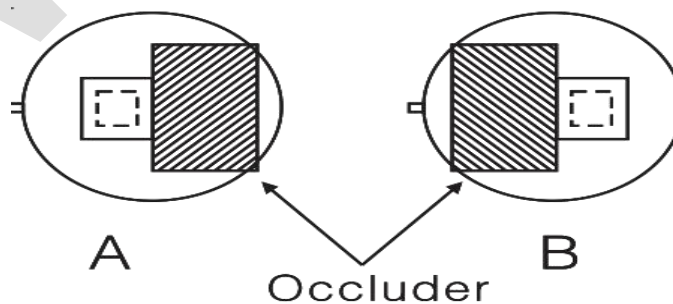


图 3

双元传感器的灵敏平衡度是通过测量每个单元的灵敏度（即单个输出峰值电压），并采用下列公式计算得出。  
 The sensitive balance of the binary sensor is measured by measuring the sensitivity of each unit (ie, the individual output peak voltage) and using the following formula

平衡度 =  $|VA - VB| / (VA + VB) \times 100\%$   
 Balance =  $|VA - VB| / (VA + VB) \times 100\%$   
 VA = A 面的灵敏度 (mVp-p)  
 VA = sensitivity of side A (mVp-p)  
 VB = B 面的灵敏度 (mVp-p)  
 VB = sensitivity of the B plane (mVp-p)

**典型信号特性 Typical signal characteristic**

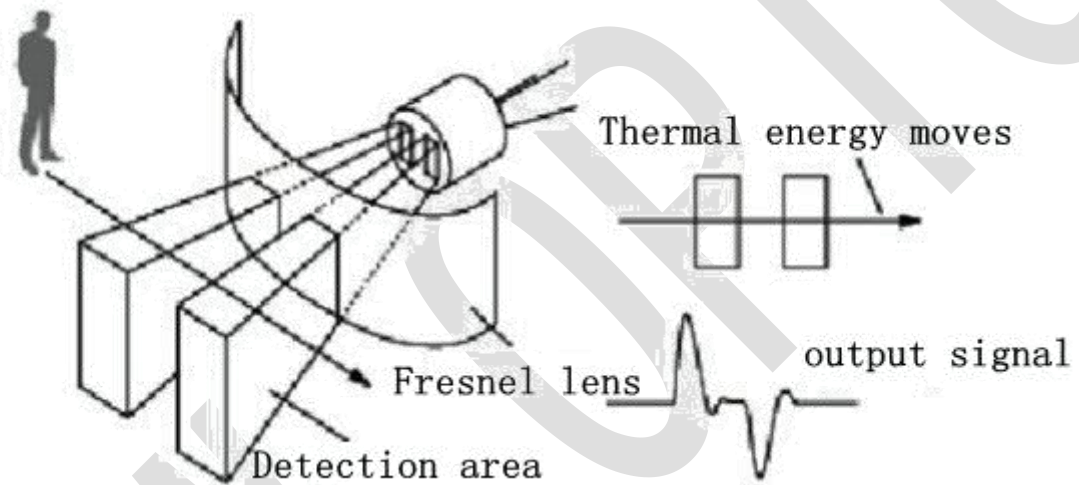


图 4

**菲涅尔透镜 Fresnel lens**

使用菲涅尔透镜可以决定传感器的检测范围和检测距离。根据客户的要求，可以对应各种检测范围和检测距离。  
 The Fresnel lens determines the detection range and distance of the sensor. According to customer requirements, it can correspond to various detection range and detection distance

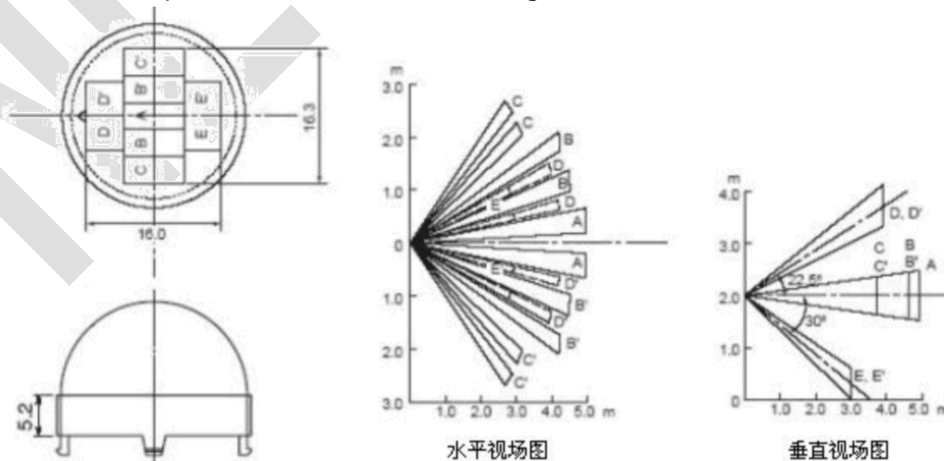


图 5

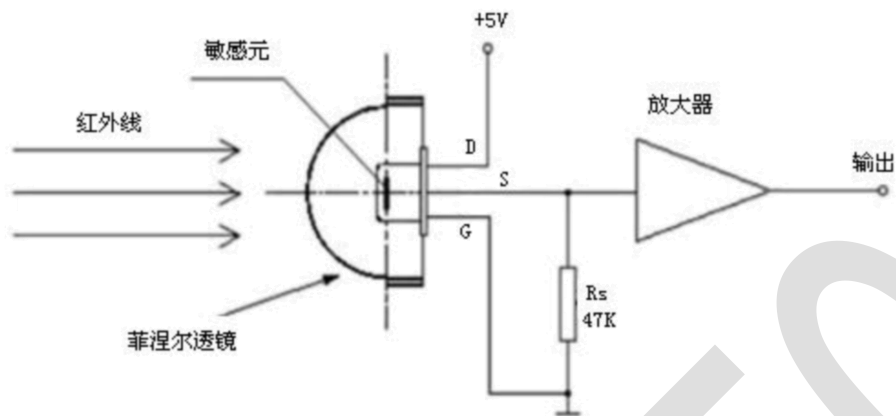


图 6

**窗口材料的可接收通过波长 Window material receiving wavelength**

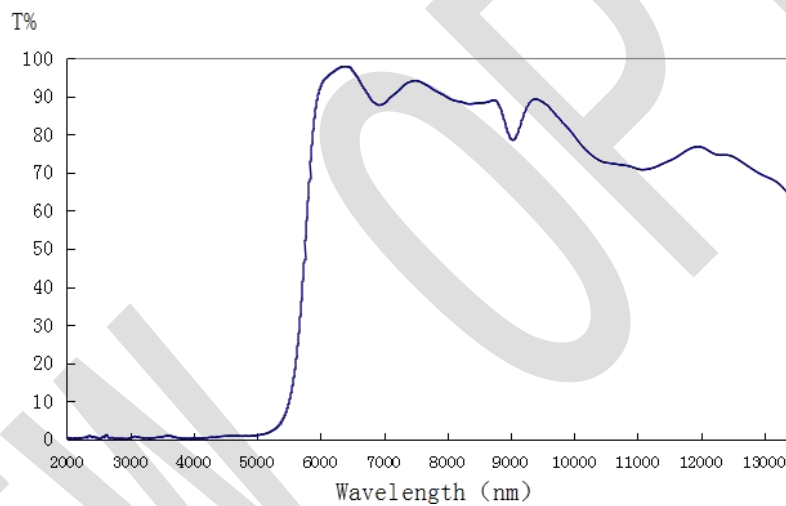


图 7

注意：图表所示为典型的 5.5um 红外滤光片参考图，曲线是红外线通过率的平均值。该窗口材料是经过特殊真空镀膜处理过的半导体硅片。

Note: the chart shows the typical 5.5um infrared filter reference graph. The curve is the average of the infrared pass rate. The window material is a semiconductor silicon wafer with special vacuum coating.

典型应用电路 Typical application circuit

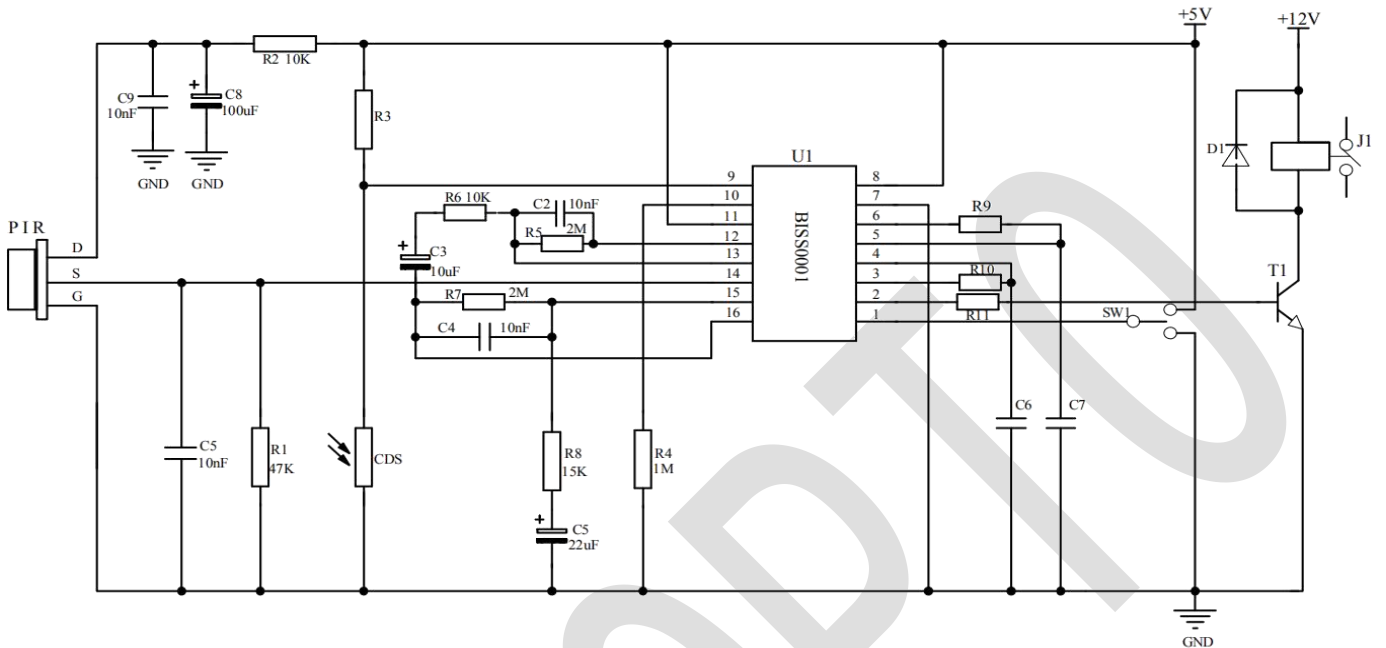


图 8

产品外形尺寸 (mm) Product Dimension

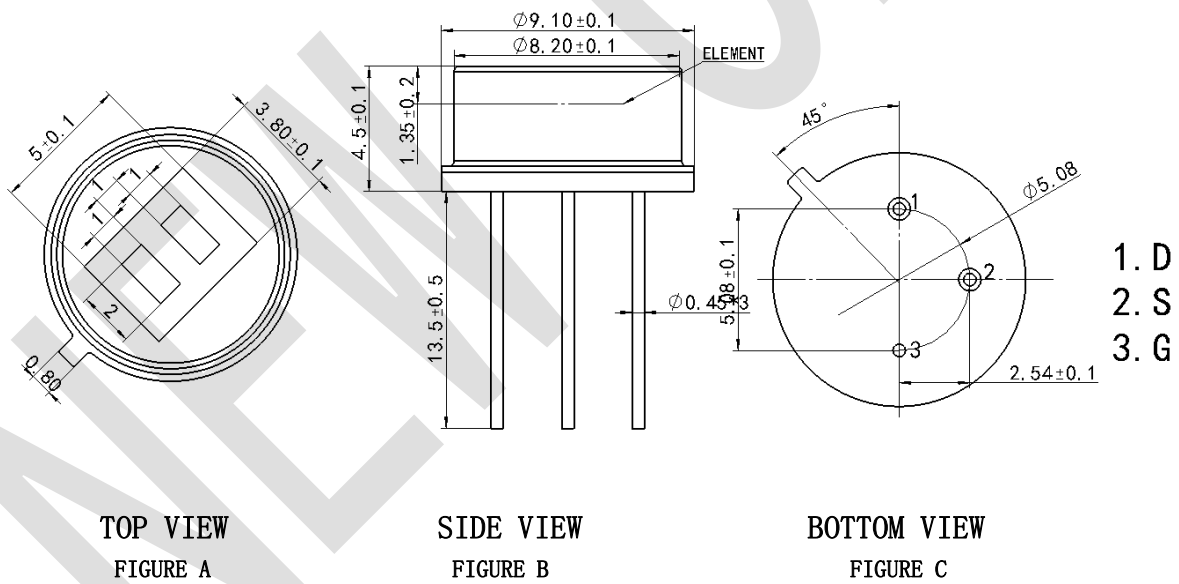


图 9

管脚定义:

Pin description:

1	D 供电引脚 Power supply pin
2	S 源极信号输出脚 Source signal output pin
3	G 接地脚 GND

**焊接 Soldering**

焊接过程中的不慎操作将会引起产品的损坏,请务必注意。焊接过程中应避免对产品支架或封装部分施加压力。焊接时,请保证焊接位置与传感器底部有一定的距离,该距离因不同的焊接方法而有所不同,请参照以下推荐焊接条件。

Careless operation during soldering will cause damage to the product, please be careful. Please avoid put pressure on the product bracket or package part during soldering. When soldering, please ensure that the soldering position has a certain distance from the bottom of the sensor. This distance varies with different welding methods. Please refer to the recommended welding conditions below.

**推荐焊接条件 Recommended Soldering Conditions**

焊接模式 Soldering Mode		固定形式 Fixed Form
手工焊接 manual soldering	烙铁温度 Soldering iron temperature	<350°C
	焊接时间 Soldering time	<5 秒 <5seconds
	焊接位置 Soldering position	>1.5mm (从 PCBA 到底座) >1.5mm(from PCBA to base)
锡炉焊接 Tin stove welding	预热 Preheat	最高温度 100°C 不超过 60 秒 Highest temperature 100 degree, not more than 60 seconds
	浸焊温度 Dip soldering temperature	最高 280°C Max 280 degree
	浸焊时间 Dip soldering time	<5 秒 <5 seconds
	焊接位置 Soldering position	>1.5mm (从 PCBA 到底座) >1.5mm(from PCBA to base)

**使用注意事项 Caution**

感谢您使用惠州市鑫永诚传感科技有限公司的 PIR 系列产品,为增进您对我公司产品特性的了解,也为方便您快速掌握产品的基本操作,为尽量减少或避免因人为等因素造成不必要的产品损坏,使其能够更好的为您的生产服务,特针对使用过程中的一些规范使用作相应说明,同时即使是同一规格 PIR,在实际应用领域其可靠性与整体系统设计水平、作业方式、使用条件均相关。本使用说明不可能涵盖客户使用过程中可能碰到的所有问题,由此带来的不便,敬请谅解!

Thanks for using Huizhou Newopto Sensor Technology Co.,Ltd PIR series products.In order to enhance your understanding of our products characteristics and avoid unnecessary damage due to man made factors,we provide corresponding operation standard instruction.At the same time,even if you are using the same specification PIR,its reliability is related to overall system design level,operation mode and use condition.This instruction couldn't cover all questions customers may meet during using.We apologize for any inconvenience caused sincerely.

■ **产品声明 Product Declaration**

- 传感器的出厂参数是在标准黑体和相关参数测试条件下经过一分钟稳定时间后测试所得。
- The factory parameters of the sensor are tested after one minute stabilization time under standard blackbody and related parameter test conditions.
- 使用本产品之前，请贵司务必预先进行测试，以便确认是否适合使用目的，产品介绍的用途并不保证不抵触任何专利，有关 PIR 产品的进出口法律责任应由客户担负，请预先查清每个国家或地区的有关规定，产品可能会因性能提供或规格参数改变等缘故，恕不经预告更改，我们要求量产前签订正式的产品规格书。
- In order to confirm the product is right for using purpose , pretest is necessary before use . We don't guarantee the product application introduction don't contravene any patent. The corresponding import and export legal responsibility should be taken by customers. Please verify relevant provision in each country and district beforehand. We may change specifications from time to time in the interest of product development,without prior notification or public announcement.We require formal product specifications to be signed before mass production.

■ **储存 Storage**

- 在温度不高于 30℃，湿度不高于 60%RH 的条件下，产品保存期限为 6 个月。将产品保存在密封的容器中并附带干燥剂可以在一定程度上延续产品的储存日期。不良的储存条件会导致产品引脚的腐蚀或产品性能的改变。
- Under the storage conditions of 30℃ or less and humidity less than 60%RH, the storage period is 6months. Store the products in sealed container with moisture absorbent could prolong the storage time to a certain extent. Bad storage conditions may cause the product pin corrode or characteristics change.

■ **静电 Static**

- 静电和电涌会导致产品特性发生改变，例如正向电压降低等，如果情况严重甚至会损毁产品，所以在使用时必须采取有效的防静电措施。所有相关的设备和机器都应该正确的接地，同时必须采取其他防静电和电涌的措施。使用防静电手环，防静电垫子，防静电工作服，工作鞋，手套，防静电容器，都是有效的防止静电和电涌的措施。
- Static and electric surge would change the product features,such as decreasing forward voltage or damage the products.Please make sure adopt effective anti-static measures. All the relative devices and machinery must be properly grounded.And please use anti-static wrist bands,anti-electrostatic gloves, anti-electrostatic containers at the same time to prevent static and electric surge.

■ **设计建议 Design Suggestion**

- 设计产品时请注意传感器的窗口方向，结合菲涅尔透镜来达到较理想的探测角度。

- Please pay attention to the window direction of the sensor when designing the product, and combine the Fresnel lens to achieve a better detection angle.
- 传感器的距离和背景温度、移动中的目标温度、菲涅尔透镜、环境温度、放大器放大倍数设置均有直接关系，使用时需综合考虑各参数。
- The sensor detection distance is related to the background temperature, the moving target temperature, the Fresnel lens, the ambient temperature, and the amplifier magnification setting. It is necessary to consider all parameters when using.

■ 其它 Others

- 传感器采用金属外壳密闭封焊而成，为保证器件的气密性，使用过程中不建议对引线进行弯折，弯折可能会破坏玻璃和金属封接部位的气密性，造成器件漏气。如果需要弯折使用，请使用工具辅助，并保证折弯过程中引线根部不受力。请保证折弯点与传感器底座之间有 3mm 以上的距离。使用过程中不可轴向扭动引线。
- The sensor is sealed by a metal casing. In order to ensure the airtightness of the device, it is not recommended to bend the lead during use. Bending the lead may damage the airtightness of the glass and metal sealing parts, cause air leakage. If you need to bend, please use tool assist and ensure that the root of the lead is not stressed during the bending process. Please ensure the distance between the bending point and sensor base is more than 3mm. Do not twist the leads axially during use.
- 传感器窗口镜片为半导体硅片经特殊材料真空镀膜的滤光片，使用时不能用手或硬物直接接触窗口，如滤光片有脏污，可用绒布沾无水乙醇适度擦拭。
- The sensor window lens is a semiconductor wafers filter vacuum coated by special materials. Please don't touch the window with your hands or hard objects when using. If the filter is dirty, please wipe it with absolute ethanol by lint-free cloth.
- 传感器应避免机械冲击，频繁、过度振动会导致传感器内部敏感元断裂，使用时需轻拿轻放。
- Please avoid mechanical shock for the sensor. Frequent or excessive vibration will cause the sensitive element break.
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