厦 门 华 联 半 导 体 科 技 有 限 公 司

Xiamen Hualian Semiconductor Technology Co., Ltd.

产品规格书
SPECIFICATION

产品名称：可见光探测器

DESCRIPTION: Visible Light Detector

产品型号：HOICD0201P

PART NO.：HOICD0201P

拟制 Prepared	审核 Verified	批准 Approved

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1 概述 General

HOICD0201P 是一个内部集成光敏二极管和电流放大器的光电传感器，可见光范围内高度敏感，输出线性度良好。

HOICD0201P is a photoelectric sensor which incorporates a photodiode and a current amplifier in a single chip. It is highly sensitive in range of visible light and its illuminant output linearity is excellent.

2 特点 Features

- 与人眼相似的光学光反应 Near human eye photopic response
- 电流输出与光亮度比高度线性化 Current output highly linear vs light level
- 反应速度快 Fast response
- 无色透明封装 Water clear epoxy package.

3 应用 Applications

- 黎明前或傍晚时感光 Dawn/dusk sensing
- 安全灯 Security lighting
- 笔记本电脑、手机背光控制 LCD backlight control in Notebook PC. Mobile-phone, etc
- 夜灯 Night-lights

4 极限参数 Absolute Maximum Ratings (T=25℃)

表 1 极限参数

Table1 Absolute Maximum Ratings

参数名称 Parameter	符号 Symbol	额定值 Value	单位 Unit
供给输入电压 Give Input Voltage	V	-0.3 ～10	V
供给输入电流 Give Input current	I	内部限制 Within Restrict	mA
工作温度范围 Operating Temperature Range	T_{OP}	-25～+85	℃
存储温度 Storage Temperature Range	T_{st}	-40～+100	℃
焊接温度 Soldering Temperature	T_{sol}	260	℃

5 光电参数 Opto-Electrical Characteristics（Rss=10kΩ，Vdd=5V， Ta=-25℃）

表 2 光电参数

Table2 Opto-Electrical Characteristics

参数名称 Parameter	Symol 符号	Test Conditions 测试条件	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
暗电流 Dark Current	I_{DD}	0Lux Ta=25℃	—	—	150	nA
光电流 Light Current	Iss	100Lux	100	160	280	uA
		50Lux	50	80	140	uA
		10Lux	6	10	18	uA
峰值光谱反应 Wavelength of Peak Sensitivity	λ_p	—	—	520	—	nm

6 推荐应用电路 Recommended applications Circuit

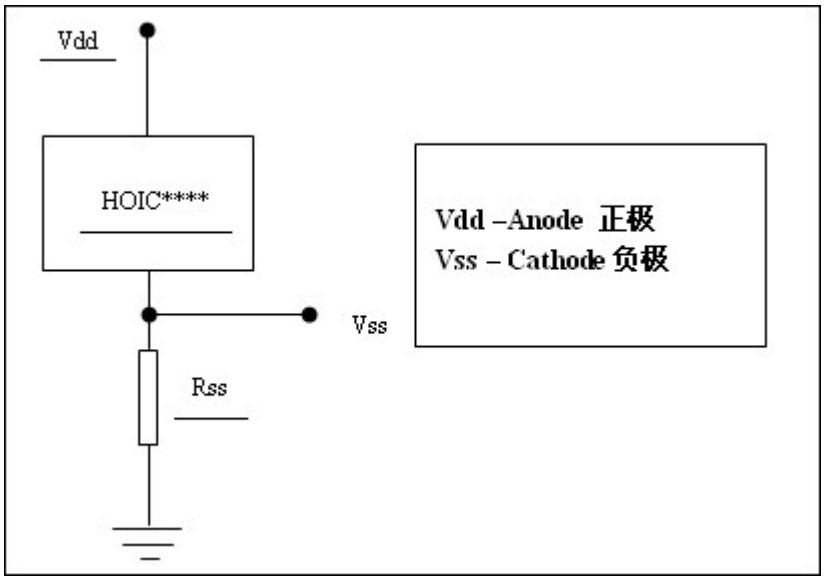


图 1 推荐应用电路 Figure 1 Recommended applications circuit

6 外形尺寸 Dimensions

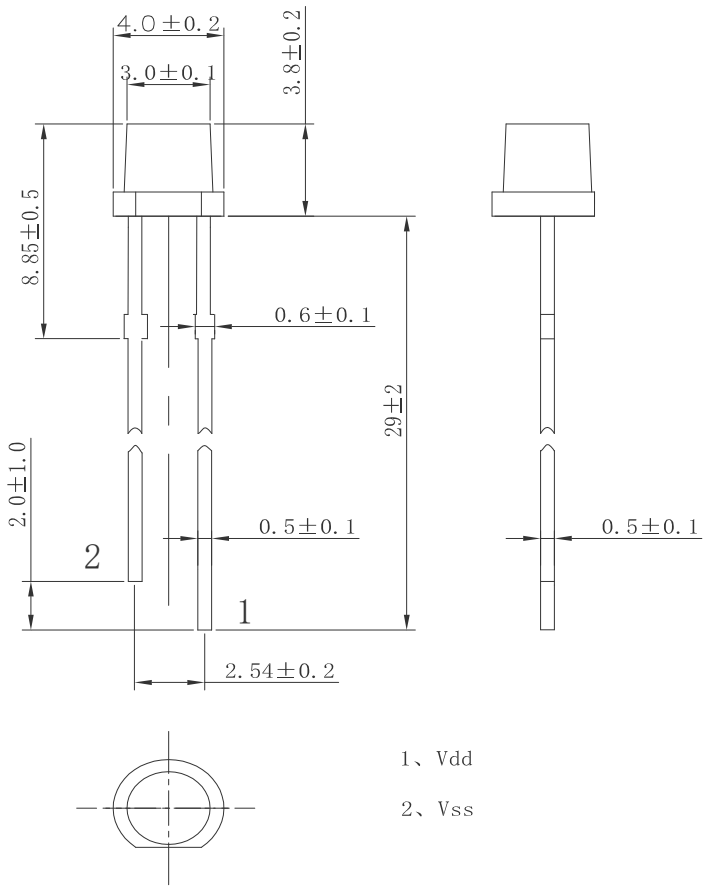


图 2 外形尺寸 Figure 2 Dimension

7 特性曲线 Characteristics Curve

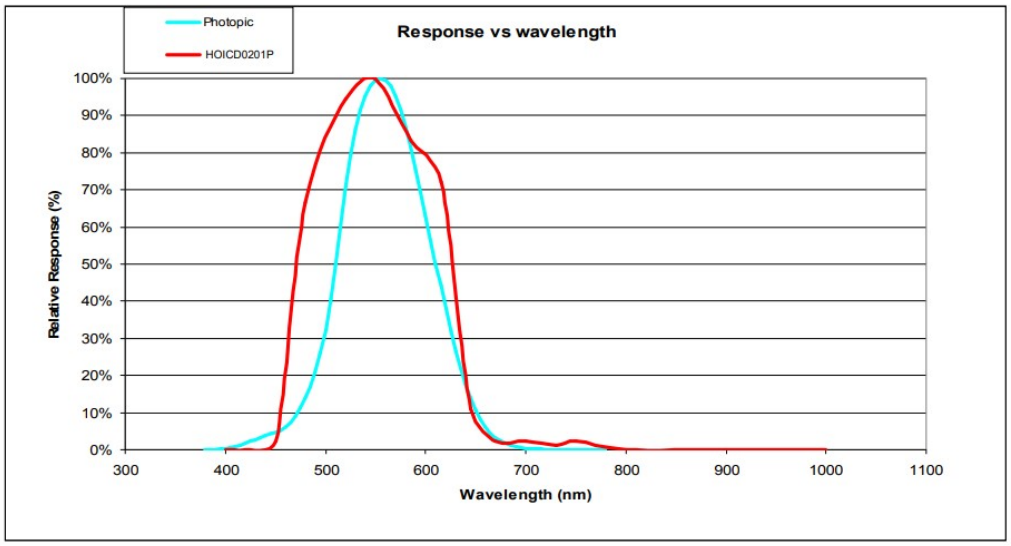


图 3 人眼与可见光探测器反应曲线 Figure 3 Overlaid response curves

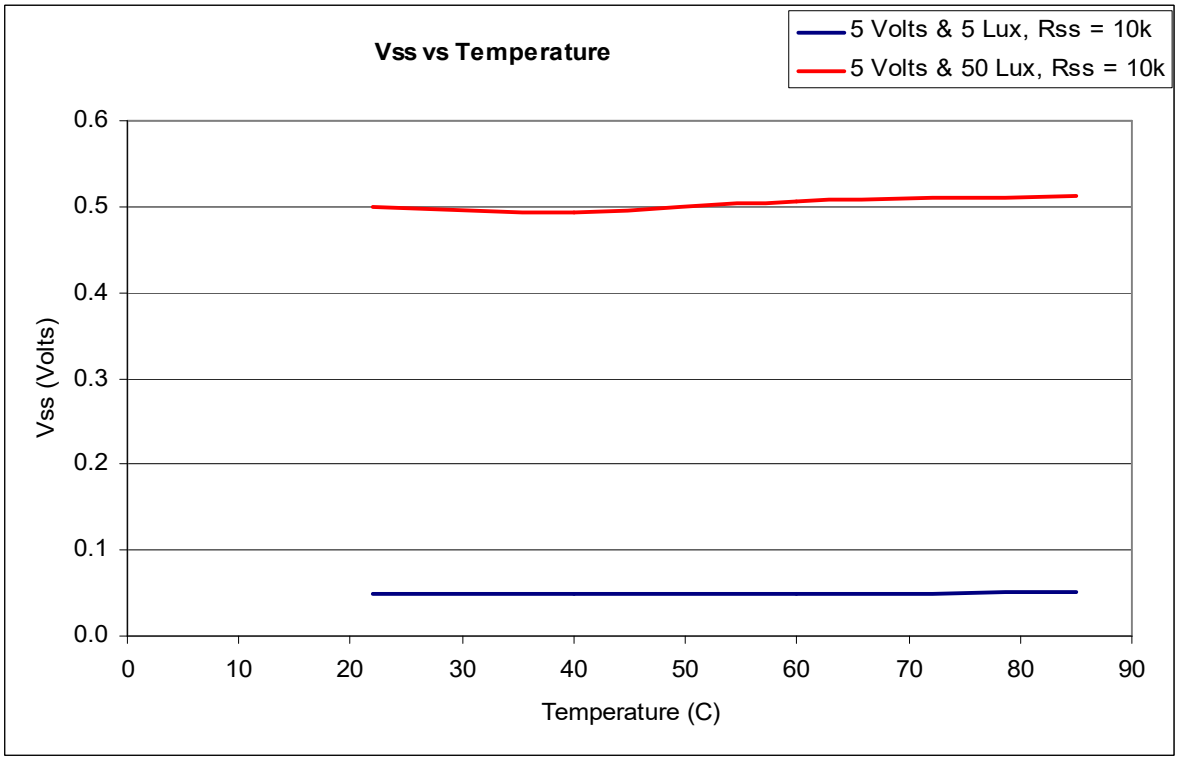


图 4 Vss 与温度曲线 **Figure 4** Vss vs Temperature Curve

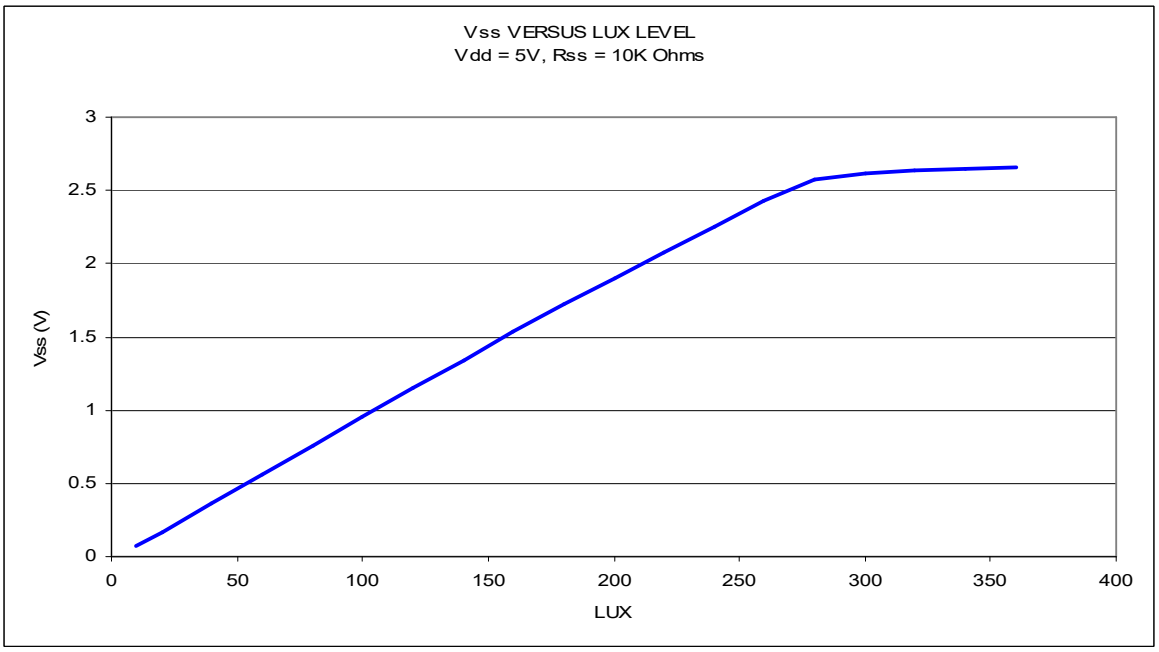


图 5 Vss 与光亮度曲线（1）**Figure 5** Vss vs luminance Curve（1）

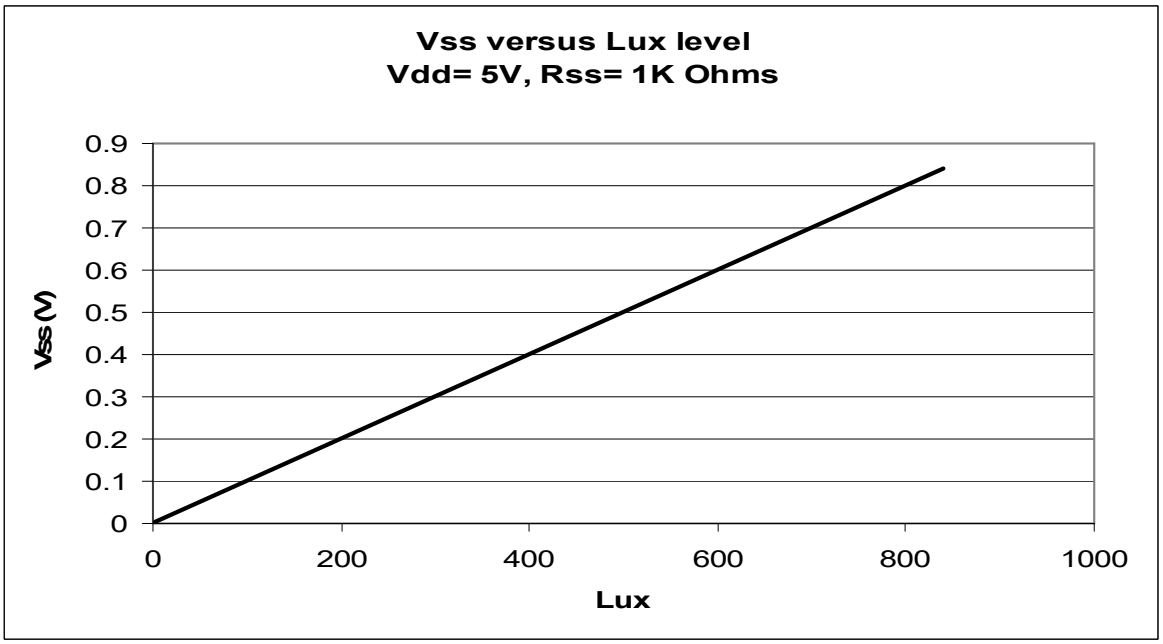


图 6 Vss 与光亮度曲线（2）Figure 6 Vss vs luminance Curve（2）

8 可靠性试验要求 Reliability Test

表 3 可靠性试验要求

Table3 Reliability Test

组别 No.	试验项目 TEST ITEM	试验样品 SAMPLE NUMBER	试验条件 TEST CONDITIONS	指标 REQUEST	[Ac，Re]
1	引出端拉力 Terminal Pull	16	外加力：5N Pull：5N 时间：10 秒 Time：10s	无损坏 No Damage	[0，1]
	引出端弯曲强度 Terminal Intension	16	外加力：2.5N 0°～90°～0° 弯曲 2 次 Pull：2.5N 0°～90°～0° Bend 2 times	无损坏 No Damage	[0，1]
2	可焊性 Solderability	16	温度：（245±5）℃ Temperature：（245±5）℃ 时间：（2±0.5）秒 浸入离器件本体（1.0～1.2）mm 处 Times：（2±0.5）s Dip up to 1.0~1.2mm from the terminal root 焊剂：松香 25%，酒精 75% Flux: 75% isopropyl alcohol, 25% WW resin.	浸润面积≥浸渍面积的 95% Soakage Area≥95 percent of Dip Area	[0，1]
	耐焊接热 Thermal Weld	16	焊锡温度（270±5）℃,浸渍时间（10±1)S,浸渍到离器件本体（2~2.5）mm 焊剂：松香 25%,酒精 75% Temperature：(270±5)℃ Immersed for (10±1)sec.（2.0~2.5）mm away from the body. Flux: 75% isopropyl alcohol, 25% WW resin.	试验完成后，试验样品在标准大气条件下恢复 4h 后，在 4h 内测试光电参数应符合表 2 的规定。	[0，1]

		16	烙铁焊：焊锡温度（350±5）℃,浸渍时间（10±1)秒，焊剂：松香芯焊丝，松香 2.5%-3.5% Temperaturehead of soldering iron:(350±5)℃；sodering time:(10±1) sec；matsuka wire, rosin 2.5%-3.5%	finish a test of optoelectronics characteristics within four hours after renew four hours	[0，1]
3	快速温度变化及交变湿热 Temperature Fast Changing and Heat Humidity Cycling	12	TA=（-40±2）℃，TB=（100±2）℃，暴露时间：10 分钟，转移时间：(2-3）分钟，循环次数：5 次，恢复时间 2h 后继之于循环湿热，试验严酷度：T=(40±2)℃，湿度：(90~96)%；循环次数：2 次 TA=（-40±2）℃，TB=（100±2）℃，Exposure Time：10mins；Transferring Time：2~3mins； Cycle times:5 Cycles；Following the Heat Humidity Cycling after renew 2 hours: asperity degree： T=（40±2）℃,humidity：(90~95)%, 2 Cycles,		[0，1]
4	电耐久试验 Operating Life	25	Rss=10kΩ，温度：（25±3）℃，通电电压：Vdd=5V 光照强度：Ev=100lux 时间：1000 小时 Rss=10kΩ,T=（25±3）℃，Vdd=5V ； Ev=100lux，t=1000h		[0，1]
5	高温贮存 High Temperature Storage	16	温度：（100±2）℃，时间：1000h T：（100±2）℃，t：1000h		[0，1]
	低温贮存 Low Temperature Storage	16	温度：（-40±2）℃，时间：168h T：（-40±2）℃，t：168h		[0，1]

9 包装方式 Packing

包装采用防静电塑料袋和外包装纸箱，外包装箱上应有符合 GB191 中规定的相应运输要求的标志以及标明公司名称、商标、地址、产品名称、型号、数量等，并贴有封讫，箱内应有合格证，标明型号、生产日期及检验员代号等。

The parts are put into antistatic plastic bags which are packed in cartons. On the carton, followings are printed: mark of transportation stipulated in GB191, Company Name, Trade mark, Address, Product Description, Model and Quantity. Sealing mark is sticked on the carton too. Inside the carton there are qualification certificate, stated model, production date and inspector’s code.

9.1 内包装用防静电塑料袋，1000 只/袋。

Internally packed with antistatic plastic bags, 1000pcs/bag

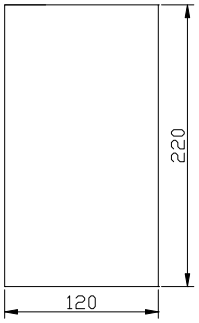


图 7 内包装塑料袋 Figure 7 Internally plastic bag

9.2 包装用纸箱 570mm×270m×205mm，10000 只/箱。

Packed with 570mm×270m×205mm cartons, 10000 pcs/carton.

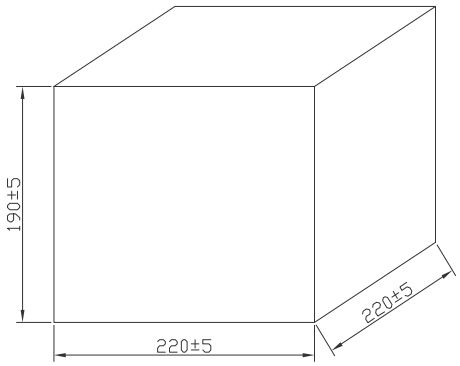


图 8 包装箱 Figure 8 Externally cartons

10 使用注意事项 Precautions for Use

10.1 引线成型 Forming

10.1.1 引线成型需在焊接前完成。

Leads should be formed before soldering.

10.1.2 不能以靠近环氧体的支架根部为支点成型。

Do not form the leads with their bases near the epoxy body as a fulcrum.

10.1.3 成型位置应离环氧本体 5mm 以上，特殊情况需在 5mm 以下（但应≥2mm）成型的，应制作特制的夹具，成型时固定住靠近环氧体的管脚部位，尽量减少对环氧体的作用应力，防止因应力过大造成探测器开路及其环氧体裂损。

Forming location should be up to 5mm from the epoxy body, if it has to be formed under 5mm（≥2mm）, special fixture should be made. When forming, the lead-frame near to epoxy body should be secured to lessen the stress on the body in order to avoid detectors open circuit and crack because of over stress.

10.2 储存 Storage

10.2.1 产品出厂后贮存的条件应为 0～+30℃、相对湿度不大于 70%，贮存期限为 3 个月。若贮存超过 3 个月，则应放在带有氮气和干燥剂的密闭容器内，贮存时间可达一年。

The products should be stored at 30℃ or less and 70%RH or less after being shipped from HUALIAN and the storage life limits are 3 months. If the products are stored for 3 months or more, they can be stored for a year in a sealed container with a nitrogen atmosphere and moisture absorbent material.

10.2.2 拆袋使用，应尽可能短时间内用完。若用不完，应满足贮存条件应为 0～+30℃、相对湿度不大于

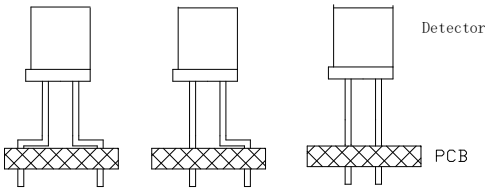
60%，并在 2 天内安装完。探测器支架是铁合金表面上镀银，银表面会受到腐蚀性气体等环境的影响，应避免使探测器处于易腐蚀或失去光泽的环境中，这会导致探测器焊接困难。

After the bag is opened, It is recommended that the detectors be used as soon as possible. Mounted within 2days at factory conditions of ≤30℃/60%RH。 Detectors lead-frames are silver plated iron alloy. The silver surface may be affected by environments which contain corrosive gasses and so on. Please avoid conditions which may be cause the detectors to corrodes, tarnish or discolor. This corrosion or discoloration may cause difficulty during soldering operations.

10.3 安装 Installation

10.3.1 探测器安装在 PCB 上，不能造成对引线施加压力。

Installation on PCB does not apply physical stress to the leads when mounting detector lamps on PCB.



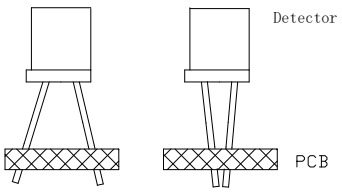


图 9 正确安装 Figure 9 Correct method **图 10 错误安装 Figure 10 Wrong method**

10.3.2 探测器安装在 PCB 后，负极引线弯曲到与 PCB 最小夹角为 15°，正极引线弯曲到与 PCB 最小夹角为 45°。 After mounting detectors lamps on PCB, the leads should be bent, the angle between the cathode leads and PCB should be 15°min. while the angle between the anode leads and the PCB 45°min..

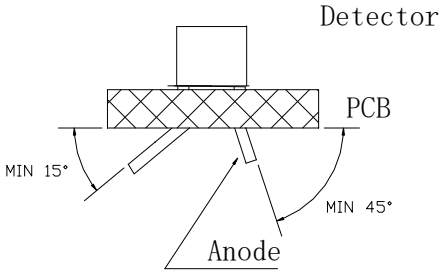


图 11 引脚与 PCB 夹角 Figure 11 angle between lead and PCB

10.4 焊接 Soldering

10.4.1 环氧不可浸入锡槽内。

Do not dip epoxy body into solder bath.

10.4.2 加热过程中不能对引线施加压力。

Do not apply stress to leads while they are heated.

10.4.3 推荐焊接条件 Recommended soldering conditions:

表 4 推荐焊接条件

Table4 Recommended soldering conditions

波峰焊 Wave Soldering		手工焊 Hand Solding	
Pre-heat Temperature	120℃ Max.	Temperature	350℃ Max.
Pre-heat Time	60 seconds Max.	Dwell Time	5 seconds Max.
Peak Temperature	260℃ Max.		
Dwell Time	5seconds Max.		

10.5 清洗 Cleaning

10.5.1 在任何情况下，清洗时间应在常温 1 分钟之内进行。

In any case, the cleaning time should be 1 minute or less at a normal temperature.

10.5.2 清洗探测器时推荐使用酒精作为清洗剂。如使用其他清洗剂，需先确认清洗剂是否会腐蚀环氧体。氟利昂不能作为清洗剂。

It is recommended that isopropyl alcohol be used as a solvent for cleaning the detectors. When use other solvents, it should be confirmed beforehand whether the solvents will dissolve the resin or not. Freon solvent should not be used to cleaning the detectors because of worldwide regulations.

10.5.3 不可用水清洗，以免腐蚀引线，建议使用酒精。

Do not clean detectors with water as the remains may rust the leads. Alcohol is suggested to be used.

10.5.4 用超声波清洗探测器时，超声功率和时间应分别小于 300W 和 30 秒；PCB 和探测器不能接触振荡器；不能使 PCB 上探测器产生共振。

When detectors are ultrasonic-washed, use the ultrasonic output power of less than 300W and the time of less than 30s; Do not let the PCB and detectors touch on the oscillator; Do not resonate the detectors attached on the PCB.

10.6 本型号探测器为静电敏感器件，所以静电和电涌会损坏器件。要求使用时佩带防静电腕带，所有的装置、设备、机器、桌子、地面都必须防静电接地。

This type of detector is an electrostatic insensitive device, so static electricity and surge will damage the device. It is required to wear a wrist-band when handling the detector. All device, equipment, machinery, desk and ground must be properly grounded.

更改记录表

Engineering Change Notice-Record

版次 EDITION	更改日期 DATE	主要更改内容 MAIN CONTENT	拟　制 PREPARED	确　认 CHECKED