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：HOICD0104P

PART NO. : HOICD0104P

拟制 Prepared	审核 Verified	批准 Approved

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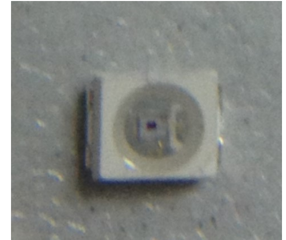
● General 概述



The ambient light sensor (ALS) HOICD0104P which is photosensitive IC assembled on lead frame. ALS measures the light intensity or brightness of light as a sensor same as human eye can detect the brightness of a light wavelength.

可见光探测器（ALS）HOICD0104P 是采用硅胶将光敏 IC 芯片封装在引线框架上。感测环境光亮度并且光谱响应度近似于人眼的感知。

● Features 特点

Near human eyes optical response 与人眼相似的光学反应
Current output is highly linear with light level 电流输出与光亮度高度线性化
Fast response 反应速度快
Water clear package. 无色透明封装
ESD grade: HBM 1C （≥1000V） 静电防护等级：人体模式 1C 级（≥1000V）
ESD grade: MM M2 （≥100V ） 静电防护等级：机器模式 M2 级（≥100V）

● Applications 应用

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

● Absolute Maximum Ratings 极限参数（Ｔａ＝２５℃）

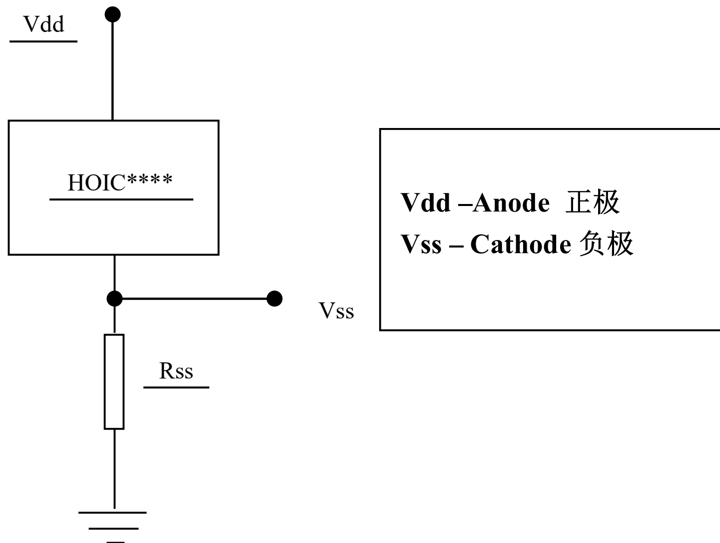
Parameter 参数名称	Symbol 符号	Value 额定值	Unit 单位
Give Input Voltage 供给输入电压	V	-0.3 ～10	V
Give Input current 供给输入电流	I	Within Restrict 内部限制	mA
Operating Temperature Range 工作温度范围	T_{OP}	-25～+85	℃
Storage Temperature Range 存储温度	T_{st}	-40～+100	℃
Soldering Temperature 焊接温度	T_{sol}	260	℃

● Opts-electric characteristics 光电参数

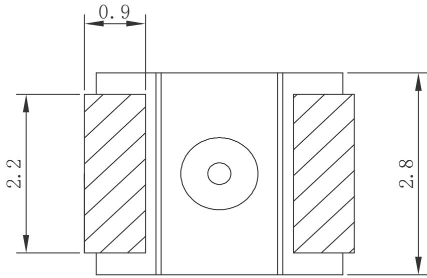
(Vdd=3.3V, Ta=25℃)

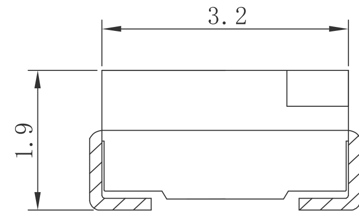
Parameter 参数名称	Symol 符号	Test Conditions 测试条件	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
Dark Current 暗电流	I_{DD}	0Lux，Ta=25℃	—	—	150	nA
Light Current 光电流	Iss1	Rss=10kΩ， Ev1=50Lux	60	90	140	μA
	Iss2	Rss=10kΩ， Ev1=25Lux	30	45	70	
Wavelength of Peak Sensitivity 峰值光谱反应	λ_p	—	—	520	—	nm

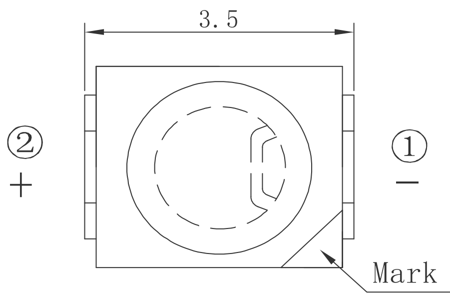
● Basic Applications and Test Circuit 基本的应用和测试电路



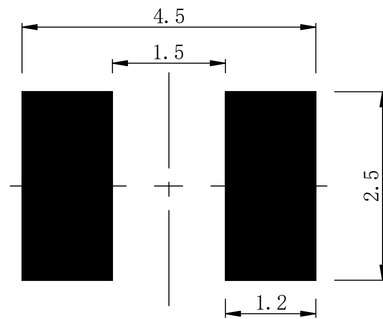
● Outline 外形图（单位:mm）



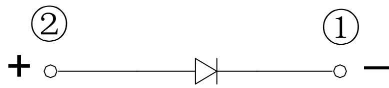




Note: Unidentified Tolerance±0.2mm

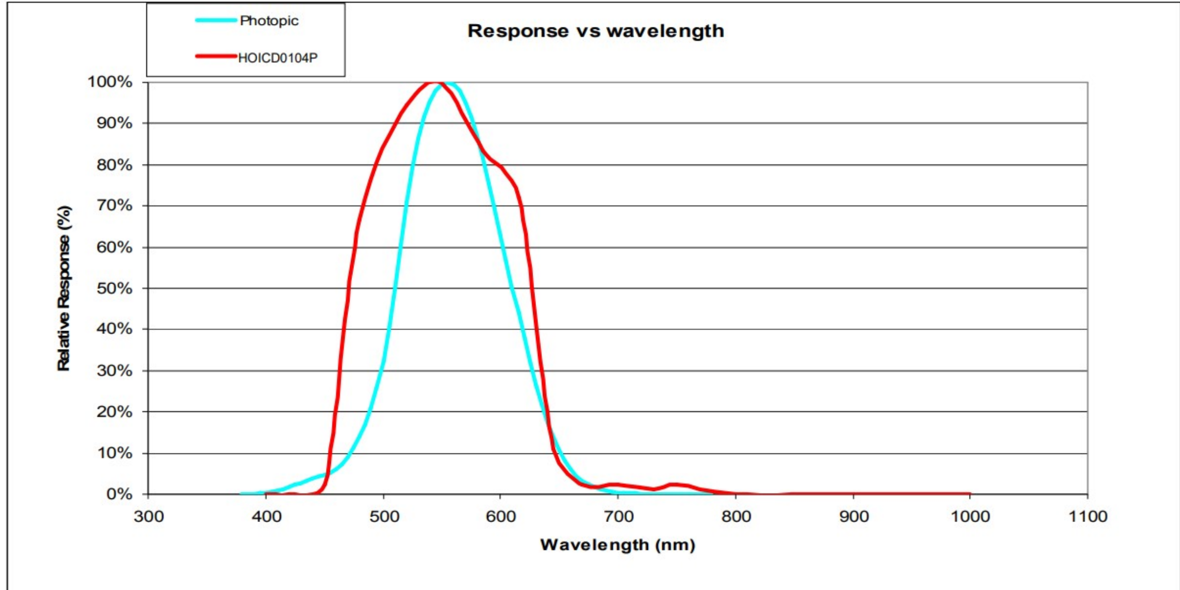


Recommended pad layout

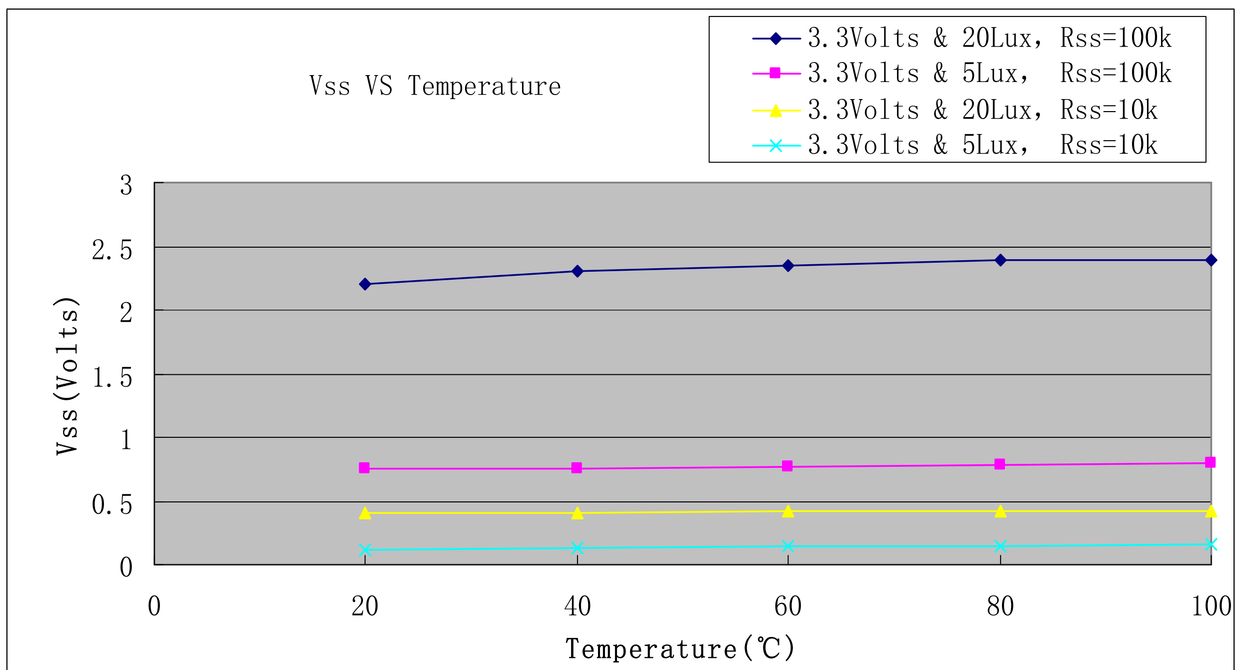


● Characteristic Curve 特性曲线

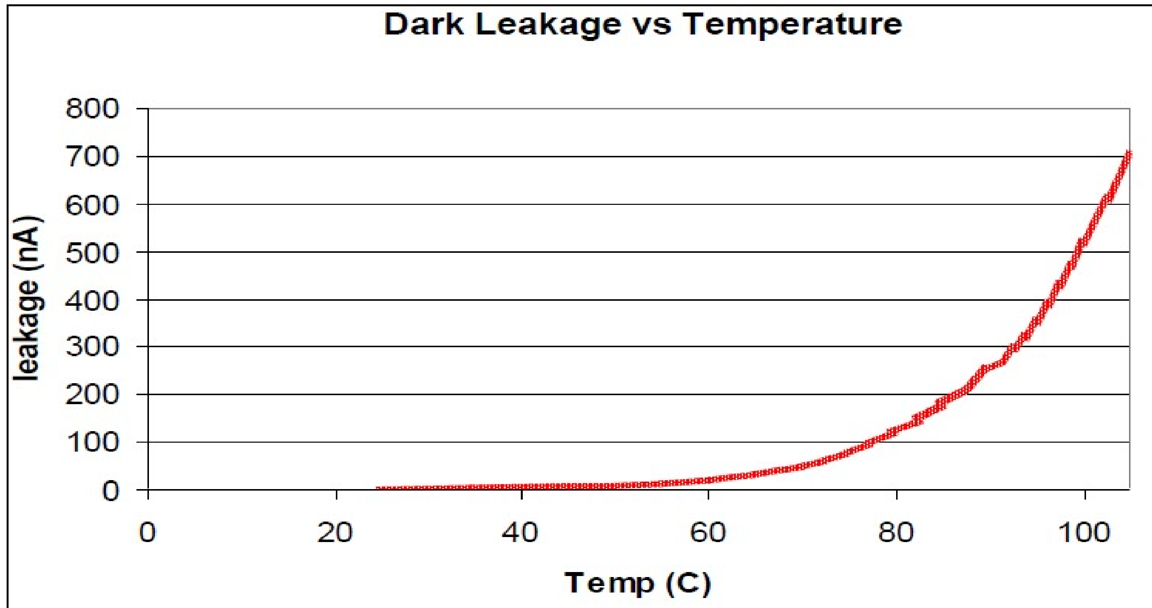
1. Overlaid response curves 人眼与可见光敏器件反应曲线



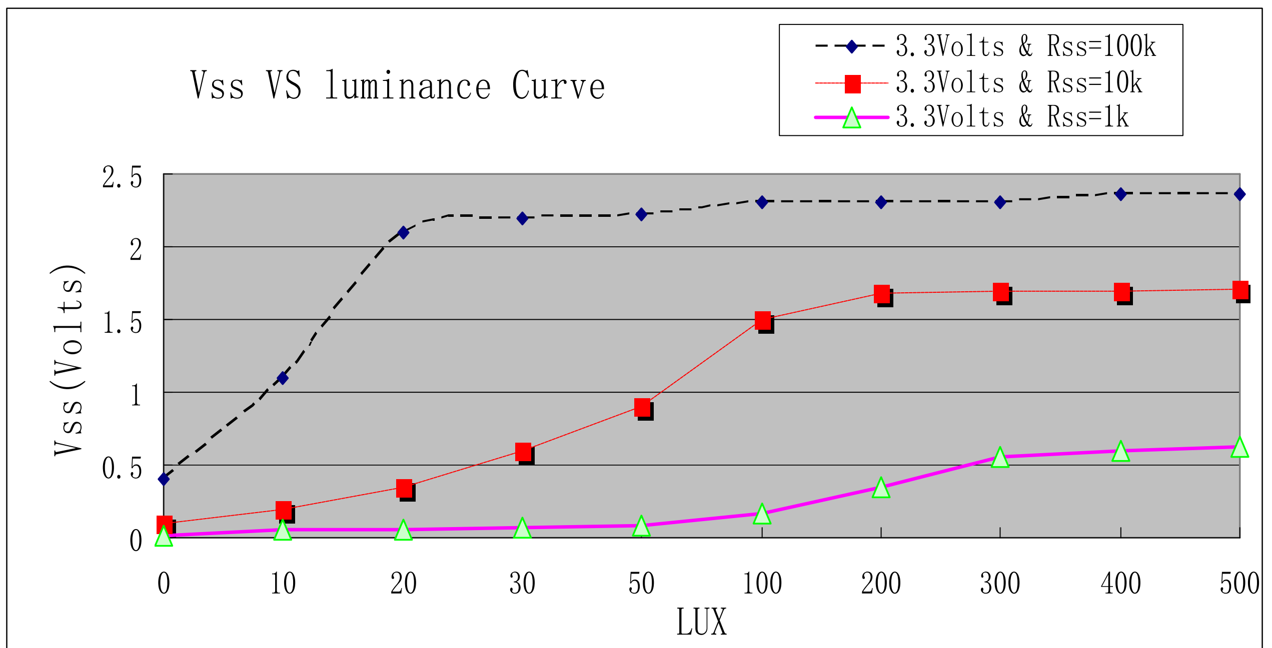
2. Vss vs Temperature Curve Vss与温度曲线



3.Dark Leakage VS Temperature Curve 暗电流与温度曲线



4. Vss vs luminance Curve Vss 与光亮度曲线



● Using Condition 使用环境定义

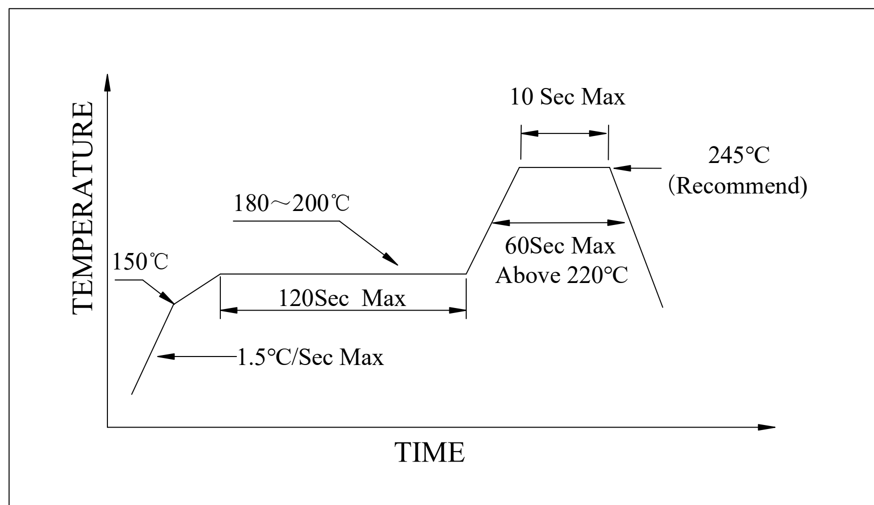
1． Recommend tin glue specifications 推荐锡膏规格

a. Melting temperature:217℃ 熔点：217 ℃

b. Contains: SnAg3Cu0.5 组分: SnAg3Cu0.5

2． Never take next process until the component is cooled down to room temperature after reflow. 回流焊工序必须在器件冷却至室温后进行。

3． The recommended reflow soldering profile (measuring on the surface of the silicon device) is following: 推荐回流焊接参数（测试于器件硅胶体表面），如下图所示：



● Product quality control requirements 产品质量控制要求

1 Manual soldering (We do not recommend this method strongly.)手工焊接（我们建议应尽量避免采用这种方法）

1.1 Soldering tin material: SnAg0.3Cu0.7. 焊锡材料：SnAg0.3Cu0.7。

1.2 To prevent cracking, please bake before manual soldering.在手工焊接前先进行烘烤，可避免器件突然受热开裂。

1.3 Lead soldering：Not more than 3 seconds ,3times@Max 280℃.引脚焊接最高280℃不超过 3 秒，3 次。

1.4 In manual soldering, take care not to damage the package especially terminal or silicon. (Do not give stress to the product when soldering.)手工焊接时，请注意避免损伤器件硅胶体或引线焊脚。（焊接时不要对器件施加外力）。

1.5 Do not use again if you remove the soldered product.已焊接过的器件请不要回用。

1.6 It is recommended using an iron with a temperature control.建议使用带温度控制的烙铁。

2. Cleaning 清洗

The conditions of cleaning after soldering:焊接后清洗的条件

2.1 An alcohol-based solvent such as Isopropy1 Alcohol (IPA) is recommended.
清洗剂推荐采用乙醇（如 IPA）。

2.2 Temperature×Time:＜50℃×30sec, or ＜30℃×3min
温度×时间: ＜50℃×30 秒, or ＜30℃×3 分钟

2.3 Ultra sonic cleaning: ＜15W/bath; Bath volume: 1 liter max.
超声清洗＜15 瓦/盆浴；盆浴容量：至多一升

2.4 Curing: 100℃ max,＜3min. 恢复: 100℃ 最大,＜3 分钟.

3. Cautions of pick and place 吸起及放置注意事项

3.1 It should be avoided to load stress on the silicon during high temperature.
高温时避免对器件硅胶体施加外力。

3.2 Avoid rubbing or scraping the silicon by any object.
避免外界物品导致器件硅胶刮伤或擦伤。

3.3 Electric-static may cause damage to the component. Please confirm that the equipment is grounding well. Using an ionize fan is recommended.
静电会导致器件损伤，请确认设备接地良好，有条件可采用离子风机。

3.4 Please do not force over 5 Nekton impact or pressure to silicon surface of devices of the modules ,And less than 3 times. Automatic working, Sucking mouth(Outer diameter greater than 3 mm) on the part of the product PPA, Not touching the silicon.
硅胶体正面法向承受按压力需小于 5 牛顿，按压次数小于 3 次。上线自动贴片时，吸嘴(外直径建议 3 mm 以上)对准产品的 PPA 支架体部分.不宜接触到硅胶体。

4. Cautions of design and applications 设计及应用注意事项

4.1 Any application should refer to the specifications of absolute maximum ratings.任何应用必须符合器件的极限参数。

4.2 The dimensions of the recommended soldering pattern may not meet every user. Please confirm and study first before designing the soldering pattern in order to obtain the best performance of soldering.推荐焊盘的尺寸并不适用于所有客户，请参考实际焊接工艺进行调节。

4.3 Do not contact with any component on the assembly board.避免在装配板上与其他器件相接触。

4.4 It is required to wear a wrist-band when handling the device. All device, equipment, machinery, desk and ground must be properly grounded.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。

● Transport and storage requirements 运输及存储要求

1. MSL 3 湿度敏感度等级为 3 级

2. Dry pack 干燥包装

2.1 Avoid absorbing moisture at any time during transportation or storage. 运输及储存中避免吸潮。

2.2 Every reel will be packaged in the moisture barrier anti-static bag (Specific bag material will depend upon customers' requirement or selection). And the bag is well sealed before shipment.卷轴采用防潮防静电包装（可根据用户的要求或选择采用特殊的包装材料），包装袋密封后装货。

3. Storage 储存

3.1 Recommended storage condition: At ＜40℃ and relative humidity 60%RH max; 建议未拆封前环境储存条件：温度小于 40℃,最大相对湿度 60%;

3.2 After this bag is opened, devices that will be applied to infrared reflow soldering, wave soldering, or equivalent soldering process must be: 袋子开封后,元件若将进行红外线回流焊、波峰焊或类似的焊接处理，必须在：

a. Mounted within: 168 hours of factory conditions ≤30℃/60% RH, or; 168 小时内完成焊接工作（温度≤30℃，湿度≤60%RH），或;

b. Stored at less than 10%RH. 储存环境的相对湿度低于 10%;

3.3 Devices require baking before mounting, if 3.2a or 3.2b is not met, devices must be baked under below conditions:24 hours at (60±3)℃.假如不符合 3.2a 或 3.2b 的条件,则元件焊接前须烘烤：烘烤条件：温度(60±3)℃,时间 24h。

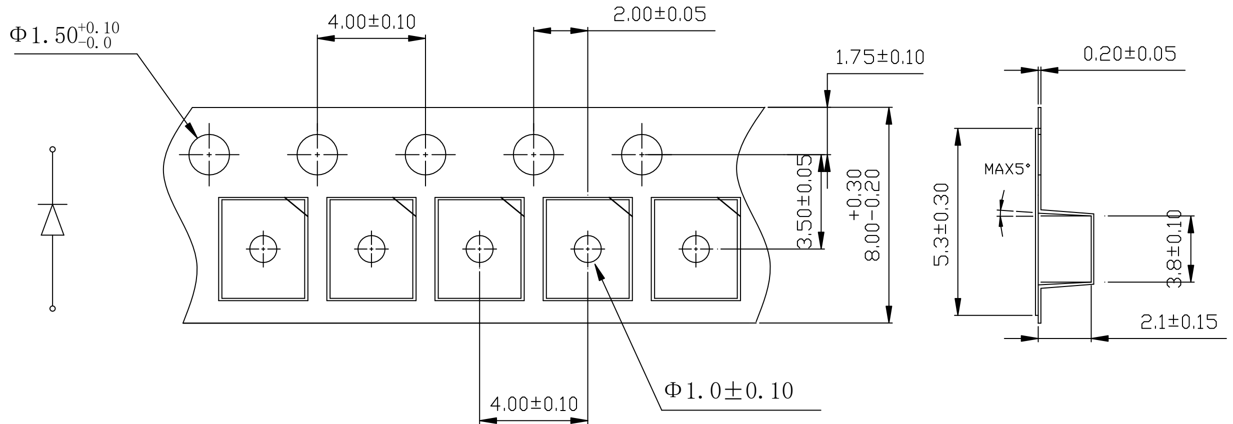
3.4 If the bag HIC shows more than 30%RH , baking conditions refer to item 3.3: 若袋内湿度卡显示的湿度超过 30%,则元件须按 3.3 的条件进行烘烤;

3.5 Shelf life in sealed bag:12 month at＜40℃ and ＜60%RH. otherwise baking must be done referring to conditions listed in item 3.3. 密封袋包装保存期限：12 个月（温度＜40℃，湿度＜60%RH）。若超过，则元件焊接前须烘烤，烘烤条件同 3.3。

● Packing 包装示意图

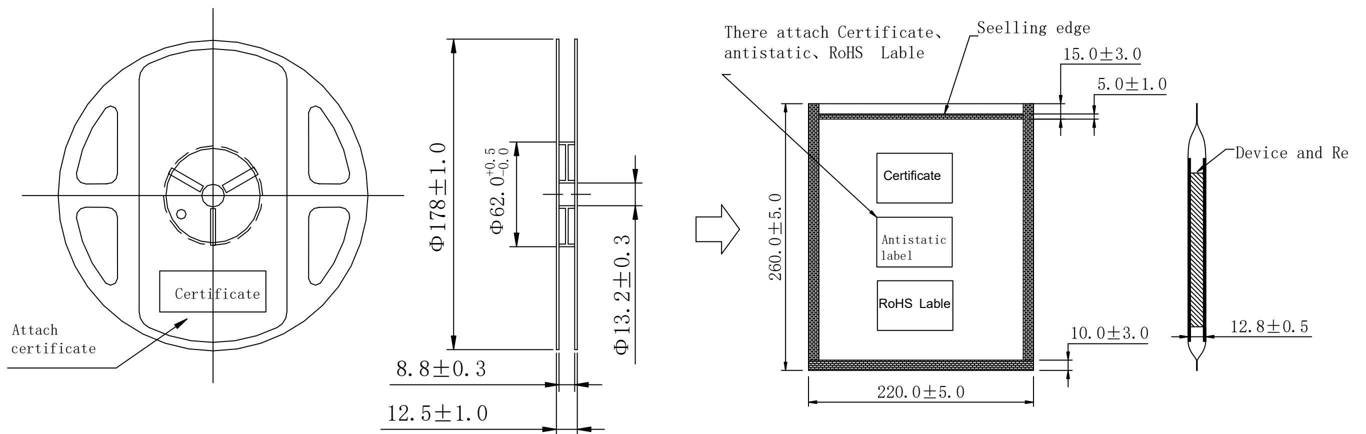
All measurements are ±0.1mm unless otherwise indicated.未注公差：±0.1 mm。

1. Taping 编带规格

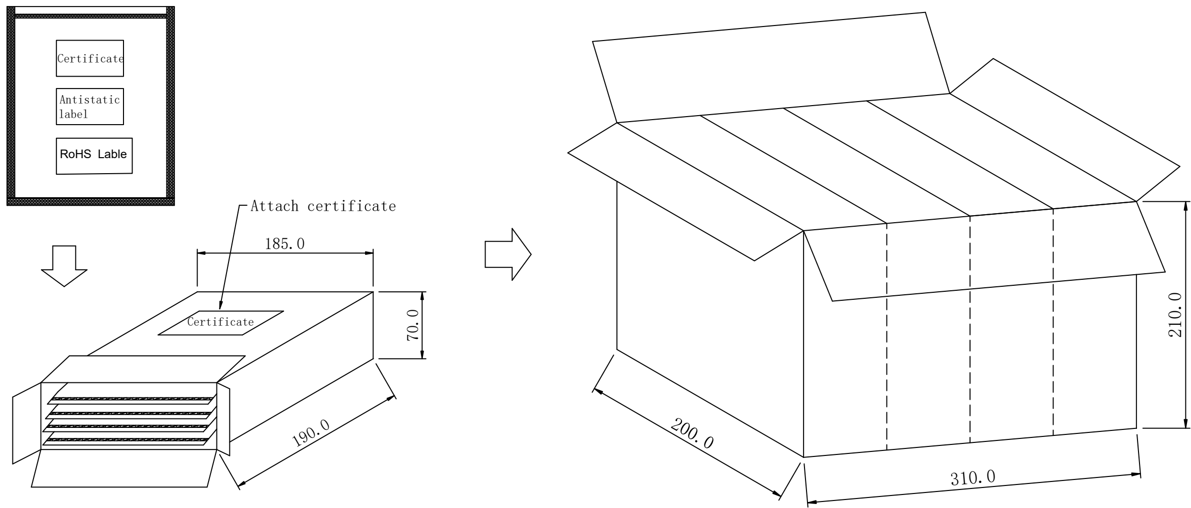


2. Reel and bag 卷盘及铝箔袋规格

Reel：2000pcs/reel 卷盘:2000 只/盘， Bag：2000pcs/bag 防静电铝箔袋：2000 只/袋。



3. Cardboard box 包装纸箱规格



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