

深圳触觉智能科技有限公司

Shenzhen Tactile Intelligence Technology Co.

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模组承认书

Camera Module Approval Sheet

产品规格 : 5 Mega AF camera module
Product Specification

产品型号 : OV5648(ZV-P26-50-VD5.1)
Product No.

日期 : 2024-06-20
Date

供应商确认会签栏 Supplier sign:

| | | | | |
|-------------|-----------------|----------------|---------------|----------------|
| 触觉智能 IDO | 单位 Dept. | 制作 Prepared | 审核 Checked | 批准 Approved |
| | 签章 Signature | SCS | HZT | FDS |

客户承认会签栏 Customer sign:

| | | | | |
|----------------|-----------------|-----------|----------|----------------|
| 客户 Customer | 单位 Dept. | 工程 ENG | 品质 QA | 批准 Approved |
| | 签章 Signature | | | |

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变更历史

Revision history

| 版本号 Revision No. | 修订内容 Modification Content | 日期 Date | 修订人 Reviser |
|---------------------|------------------------------|------------|----------------|
| V1.0 | 初版 First release | 2024-06-20 | S |
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1. 产品图片 Product Picture



2. 摄像头主要规格 Key Specifications

| | | |
|---|-------------------------|---|
| 最大分辨率 Maximum Resolution | | 5 Mega |
| 图像传感器 Image Sensor | | OV5648 |
| 最高有效像素 Max Active Pixel Array | | 2592H*1944V |
| 像素点大小 Pixel Size | | 1.4 μ m * 1.4 μ m |
| 输出格式 Output Format | | 8-/10-bit RGB Raw output |
| 最大图像传输速率 Maximum Image Transfer Rate | | QSXGA (2592 x 1944): 15 fps 1080p: 30 fps 960p: 45 fps 720p: 60 fps VGA (640 x 480): 90 fps |
| 供电电压 Power Supply | AVDD | 2.8V (typical) |
| | DOVDD | 1.8V (typical) |
| | DVDD | 1.5V (typical) |
| 时钟 Input Clock Frequency | | 6~27 MHz |
| 封装类型 IC Package | | PLCC |
| 对焦方式 Focusing Type | | AF |
| 镜头 Lens | Lens Size and Structure | 1/4" 4P_IR |
| | EFL | / mm |
| | FNo. | / |
| | FOV | D=65° \pm 3 ° |
| | CRA | </° |
| 基板 Substrate | | FPC |
| 模组尺寸 Module Size | | 50*12.5*5.0mm |
| 工作温度 Operating Temperature | | -10~60°C |
| 稳定出图温度 Stable Temperature | | -0~50°C |
| 储存温度 Storage Temperature | | -30~70°C |

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CONNECTOR
PIN DESCRIPTION

| PIN | SIGNAL |
|-----|-----------|
| 1 | AF_2.8V |
| 2 | AVDD_2.8V |
| 3 | DVDD_1.5V |
| 4 | DOVDD1.8V |
| 5 | RESET |
| 6 | PWDN |
| 7 | SCL |
| 8 | SDA |
| 9 | MCLK |
| 10 | DGND |
| 11 | MDN0 |
| 12 | MDP0 |
| 13 | DGND |
| 14 | MDN1 |
| 15 | MDP1 |
| 16 | DGND |
| 17 | MCN |
| 18 | MCP |
| 19 | DGND |
| 20 | MDN2 |
| 21 | MDP2 |
| 22 | DGND |
| 23 | MDN3 |
| 24 | MDP3 |

8.5±0.2

50±0.2

11.5±0.05

8.5

12.5±0.1

PI补强

PI+PPC-0.3±0.03

PPC无胶电解 -0.1±0.03

RoHS

| SENSOR 主要参数(Key parameter) | | LENS 主要参数(Key parameter) | |
|----------------------------|----------------|--------------------------|-------|
| 感光芯片(Sensor type) | OV5648 1/4" | 焦距(EFL) | /mm |
| 像素(Array size) | 2592H x 1944V | 光圈(F/NO) | /f |
| 模拟电压 (AVDD) | 2.8V (Typical) | 视场角 (View angle) | DI65° |
| 数字电压 (DVDD) | 1.5V (Typical) | 畸变 (TV-Distortion) | /% |
| 接口电压 (DOVDD) | 1.8V (Typical) | 景深 (Focusing rane) | TBD |
| 芯片CRA | 29.1° | Chief Ray Angle | /° |
| 芯片IC 像素(Sensor IC) | / | COMPOSITION | 4P |
| 像素尺寸(Pixel Size) | 1.4umx1.4um | FILETER | / |

| TOLERANCE TYPE | | | | |
|----------------|--------|--------|--------|--------|
| SELECT | A | B | C | D |
| level dim | ✓ | | | |
| ~ 5 | ±0.03 | ±0.05 | ±0.08 | ±0.10 |
| 5~10 | ±0.05 | ±0.08 | ±0.10 | ±0.15 |
| 10~50 | ±0.08 | ±0.10 | ±0.15 | ±0.20 |
| 50~100 | ±0.10 | ±0.15 | ±0.20 | ±0.25 |
| 100~ | ±0.10% | ±0.15% | ±0.20% | ±0.30% |

| REV. | Zone | Description | Approved | Date |
|------|------|---------------|----------|------------|
| V1.0 | All | First Release | H | 2024-05-10 |

| Drawn : | HZT | 2024-05-10 | Part Number: ZV-P26-50-VD5.1 | Version 1/0 |
|------------|-----|------------|---------------------------------|----------------|
| Checked : | HZT | 2024-05-10 | Projection Type: Third Angle | Unit: mm |
| Approved : | FDS | 2024-05-10 | Material: Surface Finish | |

| No. | 项目 Item | 标准 Standard | 检验方法 Inspection Method | 等级 Class |
|-----|------------------------------|---|------------------------------|-------------|
| 1 | 模组外观 Module appearance | 模组表面无脏污、无肉眼可见划伤。 No dust, no visible scratches on surface. | 目视检查 Visual Inspection | A |
| 2 | 镜头 Lens | 1. 直径方向1/2塑胶环宽度范围内无明显脏污、 色差、油污状亮块、塑胶成型杂质。 No obvious impurity and No feeling nick defect and oil impurity on surface of lens within 1/2 area. 2. 直径方向1/2塑胶环宽度范围外，无有感刮 痕。 There is no chip or crack on the lens at another 1/2 area. | 目视检查 Visual Inspection | A |
| 3 | 螺纹胶 Screw glue | 在螺纹圆上对称分布，其他以不影响客户组装为准 Normally screw glue shall be symmetrical distributed around lens circle side. Particular circs, glue distribution must not disturb customer's | 目视检查 Visual Inspection | A |

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| | | assembly operation. | | |
|------------------------|--------------------|---|---------------------------|-------------|
| 4 | 密封胶 Sealed glue | 胶在底座与PCB之间须均匀布满，不可有露间隙、厚薄不均等现象。 Sealed glue distributing between holder and PCB must be symmetrical and smooth. Not allow glue leakage and asymmetric thickness. | 目视检查 Visual Inspection | A |
| 5 | FPC | 1. 表面不可有明显脏污、刮痕等现象。 No obvious impurity and scratch on surface. 2. 边缘突出毛刺、分板残余，以不影响外形公差为准。If was not be cleaned and did not influence the total outside dimension, it would be permitted. | 目视检查 Visual Inspection | A |
| 外形尺寸 Outside dimension | | | | |
| No. | 项目 Item | 标准 Standard | 检验方法 Check method | 等级 Class |
| 1 | 高度 Height | 符合图纸要求 Meet the requirements of the drawings | 数显卡尺 Digital caliper | A |
| 2 | 长度 Length | 符合图纸要求 Meet the requirements of the drawings | 数显卡尺 Digital caliper | A |
| 3 | 宽度 Width | 符合图纸要求 Meet the requirements of the drawings | 数显卡尺 Digital caliper | A |

备注 Remark:

1. 外观重要性等级的定义 The definition of the appearance importance class

A: 缺陷可以在成品中找到，或者与良品有明显的视觉差异，例如裂纹、缺陷和灰尘，或者影响图像质量，或者由客户指定。我们将强调这些项目并检查所有产品。

The defect can be found in the finished product, or have obvious visual differences from good products, such as crack, defect and dust, or influence image quality, or are appointed by the customer. We will emphasize these items and check all products.

B: 缺陷可以在成品中找到，并且与良品有视觉差异，但不影响客户的审美判断。或者缺陷不能在成品中找到并且不会产生功能问题，而是将稍微影响顺序制造过程或条件。我们将在制造过程中监督这些项目并选择性地检查产品。

The defect can be found in the finished product and has visual difference from the good one, but will not affect customer's aesthetic judgement. Or the defect can not be found in the finished product and will not generate functional problem, but will slightly influence sequential manufacture process or condition. We will supervise these items in the manufacturing process and check products selectively.

C: 检查方法：距离 30CM,垂直或 45°反射视线方向。

Check method: distance 30cm,visual vertical or 45°reflection.


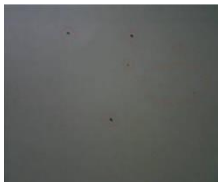
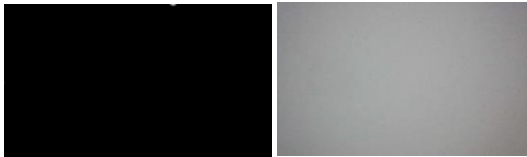

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2. 参考抽样标准 Referenced sampling standard

GB/T 2828.1-2012/ISO 2859-1:1999 and ANSI/ASQC.4-1993 II

5. 摄像头图像规格 Image Specification

| 序号 No. | 项目 Item | 标准 Standard | 检验方法 Check method | 等级 Class |
|-----------|---------------------------------------|---|--|-------------|
| 1 | 分辨率 Resolution | 5 MEGA | D65 light source ISO12233 chart | A |
| 2 | 功能 Function | 不允许有花屏、黑屏（无功能）等不良 Blurred screen and black screen (No Function) are not allow to exist.  | 测试软件/目测 Test software/ Visual inspection | A |
| 3 | 污点 Blemish | 全屏，污点大小 $\leq 0.6\text{mm}$ 污点数量 ≤ 3 个 Full screen, blemish size $\leq 0.6\text{mm}$ blemish number ≤ 3  | 测试软件/目测 Test software/ Visual inspection | A |
| 4 | 坏点与集束型 坏点 Dead & Wound pixel | 不大于5个像素点以上 No more than 5 pixels  | 测试软件/目测 Test software/ Visual inspection | A |
| 5 | 暗角 Dark corner | 四个角没有明显的暗角。（鱼镜头除外） No obvious dark corner at the four corners. (fisheye lens is excepted)  | 测试软件/目测 Test software/ Visual inspection | A |
| 6 | 成像方向 Imaging direction | 符合图纸要求 According to diagram | 测试软件/目测 Test software/ Visual inspection | A |

等级的定义The definition of the class:

A) 严重不合格：经检验判定的批量不合格，或造成较大经济损失、直接影响产品质量、主要功能、性能技术指标等的不合格,用字母A表示；

Critical: The unqualified batch judged by inspection, or the unqualified batch which causes

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great economic loss, directly affects the product quality, main function, performance and technical index, shall be represented by the letter A;

B) 一般不合格:一般不合格是指能够同时满足下列条件的不合格品,用字母B表示。

General: General unqualified refers to the unqualified products that can meet the following conditions at the same time, represented by the letter B.

I) 不影响最终产品的外观质量;

Does not affect the appearance quality of the finished product

II) 不影响最终产品的技术性能;

It does not affect the technical performance of the finished product.

III) 原材料或最终产品不影响下道工序的加工或组装。

The raw materials or finished products do not affect the processing or assembly of the next process.

6. 摄像头可靠性测试 Reliability Test

| 测试项目 Test item | 测试条件 Test condition | 判断Judgment |
|--|--|---|
| 高温存储 High temperature storage | 温度 Temperature: 70°C 时间 Time: 48H | 试验后常温(25±5°C)放置2H 后进行测试其功能。Test the functions after placing the samples under room temperature(25±5°C) for 2 hour. 1. 功能 Function: 1.1 分辨率: 试验后分辨率变异<20%且满足出货标准。 Resolution: Difference<20% after test, and meet the criterion of shipment 1.2 Shading:试验后满足出货标准。Meet the criterion of shipment after test 2. 外观: 试验后不能出现由试验导致的不良。 Appearance: Do not exist NG after test |
| 低温存储 Low temperature storage | 温度 Temperature: -20°C 时间 Time: 48H | |
| 高温运行 High temperature operating | 温度 Temperature: 60°C 时间 Time: 48H | |
| 低温运行 Low temperature operating | 温度 Temperature:-10°C 时间 Time: 48H | |
| 高温高湿运行 High temperature and high humidity operating | 温度 Temperature: 70°C 湿度 Humidity: 93% RH 时间 Time : 48H | |
| 静电测试 ESD test | 空气放电 Air discharge : ±4KV 接触放电 Touch discharge : ±2KV 循环 cycle : 10s/time 10cycle | |
| 振动测试 Vibration test | 频率 Frequency : 10Hz~55Hz~10Hz 振幅 Amplitude : 1.5~2mm(p-p) 次数 Sweep time : 30 min/direction 方向 Direction : X,Y,Z | |

7. 摄像头包装 Packing

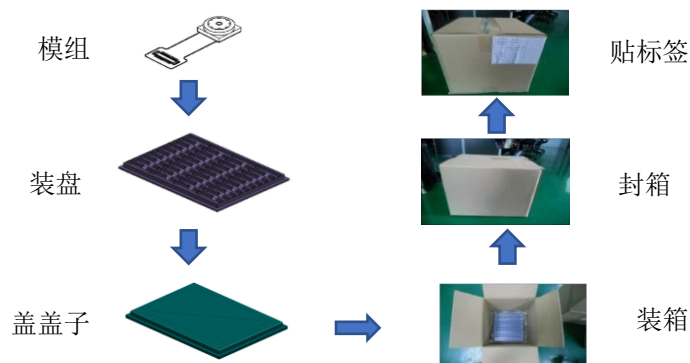
包装应避免运输过程中损坏部件。单个摄像头模组应放在可重复使用的托盘中交付。一个托盘就放多个摄像头模组。每个摄像头之前应隔开。

Package must prevent damage to the components during transport. The single camera module shall be delivered in a reusable tray. Several cameras shall be packed in one tray. The tray has separate holders for each camera module.

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包装流程 Packing process : (For reference only)



8. 摄像头保存条件和保质期 Storage condition and expiring time

| | |
|---|--|
| 仓库存储温湿度 Storage temperature and humidity of warehouse | 温度 Temperature : 22°C±5°C 湿度 Humidity : 40~75% RH |
| 保质期 Expiring time | 1 year |

9. 摄像头使用注意事项 Application notes

为了避免不良事故的发生和产品性能的破坏, 请遵守如下警告及禁止事项。

In order to prevent accidental use and performance deterioration, please keep the following precautions and inhibited terms.

储存注意事项 Cautions for storage

储存产品时须按温度 22°C±5°C, 湿度 40%~75%要求放置, 注意不可受日光直射或重物重压。

Store the products at the temperature 22°C±5°C and humidity 40%~75% mentioned in the specification. Please avoid direct sunlight and pressure.

操作过程注意事项 Cautions for operation

- 1) 请勿以锐利刀刃或其它尖锐制品在本制品上磨擦。
Don't scratch or rub with knives or other sharp substances.
- 2) 请勿任意拉扯或弯折本制品。
Don't stretch or bend.
- 3) 请勿将产品堆叠放置以免引起表面刮花造成外观不良
Don't pile products in order to avoid scratch and flawed appearance.
- 4) 请避免将本制品靠近或暴露于有机溶剂, 酸性气体的环境下使用及存放。
Keep away from organic solvent or acidic environment.
- 5) 请勿任意剥离或扯解本制品。
Don't detach the surface or dissemble the product.
- 6) 请勿直接用手接触产品, 因而请在接触产品之前戴上清洁的指套、手套和面罩以免污染到产品的通光孔, 并且握拿产品时请握住产品的四周
Do not directly touch camera. So, please wear clean finger sacks, gloves and mask to protect the products, and also hold the portion outside the view area when handling camera.
- 7) 为保持产品的最佳拍照效果, 请勿按压镜头表面
Don't press the surface of Lens, in order to keep good image.
- 8) 请注意 ESD 防护, 与摄像头接触人员必须配带静电环
Notice ESD protection, and must wear ESD ring when touching camera.