CSI camera module specification

The Camera Module Specification
With 5MP Pixel Color CMOS Sensor

Customer	
Product number	**HJ5647_FPC-V1.0**
Date	**2024-12-18**
Version	
compile	
Audit	
Authorize	
The customer to confirm	

Customer seal

Product catalogue

1. Preface

This specification shows the main information of the camera module. It contains the component structure and main functions of the camera module, as well as the information of quality inspection and reliability test.

2. General

The camera module includes：**OmniVision OV5647** image sensor, lens and FPC. It adopts the latest pixel technology and image processing technology to provide customers with cost-effective photography solutions. This product can output images of different sizes, such as VGA, CIF and QVGA. Ensure the original picture quality and faster frame rate. The user can set the 2-wire performance bidirectional synchronous serial bus of register control image. The sensor can output VGA at 30 fps per second. It also has AEC, AWB, LSC, etc.

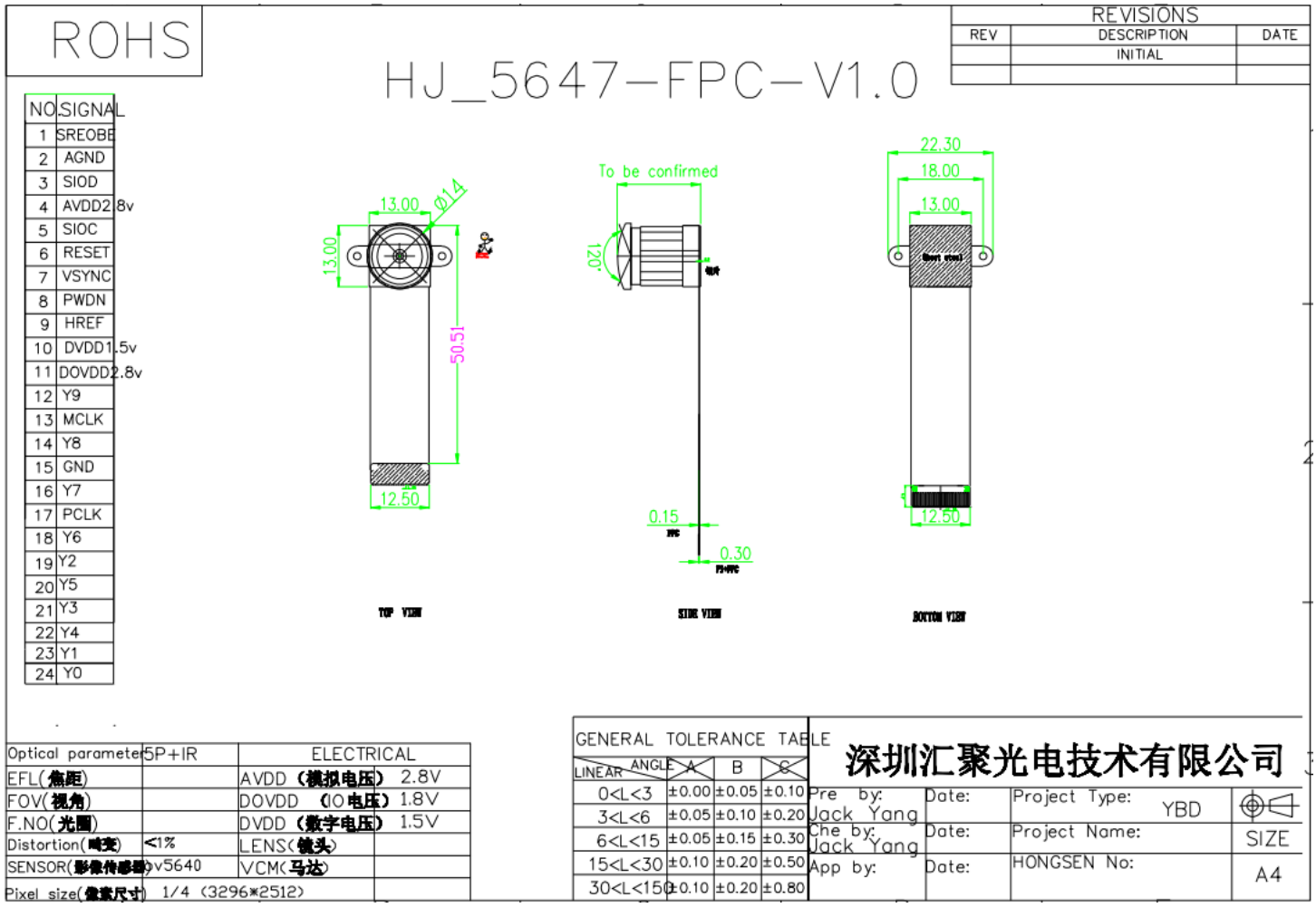
3.Mainly used in

- mobile phone
- digital products
- computer camera
- mid tablet
- tachograph
- others

4. Parameters

Module No	**HJ5647-FPC-V1.0**
Module Size	W15.5mm × L50mm ×H 10.4mm (±0.2MM)
Temperature (Operation)	0°C to 85°C
Temperature (Storage)	-20°C to 85°C
Assembly technique	SMT (ROSH)
Object distance	20CM
PCB printing ink	black
USB power supply voltage	N.A
Interface	24PIN MIPI
Power	180-200MA
Operating system request	**N.A**
Package	Anti-electrostatic tray
Sensor Type	1/4” COMS
Array Size	2592x1944 1080P 960P VGA 640*480
Max Dynamic range	N.A
Pixel Size	1.4μm x 1.4μm
Maximum Image Transfer Rate	1080P 30FPS
Package	PLCC
Lens Type	
Lens Construction	4P+IR
F/No	2.0
EFL	2.85mm
BFL(Optical)	3.8mm
FOV	65
TV Distortion	<5 %
IR Filter	650±10nm with IR
DSP Type	
AGC/AEC/Whiter balance	Auto
Support the compression formats	MJPEG/YUV

2.Module Mechanical Dimension



3. Appearance Specification

appearance				
number	project	requirements	Inspection methods	Nonconformity classification
1	Module appearance	There is no dirt, no visible scratch, no impurities in the plastic.	8 x magnifying glass	A

2	The lens	No visible bruises or dirt can be seen in the light of 800 + 100Lux intensity and 45 degree reflected light.	8 x magnifying glass	A
3	Thread glue	The glue length is 1/3-1/2 of the circumference, and the glue should not overflow to the lens end and lens base.	8 x magnifying glass	A
4	sealant	Between the base and the FPC is evenly filled with sealant, there is no gap, no uneven thickness, no glue overflow FPC edge leads to the appearance of excessive size.	8 x magnifying glass	A
5	PCB	1) the surface is clean and clear; 2) the length of the edge burr is less than 1mm and the width is less than 0.3mm; 3) the edge gap length is less than 1mm, and the width is less than 0.1mm and no more than 2 parts per edge.	45 x microscope (continuous zoom)	A
Installation dimensions				
The serial number	project	requirements	Inspection methods	Nonconformity classification
1	highly	Conform to drawing requirements	Digital caliper	A
2	length	Conform to drawing requirements	Digital caliper	A
3	width	Conform to drawing requirements	Digital caliper	A

4. Image Specification

Optical performance inspection requirements				
Number	Inspection items	requirements	Inspection methods	Nonconformity classification
1	Dust	In the white field, the image is obtained and the visual images are not allowed to have visible foreign bodies.	Test fixture. Light box. 6500K white backlight	A
2	imaging direction	Conform to drawing requirements	The test fixture	A
3	Dead & Wound Pixel	1) under the dark field: the total number of highlights is less than 400pixel; The cluster of two adjacent pixels is less than 20; There are no more than three pixel highlights. 2) white field: the total dark points are less than 400pixel; The cluster dimmer of two adjacent pixel is less than 20; There are no more than 3 pixels of the cluster.	The test software A small light box (6500K white backlight)	A
4	Resolution	2 million pixel: the center is not less than 600LW/PH.	MTF test program	A
5	FOV	Horizontal : Vertical: Diagonal:	Test fixture, Field Angle plate.	A
6	Shading	The brightness mean of 90% test field at the center of the four corners is at least 45% of the brightness of the center test field. The brightness of each Angle is above 35% of the center brightness (the sample size is 40*40 pixels, and the sensor dark Angle compensation function is not opened)	Test software, Small light box (3400Lux, 6500K white backlight)	A

7	Color	The color reduction error is not greater than 20%.	The test software Color checker card	A
8	TV distortion	The occipital distortion (positive) or barrel distortion (negative) is less than 1%.	The test software ISO12233 target	A
9	Grayscale	Adjacent distinguishable gray order brightness difference must be less than 8.	Test software, Gray-scale target	A
10	CA	Less than 0.5	The test software ISO12233 target	A
11	Torsional	Not less than 1 KGF. Cm.	The torsion move hand	A
12	Thrust	Not less than 2 N	Thrust meter	A

Description of qualified product classification:

- **Qualified:** the main functions, performance and technical indicators, etc. are qualified in batch after inspection, which is represented by letter **A**;
- **General nonconformity:** General nonconformity refers to the nonconforming products that can meet the following conditions at the same time, represented by the letter **B**.

Ⅰ) does not affect the appearance of the final product quality.

Ⅱ) does not affect the final product technical performance;

Ⅲ) does not affect the raw materials or final product of processing or assembling of next working procedure.

- **Serious nonconformity:** batch nonconformity determined by inspection, or nonconformity that causes large economic losses and directly affects product quality, main functions, performance and technical indicators, etc., is represented by letter **C**;

5. Sample Plan

The serial number.	Inspection items	The sampling frequency	Inspection methods	note
Imaging and reliability projects				
1	The stain	Each batch N=5, C=0.	Same as production	Production of all inspection items.
2	Imaging direction	Each batch N=5, C=0.	The test fixture	Production of all inspection items.
3	Bad points and cluster bad points	Each batch N=5, C=0.	Same as production	Production of all inspection items.
4	The resolution	Each batch N=5, C=0.	MTF test program	Production of all inspection items.
5	Viewing Angle	Each batch N=5, C=0.	Test fixture, Field Angle plate	Sample phase full inspection evaluation project. QA sampling project
6	Image uniformity	Each batch N=5, C=0.	Test software, Small light box (3400Lux, 6500K white backlight)	Production of all inspection items.
7	The dispersion	Each batch N=5, C=0.	The test software、 Color checker card	Sample phase full inspection evaluation project. QA sampling project
8	Geometric distortion	Each batch N=5, C=0.	The test software、 ISO12233 target boards	Sample phase full inspection evaluation project. QA sampling project
9	gray-scale	Each batch N=5, C=0.	The test software Gray-scale target boards	Sample phase full inspection evaluation project. QA sampling project

10	Reliability test	Sample preparation stage: sampling plan: 2PCS/ each production batch, acceptable level 0/1. Production stabilization stage: sampling plan: 5PCS/month per project, acceptable level 0/1.		
Appearance of the project				
1	Module appearance	AQL=0.65	8 x magnifying glass	Production of all inspection items.
2	The lens	AQL=0.65	8 x magnifying glass	Production of all inspection items.
3	Thread glue	AQL=0.65	8 x magnifying glass	Production of all inspection items.
4	sealant	AQL=0.65	8 x magnifying glass	Production of all inspection items.
5	PCB	AQL=0.65	45X microscope (continuous zoom)	Production of all inspection items.
6	The connector	AQL=0.65	45X microscope (continuous zoom)	Production of all inspection items.
外型尺寸				
1	highly	AQL=0.65	Same as production	Production of all inspection items.
2	length	AQL=0.65	Same as production	Production of all inspection items.
3	width	AQL=0.65	Same as production	Production of all inspection items.
4	Screw torque	Each batch N=5, C=0	The torsion move hand	QA sampling project
5	The base of thrust	Each batch N=5, C=0.	Thrust meter	QA sampling project

6. Reliability Specification

The serial number	Test project	Conditions and requirements	Test equipment
1	Low temperature storage	- 30 ℃, 96 hours cooling time every 30 min	Low temperature box
2	Low temperature operation	- 20 ℃, 96 hours cooling time every 30 min	Low temperature box
3	High temperature storage	80 ℃, 96 hours cooling time every 30 min	High temperature box
4	High temperature operation	70 ℃, 96 hours cooling time every 30 min	High temperature box
5	High temperature and high humidity storage.	60 ℃, 90% RH, 120 to pump up the cooling time for 30 min	High temperature humidity chamber
6	High temperature and high humidity operation.	48 hours 40 ℃, 90% RH, cooling time every 30 min	High temperature humidity chamber
7	Cold and thermal shock test	- 10 ℃ to 70 ℃ (each 30 min) high and low temperature conversion time is less than 5 minutes Total to each other: 10 cycles	Low temperature box/high temperature box.
8	Free fall test (after packing)	Height 150cm, 10 times.	Oak floor

9	Vibration test (after packing)	10Hz ~ 200Hz ~ 10Hz, amplitude 2mm,XYZ in three directions, vibration for 2 hours.	Vibration test bench
10	Static test (power outages)	150Pf, 330 o + 8KV, air discharge measurement 10 times.	Electrostatic tester