Product Specification

Product: InnoCAM_DCM_IMX577

Product Part Number: INV-IMX577-12MP

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REVISION HISTORY

Revision	Description of change	Changed by	Date
1.0	Initial Draft	Jamie Lynn	09/30/2024

APPROVAL

Company	Name	Signature	Date
InnoWave Design LLC	Tony Reed		09/30/2024
InnoWave Design LLC	Jamie Lynn		10/01/2024

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1. General

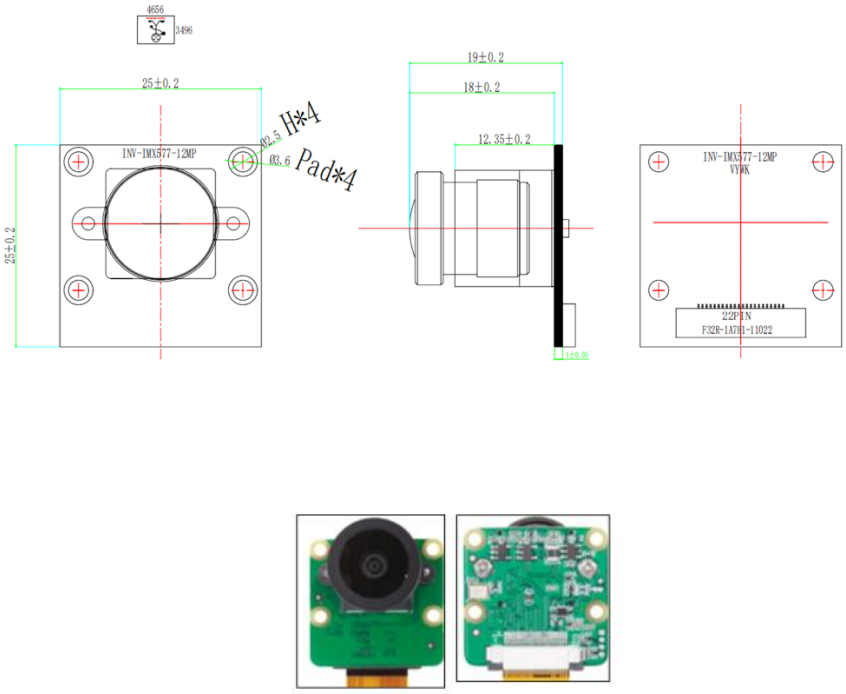
The INV-IMX577-12MP camera module is based on the Sony IMX577 color CMOS 12-megapixel image sensor with M12 mount lens. The IMX577 image sensor is a diagonal 7.857mm (Type 1/2.3) 12.3MP CMOS active pixel Type stacked image sensor with a square pixel array. The IMX577 adopts Sony's Stacked CMOS Image Sensor technology to achieve high speed image capturing by column parallel A/D converter circuits and high sensitivity and low noise image (comparing with conventional CMOS image sensor) through the backside illuminated imaging pixel structure. R, G, and B pigment primary color mosaic filter is employed. It equips an electronic shutter with variable integration time. It operates with three power supply voltages: analog 2.8 V, digital 1.05 V and 1.8 V for input/output interface and achieves low power consumption.

1.1. Specifications

Sensor Make and Model	Sony IMX577 (RGB)
Sensor Type	CMOS
Resolution	12MP
Active array size	4056 x 3040 pixels
Pixel Size	1.55um x 1.55um
Optical Format	1/2.3”
Size	25x25mm
Chroma	Color
Substrate material	Silicon
Frame Rate	Full @60fps (4-Lane), 30fps (2-Lane)
Input Voltage	1.05V, 1.8V, 2.8V
Input Clock Frequency	6 - 27 MHz
Guaranteed Temperature Ranges	Operating -20C to +75C Storage -30 to +80C Performance -20C to +60C
Field of View (FOV) degrees	D=75°, H=62°
Aperture (F#)	2.8
Distortion	<-1.5%
Focus Range	50mm to infinity

INV-IMX577-12MP

1.2. Layout



Pin Assignment	
1	VCC
2	VCC
3	GND
4	MDP0 (RX0+)
5	MDN0 (RX-)
6	GND
7	MDP1 (RX1+)
8	MDN1 (RX1-)
9	GND
10	MDP2 (RX2+)
11	MDN2 (RX2-)
12	RST#
13	MDP3 (RX3+)
14	MDN3 (RX3-)
15	GND
16	MCP (CK+)
17	MCN (CK-)
18	GND
19	SCL
20	SDA
21	PWR#
22	MCLK

Notes:

1. Unmarked Tolerance: ±0.2
2. IIC address: 0x54
3. Sensor IIC address: 0X34(write), 0X35(read), EEPROM IIC Address: OXAO(write), OXA1(read), Model: BL24SA64-CS
4. Reset low effective
5. Base wall thickness ≥ 0.25mm
6. Focusing Distance: 150cm
7. Matching Connector: F32R-1A7H1-11022 / Molex 54548-2271 (0.5S-2X-nPWB)

Figure 1: camera module assembly layout

2.1. Operating Temperature

The camera module shall be fully functional when ambient temperature is between -20°C to 60°C with image quality remaining stable. Test duration is 24 hours.

2.2. Storage Temperature

The camera module shall withstand storage temperatures between -30°C to 70°C. Test duration is 48 hours.

2.3. Humidity

The camera module shall withstand humidity at or below 90% RH under non-condensing conditions for 24 hours.

2.4. Thermal Shock

The camera module shall withstand the following temperatures (with humidity off)
-30°C to 70°C
20 min cycles (10 min dwell, 5 min ramp, 10 min dwell)

2.5. High Temperature Test

60C, humidity off, 24 hours

2.6. Low Temperature Test

-20C, humidly off, 24 hours

Stable image is -30°C to 70°C junction temperature. The sensor functions but image quality may be noticeably different at temperatures outside of stable image range. Image quality remains stable between 0°C to 50°C.

3. Reliability Requirements

3.1. Drop Test

The camera module shall withstand a 1.2m Drop in packaging onto Concrete (12 drops) Random Positions

3.2. Random Vibration

The camera module shall withstand vibration of the following conditions
Frequency range： 50Hz
Amplitude：2mm Duration 10 minutes for each position
Test all 3 axes (X, Y, Z)

3.3. Salt Fog Test

Condition: 5%nacl solvent Test duration：24H

3.4. ESD (Electronic Discharge)

The camera module shall withstand Electrostatic Discharge of
8KV Contact Discharge
12KV Air Discharge
10 Times for a Second

4. Product Performance Verification

To verify the camera module performance, the following tests will be conducted at either the factory during production or as an initial qualification characterization in either the factory laboratory or at the InnoWave laboratory.

4.1. Electrical Parameters

Parameter	Test Frequency
Current consumption – Standby	Initial Qualification
Current consumption – Idle	Initial Qualification
Current consumption – Viewfinder	Initial Qualification
Current consumption – Capture	Initial Qualification

Table 5: Electrical parameter measurements

4.2. Image Test Parameters

Parameter	Test Frequency
Thermal Shock	Initial Qualification
Humidly	Initial Qualification
High Temperature Test	Initial Qualification
Low Temperature Test	Initial Qualification
Drop Test	Initial Qualification
Random Vibration Test	Initial Qualification
Salt Fog Test	Initial Qualification
ESD Test	Initial Qualification

Table 6: Image parameter measurements

4.3. Mechanical Parameters

Parameter	Test Frequency
X Dimension (mm)	Initial Qualification
Y dimension (mm)	Initial Qualification
Z Dimension (mm)	Initial Qualification

Table 7: Mechanical parameter measurements

4.4. Environmental and Reliability Test Parameters

Parameter	Test Frequency
Thermal Shock	Initial Qualification
Humidly	Initial Qualification
High Temperature Test	Initial Qualification
Low Temperature Test	Initial Qualification
Drop Test	Initial Qualification
Random Vibration Test	Initial Qualification
Salt Fog Test	Initial Qualification
ESD Test	Initial Qualification

Table 8: Environmental and Reliability parameter measurements

5. Product Identification TBD

All modules will be marked with an identification number using laser marking or bar code label.

6. Packaging

The package will prevent damage to the components during transport and will be suitable for electrostatic-sensitive devices. The single camera modules shall be delivered in a reusable tray of anti-static plastic material. Several cameras shall be packed in one tray.
The tray has separate holders for each camera module.

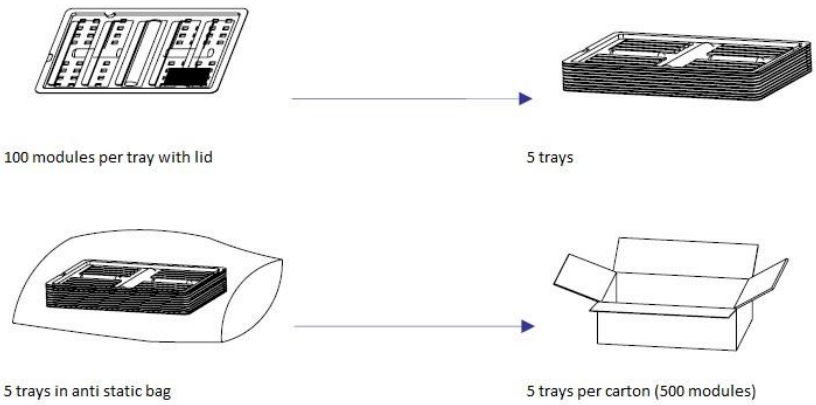


Figure 3: Packaging Example