Product Specification

Product: InnoCAM_DCM_IMX477

Part Number: INV-IMX477-12MP

Revision: Rev 1.0

Document No: INV462

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REVISION HISTORY

Revision	Description of change	Changed by	Date
1.0	Initial Draft	Jamie Lynn	01/15/2025
1.1	Updated with new connector and pinout	Jamie Lynn	01/16/2025
1.2	Updated with Schematic	Jamie Lynn	01/16/2025
1.3			

APPROVAL

Company	Name	Signature	Date
InnoWave Design LLC	Jamie Lynn		01/16/2025
InnoWave Design LLC	Tony Reed		01/19/2025

Contents

1. General

The IMX477-AACK is a diagonal 7.857 mm (Type 1/2.3) 12.3 Mega-pixel CMOS active pixel type stacked image sensor with a square pixel array. It adopts Sony's Stacked CMOS Image Sensor technology to achieve high speed
image capturing by column parallel AVD 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.

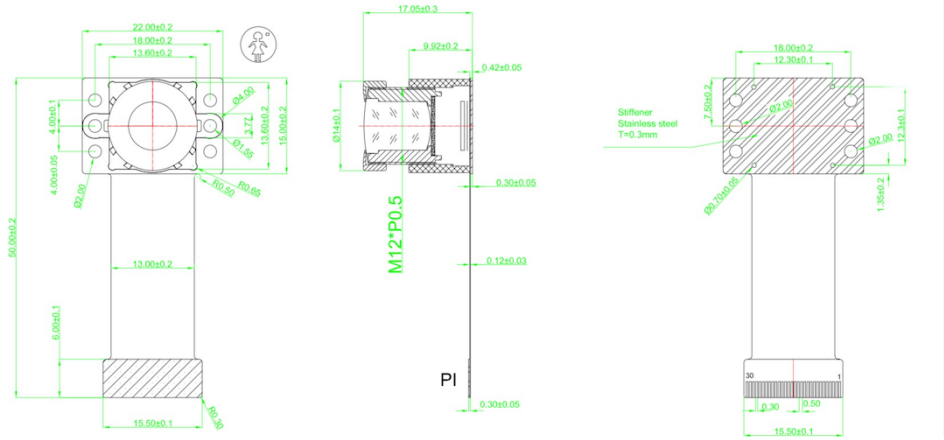
1.1. Specifications

Make and Model	Sony IMX477
Optical format	1/2.44-inch, 3 MP (4:3 aspect ratio)
Active pixels	4056 (H) X 3040 (V)
Pixel size	1.55 µm × 1.55 µm
Chief ray angle (CRA)	<27.9°
Die size	6.287mm x 4.712mm
Input clock frequency	24 MHz
Interface	4-lane MIPI
Subsampling modes (column and row)	2×2 binning and subsampling (horizontal and vertical)
ADC resolution	10 bits
Analog gain	1x – 16x
Digital gain	Up to 16x
Scaler	on-chip scaler
Supply voltage	1.05V, 1.8V, 2.8V
Power consumption	100mW -200mW
Dynamic Range	70 dB
Guaranteed Temperature Ranges	Operating -20C to+70C
	Storage -30 to +80C
	Performance -20C to +60C
Maximum Image Circle	8.0 mm
Field of View (FOV) degrees	Horizontal 105
Aperture (F#)	3.0
Distortion (TV)	<-30%
Focus Range	1m to infinity
Focal Length	3.65mm

Table 1: Specifications

1.2. Layout

Figure 1: Camera module assembly layout



Pin1	GND
Pin2	AVDD2.8V
Pin3	DVDD1.05V
Pin4	DOVDD1.8V
Pin5	GND
Pin6	SCL
Pin7	SDA
Pin8	GND
Pin9	SLASEL
Pin10	XVS
Pin11	XCLR
Pin12	GPO
Pin13	GND
Pin14	MCLK
Pin15	GND
Pin16	MDP3
Pin17	MDN3
Pin18	GND
Pin19	MDP1
Pin20	MDN1
Pin21	GND
Pin22	MCP
Pin23	MCN
Pin24	GND
Pin25	MDP2
Pin26	MDN2
Pin27	GND
Pin28	MDP4
Pin29	MDN4
Pin30	GND

2. Environment Requirements

2.1. Operating Temperature

The camera module shall be fully functional when ambient temperature is between -20°C to 60°C with image qualityremaining 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 noticeablydifferent 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
positionTest 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 of8KV 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 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. Mechanical Parameters

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

Table 6: Mechanical parameter measurements

4.3. 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 7: 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.

9 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 trayof anti-static plastic material. Several cameras shall be packed in one tray.
The tray has separate holders for each camera module.

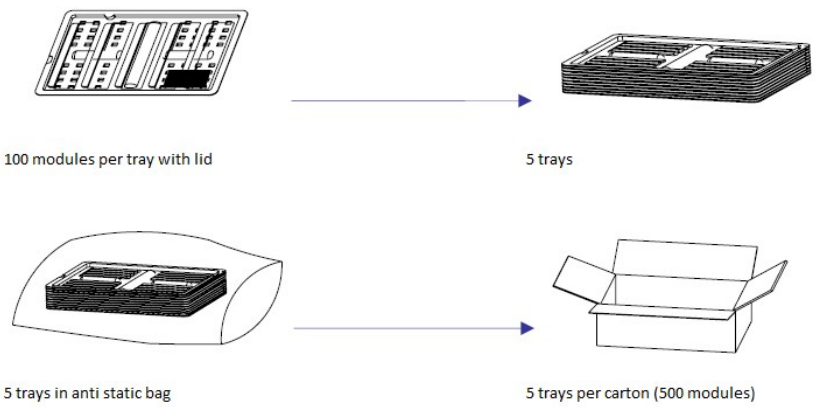


Figure 4: Packaging Example