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Product Specification

Product: InnoCAM_DCM_IMX989

Product Part Number: INV-IMX989-50MP

Revision: Rev 1.0

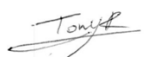
Document No: INV478

INV-IMX989- 50MP

REVISION HISTORY

Revision	Description of change	Changed by	Date
1.0	Initial Draft	Jamie Lynn	02/10/2026

APPROVAL

Company	Name	Signature	Date
InnoWave Design LLC	Tony Reed		03/16/2026
InnoWave Design LLC	Jamie Lynn		03/17/2026

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1. General

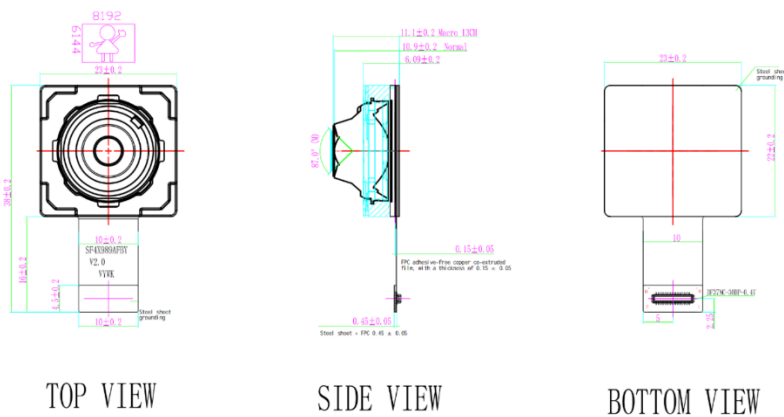
The Sony IMX989 is a 50.3-megapixel CMOS image sensor designed for high-resolution imaging applications. It features a large 1-inch-type format with 1.6 μm pixels, providing high sensitivity, low-noise performance, and excellent image quality in challenging lighting conditions. The sensor is optimized for high-quality still and video imaging, including 4K video capture, and supports advanced HDR capabilities for scenes with high contrast. Its large optical format and high pixel count make it well suited for demanding imaging systems requiring high detail, strong low-light performance, and wide dynamic range.

1.1. Specifications

Sensor Make and Model	Sony IMX989 (RGB)
Sensor Type	CMOS
Resolution	50MP
Active array size	8192 $\times$ 6144pixels
Pixel Size	1.6 μm x 1.6 μm
Optical Format	1"
Size	22x21mm
Chroma	Color
AVDD	2.9V
DOVDD	1.8V
DVDD	1.1V
Field of View (FOV)	D=87°, H=72°, V=57°
Aperture (F#)	1.9 $\pm$ 5%
Distortion	<1%
Focus Range	130 cm to infinity
EFL	8.7 $\pm$ 5%

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1.2. Layout



Pin Assignment

Camera Module PIN DEFINITION:

	CPHY	IMX989
1	DQND	
2	T0C	
3	T1A	
4	DQND	
5	T2A	
6	T2B	
7	DQND	
8	MCP/T1B	
9	MCP/T1C	
10	DQND	
11	T0A	
12	T0B	
13	DQND	
14	T2C	
15	NC	
16	DQND	
17	MCLK	
18	RESET	MCLR
19	DQND	
20	DOVDD 1.8V	VDD (Interface)
21	DVDD 1.1V	VDDG
22	DVDD 1.1V	VDDG
23	SDA	
24	SCL	
25	AF_VDD 2.8V	
26	AVDD 2.9V	VDDA1
27	AVDD 1.8V	VDDA2
28	DOVDD 1.2V	VDD (Interface)
29	AF_GND	
30	AGND	

Figure 1: camera module assembly layout

Notes:

1. Output Formats: RGB raw: 8, 10, 12 bit / 14 bit
2. VCM Driver Address: 0x18
3. Lens: 8P + IR filter, 650 nm

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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, humidity 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

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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
Humidity	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

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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
Humidity	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.

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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.

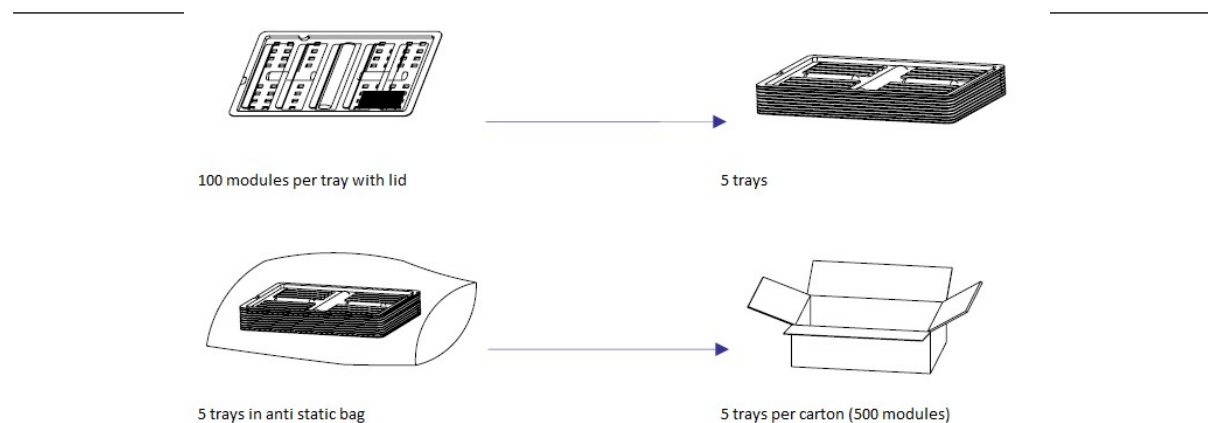


Figure 3: Packaging Example