Product Specification

Product: InnoCAM_DCM_AR0246

Product Part Number: INV-AR0246FF-2MP

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REVISION HISTORY

Revision	Description of change	Changed by	Date
1.0	Initial Draft	Jamie Lynn	09/24/2025

APPROVAL

Company	Name	Signature	Date
InnoWave Design LLC	Tony Reed		09/24/2025
InnoWave Design LLC	Jamie Lynn		09/24/2025

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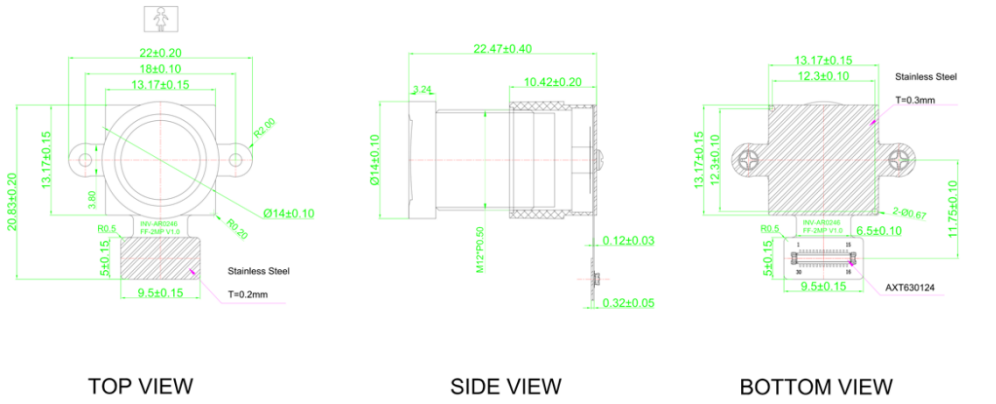
1. General

The INV-AR0246-2MP camera module is based on the OnSemi AR0246 color CMOS 2-megapixel image sensor with M12 mount lens. The AR0246 belongs to onsemi's Hyperlux LH product family, it's a 1/4−inch Back-Side Illuminated (BSI) Stacked CMOS digital image sensor with a 1920 x 1080 active−pixel array. This advanced sensor captures images in either linear, enhanced Dynamic Range (eDR) or embeded High Dynamic Range (eHDR with 120dB) modes, with a rolling−shutter readout. The AR0246 has Adaptive Local Tuning Mapping (ALTM) inside to support low cost ISP with excellent image quantity. It is supported by a 2.0 µm BSI pixel from **onsemi** and delivers excellent performance in lowlight & NIR wavelengths. The sensor includes advanced functions such as Wake On Motion (WOM), Line Interleaved HDR (LI-HDR), eDR and eHDR. With eHDR+ALTM, it makes AR0246 highly suitable for a variety of applications including facial recognition, carDVR and security camera and Wearables.

1.1. Specifications

Sensor Make and Model	OnSemi AR0246 (RGB)
Sensor Type	CMOS
Resolution	2MP
Active array size	1920 x 1080 pixels
Pixel Size	2um x 2um
Optical Format	1/4”
Size	22x21mm
Chroma	Color
Substrate material	Silicon
AVDD	2.6V~2.9V (2.8V nominal)
DOVDD	1.7V~1.9V (1.8V nominal)
DVDD	1.0~1.1V(1.05V nominal)
Guaranteed Temperature Ranges	Operating -20C to +75C Storage -30 to +80C Performance -20C to +60C
Field of View (FOV)	D=73°, H=61°, V=34°
Aperture (F#)	2.4
Distortion	<-6%
Focus Range	70cm to infinity
EFL	3.6mm

1.2. Layout



Pin Assignment

1	DGND
2	DGND
3	SDA
4	NC
5	DOVDD_1.8V
6	SCL
7	AGND
8	XSHUTDOWN
9	AVDD_2.8V
10	DVDD_1.05V
11	NC
12	NC
13	DGND
14	NC
15	DGND
16	DATA1_P
17	DATA1_N
18	DGND
19	NC
20	NC
21	DGND
22	CLK_P
23	CLK_N
24	DGND
25	DATA2_P
26	DATA2_N
27	DGND
28	NC
29	NC
30	DGND

Figure 1: camera module assembly layout

Notes:

1. Output Formats: RAW 12 Bits
2. IIC address: W/R: 0x20/0x21, SADDR2, SADDR1, SADDR0=L)

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.

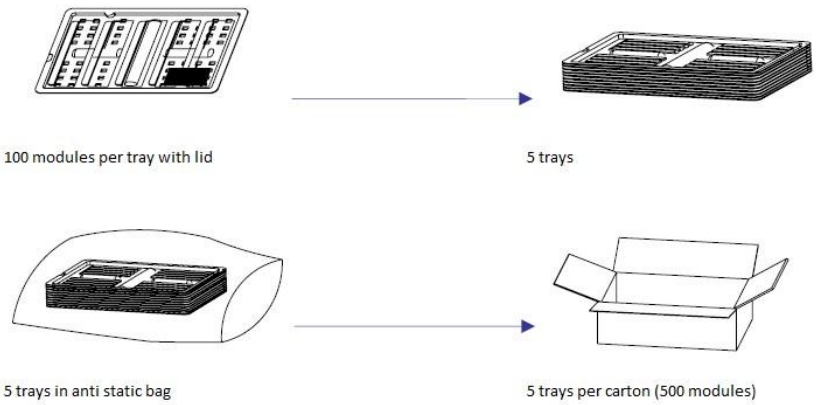


Figure 3: Packaging Example