



INNOWAVE
INSPIRE THE NEXT



INNOCAM
BEYOND EXPECTATIONS
BY INNOWAVE

Product Specification

Product: InnoCAM_DCM_AR0521USB

Product Part Number: INV-AR0521-5MP-USB

Revision: Rev 1.0

Document No: INC10021



INV-AR0521-5MP-USB

REVISION HISTORY

Revision	Description of change	Changed by	Date
1.0	Initial Specification		02/01/2023

APPROVAL

Company	Name	Signature	Date
InnoWave Design LLC	Jamie Lynn		02/03/2023
InnoWave Design LLC	Tony Reed		02/03/2023



INV-AR0521-5MP-USB

Contents

Product Specification	1
1. General	4
1.1. Specifications	4
1.2. Sensor Features	4
1.3. Applications	4
1.4. Layout	5
2. Electrical	5
2.1. Absolute Maximum Ratings	5
2.2. DC Characteristics	5
3. Environment Requirements	6
3.1. Operating Temperature	6
3.2. Storage Temperature	6
3.3. Humidity	6
3.4. Thermal Shock	6
3.5. High Temperature Test	6
3.6. Low Temperature Test	6
4. Reliability Requirements	6
4.1. Drop Test	6
4.2. Random Vibration	6
4.3. Salt Fog Test	6
4.4. ESD (Electronic Discharge)	6
5. Product Performance Verification	7
5.1. Electrical Parameters	7
5.2. Mechanical Parameters	7
5.3. Environmental and Reliability Test Parameters	7
6. Product Identification TBD	7
7 Packaging	8

INV-AR0521-5MP-USB

1. General

The INV-AR0521-5MP-USB is a camera module with a AR0521 1/2.5" color CMOS 5-Megapixel 2592 x 1944. The AR0521 is a 1/2.5-inch CMOS digital image sensor with an active-pixel array of 2592 (H) x 1944 (V). It captures images in either linear or high dynamic range modes with a rolling-shutter readout, and includes sophisticated camera functions such as binning, windowing and both video and single frame modes. It is designed for both low light and high dynamic range performance, with line interleaved T1/T2 read out to support off chip HDR in an ISP chip. The AR0521 produces extraordinarily clear, sharp digital pictures, and its ability to capture both continuous video and single frames makes it the perfect choice for a security applications.

1.1. Specifications

Sensor Make and Model	Onsemi AR0521
Resolution	5 MP
Active array size	2592 x 1944
Pixel Size	2.2 μm x 2.2 μm
Module Size	38 x 38
Output Format	MJPEG / YUV2
Output interface	USB 2.0
Chroma	Color
Temperature Range	Operating -30C to+70C junction temperature Stable Image 0C to +50C junction temperature
Lenses	1/2.5", 1.8mm, 2.1mm, 2.8mm, 3.6mm, 6mm, 8mm, 12mm and 16mm.
EFL	1.96
TV Distortion	<-40%
Focus Range	30cm to infinity

Table 1: Specifications

1.2. Applications

- PC multimedia
- Surveillance

INV-AR0521-5MP-USB

1.3. Layout

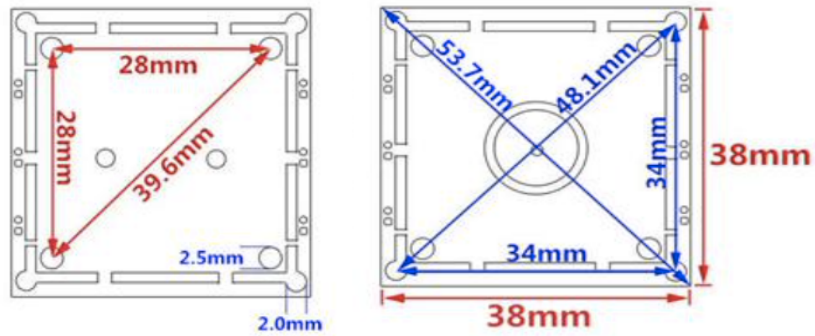


Figure 1: Camera module assembly layout



INV-AR0521-5MP-USB

2. Environment Requirements

2.1. Operating Temperature

The camera module shall be fully functional when ambient temperature is between -20°C to 60°C but 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.

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 85% RH under non-condensing conditions for 24 hours.

2.4. Thermal Shock

The camera module shall withstand the following temperatures (with humidity off)

-40°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. 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.

INV-AR0521-5MP-USB

7 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.

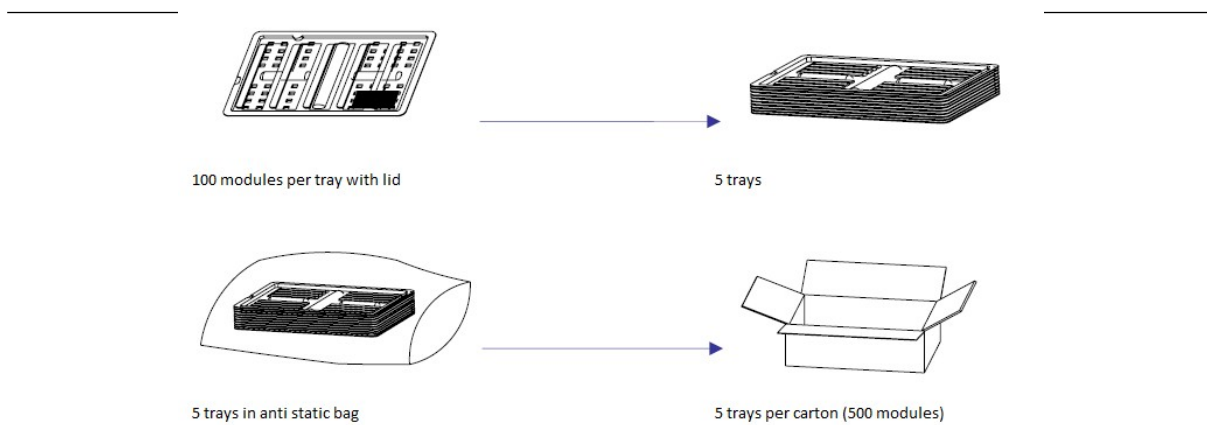


Figure 4: Packaging Example