



INV-OV2710FF-2MP



INNOWAVE
INSPIRE THE NEXT



Product Specification

Product Model Number: InnoCAM_DVP_OV2710PDFF

Product Part Number: INV-OV2710FF-2MP

Revision: Rev 1.1

Document No: INV132

Contact us: sales@innowave.design



INV-OV2710FF-2MP

REVISION HISTORY

Revision	Description of change	Changed by	Date
1.0	Initial Draft	Jamie Lynn	04/19/2022
1.1	Updated with schematic, new lens, new connector, and new pinout	Jamie Lynn	08/02/2022

APPROVAL

Company	Name	Signature	Date
InnoWave Design LLC	Jamie Lynn		08/09/2022
InnoWave Design LLC	Tony Reed		08/11/2022

Contents

Product Specification	1
1. General.....	4
1.1. Specifications	4
1.2. Sensor Features	5
1.3. Applications.....	5
1.4. Layout.....	6
2. Electrical	7
2.1. DC characteristics (-30°C < TJ < 85°C)	7
2.2. AC Characteristics	8
AC characteristics (TA = 25°C, VDD-A = 2.8V)	8
3. Environment Requirements	8
3.1. Operating Temperature	8
3.2. Storage Temperature	8
3.3. Humidity.....	8
3.4. Thermal Shock	8
3.5. High Temperature Test	8
3.6. Low Temperature Test.....	9
4. Reliability Requirements	9
4.1. Drop Test.....	9
4.2. Random Vibration	9
4.3. Salt Fog Test.....	9
4.4. ESD (Electronic Discharge)	9
5. Product Performance Verification	9
5.1. Electrical Parameters	9
5.2. Mechanical Parameters.....	9
5.3. Environmental and Reliability Test Parameters	10
6. Product Identification TBD.....	10
7 Packaging.....	10

1. General

The INV-OV2710FF-2MP is a color fixed focus 2megapixel 1920x1280 camera module with a 4 element glass lens plus IRCF within a lens holder. The image sensor and image processor in one package is also part of the complete camera module.

1.1. Specifications

Sensor Make and model number	Omni Vision OV2710-A68A
Sensor Type	68 pin CSP
Resolution	2MP (1920 x 1080)
Active array size	1920x1080
Pixel Size	3um x 3um
Module Size	12.5x12.5x22.8 mm
Optical size	1/2.7"
Output Interfaces	10-bit parallel / One-lane MIPI
Output Format	RGB RAW (10 bit)
Chroma	Color
Image Area	5856 um x 3275 um
Package dimensions	7465 um x 5865 um
Frame Rate	15 fps @ 1600 x 12000
Sensor CRA	23.6 degrees
Power Requirements	Active: 350 mW Power down: 70uA
Power Supply	Core: 1.425~1.575V (1.5V typical) Analog: 3.0~3.6V (3.3V typical) I/O:1.7V~3.6V (1.8V typical)
Input Clock Frequency	6~27 MHz
Maximum image transfer rate	1080p:30 fps cropped 720p:60 fps VGA: 120 fps QVGA: 240 fps
Shutter	Rolling
Scan mode	Progressive
Maximum Exposure Interval	1096 tline
Operating Temperature Range	-30° C to 85° C junction temperature
Stable Image Temperature Range	0° C to 65° C junction temperature
Connector	OK-14-GM030-04
Lens Model	100-003-650+HZ125
Construction	4G+IRCF
Lens Type	Fixed Focus
Max Image	Ø 6.78
Field of View (FOV)	
Vertical	58°
Horizontal	113°
Diagonal	137°

INV-OV2710FF-2MP

Aperture (F#)	2.4
EFL	3.3mm
TV Distortion	<-42%
Lens CRA	10.2°
Focus Range	60cm - infinity
Thread	M12*P0.5
TTL	22mm

Table 1: Specifications

1.2. Sensor Features

- Programmable controls: gain, exposure, frame rate, image size, horizontal mirror, vertical flip, cropping, windowing, and panning
- Automatic image control functions: automatic exposure (AEC), automatic gain control (AGC), automatic white balance (AWB) and automatic black level calibration (ABLC)
- Serial camera control bus (SCCB)
- Lens correction
- Defect pixel correction (DPC)
- Digital video port (DVP) parallel output interface
- Support for one lane MIPI interface (up to 800 Mbps)
- Support for output formats: 8-/10-bit RAW RGB
- Support for image sizes: 1080p @ 30 fps, cropped 720p @ 60 fps, and VGA @ 60 fps
- Support for black sun cancellation
- Embedded one-time programmable (OTP) memory
- On-chip phase lock loop (PLL)
- Built-in 1.5V regulator for core

Table 2: Sensor Features

1.3. Applications

- Notebook Computers
- High-end video conferencing
- Security

INV-OV2710FF-2MP

1.4. Layout

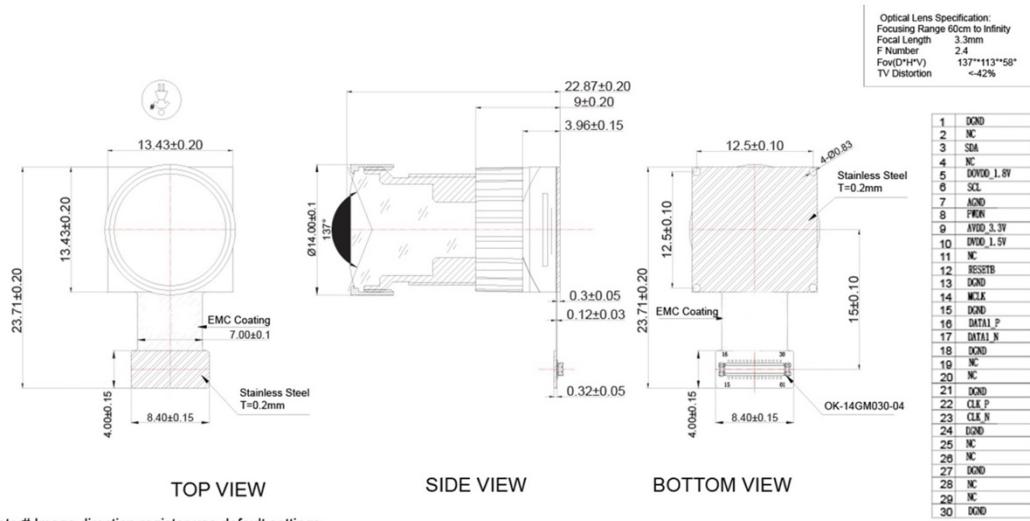


Figure 1: Camera module assembly layout

INV-OV2710FF-2MP

1.5. Lens

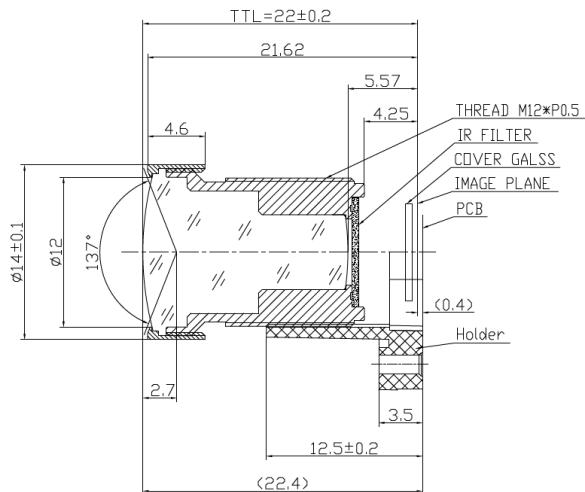


Figure 3: Lens assembly

2. Electrical

2.1. DC characteristics (-30°C < TJ < 85°C)

Supply	Parameter	Min	Typ	Max	Unit
VDD-A	supply voltage (analog)	3.00	3.30	3.60	V
VDD-D	supply voltage (digital core)	1.43	1.50	1.58	V
VDD-IO	supply voltage (digital I/O)	1.70	1.80	3.60	V
IDD-A	active (operating) current		80	90	mA
IDD-IO b, c			50	60	mA
IDDS-SCCB	Standby Current		0.7	1	mA
IDDS-PWDN			50	120	mA
Digital inputs (typical conditions: AVDD = 3.3V, DVDD = 1.5V, DOVDD = 1.8V)					
VIL				0.54	V
VIH	input voltage HIGH	1.26			V
CIN	input capacitor			10	pF
Digital outputs (standard loading 25 pF)					
VOH	Output Voltage HIGH	1.62			V
VOL	Output Voltage Low			0.18	V
Serial interface inputs					
VIL	SIOC and SIOD	-0.5	0	0.54	V
VIH	SIOC and SIOD	1.26	1.8	2.3	V

INV-OV2710FF-2MP

- a. using the internal DVDD regulator is strongly recommended for minimum power down current
- b. active current is based on sensor resolution at full size and at full speed, 25°C
- c. with MIPI function, the active current needs an additional 20mA
- d. standby current is measured at room temperature
- e. based on DOVDD = 1.8V

Table 3 DC characteristics

2.2. AC Characteristics

AC characteristics ($T_A = 25^\circ\text{C}$, $V_{DD-A} = 2.8\text{V}$)

symbol	parameter	min	typ	max	unit
ADC parameters					
B	analog bandwidth		40		MHz
DLE	DC differential linearity error				LSB
ILE	DC integral linearity error		1		LSB
	settling time for hardware reset			<1	ms
	settling time for software reset			<1	ms
	settling time for resolution mode change			<1	ms
	settling time for register setting			<300	ms

Table 4: AC Characteristics

3. Environment Requirements

3.1. 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.

3.2. Storage Temperature

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

3.3. Humidity

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

3.4. 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)

3.5. High Temperature Test

60C, humidity off, 24 hours

INV-OV2710FF-2MP

3.6. 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.

4. Reliability Requirements

4.1. Drop Test

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

4.2. 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)

4.3. Salt Fog Test

Condition: 5%nacl solvent Test duration: 24H

4.4. ESD (Electronic Discharge)

The camera module shall withstand Electrostatic Discharge of

8KV Contact Discharge

12KV Air Discharge

10 Times for a Second

5. 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.

5.1. 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

5.2. Mechanical Parameters

INV-OV2710FF-2MP

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

Table 6: Mechanical parameter measurements

5.3. 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

6. Product Identification TBD

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

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.

INV-OV2710FF-2MP

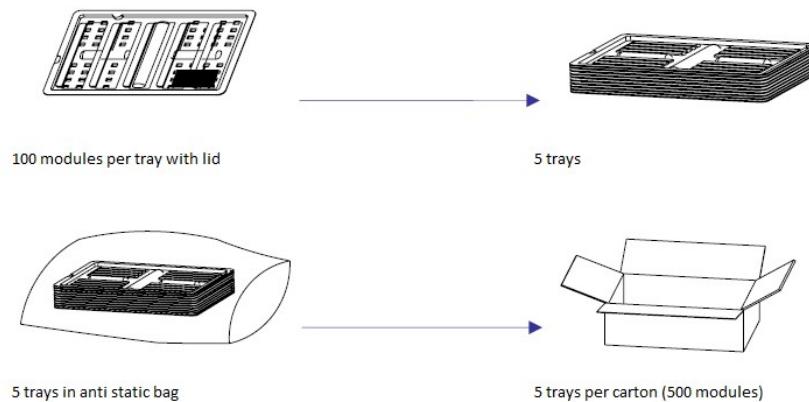


Figure 4: Packaging Example