VADZO

FALCON-522MRS

5MP USB 3.0 UVC Monochrome Camera based on Onsemi AR0522 Sensor

Vadzo Falcon-522MRS is a 5MP NIR Monochrome USB 3.0 Camera based on Onsemi AR0522 Sensor. The camera delivers max resolution of 5MP and Video streaming of 1080p@60fps and 720p@60fps. The camera comes with a M12/S-Mount lens holder that supports a 74DFOV lens by default.

Key Features

- Sensor Model: Onsemi Sensor
- Max Resolution: 5 MP
- Pixel Size: 2.2 µm x 2.2 µm
- Shutter: Rolling Shutter
- Lens FOV: 74 DFOV
- Compliance: UVC, RoHS 3, REACH

Applications

- **Medical & Life Science Devices:** Ophthalmology Camera, Intraoral Camera, Dermatoscope Camera, Digital Microscope Camera, Pathology Camera.
- **Warehouse Robotics Camera:** Object Scanning, Document Scanning, OCR, Obstacle Detection.
- **Smart Surveillance:** Iris Recognition, Day/Night Video Recording, Smart Parking, Pedestrian Safety.

INDEX

1. Introduction 3
2. Camera Specifications 3
3. Supported Resolutions 4
4. Supported Camera Functions 5
5. USB 3.0 Interface 5
6. Status LED 5
7. General Purpose I/O Lines 5
8. Temperature and Humidity Specifications 6
9. Dimensions 7
Board Top Side – 2D 7
Board Bottom Side - 2D 7

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1. Introduction

Falcon-522MRS is a 5MP UVC Compliant USB 3.0 Fixed-Focus monochrome camera based on Onsemi AR0522 sensor. The camera is designed to be backward compatible with USB 2.0 as well.

The sensor is integrated with the USB 3.0 controller to provide UVC Compliant USB 3.0 camera. The USB controller is also programmed to support HID Pipeline that shall support UVC extension functions that are not supported in the standard UVC drivers.

2. Camera Specifications

General Information	
Product Family	Falcon series
Camera Model	Vadzo Falcon-522MRS
Sensor	
Sensor	AR0522 CMOS sensor from Onsemi
Sensor Format	1/2.5”
Pixel Size	2.2 µm x 2.2 µm
Max Resolution	5MP – 2592(H) x 1944(V)
Shutter	Rolling Shutter
Chroma	Mono
Camera Data	
Interface	USB 3.0 Gen1 Backward compatible to USB 2.0
Pixel Depth	8bit / 12bit
Output Format	Y8 & Y12
Exposure Control	Manual Control via software & Auto-Exposure
GPIO	6 pins. 1x Digital Input, 1x Digital Output, 3x NC and GND
Camera Hardware	
Lens	S Mount (M12 Standard)

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USB connector	Type C
GPIO connector	Connector on-board: Wurth 665306124022 Mating connector: Wurth 665006113322
Power Supply	USB powered
Power Requirement	Max: 1.75 W at 5VDC Min: 1.05 W at 5VDC
Operating Temperature	-30^{o}C to 70^{o}C
Dimension	38mm (L) x 38mm (B) convertible to 32mm (L) x 32mm (B)
Weight	13 Grams (Without Lens)
Camera Software	
Video Resolutions	VGA, HD, Full HD, and 5MP
Video formats	Y8 and Y12
Still Image Resolutions	VGA, HD, Full HD, and 5MP
Image Capture formats	Y8 and Y12
Image Capture Modes	Software trigger
UVC Camera Controls	Brightness and Exposure
OS Supported	Windows and Linux
Conformity	
Conformity	UVC Compliant, RoHS 3, REACH

3. Supported Resolutions

Resolution	Frame Rates (FPS) in USB 3.0 Mode
640 x 480 (VGA)	120
1280 x 720 (HD)	60
1920 x 1080 (FHD)	60
2592 x 1944 (5MP)	30

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4. Supported Camera Functions

The List of functions supported by the Falcon-522MRS camera are:

- Resolution Control
- Image Format Setting
- Video Format Setting – Y8 or Y12
- Image Capture Software Trigger
- Gain – Auto & Manual
- Exposure – Auto & Manual
- Anti Flicker – 50Hz/60Hz
- Digital Pan, Tilt and Zoom

5. USB 3.0 Interface

The camera module's USB 3.0 connector is a standard USB Type C connector. It provides a nominal 5 Gbit/s SuperSpeed data transfer connection to supply power to the device and to transmit video data and control signals. The power supply must comply with the Universal Serial Bus 3.0 Specification. The nominal operating voltage is 5 VDC, effective on the camera module's connector. Connection assignments and numbering adhere to the Universal Serial Bus 3.0 standard. USB Certified 3.0 Gen 1 or higher cables to be used. Vadzo does not recommend non-certified USB cables.

6. Status LED

Status LED's indicate the below:

- Red color indicates Device is powered ON with no Streaming.
- Yellow color indicates: Camera is currently Streaming.

7. General Purpose I/O Lines

GPIO lines are terminated through Six (6) pin socket connector from Würth Elektronik part number 665306124022.Refer to the below table for GPIO Connector Pin Numbering and Assignments.

Pin	Line	Function
1	Power	Do not use.
2	-	Do not use*
3	-	Do not use*

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4	Input1	General Purpose I/O (GPIO) line with 1.8V tolerant directly connected to MCU Preset: Input Line
5	Output1	General Purpose I/O (GPIO) line with 1.8V tolerant directly connected to MCU Preset: Output Line
6	GND	Ground

**Vadzo engineering team shall be able to enable the IOs on the firmware level as per the end user technical requirements under the purview of Vadzo Imaging customisation program.*

Recommended mating connector from Würth Elektronik part number 665006113322.

8. Temperature and Humidity Specifications

Description	**Specification**
Operating Temperature	-30^{o}C to 70^{o}C
Storage Temperature	-30^{o}C to 70^{o}C
Humidity	20% to 80%, Relative, non-condensing.

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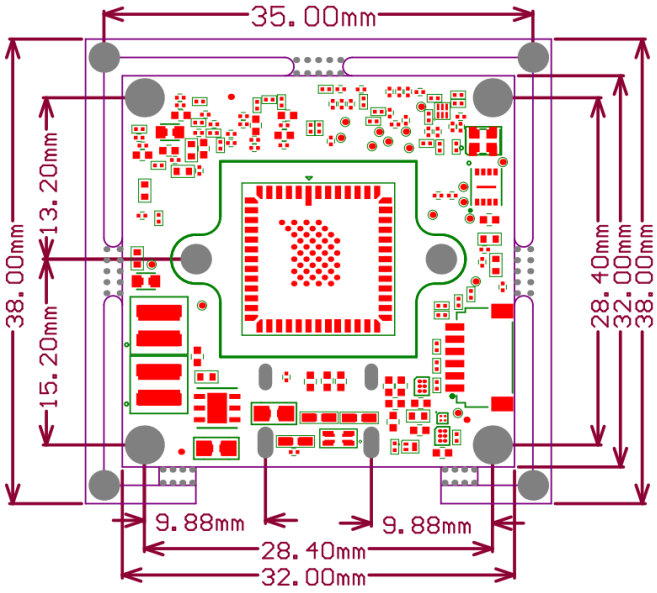
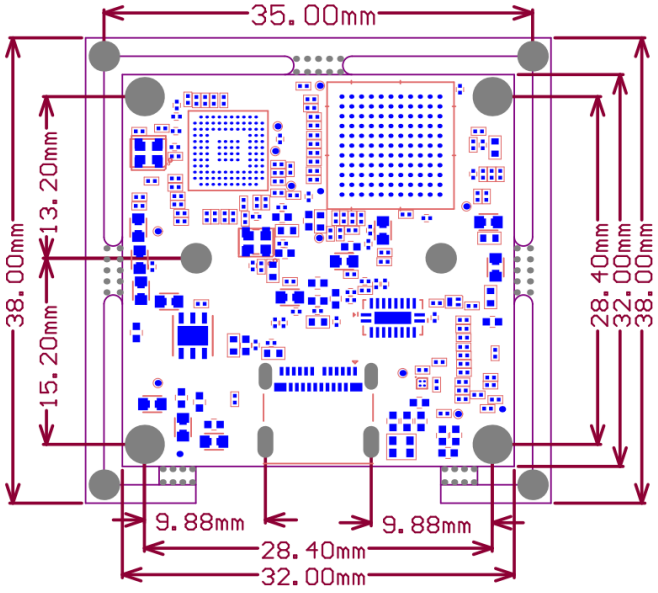
9. Dimensions

Board Top Side – 2D



Board Bottom Side - 2D



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