VADZO

# FALCON-522MRS

5MP USB 3.0 UVC Color 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.

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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) |

| | |
|---|---|
| USB connector | Type C |
| GPIO connector | Connector on-board: Wurth 665306124022<br>Mating connector: Wurth 665006113322 |
| Power Supply | USB powered |
| Power Requirement | Max: 1.75 W at 5VDC<br>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 |

# 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* |

| | | |
|---|---|---|
| 4 | Input1 | General Purpose I/O (GPIO) line with 1.8V tolerant directly connected to MCU<br><br>Preset: Input Line |
| 5 | Output1 | General Purpose I/O (GPIO) line with 1.8V tolerant directly connected to MCU<br><br>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.*

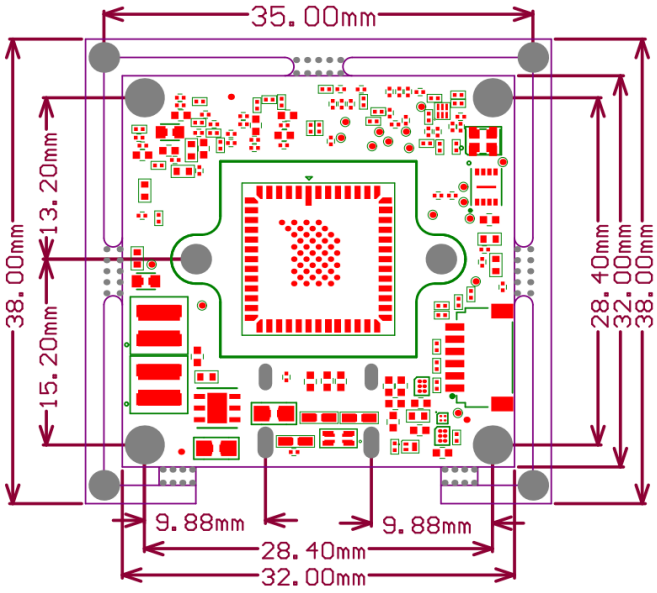
Recommended mating connector from Würth Elektronik part number 665006113322.

# 8. Temperature and Humidity Specifications

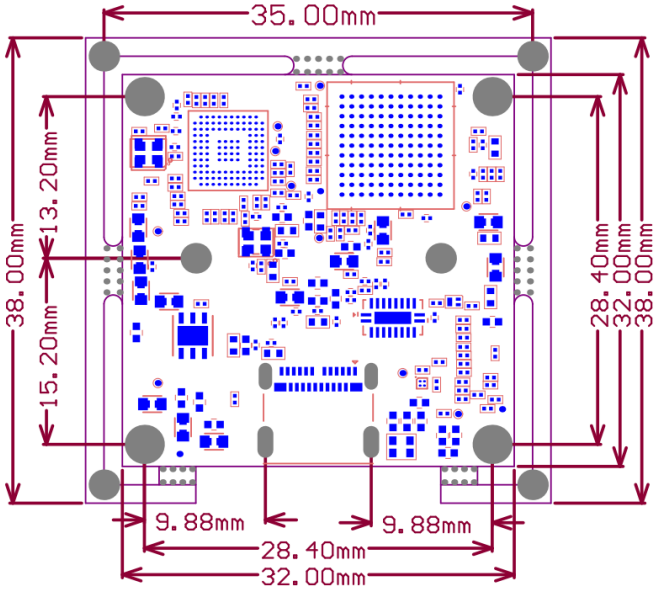
| **Description** | **Specification** |
|---|---|
| Operating Temperature | -30$^{o}$C to 70$^{o}$C |
| Storage Temperature | -30$^{o}$C to 70$^{o}$C |
| Humidity | 20% to 80%, Relative, non-condensing. |

# 9. Dimensions

## Board Top Side – 2D




## Board Bottom Side - 2D



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