

2MP Color USB 2.0 UVC Camera based on Onsemi AR0234 Sensor

Vadzo Merlin-234CGS is a 1080p global shutter USB 2.0 Camera based on Onsemi AR0234 Sensor with high-performance ISP. The camera delivers a max resolution of 2MP and Video streaming of 1080p@30fps, 720p@30fps, and VGA@60fps in H.264 and MJPEG. The camera has an M12/S-Mount lens holder supporting a 74DFOV lens by default. The camera also supports on-board dewarping for high FOV optics. You can stream video in H.264, YUV, and MJPEG format and capture images in BMP and JPEG format.

Key Features

- Sensor Model: AR0234 Onsemi Sensor
- Max Resolution: 2MP
- Pixel: 3.0 μm x 3.0 μm
- Shutter: Global Shutter
- Lens FOV: 74 DFOV
- Compliance: UVC Compliant, RoHS 3, REACH



Applications

- **Warehouse Robotics:** Object Scanning, Document Scanning, OCR, Obstacle Detection.
- **Mobile Robot Camera:** AGV cameras, AMR Camera, Drone Camera, Robotic ARM Camera.
- **Smart Surveillance Camera:** Facial Recognition, Day/Night Video Recording, Smart Parking, Pedestrian Safety.

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1. Introduction

Merlin-234CGS is a UVC-Compliant USB 2.0 Fixed-Focus Global Shutter color camera based on the Onsemi AR0234 sensor.

The camera incorporates the AR0234 CMOS sensor from Onsemi integrated with an on-board Image Signal Processor (ISP) to perform functions such as debayering, demosaicing, color correction, contrast correction, gamma correction, denoising, lens corrections, and so on. In addition to this, the ISP also supports on-board dewarping, dual UVC endpoint streaming, Auto functions such as Auto-Focus, Auto-Exposure, and Auto-White Balance. The Image Signal Processor is integrated with the USB 2.0 controller to provide UVC Compliant USB 2.0 camera.

2. Camera Specifications

General Information	
Product Family	Merlin series
Camera Model	Vadzo Merlin-234CGS
Sensor	
Sensor	AR0234 sensor from Onsemi
Sensor Format	1/2.6"
Pixel Size	3.0 μm x 3.0 μm
Max Resolution	2MP – 1920(H) x 1200(V)
Shutter	Global Shutter
Chroma	Color
Camera Data	
Interface	USB 2.0 Micro B Interface
Pixel Depth	8bit / 10bit
Output Format	H.264, MJPEG and YUV
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	USB 2.0 Micro B Connector
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	-40 ⁰ C to 85 ⁰ 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, and FHD
Video formats	H.264, YUV and MJPEG format
Still Image Resolutions	VGA, HD, and FHD
Image Capture formats	BMP and JPEG
Image Capture Modes	Software Trigger
UVC Camera Controls	Brightness, Exposure, Contrast, Sharpness, Saturation, Gamma, Gain, White Balance
Additional Controls	ROI-based Auto-Exposure, JPEG Compression Control, Denoising, Flip
OS Supported	Windows, Linux, Android (need additional SDK)
Conformity	
Conformity	UVC Compliant, RoHS 3, REACH

3. Supported Resolutions

Single Stream Mode:

Resolution	Frame Rates (FPS) in USB 2.0 Mode		
	H.264	MJPEG	YUV420
320 x 240 (QVGA)	30	30	30
640 x 480 (VGA)	30	30	18
1280 x 720 (HD)	30	30	10
1920 x 1080 (FHD)	30	30	5

Dual Stream Mode:

Resolution	Frame Rates (FPS) in USB 2.0 Mode		
	Stream 1	Stream 2	
	H.264	MJPEG	YUV420
320 x 240 (QVGA)	30	NA	NA
640 x 480 (VGA)	30	30	NA
1280 x 720 (HD)	30	30	10
1920 x 1080 (FHD)	30	30	5

4. Supported Camera Functions

The List of functions supported by the Merlin-234CGS camera are:

- Resolution Control
- Image Format Setting
- Video Format Setting – YUV422, H.264 and MJPEG
- Image Capture Software Trigger
- Gain – Auto & Manual
- Exposure – Auto & Manual
- White Balance – Auto & Manual
- Anti Flicker – 50Hz/60Hz
- Contrast Control
- Gamma Control
- Hue & Saturation Control
- Sharpness Control

5. USB 2.0 Interface

The camera module's USB 2.0 connector is a standard USB 2.0 Micro B connector. It provides a nominal 480 Mbps 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 2.0 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 2.0 standard. USB-certified cables are to be used. Vadzo does not recommend non-certified USB cables.

6. Status LED

Status LEDs 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) a 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	Input1	Hardware Trigger
3	-	Do not use*
4	-	Do not use*
5	-	Do not use*
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.*

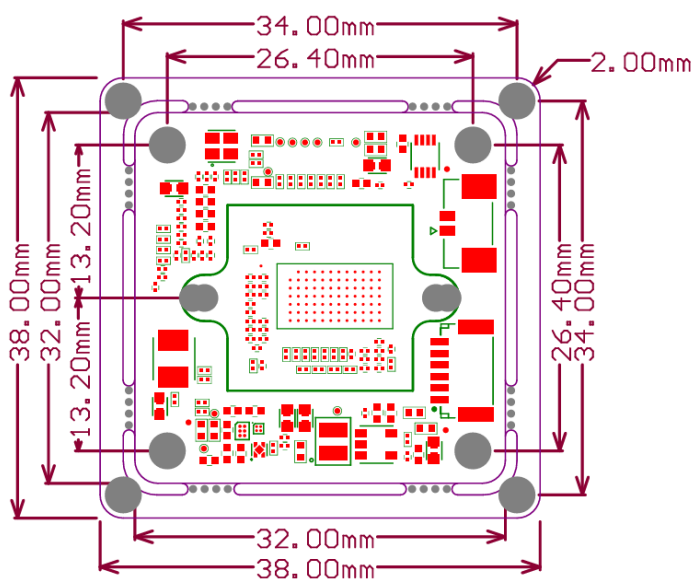
Recommended mating connector from Würth Elektronik part number 665006113322.

8. Temperature and Humidity Specifications

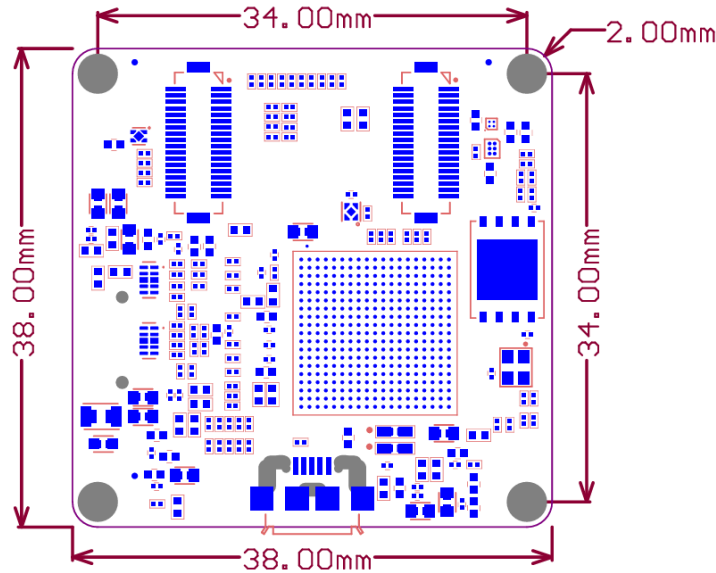
Description	Specification
Operating Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Humidity	20% to 80%, Relative, non-condensing.

9. Dimensions

Board Top Side – 2D



Board Bottom Side - 2D



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