Order Now SDK Product Folder Support

VADZO

MERLIN-521CRS

5MP Color Low-Noise UVC USB 2.0 Camera based on Onsemi AR0521 Sensor

Vadzo Merlin-521CRS is a 5MP low noise USB 2.0 Camera based on Onsemi AR0521 Sensor coupled with high-performance ISP. The camera delivers max resolution of 5MP and Video streaming of 1080p@30fps and 720p@30fps. Applicable in use cases such as medical device camera, patient care camera, security camera, surveillance camera, smart parking camera, etc.

Key Features

- Sensor Model: AR0521 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 Devices Camera:** Ophthalmology Camera, Dermatoscope Camera, Digital Microscope Camera, Pathology Camera.
- **Warehouse Robotics Camera:** Object Scanning, Document Scanning, OCR, Obstacle Detection.
- **Kiosk Camera:** Document Scanning, OCR, Barcode Reading, Facial Recognition, Demography Analysis.
- **Smart Surveillance Camera:** Facial Recognition, Day/Night Video Recording, Smart Parking, Pedestrian Safety.

INDEX

1. Introduction

Merlin-521CRS is a UVC-compliant USB 2.0 Fixed-Focus color camera based on the Onsemi AR0521 sensor. The camera incorporates the AR0521 Bayer 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 Auto functions such as Auto-Exposure and Auto-White Balance.

The Image Signal Processor is integrated with the USB 2.0 controller to provide a compliant USB 2.0 camera. The USB controller is also programmed to support the HID Pipeline which shall support UVC extension functions that are not supported in the standard UVC drivers.

2. Camera Specifications

General Information	
Product Family	Merlin series
Camera Model	Vadzo Merlin-521CRS
Sensor	
Sensor	AR0521 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	Color
Camera Data	
Interface	USB 2.0 Micro B Interface
Pixel Depth	8bit / 10bit
Output Format	YUV422 & MJPEG

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: 1.5 W at 5VDC Min: 1.0 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	YUV422 and MJPEG
Still Image Resolutions	VGA, HD, Full HD, and 5MP
Image Capture formats	BMP and JPEG
Image Capture Modes	Software Trigger
UVC Camera Controls	Brightness, Exposure, Contrast, Sharpness, Saturation, Gamma, Gain, White Balance
OS Supported	Windows, Linux, Android (need additional SDK)
Conformity	
Conformity	UVC Compliant, RoHS 3, REACH

3. Supported Resolutions

Resolution	Frame Rates (FPS) in USB 2.0 Mode	
	YUV	MJPEG
640 x 480 (VGA)	120	120
1280 x 720 (HD)	60	60
1920 x 1080 (FHD)	60	60
2592 x 1944 (5MP)	25	60

4. Supported Camera Functions

The List of functions supported by the Merlin-521CRS camera are:

- Resolution Control
- Image Format Setting
- Video Format Setting – H.264/MJPEG/ YUV
- 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 the camera is currently Streaming.

7. General-Purpose I/O Lines

GPIO lines are terminated through Six (6) a-pin socket connectors 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 the Vadzo Imaging customization program.*

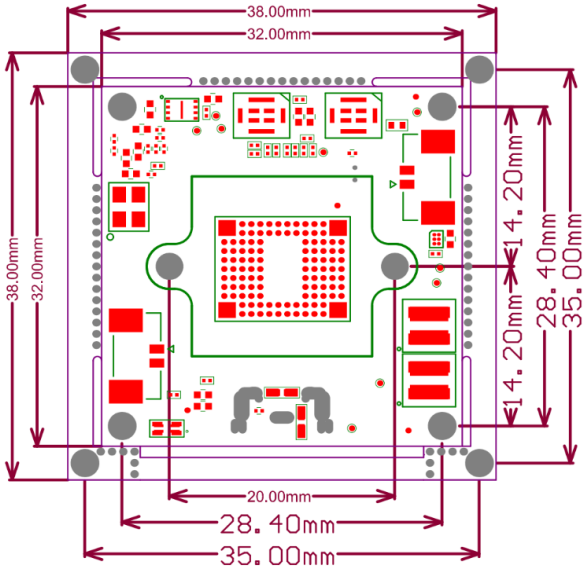
Recommended mating connector from Würth Elektronik part number 665006113322.

8. Temperature and Humidity Specifications

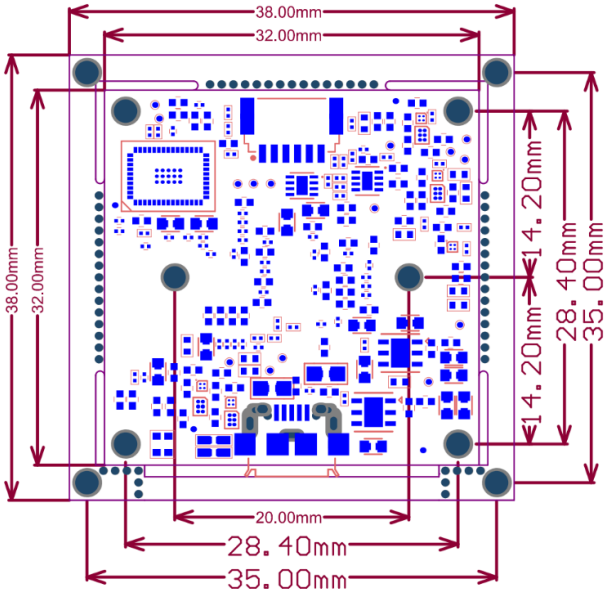
Description	Specification
Operating Temperature	-30^{0}C to 70^{0}C
Storage Temperature	-30^{0}C to 70^{0}C
Humidity	20% to 80%, Relative, non-condensing.

9. Dimensions

Board Top Side – 2D



Board Bottom Side - 2D



IMPORTANT NOTICE AND DISCLAIMER

Vadzo Imaging products are sold by description only. Vadzo Imaging reserves the right to change the information in this document, including URL references and/or specifications is subject to change without notice. Customers should obtain the latest relevant information and data sheets before placing orders and should verify that such information is current and complete.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

THIS DOCUMENT IS PROVIDED AS IS WITH NO WARRANTIES WHATSOEVER, INCLUDING ANY WARRANTY OF MERCHANTABILITY, NON-INFRINGEMENT, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY WARRANTY OTHERWISE ARISING OUT OF ANY PROPOSAL, SPECIFICATION, OR SAMPLE.

All liability, including liability for infringement of any proprietary rights, relating to the use of information in this document is disclaimed. No licenses express or implied, by estoppel or otherwise, to any intellectual property rights are granted herein.

All trade names, trademarks, and registered trademarks mentioned in this document are the property of their respective owners and are hereby acknowledged.

VADZO