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FALCON-5640CRA

5MP Autofocus UVC USB 3.0 Color Camera based on Omnivision OV5640 Sensor

Vadzo Falcon-5640CRA is a 5MP Autofocus USB 3.0 Camera based on Omnivision OV5640 Sensor. The camera supports features such as unique ID, AF, AE, AWB, etc. The camera delivers max resolution of 5MP and Video streaming of 1080p and 720p. The camera comes with a VCM based Autofocus lens assembly that supports either 70DFOV lens or 84DFOV by default. You shall be able to stream video in YUV and MJPEG format and capture images in BMP and JPEG format.

Key Features

- Sensor Model: Omnivision Sensor
- Max Resolution: 5 MP
- Pixel Size: 1.4 μm x 1.4 μm
- Shutter: Rolling Shutter
- Lens FOV: 70 DFOV and 84 DFOV
- Compliance: UVC, RoHS 3, REACH



Applications

- **Retail Analytics & Automation:** Inventory Monitoring, Age Verification, Demography Analysis, Shelf Monitoring, Self-Checkout.
- **Kiosk & Digital Signages:** Document Scanning, OCR, Barcode Reading, Facial Recognition, Demography Analysis.
- **Smart Surveillance:** Facial Recognition, Day/Night Video Recording, Smart Parking, Pedestrian Safety.

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1. Introduction

Falcon-5640CRA is a UVC Compliant USB3.0 Auto-Focus color camera based on Omnivision OV5640 sensor. The camera is designed to be backward compatible with USB2.0 as well.

The camera incorporates the OV5640 color sensor from Omnivision. The sensor comes in a System-On-Chip package with integrated 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-Focus, Auto-Exposure and Auto-White Balance.

The OV5640 SoC is integrated with the USB3.0 controller to provide UVC Compliant USB3.0 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-5640CRA
Sensor	
Sensor	OV5640 CMOS sensor from Omnivision
Sensor Format	1/4"
Pixel Size	1.4 μm x 1.4 μm
Max Resolution	5MP – 2592(H) x 1944(V)
Shutter	Rolling Shutter
Chroma	Color
Camera Data	
Interface	USB 3.0 Gen1 Backward compatible to USB 2.0
Pixel Depth	8bit / 10bit
Output Format	YUV422 & MJPEG
Exposure Control	Manual Control via software & Auto-Exposure

Focus Control	Manual Control via software & Auto-Focus
GPIO	6 pins. 1x Digital Input, 1x Digital Output, 3x NC and GND
Camera Hardware	
Lens	VCM based Auto-Focus with Focus range of 100mm to Infinity
Lens FOV	Variant 1: 70 DFOV Variant 2: 84 DFOV
Lens Filter	Variant 1: With NIR Cut Filter Variant 2: Without NIR Cut Filter
USB connector	USB 3.0 Gen 1 Micro B Connector
GPIO connector	Connector on-board: Wurth 665106131822 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 ⁰ C to 70 ⁰ C
Dimension	75mm(L) x 16mm (B) x 9.8mm (H)
Weight	18 Grams
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, Focus Control
OS Supported	Windows, Linux, Android (need additional SDK)

Conformity	
Conformity	UVC Compliant, RoHS 3, REACH

3. Supported Resolutions

Resolution	Frame Rates (FPS) in USB 3.0 Mode	
	YUV	MJPEG
640 x 480 (VGA)	30	30
1280 x 720 (HD)	30	30
1920 x 1080 (FHD)	30	30
2592 x 1944 (5MP)	15	30

4. Supported Camera Functions

The List of functions supported by the Falcon-5640CRA camera are:

- Resolution Control
- Image Format Setting
- Video Format Setting – YUV/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 3.0 Interface

The camera module's USB 3.0 connector is a standard USB Micro-B USB 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. This camera can also accommodate USB2.0 Micro B cable in USB2.0 mode. 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 665106131822. 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 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.*

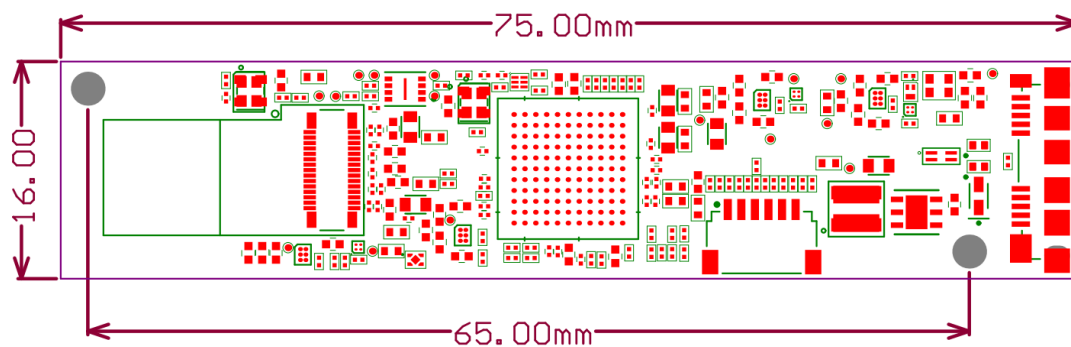
Recommended mating connector from Würth Elektronik part number 665006113322.

8. Temperature and Humidity Specifications

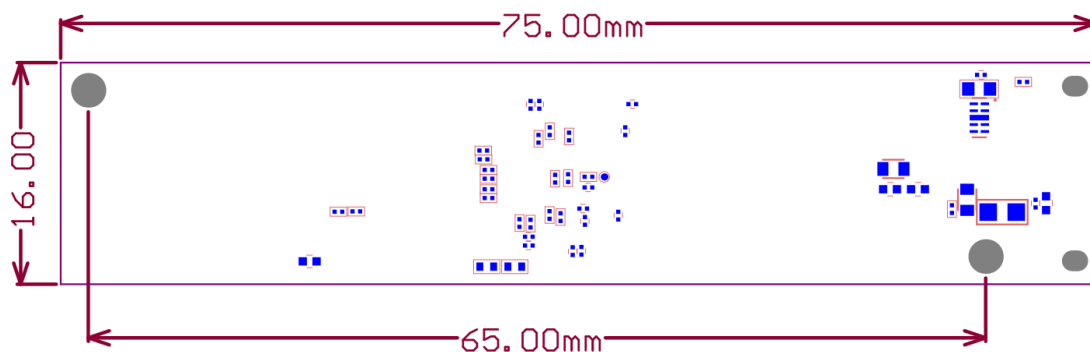
Description	Specification
Operating Temperature	-30°C to 70°C
Storage Temperature	-30°C to 70°C
Humidity	20% to 80%, Relative, non-condensing.

9. Dimensions

Board Top Side – 2D



Board Bottom Side - 2D



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