VADZO

BOLT-5640CRA

5MP Autofocus MIPI Color Camera based on Omnivision OV5640 Sensor

Vadzo Bolt-5640CRA is a 5MP MIPI Camera based on Omnivision OV5640 Sensor coupled with high-performance ISP. The camera delivers max resolution of 5MP and Video streaming of 1080p, 720p and VGA. Applicable in use cases such as kiosk camera, digital signage camera, pathology camera, robotics camera, retail AI camera, etc. Bolt-5640CRA has been integrated with solutions based on platforms such as Raspberry PI, Nvidia Nano, Nvidia XavierNX, etc.

Key Features

- Sensor Model: OV5640 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: 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

Bolt-5640CRA is a MIPI Auto-Focus color camera based on Omnivision OV5640 sensor.

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.

2. Camera Specifications

General Information	
Product Family	Bolt series
Camera Model	Vadzo Bolt-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	2 Lane MIPI CSI-2
Pixel Depth	8bit / 10bit
Output Format	YUV422
Exposure Control	Manual Control via software & Auto-Exposure
Focus Control	Manual Control via software, Phase Detection Auto-Focus & Contrast Based Auto-Focus
GPIO	2x NC

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Camera Hardware	
Lens	VCM based Auto-Focus with Focus range of 100mm to Infinity
Lens FOV	Variant 1: 70 DFOV Variant 2: 84 DFOV
MIPI connector	XF3M(1)-1515-1B (2 Lane)
Power Requirement	Max: 1.45 W at 3.3VDC Min: 0.80 W at 3.3VDC
Operating Temperature	-30^{0}C to 70^{0}C
Dimension	40mm(L) x 15mm (B) x 9mm (H)
Weight	12 Grams
Camera Software	
Video Resolutions	VGA, HD, Full HD, and 5MP
Video formats	YUV422
Still Image Resolutions	VGA, HD, Full HD, and 5MP
Image Capture formats	BMP
Image Capture Modes	Software trigger
Camera Controls	Brightness, Exposure, Contrast, Sharpness, Saturation, Gamma, Gain, White Balance, Focus Control, Denoising, JPEG Compression
Conformity	
Conformity	RoHS 3, REACH

3. Supported Resolutions

Resolution	**Frame Rates (FPS) in 2-Lane MIPI CSI 2**
	YUV
640 x 480 (VGA)	60
1280 x 720 (HD)	30
1920 x 1080 (FHD)	30
2592 x 1944 (5MP)	15

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4. Supported Camera Functions

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

- Resolution Control
- Image Format Setting
- Video Format Setting – YUV422
- Image Capture Software Trigger
- Gain – Auto & Manual
- Exposure – Auto & Manual
- White Balance – Auto & Manual
- Focus – Auto Focus & Manual
- Anti Flicker – 50Hz/60Hz
- Contrast Control
- Gamma Control
- Hue & Saturation Control
- Sharpness Control
- ROI Based Auto-Functions – Focus & Exposure

5. MIPI Interface

The camera module supports 2-Lane MIPI CSI 2 interface. Vadzo has designed the camera hardware such that it can be directly integrated with Raspberry PI as well Nvidia Jetson development kit via the 2-Lane MIPI CSI 2 interface.

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. 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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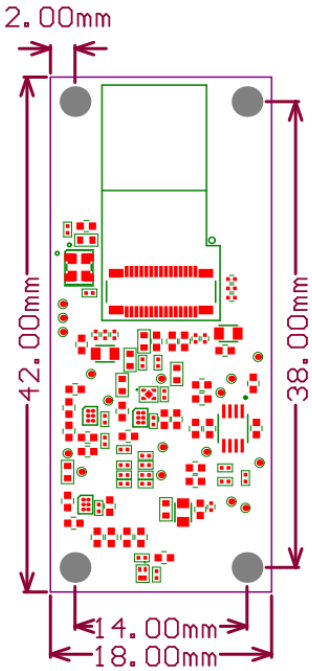
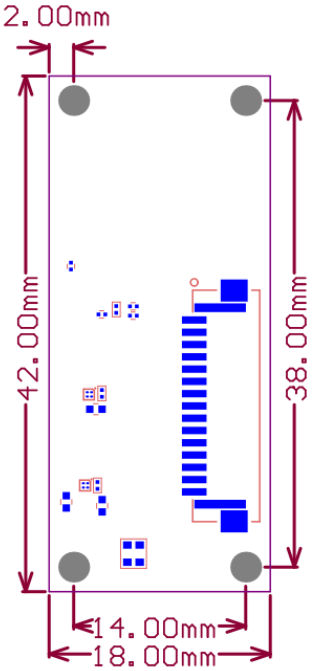
8. Dimensions

Board Top Side – 2D



Board Bottom Side - 2D



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