VADZO

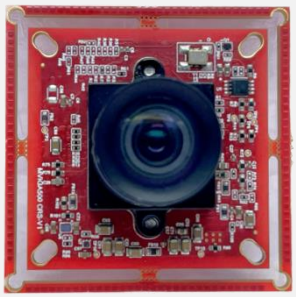
BOLT-291CRS

2MP Color Full HD MIPI Camera based on Sony Starvis IMX291 Sensor

Vadzo Bolt-291CRS is a Full HD MIPI Camera based on Sony Starvis IMX291 Sensor coupled with high-performance ISP. The camera delivers a max resolution of 2.13MP and Video streaming of 1080p, 720p, and VGA. Applicable in use cases such as retail AI camera, medical device cameras, facial recognition cameras, kiosk cameras, digital signage camera, etc. Bolt-291CRS has been integrated with solutions based on platforms such as Raspberry PI, Nvidia Nano, Nvidia XavierNX, etc.

Key Features

- Sensor Model: IMX291 Sony Sensor
- Max Resolution: 2.13 MP
- Pixel Size: 2.9 µm x 2.9 µm
- Shutter: Rolling Shutter
- Lens FOV: 74 DFOV
- Compliance: RoHS 3, REACH



Applications

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

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1. Introduction

Bolt-291CRS is a MIPI Fixed-Focus color camera based on Sony Starvis IMX291 Sensor. The sensor supports 120+dB Dynamic Range.

The camera incorporates the IMX291 sensor from Sony Starvis 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.

This is a two-board camera solution that comprises of the camera module board and the adapter board. There are two variants of the adapter board to 2-Lane MIPI CSI 2 as well as 4-Lane MIPI CSI 2 interfaces.

2. Camera Specifications

General Information	
Product Family	Bolt series
Camera Model	Vadzo Bolt-291CRS
Sensor	
Sensor	IMX291 Sensor from Sony Starvis
Sensor Format	1/2.8”
Pixel Size	2.9 µm x 2.9 µm
Max Resolution	2.13 MP – 1920(H) x 1080(V)
Shutter	Rolling Shutter
Chroma	Color
Camera Data	
Interface	2 Lane MIPI CSI-2
Pixel Depth	8bit
Output Format	YUV422
Exposure Control	Manual Control via software & Auto-Exposure
GPIO	2 x NC

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Camera Hardware	
Lens	S Mount (M12 Standard)
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	38mm (L) x 38mm (B) convertible to 32mm (L) x 32mm (B)
Weight	13 Grams (Without Lens)
Camera Software	
Video Resolutions	VGA, HD, and Full HD
Video formats	YUV422
Still Image Resolutions	VGA, HD, and Full HD
Image Capture formats	BMP
Image Capture Modes	Software trigger
Camera Controls	Brightness, Exposure, Contrast, Sharpness, Saturation, Gamma, Gain, White Balance, Denoising
Conformity	
Conformity	RoHS 3, REACH

3. Supported Resolutions

Resolution	Frame Rates (FPS) in 2-Lane MIPI CSI 2
640 x 480 (VGA)	90
1280 x 720 (HD)	60
1920 x 1080 (FHD)	60

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4. Supported Camera Functions

The List of functions supported by the Bolt-291CRS 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
- Anti Flicker – 50Hz/60Hz
- Contrast Control
- Gamma Control
- Hue & Saturation Control
- Sharpness Control

5. MIPI Interface

The camera module supports both 4-Lane MIPI CSI 2 as well as 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. Vadzo has used the XF3M(1)-1515-1B from Omron for this interface. Vadzo has integrated the capability of functioning in the 4-Lane MIPI CSI 2 bandwidth as well to ensure that you can achieve faster frame rates.

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

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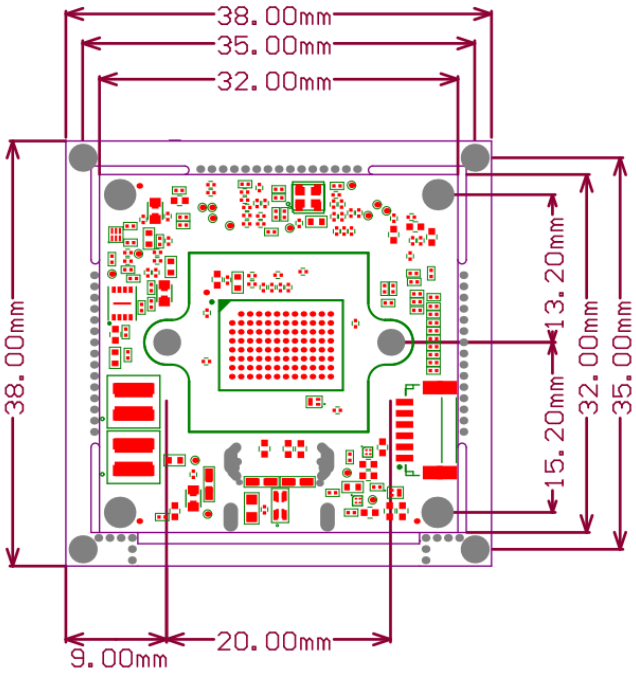
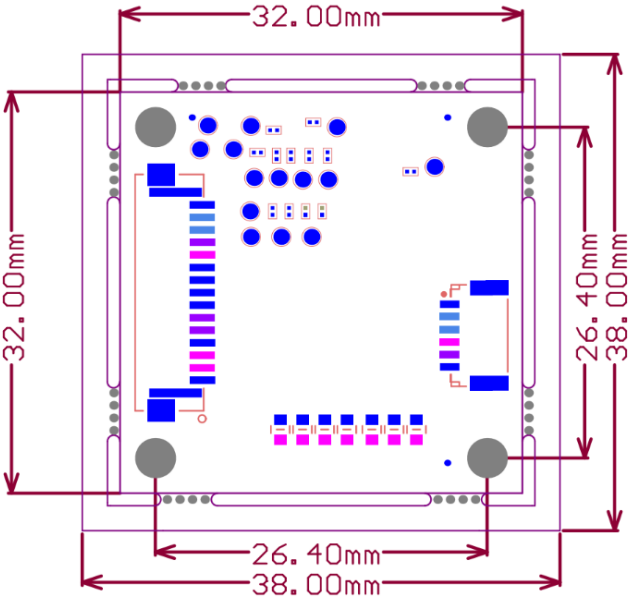
8. Dimensions

Board Top Side – 2D



ATR Board: 2-Lane Bottom Side – 2D



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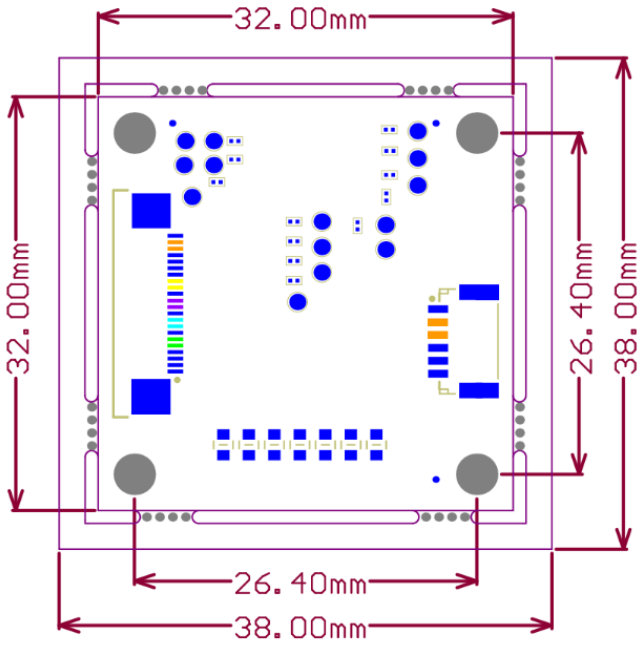
ATR Board: 4-Lane Bottom Side – 2D



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