VADZO

BOLT-258CRA

13MP Color MIPI Camera based on Sony IMX258 Sensor

Vadzo Bolt-258CRA is a 4K MIPI Camera based on Sony IMX258 Sensor coupled with high-performance ISP. The camera delivers max resolution of 13MP and Video streaming of 4K, 1080p and 720p. Applicable in use cases such as kiosk camera, digital signage camera, security camera, surveillance camera, medical device camera, patient care camera, etc. Bolt-258CRA has been integrated with solutions based on platforms such as Raspberry PI, Nvidia Nano, Nvidia XavierNX, etc.

Key Features

- Sensor Model: IMX258 Sony Sensor
- Max Resolution: 13MP
- Pixel Size: 1.12 µm x 1.12 µm
- Shutter: Rolling Shutter
- Lens FOV: 78 DFOV and 82 DFOV
- Compliance: RoHS 3, REACH

Applications

- **Medical & Life Science Devices:** Ophthalmology Camera, Intraoral Camera, Dermatoscope Camera, Digital Microscope Camera, Pathology Camera.
- **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.
- **Warehouse Robotics:** Object Scanning, Document Scanning, OCR, Obstacle Detection.

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1. Introduction

Bolt-258CRA is a Phase Detection Auto-Focus MIPI color camera based on Sony IMX258 sensor.

The camera incorporates the IMX258 Bayer sensor from Sony 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 camera supports both Phase Detection Auto-Focus as well as Contrast Auto-Focus.

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-258CRA
Sensor	
Sensor	IMX258 CMOS sensor from Sony
Sensor Format	1/3.06”
Pixel Size	1.12 µm x 1.12 µm
Max Resolution	13MP – 4208(H) x 3120(V)
Shutter	Rolling Shutter
Chroma	Color
Camera Data	
Interface	2-Lane MIPI CSI 2 & 4-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
Camera Hardware	
Lens	VCM based Phase Detection Auto-Focus and Contrast Based Auto-Focus with Focus range of 100mm to Infinity.
Lens FOV	Variant 1: 78 DFOV
MIPI connector	XF3M(1)-1515-1B (2 Lane) & 54548-2271 (4 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	78mm(L) x 15mm (B) x 9.8mm (H)
Weight	12 Grams
Camera Software	
Video Resolutions	VGA, HD, Full HD, 4K and 13MP
Video formats	YUV422
Still Image Resolutions	VGA, HD, Full HD, 4K and 13MP
Image Capture formats	BMP
Image Capture Modes	Software trigger
Camera Controls	Brightness, Exposure, Contrast, Sharpness, Saturation, Gamma, Gain, White Balance, Focus Control, ROI based Auto-Exposure, ROI based Auto-Focus, Denoising, JPEG Compression
Conformity	
Conformity	RoHS 3, REACH

3. Supported Resolutions

Resolution	Frame Rates (FPS) in MIPI 4-Lane
	YUV
640 x 480 (VGA)	90
1280 x 720 (HD)	60
1920 x 1080 (FHD)	30
3840 x 2160 (4K)	30
4208 x 3120 (13MP)	20

4. Supported Camera Functions

The list of functions supported by the Bolt-258CRA camera are:

- Resolution Control
- Image format setting
- Video format setting – YUV
- Image capture software trigger
- Gain – Auto & Manual
- Exposure – Auto & Manual
- White Balance – Auto & Manual
- Focus – PDAF Auto Focus, Contrast 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 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:

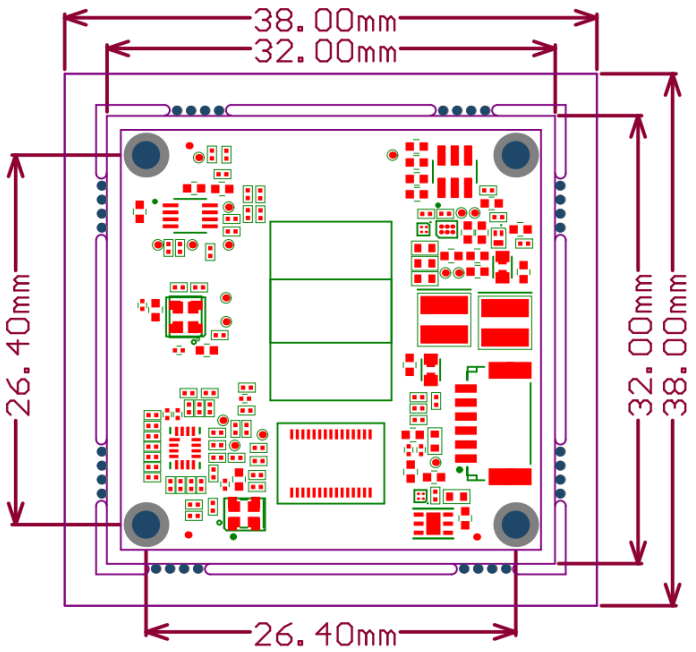
- Red color indicates Device is powered ON with no Streaming.
- Yellow color indicates: Camera is currently Streaming.

7. Temperature and Humidity Specifications

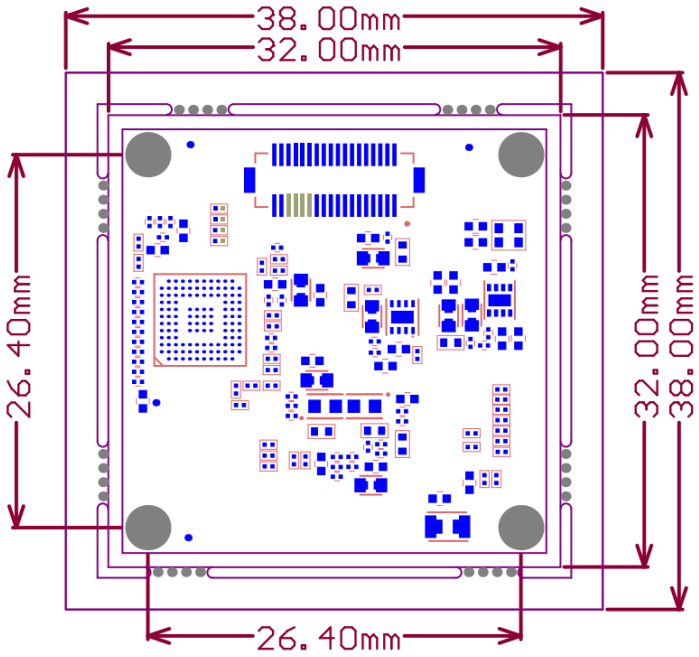
Description	Specification
Operating Temperature	-30°C to 70°C
Storage Temperature	-30°C to 70°C
Humidity	20% to 80%, Relative, non-condensing.

8. Dimensions

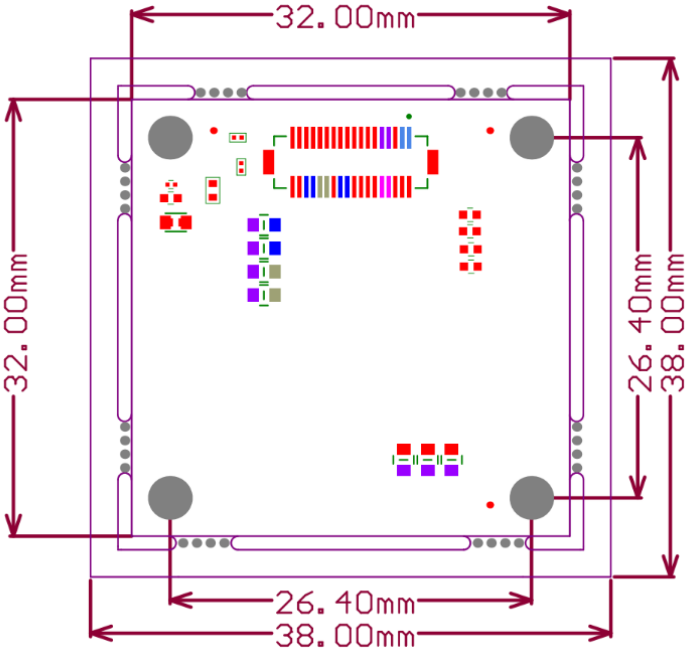
Board Top Side – 2D



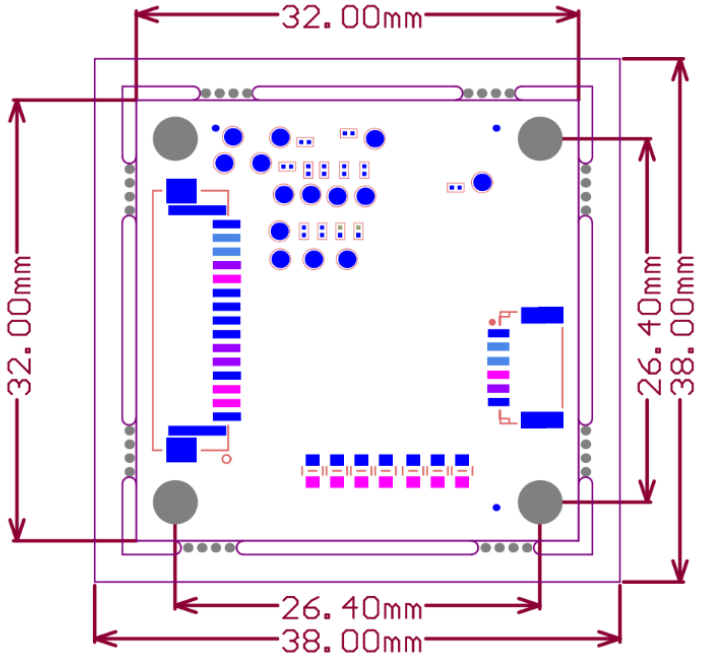
Board Bottom Side - 2D



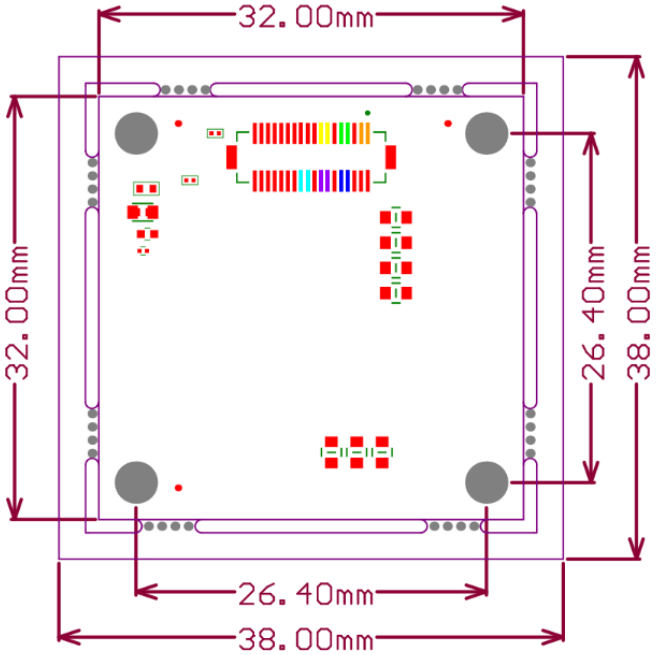
ATR Board 2-Lane Top Side – 2D



ATR Board 2-Lane Bottom Side – 2D



ATR Board 4-Lane Top Side – 2D



ATR Board 4-Lane Bottom Side – 2D