
5MP Color MIPI Camera based on Onsemi AR0544 Hyperlux™ LP Sensor

Vadzo Bolt-544CRS is a 5MP MIPI Camera based on the Onsemi AR0544 Hyperlux™ LP product family Sensor coupled with a high-performance ISP. The camera delivers a max resolution of 5MP and Video streaming of 1080p, 720p, and VGA. The camera comes with advanced features such as Low Power Consumption, Wake-on-Motion (WOM), enhanced Dynamic Range (eDR) & Line Interleaved HDR (LI-HDR) Modes, and so on. Bolt-544CRS has been integrated with solutions based on platforms such as Raspberry PI, Nvidia Nano, Nvidia XavierNX, etc.

Key Features

- Sensor Model: AR0544 CMOS Sensor from Onsemi Hyperlux™ LP
- Max Resolution: 5MP (2592 x 1944)
- Pixel Size: 1.4 μm x 1.4 μm
- Shutter: Rolling Shutter
- Lens FOV: 74 DFOV
- Compliance: 2 Lane MIPI CSI-2 & 4 Lane MIPI CSI-2

**Applications**

- **Automation & Robotics Camera:** Machine Vision, Inspection Robots, Warehouse Robots, AGVs.
- **Smart Security Camera:** Facial Recognition, Wearable Body Camera, Access Control Camera, Day/Night Video Recording, Smart Parking, Pedestrian Safety.
- **Retail Automation Camera:** Retail Analytics, Self-Checkout, Retail Kiosks, Inventory Management.
- **Telematics Camera:** Dashcam, Driver Monitoring, Cargo Monitoring Camera, Fleet Management.
- **Kiosk Camera: Document Scanning, OCR, Barcode Reading, Facial Recognition, Demography Analysis.**

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1. Introduction

Bolt-544CRS is a low-power MIPI color camera based on the Onsemi AR0544 Hyperlux™ LP sensor. The camera incorporates the AR0544 sensor from Onsemi integrated with an onboard Image Signal Processor (ISP) to perform functions such as Wake-on-Motion, Low Power Consumption, enhanced Dynamic Range (eDR) & Line Interleaved HDR (LI-HDR) Modes, 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-544CRS
Sensor	
Sensor	AR0544 CMOS Sensor from Onsemi Hyperlux™ LP
Sensor Format	1/4.2"
Pixel Size	1.4 μm x 1.4 μm
Max Resolution	5MP – (2592 x 1944)
Shutter	Rolling Shutter
Chroma	Color
Camera Data	
Interface	2 Lane MIPI CSI-2 & 4 Lane MIPI CSI-2
Pixel Depth	10bit
Output Format	YUV422
Exposure Control	Manual Control via software & Auto-Exposure
GPIO	2 x NC

Camera Hardware	
Lens	S Mount (M12 Standard)
MIPI Connector	686115148922 (2 Lane) & F305-1A7H1-21022-E100(4 Lane)
Power Requirement	Max: 1.45 W at 3.3VDC Min: 0.80 W at 3.3VDC
Operating Temperature	-30 °C to +85 °C
Dimension	38mm (L) x 38mm (B) convertible to 32mm (L) x 32mm (B)
Weight	22 Grams (Without Lens)
Camera Software	
Video Resolutions	VGA, HD, Full HD and 5MP
Video formats	YUV422
Still Image Resolutions	VGA, HD, Full HD and 5MP
Camera Controls	Brightness, Exposure, Contrast, Sharpness, Saturation, Gamma, Gain, White Balance, Flip control
Conformity	
Conformity	RoHS 3, REACH

3. Supported Resolutions

Resolution	2-Lane MIPI CSI-2 Frame Rates (FPS)	4-Lane MIPI CSI-2 Frame Rates (FPS)
	YUV422	YUV422
640 x 480 (VGA)	60	60
1280 x 720 (HD)	60	60
1920 x 1080 (FHD)	60	60
2592 x 1944 (5MP)	25	30

Note: FPS will be varied as per the Host platform

4. Supported Camera Functions

The List of functions supported by the Bolt-544CRS camera are:

- Resolution Control
- Video Format Settings – YUV422
- Image Capture
- Gain, Contrast
- Exposure – Auto & Manual
- Anti Flicker – 50Hz/60Hz
- Brightness, sharpness, saturation
- Digital PTZ
- White balance-Auto & Manual

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 686115148922(2 Lane) from Wurth Elektronik 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. Vadzo has used the F305-1A7H1-21022-E100(4 Lane) from Amphenol for this interface

6. Status LED

Status LED's indicate the below:

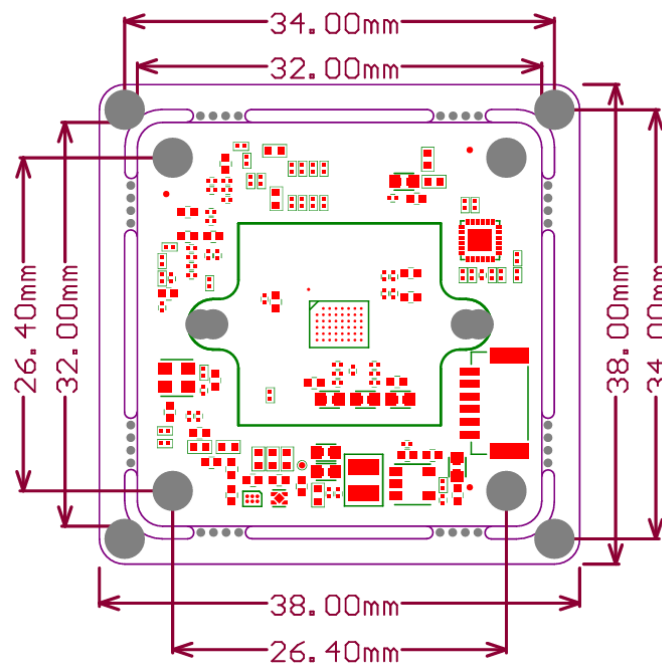
- Red color indicates Device is powered ON with no Streaming.
- Yellow color indicates: Camera is currently Streaming.

7. Temperature and Humidity Specifications

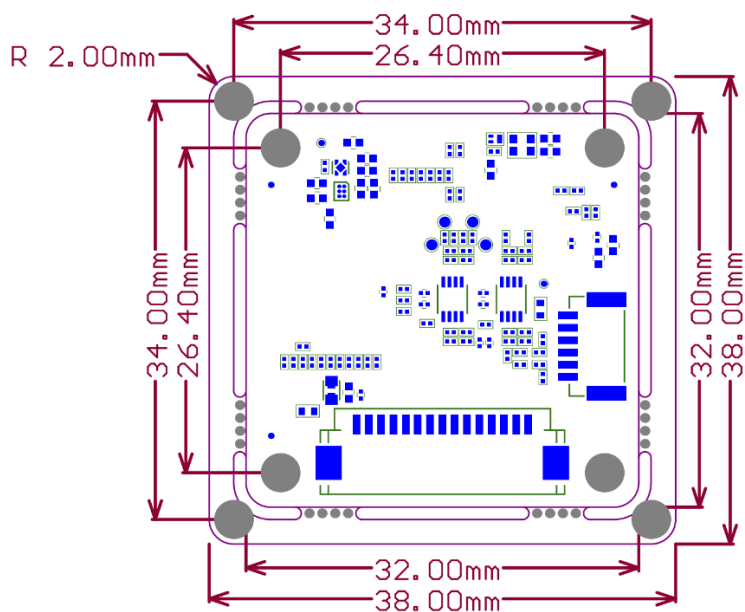
Description	Specification
Operating Temperature	-30 °C to +85 °C
Storage Temperature	-30 °C to +85 °C
Humidity	20% to 80%, Relative, non-condensing.

8. Dimensions

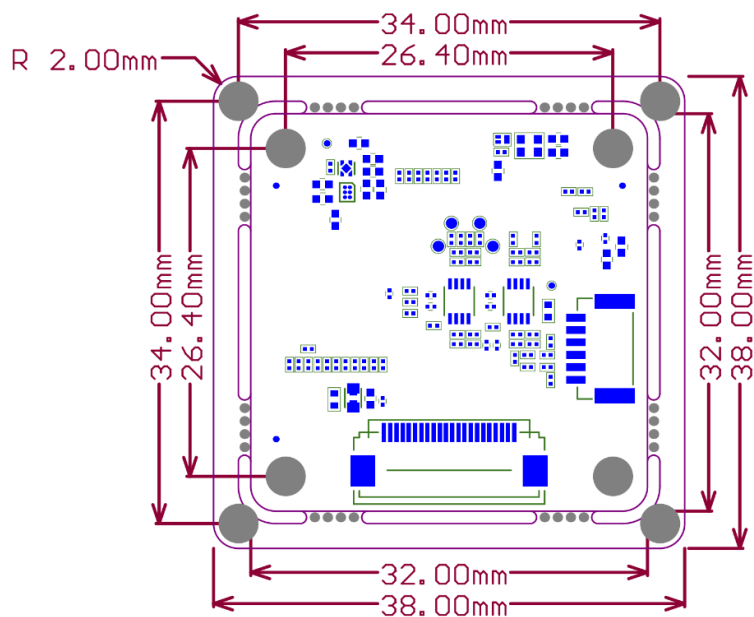
Board Top Side – 2D



ATR Board 2-Lane Bottom Side – 2D



ATR Board 4-Lane Bottom Side – 2D



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