VADZO

BOLT-2020MRS

20MP NIR Monochrome MIPI Camera based on Onsemi Hyperlux™ LP AR2020 Sensor

Vadzo Bolt-2020MRS is a 20MP MIPI Camera based on Onsemi Hyperlux™ LP AR2020 Imaging Sensor. The camera comes with inherent capabilities such as enhanced dynamic range (eDR), excellent Low-Light and NIR Sensitivity. The camera delivers max resolution of 20MP and Video streaming of 20MP, 4K, 1080p and 720p. The camera comes with a M12/S-Mount lens holder that supports a 74DFOV lens by default. The camera supports image capture and video streaming in Y8 format, and store in BMP format. Bolt-2020MRS can be integrated with solutions based on platforms such as Raspberry PI, Nvidia Nano, Nvidia XavierNX, Nvidia Orin AGX, etc.

Key Features

- Sensor Model: AR2020 Onsemi Hyperlux™ LP
- Max Resolution: 20MP
- Pixel Size: 1.4 µm x 1.4 µm
- Shutter: Rolling Shutter
- Lens FOV: 74 DFOV
- Compliance: RoHS 3, REACH

Applications

- **Machine Vision Cameras:** Quality Inspection, Assembly Line Monitoring, Object Recognition and Classification, Surface Inspection, High-Speed Imaging.
- **Smart Surveillance Camera:** Iris Recognition, Day/Night Video Recording, Smart Parking.
- **Medical Devices:** Digital Pathology, Digital Microscopes, Ophthalmic Devices, Fluorescence Imaging.

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1. Introduction

Bolt-2020MRS is a Fixed-Focus Monochrome camera based on Onsemi AR2020 sensor. The camera incorporates the Onsemi Hyperlux™ LP AR2020 low-noise CMOS sensor that supports key features like enhanced HDR, Excellent NIR Response @850n and 900nm, Wake on Motion, and so on. In addition to this, the camera supports 4-lane MIPI CSI-2 Interface and has been tested with platforms such as Raspberry PI, Nvidia Nano, Nvidia Orin AGX and Nvidia XavierNX.

2. Camera Specifications

General Information	
Product Family	Bolt Series
Camera Model	Vadzo Bolt-2020MRS
Sensor	
Sensor	AR2020 CMOS sensor from Onsemi
Sensor Format	1/1.8”
Pixel Size	1.4µm x 1.4µm
Max Resolution	20MP - 5120(H) x 3840(V)
Shutter	Rolling Shutter
Chroma	Mono
Camera Data	
Interface	4 Lane MIPI CSI-2
Pixel Depth	8bit
Output Format	Y8
Exposure Control	Manual Control via software
GPIO	2x NC
Camera Hardware	
Lens	S Mount (M12 Standard)
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°C to 70°C
Dimension	38mm (L) x 38mm (B) convertible to 32mm (L) x 32mm (B)
Weight	18 Grams (Without Lens)
Camera Software	
Video Resolutions	VGA, 720p, 1080p, 4K, 5K and 20MP (5120x3840).
Video formats	Y8
Image Capture formats	BMP and Y8
Image Capture Modes	Software trigger
OS Supported	Windows, Linux.
Conformity	
Conformity	RoHS 3 and REACH

3. Supported Resolutions

Resolution	**4-Lane MIPI CSI-2 Frame Rates (FPS)**
	Y8
640 x 480 (VGA)	1920
1280 x 720 (HD)	640
1920 x 1080 (FHD)	284
3840 x 2160 (4K)	71
5120x2880 (5K)	40
5120 x 3840 (20MP)	30

4. Supported Camera Functions

The List of functions supported by the Bolt-2020MRS camera are:

- Resolution Control
- Image Format Setting
- Video Format Setting – Y8
- Image Capture Software Trigger
- Gain – Auto & Manual
- Exposure – Auto & Manual
- Anti Flicker – 50Hz/60Hz

5. MIPI Interface

The camera module supports both 4-lane and 2-lane MIPI CSI-2 interfaces, with 4-lane MIPI CSI-2 as the primary operating mode to enable higher bandwidth and faster frame rates. Vadzo has designed the camera hardware to support direct integration with Raspberry Pi and NVIDIA Jetson development kits using either interface.

The design uses the Omron XF3M(1)-1515-1B connector to ensure reliable high-speed connectivity.

6. Status LED

Status LEDs indicate the below:

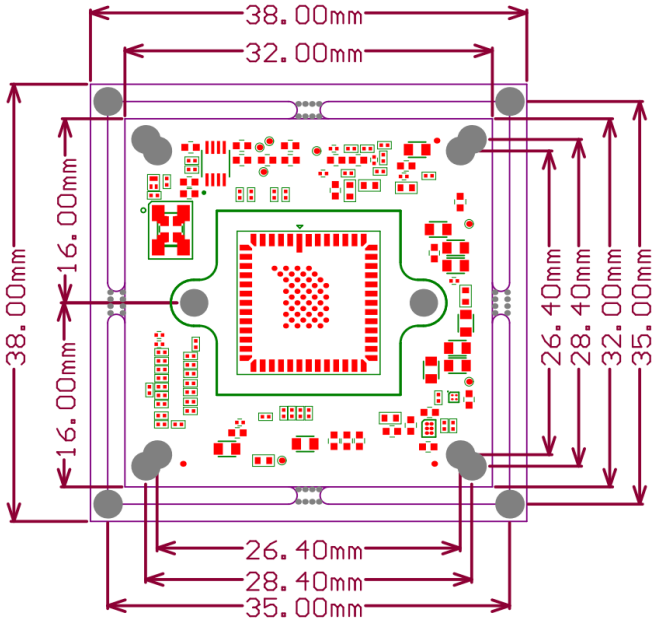
- Red Color indicates Device is powered ON with no Streaming.
- Yellow Color indicates: Camera is currently Streaming.

7. Temperature and Humidity Specifications

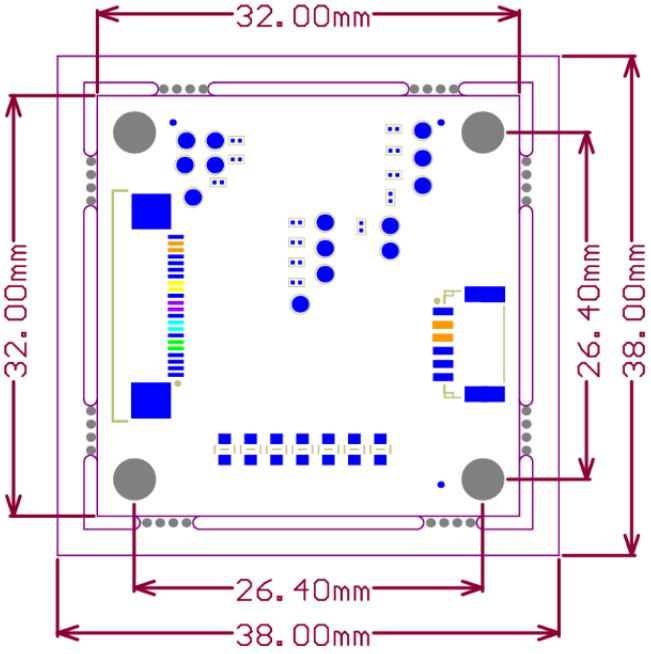
Description	**Specification**
Operating Temperature	-30^{0}C to 70^{0}C
Storage Temperature	-30^{0}C to 70^{0}C
Humidity	20% to 80%, Relative, non-condensing.

8. Dimensions

Base Board Top Side – 2D



ATR Board: 4-Lane Bottom Side – 2D



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