MIPI CSI2 camera modules

MIPI CSI-2 camera modules for Raspberry Pi & Jetson platforms. Cameras share same dimensions and 4 lane 22pin connector along with extra 5 pin connector for synchronization signals.

- Overview
- 462x-CSI
- 234x-CSI
- 477x-CSI
- 822x-CSI
- Dimensions
- Boxed camera dimensions

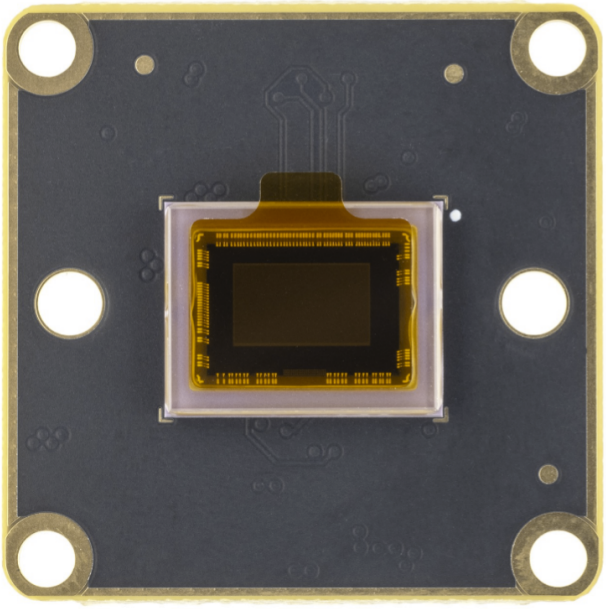
Overview

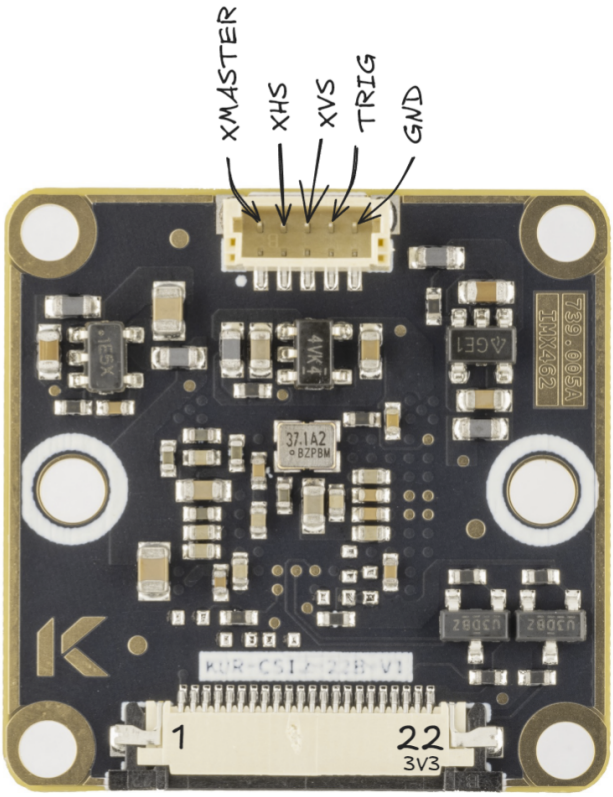
- RGB or Mono sensor.
- M12/M12L/bare board.
- Global / Rolling shutter.
- High speed.
- Wide dynamic range.
- 22-pin FFC (0.5mm) standard connector.
- Small footprint.
- Extra connector for synchronization signals.
- <1 W typical - perfect for edge-AI, robotic vision, surveillance, and many more applications.

462x-CSI

Camera variants

SKU	Lens mount	Chroma	Note
462C-CSI-M12	9.5mm for wide angle lenses	RGB Color	**Most common use for wide angle and fish-eye lenses.**
462C-CSI-M12L	14.7mm for regular and telephoto lenses	RGB Color	**Modification for lenses above 6mm (typical)**
462M-CSI-M12	9.5mm for wide angle lenses	Mono	Same as 462C-M12 but Mono sensor for better light sensitivity
462M-CSI-M12L	14.7mm for regular and telephoto lenses	Mono	Same as 462C-M12L but Mono sensor for better light sensitivity





MIPI CSI2 wiring

Interface connector 22pin 0.5mm pitch 687122183622 from Würth Elektronik. Top facing pins.

Pin	Signal	Description
1	GND	
2	D0_N	
3	D0_P	
4	GND	
5	D1_N	
6	D1_P	
7	GND	
8	CLK_N	
9	CLK_P	
10	GND	
11	D2_N	
12	D2_P	
13	GND	
14	D3_N	
15	D3_P	
16	GND	
17	ENABLE	Wired to sensor XCLR
18	N.C.	
19	GND	
20	SCL	
21	SDA	

22	+3.3V	

AUX wiring

Interface connector 5 pin 1mm pitch 665305124022 from Würth Elektronik.

Pin	Signal	Description
1	XMASTER	Master / Slave selection
2	XHS	Horizontal sync signal
3	XVS	Vertical sync signal
4	TRIG	Trigger mode input
5	GND	

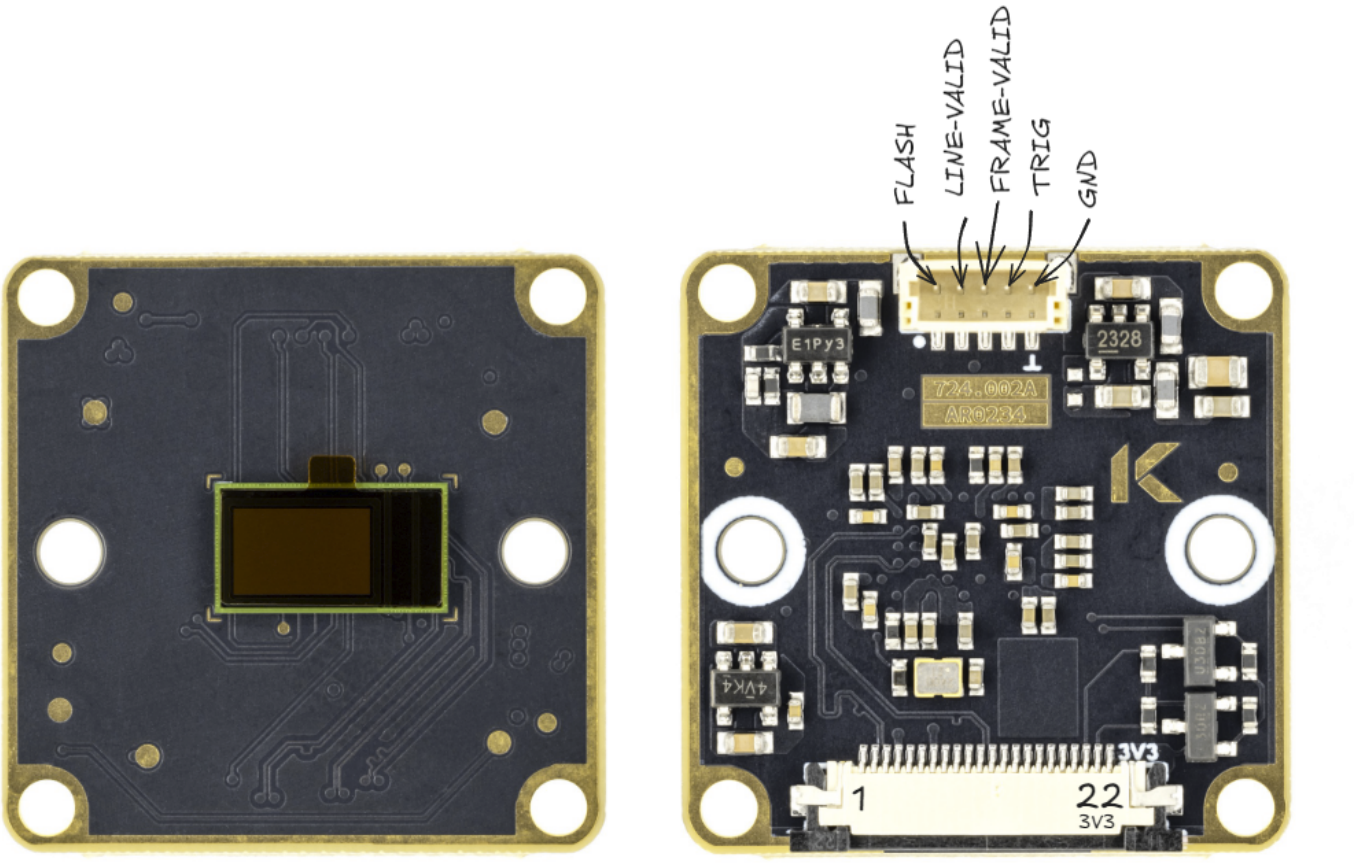
234x-CSI

The AR0234CS is a 2.3-megapixel global shutter CMOS sensor that uses a 3.0µm pixel array of 1920 x 1200, giving a 1/2.6″ (6.8mm diagonal) optical format. It outputs 8 or 10 bit RAW through up to four MIPI CSI-2 lanes at 900 Mb/s per lane. Default streaming reaches 120 fps at full resolution, while a 2×2 binned 960 x 600 window delivers 237fps. Best suitable for: bar-code scanners, gesture-recognition devices, 3D scanners, positional tracking systems, iris scanning terminals, augmented reality headsets, virtual reality headsets, biometric sensors, machine-vision cameras, and industrial-inspection equipment.

Camera variants

SKU	Lens mount	Chroma	Note
234C-CSI-M12	9.5mm for wide angle lenses	RGB Color	**Most common use for wide angle and fish-eye lenses.**
234C-CSI-M12L	14.7mm for regular and telephoto lenses	RGB Color	**Modification for lenses above 6mm (typical)**
234C-CSI	No lens mount	RGB Color	Bare sensor board without lens mount
234C-CSI-CS	CS lens mount	RGB Color	Boxed camera with CS mount and IRCUT filter.

Pinout



Interface connector 22pin 0.5mm pitch 687122183622 from Würth Elektronik. Top facing pins.

Pin	Signal	Description
1	GND	
2	D0_N	
3	D0_P	
4	GND	
5	D1_N	
6	D1_P	
7	GND	
8	CLK_N	
9	CLK_P	
10	GND	

11	D2_N	
12	D2_P	
13	GND	
14	D3_N	
15	D3_P	
16	GND	
17	ENABLE	Wired to sensor RESET_N
18	N.C.	
19	GND	
20	SCL	
21	SDA	
22	+3.3V	

AUX wiring

Interface connector 5 pin 1mm pitch 665305124022 from Würth Elektronik.

Pin	Signal	Description
1	FLASH	
2	LINE-VALID	
3	FRAME-VALID	
4	TRIG	
5	GND	

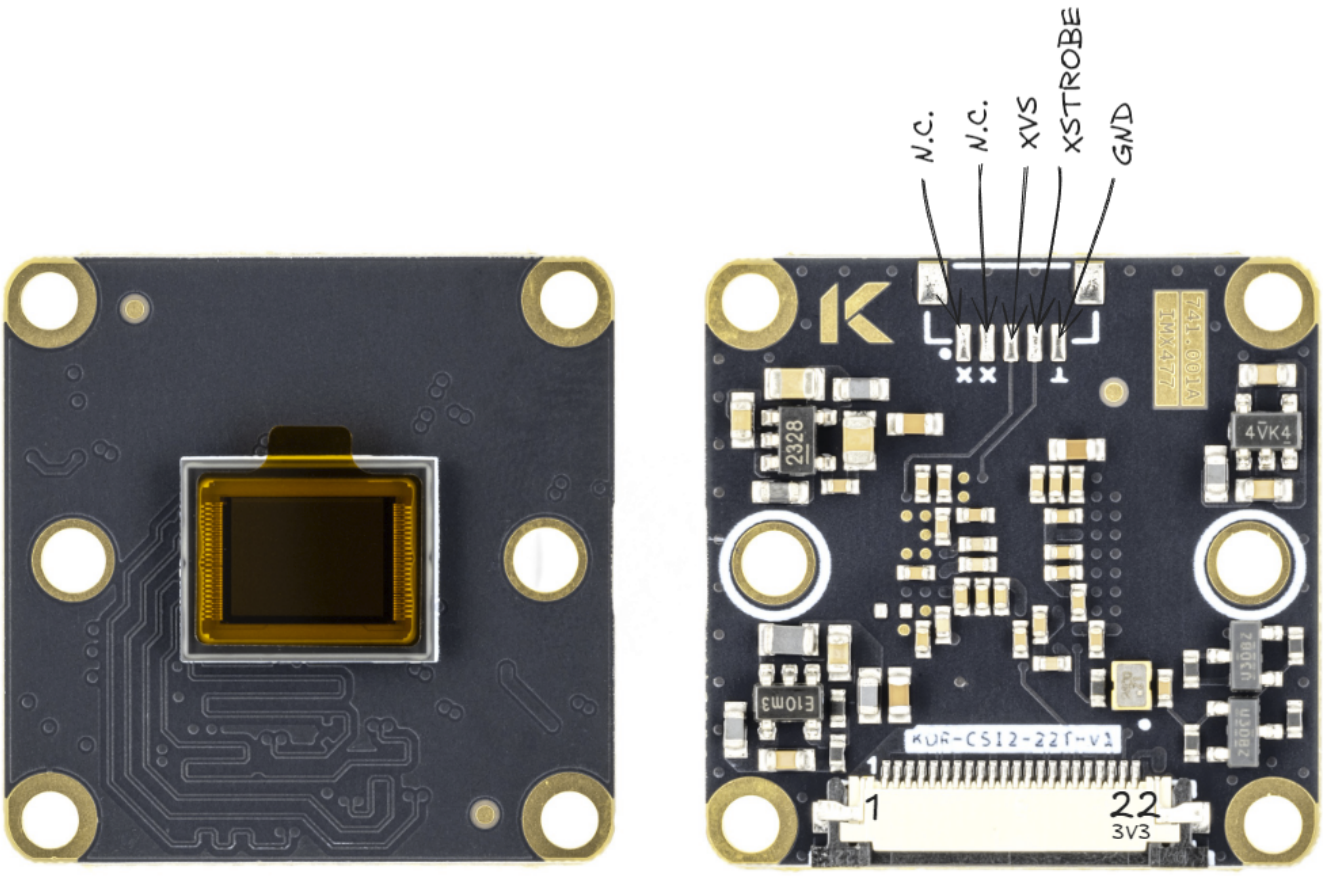
477x-CSI

The IMX477 is a stacked back side illuminated Exmor RS CMOS image sensor with a 7.857 mm (type 1/2.3″) optical format and 4056 × 3040 active square pixels at a 1.55µm pitch, giving 12.3-megapixel resolution. It uses an electronic rolling shutter with variable integration time, 10/12-bit ADCs that stream RAW12/10/8 over a 2 or 4-lane MIPI CSI-2 interface running up to 2.1Gb/s per lane. Normal mode delivers the full 4056 x 3040 picture at 60fps in 10-bit format and can stream up to 240fps in 1080 resolution. Auxiliary functions include pixel-binning and V-sub-sampling engines, ambient light and temperature sensors, flash strobe drive, HDR mode, independent image flip/mirror, power save mode and multi camera synchronization. Best suitable for: consumer 4K camcorders and other high speed, multi camera video systems.

Camera variants

SKU	Lens mount	Chroma	Note
477C-CSI-M12	9.5mm for wide angle lenses	RGB Color	**Most common use for wide angle and fish-eye lenses.**
477C-CSI-M12L	14.7mm for regular and telephoto lenses	RGB Color	**Modification for lenses above 6mm (typical)**

Pinout



Interface connector 22pin 0.5mm pitch 687122183622 from Würth Elektronik. Top facing pins.

Pin	Signal	Description
1	GND	
2	D0_N	
3	D0_P	
4	GND	
5	D1_N	
6	D1_P	
7	GND	
8	CLK_N	
9	CLK_P	

10	GND	
11	D2_N	
12	D2_P	
13	GND	
14	D3_N	
15	D3_P	
16	GND	
17	ENABLE	Wired to sensor RESET_N
18	N.C.	
19	GND	
20	SCL	
21	SDA	
22	+3.3V	

AUX wiring

Interface connector 5 pin 1mm pitch 665305124022 from Würth Elektronik.

Pin	Signal	Description
1	N.C.	Not connected
2	N.C.	Not connected
3	XVS	
4	XSTROBE	
5	GND	

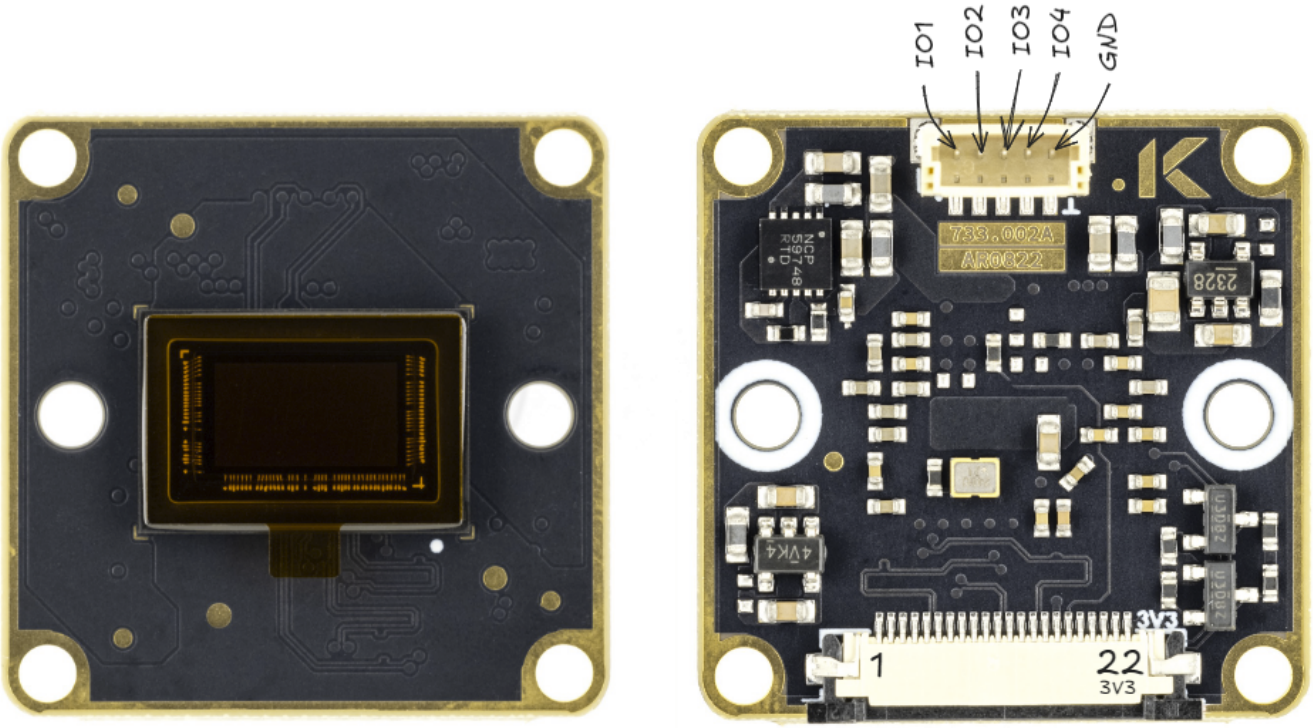
822x-CSI

The AR0822 is an 8-megapixel stacked back-side-illuminated CMOS image sensor that uses a 2.0µm pixel pitched array of 3840 x 2160 pixels, corresponding to a 1/1.8″ (8.81 mm diagonal) optical format. It offers electronic rolling-shutter and global-reset-release readout, feeding up to 4-lane MIPI CSI-2 interface at 350 Mb/s to 2 Gb/s per lane via an 12-bit ADC. In linear mode the device streams native 4 K video at 60 frames per second; high-dynamic-range operation includes two-exposure line-interleaved HDR and three-exposure embedded HDR at up to 30 fps, producing a composite dynamic range of 120 dB, while a single-exposure extended-dynamic-range mode reaches 45 fps. In FullHD mode sensor can stream up to 120fps. Best suitable for: security camera systems, IoT imaging nodes and connected device cameras, vehicle car DVR (dash cam) recorders.

Camera variants

SKU	Lens mount	Chroma	Note
822C-CSI-M12	9.5mm for wide angle lenses	RGB Color	**Most common use for wide angle and fish-eye lenses.**
822C-CSI-M12L	14.7mm for regular and telephoto lenses	RGB Color	**Modification for lenses above 6mm (typical)**
822M-CSI-M12	9.5mm for wide angle lenses	Mono	Same as 822C-M12 but Mono sensor for better light sensitivity
822M-CSI-M12L	14.7mm for regular and telephoto lenses	Mono	Same as 822C-M12L but Mono sensor for better light sensitivity

Pinout



Interface connector 22pin 0.5mm pitch 687122183622 from Würth Elektronik. Top facing pins.

Pin	Signal	Description
1	GND	
2	D0_N	
3	D0_P	
4	GND	
5	D1_N	
6	D1_P	
7	GND	
8	CLK_N	
9	CLK_P	
10	GND	
11	D2_N	

12	D2_P	
13	GND	
14	D3_N	
15	D3_P	
16	GND	
17	ENABLE	Wired to sensor RESET_N
18	N.C.	
19	GND	
20	SCL	
21	SDA	
22	+3.3V	

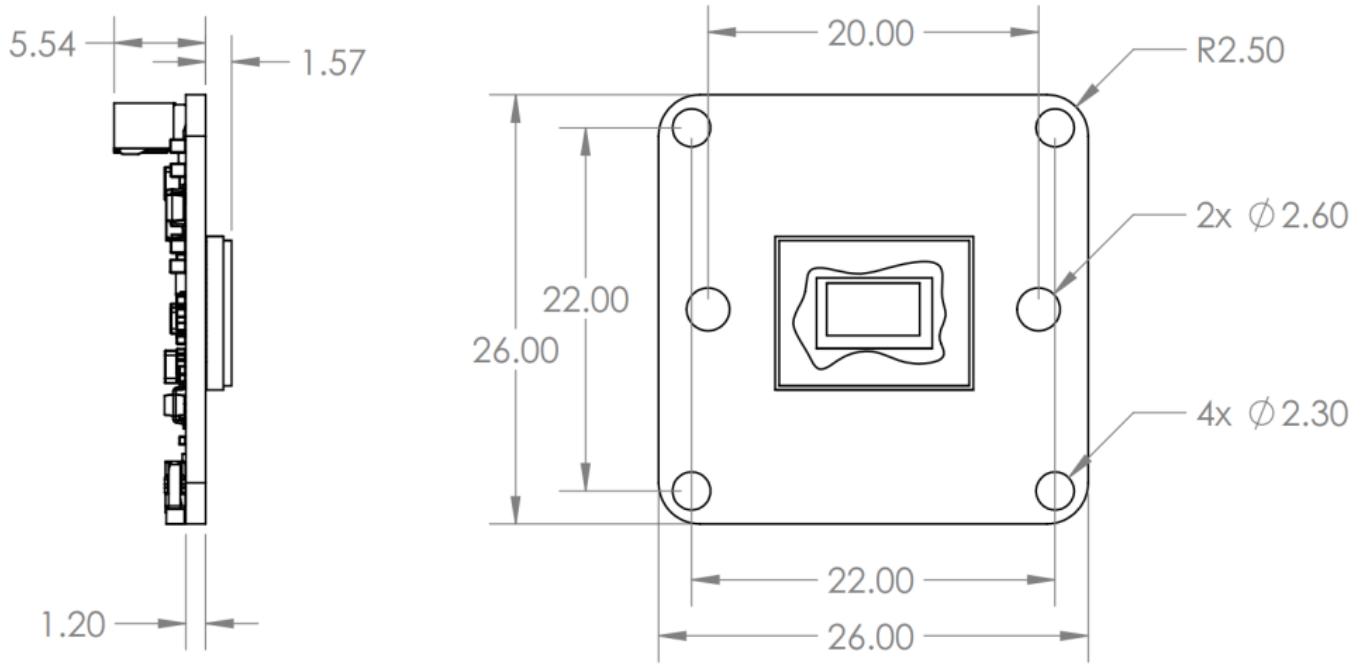
AUX wiring

Interface connector 5 pin 1mm pitch 665305124022 from Würth Elektronik. IOx pins are defined with AR0822 registers.

Pin	Signal	Description
1	IO1	
2	IO2	
3	IO3	
4	IO3	
5	GND	

Dimensions

- Board dimensions: 26 x 26 x 8.31mm
- Weight: ~2.8g



Boxed camera dimensions

Boxed CSI camera variant dimensions.

