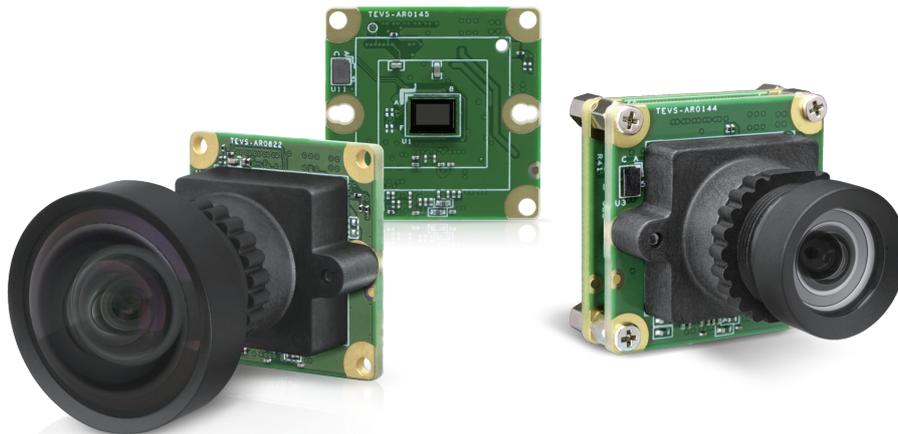


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INNOVATORS OF TECHNOLOGY

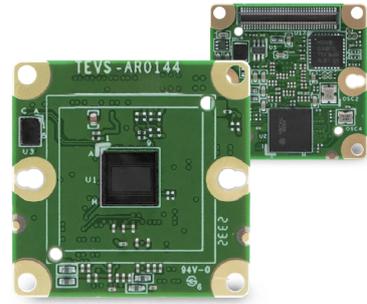


# MIPI CSI-2 Sensors

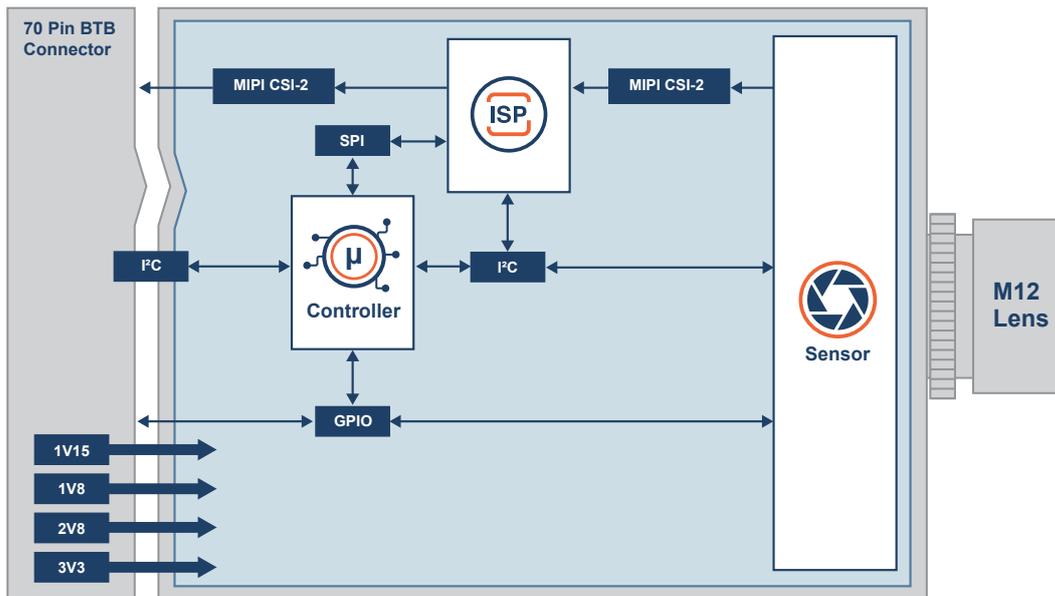
Embedded Vision

# MIPI CSI-2 Sensor Series

TechNexion MIPI CSI-2 Sensor Modules are a scalable hardware size and pin compatible family of camera sensors ranging from 1MP to 13MP in rolling or global shutter configurations that can be used in a large variety of applications ranging from robotics, medical, sporting to smart city, infrastructure and embedded industrial applications.



## Block Diagram



## Sensor Comparison

< 2 MP	5 MP	8 MP	10 ~ 20 MP
<b>AR0144</b> Global Color	<b>AR0521</b> Rolling Color	<b>AR0821</b> eHDR Rolling Color	<b>AR1335</b> Rolling Color
<b>AR0145</b> Global Color/ Mono	<b>AR0522</b> Rolling Color/ Mono	<b>AR0822</b> eHDR Rolling Color/ Mono	<b>AR2020</b> Rolling Color
<b>AR0234</b> Global Color	<b>AR0524</b> Global Color/ Mono	<b>AR0830</b> Rolling Color/ Mono	
<b>AR0235</b> Global Color/ Mono	<b>AR0544</b> Rolling Color		
<b>AR0246</b> eHDR Rolling Color			

Unified single software driver.

# Platform Support

TechNexion TEVS MIPI CSI-2 Sensor Modules are supported on a wide variety of SOC platforms and are available with adaptors to easily connect to silicon vendor evaluation boards.

	i.MX95 i.MX93 i.MX8M Plus i.MX8M Mini		Jetson AGX Orin Jetson Orin NX Jetson Orin Nano Jetson Xavier NX Jetson Nano
	Alder Lake-N Meteor Lake Arrow Lake Panther Lake		Sitara AM62 / AM62A Sitara AM67 / 68 / 69 Jacinto TDA4VM Jacinto TDA4VH
	RZ/V2N RZ/V2H		BeagleY-AI BeaglePlay
	Raspberry Pi 4 Raspberry Pi 5		SL2610 SL1680 SL1640 SL1620
	STM32 MP25 STM32 N6		

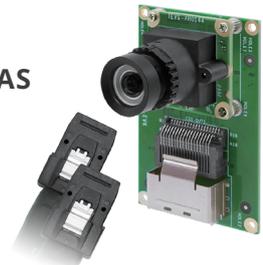
RPI15



RPI22



Mini-SAS



# Software Enablement

Product drivers, integration guides for TechNexion TEVS MIPI CSI-2 Sensor Modules are available online, thus helping a quick and easy integration and evaluation path.

All TechNexion Embedded Vision products are supported with VizionViewer and VizionSDK, giving your engineering team full control over the camera settings by using C++ or Python.



VizionViewer™



VizionSDK

# Software SDK Available

# Specifications

New

New

	AR0144	AR0145	AR0234	AR0235	AR0246	AR0521	AR0522
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## Camera Information

CMOS Sensor	onsemi AR0144	onsemi AR0145	onsemi AR0234	onsemi AR0235	onsemi AR0246	onsemi AR0521	onsemi AR0522
Active Pixels	1280 (H) x 800 (V) = 1MP	1280 (H) x 800 (V) = 1MP	1920 (H) x 1200 (V) = 2.3MP	1920 (H) x 1200 (V) = 2.3MP	1920 (H) x 1080 (V) = 2MP	2592 (H) x 1944 (V) = 5MP	2592 (H) x 1944 (V) = 5MP
Pixel Size	3.0 μm x 3.0 μm	2.8 μm x 2.8 μm	3.0 μm x 3.0 μm	2.8 μm x 2.8 μm	2.0 μm x 2.0 μm	2.2 μm x 2.2 μm	2.2 μm x 2.2 μm
Illuminated Type	Front Side Illuminated (FSI)	Front Side Illuminated (FSI)	Front Side Illuminated (FSI)	Front Side Illuminated (FSI)	Front Side Illuminated (FSI)	Back Side Illuminated (BSI)	Back Side Illuminated (BSI)
Maximum S/N Ratio	38 dB	37 dB	38 dB	37 dB	39 dB	40 dB	40 dB
Input Clock Range	48 MHz	48 MHz	48 MHz	48 MHz	48 MHz	48 MHz	48 MHz
Optical Format	1/4" (Diagonal 4.5 mm)	1/4.3" (Diagonal 4.23 mm)	1/2.6" (Diagonal 6.8 mm)	1/2.8" (Diagonal 6.34 mm)	1/4" (Diagonal 4.41 mm)	1/2.5" (Diagonal 7.13 mm)	1/2.5" (Diagonal 7.13 mm)
Shutter Type	Global Shutter	Global Shutter	Global Shutter	Global Shutter	Rolling Shutter	Rolling Shutter	Rolling Shutter
Chromaticity	Color	Color / Mono	Color	Color / Mono	Color / Mono	Color	Color / Mono
HDR Support	-	-	-	-	Yes	-	-
Maximum Frame Rate (YUV422-UYYV)	1280 x 800 @ 60 fps 1280 x 720 @ 60 fps 640 x 480 @ 60 fps	1280 x 800 @ 115 fps 1280 x 720 @ 115 fps 640 x 480 @ 115 fps	1920 x 1200 @ 60 fps 1920 x 1080 @ 60 fps 1280 x 720 @ 120 fps 640 x 480 @ 120 fps	1920 x 1200 @ 60 fps 1920 x 1080 @ 60 fps 1280 x 720 @ 120 fps 640 x 480 @ 120 fps	1920 x 1080 @ 30 fps 1280 x 720 @ 30 fps 640 x 480 @ 30 fps	2592 x 1944 @ 24 fps 2560 x 1440 @ 32 fps 1920 x 1080 @ 60 fps 1280 x 960 @ 60 fps 1280 x 720 @ 60 fps 640 x 480 @ 120 fps	2592 x 1944 @ 24 fps 2560 x 1440 @ 32 fps 1920 x 1080 @ 60 fps 1280 x 960 @ 60 fps 1280 x 720 @ 60 fps 640 x 480 @ 120 fps
Output Format	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12

## Camera Interface

Module Data Transmission	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes
Communication Interface	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C
Connector	70 Pin Standardized Camera Connector		70 Pin Standardized Camera Connector		70 Pin Standardized Camera Connector		

## Power

Supply Voltage	I/O: 1.8V; Analog: 2.8V; Digital: 1.15V & 3.3V						
Power Consumption	UYYV 1280 x 800 @60FPS ≤ 486 mW	UYYV 1280 x 800 @115FPS ≤ 523 mW	UYYV 1920 x 1200 @60FPS ≤ 727 mW	UYYV 1920 x 1200 @60FPS ≤ 589 mW	UYYV 1920 x 1080 @30FPS ≤ 628 mW	UYYV 2592 x 1944 @24FPS ≤ 694 mW	UYYV 2592 x 1944 @24FPS ≤ 678 mW
SW Standby Power (Total)	≤ 46 mW Standby	≤ 32 mW Standby	≤ 53 mW Standby	≤ 47 mW Standby	≤ 59 mW Standby	≤ 50 mW Standby	≤ 43 mW Standby
HW Standby Power (Total)	≤ 21 mW Standby	≤ 21 mW Standby	≤ 30 mW Standby	≤ 22 mW Standby	≤ 38 mW Standby	≤ 25 mW Standby	≤ 20 mW Standby

## Software Support

Operation System	Linux, Yocto, Android						
Software	VizionViewer™						
Development SDK	VizionSDK						

## Environmental and Mechanical

Dimensions	24.5(W) x 24.5(H) x 3.8(D) mm	24.5(W) x 24.5(H) x 3.8(D) mm	24.5(W) x 24.5(H) x 3.8(D) mm	24.5(W) x 24.5(H) x 3.8(D) mm	24.5(W) x 24.5(H) x 3.8(D) mm	24.5(W) x 24.5(H) x 4.4(D) mm	24.5(W) x 24.5(H) x 4.4(D) mm
Weight	≤ 3 grams	≤ 3 grams	≤ 3 grams	≤ 3 grams	≤ 3 grams	≤ 3 grams	≤ 3 grams
Operating Temperature	- 30°C to + 70°C	- 30°C to + 70°C	- 30°C to + 70°C	- 30°C to + 70°C	- 30°C to + 70°C	- 30°C to + 70°C	- 30°C to + 70°C
Certification	Compliant with CE / FCC / RoHS / REACH directives		Compliant with CE / FCC / RoHS / REACH directives		Compliant with CE / FCC / RoHS / REACH directives		

# Specifications

26Q4

New

New

26Q2

	AR0524	AR0544	AR0821	AR0822	AR0830	AR1335	AR2020
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## Camera Information

CMOS Sensor	onsemi AR0524	onsemi AR0544	onsemi AR0821	onsemi AR0822	onsemi AR0830	onsemi AR1335	onsemi AR2020
Active Pixels	2592 (H) x 1944 (V) = 5MP	2592 (H) x 1944 (V) = 5MP	3848 (H) x 2168 (V) = 8MP	3840 (H) x 2160 (V) = 8MP	3840 (H) x 2160 (V) = 8MP	4208 (H) x 3120 (V) = 13MP	5120 (H) x 3840 (V) = 20MP
Pixel Size	2.2 μm x 2.2 μm	1.4 μm x 1.4 μm	2.1 μm x 2.1 μm	2.0 μm x 2.0 μm	1.4 μm x 1.4 μm	1.1 μm x 1.1 μm	1.4 μm x 1.4 μm
Illuminated Type	Back Side Illuminated (BSI)	Back Side Illuminated (BSI)	Back Side Illuminated (BSI)	Back Side Illuminated (BSI)	Front Side Illuminated (FSI)	Back Side Illuminated (BSI)	Back Side Illuminated (BSI)
Maximum S/N Ratio	TBD	39.9 dB	41.8 dB	40.5 dB	39.9 dB	37 dB	39.9 dB
Input Clock Range	48 MHz	48 MHz	48 MHz	48 MHz	48 MHz	48 MHz	48 MHz
Optical Format	1/2.5" (Diagonal TBD)	1/4.2" (Diagonal 6.05 mm)	1/1.7" (Diagonal 9.25 mm)	1/2" (Diagonal 8.81 mm)	1/2.9" (Diagonal 6.17 mm)	1/3.2" (Diagonal 5.8 mm)	1/1.8" (Diagonal 8.96 mm)
Shutter Type	Global Shutter	Rolling Shutter	Rolling Shutter	Rolling Shutter	Rolling Shutter	Rolling Shutter	Rolling Shutter
Chromaticity	Color / Mono	Color / Mono	Color	Color / Mono	Color / Mono	Color	Color / Mono
HDR Support	Yes	Yes	Yes	Yes	Yes	-	Yes
Maximum Frame Rate (YUV422-UYYV)	2592 x 1944 @ 24 fps 2560 x 1440 @ 32 fps 1920 x 1080 @ 60 fps 1280 x 960 @ 60 fps 1280 x 720 @ 60 fps 640 x 480 @ 120 fps	2592 x 1944 @ 24 fps 2560 x 1440 @ 32 fps 1920 x 1080 @ 60 fps 1280 x 960 @ 60 fps 1280 x 720 @ 60 fps 640 x 480 @ 120 fps	3840 x 2160 @ 15 fps 2560 x 1440 @ 30 fps 1920 x 1080 @ 60 fps 1280 x 720 @ 60 fps 640 x 480 @ 60 fps	3840 x 2160 @ 15 fps 2560 x 1440 @ 30 fps 1920 x 1080 @ 60 fps 1280 x 720 @ 60 fps 640 x 480 @ 60 fps	3840 x 2160 @ 15 fps 2560 x 1440 @ 30 fps 1920 x 1080 @ 60 fps 1280 x 720 @ 60 fps 640 x 480 @ 60 fps	4208 x 3120 @ 10 fps 3840 x 2160 @ 15 fps 2560 x 1440 @ 30 fps 1920 x 1080 @ 60 fps 1280 x 720 @ 120 fps 640 x 480 @ 60 fps	TBD
Output Format	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12	YUV422-UYYV / YUV420 RGB888 / RGB565 / RGB555 JPEG / MJPEG RAW8 / RAW10 / RAW12

## Camera Interface

Module Data Transmission	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes	MIPI CSI-2, up to 4 lanes
Communication Interface	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C	I <sup>2</sup> C
Connector	70 Pin Standardized Camera Connector		70 Pin Standardized Camera Connector		70 Pin Standardized Camera Connector		

## Power

Supply Voltage	I/O: 1.8V; Analog: 2.8V; Digital: 1.15V & 3.3V						
Power Consumption	TBD	TBD	UYYV 3840 x 2160 @15FPS ≤ 1004 mW	UYYV 3840 x 2160 @15FPS ≤ 881 mW	TBD	UYYV 4300 x 3120 @10FPS ≤ 723 mW	TBD
SW Standby Power (Total)	TBD	TBD	≤ 97 mW Standby	≤ 109 mW Standby	TBD	≤ 58 mW Standby	TBD
HW Standby Power (Total)	TBD	TBD	≤ 52 mW Standby	≤ 50 mW Standby	TBD	≤ 26 mW Standby	TBD

## Software Support

Operation System	Linux, Yocto, Android						
Software	VizionViewer™						
Development SDK	VizionSDK						

## Environmental and Mechanical

Dimensions	TBD	24.5(W) x 24.5(H) x 3.8(D) mm	24.5(W) x 24.5(H) x 4.5(D) mm	24.5(W) x 24.5(H) x 4.9(D) mm	24.5(W) x 24.5(H) x 3.8(D) mm	24.5(W) x 24.5(H) x 3.8(D) mm	TBD
Weight	≤ 3 grams	≤ 3 grams	≤ 3 grams	≤ 3 grams	≤ 3 grams	≤ 3 grams	≤ 3 grams
Operating Temperature	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C
Certification	Compliant with CE / FCC / RoHS / REACH directives		Compliant with CE / FCC / RoHS / REACH directives		Compliant with CE / FCC / RoHS / REACH directives		

# S-Mount Lens Information

		Focal Length	Aperture	D-FOV	H-FOV	V-FOV	TTL	MOD	Distortion	Lens Structure
AR0144	S33	8 mm	F1.6	33.1° ± 5%	28.0° ± 5%	17.4° ± 5%	26.2 mm	0.3 m	<-5.03%	6G + IR
	S83	2.85 mm	F2.8	82.6° ± 5%	73.5° ± 5%	50.3° ± 5%	20 mm	0.3 m	<-0.35%	2G + 3P + IR
AR0145	S31	8 mm	F1.6	31.2° ± 5%	26.3° ± 5%	16.3° ± 5%	26.2 mm	0.3 m	<-5.03%	6G + IR
	S78	2.85 mm	F2.8	78.2° ± 5%	69.5° ± 5%	47.1° ± 5%	20 mm	0.3 m	<-0.35%	2G + 3P + IR
AR0234	S32	12 mm	F2.0	31.8° ± 5%	26.9° ± 5%	16.8° ± 5%	23.2 mm	0.3 m	<-2.50%	5G + IR
	S83	3.9 mm	F2.8	82.8° ± 5%	73.4° ± 5%	50.1° ± 5%	22 mm	0.3 m	<1.26%	2G + 2P + IR
	S128	2.87 mm	F2.8	127.7° ± 5%	110.5° ± 5%	68.6° ± 5%	21 mm	0.3 m	<-20%	4G + 1P + IR
	S191*1	2.18 mm	F2.4	191.28° ± 5%	154° ± 5%	93.73° ± 5%	14.5 mm	0.2 m	<-75.6%	2G + 3P + IR
AR0235	S30	12 mm	F2.0	29.6° ± 5%	25.3° ± 5%	15.9° ± 5%	23.2 mm	0.3 m	<-2.50%	5G + IR
	S79	3.9 mm	F2.8	78.9° ± 5%	69.6° ± 5%	46.6° ± 5%	22 mm	0.3 m	<1.26%	2G + 2P + IR
	S120	2.87 mm	F2.8	120.3° ± 5%	104.6° ± 5%	62.1° ± 5%	21 mm	0.3 m	<-20%	4G + 1P + IR
AR0246	S33	8 mm	F1.6	33.0° ± 5%	28.6° ± 5%	15.9° ± 5%	26.2 mm	0.3 m	<-5.03%	6G + IR
	S83	2.85 mm	F2.8	82.3° ± 5%	74.5° ± 5%	46.2° ± 5%	20 mm	0.3 m	<-0.35%	2G + 3P + IR
AR0521	S34	12 mm	F2.0	33.6° ± 5%	26.8° ± 5%	20.1° ± 5%	23.2 mm	0.3 m	<-2.50%	5G + IR
	S85	3.9 mm	F2.8	85.2° ± 5%	73.0° ± 5%	58.1° ± 5%	22 mm	0.3 m	<1.26%	2G + 2P + IR
	S140	2.87 mm	F2.8	140.0° ± 5%	110.5° ± 5%	81.4° ± 5%	21 mm	0.3 m	<-20%	4G + 1P + IR
AR0522	S34	12 mm	F2.0	33.6° ± 5%	26.8° ± 5%	20.1° ± 5%	23.2 mm	0.3 m	<-2.50%	5G + IR
	S85	3.9 mm	F2.8	85.2° ± 5%	73.0° ± 5%	58.1° ± 5%	22 mm	0.3 m	<1.26%	2G + 2P + IR
	S140	2.87 mm	F2.8	140.0° ± 5%	110.5° ± 5%	81.4° ± 5%	21 mm	0.3 m	<-20%	4G + 1P + IR
AR0544	S22	12 mm	F2.0	21.3° ± 5%	17.1° ± 5%	12.8° ± 5%	23.2 mm	0.3 m	<-2.50%	5G + IR
	S62	3.9 mm	F2.8	61.4° ± 5%	51.0° ± 5%	39.5° ± 5%	22 mm	0.3 m	<1.26%	2G + 2P + IR
AR0821	S44	12 mm	F2.0	44.0° ± 5%	38.3° ± 5%	21.6° ± 5%	23.09 mm	0.15 m	<2%	5G + IR
	S74	6 mm	F2.8	74.4° ± 5%	67.1° ± 5%	40.8° ± 5%	28.6 mm	0.1 m	<0.5%	7G + IR
	S119	3 mm	F2.0	118.8° ± 5%	110.7° ± 5%	75.4° ± 5%	29.56 mm	0.3 m	<-5%	2G + 3P + IR
	S156	3.2 mm	F2.0	156.0° ± 5%	137.2° ± 5%	79.4° ± 5%	44.98 mm	0.3 m	<-32%	8G + IR
AR0822	S42	12 mm	F2.0	41.7° ± 5%	36.3° ± 5%	20.5° ± 5%	23.09 mm	0.15 m	<2%	5G + IR
	S72	6 mm	F2.8	72.0° ± 5%	64.7° ± 5%	39.0° ± 5%	28.6 mm	0.1 m	<0.5%	7G + IR
	S108	3 mm	F2.0	108.6° ± 5%	104.0° ± 5%	72.2° ± 5%	29.56 mm	0.3 m	<-5%	2G + 3P + IR
	S150	3.2 mm	F2.0	150.0° ± 5%	132.6° ± 5%	77.6° ± 5%	44.98 mm	0.3 m	<-32%	8G + IR
AR1335	S85	3.2 mm	F2.4	84.6° ± 5%	70.3° ± 5%	55.2° ± 5%	22 mm	0.3 m	<1.6%	4G + 2P + IR

\* Note 1 : Only compatible with board-level camera modules.

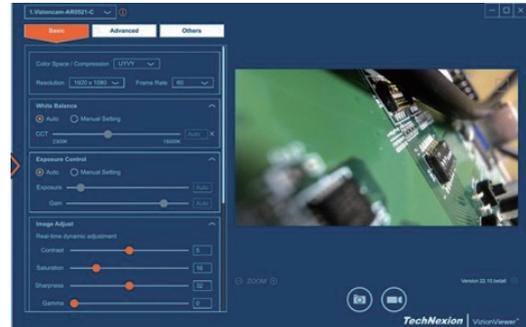
Don't see what you are looking for ? Talk to us.

# Customization

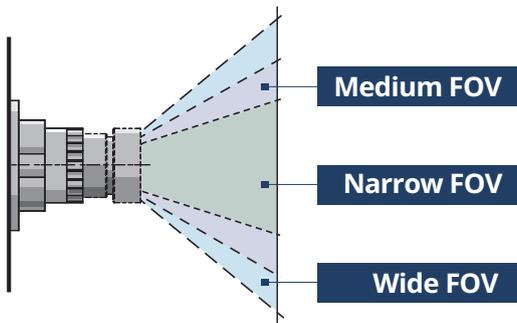
Embedded system design often requires customization to fit the specific target application. Contact your TechNexion sales representative for a consultation if you have questions on one of the following subjects:

## Firmware Support

TechNexion MIPI CSI-2 Sensors come with OSP (on sensor profile) support enabling fast boot up and availability of multi camera setups in robotic and industrial embedded applications by providing granular configuration support right inside the camera and completely user definable and configurable with VizionSDK and VizionViewer software.



## Custom Lenses



By using a standard S-Mount lens assembly. Our team of optical engineers can assist with precise customization in response to specific requirements to fit your embedded vision project involving FOV, TTL, MOD or mechanical or environmental constraints ensuring optimal performance across a range of use cases.

## Optical Light Filters

Searching for a lens with or without an IR-cut filter is as easy as select a standard TechNexion camera sensor. However for custom filters in other light spectrums our optical engineers are standby for a consultation to learn more about your embedded vision project.

