

Datasheet

Main Features

- Sensor: 2048 rectangular pixels size 14x28µm or 10x20µm
- Interface: Camera Link® Base for EM2, Base/Medium for EM4
- Data rate:
 - EM2: 80 Mpixel/s
 - EM4: 160 Mpixel/s
- Bit Depth: 12,10 or 8 bits
- 100% Aperture, Built-in Anti-blooming, No Lag
- Automatic Tap Balance and Flat Field correction
- Contrast Expansion
- Look Up Table
- Standby Low Power Mode
- Very Compact Design: 93 x 56 x 43 mm (w, h, d)
- Fully Configurable with e2v's CommCam software



Product Description

E2v has derived from its AViVA EM4 line-scan camera a special version dedicated to the OCT and spectrometers market. For that purpose, it is design around an image sensor with a rectangular pixel, of either 10x20 µm or 14x28 µm, and with optimized noise characteristics to give outstanding results in the Fourier domain.

The camera benefits from the main features of the EM4 camera : rich feature set, such as automatic FFC and tap balance, or LUT, and the proven qualities of the AViVA family : ease of use, reliability, and high precision mechanical design.

Typical Applications

- OCT (Optical Coherence Tomography)
- Spectrometer

1. Standard Conformity

AViiVA cameras have been tested using the following equipment:

- A shielded power supply cable
- A camera Link data transfer cable ref. 14B26-SZLB-500-OLC (3M)

e2v recommends using the same configuration to ensure the compliance with the following standards.

1.1 CE Conformity

The AViiVA cameras comply with the requirements of the EMC (European) directive 2004/108/CE (EN 50081-2, EN 61000-6-2).

1.2 FCC

AViiVA cameras further comply with Part 15 of the FCC rules, which states that: operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation

This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

1.3 RoHS Conformity

AViiVA cameras comply with the requirements of the RoHS directive 2002/95/EC.

2. Key Specifications

Table 2-1. Typical Performance

Characteristics	Value		Unit
Sensor Characteristics at Maximum Pixel Rate			
Resolution	2048	2048	Pixels
pixel size (square)	10x20	14x28	µm
Max line rate EM4 (four taps)	70	37	kHz
Max line rate EM2 (two taps)	37	19	
Radiometric Performance at Maximum Pixel Rate and Minimum Camera Gain			
Bit depth	8, 10, 12		Bits
Responsivity (14 µm pixels size)	135		LSB/(nJ/cm²)
Responsivity (10 µm pixels size)	77		LSB/(nJ/cm²)
Response nonlinearity	<1		%
PRNU	±1		%
Dynamic range	68		dB
Functionality (Programmable via Control Interface)			
Gain	Up to 32 dB		
Offset	-4096 to +4096 LSB		
Trigger Mode	Timed (Free run) and triggered (Ext Trig, Ext ITC) modes		
Mechanical and Electrical Interface			
Size (w x h x l)	93 x 56 x 43 with lateral heatsinks 60 x 56 x 43 without lateral heatsinks		mm
Weight	310g (without mount but includes lateral heatsinks)		g
Lens mount	F, T2, M42x1 compliant with AViVA SM2 series		
Sensor alignment (see Section 4.)	±100		µm
Sensor flatness	±35		µm
Power supply	Single 12 DC to 24 DC		V
Power dissipation	< 11		W
Low power mode	< 4		
General features			
Operating temperature	0 to 60 (front face)		°C
Storage temperature	-40 to 70		°C
Regulatory	CE, FCC and RoHS compliant		

3. Camera Performance

3.1 Camera Characterization

Table 3-1. Camera Preliminary Characterization

	Unit	Min Gain			Min Gain +12dB			Min Gain +24dB		
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
Dark Noise RMS	LSB		1.5	2.5		6	10		24	40
Dynamic range	dB	64	68		52	56		40	44	
FPN rms	LSB		0.3	tbd		0.4	tbd		2	tbd
FPN peak-to-peak	LSB		2	tbd		4	tbd		15	tbd
PRNU rms (at half saturation)	%		0.1			0.1			0.2	
PRNU peak to peak (at half saturation)	%		±1			±1			±1	

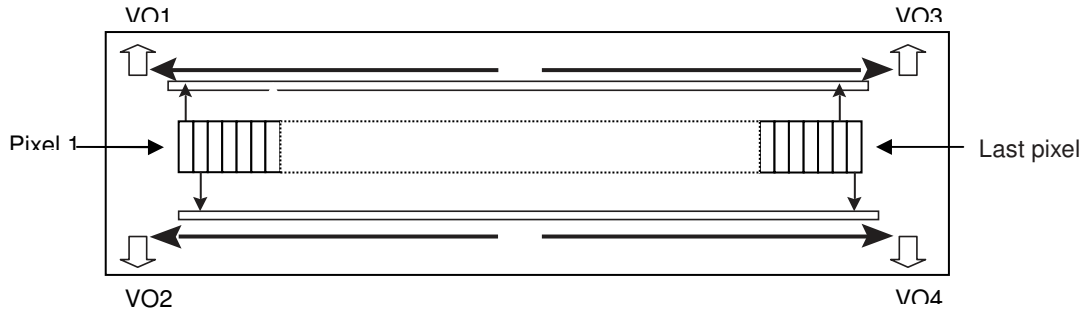
Test conditions:

- Maximum data rate (4 × 40 MHz)
- Light source 3200K with BG38 filter 2 mm thickness
- LSB are given for 12-bit depth configuration
- Stabilized front face temperature 50 degrees

3.2 Image Sensor

Figure 3-1. Sensor Architecture

EM4 sensors



EM2 sensors

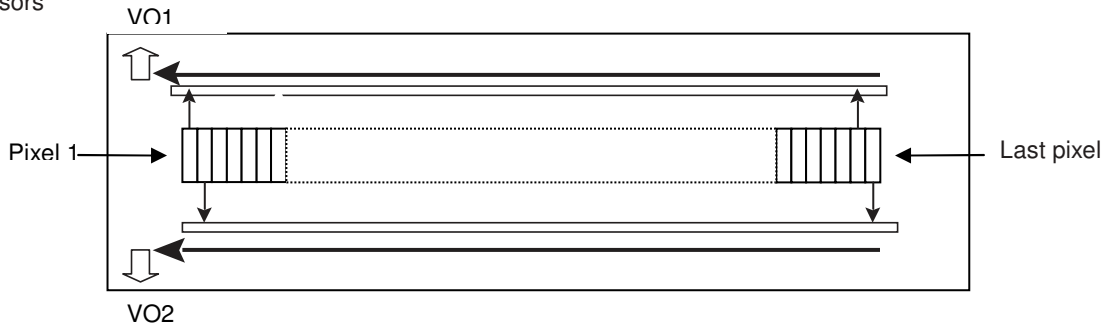
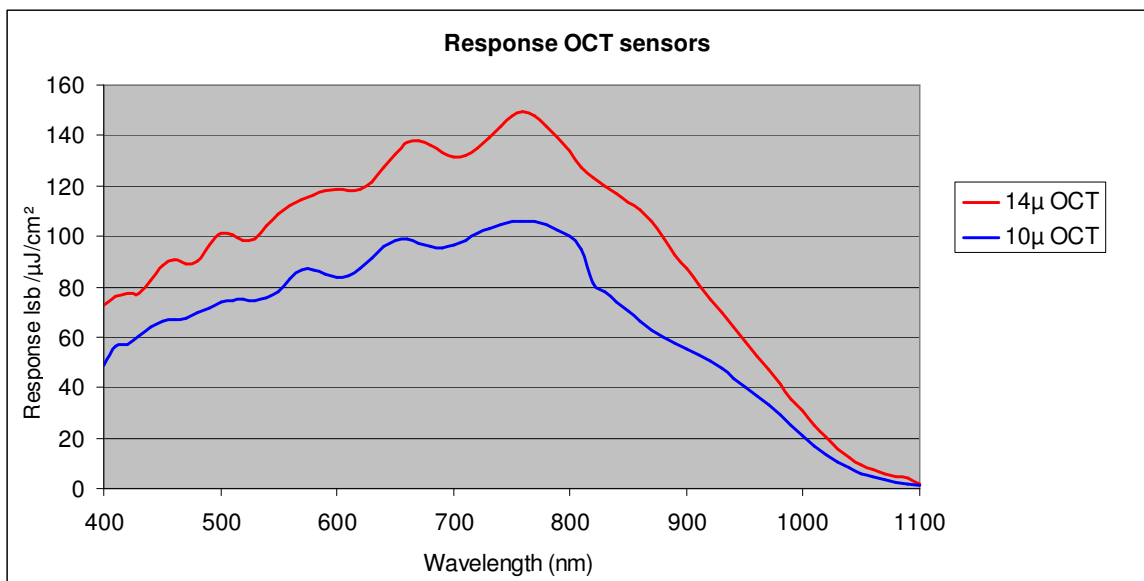


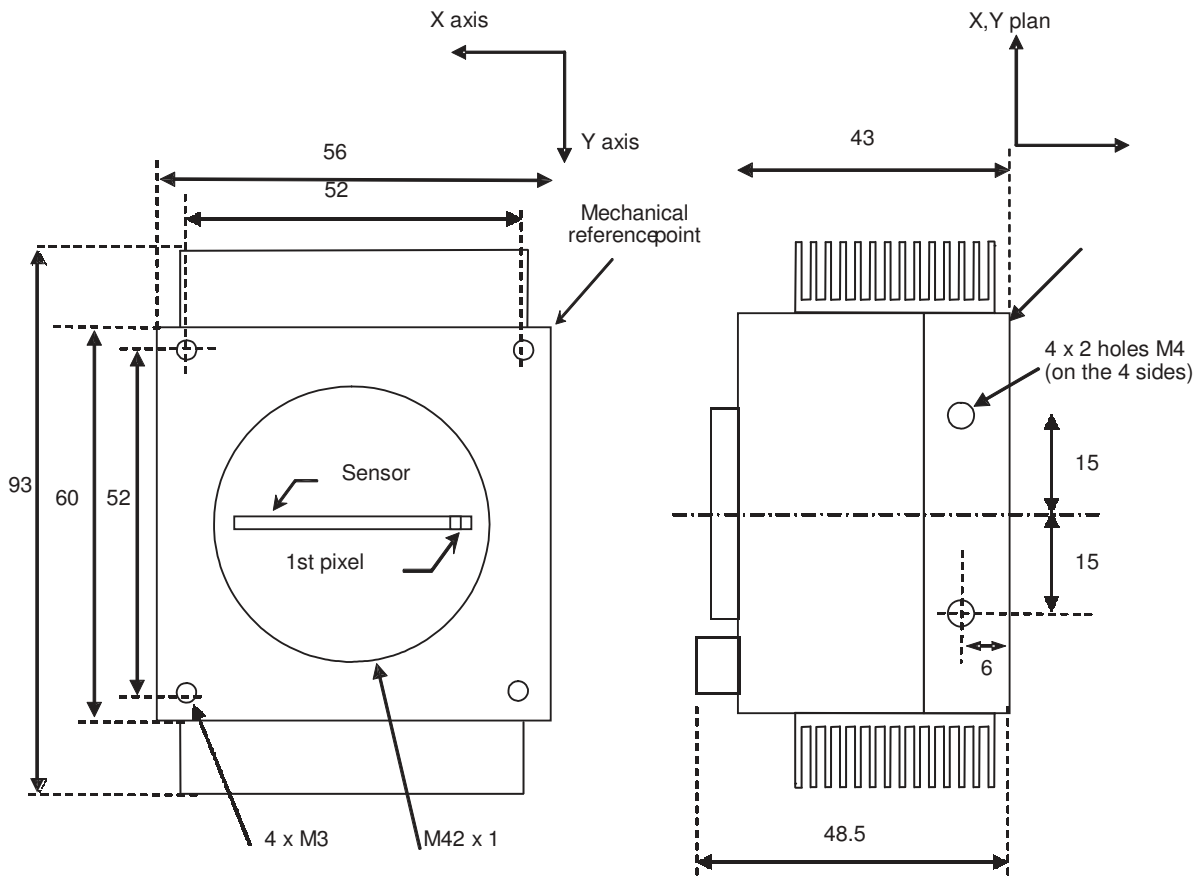
Figure 3-2. Response



4. Camera Hardware Interface

4.1 Mechanical Drawings

Figure 4-1. Mechanical Drawings



Note: All dimensions are in millimeters

4.1.1 Sensor Alignment

Table 4-1.

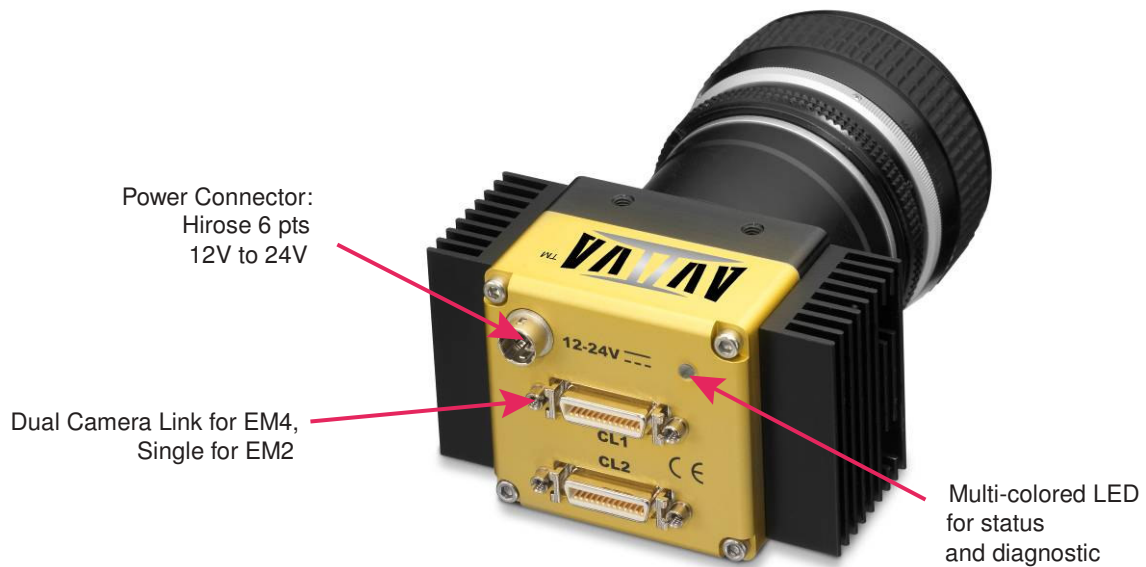
Sensor Alignment	
Z	-10.3 ±150 μm
Y	30 ±100 μm
Planarity	±35 μm
Rotation (X,Y plan)	±0.2°
Tilt (versus lens mounting plane)	±35 μm

Table 4-2.

X For First Pixel Location	
2048 x 10 μm x 20 μm sensor	17.76 ±100μm
2048 x 14 μm x 28 μm sensor	13.66 ±100 μm

4.2 Input/Output Connectors and LED

Figure 4-2. Rear View




4.2.1 Power Connector

Camera connector type: Hirose HR10A-7R-6PB (male)

Cable connector type: Hirose HR10A-7P-6S (female)

Table 4-3.

	Signal	Pin	Signal	Pin
	PWR	1	GND	4
	PWR	2	GND	5
	PWR	3	GND	6
Power supply from 12V to 24V Power 15W max with an inrush current of 2A during power up				

4.2.2 Camera Link Output Configuration

EM2 cameras follow Camera Link® Base configuration standard, two taps interleaved. Each tap run at 40M pixel per second, 8 bits, 10 bits or 12 bits per pixel.

EM4 cameras follow Camera Link® Medium configuration standard, four taps (two taps right interleaved and two taps left interleaved). Each tap run at 40Mpixel per second, 8 bits, 10 bits or 12 bits per pixel.

EM4 cameras can also be configured in Base configuration. In that case, sensor tap1 and tap2 are multiplexed at 80Mpix/second. Same as sensor tap2 and tap3.

5. Camera Models

Table 5-1. Ordering Code

Part Number	Sensor Type (Resolution, Pixels size)	Description
Camera		
EV71YEM4CL2010-BA9	2048 pixels, 10µm x 20µm size	AViVA EM4 CL 2010 OCT
EV71YEM4CL2014-BA9	2048 pixels, 14µm x 28µm size	AViVA EM4 CL 2014 OCT
EV71YEM2CL2010-BA9	2048 pixels, 10µm x 20µm size	AViVA EM2 CL 2010 OCT
EV71YEM2CL2014-BA9	2048 pixels, 14µm x 28µm size	AViVA EM2 CL 2014 OCT
Accessories		
AT71KFPVIVA-ABA		F mount (NIKON)
AT71KFPVIVA-AKA		T2 mount (M42 x 0.75)
AT71KFPVIVA-ADA		M42 x 1 mount
AT71KFPVIVA-ACA		C mount



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