Specification
S-25A70-Ex/CXP

CoaXPress

Key characteristics

25 Mpx 4.5 µm²	5120 5120	72+ FPS
CMOS Global Shutter	32.6 mm Optical format	<8 W
<80 mm	<400 g	56 dB DNR

- OnSemi VITA25k sensor
- True Global Shutter CMOS
- Monochrome and Color
- Dark and bright uniformity corrections
- Multiple Low Frequency Flat Field Correction sets
- CXP-3 DIN 4 and CXP-6 DIN 2/4 configurable
- M12 I/O connector
- CoaXPress V1.1.1 compliant
- CoaXPress V1.0 compatible

Introduction

The Sapphire 25 Mpx CoaXPress camera delivers 5120x5120 pixel resolution at 72+ fps with 4.5 micron square pixels. Adimec offers the Sapphire 25 Mpx CXP cameras in a low power, compact outline design without forced cooling through a fan. This provides optimal design freedom for integrating optics and placement in inspection tools.

Global non-uniformities in the scene due to optics or lightning can be corrected via the Low Frequency Flat Field Correction. Multiple LF FFC sets are supported to compensate for various system lightning or optics conditions.

Similar to our Q-12A180, the Sapphire is based on Adimec's new second generation CoaXPress V1.1.1 compliant 25 Gb/s CoaXPress Quad interface. This interface is also fully backward compatible to existing V1.0 frame grabbers.

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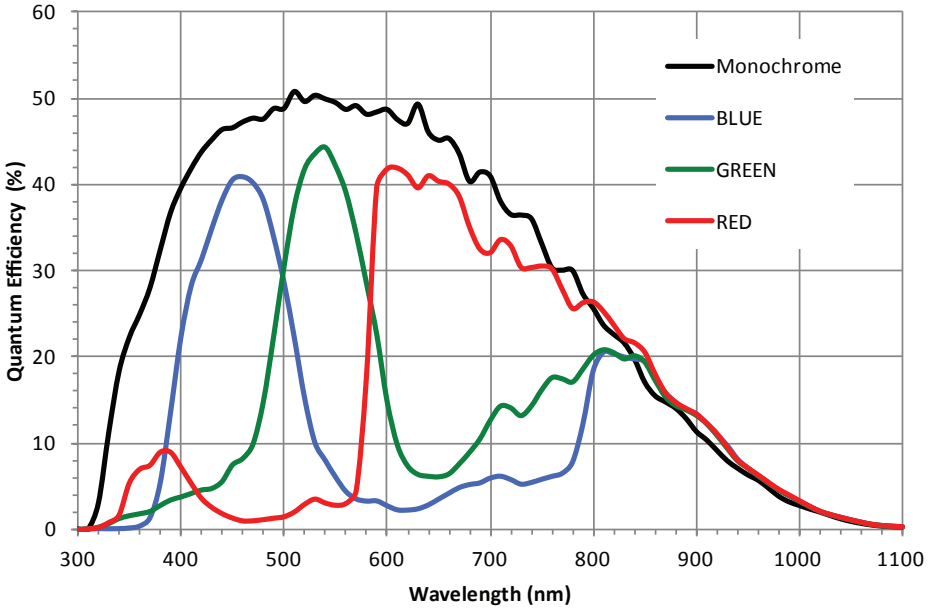
Performance

Type	ON Semiconductor VITA25K	
Architecture	CMOS Progressive scan 5T Global Shutter (PLS <1/700)	
Optical format	32.6 mm diagonal	
Pixel size	4.5 µm x 4.5 µm	
Active pixels	5120 (H) x 5120 (V)	
Microlenses	Yes	
Dynamic range	56 dB*	52 dB**
Full well	22 ke$^-$ *	13 ke$^-$ **
Dark noise	34 e$^-$ *	34 e$^-$ **
Sensitivity mono	18 LSB10	

* Sensor specification
** Typical value

Quantum Efficiency



Functionality

Image acquisition	Continuous / Controlled
Integration time control	Programmable between 78 µs and 100 ms in steps of 1 µs
Gain	Digital fine gain selectable between 1x and 32x in steps of 0.001
Video Processing	Automatic black level control loop – Manual/One push White Balance – User programmable Look Up Table in output stream (10 bit)
Region of interest	Size and position programmable Region of Interest (ROI) – Increased frame speed via ROI – Multiple band ROI readout
Defect pixel correction	On/Off switchable – Readout and editing of defect pixel map – Factory calibrated
Test mode	Internal test pattern generator available for checking of the complete digital image chain
Mirroring	The output can be reversed in the horizontal direction
Uniformity correction	Up to 50 low frequency flat field correction sets can be saved in non-volatile memory (Mono only) – Up to 18 out of 50 can be live switched from frame to frame (Mono only) User calibratable dark field and bright field uniformity correction
Miscellaneous functions	Programmable I/O polarity – 1 factory set and 1 user set for storage of camera settings – Camera type, build state and serial number can be read via software

Interfacing

Video

Video output	CoaxPress V1.1.1 /1.0 CXP-3 DIN 4 and CXP-6 DIN 2/4 configurable
External Sync	I/O or CXP controlled
Output resolution	8 / 10 bit
Connector	4 x DIN1.0/2.3 (Figure 1)

Camera Control Protocol

Interface	GenICam via CoaxPress
Throughput	20 Mbps
Protocol	GenTL

I/O

Output	Fully programmable flash strobe signal (duration, delay and polarity)
Input	Trigger signal with programmable polarity
Connector	M12 Binder 09-3432-216-04 (figure 2)

Power

Input voltage	24 Vdc PoCXP
Power dissipation	<8 W @ 24Vdc full continuous operation at maximal framespeed. When the Low Frequency Flat Field Correction is enabled the additional power dissipation is ± 0.7 W
Power connector	DIN1.0/2.3 CoaXPress Masterlink (figure 1)

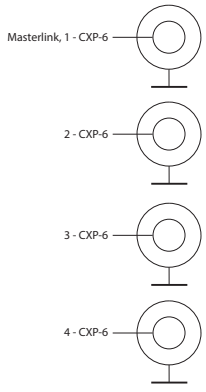
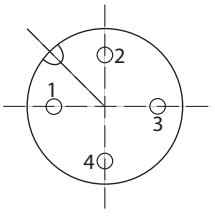


Figure 1: Quad CXP DIN1.0/2.3

1 Trigger in
2 Flash strobe out
3 Flash strobe return
4 Trigger return



BINDER-09-3432-216-04

Figure 2: M12 I/O connector

Mechanical

Mounting	2 M4 mounting holes per side on camera front
Lensmount	4 x M3 at 60mm pitch - 50 mm G7 reference (Optional: F, M42, T2, TFLII, EF)
Outline	See figure 3
Weight	400 g +/- 5% excl. lensmount

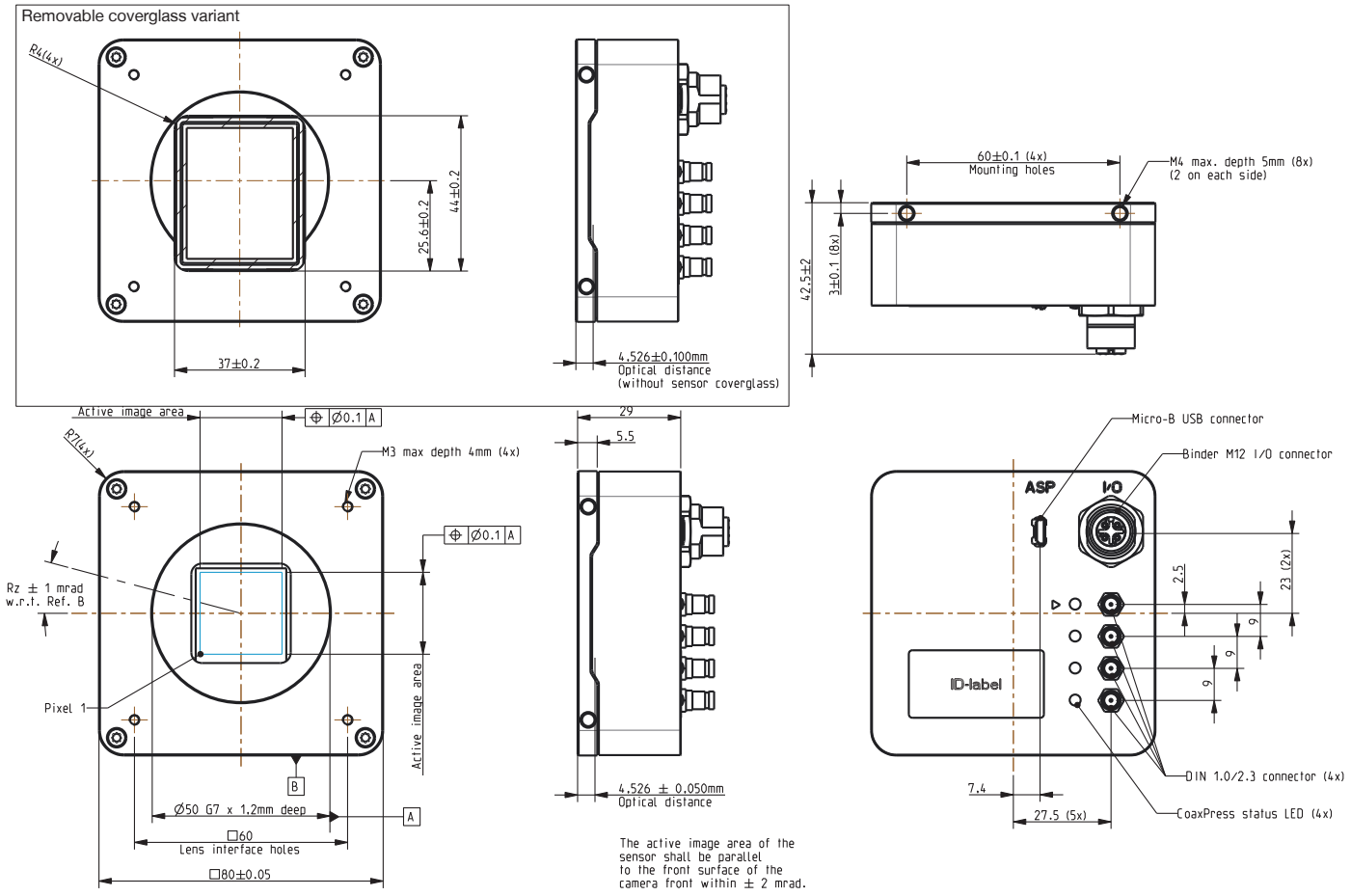


Figure 3: Mechanical outline

Sensor Mounting Accuracy

XY-centering	± 0.050 mm
Rotation	± 1 mRad
Optical distance	4.526 ± 0.050 mm
Perpendicularity	± 2 mRad

Compliance & Reliability

RoHS

RoHS	Yes

CE-mark

ESD	Contact discharge +/- 4 kV; Air discharge +/- 8 kV
Workmanship	In accordance with IPC-J-STD-001 class 3 and inspected according IPC-A-610C class 2

Reliability

MTBF	> 75,000 h @ 30° C

Environmental

Operating

Temperature	0° C to +30° C or max housing temp 50° C
Humidity (relative)	20 % - 80 % non-condensing
Shock	10 g, half sine shape, 6 - 10 ms duration
Vibration	3 g sinusoidal vibration sweeps 5 - 150 Hz

Storage

Temperature	-25° C to +65° C
Humidity (relative)	5 % - 95 % non-condensing
Shock	25 g, half sine shape, 6 - 10 ms duration
Vibration	10 g sinusoidal vibration sweeps 5 - 150Hz

Camera Types	Interface connector	I/O connector	Sensor	Type	Max. fps @ Full resolution
S-25A70-Em/CXP-6	4 x DIN1.0/2.3	M12 4p	NOIV1SN025KA-GDC	Mono	72+ fps
S-25A70-Ec/CXP-6	4 x DIN1.0/2.3	M12 4p	NOIV1SE025KA-GDC	Raw Bayer	72+ fps
S-25A70-Em/CXP-6-V49	4 x DIN1.0/2.3	M12 4p	NOIV1SN025KA-GWC	Removable coverglass (Mono)*	72+ fps

*Removable coverglass imperfections (scratches, ditches, dust, etc.) are not covered under warranty.

Adimec

Adimec is the leading supplier of high-end cameras for machine vision, medical and outdoor imaging applications. Our Adimec True Accurate Imaging® technology forms the foundation for a broad range of camera products, and brings new levels of precision and accuracy to vision systems.

Custom cameras

Adimec has the ability to offer additional camera functionality and create customer specific cameras even for small volume programs. Built from platforms, our standard line of cameras give us a flexible base that can be tailored to fit your specifications. Contact us to discuss these options in more detail. Visit: www.adimec.com for product details.

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