COSMOS-3k LARGE AREA CMOS CAMERA

KEY FEATURES

- Large 3k × 3k pixel sensor
- > 90% QE
- 10 µm pixel size
- < 1 e^- read noise
- 61 fps at full resolution
- Sensor temperature: liquid cooled < -25°C, air cooling option -10°C
- Dark current ~0.1 e^-/p/s
- 101 dB dynamic range
- Rolling and true global shutter
- Hardware, electronics, sensor and software developed by Teledyne

TYPICAL APPLICATIONS

- Ground-Based Astronomy
- Exoplanet Characterization
- Orbital Object Tracking
- Near-Earth Object Characterization
- Time Domain Astronomy
- Solar Physics
- Adaptive Optics
- Speckle/Lucky Imaging

RELIABILITY

- High realiability, industry-leading Citadel chamber design

Next-Generation, Large Sensor, High-Performance Camera for Astronomy

The Teledyne COSMOS camera unites the best of CCD and CMOS performance to deliver a breakthrough imaging platform unlike anything available today. Designed for demanding applications, COSMOS sets a new standard in resolution, pixel size, sensitivity, and speed. It is the only large-format, high-performance CMOS camera fully designed and manufactured by a single trusted source–Teledyne.

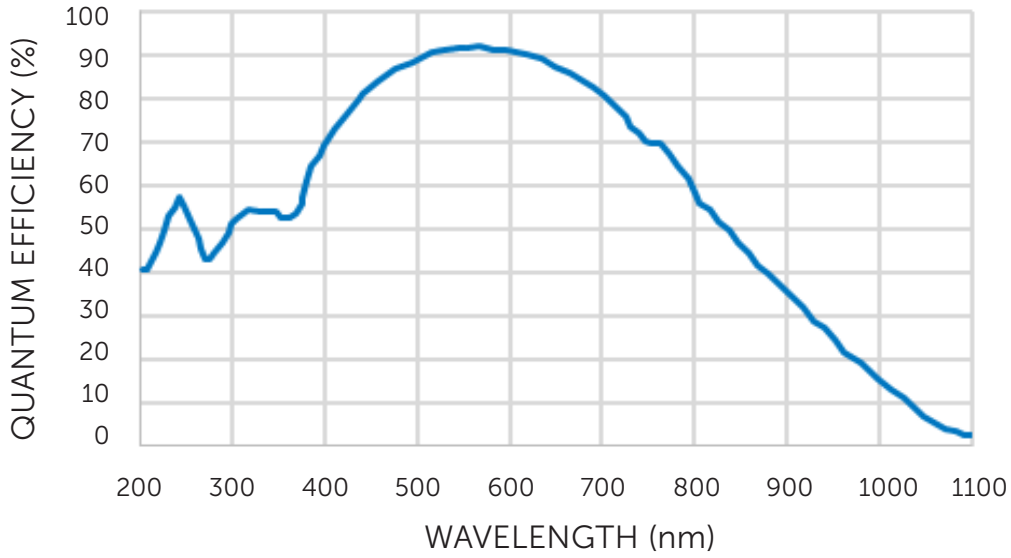
Teledyne has a history of providing solutions for world-changing projects, including the Mars Rover missions, ground-based observatories, and the James Webb Space Telescope. The COSMOS camera, leveraging its large area CMOS technology, stands as the ultimate solution for astronomy and other demanding scientific applications.

COSMOS-3k SPECIFICATIONS

SPECIFICATIONS	Camera Performance
Sensor	Back illuminated, grade 1, 100% fill factor
Active Array Size	3264 x 3264 (10 megapixels)
Pixel Area	10 x 10 µm (100 $µm^2$)
Sensor Area	32.6 x 32.6 mm (46 mm diagonal)
Peak QE%	> 90% peak QE
Spectral Response	200 – 1050 nm
Full Well Capacity	~ 14ke$^-$ (typical, high gain); > 100,000 e$^-$ (typical low gain)
Read Noise	< 1.5 e$^-$ RMS (typical, high gain mode) < 1 e$^-$ RMS (typical, CMS mode)
Dark Current	~ 0.1 e$^-$/p/s (typical)
Cooling Method	Thermoelectric with air and liquid circulation (external chiller required for liquid cooling)
Cooling Temperature	< -10 °C (air cooled); < -25 °C (liquid cooled)
Data Interfaces	CoaXPress® (Teledyne PCIe frame grabber card included)
Bit depth	14-, 16-, and 18-bit
Readout Modes	Rolling and true global shutter
Max Exposure Time	> 1 hour
Window Material	Sapphire glass, broadband AR coatings standard
Operating Temperature Range*	-30°C to 30°C; relative humidity: ≤ 75%; altitude: < 4500 m (with smart window enabled)
Camera Weight	11 kg
Camera Dimensions	13.9 x 13.9 x 21.0 cm
Nonlinearity**	< 1%
Binning	2 x 2 and 4 x 4 (on FPGA)
I/O signals	Three MCX connectors: 2x software configurable outputs, 1x trigger input
Certification	CE

*Contact Teledyne for more information on recommended environmental conditions; camera head only. Non-condensing conditions recommended.
**Per EMVA 1288

COSMOS-3k QE CURVE



COSMOS-3k READOUT MODES – NOISE

HDR: High Dynamic Range Mode; CMS: Correlated Multisampling

Data	Gain Setting	Shutter Mode	Read Noise (e^-)*
16 bit	High – CMS 8x	Rolling	< 1
14 bit	High	Rolling	1.4
14 bit	High	Global	2
16 bit	Low	Rolling	6
16 bit	Low	Global	11
18 bit	HDR	Rolling	1.2

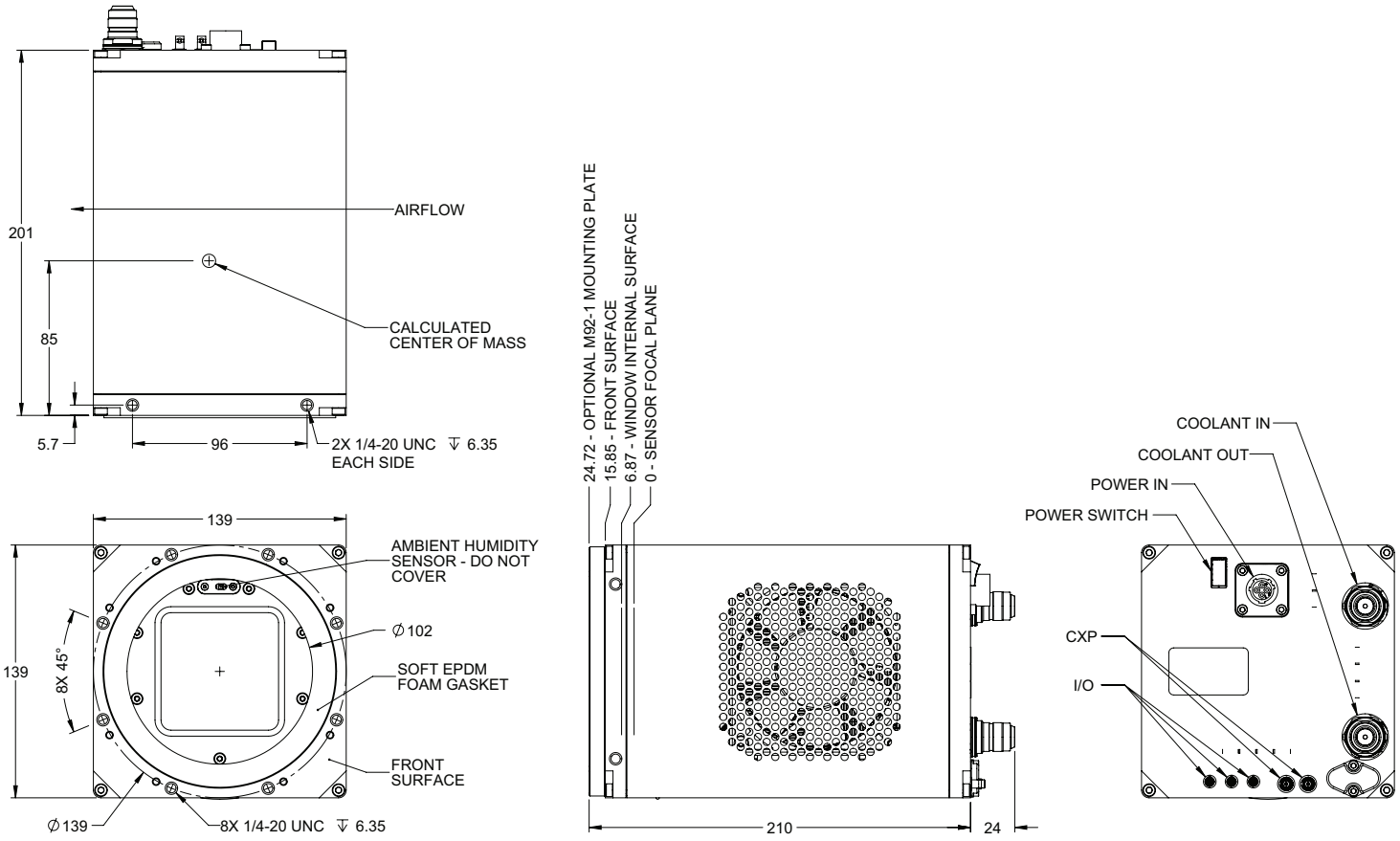
* Typical values

COSMOS-3k SPEED TABLE

Frame Rates (frames per second)

Region of interest size (pixels)	14-bit (rolling shutter)	14-bit (global shutter)	16-bit (rolling shutter)	16-bit (global shutter)	16-bit (rolling shutter – CMS)	18-bit (HDR)
3260 x 3260	61	47	19	15	2.0	7.2
3260 x 2048	97	75	30	24	3.2	11
3260 x 1600	125	96	39	31	4.1	14
3260 x 1024	195	149	61	48	6.4	22
3260 x 512	387	296	123	96	12	45
3260 x 256	765	580	242	188	25	90

COSMOS 3k DIMENSIONAL OUTLINES (Unit: mm)



FOR MORE INFORMATION & SUPPORT CONTACT:

www.teledynevisionsolutions.com/contact/contact-us

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