COSMOS-3k LARGE AREA CMOS CAMERA

KEY FEATURES

- Large 3k x 3k pixel sensor
- >90% QE
- 10 µm pixel size
- < 1 e^- read noise
- 56 fps at full resolution
- Sensor temperature <-25°C
- Dark current < 0.05 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

- An all-metal, hermetically sealed vacuum enclosure designed for long-term reliability

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

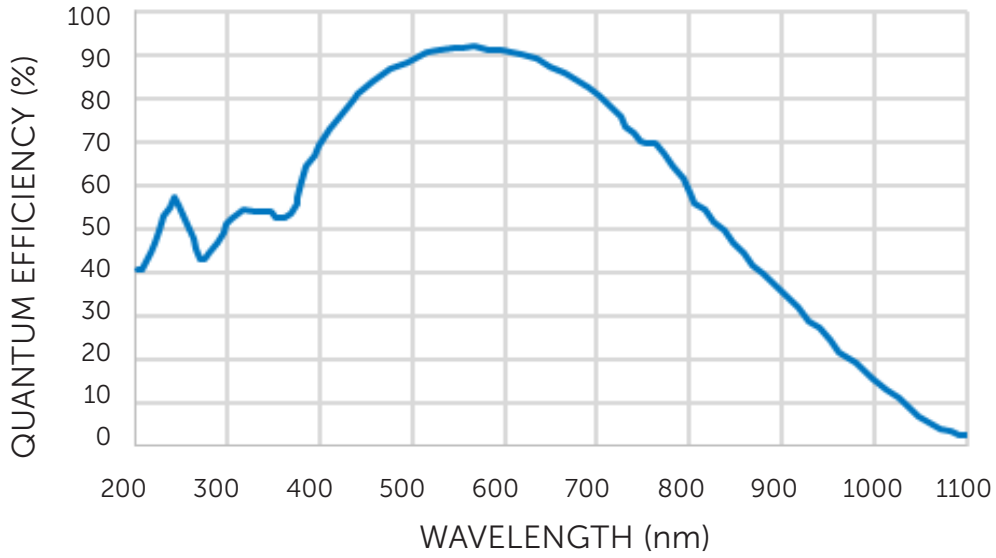
Teledyne Princeton Instruments COSMOS camera merges CCD and CMOS performance, resulting in a new generation of camera distinct from anything else currently on the market. The COSMOS camera excels in several key areas: resolution, pixel size, sensitivity, and speed. Notably, it is the only large format, high performance CMOS camera designed and manufactured entirely within a single source, at Teledyne.

Teledyne Imaging 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 more.

COSMOS-3k SPECIFICATIONS

SPECIFICATIONS	Camera Performance
Sensor	Back illuminated, grade 1, 100% fill factor
Active Array Size	3260 x3260 (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 – 1100 nm
Full Well Capacity	~ 14ke^- (typical, high gain), > 100,000 e^- (typical low gain)
Read Noise	< 1.8 e^- RMS (typical, high gain mode) < 1 e^- RMS (typical, CMS mode)
Dark Current	< 0.05 e^-/p/s (typical)
Cooling Method	Thermoelectric with liquid circulation (requires external chiller)
Cooling Temperature	< -25 °C (guaranteed)
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	JGS1 UV grade quartz glass; different AR coating options
Operating Temperature Range	-30°C to 30°C; relative humidity: ≤ 90% (non-condensing); altitude: 0-4500 meters
Camera Weight	TBD
Camera Dimensions	TBD
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

COSMOS-3k QE CURVE



COSMOS-3k READOUT MODES AND PROPERTIES

HDR: High Dynamic Range Mode; CMS: Correlated Multisampling

Data	Gain Setting	Shutter Mode	Read Noise (e-)
14 bit	High – CMS 16x	Rolling	< 1
14 bit	High	Global	3
16 bit	Low	Rolling	6
16 bit	Low	Global	15
18 bit	HDR	Rolling	1.5

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