QX OEM

PRODUCT DATASHEET

QI400BSI
Scientific CMOS

Back Illuminated Scientific CMOS

Discovery depends on every photon

QI400BSI is the Scientific CMOS with extreme sensitivity using high Quantum Efficiency (QE) Backside Illumination (BSI), a first for Scientific CMOS cameras. The QI400BSI's sensor converts up to 95% of incident photons into a measurable signal. Unlike microlens approaches to increasing QE, which lose effectiveness as objective magnification is increased, QI400BSI's sensor brings light into the pixel photodiode from behind, avoiding structures that reflect or absorb light. When combined with large 11µm pixels, QI400BSI can deliver over 300% more signal than other sCMOS cameras at 100X magnification.

More importantly, QI400BSI outperforms EMCCD cameras—with no excess noise that negates the benefit of using a high QE sensor, and additional limitations from EM gain calibration, stability, expense, and sensor lifetime With a true 16-bit dynamic range, QI400BSI easily accomplishes what EMCCD can not—detect weak and bright signals within the same image with photon-noise limited performance.

The extreme sensitivity not only allows fainter signals to be detected, it provides the flexibility to increase frame rates, or turn down the excitation intensity to reduce cellular photo-damage. Yet QI400BSI maintains the same high frame rates, field-of-view and extremely low read noise that has made sCMOS so popular for live-cell imaging.

APPLICATIONS

- **Super-Resolution Microscopy**
- **Confocal Microscopy**
- **Single Molecule Fluorescence**
- **Light Sheet Microscopy**

FEATURES	BENEFITS
High Quantum Efficiency **95% Peak QE**	Maximizes ability to detect weak signals, enables short exposure times for high frame rates, minimizes phototoxicity across a wide range of wavelengths
Large 11µm Pixel Size	Maximize light collection while maintaining proper spatial sampling
Extremely Low Read Noise	Maximize your ability to detect faint fluorescence
Fast Frame Rates	Capture highly dynamic events with high temporal resolution
Large Field of View	Maximize the number of cells that can be tracked and monitored per frame
Enhanced Dynamic Range	Measure both bright and dim signal levels within the same image 50,000:1 Dynamic Range (94 dB)
Multiple Expose Out Triggering	Control up to four light sources for multi-wavelength acquisitions
SMART Streaming	Faster acquisition rates with variable exposures, ideal for multi-probed live cell imaging Compatible with Multiple Expose Out Triggering

INCLUDED

- **QI400BSI Scientific CCD Camera**
- **PCIe Card/Cable**
- **Trigger Cable**
- **Power Supply**
- **Manuals and QuickStart Guide**
- **Performance and Gain Calibration Test Data**

ADDITIONAL ACCESSORIES

- **Liquid Circulator**
- **Liquid Cooling Tubes**

SPECIFICATIONS

Sensor	GPixel GSense 144 BSI CMOS Gen IV, Grade 1 in imaging area
Active Array Size	1200 x 1200 pixels (1.44 Megapixel)
Pixel Area	11µm x 11Qµm (121µm^2)
Sensor Area	13.2mm x 13.2mm, 18.7mm diagonal
Peak QE%	>95%
Read Noise	1.6e- (Median), 1.8e- (RMS)
Full-Well Capacity	80,000e- (Combined Gain), 4,500e- (High Gain)
Dynamic Range	50,000:1 (Combined Gain)
Bit Depth	16-bit (Combined Gain), 12-bit (High Gain)
Readout Mode	Rolling Shutter, Effective Global Shutter
Binning	2x2 (on FPGA)

CAMERA INTERFACE

Digital Interface	PCIe, USB 3.0
Lens Interface	C-Mount
Mounting Points	2 x 1/4 20˝ mounting points per side to prevent rotation
Liquid Cooling	Quick Disconnect Ports

COOLING PERFORMANCE

Air Cooled	-10ºC @ 30ºC Ambient, 2.9e-/pixel/second
Liquid Cooled	-25ºC @ 30ºC Ambient, 0.7e-/pixel/second

TRIGGERING

Input Trigger Modes	**Trigger-First** Sequence triggered on first rising edge **Edge** Each frame triggered on rising edge **SMART Streaming** Fast iteration through multiple exposure times
Output Trigger Modes	**First Row** Expose signal is high while first row is acquiring data **Any Row** Expose signal is high while any row is acquiring data **All Rows** Effective Global Shutter – Expose signal is high when all rows are acquiring data
Output Trigger Signals	**Expose Out (up to four signals), Read Out, Shutter Out, Trigger Ready**

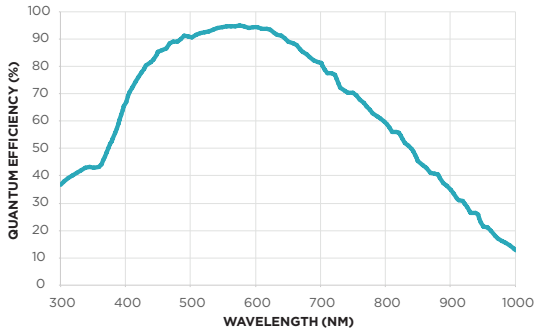
FRAME RATE

(PCIe Interface)

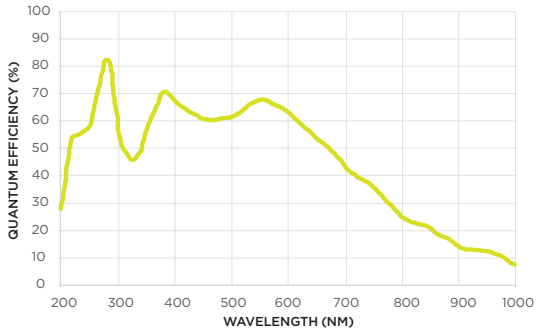
Array Size	16-bit	12-bit
1200 X 1200	41	82
1200 X 512	96	192
1200 X 256	192	384
1200 X 128	384	768

SPECTRAL RESPONSE

QI400BSI

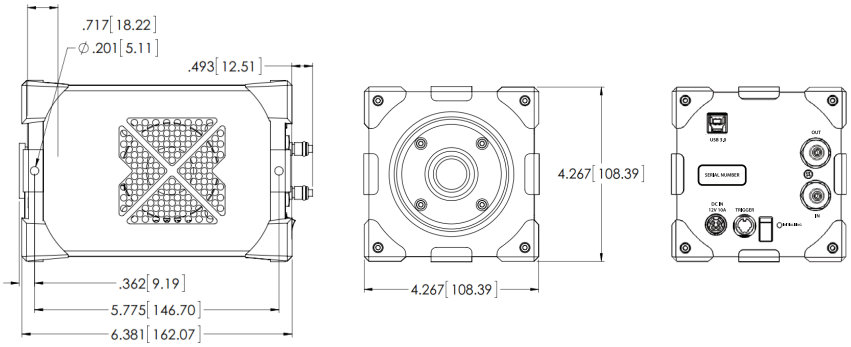


QI400BSI-UV



DIMENSIONS

Distance from C-mount to sensor



OEM

- Cameras optimized for application needs
- Flexible and customizable branding options
- Unique part number/Bill of Materials (BOM)
- Single driver platform supports a wide range of product offerings
- Strategically located global service centers
- Dedicated support from a focused OEM team

PHOTOMETRICS

QIMAGING

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Results are typical and may vary from camera to camera.

*For more information, visit the OEMImaging website at www.oemimaging.com

Note: Specifications are typical and subject to change.

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