

sMAX6504B Series

sMAX6504B-VIS-U10-10G

sMAX6504B-UV-U10-10G

sMAX6504B-VIS-U20-CXP

sMAX6504B-UV-U20-CXP



Scientific Applications

Astronomical Observation

Model	Filter	Sensor Model/Type	pixel size (μm)	Sensor Size	Resolution	Frame Rate	Data Interface
sMAX6504B-VIS-U10-10G	Double-side AR-coated protective glass	GSENSE6504BSI/CMOS sensor	6.5 × 6.5	1.2"	2048 × 2048	10Gige: 248fps@8bit, 124fps@12bit, 124fps@16bit	USB3.2 Gen 2x1/10Gige
sMAX6504B-UV-U10-10G	Ultraviolet quartz glass					USB3.2 Gen 2x1: 224fps@8bit, 112fps@12bit, 112fps@16bit	
sMAX6504B-VIS-U20-CXP	Double-side AR-coated protective glass					CXP: 298fps@8bit, 298fps@12bit, 170fps@16bit	USB3.2 Gen 2x2/CXP 2.0x4
sMAX6504B-UV-U20-CXP	Ultraviolet quartz glass					USB3.2 Gen 2x2: 298fps@8bit, 298fps@12bit, 170fps@16bit	

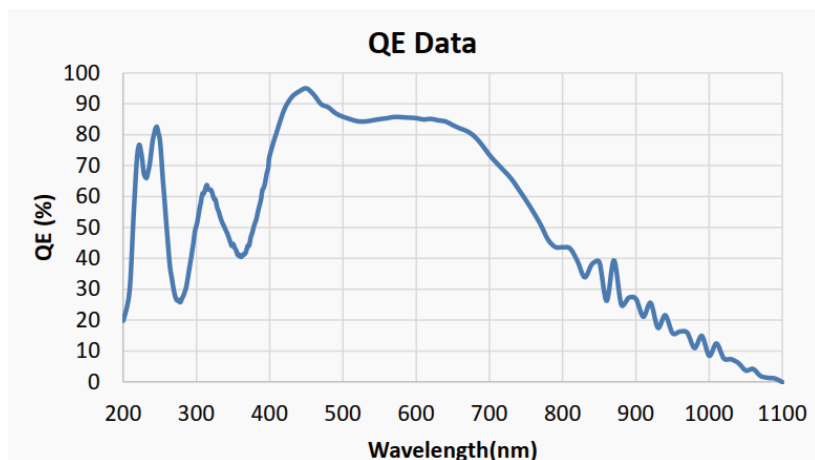
※ Available in both air-cooled and water-cooled configurations.

Characteristics

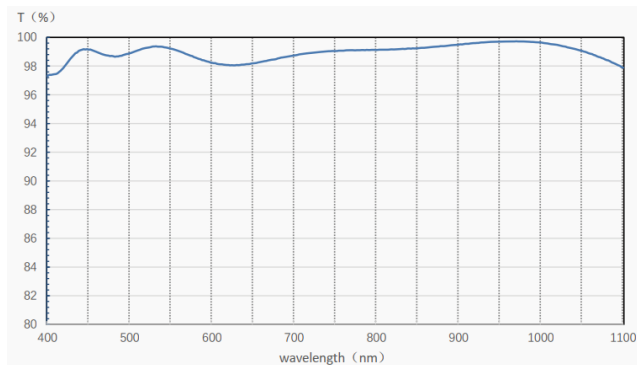
The sMAX6504B series is equipped with the GSENSE6504BSI 1.2-inch image sensor. To address the inherent thermal noise of the sensor, an efficient cooling module has been specially designed, enabling the camera sensor to operate at temperatures up to 40°C (air cooling) or 55°C (water cooling) below ambient. An anti-condensation mechanism has been designed to address the common issue of condensation at low temperatures in cooled cameras, ensuring that the surfaces of the sensor and filter do not fog at low temperatures. Video and image data from the sMAX6504B series can be transmitted via USB3.2 Gen 2x1, USB3.2 Gen 2x2, 10Gige, or CXP interfaces for quick preview.

- Equipped with GSENSE6504BSI scientific-grade CMOS sensor
- Wide spectral range of 200nm-1100nm
- Ideal for UV and visible light band application scenarios
- Maximum signal-to-noise ratio: 41.3dB (high dynamic mode)
- Dynamic range: 86dB (high dynamic mode)
- Ultra-low dark current: $\leq 0.01e^{-}/s/pix@-20^{\circ}C$
- Support external IO trigger control
- Supports high sensitivity/high full well/balanced/high dynamic range (HDR) modes
- Ultra-low readout noise: 0.72e⁻ (high dynamic mode)/0.74e⁻ (high sensitivity mode)
- Precise temperature control, with air cooling below 40°C of room temperature and water cooling below 55°C of room temperature
- The frame rates of USB3.2 Gen 2x1/USB3.2 Gen 2x2/10Gige/CXP can reach 224fps/298fps/248fps/298fps respectively
- Resolution: 2048×2048
- 6.5x6.5μm pixel size
- Rolling shutter/Global reset
- USB3.2 Gen 2x1/USB3.2 or Gen 2x2/10Gige/CXP interface
- Mono 8/Mono 12/Mono 16
- 8Gb memory

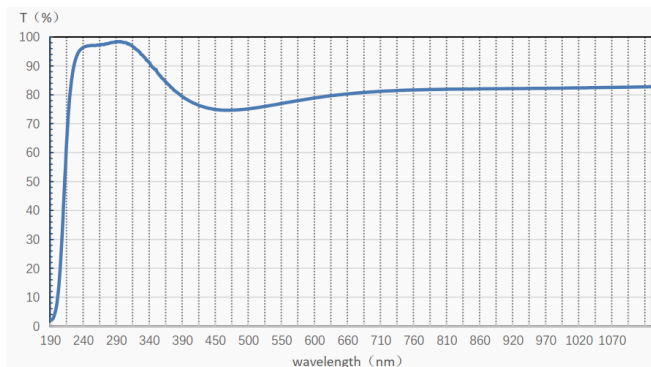
Curve



GSENSE6504BSI QE Curve



Transmittance curve of AR protective glass



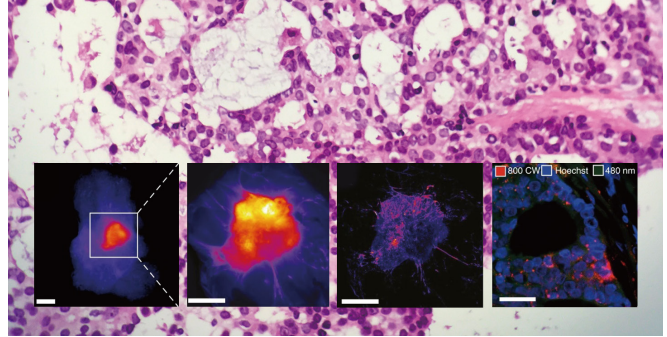
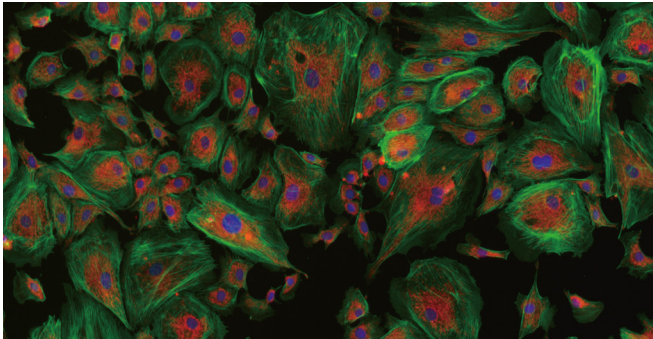
Transmittance curve of Ultraviolet quartz glass

Parameters

Model parameter	sMAX6504B-VIS-U10-10G Double-side AR-coated protective glass	sMAX6504B-UV-U10-10G Ultraviolet quartz glass	sMAX6504B-VIS-U20-CXP Double-side AR-coated protective glass	sMAX6504B-UV-U20-CXP Ultraviolet quartz glass
Sensor Model	GSENSE6504BSI			
Sensor Type	CMOS Image sensor			
Spectral Range	200nm-1100nm			
Pixel Size	6.5μm×6.5μm			
Sensor Size	1.2”			
Resolution	2048×2048			
Frame Rate	10Gige:248fps@8bit, 124fps@12bit, 124fps@16bit USB3.2 Gen 2x1:224fps@8bit, 112fps@12bit, 112fps@16bit		CXP:298fps@8bit, 298fps@12bit, 170fps@16bit USB3.2 Gen 2x2:298fps@8bit, 298fps@12bit, 170fps@16bit	
Memory	1024MB(8Gb)			
Conversion Gain	0.26e-/DN(High Sensitivity Mode) 0.21e-/DN (HDR Mode)			
Dynamic Range	62.1dB(High Sensitivity Mode) 86dB(HDR Mode)			
Readout Noise	0.74e-(High Sensitivity Mode) 0.72e-(HDR Mode)			
Full Well Depth	1.03ke-(High Sensitivity Mode) 13.48ke-(HDR Mode)			
S/N Ratio	30.1dB(High Sensitivity Mode) 41.3dB(HDR Mode)			
Sensitivity	9.2x107e-/((W/m2).s)@450nm			
Dark Current	≤0.05e-/s/pix@-10℃ , ≤0.01e-/s/pix@-20℃			
Quantum Efficiency	95%@450nm			
Exposure time Range	12us-300s			
Shutter Mode	Rolling shutter/Global reset			
Binning Mode	Software Bining:2×2~8×8, Hardware Binning: 1x1, 1x2, 2x1, 2×2			
Data Interface	USB3.2 Gen 2x1/10Gige		USB3.2 Gen 2x2/CXP 2.0x4	
Digital I/O	1 channel optocoupler isolated input, 1 channel optocoupler isolated output, 2 channels non-isolated input/output ports			
Data Format	Mono 8/Mono 12/Mono 16			
Cooling ΔT	Air cooling is 40℃ lower than room temperature / Water cooling is 55℃ lower than room temperature			
General Parameters				
Power Supply Method	19V 4.74A power adapter			
Power Consumption	<46W@USB3.2 / <55W@10Gige / TBD@CXP			
Temperature	Operating temperature: -30~60℃, storage temperature: -40~85℃			
Humidity	20%-80%, no condensation			
Size	85*85*118mm			
Weight	976g			
Lens Mount	C interface			
Software	Provide SDK development kit/ToupView software			

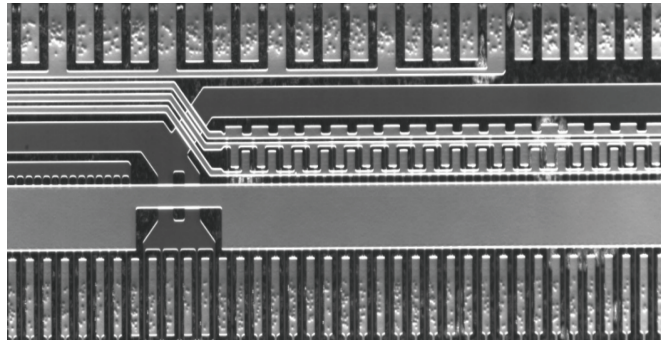
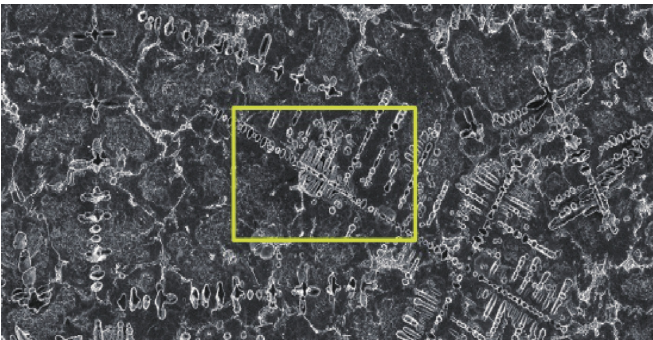
Applications

• life sciences



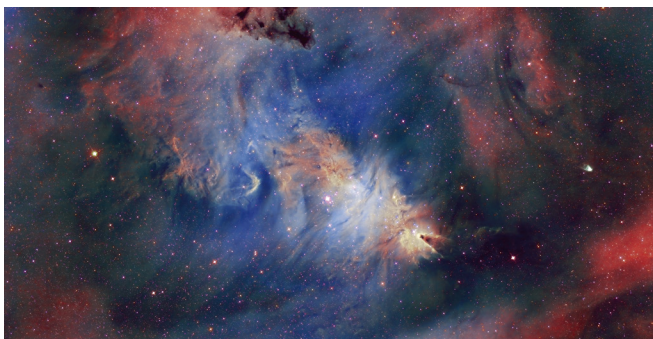
It can meet the multi-dimensional scientific research needs from single-molecule in-situ detection to high-throughput automated imaging, and provide core support for revealing the cross-scale mysteries of living systems.

• Semiconductor testing



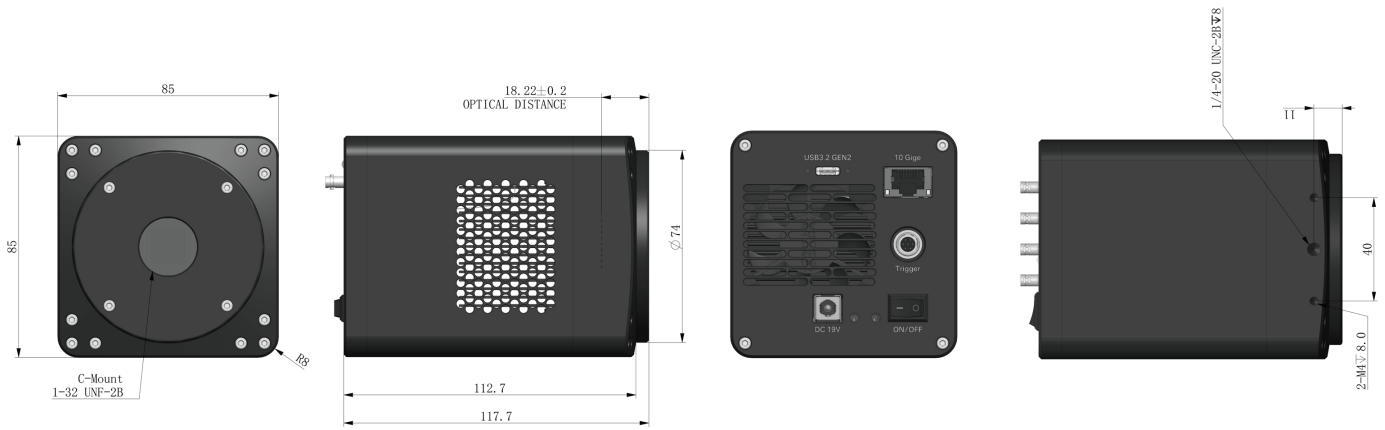
It can provide imaging solutions for semiconductor inspection, meeting the needs for high-speed imaging and high-precision identification of defects at the micron and nanoscale.

• Astronomical observation

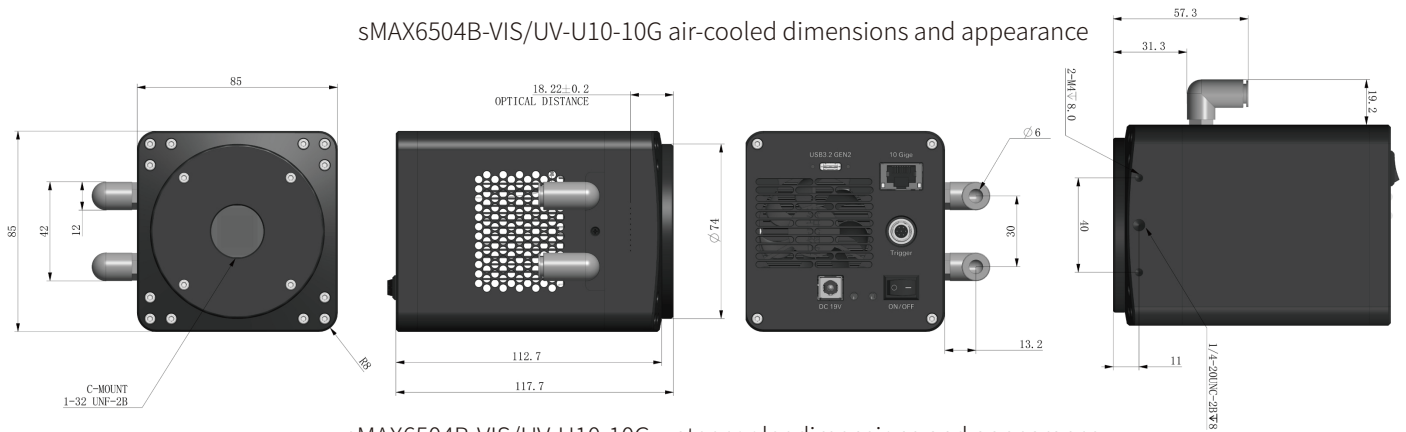


It can meet the application needs of multiple fields such as quantum optics experiments and astronomical observation, realize multi-scale observation from elementary particles to the macroscopic universe, and provide observational support for exploring the underlying nature of the world.

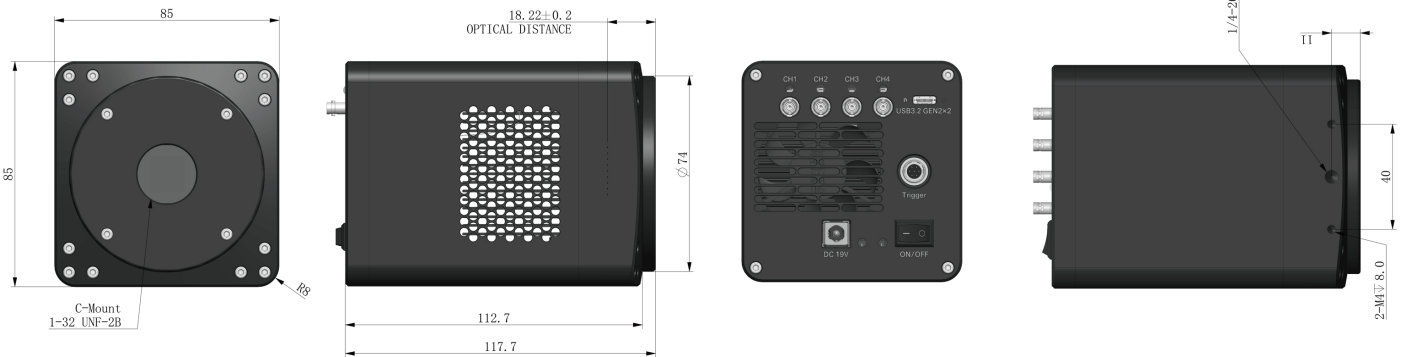
Size & Shape



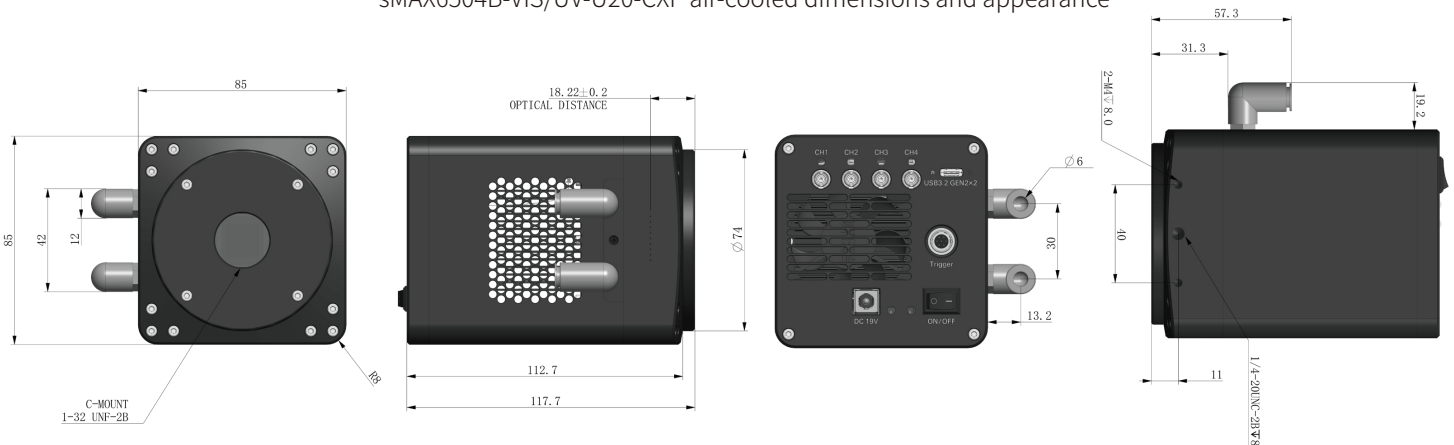
sMAX6504B-VIS/UV-U10-10G air-cooled dimensions and appearance



sMAX6504B-VIS/UV-U10-10G water cooler dimensions and appearance



sMAX6504B-VIS/UV-U20-CXP air-cooled dimensions and appearance



sMAX6504B-VIS/UV-U20-CXP water cooler dimensions and appearance