PRELIMINARY

SENSORS UNLIMITED

1.25 x 1.25 x 1.10 inches
31.8 x 31.8 x 28 mm

Micro-SWIR™ 640CSX Camera

Mil-Rugged, High Sensitivity, Small SWaP,+C InGaAs SWIR Camera

The compact 640CSX is the next generation SWIR video camera, designed for applications requiring small Size, Weight, and Power (SWaP) applications and available without ITAR restriction.

The Sensors Unlimited Micro-SWIR 640CSX camera features a 640x512 pixel, high-sensitivity, stabilized InGaAs snapshot imager and utilizes Sensors Unlimited's advanced image enhancement algorithms to produce highest quality imagery in all lighting conditions.

The camera provides real-time daylight to low-light imaging in the Short Wave Infrared (SWIR) wavelength spectrum for a range of applications that include industrial process monitoring, enhanced vision, and persistent surveillance. On-board Automatic Gain Control (AGC) optimizes the camera's dynamic response throughout day and night imaging scenarios. Camera Link® digital output provides for plug-and-play video with 12-bit images for digital image output.

The light weight, compact size, and low power draw are ideally suited for integration into commercial systems and industrial process monitoring applications. Optional NIR/SWIR technology is available to extend the sensitivity of the 640CSX below 0.9 µm, offering the advantage of both Near Infrared (NIR) and Short Wave Infrared wavelength response.

FEATURES

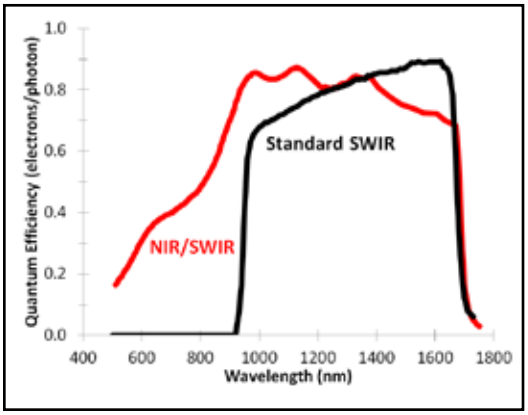
- 640x512 pixel format, 12.5 µm pitch
- 30 or 60 frames per second full frame rate
- 1.5 W power consumption (@ 20° C)
- High sensitivity 0.9 to 1.7 µm spectrum response imager; NIR/SWIR, from 0.7 to 1.7 µm
- Low light to daytime imaging
- Compact size
- All solid-state InGaAs imager
- Snapshot exposure
- On-board, real time non-uniformity corrections
- Digital 12-bit Camera Link® base output
  Other output options available upon request
- Automatic Gain Control (AGC)
- C-mount compatible; adapters available
- Selectable contrast enhancement modes
- User defined Region of Interest (ROI) windowing mode
- Digital pixel binning
- FCC Part 15 and MIL-STD-461F certified
- Tested to MIL-STD-81OG for functional shock, vibration, thermal shock, storage temperature, and humidity
- Operation from -40°C to 70°C case temperature

UTC Aerospace Systems

Model No: Micro-SWIR 640CSX Camera

MECHANICAL SPECIFICATIONS	
Model	SU640CSX-12.5B-ENC housed series SU640CSX-12.5B-OEM
Dimensions (width x height x depth) (excludes connectors, excludes lens)	ENC Series: 1.25"W x 1.25"H x 1.10"D 31.8 x 31.8 x 28 mm OEM Series: 1.25"W x 1.25"H x 1.10"D 31.8 x 31.8 x 28 mm
Weight	ENC Series: ≤45 grams OEM Series: ≤41 grams
Lens mount	C-mount
Camera Link Connector	26 Pin SDR standard connector Board-to-board connector option for OEM model
Power Input Connector	14 Pin SDR standard connector
Pixel Pitch	12.5 µm
Focal Plane Array Format	640 x 512 pixels
Active Area	8.0 mm x 6.4 mm (10.2 mm diagonal)

ENVIRONMENTAL & POWER SPECIFICATIONS	
Operating Case Temperature	-40°C to 70°C
Storage Temperature	-54°C to 85°C
Humidity	95% RH non-condensing
Power Requirements:	
DC Voltage	DC Voltage: +4.5-16V
Steady State Power **Max Power**	Power: 1.5 W at 20°C case temperature, max ≤4.25 W
Functional Shock, Random Vibration, Thermal Shock	MIL-STD-810G compliant design



ELECTRICAL SPECIFICATIONS		
Optical Fill Factor	100 %	
Spectral Response	Standard, 0.9 µm to 1.7 µm NIR/SWIR, 0.7 µm to 1.7 µm	
Quantum Efficiency	Standard, ≥ 65% from 1 µm to 1.6 µm NIR/SWIR, ≥ 65% from 0.9 µm to 1.6 µm	
Digital Output Frame	**30 fps**	**60 fps**
Mean Detectivity, D* [1] (cm√Hz/W)	≥ 2.5 x 10^{13}	≥ 2.8 x 10^{13}
Noise Equivalent Irradiance [1] (photons/cm²/s)	≤ 9.7 x 10^{8}	≤ 1.2 x 10^{9}
Noise (RMS) [1]	≤ 35 electrons (typical)	≤ 25 electrons (typical)
Dynamic Range [1]	≥ 2500:1 at low gain ≥ 800:1 at high gain	≥ 2500:1 at low gain ≥ 1100:1 at high gain
Operability [2]	≥ 99 %	
Exposure Times	Proconfigured: 200 µs to 33 ms User configurable	
Image Correction	2-point (offset and gain) pixel by pixel, user selectable	
Output Format	12 bit base Camera Link® Other output options available	
Scan Mode	Continuous with user configurable trigger modes	

[1] λ = 1.55 µm, exposure time = 33 ms (30fps), 16.67 ms (60 fps), case temperature = 20°C, highest sensitivity gain setting, no lens, x1 digital gain with enhancement, AGC, and correction off

[2] The fraction of pixels with responsivity deviation between +/- 35% from the mean.

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