



## Cooled VGA Vis-SWIR InGaAs Camera

### Quantitative SWIR imaging and spectroscopy

The camera uses selected back thinned InGaAs focal plane arrays with low dark current and low defective pixel count.

Thanks to efficient cooling and stable offset, the InGaAs camera allows reproducible acquisition for precise metrology measurements in the Vis-SWIR spectrum.

Camera Link and Gigabit Ethernet Vision compliant interface enables easy integration into existing systems.

OEM versions with special form factors / cooling options are available for integration into specific instruments / systems.

### Key Features

- | 14-bit digitization / 16-bit image processing
- | Read out noise down to typically <30 electrons
- | >200 fps with region of interest ROI
- | Excellent linearity response to varying intensities and / or exposures
- | Gigabit Ethernet & Camera Link interface
- | Software option: SDK kit, Labview VI's

### Applications

#### Available with passive cooling

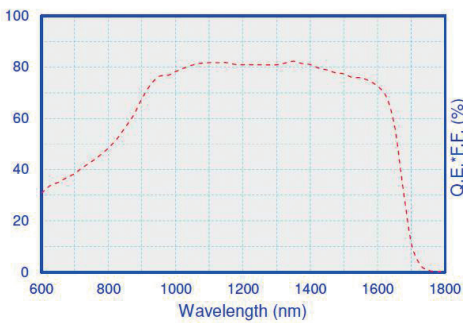
- Semiconductor inspection
- Vis-SWIR handheld vision enhancement
- Vis-SWIR airborne payload
- Photoluminescence for solar cells

#### Air cooling or water cooling for long exposure

- Astronomy
- Hyperspectral imaging
- Laser beam profiling
- Spectroscopy

## Cooled VGA Vis-SWIR InGaAs Camera

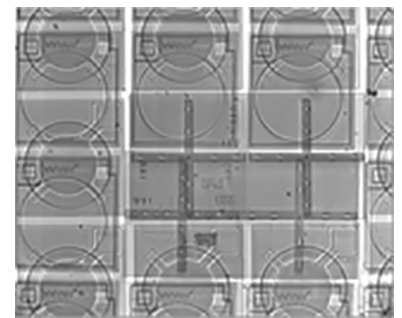
Characteristics	PSEL VGA 15 $\mu$ m
Spectral Range	600 - 1700 nm
Resolution	640 x 512
Sensor Size	9.6 mm x 7.68 mm
Frame Rate	174 fps at full VGA resolution 570 fps at ¼ VGA resolution 7,200 fps at 640x4 resolution (spectroscopy or line mode)
Pitch	15 $\mu$ m x 15 $\mu$ m
Full Well Capacity	20k - 23k electrons (high gain mode) 80k - 105k electrons (mid gain mode) 1.0M - 1.5M electrons (low gain mode)
Read Out Noise	28 - 40 electrons (high gain mode)
Reading Mode	Integrate Then Read, Integrate While Read
Dark Current	1 fA uncorrected, approx. 0.2 fA with corrections with air cooling 0.2 fA uncorrected, approx. 0.05 fA with corrections with water cooling
Sensor Temperature (°C)	-25°C with air cooling, -50°C with water cooling (lower dark current)
Corrections	Non uniformity, bright pixel, gain, offset, flatfield
ADC	14-bit with 16-bit digital processing
Exposure	30 microseconds up to > 1 minute
QE at 1350 nm	82%



Quantum efficiency response of Cooled Vis-SWIR InGaAs camera



Photoemission microscopy on IC using water cooled Vis-SWIR InGaAs camera, with 20x objective, exposure time 30s



Transmission infrared microscopy of MEMS wafers using Vis-SWIR InGaAs camera with 6x objective, exposure time 15ms