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VIS-SWIR DETECTOR MODULE



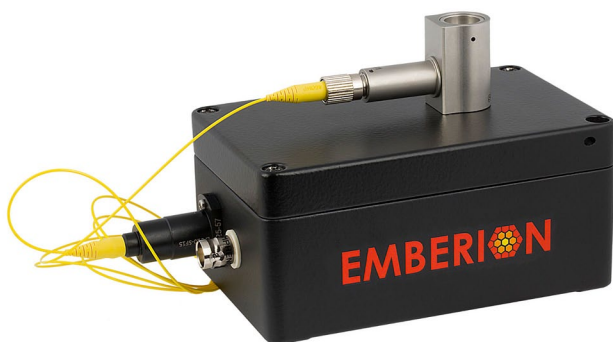
Overview

Emberion's graphene photodetectors convert light to an electronic signal using graphene charge transducers combined with nanocrystal light absorber. They provide superior responsivity with very low noise over a broad spectral range from visible to near infrared/short-wave infrared (NIR/SWIR) wavelengths without cooling below room temperature. The dynamic range of the detectors is very large, owing to low noise and a response that does not saturate. The size of rectangular photosensitive active area is tailorable.

The photodetectors are packaged into standard TO-5 cans. For evaluation purposes, we also offer detectors in TO-8 cans with a built-in thermo-electric cooling (TEC) element for thermal stabilization. In addition to discrete analog components in a TO-5/8 can, our photodetectors are available as digital modules, i.e. circuit boards comprising HW&SW implementation for calibration, signal pre-processing, analog-to-digital conversion and digital I/O. Potential applications include spectrometry, optical gas detection and optical power measurements.

Technology in Brief

- Ultra-sensitive photodetector combining a graphene field-effect transistor charge transducer with an efficient light absorbing layer
- Wide spectral range from visible light to short-wave infrared covered with a single photodetector
- Excellent detector performance achieved at room temperature



Customer sample and evaluation kit for performance measurements



Analog component package for detector chip and TEC element

Unique Benefits

- Low noise-equivalent irradiance (NEI)
- Non-saturating detectors, large dynamic range
- Broad range of wavelengths
- Scalable pixel size

Technical Data

Spectral range	400 - 1800 nm
Photosensitive area (rect)	0.5 × 0.5 mm ²
Specific detectivity*	> 10 ¹⁰ Jones
Noise-equivalent irradiance*	< 10 ⁻⁴ W/m ²
Sampling rate	max 100 Hz
Full dynamic range	120 dB
Stability	< 5 % per year
Hysteresis	< 1 %
Full scale non-linearity**	< 3 %
Analog detector package***	TO-5
Analog detector I/O	5 pins
Supply voltage to analog detector	0.5 V
Supply voltage to digital module	5.5 V
Digital module board size	3 × 3 cm ²
Digital module I/O	SPI with 1.8 V

* at λ = 1600 nm, sampling rate 100 Hz

** after correction

*** TO-8 with 12 pins available for evaluation purposes