VIGO SYSTEM

EPIC Online Technology Meeting on Mid-IR Photonics

Infrared solutions for your applications

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ABOUT US

// Key competitive advantages

VIGO System supplies a wide range of **products for photonics**. Our offer includes both epitaxial semiconductor materials as well as infrared detectors and detection modules. All products are **based on our own unique technology**.

Our competitive advantage is based on:

- Over **30 years** of experience in detector manufacturing
- The best quality to price ratio
- Ability to meet the highest quality requirements (NASA, military)
- Main supplier for detectors for QCL
- > **150 employees** (1 professor, 14 PhDs and >50 engineers)
- **6500 m^2** of production area

// Our strengths

- **TECHNOLOGY** Unique technology, established internally and continuously developed, allowing production of sophisticated optoelectronics sensors
- **PEOPLE** Highly educated and experienced personnel
- **MARKET KNOWLEDGE** Numerous group of satisfied customers. Wide network of distributors
- **INNOVATION** Close co-operation with academia and R&D institutions allowing for highly advanced research. Ability to recruit highly competitive staff

Verticaly integrated manufacturer of Mid IR components

// **Complete production line** for infrared semiconductors and Mid IR photonic devices

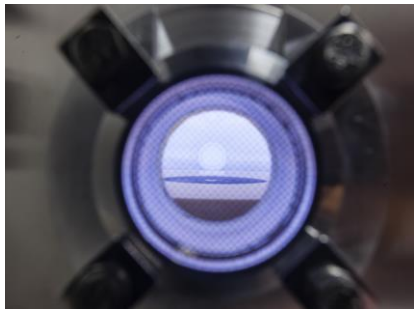
1. Epitaxy →

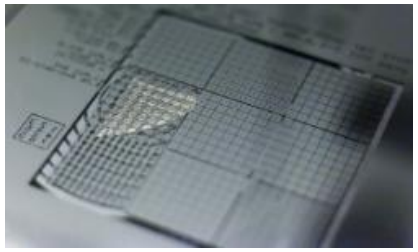
Growth of MCT and III-V semiconductor layers in MOCVD and MBE technology

Production of high quality epitaxial heterostructures from materials of group III-V. GaAs and InP based products.

2. Processing ↓

Contact and passivation deposition, dry and wet etching and photolithography





Preparation of structures for assembly: dicing, wirebonding and flip-chip

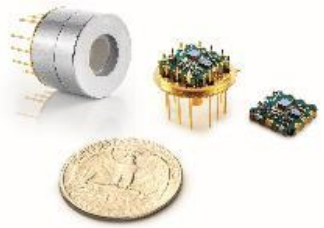
3. Detectors packaging ←

Microlenses monolithically integrated with the active structures

Automated assembly, hermetization and packaging

4. Integration with electronics

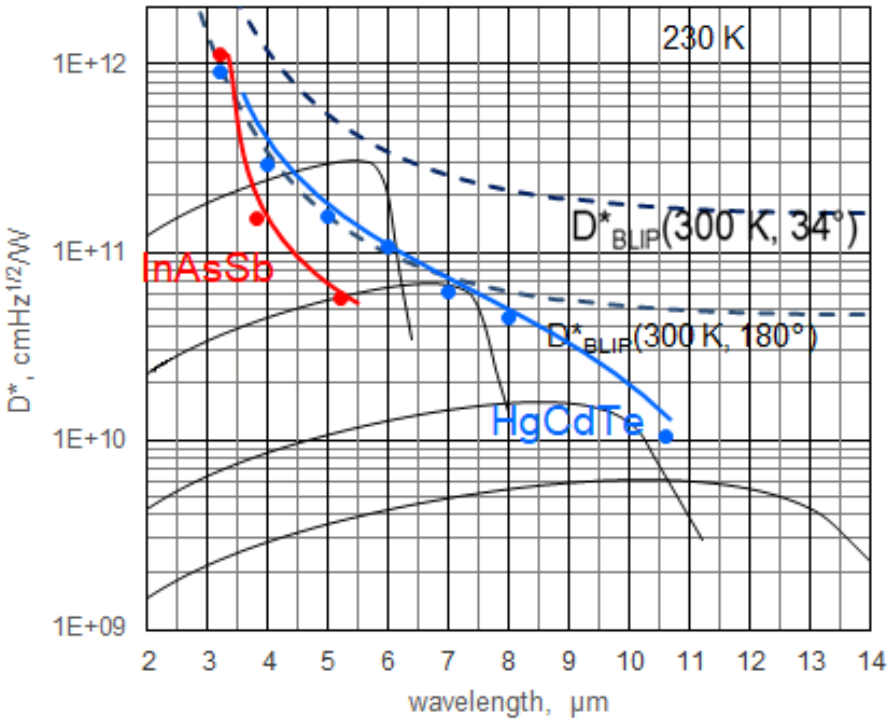
Dedicated electronics for each type of infrared detector



Integration of infrared detector with electronics in common packages. Complete detection modules

VIGO System – WHAT WE OFFER?

// Parameters vs fundamental limits



// Detectivity approaching fundamental limits of performance

Time response aproaching GHz range

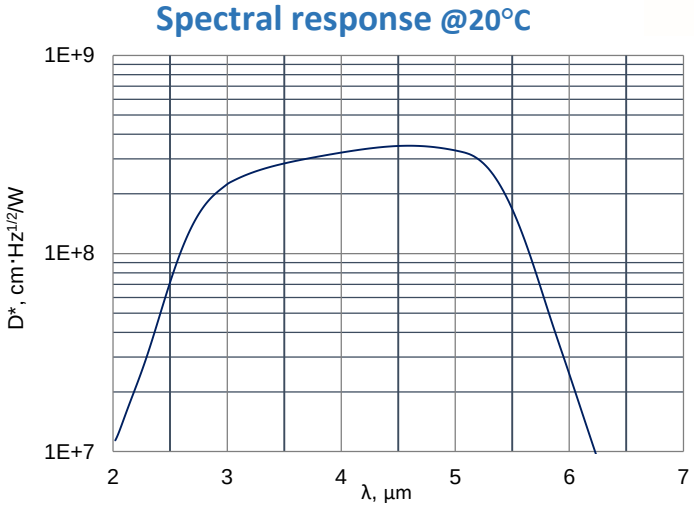
VIGO System – NEW PRODUCT LINE

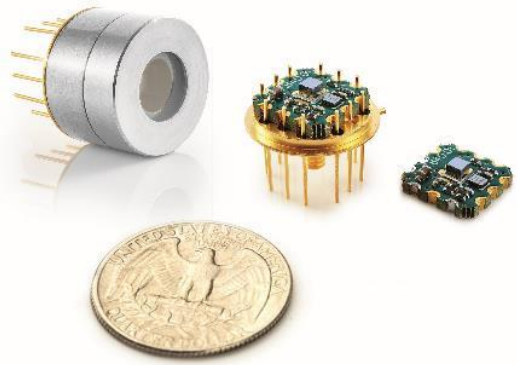
// Affordable MWIR detection module:

- **Detector integrated with low noise preamplifier in a common minniaturized package(10×10×3 mm^3)**
- **Uncooled MWIR InAsSb detector**
- **Frequency responce –** DC to 3MHz
- **RoHS compliance** – consumer market safety!
- **Competetive price – 120 Euro**

// In development:

- **Other spectral ranges**
- **Further miniaturization**
- **Temperature stabilization**
- **Planar optics**
- **Digital output (SPI and USB)**





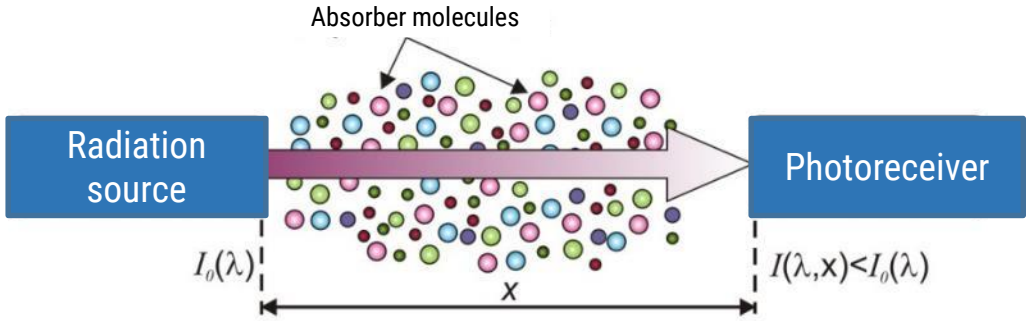
Parameters	
Peak wavelength	4.6 µm
10% cut-on wavelength	1.2 to 4.0 µm
10% cut-off wavelength	5.9 µm
Peak voltage responsivity	400 V/W
Peak detectivity	3.5×10^8 cm·Hz$^{1/2}$/W
Electrical bandwidth	3 MHz
Acceptance angle	up to 160°
Output voltage swing	0.5 V
Storage temperature	-20 to 60°C

VIGO System – NEW PRODUCT LINE

// Spectroscopy, eg. gas, liquids and solids analysis

- Strong absorption lines
- Detection of almost any chemical compound
- High sensitivity
- High selectivity

The chemical composition analysis system is usually built from a MWIR radiation source and a receiver (detector)



Each chemical compound has its own spectral lines on the spectral characteristics

// Industry

- Temperature measurement
- Laser metrology
- Monitoring of industrial and laboratory processes
- Laser parameters monitoring and control

VIGO System – NEW PRODUCT LINE

// MWIR/LWIR HgCdTe and InAsSb linear arrays

Features

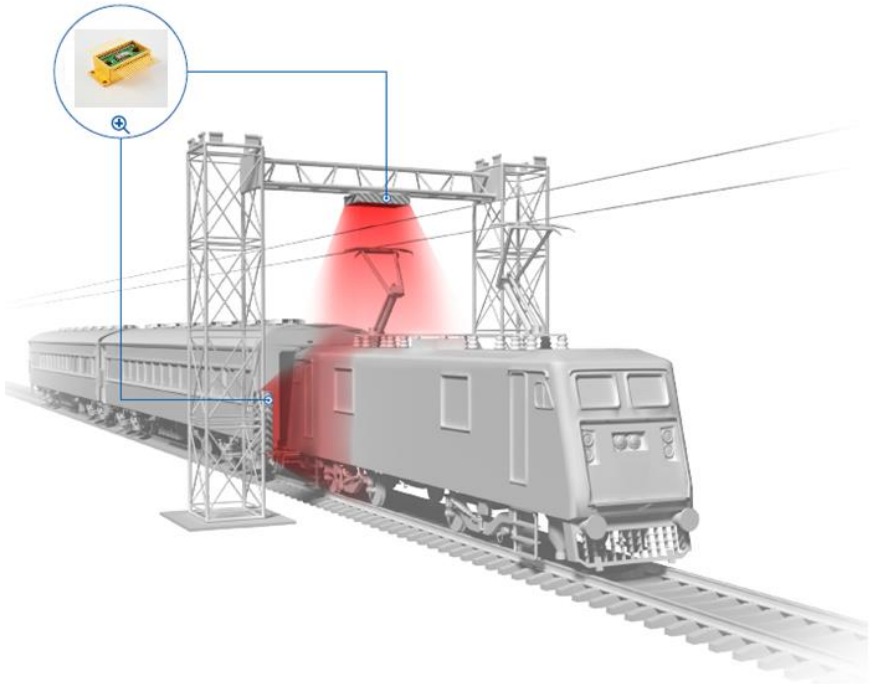
- High sensitivity
- High-speed response
- From DC to a few MHz
- Low drift of output signals
- Compact, small size and weight packages
- Convenient cryogenic-free operation
- Customizable array formats, spectral range, responsivity and signal processing circuits

Array format	linear or bilinear, up to 32 elements
Pixel size	minimum 25×25 µm
Detector material	HgCdTe or InAsSb
Detector type	PV or PC
Cut-off wavelength	3 to 14 µm
Cooling	1 to 4-stage TEC
Time constant	1 ns – 10 µs
Active elements temperature	210 – 270 K
Temperature sensors	thermistor or diode
Package	TO8 16-pin or butterfly 40-pin
Window	Si/Al_2O_3/Ge/ZnSe with or w/o AR coating, planar or wedged
Ambient temperature	-20 to 70°C
Storage temperature	-20 to 50°C

MAIN APPLICATION TYPES

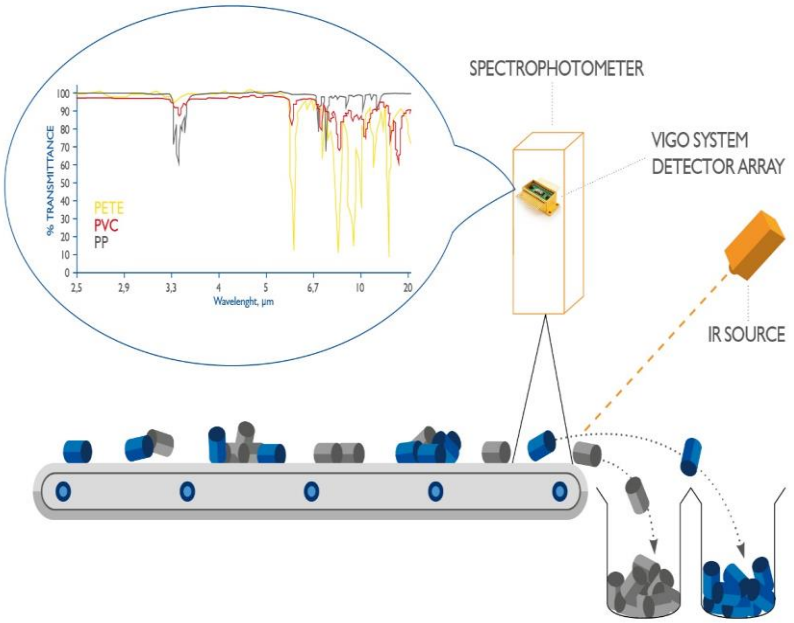
// Temperature monitoring

- Temperature control of fast moving objects
- Advantage over other sensors in terms of response time, detectivity and resistance to enviromental conditions



// Plastic sorting

- Elimination of moving parts and/or filters
- High separation accuracy due to high SNR ratio
- High speed measurement
- Low power consumption



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