

VTC – VCSEL Testing Camera

Near-field analysis of VCSEL arrays

Key features at a glance

- ▲ 2D measurement solution for near field characterization of VCSEL arrays
- ▲ Single emitter wavelength measurements
- ▲ Microscope objective, digital resolution 0.3 μm
- ▲ Flat-field and absolute power calibration, traceable to national institute (PTB)
- ▲ Fully compatible with LumiSuite



The VTC is the perfect solution for single emitter characterization of VCSEL arrays. The system, consisting of a camera and corresponding microscope optics, is capable of simultaneously determining position as well as radiant power of single emitters on a VCSEL array in a single-shot camera measurement. As a result, the system allows for fast and easy detection of defect emitters on the VCSEL array. The VTC is calibrated traceable to the PTB (National Institute of Germany) enabling the absolute measurement of radiant power with highest accuracy and error budget analysis.

\\ EXPANDABLE SYSTEM SOLUTIONS

Optional translation stages enable the characterization of numerical aperture as well as the waist of the VCSEL emission profile. A full automation of the characterization of the complete VCSEL array is possible. The device under test is not required to be moved.

Moreover, an additional CAS high-resolution spectrometer can be connected to the VTC in order to measure the spectrum of each single emitter. This allows for a full optical characterization of the complete VCSEL array including single emitter analysis in terms of spectrum and radiant power.



▲ The spectrum of each single emitter can be measured with CAS high-resolution spectrometers

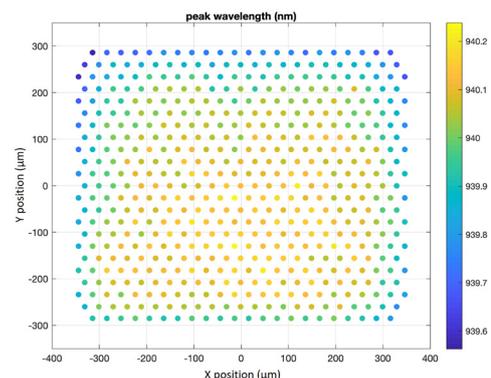
\\ MEASUREMENT RESULTS

For each single emitter:

- » Position (x and y)
- » Radiant flux
- » Defect emitter analysis

With optional features:

- » Waist
- » Numerical aperture
- » M^2 value
- » Focus position
- » Spectral analysis of single emitters



▲ Peak wavelength analysis of single emitters on a VCSEL array

\\ TECHNICAL SPECIFICATIONS

VCSEL Testing Camera	
Camera System	
Spectral range	400 – 1000 nm, calibrated for 900 – 980 nm
Camera	12 Megapixel CMOS
Digital resolution	0.345 μm
Optical resolution	2.2 μm (at 940 nm)
Field of View	1.4 mm x 1 mm
Integration times	28 μs – 1 s
Radiometric measurement accuracy ¹⁾	6% (tbd)
NA	0.26
Translation stage (optional, Z for numerical aperture/waist/M²/focus position, X/Y for full array characterization and spectral data)	
Travel range	10 cm (for X, Y and Z)
Positioning accuracy	2 μm
Wavelength measurement with CAS spectrometer ²⁾ (optional, for spectral data)	
Spectral range	800 – 1000 nm
Spectral resolution (typical)	0.12 – 0.4 nm
Data point interval (typical)	0.05 – 0.16 nm
Filter wheel with optical density filters (typical)	OD 0.5/1/1.5/2/2.5
Measuring ranges (typical)	80 – 160 nm
Wavelength accuracy	± 0.05 nm
Integration time	4 ms – 65 s
Spatial resolution	Diameter 20 μm

¹⁾ With factory calibration traceable to PTB.

²⁾ Exact specifications depend on the chosen high-resolution CAS model.

Instrument Systems is continually working to develop and improve products. Technical changes, errors or misprints do not constitute grounds for compensation. The company's terms of delivery and payment apply in all other respects.