

CALIPER-HERO: VCSEL SWEPT SOURCE LASER

ULTRAFAST 3D OCT IMAGING



- **Narrow linewidths at MHz scan rates**
- **Compact modular platform**
- **Single-mode optical spectrum**
- **Continuous wavelength tuning**
- **High throughput single channel acquisition**
- **Optical spectrum shaping**

THE FASTEST SCALABLE SOLUTION FOR 3D IMAGING

The CALIPER-HERO is a compact turn-key 1060nm laser module with fast MHz wavelength sweeping for ultrafast 3D OCT imaging applications. The long coherence length enables large imaging depth, and combined with stable continuous wavelength sweeping, the HERO is the ideal choice for 3D imaging application requiring high resolution and high frame rates. The HERO is equipped signal outputs for safety and synchronization.

The CALIPER-HERO VCSEL swept source laser is using a monolithic MEMS-VCSEL structure with reliable datacom VCSEL technology and a single material MEMS for increased reliability.

The patented Highly Efficient Resonant Oscillator (HERO™) technology achieves fast MHz scan rates by operating a MEMS mirror in vacuum. The long-term sweep stability enables efficient high-throughput data acquisition using a single-channel DAQ with pre-calibrated FFT linearization.

The compact CALIPER-HERO VCSEL swept source delivers OCT A-scan so fast that the image is not distorted by a blink of the eye.

We Build Bridges Between Our Cutting-Edge Technology and Your Product Innovations

OCTLIGHT is a world-leading company within VCSEL Swept Source laser technology. We focus exclusively on developing and producing VCSEL Swept Source laser modules, and on helping our customers integrate our VCSEL technology into their products. Read more on octlight.com and download our whitepapers about how to build an OCT A-scan system and our VCSEL technology.

TECHNICAL SPECIFICATIONS

Model	Standard	Superior
Center wavelength [nm]	1060 ± 20	1060 ± 10
Sweep range, 10 dB [nm]	>20	40-50
Optical power [mW]	>15	15-50
Sweep rate, bi-dir [kHz]	1700 ± 20%	1700 ± 5%
Coherence length [mm]	>100	>100
Spectrum ripple [dB]		< 0.1
Ortho-RIN [%]		< 2
Envelope shaping	Factory setting	User programmable

Interface and size	
Fiber output	FC/APC connector
Power supply	12V input or 100-230V 50-60 Hz power supply, max current 3A
A-scan trigger	TTL 1-1.4V min/max, 100 Ohm termination, SMA connector
Control	Serial/USB
Safety interlock	Safety interlock < 5 us delay, EN 60825-1
Dimensions	189x114x56.5 mm

APPLICATIONS

- Non-invasive medical imaging for wide-field Ophthalmic imaging
- Fast image acquisition for rapid pull-back in Cardiovascular imaging
- Ultra-fast depth monitoring for laser welding
- High resolution, fast frame rate for LiDAR

