



Description

The ss3388 SOLARITY alpha prototype is a highly reliable all-fiber, short cavity, high performance swept wavelength laser designed for Optical Coherence Tomography (OCT) applications.

The ss3388 offers the required combination of fast 200 kHz scan rates, high output power, and polarization stable, 150nm wavelength range lasing at 1310 nm. The ss3388 enables up to 10 mm of imaging depth in tissue, free from the types of sweep rate harmonic and spectral sideband distortions that are common among other high speed swept sources and known to adversely affect high quality OCT images.

The SOLARITY line of swept wavelength lasers outputs highly linear wavelength sweeps, as well as wavelength trigger and calibration pulse signals, that when combined with cost effective current generation digitizers enable high resolution imaging systems with only periodic need for sweep rate recalibration. The flexibility of the SOLARITY platform easily allows

for custom OEM applications in biomedical and industrial imaging, optical frequency domain ranging, high speed optical sensing, and spectroscopy.

SOLARITY lasers are built upon the core Micron Optics Fabry-Perot technology platform, using highly reliable piezoelectric actuators with MTBFs in excess of 3000 years over specified operating conditions. This proven laser platform, having demonstrated reliability with 1000s of units in the field representing > 100 million hours of field use, enables long-term, worry free operational life of the SS-OCT system.

Reliable fast scanning, long coherence lengths and wide sweep ranges allow for high quality, artifact-free OCT images.

Key Features

Fast scanning 100 - 200 kHz

Long coherence lengths up to 20 mm

Wide sweep ranges 150 nm

High quality, artifact free images no sweep harmonics or PSF sidebands

Multiple operating ranges 1060 and 1310, 1550 nm windows

Proven reliability and longevity with over 100 million hours logged since 2000



Key Applications

Optical Frequency Domain Imaging (OFDI)

High speed 1310 nm swept wavelength lasers enable OCT imaging systems of high acquisition rates, enhanced SNR with excellent imaging depth, alleviating the excessive fringe washout or sensitivity drop-off characteristic of 1310 nm spectral domain OCT systems.

Chromatic Confocal Microscopy (CCM)

The ss3388 swept wavelength output is imaged by a chromatically dispersive lens into a fast scanning axial spot illuminating into the sample. The reflected optical signal is focused back through the optical fiber and detected remotely to enable high-resolution, non-contact 3D surface metrology including roughness characterization and surface flaw detection.

Spectrally Encoded Confocal Microscopy (SECM)

High speed swept spectrum lasing enables confocal microscopy without need for a fast beam scanning mechanism at the probe tip, spatial information then being decoded by measuring the spectrum of reflected light.



Performance Properties

	ss3388-100-1310-20	ss3388-200-1310-04
Center wavelength	1310 nm	1310 nm
Wavelength sweep range ¹	> 150 nm	> 150nm
Coherence length	20 mm	4 mm
Sweep rate	100 kHz	200 kHz
Average optical power, DC	50 mW	70 mW
Sensitivity	104 dB	
Sweep linearity	< 5%	
Optical output isolation	30 dB	
Optical connectors	FC/APC, SC/APC, LC/APC, E2000	
Degree of polarization	> 300:1	

Physical Properties

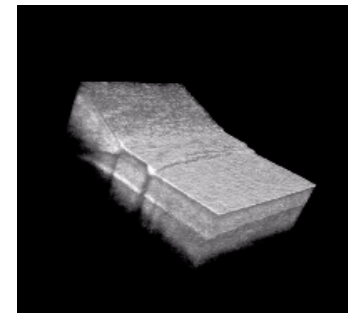
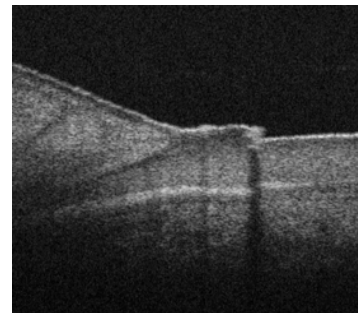
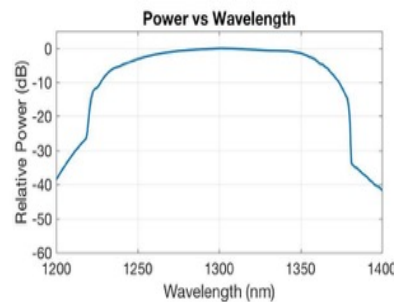
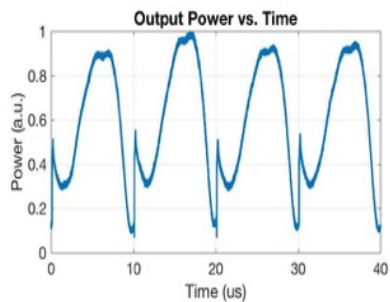
Dimensions / weight	182 mm x 137 mm x 53 mm / 2 kg	
Operating / storage conditions	0 to 50 C, < 80%RH non-condensing / -20 to 70 C, < 95%RH non-condensing	
Electrical connector	LVTTTL trigger signal for sweep and wvl markers, SMA connections	
Input voltage	9 - 36 VDC, AC/DC converter included (100~240 VAC, 47~63 Hz)	
Power consumption at 12 V	20 W typ, 30 max	

OEM Options

Contact Micron Optics for configuration details

Notes

- 1 Width at 10 dB drop of peak power, function of wavelength region
- 2 Will comply with the WEEE Directive 2012/19/EU for the following European countries: UK, IT, DE, FR, NL, BE, ES, CH.
- 3 Denotes Alpha prototype



Representative OCT images taken with ss3388 short cavity FP swept wavelength laser source.

Images taken in partnership with Wellman Center for Photomedicine, Massachusetts General Hospital and Harvard Medical School.

Representative time domain scan of bilateral 100 kHz laser scan (far left) and associated spectral domain trace (left center). Cuticle and nail bed (center right) and 3D reconstruction of cuticle scan (far right).