Optical Coherence Tomography Products

Wavelength-Swept Laser – λ-Sweep™

General Photonics' wavelength-swept laser is a high sweep rate OEM laser source for fiber sensor, OCT, and spectrum analysis development applications. The laser's wavelength can be swept at a rate of up to 16 kHz across a spectral range of up to 150 nm, with an output optical power of up to 20 mW. A power monitoring output is included to indicate the instantaneous laser output power at each wavelength. Other laser health parameters, such as laser average power, driving current, and chip temperature, are also provided via a digital interface. Finally, the laser incorporates automatic polarization optimization to guarantee long term stability. The WSL-001 is available with either a linearly polarized output (aligned to the slow axis of a PM fiber) or a depolarized output. It can also come equipped with a built-in variable optical attenuator (VOA) and a sweep monitor that provides two λ-trigger (TTL) signals to indicate the exact starting and ending wavelengths of each wavelength sweep. The λ-triggers can be used with a sweep profile lookup table to pinpoint the absolute frequency or wavelength of the laser at each instant during a wavelength sweep. This combination of features makes it easy to integrate the tunable laser into sensor interrogators, optical coherence tomography (OCT) equipment, spectrum analysis equipment, and general purpose test and measurement instruments.

Preliminary Specifications:

Center Wavelength Range	1060, 1310, 1550 nm ± 20 nm
Spectral Range @ -10dB Cutoff Point [1]	1310/1550 nm: 100 ~ 150 nm; 1060 nm: ~ 60 nm, (specify when ordering)
Repetition Rate	up to 16 kHz (specify when ordering)
Sweep Average Power [1]	> 10 mW
Static Peak Output Power [1]	> 20 mW
Coherence Length (3 dB)	> 6.5 mm
Signal-to-Spontaneous Emission Noise Ratio [2]	40 dB
Polarization Extinction Ratio (PM output option)	> 20 dB
Degree of Polarization (Depolarized output option)	< 5%
Optical Connector	FC/APC
Variable Optical Attenuation Range	20 dB
Reference Wavelength Triggers	TTL pulse at start (λ_{min}) and end (λ_{max}) of each sweep
Reference Wavelengths	λ_{min} and λ_{max}, user selectable
Sweep Sync Pulse	TTL, each sweep
Instantaneous Power Monitor	Analog, 0 - 5 volts
Communication Interface	RS-232
Operating Modes	Static wavelength output Swept wavelength output
Power Supply Voltages	+12 VDC (1A), -12 VDC (1A), +5 VDC (5A)
Power Consumption	10 W (typical)
Operating Temperature	0 to 50 °C
Storage Temperature	-20 to 70 °C
Dimensions	2" (H) × 6.4" (W) × 8" (L)
Weight	2.3 kg (5 lbs)

Notes:
1. Typical values for 1310nm 10 KHz module. Values may be different at other wavelengths or sweep rates.
2. Measured with static wavelength output.

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Features:

· Polarization stabilized output
· Fast sweep speed (up to 16 kHz)
· High output power (20 mW)
· Sweep start and end trigger (TTL)
· Reference wavelength triggers
· Built-in VOA
· Power monitoring function
· RS-232 interface

Applications:

· Fiber sensor interrogation
· Optical Coherence Tomography (OCT)
· Medical imaging
· Test & measurement
· Spectrum analysis
· R&D

Typical Performance Data:

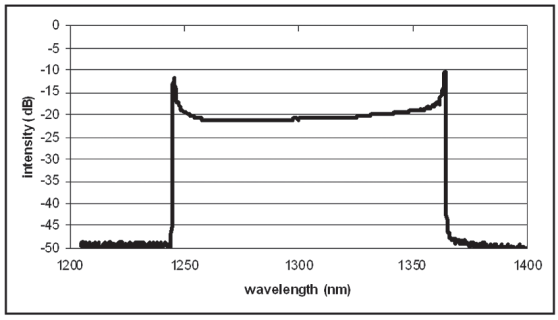

Figure 1. Typical WSL spectrum, measured with an optical spectrum analyzer in pulsed mode. The spectral resolution is 1 nm.

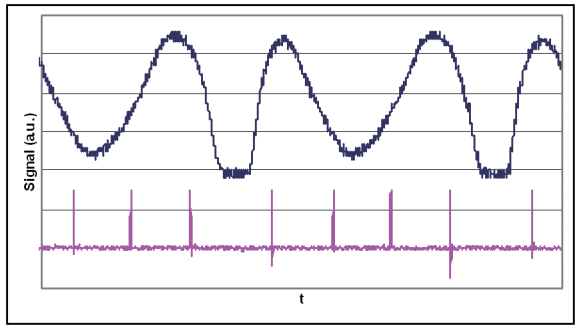

Figure 2. Instantaneous power (black) measured during swept operation, with starting/ending wavelength triggers (red).

Ordering Information:

WSL – 001 – □□ – □□ – □ – □

Wavelength:	Output Polarization:	VOA:	Reference Wavelength Triggers:
10 = 1060 nm	LS = linear	A = Without VOA	A = Without λ triggers
13 = 1310 nm	(slow axis)	B = With VOA	B = With λ triggers
15 = 1550 nm	DP = depolarized		