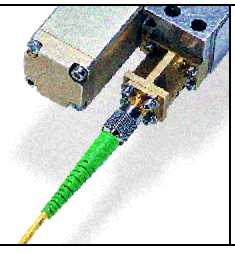
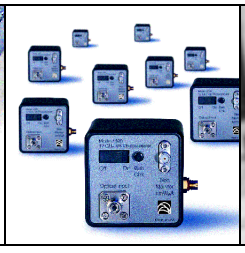
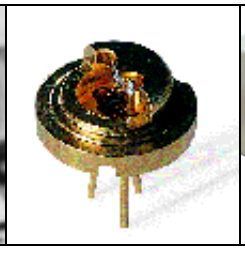
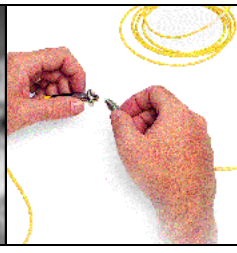
Empower your Manufacturing Line

Vidia™-Swept Tunable Laser Source

Enabling Global Communications by
Advancing the Future of Optical Networks



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A Whole New Way To Manufacture

Could you use more capacity? Is test the bottleneck in your process?

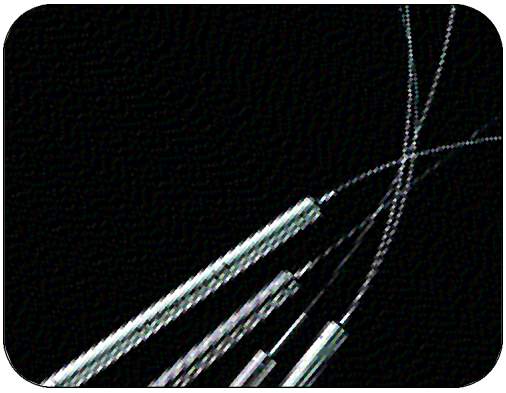
Do you want to increase your yield by performing wavelength characterizations ***during*** *crucial manufacturing processes rather than just at final test?*

Now you can test and qualify DWDM components in seconds rather than the minutes or even hours required by traditional methods. Designed specifically for DWDM-component testing applications which require the fastest and highest-resolution wavelength measurements, **the Vidia™-Swept tunable laser source lets you characterize components faster than an OSA with the resolution bandwidth of a narrow-linewidth laser.**

For the first time, you'll be able to monitor the spectral response of optical components with picometer resolution, in real time, during the manufacturing process itself. And, the Vidia-Swept is not just fast, it's also accurate. With guaranteed open-loop absolute wavelength accuracy (AWA) of ±30 pm throughout the entire scan—even at 100 nm/s—you will be able to observe spectral changes in real-time over wide wavelength ranges while you are making critical adjustments to components on the manufacturing floor. You can't buy another laser that guarantees this resolution at tuning speeds this high—this makes the Vidia-Swept the only tunable source that is suitable for real-time spectral observation.

The Vidia-Swept tunable laser source is the ideal tool for increasing measurement efficiency and maximizing throughput and yield.

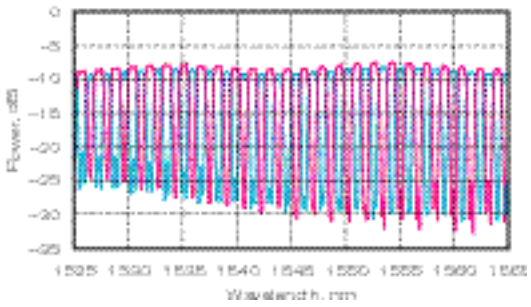
Real-Time Characterization



- *The fastest scan speed available (100 nm/s)*
- *Unparalleled scan-to-scan repeatability*
- *1-pm resolution for precise wavelength characterization*
- *Enough power to simultaneously measure 40 channels of a Mux/Demux: >4 dBm*
- *Increase manufacturing yield as well as throughput*
- *True 24/7 reliability*

The Ideal System For In-Process Test Alignment

Consider a typical measurement of a 100-GHz interleaver. A 4,000-point measurement would take over 2 hours with traditional step-and-measure lasers, but takes less than one second with the Vidia™-Swept. By incorporating this swept-wavelength laser into your in-process alignment station, you'll be able to make measurements of interleavers, Muxes, Demuxes, or other passive components in less than 1 second. Visual update rates of up to 2 Hz mean you can actually see changes in performance in real-time as you manufacture your components. The speed, resolution, and reliability of this system will allow you to dramatically increase the yield of your manufacturing line.



Data gathered using a swept-wavelength scan of a 100-GHz interleaver, showing both interleaver outputs. While a step-and-measure system would take two hours to make this 4000-point measurement, using the Vidia-Swept laser this data was taken in less than a second.

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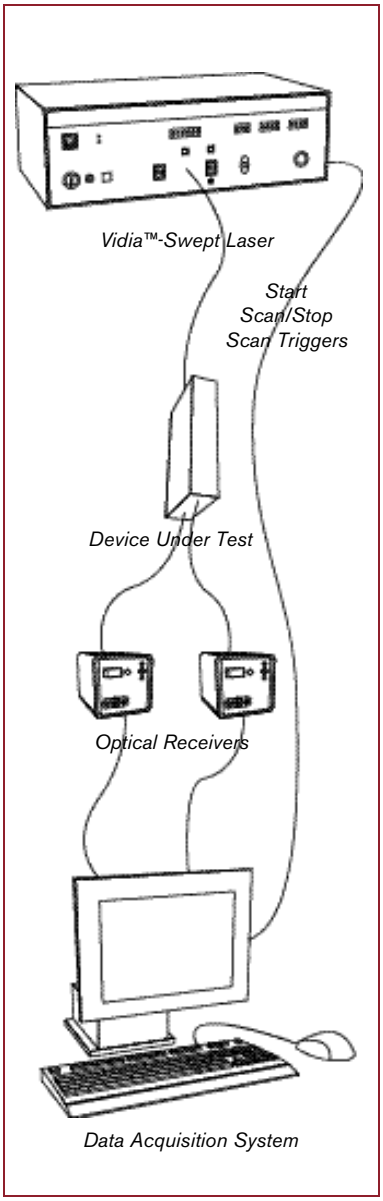
Building a Swept-Wavelength System

Schematic of a Swept-Wavelength System



Building a swept-wavelength system is simple. Like traditional step-and-measure systems, you'll need a tunable laser source, the device you need to test, some optical receivers (the number depends on the number of output ports in your device), and a data acquisition and display system. The swept-wavelength system differs from the step-and-measure systems only in the specific requirements of the source and receivers. In the step-and-measure system, the source is "stepped" through the wavelength range, dwelling for a period of time at a number of specified wavelengths while data is taken. In the swept-wavelength system, the source is swept through the wavelength range of interest at a constant speed. Data is acquired continuously throughout the sweep. The key components to a swept-wavelength system are described below:

Source: The most critical component in the system, the source must be able to scan linearly and mode-hop-free over the wavelength range. The accuracy of the measurement is directly coupled to the linearity of the laser sweep.

Detection: Power meters are too slow for this technique so photodetectors are the best choice. Be sure you choose one (like the New Focus Model 2011) with the bandwidth to handle the fast sweep of the Vidia-Swept.

Data Acquisition/Display: Data from the photodetectors is sent into a DAQ card and displayed on your computer. Alternatively, the photodiode output can be displayed directly on a multichannel oscilloscope.

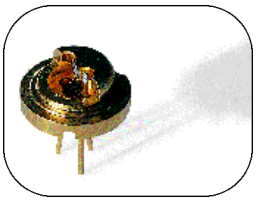
Contact us for free copies of our application notes describing the swept-wavelength method in more detail:

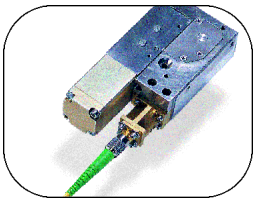
- *Application Note 9: Swept Wavelength Testing: Measuring Fiber-Bragg-Grating Temperature Drift*
- *Application Note 10: Swept-Wavelength Testing: Saving Time and Bringing Real-time Process Control to the Manufacturing Environment*
- *Application Note 11: Insights into Making Swept-Wavelength Measurements for the Characterization of Passive Fiber-Optic Components*

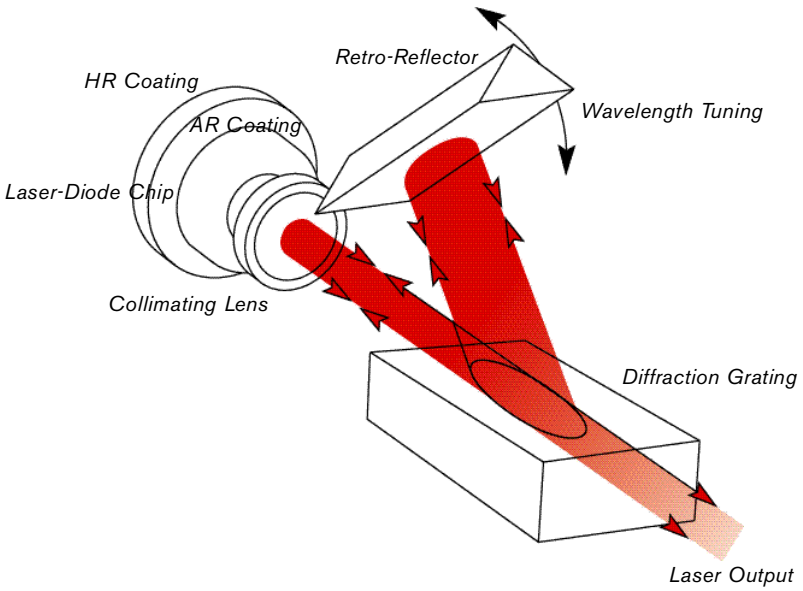
Truly Continuous Mode-Hop-Free Tuning

It's What's Inside That Counts

The StableWave™ cavity configuration in our tunable lasers is the culmination of over eight years of experience in the tunable diode laser business. This cavity is based on a modified Littman-Metcalf design providing true single-mode operation and achieving mode-hop-free tuning over wide wavelength ranges. By using an anti-reflection-coated Fabry-Perot laser diode and our patented pivot-point design, the StableWave cavity ensures high output powers and truly continuous, mode-hop-free tuning. To guarantee the quality of the laser diode coatings, we employ a proprietary anti-reflection coating process at our in-house coating facility. This process coupled with the patented design ensures stable, robust single-mode operation—the amplitudes of non-lasing modes are suppressed to 40 dB below the lasing mode. In addition, our experience in precision opto-mechanics provides the StableWave cavity with true 24/7 reliability for consistent performance.







Modified Littman-Metcalf Laser Cavity

By using a patented pivot-point location for the retro-reflector, we achieve mode-hop-free tuning over a wide tuning range. The pivot point is positioned with submicron accuracy to maintain the same cavity axial mode as the laser wavelength changes. The diffraction grating acts as the frequency-selective output coupler.

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MODEL	6428
Applications	Swept-Wavelength Characterization; Real-Time Wavelength Monitoring High-Resolution Step and Measure
Wavelength Range	C-band (1500–1575 nm) (1)
Output Power	>+6 dBm (1520–1570 nm), >0 dBm (1500–1575 nm)
Absolute Wavelength Accuracy	30 pm (2)
Side-Mode Suppression Ratio (at 6 dBm)	>45 dBc >50 dBc (typical)
Signal-to-Peak-Noise Ratio (ASE, SSE)	>50 dB (3)
Fiber Type	PM (Polarization Maintaining)
Polarization Extinction Ratio	15 dB (typical)
Computer Interface	GPIB and RS232
Palmtop Interface with Software	Optional
Operating Temperature	15–35 °C
Storage Temperature	–20 °C to +70 °C
Swept-Mode Specifications	
Scan Speed	1–100 nm/s
Power Flatness While Scanning	±0.25 dB (typical)
Wavelength Resolution (Swept Mode)	0.1 pm (typical)
Settable Triggers	2
Step-Mode Specifications	
Tuning Speed	100 nm/s
Power Repeatability	0.06 dB (typical)
Wavelength Resolution (Step Mode)	1 pm
Wavelength Repeatability (Step Mode)	±3 pm (typical)
Wavelength Settling Time (Step Mode)	<100 msec (typical)
Wavelength Stability	<5 pm over 1 hr

(1) *Mode-hop-free range is 1520–1570 nm.*

(2) *With single point recalibration, 1520–1570 nm.*

(3) *Measured with 0.1-nm resolution bandwidth.*

ALL DATA SUBJECT TO CHANGE

If you are interested in step-and-measure, discrete-wavelength testing, contact us about the Vidia™-Discrete tunable laser source.

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