

Brochure

VIAVI

OSA-500RS Testing Solution

xWDM Spectral Testing Just Got Easier,
Faster, and More Reliable

Operators globally are under increasing pressure to add more and more bandwidth with continuously shrinking budgets, while providing the best customer experience.

The VIAVI OSA-500RS accurately validates optical performance under extreme conditions as networks are continually pushed to higher levels and ROADMs are added for uninterrupted service.

The OSA-500RS delivers highly valuable benefits to operators and NEMs who commission, install, upgrade, or troubleshoot anywhere within the fiber network ecosystem.

T-BERD/MTS-8000 Scalable Multitest Platform

VIAVI offers a wide range of OSA modules for its T-BERD®/MTS family of multi-application platforms. The T-BERD/MTS-8000 is the world's most scalable test platform for next-generation high-speed network deployment (40 G and 100 G) and offers physical, optical, and transport/Ethernet testing capabilities.



Key Benefits

- Improve field operations by getting true in-band OSNR results 40% quicker
- Ensure results reliability with:
 - the industry's most accurate measurements for any xWDM or ROADM network
 - guaranteed wavelength calibration for life that cuts maintenance costs in half
- Transform any technician immediately into an OSA expert with automated tests and pass/fail analysis at the push of a button.
- Use one flexible, universal tool to test any type of xWDM/ROADM network.

Applications

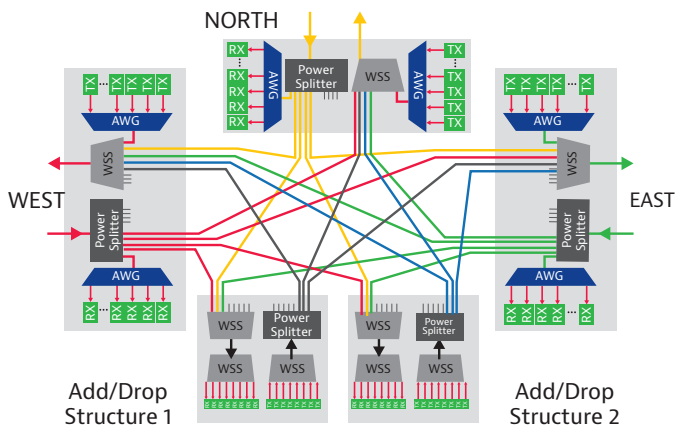
- Deploy and maintain DWDM Metro and Core networks
- Provision and troubleshoot ROADM networks
- Install and maintain CWDM systems in CATV, Access, and Mobile Backhaul
- Test 40 G and 100 G interfaces and networks
- Perform spectral tests on optical components

The Universal OSA-500RS Can Do It All

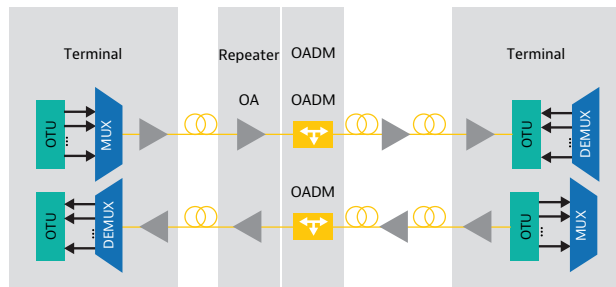
Buy Fewer Test Tools and Lower your CapEx

For technical crews who use these applications:

Provisioning and Troubleshooting ROADMs Networks



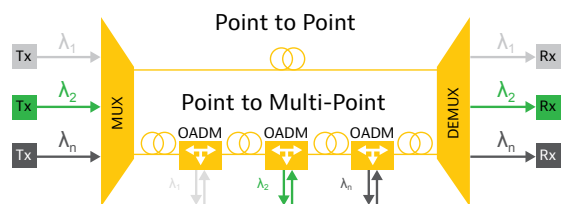
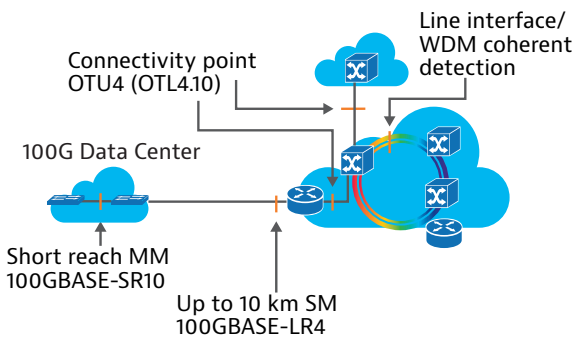
Deploying and Maintaining DWDM Metro and Core Networks Repeater



Testing 40 G and 100 G Interfaces and Networks

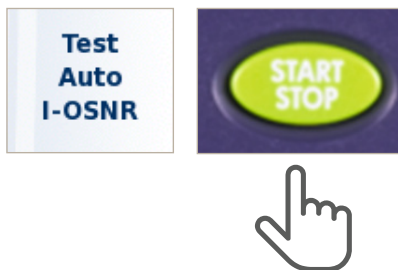
Spectral Testing of Optical Components

Monitoring CATV, Access, and Mobile Backhaul CWDM Systems

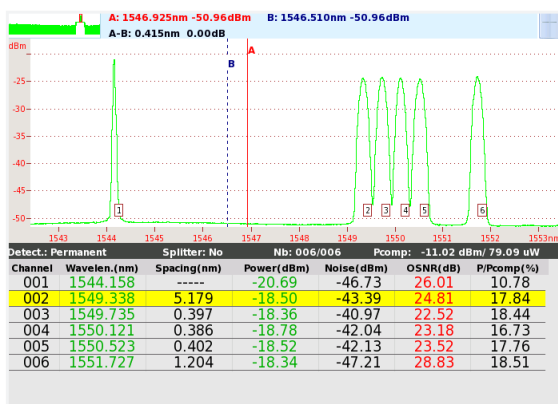


Transform your Technicians Into Instant OSA Experts

This easy-to-use OSA is key to successful WDM system deployment and maintenance. Spectral analysis can be challenging for technicians because of its complex instrument setup. Therefore, providers need a solution now more than ever that minimizes the need for training yet drives field efficiency and increases productivity.



Step 1: Press Start



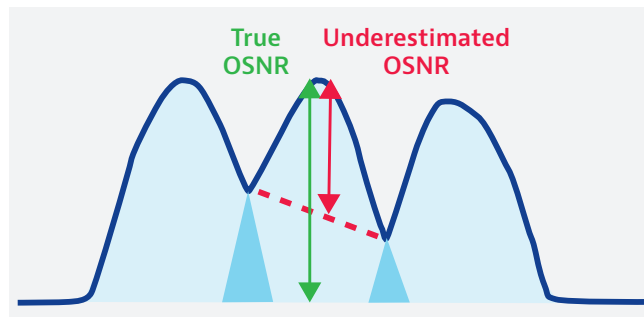
Step 2: Get Complete Test Result

Increase Field Efficiency with True OSNR Results in Any High-Speed or ROADM Network

OSAs are often used to measure OSNR for optical-layer service-performance analysis. Inaccurate OSNR measurements can lead to poorly estimated service performance.

As the graph shows, modern networks transporting densely spaced, high-data-rate signals can create overlapping spectral edges, which make it impossible to measure the noise floor between the signals and leads to underestimated OSNR.

Underestimated OSNR can indicate network problems in a perfectly fine network.

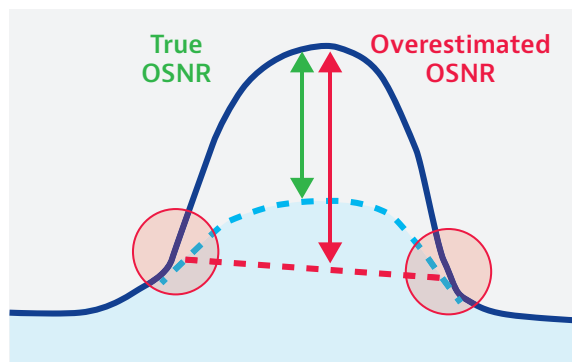


OSNR with Overlapping Spectra at 40G

Introducing ROADMs further complicates measuring OSNR with the conventional methods described in IEC 61280-2-9 and instead requires using new methods to measure in-band OSNR.

Instruments that only measure in-band noise at the spectral edges can significantly overestimate OSNR, as the graph shows.

Overestimating OSNR impedes the identification of network problems that degrade performance, increasing troubleshooting time and expense.

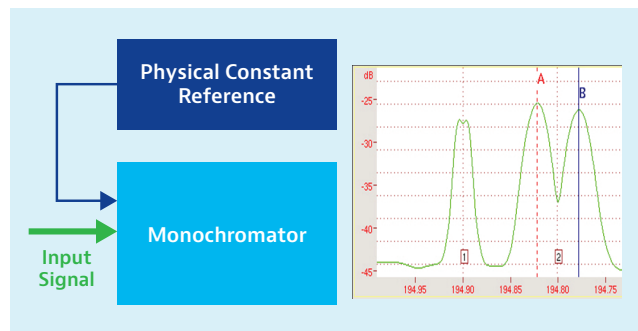


Noise shaping with ROADMs

Therefore, VIAVI developed a proprietary method for measuring OSNR within the signal bandwidth that shows the true in-band OSNR. Unlike other solutions, the VIAVI instrument measures and displays the noise distribution for the entire width of each DWDM channel to measure the signal's true OSNR.

Measure Confidently with a Self-Calibrating VIAVI OSA

The differences between a calibrated and an uncalibrated OSA are significant.



Excessive channel wavelength drift in DWDM systems can degrade performance and increase bit error rates because of high power attenuation in network elements such as multiplexers, demultiplexers, and ROADMs. Although it requires high wavelength accuracy, an OSA can detect this problem.

Even though many OSAs have an internal wavelength reference for calibration, they cannot guarantee the highest wavelength accuracy. The internal wavelength reference must be highly accurate regardless of changing environmental conditions or aging and, therefore, must be regularly recalibrated.

Only a physically constant reference can maintain internal wavelength accuracy without recalibration.

Guidelines:

- Instrument measurement accuracy should be better than 10 times the measurement limit.
- Absolute wavelength accuracy for a DWDM system with 50 GHz channel spacing should be ± 5 GHz = ± 40 pm.
- Absolute wavelength accuracy for a UDWDM system with 25 GHz channel spacing should be ± 2.5 GHz = ± 20 pm.

Inaccurate wavelength measurements can indicate that a channel is stable when in fact it is off frequency. Likewise, an unstable reference may indicate channel drift when in fact it is stable.

Uncalibrated OSA instruments can cause users to mistrust the system or the OSA.

Users can always trust the VIAVI OSA-500RS because of its internal physical constant wavelength calibrator.

You can now guarantee ± 10 pm optimal wavelength accuracy for a lifetime and cut calibration costs in half by eliminating recalibration.

Ordering Information

Description	Part Number
Standard OSA-500M	
OSA-500M, PC-version	2281/91.20
OSA-500M, APC-version	2281/91.30
Standard OSA-501M with 12.5 G Channel Drop	
OSA-501M, PC-version	2281/91.23
High Dynamic Range OSA-500	
OSA-500, PC-version	2281/91.51
ROADM, In-Band OSNR OSA-500R	
OSA-500R, PC-version	2281/91.55
OSA-500R, APC-version	2281/91.65
ROADM, High-Speed In-Band OSNR OSA-500RS	
OSA-500RS, PC-version	2281/91.57
OSA-500RS, APC-version	2281/91.67
Application Software for Report Generation	
Optical fiber trace software	EOFS100
Optical fiber cable software	EOFS200

VIAVI

High-Performance Full-Band OSAs

OSA-500/500M/501M/500R/500RS

Test xDWM networks and optical components with fullband, high-performance optical spectrum analyzers.

Targeted for advanced test solutions, OSA-500x modules represent high-performance VIAVI Solutions™ solutions use for full-band spectral testing. Their industry-leading 0.038 nm optical resolution bandwidth makes these optical spectrum analyzers ideal for unmatched performance testing in ultradense wavelength-division multiplexing (DWDM) networks with channel spacing down to 25 GHz

All instruments include an internal wavelength calibrator that guarantees 0.010 nm unsurpassed wavelength accuracy without external recalibration. Here is the list of VIAVI OSA modules and their core capabilities:

- OSA-500M — General-purpose high-performance OSA for use in installing and maintaining DWDM networks.
- OSA-501M — Provides a unique channel-drop function to isolate single DWDM channels from the spectrum during maintenance and troubleshooting.
- OSA-500 — Improves the optical-filter dynamic range for testing the highest DWDM system OSNR values.
- OSA-500R and OSA-500RS — Include a new technique to measure true in-band OSNR in ROADM-based and in 40 G systems with overlapping spectra.
 - The OSA-500R — The standard instrument for measuring in-band OSNR.
 - The OSA-500RS — The high-speed version that can complete measurements in less than 30 seconds.

Combining very high optical resolution using innovative free-space optics with full-band measurement capability make VIAVI OSAs ideal portable solutions for testing wavelength division multiplexing (xWDM) systems during provisioning, maintenance, and upgrades.



Key Benefits

- Simple automated testing with pass/fail analysis at the push of a button
- Get true OSNR results in seconds with the fastest in-band OSA (by 40%)
- Optimize service quality with accurate, reliable OSNR measurements
- Eliminate wavelength calibration with a self-calibrating OSA that cuts maintenance costs in half

Key Features

- Portable lab technology for field use
- Full-band 1250–1650 nm for CWDM and DWDM networks
- Ultra-high 0.038 nm optical resolution bandwidth
- Industry-leading 0.01 nm wavelength accuracy
- Future-proof signal analysis for 40/100 G data rates, and 100G polarization multiplexing channels OSNR on line measurement (without channel overlap).
- Channel drop function for single-channel isolation and tunable filter applications
- In-band option to measure true OSNR in ROADM and 40 G networks

Applications

- Provisioning and troubleshooting ROADM networks
- Deploying and maintaining DWDM Metro and Core networks
- Testing 40 G and 100 G interfaces and networks
- Installing and maintaining CWDM systems in CATV, Access, and Mobile Backhaul

Specifications

Spectral Measurement	
Wavelength range	1250 to 1650 nm
Resolution bandwidth(FWHM) ²	0.038 nm
Abs. wavelength accuracy ²	± 0.01 nm
Wavelength reference	internal, physical constant
Wavelength recalibration period	internal recalibration (no factory recalibration required)
Readout resolution	0.001 nm
Measurement samples	120,000
Power Measurement	
Dynamic range ³	-70 to +23 dBm
Absolute accuracy ^{2,4}	±0.5 dB
Total safe power ⁵	+23 dBm
Readout resolution	0.01 dB
Linearity ⁶	±0.1 dB
Flatness ²	±0.25 dB
WDM Measurement	
Optical rejection ratio2 (OSA-500 only)	
At ±0.2 nm (for 50 GHz ch-spacing)	45 dBc
At ±0.4 nm (for 100 GHz ch-spacing)	50 dBc
Optical rejection ratio2 (OSA-500M/501M/500R/500RS only)	
At ±0.2 nm (for 50 GHz ch-spacing)	40 dBc
At ±0.4 nm (for 100 GHz ch-spacing)	47 dBc
Channel spacing	25 to >200 GHz, CWDM
Number of optical channels	256
Data signals	up to 1 TBps
Modulation formats (Such as NRZ/RZOOK, DB, PSBT, CSRZ, DPSK, BPSK, QPSK, and PM QPSK)	All formats supported
Scanning time (including WDM analysis)	
Full band	<5 s
C-band	1 s
Measurement Modes	
Analysis	WDM, Drift, DFB, LED, FPL, EDFA in-band OSNR, ST, ch-drop (OSA-501M only)
Display	Graph, WDM table, graph and table
Channel Drop Option (OSA-501M only)	
Wavelength range	1300 to 1650 nm
Data rates	up to 12.5 Gbps
Spectral filter bandwidth	>20 GHz
Insertion loss ⁷	<12 dB
Tracking mode	auto wavelength control
In-band OSNR (OSA-500R, OSA-500RS only)	
I-OSNR dynamic range	up to >30 dB
PMD tolerance ⁸	up to 25 ps
Measurement accuracy ⁹	±0.5 dB
Data signals ¹⁰	up to 100 Gbps
Measurement time ¹¹	< 30 s

Optical Interfaces	
Optical port	universal SM-PC, universal SM-APC
Connectors	FC, SC, ST, LC, DIN
ORL ¹²	>35 dB
Dimensions	
Weight (module)	2.2 kg (4.6 lb)
Size (module)	50 x 250 x 305 mm (20 x 98 x 120 in)
Temperature	
Operating	+0 to +45°C (32 to 113°F)
Storage	-20 to +60°C (-4 to 140°F)
Relative humidity	0 to 95% noncondensing

Notes:

- Unless otherwise specified, all specifications are based on a temperature of 23°C ±2°C with an FC/PC connector after warm-up
- Typical for 1520 to 1565 nm at 18 to 28°C
- Max. power per channel +15 dBm
- At -10 dBm, including PDL
- +20 dBm for OSA-500R
- Signal power from -40 dBm to +10 dBm
- Typical for 1520 to 1620 nm at 23°C
- For data rates up to 10 Gbps
- Typ ±0.5 dB for OSNR <25 dB, signal power >-25 dBm, PMD <25 ps
Typ. ±1 dB for data rates ≥40 Gbps with ch-spacing ≥100 GHz
- Except for dual pol-mux and fast polarization scrambled signals
- For OSA-500RS 20 nm scan and 40 channels
- At 1550 nm

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OSA-500RS, PC-version	2281/91.57
OSA-500RS, APC-version	2281/91.67
Application Software for Report Generation	
Optical fiber trace software	EOFS100
Optical fiber cable software	EOFS200