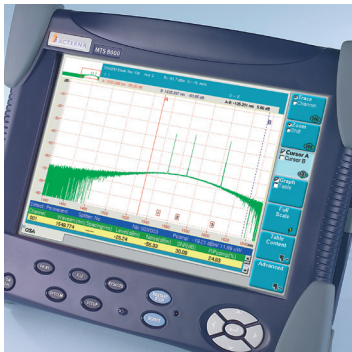


MTS/T-BERD 8000 Platform

Optical Spectrum Analyzer Module



MTS/T-BERD 8000 platform

Key Features

- New in-band OSA version for measuring the true OSNR in ROADMs networks and in the AON
- Full-band optical spectrum analyzers
Cover wavelengths of 1250 to 1650 nm for DWDM and CWDM (metro) testing
- High-resolution monochromator design with lab optical performance makes JDSU's OSAs ready for the next generation of ultra dense WDM systems
- Best-in-class wavelength accuracy of 10 pm with a lifetime guarantee based on an internal reference (requires no external calibration)
- Channel drop function for single channel isolation and tunable filter applications.
- Built-in test applications for optical component testing of DFBs and optical amplifiers
- Easy-to-use expert analysis offering one-button operation for optimized instrument settings and auto pass/fail analysis
- Future-proof signal analysis to handle ultra high data rates of 40G, 100G and next-generation modulation formats
- Increased durability due to a maintenance-free and shock-proof mechanical design
- Patented dual-port capability for measurement of two fibers simultaneously

Full-band, high-performance, and new in-band Optical Spectrum Analyzers for testing optical systems and components

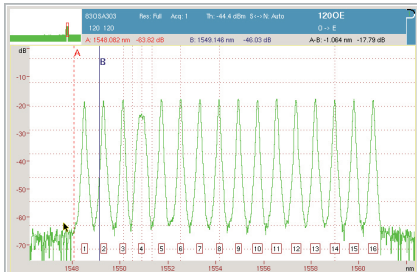
Targeted at providing advanced test solutions, the OSA-160, OSA-161, and OSA-201, JDSU's field-ready full-band DWDM analyzer modules, use a new grating-based monochromator design (JDSU patents). These analyzers offer high optical selectivity and high measurement speed for accurate measurement of wavelength, power, and optical signal-to-noise ratio (OSNR) in the presence of multiple channels.

JDSU's OSA-300, OSA-301, and OSA-303 are high-performance DWDM analyzer modules in the family of grating-based spectrum analyzers that are designed for ultra dense WDM applications (UDWDM) with high channel counts and tight channel spacing.

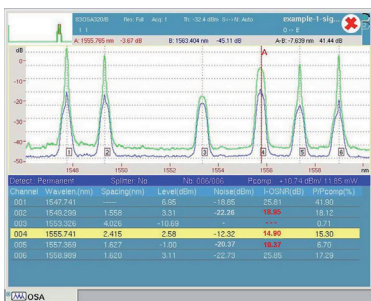
The OSA-320 is an in-band DWDM analyzer with a new technique to measure the true OSNR inside the optical channel of an Agile Optical Network (AON) with optical add-drop filters or ROADMs.



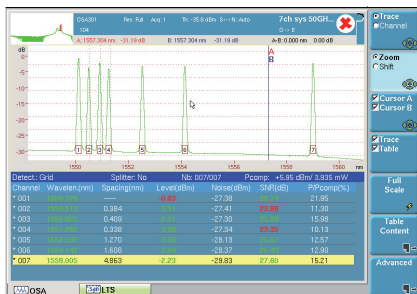
2



16 channel DWDM spectrum



Test result of a ROADM system showing signal trace and true in-band noise trace



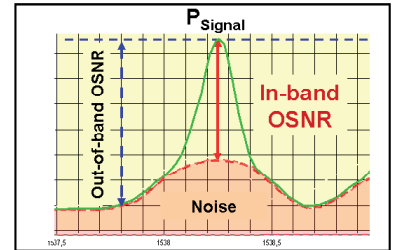
Graphical and tabular display showing pass/fail indicators and out-of-range values

Advanced optical performance

JDSU's OSA modules offer the full wavelength range of 1250 nm to 1650 nm for DWDM and CWDM (metro) applications, combining outstanding wavelength accuracy and high dynamic range. All instruments are equipped with an internal wavelength reference for on-line calibration without requiring disruption of in-progress measurements. The internal wavelength calibrator is based on a physical constant reference that guarantees unsurpassed wavelength accuracy over the instrument's lifetime without the need of external recalibration (JDSU patents).

New in-band OSNR measurement technique

In ROADM networks each optical channel may traverse different routes, optical amplifiers, and add-drop filters resulting in different OSNR for each channel. Due to optical filtering the noise floor in between optical channels is suppressed, therefore conventional OSA measurements based on the interpolation OSNR method are unreliable, as they will indicate out-of-band OSNR values that are too high – up to 10 dB above the true OSNR.



JDSU's OSA-320 follows a new optical polarization splitting (OPS) method (patent pending) which enables to suppress the transmission signal and to get access to the noise value inside the optical channel for measuring the true in-band OSNR.

Rugged and fast mechanical design

JDSU's OSA modules have a new opto-mechanical design based on a maintenance-free, fast galvanometer drive, providing the highest measurement speed and unsurpassed ruggedness for field and lab applications and for continuous operation and monitoring (JDSU patents).

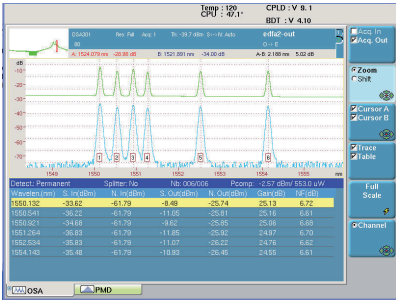
Easy to use

One-button auto-testing guarantees that technicians need no special training to carry out a DWDM test, making JDSU's instruments suitable for both novice and expert technicians. An Auto-Test mode automatically identifies WDM channels, selects the appropriate wavelength range, and provides auto scaling and system qualification according to pre-defined parameters.

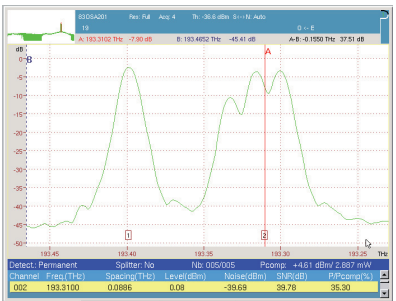
Powerful pass/fail link manager

Graphical and tabular display formats can be selected to assist in the installation, verification, and troubleshooting of multi-channel DWDM systems. Built-in test functions deliver automatic pass/fail evaluations based on pre-defined alarms, saving time and providing technicians with a quick and intuitive overview of the complete set of results.

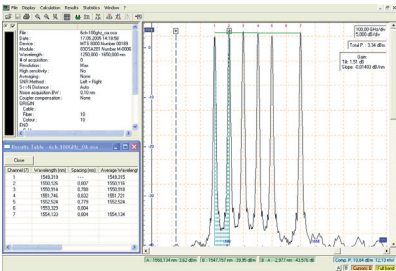
3



EDFA test application



40 Gb/s modulation with CS-RZ, PSBT-NRZ, and DPSK-RZ modulation schemes



Channel drop/isolation function

Flexible measurement capability

In-depth analysis, featuring statistical evaluation, long-term monitoring, and automatic storage capabilities, is provided. This allows for DWDM system performance verification, including the variation of optical system parameters (wavelength, power, and OSNR) as well as a series of measurements over a defined period of time. Resulting reports are provided with average, minimum, maximum, and standard deviation values of the measured parameters over time.

Built-in test applications

Test applications for optical amplifiers (EDFA) and laser sources (DFB) facilitate network component verification.

Ready for next-generation networks

With new signal analysis capabilities, all of JDSU’s OSAs are designed for high-precision measurements of power, wavelength, and OSNR in ultra high-speed networks with data rates of 40G, 100G and new modulation formats, such as RZ, CS-RZ, DPSK, and QPSK.

Channel isolation (drop) and dual-port options

A unique channel isolation option is provided to extract a single DWDM channel from the entire spectrum for further analysis with a SONET/SDH or Ethernet analyzer at data rates up to 12.5 Gbps. The built-in tracking function provides wavelength locking to the peak of the selected channel in order to avoid channel frequency drift problems during long-term measurements. The dual-port option (JDSU patents) provides simultaneous measurement of two optical signals, measuring the input and output of an optical amplifier at the same time, for example.

PMD test options

With the PMD option, the OSA can measure the differential group delay (DGD) for PMD characterization of optical fibers and systems. The measurement is based on the fixed analyzer method (TIA/EIA FOTP-113) together with a broadband source and a variable polarizer.

Advanced analysis solution

JDSU’s OFS-100 Optical FiberTrace Software is a PC-based software application within a true Microsoft Windows environment, offering post-analysis capabilities and the generation of detailed, professional OSA reports.

Specifications

Full-band DWDM analyzers

technical specifications (typical at 25 °C)

Modes

Operating modes WDM, DFB, EDFA testing
 Display modes Graph (trace + overview);
 WDM table and graph + table

Spectral measurement ranges

Wavelength range 1250 to 1650 nm
 Measurement samples 40,000
 No. of optical channels 512
 Wavelength calibration ⁽¹⁾ internal, on-line
 Wavelength accuracy ⁽²⁾ ± 20 pm
 Readout resolution 1 pm
 Resolution bandwidth (FWHM) ⁽³⁾ typ. 75 pm
 Wavelength linearity (over 10 nm) ± 10 pm

Power measurement ranges

Dynamic range ⁽⁴⁾ -75 to +23 dBm
 Noise floor RMS (with averaging) ⁽³⁾ -75 dBm
 Absolute accuracy^(3,5) ± 0.4 dB
 Linearity ⁽⁶⁾ ± 0.05 dB
 Readout resolution 0.01 dB
 Scanning time
 (1250 to 1650 nm) ⁽⁷⁾ <1.5 s
 Optical rejection ratio (ORR) ⁽³⁾
 at ±25 GHz (±0.2 nm) typ 35 dBc
 at ±50 GHz (±0.4 nm) typ 45 dBc
 PDL ⁽³⁾ ± 0.1 dB
 Flatness ⁽³⁾ ± 0.2 dB
 Level reproducibility ⁽⁸⁾ ± 0.05 dB

Channel isolation option (OSA-161/201)

Wavelength range 1250 to 1650 nm
 Data rates up to 10.7 Gb/s
 Spectral filter bandwidth typ. 220 pm
 Insertion loss typ. <10 dB
 Tracking mode auto wavelength control

Optical ports (physical contact interfaces)

Input ports

OSA-160/161 1 × SM
 OSA-201 (Dual-port) 2 × SM
 Output port (drop port)
 (OSA-161/201) 1 × SM
 Interface Universal connectors
 Optical return loss >35 dB
 Total safe power +23 dBm

(1) Built-in, physical constant wavelength calibrator, needs no re-calibration
 (2) At 1520 to 1565 nm at 23 °C
 (3) 1520 to 1565 nm at 18 to 28 °C
 (4) Max. power per channel +15 dBm, total power +23 dBm

High-performance DWDM analyzers

technical specifications (typical at 25 °C)

Modes

Operating modes WDM, DFB, EDFA testing
 Display modes Graph (trace + overview);
 WDM table and graph + table

Spectral measurement ranges

Wavelength range 1250 to 1650 nm
 Measurement samples 40,000
 No. of optical channels 512
 Wavelength calibration ⁽¹⁾ internal, online.
 Wavelength accuracy ⁽²⁾ typ. ± 10 pm
 Readout resolution 1 pm
 Resolution bandwidth (FWHM) ⁽³⁾ typ. 60 pm
 Wavelength linearity (over 10 nm) ± 10 pm

Power measurement ranges

Dynamic range ⁽⁴⁾ -75 to +23 dBm
 Noise floor RMS (with averaging) ⁽³⁾ -75 dBm
 Absolute accuracy^(3,5) ± 0.4 dB
 Linearity ⁽⁶⁾ ± 0.05 dB
 Readout resolution 0.01 dB
 Scanning time (1250 to 1650 nm) ⁽⁷⁾ <1.5 s
 Optical rejection ratio (ORR) ⁽³⁾
 at ±25 GHz (±0.2 nm) typ. 45 dBc
 at ±50 GHz (±0.4 nm) typ. 48 dBc
 PDL ⁽³⁾ ± 0.1 dB
 Flatness ⁽³⁾ ± 0.2 dB
 Level reproducibility ⁽⁸⁾ ± 0.05 dB

Channel drop option (OSA-301/303)

Wavelength range 1250 to 1650 nm
 Data rates up to 10.7 Gb/s
 Spectral filter bandwidth typ. 175 pm
 Insertion loss typ. <10 dB
 Tracking mode auto wavelength control

Optical ports (physical contact interfaces)

Input ports

OSA-300/301 1 × SM
 OSA-303 (Dual-port) 2 × SM
 Output port (drop port)
 (OSA-301/303) 1 × SM
 Interface universal
 Optical return loss >35 dB
 Total safe power +23 dBm

(5) At -10 dBm
 (6) -45 dBm to +10 dBm, at 23 °C
 (7) WDM mode full span 400 nm, 40,000 measurement samples, incl. WDM table analysis
 (8) 1 min, stable signal, const. temperature

In-band DWDM analyzer OSA-320

technical specifications (typical at 25 °C)

Modes

Operating modes In-band OSNR, WDM,
 DFB, EDFA testing
 Display modes Graph (trace + overview);
 WDM table and graph + table

Spectral measurement ranges

Wavelength range 1250 to 1650 nm
 Measurement samples 40,000
 No. of optical channels 512
 Wavelength calibration⁽¹⁾ internal, online.
 Wavelength accuracy ⁽²⁾ typ. ± 10 pm
 Readout resolution 1 pm
 Resolution bandwidth (FWHM) ⁽³⁾ typ. 60 pm
 Wavelength linearity (over 10 nm) ± 10 pm

Power measurement ranges

Dynamic range ⁽⁴⁾ -70 to +20 dBm
 Noise floor RMS (with averaging) ⁽³⁾ -70 dBm
 Absolute accuracy^(3,5) ± 0.6 dB
 Linearity ⁽⁶⁾ ± 0.05 dB
 Readout resolution 0.01 dB
 Scanning time (1250 to 1650 nm) ⁽⁷⁾ 1.5 s
 Optical rejection ratio (ORR) ⁽³⁾
 at ± 25 GHz (± 0.2 nm) typ. 45 dBc
 at ± 50 GHz (± 0.4 nm) typ. 48 dBc
 PDL ⁽³⁾ ± 0.2 dB
 Level reproducibility ⁽⁸⁾ ± 0.05 dB

In-band OSNR measurement mode

OSNR dynamic range up to >30 dB
 PMD tolerance ⁽⁹⁾ up to 50 ps
 Measurement accuracy⁽¹⁰⁾ typ ± 0.5 dB
 Data signals up to 100 Gbps
 Measurement time⁽¹¹⁾ <2 min

Optical ports

Input 1 × SM
 Interface universal
 Optical return loss >35 dB
 Total safe power +20 dBm

(9) For data rates up to 10 Gbps
 (10) For data rates ≥ 40 Gbps, typically ± 1 dB
 (11) Fast mode, independent of no. of channels

5

Ordering information

General specifications

Temperature

Operating +5 to +50 °C/41 to 122 °F

Storage -20 to +60 °C/-4 to 140 °F

Weight (module only) 2.5 kg/5.6 lbs

OSA Selection Guide

A comprehensive portfolio to better match your application requirements.

Product	Applications
OSA-320	<ul style="list-style-type: none"> AON system turn-up, verification and maintenance Measurement of true in-band OSNR in DWDM networks with optical filters and ROADMs
OSA-30x	<ul style="list-style-type: none"> DWDM system turn-up, verification, and maintenance (including channel isolation for BER testing) Component qualification (DFB, FP, LED, or EDFA) Very high ORR values
OSA-16x OSA-201	<ul style="list-style-type: none"> DWDM/CWDM system turn-up, verification, and maintenance (including channel isolation for BER testing) Network element verification (EDFA) High ORR values

Ordering information

OSA modules

Full-band DWDM analyzers

2281/91.01	OSA-160 Single port
2281/91.12	OSA-161 Single port with drop 10.7G
2281/91.14	OSA-201 Dual port with drop 10.7G

High-performance DWDM analyzers

2281/91.31	OSA-300 Single port
2281/91.32	OSA-301 Single port with drop 10.7G
2281/91.34	OSA-303 Dual port with drop 10.7G

In-band DWDM analyzer

2281/91.35	OSA-320 Single port
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PMD test option

2281/91.11	PMD test kit includes PMD evaluation software plus:
2279/31	OBS-55 Optical Broadband Source plus
2271/01	OVP-15 Optical Variable Polarizer

Application software

EOFS100	Optical fiber trace software for post-analysis
EOFS200	Optical fiber trace software for cable acceptance report generation

Optical connectors

Standard single mode
FC/PC, SC, ST, DIN, LC

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Test & Measurement Regional Sales

NORTH AMERICA TEL: 1 866 228 3762 FAX: +1 301 353 9216	LATIN AMERICA TEL:+55 11 5503 3800 FAX:+55 11 5505 1598	ASIA PACIFIC TEL:+852 2892 0990 FAX:+852 2892 0770	EMEA TEL:+49 7121 86 2222 FAX:+49 7121 86 1222	WEBSITE: www.jdsu.com
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