OPTICAL SPECTRUM ANALYZERS





Highly accurate OSAs for current and next-generation networks

- Best-in-class resolution bandwidth
- Truly portable spectral characterization for DWDM network commissioning
- In-band OSNR measurement for 40 Gbit/s and ROADM deployments
- Automated channel discovery feature for easy setup and measurement
- Over 90 dB dynamic range per scan
- High-power option, ideal for multiservice operators and CATV operators

Platform compatibility

- FTB-200 Compact Platform
- FTB-500 Platform





Next-Generation Network Assessment







Choice without Compromise

The all-new FTB-5240S and FTB-5240BP Optical Spectrum Analyzer (OSA) series covers your DWDM applications and all channel spacings, from 50 GHz DWDM to CWDM. This is what we call "no-compromise performance", whatever your network specificities and testing requirements.





Nimble OSA Meets Supertech Platforms

The FTB-5240S OSA test module, housed in either the FTB-200 Compact Platform or the FTB-500 Platform, is purpose-built for fast and accurate dense wavelength-division multiplexing (DWDM) network commissioning and high-speed networking-up to 40 Gbit/s.

Housing the FTB-5240S in the FTB-200 platform makes it the smallest, high-performance, portable solution for spectral characterization of nextgeneration networks on the market. When equipped with in-band optical-signalto-noise-ratio (OSNR) measurement capabilities in the FTB-500 platform, this versatile OSA can also be combined with the FTB-8140 Transport Blazer 40/43 Gigabit SONET/SDH/OTN Test Module to create a unique test solution for commissioning reconfigurable optical add/drop multiplexers (ROADMs), packet optical transport platforms (POT-Ps) and 40 Gbit/s systems.

Quicker Setups-Easier Testing

The application software has been designed to optimize all testing operations-boosting productivity.



Favorites button (star icon) enables direct access to your defined configuration list–right in the field



Discover button replaces any setup, ensuring automatic channel discovery and identification and intelligent analysis

Analysis Setup...

Setups and test configurations can easily be defined and stored in the instrument

Ready for Next-Generation Network Challenges

Faster Is Always Better

Testing speed is critical, which is why EXFO's FTB-5240S and FTB-5240BP OSAs housed in the FTB-500 Platform, will achieve a scan and display the results in less than one second-that's fast enough for highly efficient network element adjustments on the go.

Get the Clear Picture

The FTB-5240BP high-resolution OSA has the best optical resolution in the industry (33 pm typical)-such a resolution enables to see events in your network that are not usually visible, i.e., integrity of filters, flatness of interleavers, spectral content of advanced modulation formats, and more.



The higher resolution of the FTB-5240BP (lower trace) enables to see event not seen by standard-resolution OSAs (higher trace), such as the ripple on this interleaver.

Sharp In-Band OSNR Measurement-No Extra Hardware Needed

Thanks to its flexible and innovative patent-pending analysis method, EXFO's FTB-5240S-P-InB and FTB-5240BP delivers highly accurate OSNR measurements for systems where noise fluctuates from channel to channel. The IEC subsystem test procedure 61280-2-9 recommendation defines OSNR measurement as "the difference in power between the peak power and the noise at half the distance between the peaks". However, in ROADM or 40 Gbit/s systems, this method may lead to incorrect results.

The built-in polarization diversity detection of EXFO's OSAs, combined with an internal polarization controller, enables you to achieve accurate OSNR measurements of a ROADM system, without having to add external hardware.

Measurement Characteristics

- Multiple scans, changing the polarization state between them and using the data to determine the OSNR in-band for each channel
- For new modulation schemes, such as non-return-to-zero (NRZ), duo binary, differential phase-shift keying (DPSK), quadrature phase shift keying (QPSK), which present large line widths and often display multiple peaks, in-depth analysis ensures the correct identification and signal measurement of each carrier
- Simultaneous testing of the physical and transport or datacom layers when combined with other EXFO modules in the FTB-500 Platform

High-Power Option

With today's high-power signals making their way into the DWDM space, it is critical to have an OSA that can measure them accurately without risking damaging your test equipment. The FTB-5240S matches this need, offering a high-power option (FTB-5240S-HPW) allowing up to +23 dBm input power per channel. The option is available with or without the in-band capability.

Protecting Your Investment

If you already own an FTB-400 platform and are looking for an OSA to use with your current applications, consider the FTB-5240S and FTB-5240BP as fully compatible with the FTB-400-based OSA application.

FTB-5240S/BP Optical Spectrum Analyzers

SPECIFICATIONS a Spectral Measurement FTB-5240S and FTB- 5240S-P FTB-5240BP Wavelength range (nm) 1250 to 1650 1250 to 1650 Wavelength uncertainty (nm) b ± 0.05 ± 0.03 ±0.01 ^{c, d} ±0.01 ^{c, d} Reference Internal e Internal e 0.065 b, d Resolution bandwidth (FWHM) (nm) 0.033 b, d ±0.01^{b, d} Wavelength linearity (nm) ±0.01 ^{b, d} Wavelength repeatability 2o (nm) ±0.003 g ±0.002 g **Power Measurements** FTB-5240S and FTB-5240S-P FTB-5240BP HPW Option Dynamic range (dBm) (per channel) b -80 ^h to +18 –80 ^h to +18 -70 ^h to +23 Maximum total safe power (dBm) +23+23+29Absolute power uncertainty (dB) Power repeatability 2σ (dB) ^{d, g} +0.5+0.5+0.5±0.05 ±0.04 ±0.05 **Optical Measurements** FTB-5240S and FTB-5240S-P FTB-5240BP **HPW Option** Optical rejection ratio at 1550 nm (dB) 35 (40 typical) 45 (50 typical) at 0.2 nm (25 GHz) 35 (40 typical) 45 (50 typical) at 0.4 nm (50 GHz) 45 (50 typical) 50 (55 typical) Channel spacing 50 to 200 GHz CWDM PDL at 1550 nm (dB) ±0.08 d ±0.06 d ORI (dB) >40 >40 Measurement time (s) d, j <1 (with the FTB-500 platform) <1 (with the FTB-500 platform) (includes scanning, analysis and display) FTB-5240S-P only In-Band OSNR Measurements d, k FTB-5240BP OSNR dynamic range (dB) >351 >35 ±0.5 m OSNR measurement uncertainty (dB) ±0.5 m Repeatability (dB) ±0.2 n ±0.2 n Up to 100 Gbit/s ° Data signals Up to 100 Gbit/s º Measurement time (s) d, j <6 (eight scans with the FTB-500 platform) <6 (eight scans with the FTB-500 platform) (includes scanning, analysis and display) <75 (eight scans with the FTB-200 platform)

Notes

- All specifications are for a temperature of 23 °C ± 2 °C with an FC/UPC connector unless otherwise specified, after warm-up.
- b. From 1520 to 1610 nm.
- c. After user calibration in the same test session within 10 nm from each calibration point.
- d. Typical.
- e. Integrated and wavelength-independent self-adjustment.
- f. Full width at half maximum.
- g. Over one minute in continuous acquisition mode.
- h. With averaging.
- i. At 1550 nm, -10 dBm input.
- j. 45 nm span, full resolution, 20 peak analysis.
- k. In-band OSNR measurement performed with 64 scans.
- I. For an optical noise level of > -60 dBm.
- m. With PMD ≤15 ps and no crosstalk, uncertainty specification is valid for OSNR ≤ 25 dB. With PMD ≤15 ps and crosstalk, uncertainty specification is valid for OSNR ≤ 20 dB.
- n. Repeatability specification is valid for OSNR \leq 25 dB.
- o. Except for pol-mux and fast polarization scrambled signals.

GENERAL SPECIFICATIONS

Temperature				
operating		0 °C to 40 °C	(32 °F to 104 °F)	
	storage	-20 °C to 50 °C	(-4 °F to 120 °F)	
Relative humidity 0 % to 95 % non-condensing				
Battery life (hours) 5 (with the FTB-500 platform)				
Connectors	Connectors EI (EXFO UPC Universal Interface)			
		EA (EXFO APC Universal Interface)		
Size (H x W x D)	FTB-5240S module	96 mm x 51 mm x 260 mm	(3 ³ / ₄ in x 2 in x 10 ¹ / ₄ in)	
	FTB-5240BP module	96 mm x 76 mm x 260 mm	(3 ³ / ₄ in x 3 in x 10 ¹ / ₄ in)	
Weight	FTB-5240S module	1.5 kg	(3.3 lb)	
	FTB-5240BP module	1.7 kg	(3.8 lb)	

LASER SAFETY

LASER SAFETY 21 CFR 1040.10 and IEC 60825-1 CLASS 1 LASER PRODUCT

ORDERING INFORMATION

FTB-5240S-XX-XX-XX					
Model ■ FTB-5240S = Optical spectrum analyzer FTB-5240S-P = Optical spectrum analyzer with polarization controller FTB-5240S-HPW = Optical spectrum analyzer with polarization FTB-5240S-P-HPW = Optical spectrum analyzer with polarization controller and high-power option	Connector * EI-EUI-28 = UPC/DIN 47256 EI-EUI-76 = UPC/HMS-10/AG EI-EUI-89 = UPC/FC narrow key EI-EUI-90 = UPC/ST EI-EUI-91 = UPC/SC EI-EUI-95 = UPC/E-2000 EA-EUI-28 = APC/DIN 47256 EA-EUI-89 = APC/FC narrow key	Software option ^a 00 = Without software option InB = With In-Band ONSR software			
Example: FTB-5240S-P-HPW-EI-EUI-89-InB * EXFO Universal Interface is protected by US patent 6,612,750.	EA-EUI-91 = APC/SC $EA-EUI-95 = APC/E-2000$				

Note

a. Available with FTB-5240S-P and FTB-5240S-P-HPW only.

FTB-5240BP	- <u>XX</u>
Model	Connectors
FTB-5240BP = High resolution optical spectrum analyzer	EI-EUI-28 = UPC/DIN 47256
	EI-EUI-76 = UPC/HMS-10/AG
	EI-EUI-89 = UPC/FC narrow key
	EI-EUI-90 = UPC/ST
	EI-EUI-91 = UPC/SC
	EI-EUI-95 = UPC/E-2000
	EA-EUI-28 = APC/DIN 47256
	EA-EUI-89 = APC/FC narrow key
	EA-EUI-91 = APC/SC
Example: FTB-5240BP-EI-EUI-89	EA-EUI-95 = APC/E-2000

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EXF0 is certified ISO 9001 and attests to the quality of these products. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. EXF0 has made every effort to ensure that the information contained in this specification sheet is accurate. All of EXF0's manufactured products are compliant with the European Union's WEEE directive. For more information, please visit www.EXF0.com/recycle. However, we accept no responsibility for any errors or omissions, and we reserve the right to modify design, characteristics and products at any time without obligation. Units of measurement in this document conform to SI standards and practices. Contact EXF0 for prices and availability or to obtain the phone number of your local EXF0 distributor.

For the most recent version of this spec sheet, please go to the EXFO website at http://www.EXFO.com/specs

In case of discrepancy, the Web version takes precedence over any printed literature.

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