FTB-5240S/BP Optical Spectrum Analyzers

WDM AWARE™ TECHNOLOGY

EXFO Connect Compatible

40G

FROST & SULLIVAN 2011 BEST PRACTICES AWARD
GLOBAL PORTABLE FIBER OPTIC TEST EQUIPMENT MARKET SHARE LEADERSHIP AWARD

SPEC SHEET

Highly accurate, easy-to-use intelligent optical spectrum analyzers (OSAs) for current and next-generation networks.

KEY FEATURES

- Intelligent in-band OSNR measurement for 40 Gbit/s and ROADM deployments
- WDM-Aware technology: per-channel optimized setup for accurate results, all the time
- Automatic impairment identification for faster troubleshooting
- Compliant with Recommendaton ITU-T G.697
- One-button operation for easy setup and automatic measurement
- Truly portable spectral characterization for DWDM network commissioning
- EXFO Connect-compatible: automated asset management
- Over 90 dB dynamic range
- Flexibility to analyze WDM, EDFA, drift, spectral transmittance, and Fabry-Perot and DFB laser
- High-power option, ideal for multiservice operators and CATV operators

PLATFORM COMPATIBILITY

Platform
FTB 500

Compact Platform
FTB 200

EXFO | Assessing Next-Gen Networks

SOLUTION FOR NEXT-GENERATION NETWORKS

Consumers and compan es around the wor d requ re more bandw dth than ever before for data hungry app cat ons such as v deo on demand, vo ce over IP (VoIP), v deoconferenc ng, etc. Accord ng y, serv ce prov ders need to dep oy faster and more re ab e networks, us ng nove techno og es such as reconf gurab e opt ca add drop mu t p exers (ROADM) or 40G/100G networks.

Reduc ng downt me n any type of network ca s for an accurate measurement of opt ca s gna to no se rat o (OSNR), but ROADM and 40 Gb t/s networks present a un que cha enge, as the ex st ng OSNR measurement methods y e d ncorrect resu ts. EXFO's WDM Aware techno ogy s the answer to th s cha enge, prov d ng re ab e n band OSNR measurement.

The IEC subsystem test procedure 61280 2 9 def nes the OSNR measurement as the power rat o between the peak power and the no se at ha f the d stance between the peaks. However, n ROADM or 40 Gb t/s systems, th s method may ead to ncorrect resu ts s nce the no se eve between the peaks s no onger d rect y corre ated w th the no se eve at the channe wave ength. However, the bu t n WDM Aware techno ogy of EXFO's FTB 5240S P and FTB 5240BP OSAs enab es you to ach eve accurate n band OSNR measurements of a ROADM or 40 Gb t/s system d rect y and automat ca y.

WDM-AWARE TECHNOLOGY

- Inte gent setup and ana ys s on a per channe bas s based on the b t rate, modu at on scheme, as we as the network conf gurat on exper enced by the wave ength (ROADM, f ters, etc.)
- F rst t me r ght: no guesswork, wh ch e m nates truck ro s
- Tra n ng t me s s gn f cant y reduced as th s ready to go un t can be taken d rect y nto the f e d for the ve EXFO DWDM exper ence
- Most accurate and adapt ve n band method on the market

CHOICE WITHOUT COMPROMISE

The FTB 5240S and FTB 5240BP Opt ca Spectrum Ana yzer (OSA) ser es covers your DWDM app cat ons and a channe spac ngs, from 25 GHz DWDM to CWDM. Th s s what we ca "no comprom se performance," whatever your network spec f c t es and test ng requ rements.

NIMBLE OSA MEETS SUPERTECH PLATFORMS

The FTB 5240S OSA test modu e, housed n e ther the FTB 500 P atform or the FTB 200 Compact P atform, s purpose bu t for fast and accurate dense wave ength d v s on mu t p ex ng (DWDM) network comm ss on ng and h gh speed network ng up to 40 Gb t/s.

Hous ng the FTB 5240S n the FTB 200 p atform makes t the sma est h gh performance portab e so ut on for spectra character zat on of next generat on networks on the market. When equ pped w th n band OSNR measurement capab t es, th s versat e OSA can a so be comb ned w th the FTB 8140 Transport B azer 40/43 G gab t SONET/SDH/OTN Test Modu e to create a un que test so ut on for comm ss on ng reconf gurab e opt ca add/drop mu t p exers (ROADMs), packet opt ca transport p atforms (POT Ps) and 40 Gb t/s systems.

IMPAIRMENT IDENTIFICATION FOR FASTER TROUBLESHOOTING

Operators want to reduce the r OPEX, yet WDM networks are becom ng ncreas ng y comp ex, w th new techno og es be ng dep oyed (t ghter channe spac ng, po ar zat on mu t p exed s gna s, etc.) that ncrease the number of potent a causes for fa ure. Wh e past mpa rment types were re at ve y few and we known (excess ve oss, h gh d spers on, excess ve ASE no se, etc.), these new y dep oyed techno og es g ve r se to prev ous y uncommon mpa rments, such as crossta k and non near effects. As such, te ecommun cat ons compan es need to f nd ways to dent fy these mpa rments and the r mpact on s gna degradat on.

Th s s now poss b e w th EXFO's WDM Invest gator, wh ch prov des deta ed nformat on about the s gna and no se for each channe . Th s eff c ent mpa rment dent f cat on makes t poss b e to p npo nt the defect ve component more rap d y, thus decreas ng troub eshoot ng t me and OPEX. The WDM Invest gator

prov des nformat on on nk character st cs, such as the presence of po ar zat on mu t p exed s gna s or the presence of carved no se due to f ters or ROADMs. It a so checks the presence of severa types of mpa rments (crossta k, non near effects, carr er eakage and PMD pu se spread ng), and g ves an assessment of the r sever ty (OK, warn ng, r sk).

PAYBACK IN JUST A FEW TICKETS

A s ng e unsuccessfu troub eshoot ng t cket can cost astronom ca amounts. Each truck ro costs approx mate y $200 to $300 per hour for the truck, equ pment and techn c an a one. Rep ac ng the wrong 40G transm tter card w amount to another $10 000 or more, and serv ce eve agreement (SLA) pena t es, wh ch can take effect as ear y as one hour after fa ure of bus ness serv ces, cost around $10 000 per hour, per channe . Add t a up, and a s ng e troub eshoot ng t cket can cost between $20 000 and $30 000. The WDM Invest gator he ps avo d engthy troub eshoot ng, and pays for tse f n just a few t ckets.

POWERFUL FEATURES FOR SIMPLE NETWORK TESTING

The app cat on software of the FTB 5240S/BP OSAs has been des gned to opt m ze a test ng operat ons boost ng product v ty.

Favorites Button

The Favor tes button enab es d rect access to your def ned conf gurat on st r ght n the f e d.

i-in-Band

Inte gent setup and ana ys s on a per channe bas s based on the b t rate, modu at on scheme, as we as the network conf gurat on exper enced by the wave ength (ROADM f ters, etc.).

Referencing

Dep oy and comm ss on your network r ght from day one. Then, as ma ntenance, upgrades and troub eshoot ng occur, compare the atest measurement w th the or g na ones. Rap d y and d rect y see a changes, those made on purpose and otherw se.

General and Specific

Have a of the DWDM resu ts as we as manua spec f c nformat on supp ed by up to four markers d rect y ava ab e on a s ng e screen. No more togg ng between pages to perform fu ana ys s.

SCPI Commands

It s now poss b e to contro the OSA remote y w th a fu featured WDM mode SCPI command set.

Print to PDF

Generate a PDF report d rect y from the un t, mak ng t much qu cker and eas er to convert reports nto an e ma fr end y format.

Intuitive On-Graph Peak Detection Threshold

C ear y see and d fferent ate between the s gna and the no se. Ana yze on y that wh ch mer ts ana ys s, no more fa se peak ana ys s or ow power peaks gnored.

Note

Advanced features available as options with the FTB 200 platform.

Drift Measurements

You can mon tor power, wave engths and OSNR over t me. Fo ow the evo ut on of these cr t ca parameters, set re at ve or abso ute thresho ds and get a arm not f cat ons when they are crossed. You can a so v sua ze the current and h stor ca status of a channe s n a s ng e nterface ca ed dr ft dashboard, wh ch enab es you to v ew the WDM trace of any acqu s t on that d sp ays a change of state (.e., when a thresho d s crossed). You can a so bu d a dr ft trace from a past DWDM acqu s t on.

Advanced EDFA Analysis

S nce amp f ers are cr t ca e ements n a networks, t s cruc a to ensure that they are opt m zed, that the ga n s we d str buted and that the output power s f at. Now, you can further opt m ze EDFAs by measur ng key parameters, such as ga n per channe , no se f gure, ga n f atness and ga n s ope. More mportant y, you can save and pr nt th s va uab e nformat on.

Accurate Spectral Transmittance

W th the advent of arger spectra content through the mp ementat on of 40G and 100G, know ng the bandw dth of a g ven f ter as we as the res dua network bandw dth guarantees proper transm ss on. The Spectra Transm ttance software feature compares the f tered wave ength to the nom na one, show ng nsert on oss, channe so at on and bandw dth at d fferent power eve s.

Laser Analysis

Make sure that your transm tters are w th n spec f cat ons. W th the DFB Laser Ana ys s feature, you can character ze a DFB aser source for centra wave ength, peak power, bandw dth, SMSR, and much more. Automat ca y character ze Fabry Perot asers for centra wave ength, RMS w dth and fu w dth ha f max (FWHM).

FASTER IS ALWAYS BETTER

Test ng speed s cr t ca , wh ch s why EXFO's FTB 5240S and FTB 5240BP OSAs can comp ete a scan and d sp ay the resu ts n ess than one second that's fast enough for h gh y eff c ent network e ement adjustments on the go.

HIGH-POWER OPTION

W th today's h gh power s gna s mak ng the r way nto the DWDM space, t s cr t ca to have an OSA that can measure these s gna s accurate y w thout r sk ng damage to your test equ pment. The FTB 5240S matches th s need, offer ng a h gh power opt on (FTB 5240S HPW) a ow ng up to +23 dBm nput power per channe . The opt on s ava ab e w th or w thout the n band capab ty.

FTB-200
THE INTELLIGENT
PLATFORM BUILT
FOR THE SUPERTECH

FTB-500
BOUNDLESS.
CAPABILITIES.
TESTING UNLIMITED.

W NDOWS ENV RONMENT | MODULAR TY | BU LT- N APPL CAT ONS | TH RD-PARTY APPL CAT ONS | TOUCHSCREEN | F ELD-M NDED RUGGEDNESS | W RELESS CONNECT V TY | USB | W -F | BLUETOOTH |

Note
Advanced features available as options with the FTB 200 platform.

EXFO | Assessing Next-Gen Networks

EXFO Connect

EXFO Connect

AUTOMATED ASSET MANAGEMENT. GET CONNECTED.

EXFO Connec pushes and s ores es equipmen au oma ically in he cloud, allowing you o s reamline es opera ion from build ou o main enance.

EXPERT TEST TOOLS ON THE FTB-200 PLATFORM

EXpert Test Too s s a ser es of p atform based software test ng too s that enhance the va ue of the FTB 200 p atform, prov d ng add t ona test ng capab t es w thout the need for add t ona modu es or un ts.

EXpert TEST TOOLS

EXpert VoIP TEST TOOLS

EXper VoIP genera es a voice over IP call direc ly from he es pla form o valida e performance during service urn up and roubleshoo ing.

› Suppor s a wide range of signaling pro ocols, including SIP, SCCP, H.248/Megaco and H.323

› Suppor s MOS and R fac or quali y me rics

› Simplifies es ing wi h configurable pass/fail hresholds and RTP me rics

EXpert IPTV TEST TOOLS

EXper IP in egra es six commonly used da acom es ools in o one pla form based applica ion o ensure ha field echnicians are prepared for a wide range of es ing needs.

› Rapidly performs debugging sequences wi h VLAN scan and LAN discovery

› Valida es end o end ping and racerou e

› Verifies FTP performance and HTTP availabili y

EXpert IPTV TEST TOOLS

This powerful IPTV quali y assessmen solu ion enables se op box emula ion and passive moni oring of IPTV s reams, allowing quick and easy pass/fail veri ica ion of IPTV ins alla ions.

› Real ime video preview

› Analyzes up o 10 video s reams

› Comprehensive QoS and QoE me rics including MOS score

Note

Advanced features available as options with the FTB 200 platform.

SPECIFICATIONS [a]

SPECTRAL MEASUREMENT

	FTB-5240S and FTB-5240S-P	FTB-5240BP
Waveleng h range (nm)	1250 o 1650	1250 o 1650
Waveleng h uncer ain y (nm) [b]	±0.05 ±0.01 [c, d]	±0.03 ±0.01 [c, d]
Reference	In ernal [e]	In ernal
Resolu ion bandwid h (FWHM) (nm) [f]	0.065 [b, d]	0.033 [b, d]
Waveleng h lineari y (nm)	±0.01 [b, d]	±0.01 [b, d]
Waveleng h repea abili y 2σ (nm)	±0.003 [g]	±0.002 [g]

POWER MEASUREMENT

	FTB-5240S and FTB-5240S-P	FTB-5240BP	HPW Option
Dynamic range (dBm) (per channel) [b]	80 [h] o +18	80 [h] o +18	70 [h] o +23
Maximum o al safe power (dBm)	+23	+23	+29
Absolu e power uncer ain y (dB) [i]	±0.5	±0.5	±0.5
Power repea abili y 2σ (dB) [d, g]	±0.05	±0.04	±0.05

OPTICAL MEASUREMENT

	FTB-5240S and FTB-5240S-P	FTB-5240BP	HPW Option
Op ical rejec ion ra io a 1550 nm (dB) a 0.2 nm (25 GHz) a 0.4 nm (50 GHz)	 35 (40 ypical) 45 (50 ypical)	 45 (50 ypical) 50 (55 ypical)	 35 (40 ypical) 45 (50 ypical)
Channel spacing	25 o 200 GHz CWDM	12.5 o 200 GHz CWDM	25 o 200 GHz CWDM
PDL a 1550 nm (dB)	±0.08 [d]	±0.06 [d]	
ORL (dB)	≥40	≥40	
Measuremen ime (s) [d, j] (includes scanning, analysis and display)	<1 (wi h he FTB 500 Pla form)	<1 (wi h he FTB 500 Pla form)	

IN-BAND OSNR MEASUREMENT [d, k]

	FTB-5240S-P only	FTB-5240BP
OSNR dynamic range (dB)	>35 [l]	>35 [l]
OSNR measuremen uncer ain y (dB)	±0.5 [m]	±0.5 [m]
Repea abili y (dB)	±0.2 [n]	±0.2 [n]
Da a signals	Up o 100 Gbi /s [o]	Up o 100 Gbi /s [o]
Measuremen ime (s) [d, j] (includes scanning, analysis and display)	<6 (eigh scans)	<6 (eigh scans)
Analysis modes	WDM, EDFA, drif , spec ral ransmi ance, DFB, BP	WDM, EDFA, drif , spec ral ransmi ance, DFB

Notes

a. 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.
l. 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 ≤ 25 dB.
o. Except for pol mux and fast polarization scrambled signals.

GENERAL SPECIFICATIONS

Tempera ure		
	opera ing s orage	0 °C o 40 °C (32 °F o 104 °F) 20 °C o 50 °C (4 °F o 120 °F)
Rela ive humidi y		0 % o 95 % noncondensing
Ba ery life (hours)		5 (wi h he FTB 500 Pla form)
Connec ors		EI (EXFO UPC Universal In erface) EA (EXFO APC Universal In erface)
Size (H x W x D)	FTB 5240S module FTB 5240BP module	96 mm x 51 mm x 260 mm (3 ¾ in x 2 in x 10 ¼ in) 96 mm x 76 mm x 260 mm (3 ¾ in x 3 in x 10 ¼ in)
Weigh	FTB 5240S module FTB 5240BP module	1. 5 kg (3.3 lb) 1.7 kg (3.8 lb)

SELECTION GUIDE

OSA Module	CWDM	DWDM (100 GHz spacing)	DWDM (50 GHz spacing)	ROADM + 40 Gbit/s network
FTB 5240S	X	X	X	
FTB 5240S P	X	X	X	X
FTB 5240BP	X	X	X	X

ORDERING INFORMATION

FTB-5240S-XX-XX-XX

Model
FTB 5240S = Op ical spec rum analyzer
FTB 5240S P = Op ical spec rum analyzer wi h polariza ion con roller
FTB 5240S HPW = Op ical spec rum analyzer wi h high power op ion
FTB 5240S P HPW = Op ical spec rum analyzer wi h polariza ion con roller and high power op ion

Connector adapter *
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
EA EUI 95 = APC/E 2000

Software option
00 = Wi hou sof ware op ion
Adv = Enables advanced measuremen mode [a]
InB = Wi h WDM Aware echnology [b]
Inv = Enables he WDM Inves iga or [c]

Example FTB 5240S P HPW EI EUI 89 InB
* EXFO Universal In erface is pro ec ed by US pa en 6,612,750.

FTB-5240BP-XX-XX

Model
FTB 5240BP = High resolu ion op ical spec rum analyzer

Connector adapter *
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
EA EUI 95 = APC/E 2000

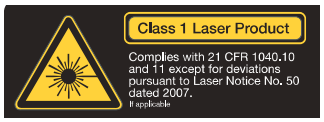
Software option
Adv = Enables advanced measuremen mode [d]
InB = Wi h WDM Aware echnology [d]
Inv = Enables he WDM Inves iga or

Example FTB 5240BP EI EUI 89 Adv InB Inv

Notes

a. Available with FTB 200v2 Compact Platform only.
b. Available with FTB 5240S P and FTB 5240S P HPW only.
c. Available only if InB is enabled.
d. Always included.

LASER SAFETY



Class 1 laser product n compl ance w th standards IEC 60825 1: 2007 and 21 CFR 1040.10.
Laser rad at on may be encountered at the output port.

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EXFO serves over 2000 customers n more than 100 countr es. o f nd your local off ce contact deta ls, please go to **www.EXFO.com/contact**.

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