

# XTM-50

## TUNABLE OPTICAL FILTER WITH ADJUSTABLE BANDWIDTH

- Center wavelength and bandwidth can be independently adjusted. Available versions cover range of 1260 nm to 1650 nm with adjustable bandwidths from 32 pm to 5 nm.



### KEY FEATURES AND BENEFITS

Adjustable bandwidth flat-top filter

Ultra-sharp filter edges

High isolation

Up to 200 nm wavelength tunability

High accuracy and repeatability

Narrowest filter: highest selectivity

## KEY FEATURES

### Adjustable bandwidth flat-top filter

The bandwidth of the XTM-50 filters can be adjusted independently of the center wavelength. The filter has a flat-top profile with minimal ripple, typically 0.2 dB with tight control across operating bands. Models are available with full width at half maximum (FWHM) bandwidths from 32 pm (4 GHz) up to 5 nm (625 GHz).

### Ultra-sharp filter edges

The XTM-50 uses EXFO patented quadruple pass technology. This creates extremely sharp filter edges with slopes of up to 800 dB/nm. Single or groups of narrowly spaced DWDM channels or coherent super-channels can be selected with ease.

### High isolation

EXFO quadruple pass technology achieves higher out-of-band isolation than conventional double-pass filters.

### Excellent wavelength coverage

Center wavelength of the XTM-50 standard model can be adjusted over a 200 nm range, covering the S, C and L telecom bands. The XTM-50 O-band covers 100 nm.

### High accuracy and repeatability

High resolution translation stages are used for both wavelength and bandwidth control. This ensures the XTM-50 can be set accurately and repeatedly over time.

### Narrowest filter—highest selectivity

The XTM-50 is the most selective filter on the market. Models are available with filter bandwidths from 32 pm (4 GHz) up to 5 nm (625 GHz).

## APPLICATION

### DWDM channel selection

Low dispersion, steep edges and high isolation mean that DWDM channels, or even coherent superchannels with spacing down to 10 GHz, can be separated with ease.

### Variable OSNR source

A variable OSNR source typically consists of an ASE source combined with a variable attenuator. Adding the XTM-50 to such a system enables consistent noise loading for all DWDM wavelengths.

### R&D of modulation formats

The XTM-50 is perfect for the filtering and analysis of sub-bands of complex modulations formats.

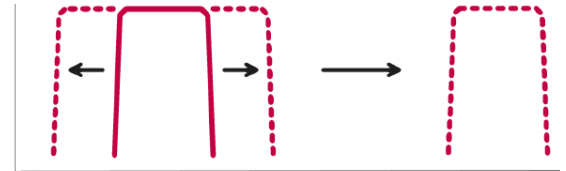


Figure 1. Bandwidth and wavelength tuning

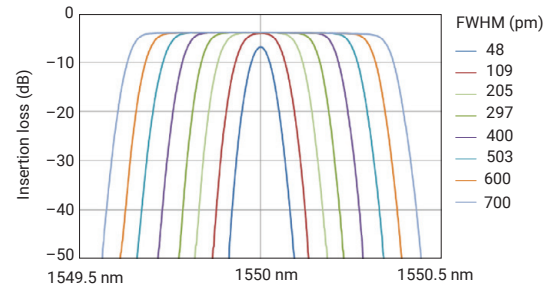


Figure 2. Example of filter's flat-top spectrum for various FWHM

| SPECIFICATIONS          |  |   |                                      |                                      |                                      |                                       |
|-------------------------|--|---|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|
|                         |  | XTM-50 standard                                     | XTM-50 ultrafine                     | XTM-50 O-band <sup>a</sup>           | XTM-50 wide                          |                                       |
| Optical characteristics | Wavelength range (nm)                            | 1450 to 1650  | 1480 to 1620                         | 1260 to 1360                         | 1525 to 1610                         |                                       |
|                         | Wavelength resolution (pm) <sup>b</sup>          | 5   | 5                                    | 5                                    | 5                                    |                                       |
|                         | Bandwidth (FWHM)                                 | Minimum<br>Maximum                                  | 50 pm (6.25GHz)<br>950 pm (120 GHz)  | 32 pm (4 GHz)<br>650 pm (80 GHz)     | 50 pm (8 GHz)<br>900 pm (160 GHz)    | 50 pm (6.25 GHz)<br>5000 pm (625 GHz) |
|                         | Bandwidth resolution                             | 1 pm  | 1 pm                                 | 1 pm                                 | 0.3 % of FWHM typical                |                                       |
|                         | Filter edge gradient                             | 500 dB/nm typical <sup>c</sup>                      | 800 dB/nm typical                    | 500 dB/nm typical <sup>c</sup>       | 500 dB/nm typical <sup>d</sup>       |                                       |
|                         | Insertion loss                                   | 5 dB (4.5 dB typical) <sup>e,f</sup>                | 5 dB (4.0 dB typical) <sup>f,g</sup> | 5 dB (4.5 dB typical) <sup>f,h</sup> | 5 dB (4.5 dB typical) <sup>i,j</sup> |                                       |
|                         | Flatness (dB)                                    | 0.2 <sup>k,p</sup> (typical)                        | 0.2 <sup>l,p</sup> (typical)         | 0.3 <sup>k,m,p</sup> (typical)       | 0.2 <sup>n,p</sup> (typical)         |                                       |
|                         | Polarization dependent loss (dB)                 | ±0.2 <sup>e</sup>                                   | ±0.2 <sup>g</sup>                    | ±0.2 <sup>h</sup>                    | ±0.2 <sup>i</sup>                    |                                       |
|                         | Out-of-band suppression (crosstalk) <sup>o</sup> | 40 dB (60 dB typical)                               | 40 dB (50 dB typical)                | 40 dB (60 dB typical)                | 40 dB (45 dB typical)                |                                       |
| Interface               | Optical fiber type                               | SMF or PMF  | SMF or PMF                           | SMF or PMF                           | SMF                                  |                                       |
|                         | Connector type                                   | FC/PC or FC/APC                                     |                                      |                                      |                                      |                                       |
| Operating conditions    | Temperature range                                | 15 °C to 35 °C (59 °F to 95 °F)                     |                                      |                                      |                                      |                                       |
|                         | Maximum optical input power (dBm)                | 30  | 30                                   | 30                                   | 27                                   |                                       |
| Size                    | Dimensions (W x D x H)                           | 193 mm x 231 mm x 139 mm (7.6 in x 9.1 in x 5.5 in) |                                      |                                      |                                      |                                       |
|                         | Weight   | 3.5 kg (7.7 lbs)                                    |                                      |                                      |                                      |                                       |

a. Specifications apply for wavelengths not equal to any water absorption line.

b. Typical, related to user dexterity.

c. From -3 dB and -40 dB for FWHM < 800 pm.

d. Between -3 and -40 dB. Typically 550 dB/nm at FWHM = 50 pm; 450 dB/nm at FWHM = 1 nm; 225 dB/nm at FWHM = 5 nm.

e. From 1500 nm to 1600 nm and FWHM > 100 pm.

f. At lowest FWHM the insertion loss is 7 dB typical.

g. From 1500 nm to 1600 nm and FWHM > 60 pm.

h. From 1280 nm to 1340 nm and FWHM > 100 pm.

i. For FWHM > 100 pm.

j. At lowest FWHM the insertion loss is < 7.0 dB.

k. Centered width of FWHM—150 pm. For 150 pm < FWHM < 650 pm.

l. Centered width of FWHM—100 pm. For 100 pm < FWHM < 500 pm.

m. From 1280 nm to 1340 nm.

n. Centered width of FWHM—150 pm. For 150 pm < FWHM < 2000 pm.

o. Measured 1 nm away from the -3 dB points.

p. Flatness max < 0.4 dB (< 0.5 dB for O-Band).

## ADVANCED FEATURES AND PERFORMANCE

Easy access to optical connectors for cleaning. Easing maintenance and enabling the lowest losses to be maintained.

## AUTOMATED VERSIONS AVAILABLE

Automated versions are also available. These provide a touch panel interface as well as USB and Ethernet ports for remote control. The XTA-50 is accurately calibrated and has both bandwidth and wavelength control. Optical properties are equivalent to the XTM-50.

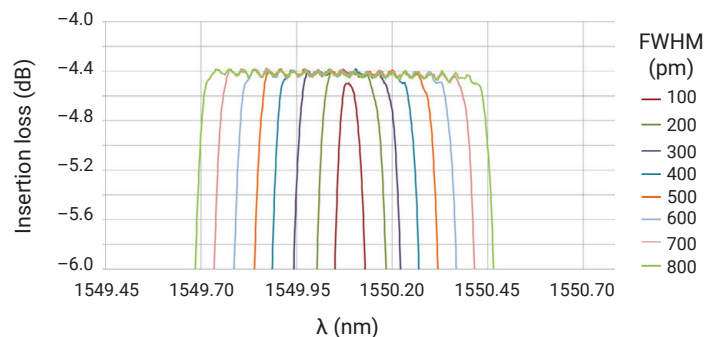


Figure 3. Expanded view of filter profile (wide)

## ORDERING INFORMATION

XTM-50-XX-XX-XX

### Model

SCL-S = 1450 nm to 1650 nm, bandwidth 50 pm to 950 pm  
 SCL-U = 1480 nm to 1620 nm, bandwidth 32 pm to 650 pm  
 CL-W = 1525 nm to 1610 nm, bandwidth 50 pm to 5000 pm  
 O-S = 1260 nm to 1360 nm, bandwidth 50 pm to 900 pm

### Output fiber

00 = SMF28 singlemode fiber  
 M = Polarization maintaining fiber<sup>a</sup>

Example: XTM-50-SCL-S-M-58

### Connector adapter

50 = FC/PC  
 58 = FC/APC

a. Not available for CL-W model.

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