Ultra-Narrow Band-Pass Filter Module

IXC-FBG-PS-M

This all fiber-based filter provides a clean extraction of narrow-band signal. Full Width Half Maximum (FWHM) could be selected at time of order from 1 to 4 GHz. Filter shape exhibit a flat-top shape in order to preserve signal integrity, steep edges and a high crosstalk over the full C or L band to remove all unwanted signals and noises.

The all-fiber design with no moving part ensures long time reliability. Fiber Bragg Gratings used in the module are thermally packaged in order to get a very stable central wavelength against lab temperature variations.

Thanks to our dedicated packaging, the bandpass wavelength can be easily and finely adjusted by user by rotating a tiny screw on the package.

FEATURES & BENEFITS

- Flat-top symmetrical pass-band filter
- Down to 1 GHz (8 pm) FWHM
- < 4 dB Insertion Loss
- > 25 dB Optical Rejection Ratio @ 10 GHz
- PM or SMF
- +/- 100 pm fine tuning

APPLICATIONS

- Microwave photonics
- Quantum communication
- Space communication
- Lidar
- Lines filtering for lasers and sensors
- RF filtering
- ASE or laser mode suppression
- Linewidth reduction
- Frequency discriminator

Typical response (IN → OUT)
Flat-top symmetrical band-pass design with an improved Q-factor, leading to better selectivity and higher signal-to-noise ratio.
**IXC-FBG-PS-M TECHNICAL SPECIFICATIONS**

**PARAMETERS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Band-pass center wavelength CW</td>
<td>1525 – 1610 (TBD) nm</td>
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<tr>
<td>Band-pass bandwidth B (FWHM)</td>
<td>1, 2, 3 or 4 (TBD) ± 0.5 GHz</td>
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<tr>
<td>Insertion loss IL</td>
<td>&lt; 4 dB</td>
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<tr>
<td>Out-of-band attenuation ΔT at ± 10 GHz</td>
<td>&gt; 25 dB</td>
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<tr>
<td>Rejection bandwidth (IN → OUT)</td>
<td>C-band or L-band</td>
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<tr>
<td>Tuning range</td>
<td>± 100 pm</td>
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<tr>
<td>Tuning resolution</td>
<td>1 GHz</td>
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<tr>
<td>CW thermal drift [-5 ; 70]° C</td>
<td>&lt; 150 pm</td>
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<tr>
<td>Packaging</td>
<td>165 x 55 x 15 mm</td>
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<tr>
<td>Input power (max.)</td>
<td>500 mW</td>
</tr>
<tr>
<td>Pigtail length</td>
<td>0.5 m</td>
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<tr>
<td>Optical connectors CC</td>
<td>FC/APC, FC/PC, SC/APC, SC/PC (0.9 mm buffered fiber)</td>
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</tbody>
</table>

1 Referenced to vacuum at ±0.05 nm, slow axis (PM Fiber)
2 Lorentzian line shape for standard 1 GHz FWHM
3 Maximum input power damage power threshold
4 Recommended input power for stable filter operation is below 2 mW for 1GHz and below 10 mW for 2 to 4 GHz FWHM version

**IXC-FBG-PS-M-CW-B-FT-CC ORDERING GUIDE**

CW: wavelength in nm, between 1525 and 1610  
B: filter bandwidth in GHz. Available: 1, 2, 3 and 4  
FT: Fiber Type. Selection between PM (PM1550 or equivalent) and SM (SMF28e+ for band-pass bandwidth ≥ 2 GHz)  
CC: Optical Connector. Available: FA (FC/APC); FP (FC/PC); SA (SC/APC) and SP (SC/PC)

**Diagram**

Typical response (IN → OUT)

This filter allows transmission of a specific narrow band while rerouting other wavelengths in C or L-band. Several bandwidths are available ranging from 1 to 4 GHz
Typical response (IN → REJ)

PACKAGING

Optical filter based on 2 athermal FBGs and an optical circulator

CONFIGURATION