



## Applications

- Tunable Channel Drop for Coarse WDM
- Optical Performance Monitoring for CWDM
- Tunable Optical Noise Filtering and Channel Locking
- Full-band Optical Spectroscopy

## Description

The **Micron Optics FFP-TF2** Fiber Fabry-Perot (FFP) tunable filter is a specialized filter based on the all-fiber Fabry-Perot etalon technology. The FFP tunable filter passes wavelengths that are equal to integer fractions of the cavity (etalon) length; all other wavelengths are attenuated according to the Airy function.

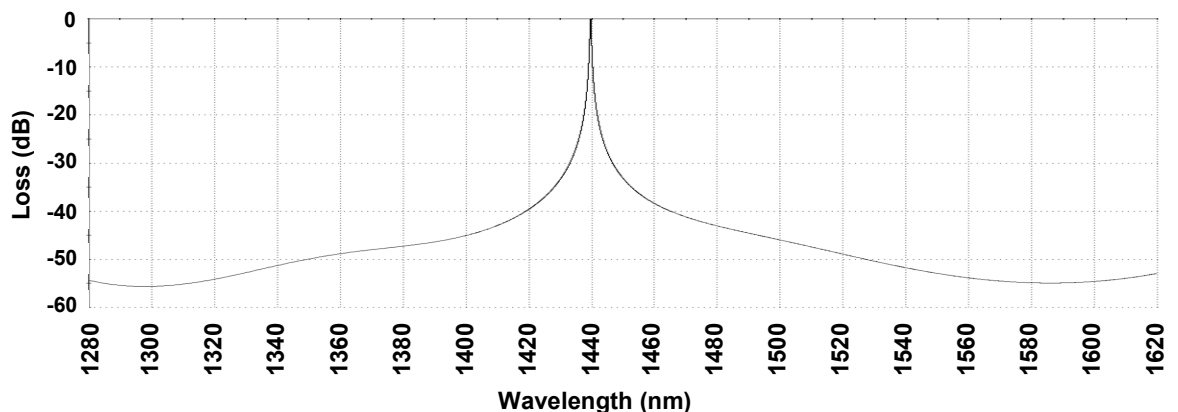
The key to the elegant design of the FFP tunable filter is the lensless fiber construction. There are no collimating optics or lenses, thus the FFP tunable filter achieves high finesse and maintains a low loss transmission profile. **Micron Optics** has eliminated the pitfalls of other Fabry-Perot component technologies, including misalignment, environmental sensitivity, and extraneous modes.

The new widely tunable filter provides a unique opportunity for the system designer to design-in just one tunable filter in an application previously incorporating multiple filters. The Free Spectral Range (FSR) of this unique filter can be as wide as 340nm allowing tunability from just one period of the frequency comb across the entire telecom spectrum.

## Features

- Wide tuning range from 1280 to 1620 nm
- Ideal for low cost, high volume applications
- High resolution for precise spectrum analysis
- Large dynamic range permits accurate measurements
- Efficient low loss design
- Wide ranges of user-specified parameters
- Thermally stable
- Vibration and shock resistant
- Small footprint
- Low power requirements
- Qualified for Telcordia GR 2883

Contrast Ratio of Finesse 750 Tunable Filter with 340 nm Free Spectral Range





## Applications

### Tunable Channel Drop for Coarse WDM

The rapid tuning and locking capabilities of Micron Optics FFP Technology enables reliable channel selection and dropping applications in dynamic optical networks. Tuning end to end across 340nm can easily be accomplished at a rate of up to 2KHz.

### Tunable Optical Noise Filtering & Channel Locking

Micron Optics FFP Technology is used in telecom systems around the world for optical noise filtering and dynamic channel locking. A key attribute is the extreme low loss nature (to < 1 dB) of the filter and its reliable locking capability. The resulting benefit is an extremely low bit error rate and high network receiver sensitivity.

### Optical Performance Monitoring for CWDM & DWDM Systems

Micron Optics FFP Technology is the base for the highest performing optical performance monitor available today, monitoring up to 400 channels in the C band alone. The high resolution, deep dynamic range and continuous tuning combine to allow accurate channel analysis. For example, Micron Optics finesse 10,000 filters have a contrast factor of 76 dB.

**Micron Optics Finesse ~750 Bandwidth Variation Plot – Free Spectral Range 340 nm**

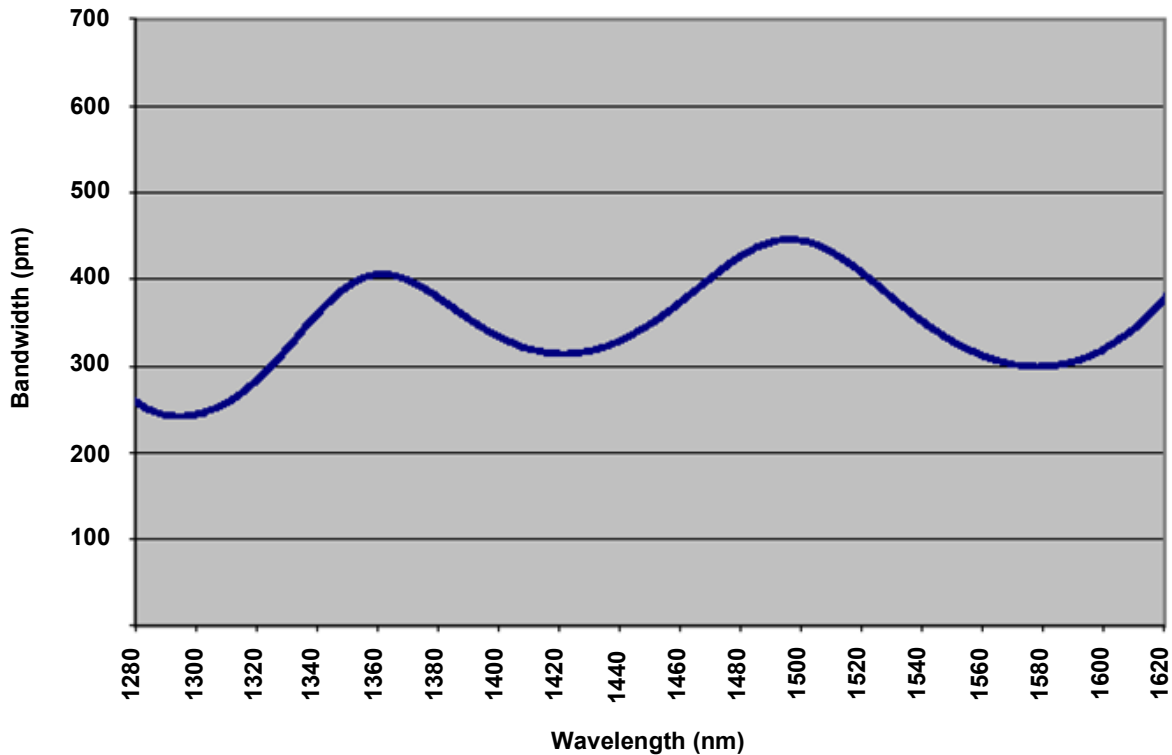
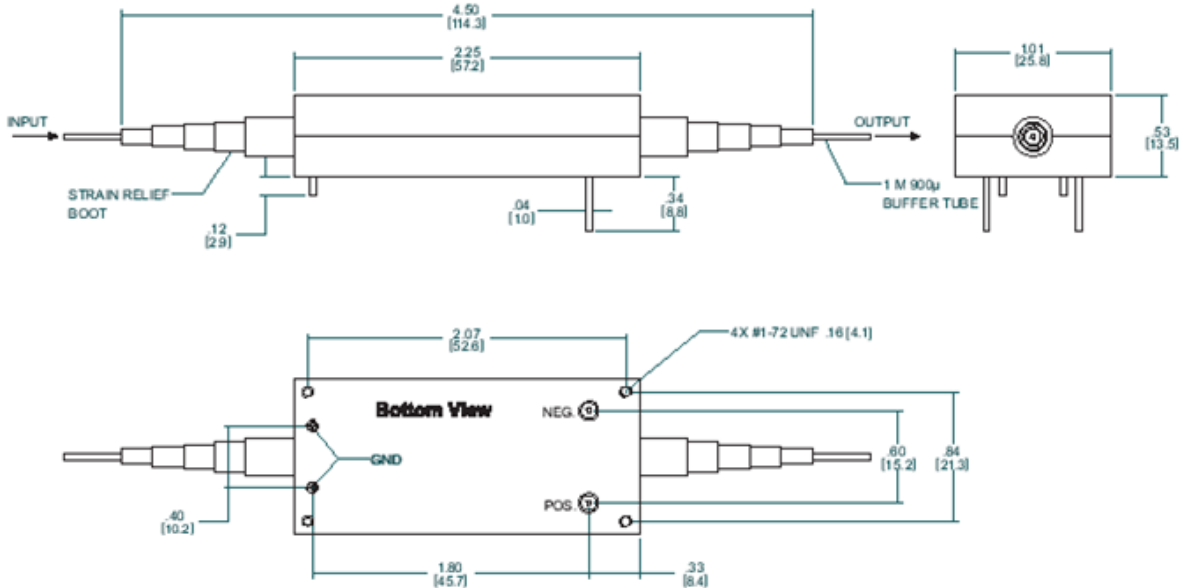


Figure 3



**Options**

- 030 Low Variation Bandwidth\*
- 060 FC/SPC Connectors (Fusion Spliced)
- 061 FC/APC Connectors (Fusion Spliced)
- 062 SC/SPC Connectors (Fusion Spliced)
- 063 SC/APC Connectors (Fusion Spliced)
- 065 FC/APC Connectors (Connectorized)
- 069 Other Connectors

\* Please verify specifications with Micron Optics.

**Part Number**

FFP-TF2 9000 – bbbuffff – I.I

**Average Bandwidth**

- Specify bandwidth
- Example:  
040 = 40 GHz Bandwidth

**Bandwidth Unit**

- G - GHz
- M - MHz

**Finesse**

- Specify finesse
- Example:  
0200 = Finesse of 200

**Insertion Loss**

- Specify loss
- Example:  
2.5 = 2.5 dB loss

**Specifications<sup>1</sup>**

**Optical**

Operating Wavelength Range <sup>2</sup>	1280 nm to 1620 nm
Free Spectral Range	340 nm (42,500 GHz)
3dB Bandwidth (see diagram on pg. 2)	0.025 nm to 34 nm (3.125 to 4,250 GHz)
Standard Finesse Values	10, 75, 750, 3000, 14000
Insertion Loss <sup>3</sup>	< 3.0 dB
Polarization Dependent Loss <sup>3</sup>	< 0.2 dB
Input Power <sup>4</sup>	< 100 mW (for F < 200)

**Electrical**

Tuning Voltage/FSR	< 18 V
Capacitance	< 3.0 µF
Slew Rate	< 90 V/ms
Cycling Speed Over 1 FSR	< 2500 Hz
Maximum Tuning (PZT) Voltage	70 V

**Environmental<sup>3</sup>**

Operating Temperature	-20° to 80° C
ΔVoltage/Operating Temperature	< 18 V
ΔInsertion Loss/Operating Temperature (dependent on FSR)	< 0.5 dB
ΔInsertion Loss/Vibration	< 0.5 dB

**Mechanical**

Dimensions	13.5 x 25.8 x 57.2 mm
Weight	53 g
Mounting Holes	(4) #1-72 UNF x 0.16 inch deep
Pigtail Jacket (loose)	900 µm buffer tubing
Pigtail Length	> 1 m
Connector	see options

**Notes:**

- <sup>1</sup> Specifications are dependent on filter configuration. Please contact Micron Optics for final specifications.
- <sup>2</sup> Other non-telecom wavelengths are available. Please contact Micron Optics for specifications.
- <sup>3</sup> Typical value; final value is dependent on Free Spectral Range and Finesse.
- <sup>4</sup> Maximum input power level depends on finesse value.

**Widely Tunable Filter For Optical Spectrum Analyzer**

<b>FFP-TF2 Standard Filter (FFP-TF2 9000–6.3G3000-3.0)</b>		
<i>Note: This filter is currently stocked at Micron Optics for best pricing and delivery.</i>		
Parameter	Spectrum	Value
<b>Wavelength Range</b>		1280-1620nm
<b>Bandwidth</b>	1280-1300nm	< 300pm
	1300-1600nm	< 50pm
	1600-1620nm	< 120pm
<b>Finesse</b>	1280-1300nm	> 500
	1300-1600nm	> 3,000
	1600-1620nm	> 1,500
<b>Free Spectral Range (FSR)</b>	1280-1620nm	> 340 nm
<b>Loss</b>		< 3.0 dB



components