

Fiber Fabry-Perot Tunable Filter | FFP-TF2

Applications

- Optical Performance Monitoring
- Spectrum Analysis
- Tunable Optical Noise Filtering
- Tunable Channel Drop for Ultra DWDM
- Tunable Sources
- Optical Sensing

Features

- Ideal for low cost, high volume applications
- High resolution for precise spectrum analysis
- Large dynamic range permits accurate measurements
- Efficient low loss design
- Tunable across O, E, S, C & L bands
- Wide ranges of user-specified parameters
- Thermally stable
- Vibration and shock resistant
- Small footprint
- Low power requirements
- Qualified for Telcordia GR 2883
- All-fiber platform
- Compact for OEM application

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 all-fiber FFP tunable filter follows the Airy function so closely that engineers can design it into the opto-electronic systems with a high degree of confidence that it will provide results very close to the theoretical mathematical model. Low loss, high isolation, and accurate power or wavelength measurements are just a few of the characteristics resulting from an ideal Airy function.

The FFP-TF2 design provides improved etalon alignment for stable long-term, high reliability, and Telcordia-qualified performance at a more attractive price. Several standard low-cost configurations are readily available for quick delivery. Custom high performance multi-band configurations are also available for special uses including sensing, biotech, and scientific applications. Options available include full-band tuning from 1260nm to 1620nm along with the largest finesse range in the industry (from finesse 10 to 16,000). The FFP-TF2 is not a direct drop-in replacement for the original FFP-TF (due to drive voltage and packaging differences), but these filters are now more suitable in many volume applications.

Fiber Fabry-Perot Tunable Filter| FFP-TF2

Specifications

FFP-TF2

Optical Properties

Operating Wavelength Range ¹ (Custom)	800 - 1200 nm			
Operating Wavelength Ranges ¹ (Standard)	O-Band	1260 - 1360 nm	C-Band	1520 - 1570 nm
	E-Band	1360 - 1480 nm	L-Band	1570 - 1620 nm
	S-Band	1480 - 1520 nm	C & L Band	1520 - 1620 nm
Free Spectral Range (fixed FSR but selectable within this range)	100 to 45,000 GHz (800 pm to 340 nm at 1550 nm)			
Standard Finesse Values (nominal)	10, 40, 100, 200, 500,			
(For non-standard finesse values up to 16,000 - Contact Micron Optics)	650, 1000, 2000, 4000			
3dB Bandwidth	Equals desired FSR/Finesse			
Insertion Loss ²	<1.5 dB			
Polarization Dependent Loss ²	<0.2 dB			
Input Power (Maximum) ³	< 100mW (for finesse <200)			
Glitch Free Dynamic Range (GFDR)	> 15 dB			

Electrical Properties

Tuning Voltage/FSR	< 18 V
Capacitance	< 3.0 μ F
Cycling Speed Over 1 FSR	800 Hz (max)
Maximum Tuning Voltage	70 V

Mechanical Properties

Dimensions	13.5 mm x 25.8 mm x 57.2 mm
Weight	53 g
Mounting Holes	(4) #1-72 UNF x 0.16 inch deep
Cable Jacket (loose)	900 μ m buffer tubing
Cable Length	>1 m
Connector	See Options

Environmental Properties ^{2,4}

Operating Temperature ¹	-20° to 80°C
Δ Operating Voltage/Operating Temperature	< 18 V
Δ Insertion Loss/Operating Temperature (dependent on FSR)	< 0.5 dB
Δ Insertion Loss/Vibration	< 0.5 dB

Notes:

1. Specifications are dependent on filter configuration. Please contact Micron Optics for final specifications.
2. Typical value; final value is dependent on Free Spectral Range and Finesse.
3. Maximum input power level depends on finesse value. Generally, the higher the finesse, the lower the maximum input power level.
4. These parameters are not available for all possible configurations. Please contact Micron Optics for details.

Ordering Information

FFP-TF2 - **www** - **bb**uffff - **ii** (Example: FFP-TF2 -1550 - 040G0200 -2.5)

www : Wavelength Band 1310 (1260 - 1360 nm) 1550 (1520 - 1570 nm) 1420 (1360 - 1480 nm) 1600 (1570 - 1620 nm) 1500 (1480 - 1520 nm) 1580 (1520 - 1620 nm)	bb : Bandwidth Specify bandwidth (i.e: 040 = 40GHz)	u : Bandwidth Unit G GHz M MHz	ffff : Finesse Specify finesse (i.e: 0200=Finesse of 200)	ii : Insertion Loss Specify Loss (i.e: 2.5=2.5dB loss)
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Options

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



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Applications

Optical Performance Monitor

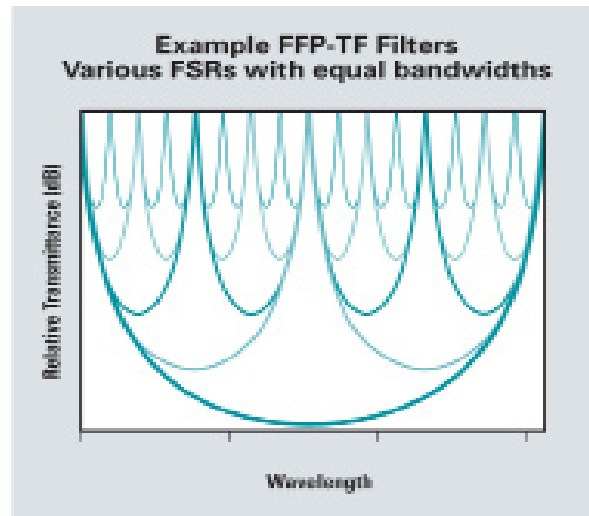
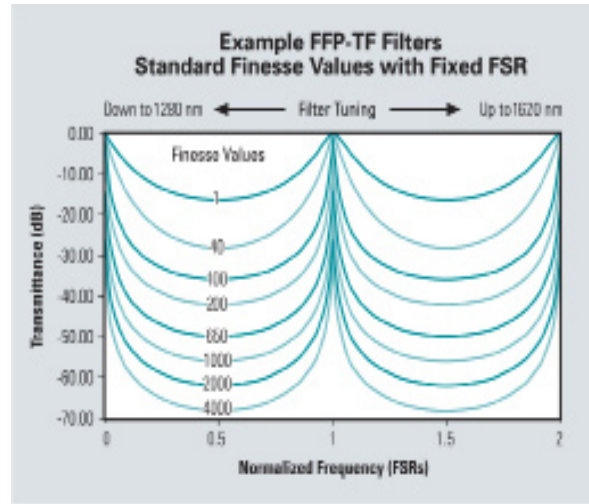
Micron Optics FFP Technology is the base for the highest performing optical performance monitor available today, monitoring up to 400 channels in the C band alone. The high resolution, deep dynamic range and continuous smooth tuning combine to allow accurate dense channel analysis. For example, Micron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

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 less than 1.5 dB) of the filter and its reliable locking capability. Data from thousands of filters in the field has shown a projected reliability of less than 80 FITs. The resulting benefit is an extremely low bit error rate and high network receiver sensitivity.

Tunable Channel Drop for Ultra DWDM (< 25 GHz spacing)

The rapid tuning and locking capabilities of the Micron Optics FFP Technology enables reliable channel selection and dropping applications in dynamic optical networks. The high degree to which the FFP filters follow the Airy Function theory allows optical engineers to accurately design system performance parameters, without the overhead of allowing for imprecise measurements. See the table below for a listing of our standard filters used for the most common applications.

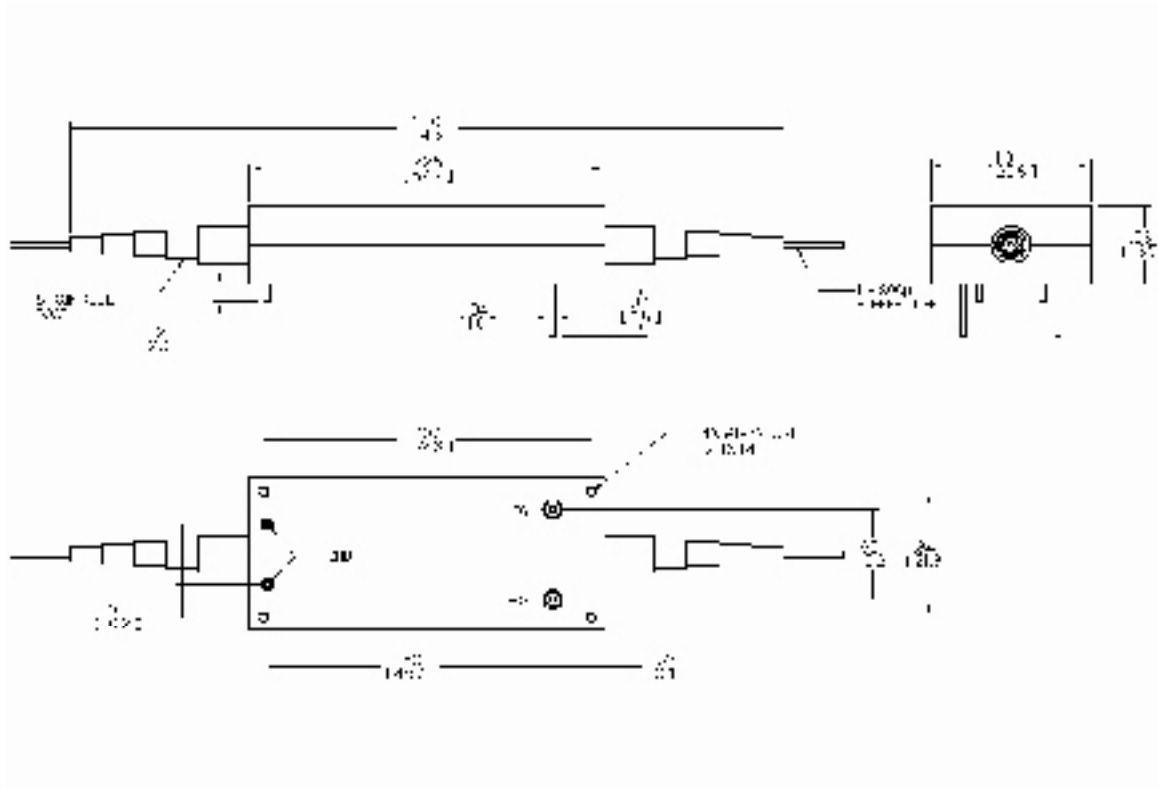


To assist in filter selection, three of the highest volume applications are listed below. These filters typically have short lead times. In addition to these standard filters, Micron Optics will be pleased to produce custom filters. Call or e-mail our sales engineers to best match our filter specifications to your applications.

FFP-TF2 Standard Filters (for common applications)

Parameter (Nominal Values)	Unit	Channel Drop	Optical Channel Monitor	Optical Channel Analyser
Wavelength Range			C + L Band	
Bandwidth	pm	500	133	50
	GHz	62.5	16.67	6.25
Free Spectral Range (FSR)	nm	100	100	100
	GHz	12,500	12,500	12,500
Finesse		200	750	2,000
Insertion Loss	dB	<1.5	<2.0	<2.5

Dimensions



Notes:
All dimensions in inches.
[mm]