

# Fiber Fabry-Perot Interferometer | FFP-I

## Applications

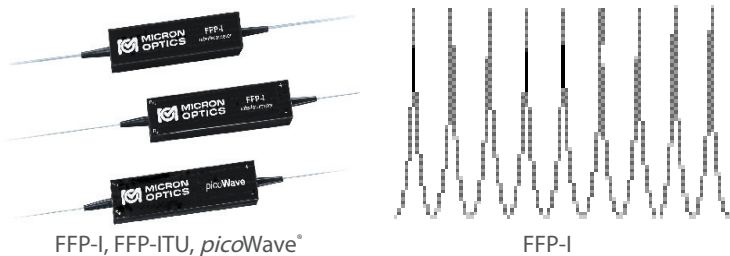
- Spectrum Sliced Source
- ITU Filter
- Calibrated Wavelength Reference
- Laser Stabilization
- WDM Emulation
- Optical Sensing

## Features

- Uniformly spaced transmission peaks
- Small footprint
- Vibration and shock resistant
- Low loss
- No alignment required

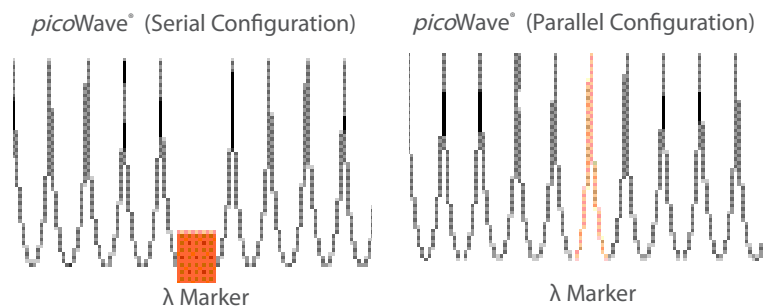
## Description

The Micron Optics FFP-I, Fiber Fabry-Perot Interferometer family of products is based on a fixed interferometer design with smooth, uniformly spaced transmission peaks. The FFP-I consists of a lensless plane Fabry-Perot Interferometer with a single-mode optical fiber waveguide between two highly reflective multilayer mirrors. The FFP-I is manufactured directly with optical fibers so no alignment or mode-matching is required. The distances between peaks (FSR) may be designed exactly to customer specifications and a TEC package is available for thermal stability and minor adjustments of the bandpass frequency or wavelength.



## *picoWave*<sup>®</sup>

The *picoWave*<sup>®</sup> is Micron Optics' patented multi-wavelength reference that enables real time wavelength calibration to picometer accuracy. Combining the uniform frequency spacing of the FFP-I, a wavelength marker of a Fiber Bragg Grating, and a built-in TEC for thermal stability, the *picoWave*<sup>®</sup> makes an ideal calibrated wavelength reference. The FFP-I and FBG can be configured in Series or in Parallel (see diagrams below).



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## Specifications

FFP-I

### Operating Wavelength Range<sup>1</sup>

Typical Spectral Ranges (nm) 800 - 1640 nm

### Optical FFP-I

Free Spectral Range (Fixed FSR but selectable within this range) 0.01 - 10,000 GHz  
 Standard Finesse Values (nominal) 5, 10, 40, 100, 150, 200, 500, 1000, 2000, 4000  
 Insertion Loss (typical)<sup>2</sup> < 3 dB  
 Thermal Coefficient ~ 1.6 GHz/°C  
 Input Power<sup>3</sup> < 100 mW ( for finesse < 200)

### Optical: *picoWave*<sup>®</sup>

Free Spectral Range (Fixed FSR but selectable within this range) 10 to 200 GHz  
 Standard Finesse Values (nominal) 10  
 Insertion Loss (typical)<sup>2</sup> 3dB  
 Wavelength Marker Location User Defined

### Electrical (optional for FFP-I with FSR > 10GHz, standard for *picoWave*<sup>®</sup>)

TEC Melcor Epoxy Filled 04OT2.0-30-F2-EP  
 TEC Drive Current <2 A  
 TEC Qmax (T<sub>H</sub> = 25 °C) <4 W  
 TEC Vmax (T<sub>H</sub> = 25 °C) <3.6 V  
 TEC Δmax (T<sub>H</sub> = 25°C) 67°C  
 Thermistor 10 KΩ NTC  
 Thermal Tuning Wavelength Range (0 - 60°C) 80 GHz  
 Thermal Tuning Wavelength Speed (typical) ~1 GHz/sec  
 Wavelength Stability (0 - 60°C)<sup>4</sup> 0.625 GHz  
 Wavelength Stability (laboratory conditions) ± 0.125 GHz  
 FSR Variation Over Tuning Range 0.05% of FSR

#### Notes:

- Each useful spectral range defined by mirror pass band.
- High resolution (BW <2 GHz) FFP-I's are generally polarization sensitive. However, polarization properties are stable and can be adjusted by a polarization controller at the FFP-I input.
- Maximum input power level depends on finesse value.

## Ordering Information

FFP-I-*www*-*bbb**uffff*-*ii*

(Example: FFP-I -1550-010G0200-2.0)

<i>www</i> : Wavelength Band	<i>bbb</i> : Bandwidth	<i>u</i> : Bandwidth Unit	<i>ffff</i> : Finesse	<i>ii</i> : Insertion Loss
1500 ( <i>S Band</i> )	Specify bandwidth	<b>G</b> GHz	Specify finesse	Specify Loss
1550 ( <i>C Band</i> )	(i.e: 010 = 10GHz)	<b>M</b> MHz	(i.e: 0200=Finesse of 200)	(i.e: 2.0 = 2dB)
1600 ( <i>L Band</i> )		<b>K</b> KHz		

## FFP-ITU FSR Tolerance Options

0050 ± 0.5%    0020 ± 0.2%    0010 ± 0.1%    0005 ± 0.05%

## Options

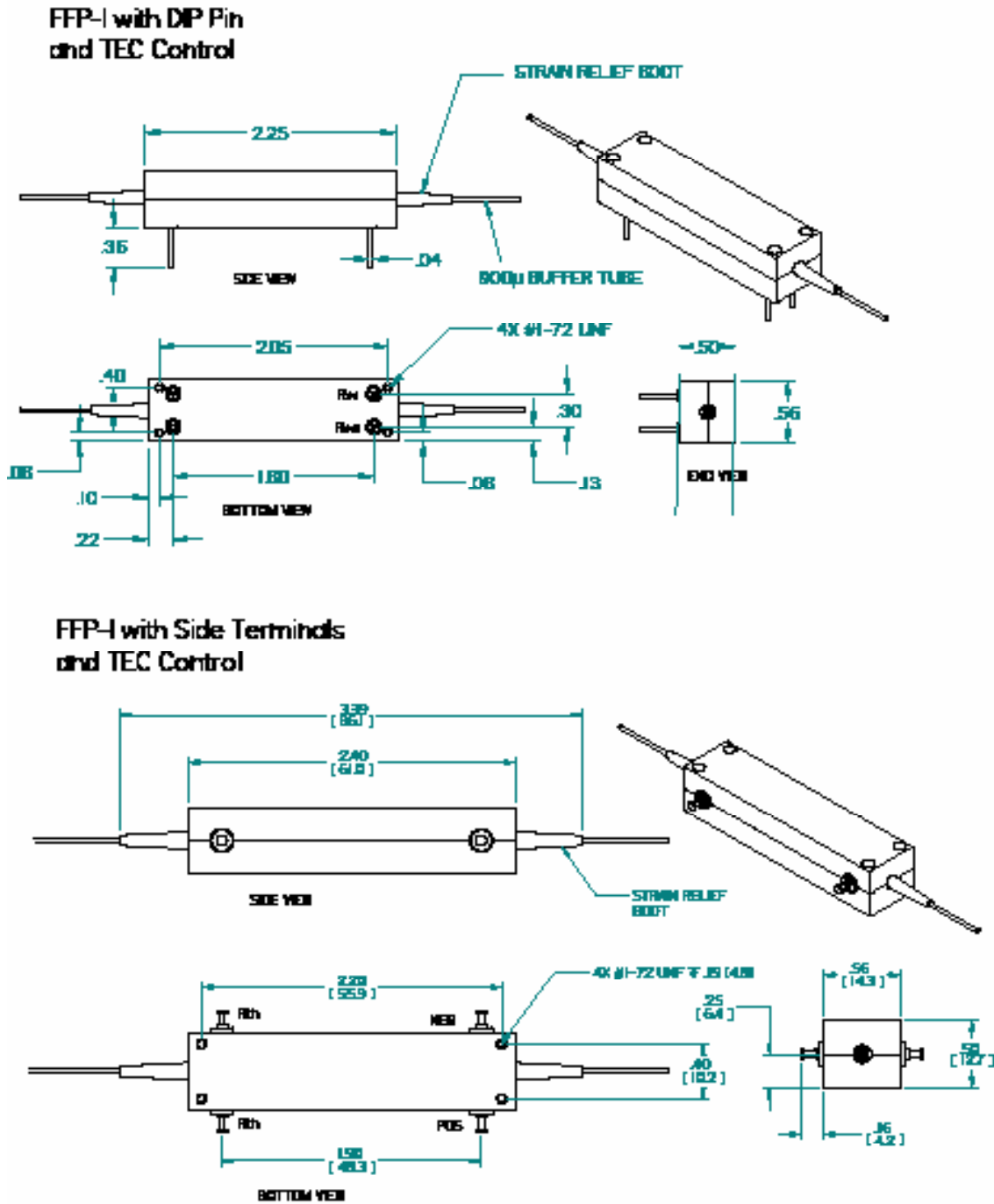
060 FC/SPC Connectors (Fusion Spliced)    061 FC/APC Connectors (Fusion Spliced)    062 SC/SPC Connectors (Fusion Spliced)    063 SC/APC Connectors (Fusion Spliced)  
 065 FC/APC Connectors (Connectorized)    069 Other Connectors    070 Side Terminal Configuration    080 TEC Equipped



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## Dimensions



Note 1: FFP-I and FFP-ITU without the TEC package do not have pins.

Note 2: For FSRs < 4GHz, call Micron Optics for package dimensions.