# Manual Grating-Based Fiber Optic Tunable Filter

(patent pending)

DATASHEET

Return to the Webpage

Agiltron's Manual Grating-Based Fiber Optic Tunable Filter provides a simple way to adjust the center wavelength of narrow band over wide band. Wavelength tuning is achieved by rotating a grating using a micrometer.

Based on a proprietary optics, Agiltron offers extremely low insertion loss, high stability, polarization independent operation, and high off-band suppression. It is tunable continuously over a wide spectral range. The device presents a most cost-effective solution for OEM applications from fiber optic networks to fiber sensing interrogation.

## Features

- Extremely low insertion loss
- Wide Tune Range
- High off-band suppression
- Uniform bandwidth
- High tuning resolution
- Compact and cost-effective

## Applications

- DWDM networks
- Fiber Sensing
- ASE control
- Tunable Fiber Lasers

## Specifications

| Parameter | | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| Wavelength Tuning Range | | 1060±15 | 1500±20 | 2000±20 | nm |
| Tuning Resolution | | - | 0.02 | - | nm |
| Insertion Loss [1] | B-Grade | 1.1 | 2.1 | 3.5 | dB |
| | A-Grade | 1.1 | 1.6 | 2 | dB |
| Bandwidth @-3dB | | 0.25 | | 0.30 | nm |
| Bandwidth @-20dB | | - | 0.8 | - | nm |
| Polarization Dependent Loss | | - | 0.25 | - | dB |
| Extinction Ratio (PM fiber only) | | - | 20 | - | dB |
| Off-Band Suppression | | - | 45 | - | dB |
| Polarization Mode Dispersion | | - | - | 0.5 | ps |
| Return Loss | | 40 | - | - | dB |
| Optical Power Handling (CW) | | - | - | 500 | mW |
| Operating Temperature | | 0 | 20 | 60 | °C |
| Storage Temperature | | -10 | | 70 | °C |

**Notes**:

[1]. It is defined as the total light coupled out over the filter's spectral passing band. Measured using a broadband light source with integration of the transmission peak. Extra loss can occur if the laser source does not match the filter profile. A special filter can be made to match the application. The smaller the fiber core, the higher the loss. Excluding connector loss

**Note:** The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:

RoHS COMPLIANT

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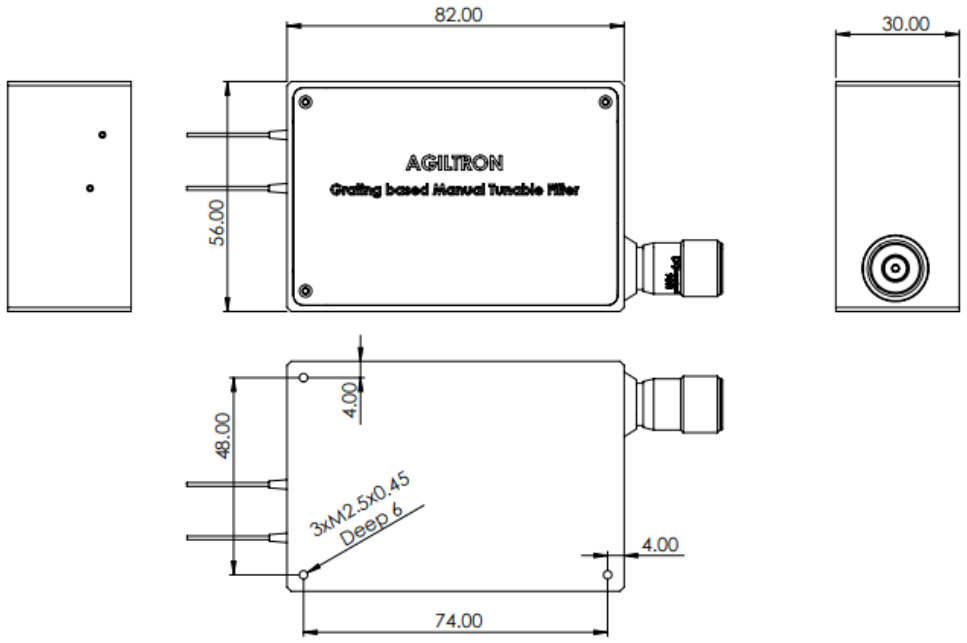
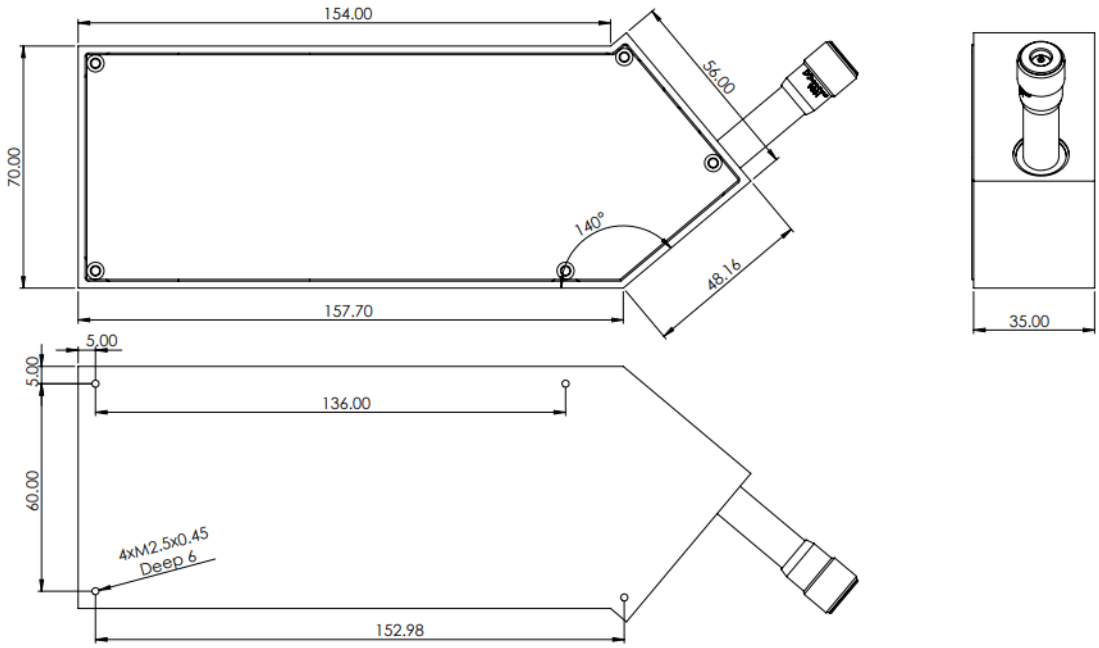
## Mechanical Dimension (mm)




**2000nm**




*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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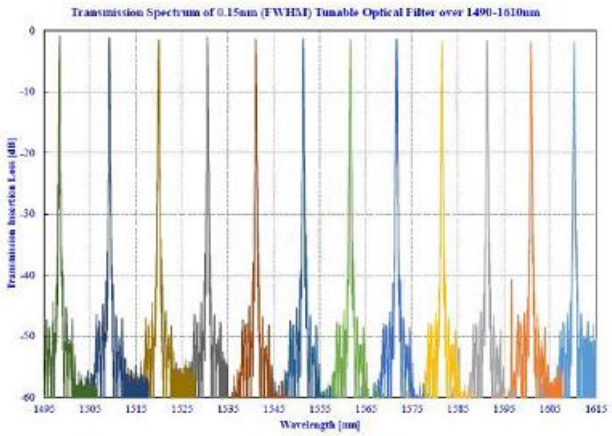
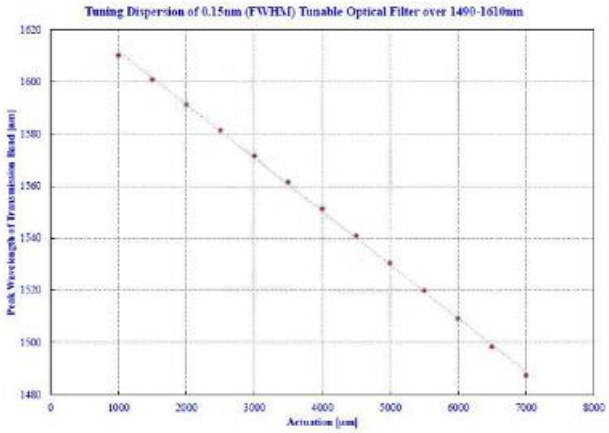
## Spectrum

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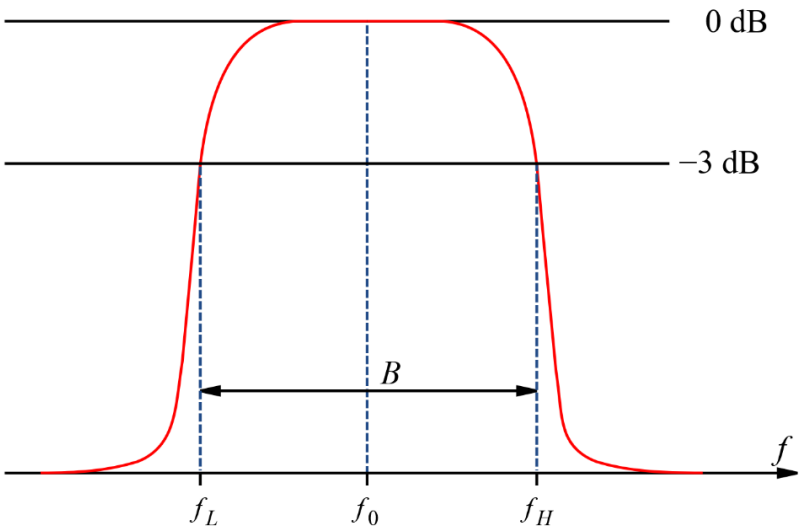
## Bandwidth Definition




## Ordering Information

| | G2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
|---|---|---|---|---|---|---|---|---|
| **Prefix** | | **Wavelength** | **Power** | **Type** | **Fiber Type** | **Fiber Cover** | **Fiber Length** | **Connector** [3] |
| **FOTF-** | 04* | 1060nm = 1<br>1310nm = 3<br>1550nm = 5<br>1600nm = 6<br>2000nm = 2<br>850nm = 8<br>950nm = 9<br>780nm = C<br>630nm = B<br>532nm = A<br>430nm = 4 | Regular = 1<br>5W = 5<br>Special = 0 | B-grade [1] = 1<br>A-grade [2] = 2 | SMF-28 = 1<br>PM1550 = 5<br>HI1060 = 2<br>PM980 = 3<br>PM1310 = 4<br>SM400 = B<br>SM450 = C<br>PM400 = D<br>PM460 = E<br>SM600 = G<br>PM630 = H<br>780HP = 7<br>PM780 = J<br>SM800 = 8<br>PM850 = A<br>SM980 = 9<br>50/125 = K<br>SM1950 = L<br>PM1950 = M<br>Special = 0 | 900um tube = 3<br>Special = 0 | 0.25m = 1<br>0.5m = 2<br>1.0 m = 3<br>Special = 0 | None = 1<br>FC/PC = 2<br>FC/APC = 3<br>SC/PC = 4<br>SC/APC = 5<br>ST/PC = 6<br>LC/PC = 7<br>Special = 0 |

* Old part number

[1]. B-grade < 3.5dB

[2]. A-grade < 2.0dB

[3]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller core fibers.



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## How to test the insertion loss of a tunable optical filter

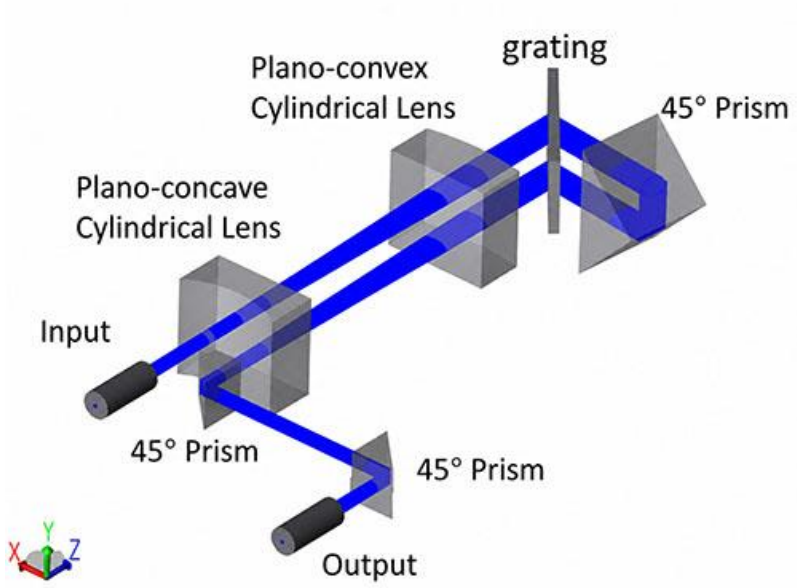
The filter only works in a specific range. Beyond this range, extra peaks may show. These peaks can be blocked with special order. Please follow these instructions to do an optical insertion loss test:

1. Connect a broadband fiber-coupled laser source to OSA, sweep one time over the specified range of the tunable filter, and then fix the curve in Trace A as a reference.

2. Connect the broadband laser source to the fiberoptic tunable filter fiber as input, then connect the other fiber port of the tunable filter as the output to the OSA.

3. Set OSA Trace B as 'write,' Trace C as 'Calculate: B-A.' Auto sweep Trace C from the specific range. Tune the micrometer to shift the peak at a different wavelength. Use 'Peak search' to record IL at a different wavelength."

## Light Path



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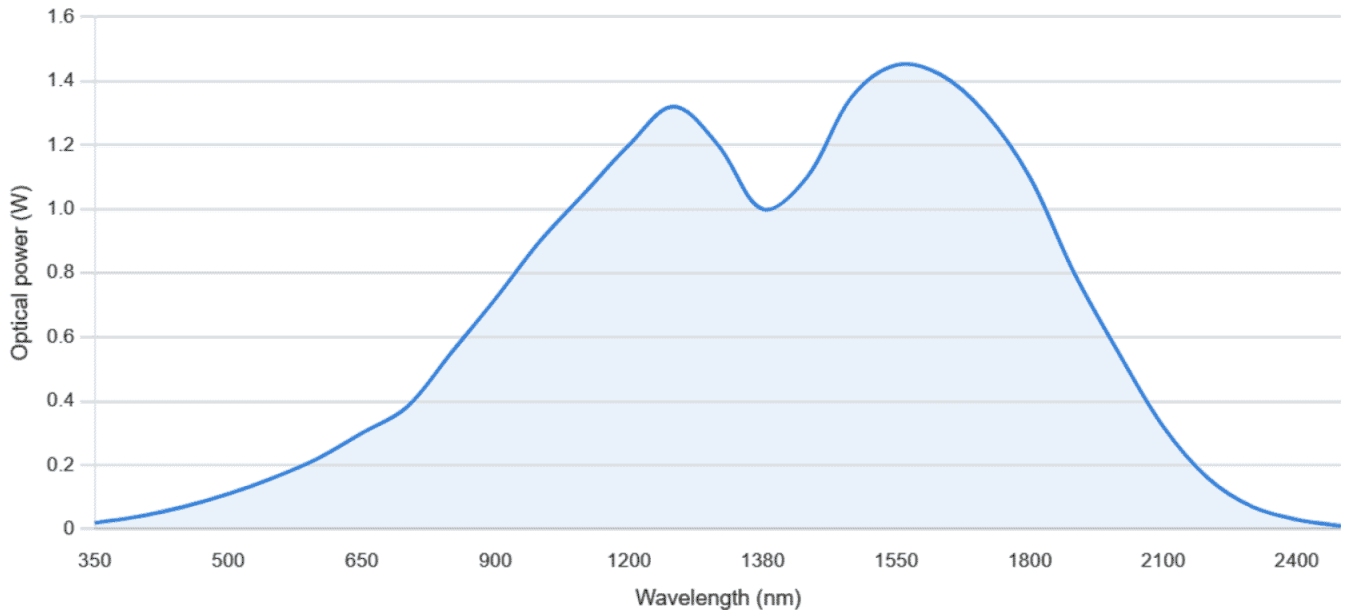
## Regular Single Mode / Polarization Maintaining Fiber Optical Power Handing vs Wavelength




Single mode fiber optical power is limited by nonlinear effects in addition to absorption that increase loss and generate heat. The curve shows the approximate safe CW power envelope for standard single-mode fiber. Actual limits depend on fiber design, core size, length, and laser characteristics. Specialty fibers can significantly increase the power limit.



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