

# Electrically Tunable Fiber Optic Grating Filter



Broadband 150nm tuning range, 0.7nm linewidth, 1.5dB loss, 800 to 1800nm center wavelength, 5W

DATASHEET

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This series of Electrically Tunable Grating-Based Fiber Optic Tunable Filters offers an exceptionally wide tuning range of over 150 nm, low insertion loss (~1.5 dB), and a narrow linewidth of 0.7 to 1.0 nm. The tunable passing band features a Gaussian-shaped peak and is continuously adjustable across a wide spectral range via a grating rotated by a micro-step motor. Wavelength tuning is controlled through a USB or RS232 interface with a GUI, and a 5V DC power supply is included. Utilizing proprietary optics, Agiltron ensures high repeatability, with options for polarization-independent or polarization-dependent operation and strong off-band suppression.

Volume discounts are available for this model.

## Features

- 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 |
|---------------------------------------|-----|---------|------|------|
| Center Wavelength                     | 800 |         | 1800 | nm   |
| Wavelength Tuning Range               |     | 170     | 210  | nm   |
| Tuning Resolution                     | -   | 0.1     | -    | nm   |
| Insertion Loss @1550nm <sup>[1]</sup> | 1.1 | 1.5     | 2.3  | dB   |
| Tuning Speed                          |     | 21      |      | nm/s |
| Bandwidth @-3dB                       |     | 0.7     | 1    | nm   |
| Bandwidth @-20dB                      | -   | 1.4     | -    | 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)           | -   | 0.5     | 5    | W    |
| Electrical Power Consumption          |     | 0.1     | 0.5  | W    |
| 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](#):

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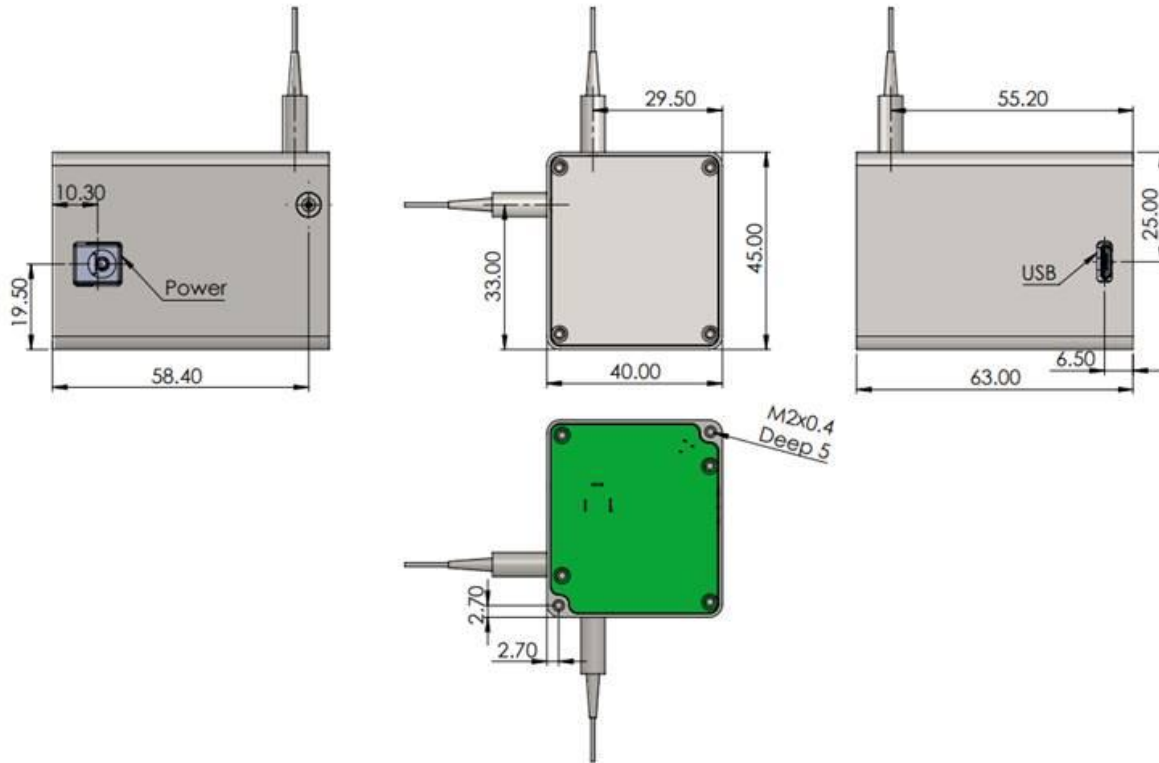
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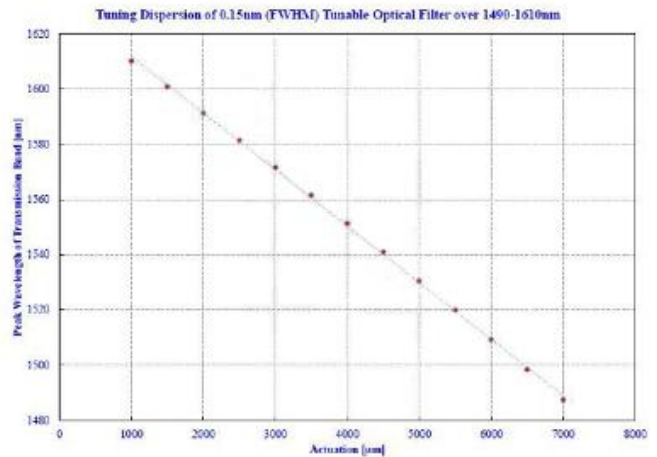
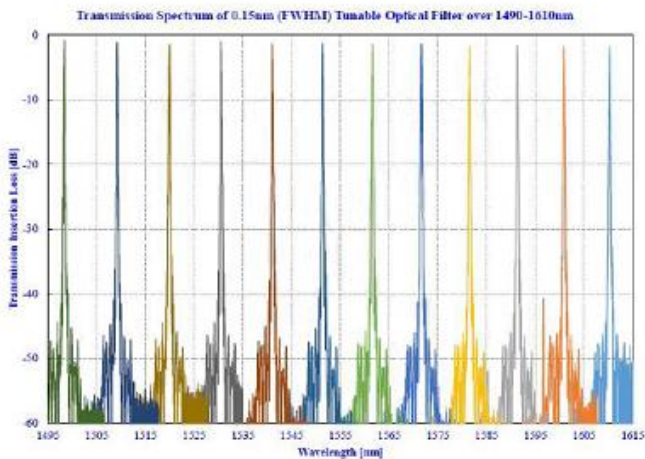
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### Mechanical Dimension (mm)



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

### Spectrum



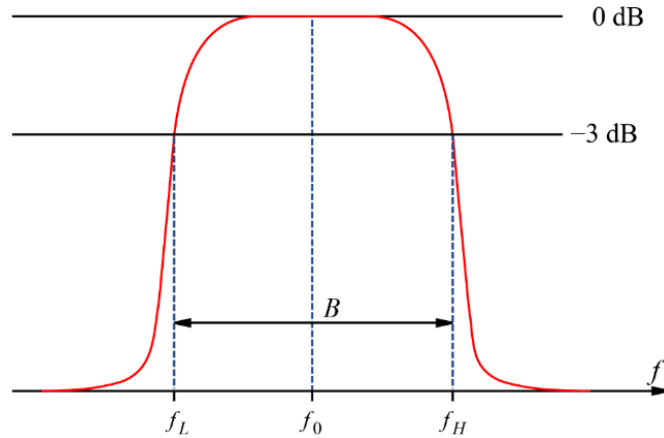
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### Bandwidth Definition



### Ordering Information (Part Number)

| Prefix | Center Wavelength | Power                                | Type                        | Fiber Type   | Fiber Cover                   | Fiber Length                                     | Connector <sup>[2]</sup>   | API <sup>[3]</sup>                   |
|--------|-------------------|--------------------------------------|-----------------------------|--|-------------------------------|--|--|--------------------------------------|
| FOTF-  | G7 <sup>[1]</sup> | Regular = 1<br>5W = 5<br>Special = 0 | Standard = 1<br>Special = 0 | SMF-28 = 1<br>SM450 = 2<br>PM460 = 3<br>SM600 = 4<br>PM630 = D<br>Hi780 = 7<br>PM780 = C<br>SM800 = 8<br>PM850 = A<br>PM980 = B<br>Hi1060 = 6<br>PM1550 = 5<br>SM1950 = 9<br>PM1950 = E<br>Special = 0 | 900um tube = 3<br>Special = 0 | 0.25m = 1<br>0.5m = 2<br>1.0m = 3<br>Special = 0 | None = 1<br>FC/APC = 3<br>FC/PC = 2<br>None = 3<br>LC/PC = 7<br>LC/APC = A<br>LC/UPC = U<br>HFPC <sup>[4]</sup> = H<br>HFAPC <sup>[4]</sup> = K<br>Special = 0 | Non = N<br>Python = P<br>LabVIEW = L |

[1]. Old part number

[2]. The connector cannot be installed directly onto bare fiber, as it 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 can remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SM28 fiber and decreases further with smaller core fibers

[3]. We provide a complete command list for customer integration but do not offer debugging support for customer code. However, an Application Programming Interface (API) service is available for an additional fee to assist with system integration and remote connectivity

[4]. High power connector that must be use in pair

**Red is non-standard specially made at a higher cost. Red wavelength requires \$1650 to buy the grating**

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### Communication protocol

Users can use the following protocol to communicate with the Tunable Filter and control its position.

**Hardware setting:** com port, 9600 bits per second, No parity, Data bits 8, 1 stop bit.

**Command description:**

When powered up, the device sends 'V2'. After successfully initialization, the device sends 'o', otherwise it sends 'e' if there is an error on hardware.

Each command is terminated with ','.

When there is a hardware error, unrecognized command, incorrect command format or the previous command has not completed the device replies with 'e'.

| Command                         | Format | Range  | Reply   |
|---------------------------------|--------|--|---|
| Select channel                  | C[n],  | [n] wavelength(nm);<br>1060<[n]<1100           | [n]   |
| Scan start                      | S[n],  | [n]: scan span;<br>1<[n]<30                    | S: start;<br>S[n]: current wavelength;<br>O: finish |
| Scan start wavelength           | L[n],  | [n]: start wavelength(nm);<br>1060<[n]<1100    | L[n]: previous value                                |
| Scan end wavelength             | H[n],  | [n]: end wavelength(nm);<br>1060<[n]<1100      | H[n]: previous value                                |
| Scan pause time each wavelength | T[n],  | [n]: wait time(second);<br>1<[n]<30; default 1 | T[n]: previous value                                |
| Increase the wavelength         | I[n],  | [n]: Fine tuning up n steps<br>1<[n]<30        | I   |
| Decrease the wavelength         | D[n],  | [n]: Fine tuning down n steps<br>1<[n]<30      | D   |
| Version                         | V,     |  | V2  |

### Operation Manual

1. Connect the accompanied wall pluggable power supply
2. Install the accompanied GUI into a computer
3. Connect the device with the computer using the accompanied cable
4. Connect the optical fibers, normally with one end to a source and the other to a system
5. Open the GUI and start scanning the wavelength

### 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."