MEMS Tunable Fiber Optic Filter

0.8nm peak width, 80nm tuning range, 20ms speed, 1060 to 2000nm

DATASHEET

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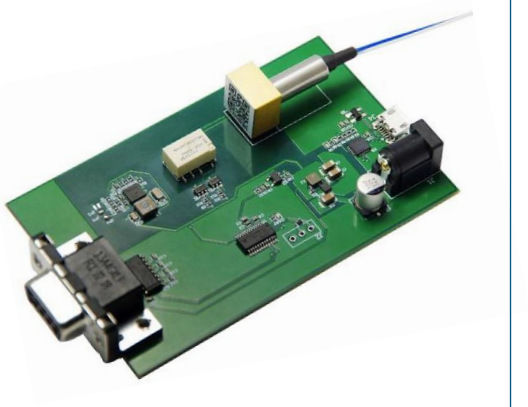

Agiltron offers Fiber Optic MEMS Tunable Filters with central wavelengths of 1060nm, 1310nm, 1550nm, and 2000nm. It is tunable continuously over a spectral range of up to 80nm at a speed of about 80ms. The wavelength tuning is actuated by driving a rotating MEMS mirror that is optically coupled with a grating and a dual fiber collimator. It is conveniently controlled with user-friendly GUI and control interfaces of USB or RS232.

Features

- Compact
- Wide Tune Range
- Low IL and PDL
- Fast Tuning Speed
- USB, RS232 Control Interfaces
- Gaussian-Shaped Passband

Applications

- DWDM networks
- Fiber Sensing
- Tunable Fiber Laser

Specifications

Parameter	Min	Typical	Max	Unit
Center Wavelength	1060	1550	2000	nm
Tuning Range [1]	-	± 40		nm
Wavelength Repeatability	-	0.03	-	nm
Tuning Speed	-	5	-	nm/ms
Temperature Dependent Wavelength			0.008	nm/C°
Insertion Loss [2]	2.5	3	5	dB
Bandwidth @-3dB	0.7	0.8	1.0	nm
Off-Band Suppression	25	30	-	dB
PDL (SM fiber only)	-	0.15	0.35	dB
PMD (SM fiber only)	-	-	0.5	ps
Extinction Ratio (PM fiber only)	18	23	-	dB
Return Loss	40	-	-	dB
Optical Power Handling	-	0.3	0.5	W
Power Consumption (5V power supply)		0.3		W
Operating Temperature	-5	20	70	°C
Storage Temperature	-40	-	85	°C

Notes:

[1]. Longer the wavelength, larger the tuning range

[2]. 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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Rev 10/31/25

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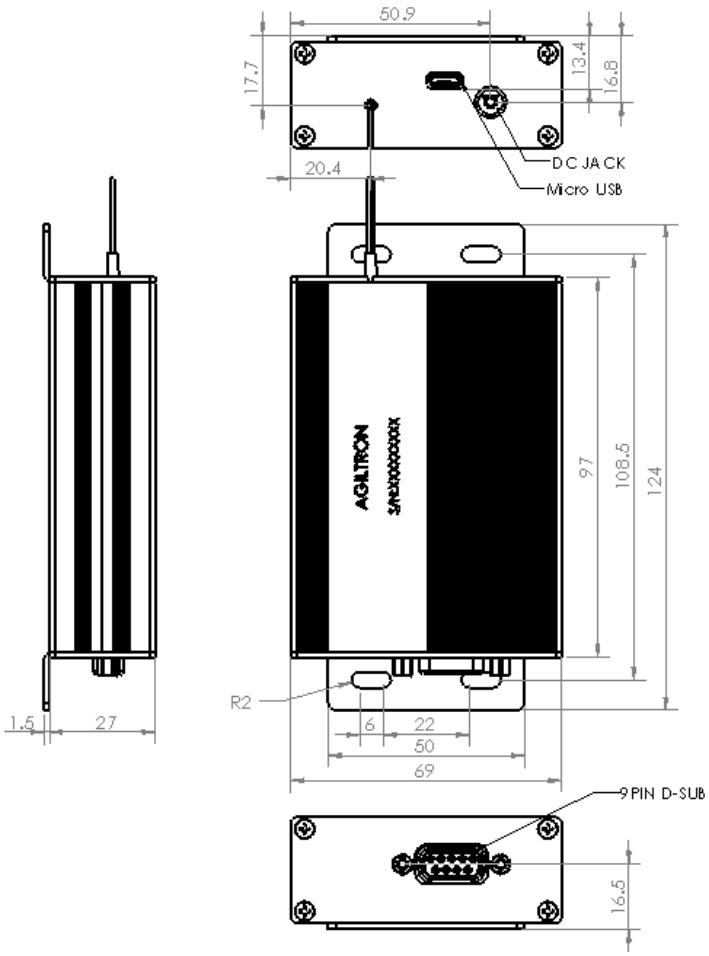
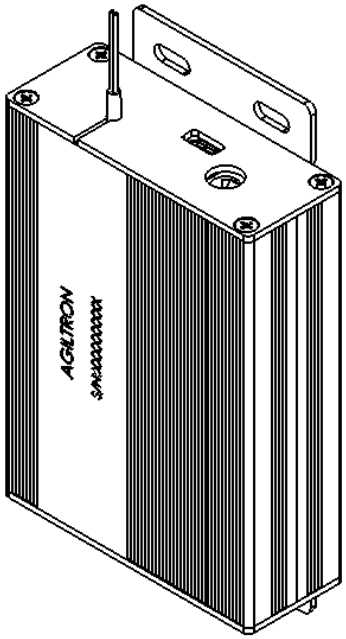
Mechanical Dimension (mm) – With Driver





Ship with a 5V DC power supply, an USB-micro USB cable, an USB flash disk, and user manual.

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

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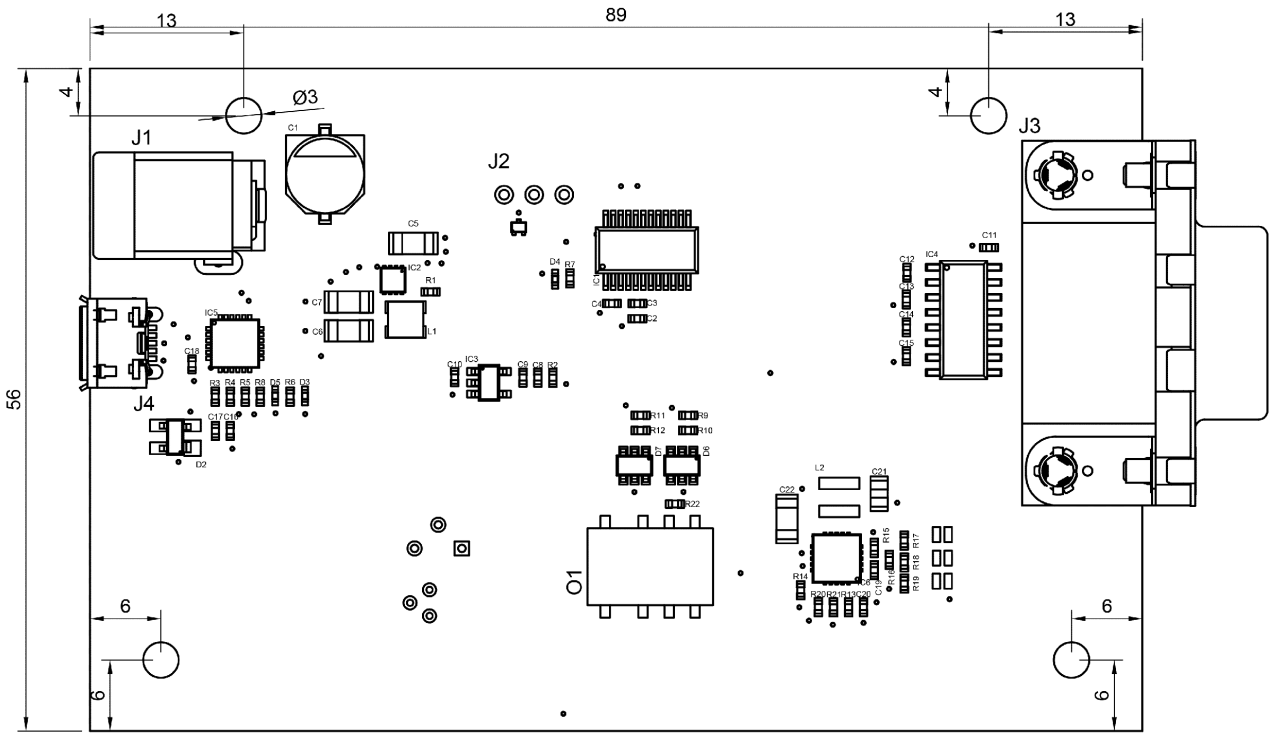
PCB Drawing



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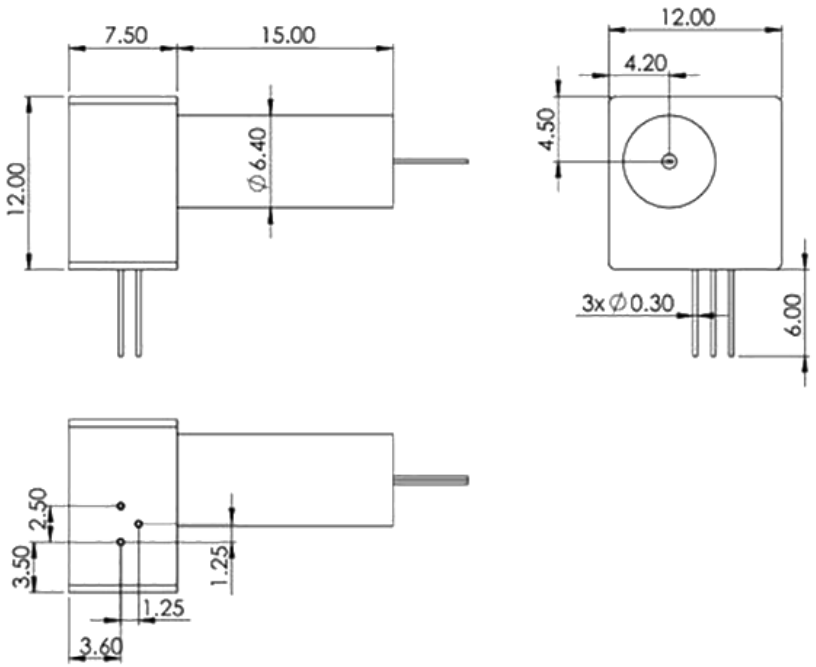
Mechanical Dimension (mm) – No Driver

No driver:



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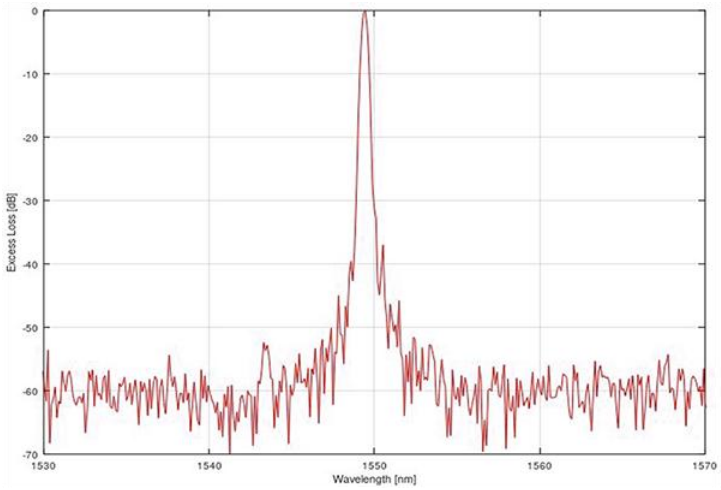
Typical Transmission Curve



Electrical Driving

Agiltron provides communication protocols and a computer control kit with USB or RS232 interface and Windows™ GUI.

Connector Pin Definition:

Power	Pin 1	GND
	Pin 2	12V

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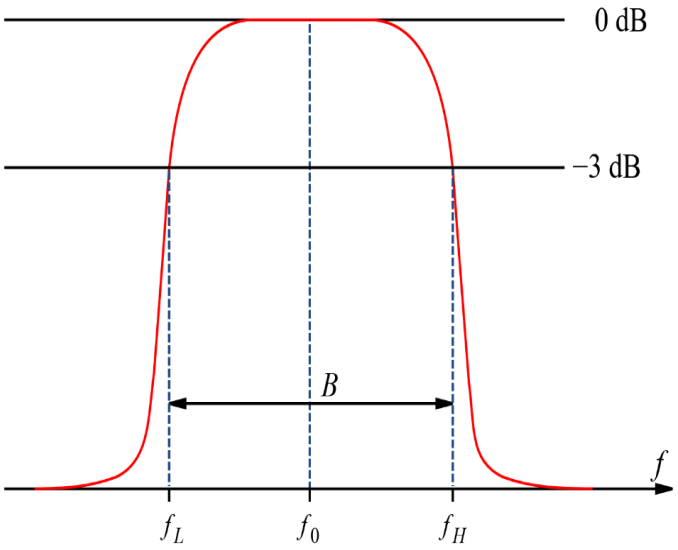
Bandwidth Definition



Ordering Information (Part Number) System

	M8	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**3dB Width**	**Wavelength**	**Power**	**Control**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector[3]**	**API [2]**
FOTF-	C [1]	1528~1610nm = 5 1560~1640nm = 2 1960 ± 40nm = 4 1620 ± 40nm = 7 1480 ± 40nm = 8 1395 ± 55nm = F 1310 ± 40nm = 3 1230 ± 50nm = E 1145 ± 45nm = D 1130 ± 40nm = C 1060 ± 40nm = 6 Special = 0	Standard = 1 High Power = 2	USB = 1 RS232 = 2 None = 5	SMF-28 = 1 HI1060 = 2 PM980 = 3 PM1550 = 4 SM1950 = 5 PM1950 = 6 Special = 0	Bare fiber = 1 900um tube = 3 Special = 0	0.25m = 1 0.5m = 2 1.0 m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 LC/UPC = U Special = 0	Non = N Python = P LabVIEW = L

[1]. Old part number

[2]. 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.

[3]. 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.

Red Items require NRE of $1950 to make the filter

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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."

Command List

```
Command/Echo  /Comments

BaudRate Setting:  115200-N-8-1

CMD:   0x01 0x02 0x00 0x00    /Check Version
Echo:  0x41 0x30

CMD:   0x01 0x12 <WaveLength High Byte> <WaveLength Low Byte>   /Set WaveLength
Echo:  <S1 Byte>       /For inner use, Relay Status
       <DAC High Byte>
       <DAC Low Byte>  /For inner use, DAC value (0-4095)
Fail:  0xFF 0xFF 0xFF

CMD:   0x01 0x13 <DAC High Byte> <DAC Low Byte>                 /Directly Control DAC
Echo:  <S1 Byte>       /Input DAC can be positive or negative, DAC>0 S1=1, DAC<0 S1=0
       <DAC High Byte>
       <DAC Low Byte>  /DAC value (0-4095), Absolute Value

CMD:   0x01 0x14 0x00 0x00                                      /Read Device Status
Echo:  <S1 Byte>       /For inner use, Relay Status
       <DAC High Byte>
       <DAC Low Byte>  /For inner use, DAC value (0-4095)
```


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