

Fiber-Fiber™ MEMS Broadband Optical Attenuator SM, MM

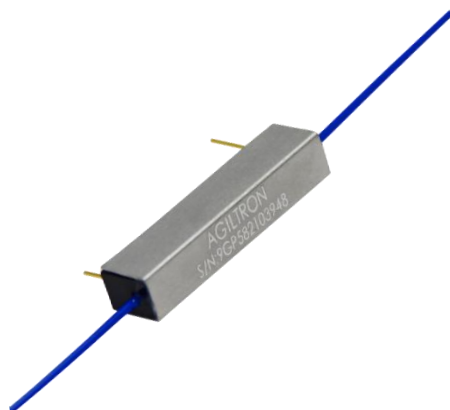


Bidirectional

(Protected by US 11125947 and pending Patents)

DATASHEET

[Return to the Webpage](#)



Features

- Low Insertion Loss
- High Reliability
- Broadband
- High Optical Power

Applications

- Dynamic gain equalization
- Sensor
- Instrumentation



The Fiber-Fiber™ series VOA uses direct fiber-to-fiber coupling with a MEMS shutter, eliminating lenses and optical coatings. It delivers low loss, ultra-broadband performance without altering fiber transmission characteristics, and supports high power in a compact, easy-to-drive design. Standard MEMS chips support fiber core diameters from 3 to 105 μm . Larger diameters are available through special fabrication runs (NRE required). The device complies with Telcordia 1209 and 1221 reliability standards. The VOA operates with low drive voltage, is bidirectional, presents a resistive load, requires no polarity, and is electrostatically insensitive.

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength	380 ^[1]		2000	nm
Band Width	broad same as fiber transmission			
Insertion Loss ^[2]		0.5	1.0	dB
Attenuation Resolution	Continuous			dB
Attenuation Range ^[3] (Core < 8 μm)	35	40	60	dB
Return Loss	28	30	40	dB
Response Time	5	20	30	ms
Optical Power Handling (CW) ^[6]		300	500	mW
Polarization Extinction Ratio	18	20	30	ms
Reliability	Telcordia 1209 and 1221			
Operating Temperature	-40 ~ 70			°C
Storage Temperature	-40 ~ 85			°C
Package Dimension	See drawing			mm
Driving Voltage	50/125	3	5	V
	105/125	13	14.5	
Driving Power Consumption	50/125	100	150	mW
	105/125	410	480	

Notes:

- [1]. Transmission is the same as the fiber without wavelength alternation
- [2]. Measure with CPR<20 laser/LED source and excluding connectors
- [3]. For a larger core, the value is reduced. For Core ~ 105 μm , the max attenuation is about 10dB. The max attenuation is about 15dB for a multimode fiber
- [4]. About 15dB
- [5]. At full attenuation
- [6]. The power handling is related to wavelength: 0.2mW for 380nm, 200mW for 980nm, 500mW for 1060nm
- [7]. The full range voltage is related to the fiber core size, the value for SM28 fiber only

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](#):

Legal notices: All product information is believed to be accurate and is subject to change without notice. Information contained herein shall legally bind Agiltron only if it is specifically incorporated into the terms and conditions of a sales agreement. Some specific combinations of options may not be available. The user assumes all risks and liability whatsoever in connection with the use of a product or its application.

Rev 02/18/26

P +1 781-935-1200

E sales@agiltron.com

W www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice. Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber-Fiber™ MEMS Broadband Optical Attenuator SM, MM



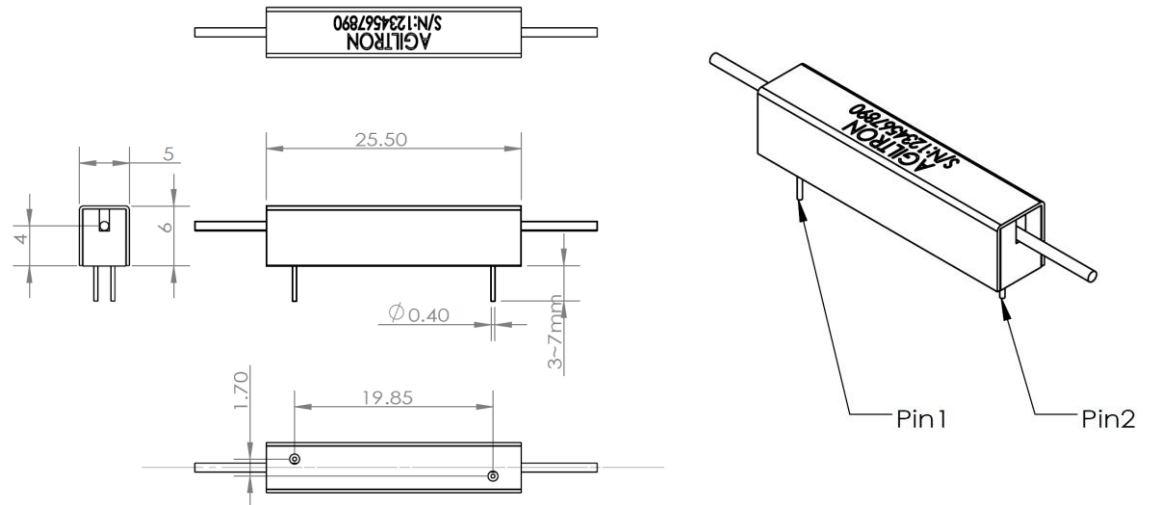
Bidirectional

(Protected by US 11125947 and pending Patents)

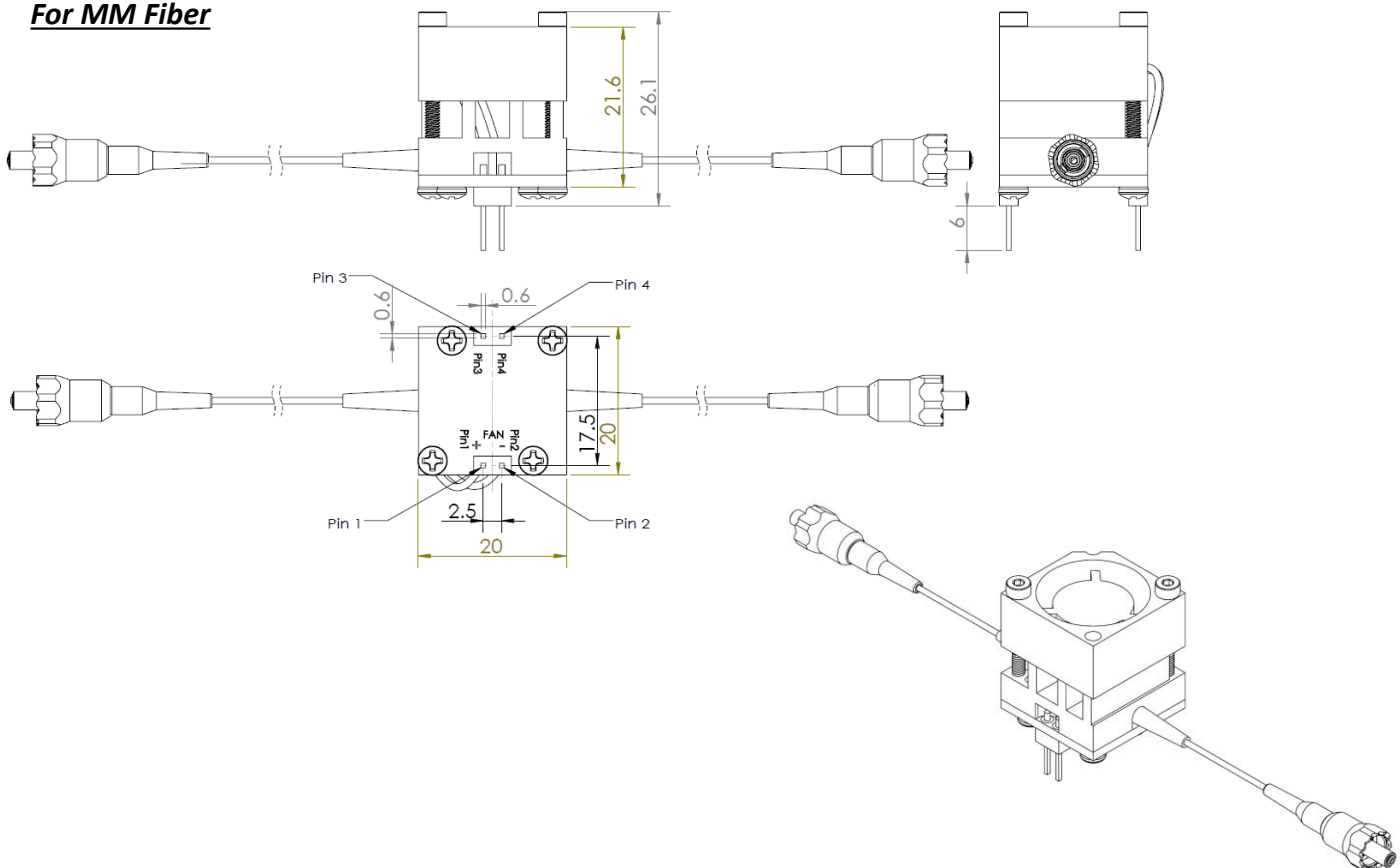
DATASHEET

Mechanical Dimensions-Package

For SM/PM Fiber



For MM Fiber



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

+1 781-935-1200

sales@agiltron.com

www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice. Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber-Fiber™ MEMS Broadband Optical Attenuator SM, MM



Bidirectional

(Protected by US 11125947 and pending Patents)

DATASHEET

Electrical Driving Information

For SM/PM Fiber

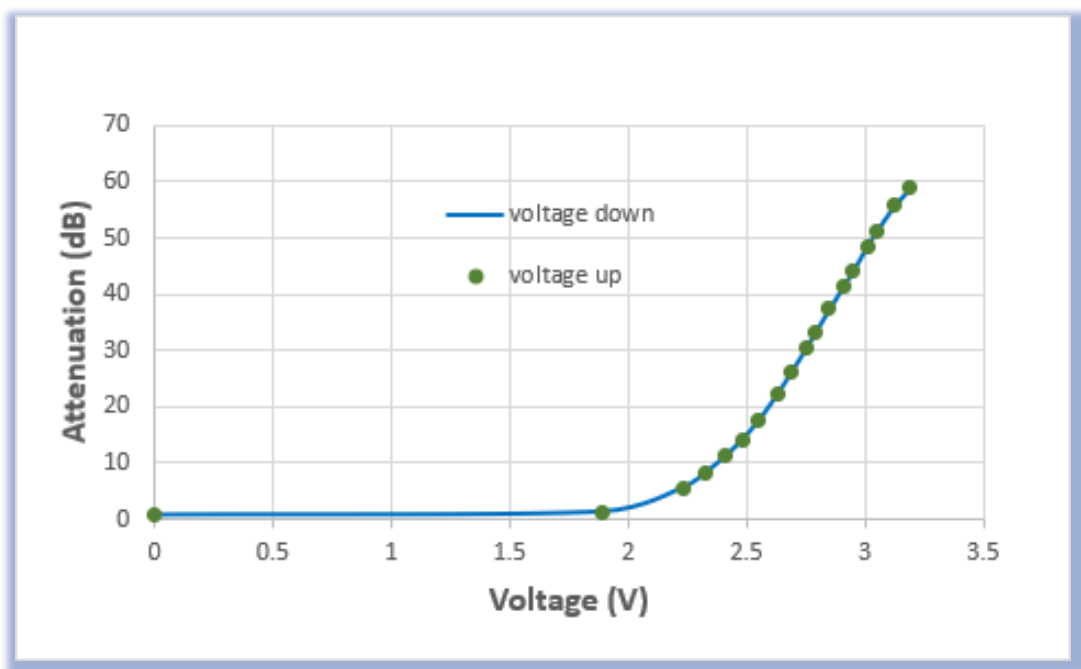
FVOA IL control	Pin 1	Pin 2
SM/PM Fiber	DC 0 ~ 5.5 V (0V)	DC 0V (0 ~ 5.5 V)

For MM Fiber

	Pin 1	Pin 2
Fan control	DC 5 V	0 V

FVOA IL control	Pin 3	Pin 4
fiber core $\leq 62.5 \mu\text{m}$	DC 0 ~ 5.5 V	0 V
fiber core 105 μm	DC 0 ~ 14.5 V	0 V

Typical Response for SM28 Fiber



+1 781-935-1200

sales@agiltron.com

www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Fiber-Fiber™ MEMS Broadband Optical Attenuator SM, MM

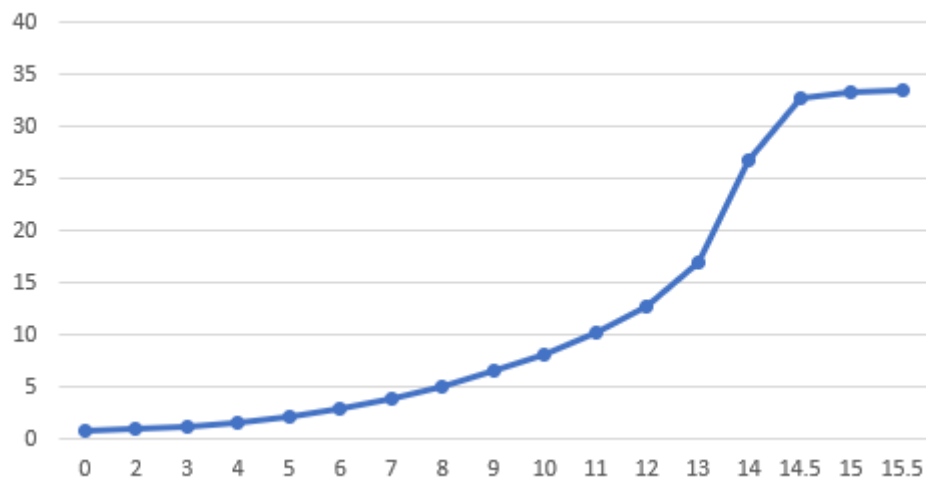


Bidirectional

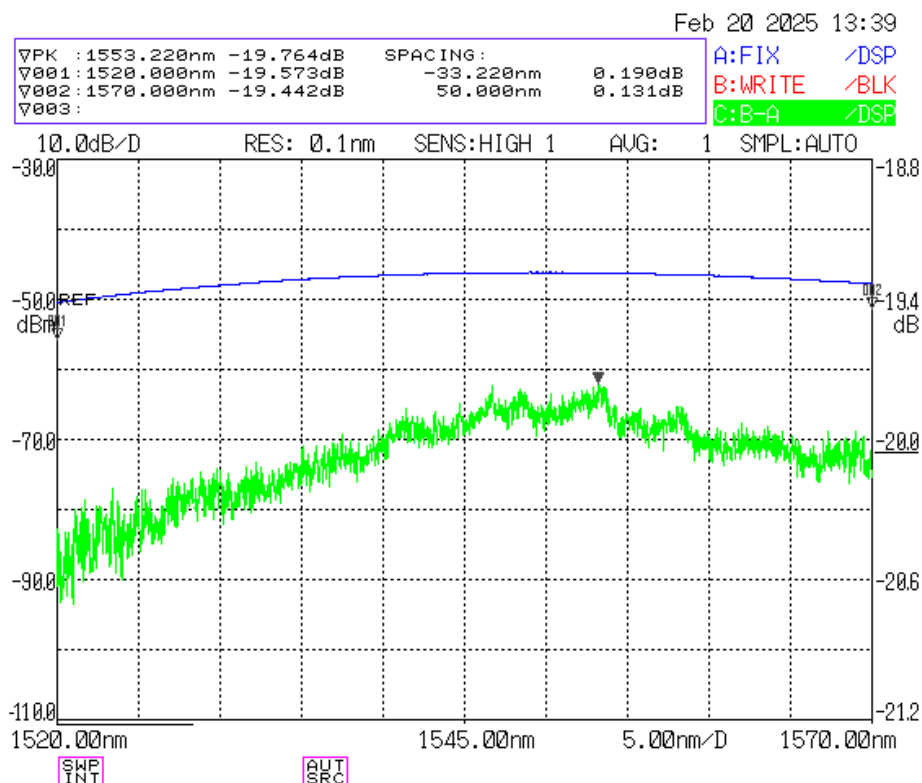
(Protected by US 11125947 and pending Patents)

DATASHEET

Typical Response 105/125 Fiber



Typical Wavelength Dependence @20dB Attenuation



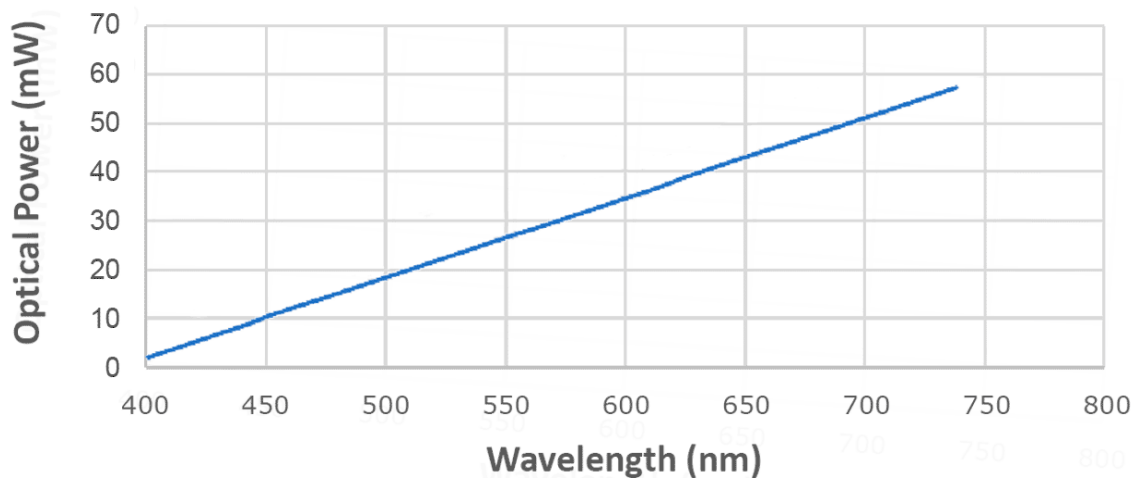
+1 781-935-1200

sales@agiltron.com

www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice. Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Optical Power Handling vs Wavelength for Standard SM Fibers



Fiber-Fiber™ MEMS Broadband Optical Attenuator SM, MM



Bidirectional

(Protected by US 11125947 and pending Patents)

DATASHEET

Ordering Information (Part Number)

Prefix	Configuration	Type	Test Wavelength	Fiber Type ^[2]	Fiber Cover	Fiber Length	Connector ^{[3][4]}
FVOA-	Standard = 11 Beam Expand ^[1] = 22 Special = 00	Normally Open = 1	488 = 4 532 = 5 630 = 6 780 = 7 850 = 8 980 = 9 1060 = 1 1310 = 3 1550 = C 2000 = 2 Special = 0	<i>Pick from below table</i>	Bare fiber = 1 900um tube = 3 Special = 0	0.25m = 1 0.5m = 2 1.0m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 LC/APC = A LC/UPC = U Special = 0

Fiber Type Selection Table:

01	SMF-28	34	PM1550	71	MM 50/125μm
02	SMF-28e	35	PM1950	72	MM 62.5μm
03	Corning XB	36	PM1310	73	105/125μm
04	SM450	37	PM400	74	FG105LCA
05	SM1950	38	PM480	75	FG50LGA
06	SM600	39	PM630	76	STP 50/125
07	Hi780	40	PM850	77	IRZS23
08	SM800	41	PM980	78	IRFS32
09	SM980	42	PM780		
10	Hi1060	43			
11	SM400	44	PM405		
12		45	PM460		
13		46			

[1]. Beam expanding increase the power handling

[2]. For a larger core, the value of the Attenuation is reduced.
For Core ~ 105μm, the max Attenuation is about 10dB

[3]. Regular fiber connector has PER ~22dB. Connector with PER >27 dB is available using special process

[4]. 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.

Application Notes

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

+1 781-935-1200

sales@agiltron.com

www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.