

# Fiber-Fiber™ MEMS Broadband Optical Attenuator

(Patent pending)

## Product Description

The **Fiber-Fiber™** series VOA is based on fiber to fiber direct coupling with a micro-electro-mechanical (MEMS) shutter in between. It eliminates the need for lens and optical coating, featuring low loss, ultra-broadband without altering fiber transmission character, high power, compact size, and easy drive. The current MEMS chips accommodate fiber with core diameter from 5 to 105  $\mu\text{m}$ . VOAs with fiber of larger diameters can be made with special chip fabrication run with a NRE charge. The **Fiber-Fiber™** series VOA is compliant with the Telcordia 1209 and 1221 reliability standards. The VOA is driven by directly applying a low electrical voltage.

## Features

- Low Insertion Loss
- High Reliability
- Low Cost
- Low power consumption
- Super compact



## Performance Specifications

Fiber-Fiber™ series VOA	Min	Typical	Max	Unit
Wavelength	380 <sup>[1]</sup>		2000	nm
Band Width	Broad band without coating			
Insertion Loss <sup>[2]</sup>		0.5	1.0	dB
Attenuation Resolution		Continuous		dB
Attenuation Range	Core < 60 $\mu\text{m}$	40	60	dB
	Core ~ 105 $\mu\text{m}$	30	35	
Return Loss		30	40	dB
Response Time	5	20	30	ms
Power Handling		500	800	mW
Driving Voltage (full range)		3.5	5	VDC
Power Consumption	0	80 <sup>[3]</sup>	220 <sup>[4]</sup>	mW
Reliability	Telcordia 1209 and 1221			
Operating Temperature		-5 ~ 70		°C
Storage Temperature		-40 ~ 85		°C
Fiber Type		50/125, 62.5/125,		
Package Dimension		See drawing below		
				mm

Notes:

[1] Transmission is the same as the fiber without wavelength alternation

[2] Measure with CPR < 20 laser/LED source and excluding connectors

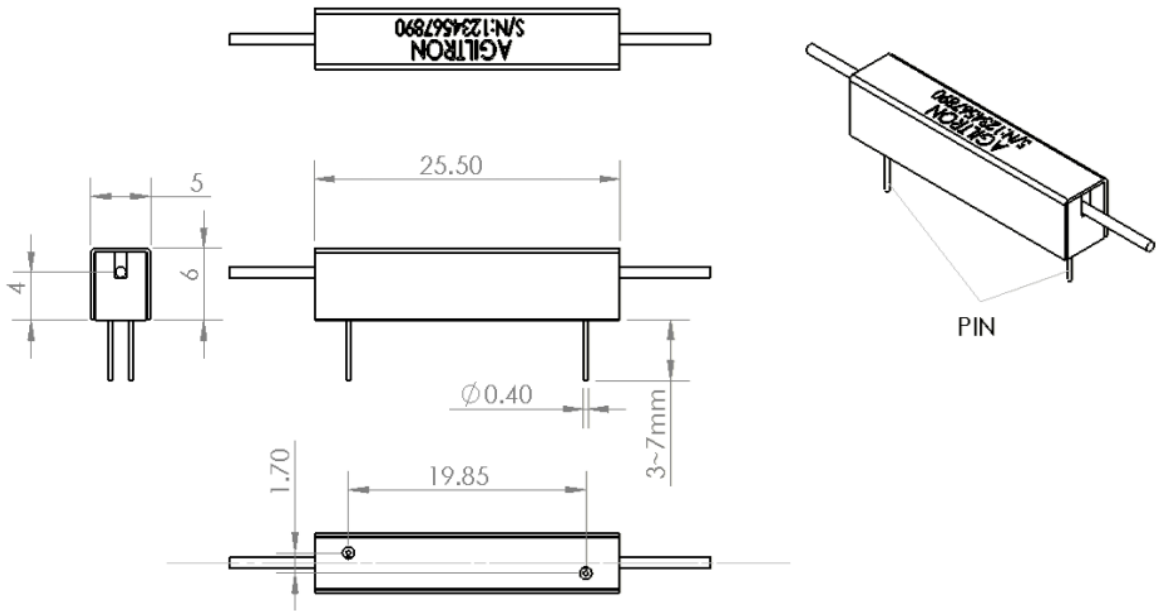
[3] about 15dB

[4] at full attenuation

## Applications

- Dynamic gain equalization
- Variable MUX/DeMUX
- Instrumentation

## Mechanical Dimensions-Package



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

## Electrical Driving Information

Pin No.	Definition	Voltage(V)	Pin No.	Definition	Voltage(V)
1	VOA	0 ~ 4.7	2	VOA	0

\*This device has no polarity.

## Ordering Information

FVOA-	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Configuration	Type	Test Wavelength	Fiber type		Fiber Length	Connector
	Standard = 11 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	SM28= 44 50 μm Core = 11 60 μm Core= 22 105 μm Core= 33 Special =00	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=7 Special=0