

MEMS Reflective Fiber Optical Variable Attenuator

(Protected by US Patent 10752492B2)



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Features

- High Reliability
- Direct DC drive
- Ultra Small
- ESD Insensitive

The MEMS Series Fiber Optical Variable Attenuator uses a patented thermal-activated micro-mirror, moving-in and -out optical paths, uniquely featuring a large extinction ratio, high stability over a wide temperature range, and a very long life cycle. The thermal MEMS is insensitive to moisture and ESD without drift issues, providing a high-reliability platform for over 25 years of continuous operation. The MEMS Straight Series VOAs are configured in single and dual channels (activated at the same time). The VOAs are bidirectional and are Telcordia standards GR1221 qualified.

Agiltron provides customized design and modular assemblies to meet control and integration applications.

Specifications

Parameter		Min	Typical	Max	Unit
Operation Wavelength	Single Mode	1260 ~ 1610			nm
	Multimode	810-890	1260-1360	1500-1600	
Insertion Loss ^{[1], [2]}			0.6	1.0 / 1.2 ^[3]	dB
PDL (SM)				0.1	dB
Extinction Ratio (PM fiber)		18			dB
Return Loss	SM, PM	50			dB
	Multimode	35			
Attenuation	SM, PM	55 ^[4]		75	dB
	Multimode	45		70	
Response Time			3	7	ms
Repetition Rate				20	Hz
Durability		10 ⁹			Cycle
Power Consumption (at maximum)				170	mW
Operating Temperature ^[5]		-5		+75	°C
Storage Temperature		-40		+85	°C
Optical Power Handling (CW)			300	500	mW
Package Dimension		10L x 6.6W x 4.6H			mm
Fiber Type	Single Mode	SMF-28 or equivalent			
	PM	Panda 150 PM or equivalent			
	Multimode	MM 50/125, MM 62.5/125 or equivalent			

Note:

- [1]. Excluding connectors.
- [2]. Multimode IL measured @ Light Source CPR < 14dB.
- [3]. Dual band.
- [4]. High attenuation > 70dB is available, please contact us.
- [5]. Lower temperature version is available, please call us



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Rev 05/27/26

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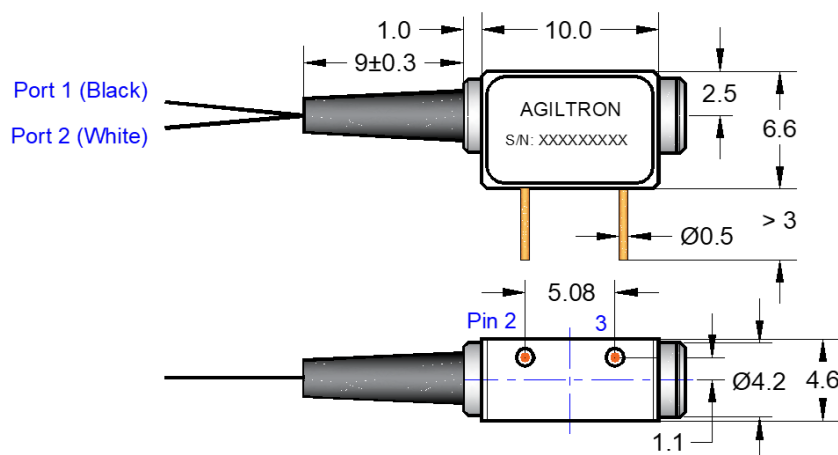
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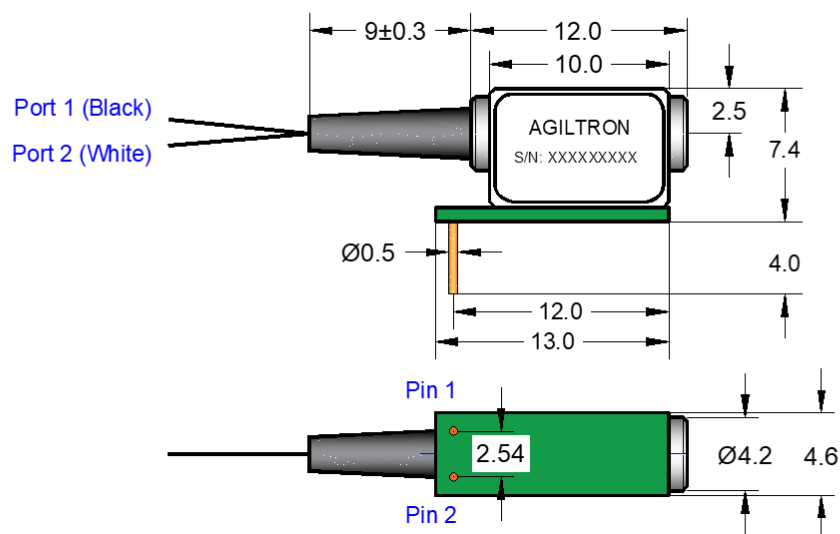
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Mechanical Dimension (unit: mm)

Package 3: Standard package



Package 5: Add Adapting PCB version



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

Electrical Driving Requirements

1. Resistance load device, insensitive to ESD.
2. Highly recommend to add 70 ohm resistor in series on Pin 3 in driver to smooth the attenuation slope.
3. **Warning: Damaged if applying voltage over the maximum (even for a short time)**
4. Pin 2 = 0V, Pin 3 = 0~4.5V (maximum)

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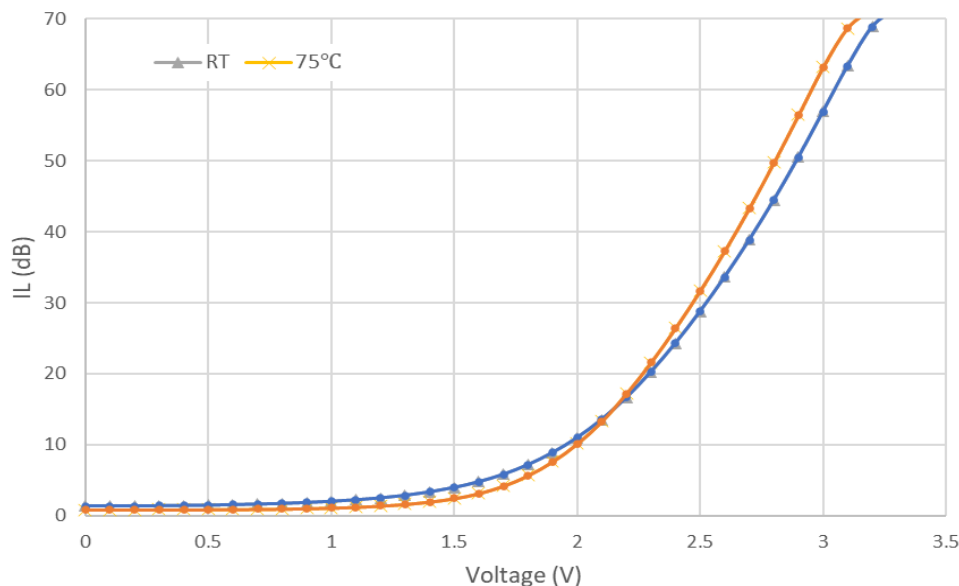
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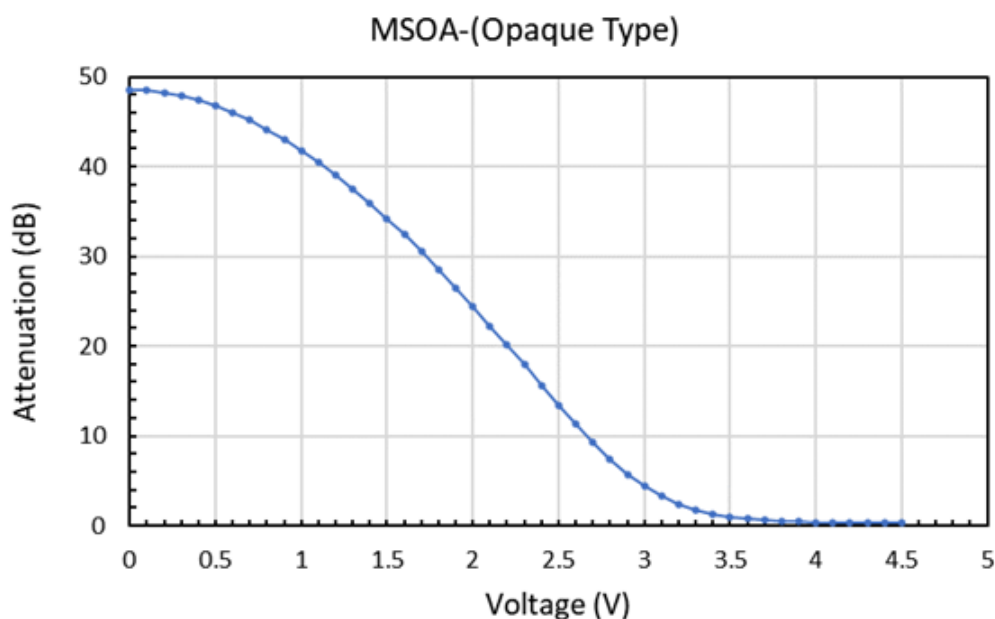
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Typical Attenuation vs. Voltage w/ T compensation for Transparent Type



Note: Measured by adding the resistor and temperature compensation on MSOA.

Typical Attenuation vs. Voltage for Opaque Type



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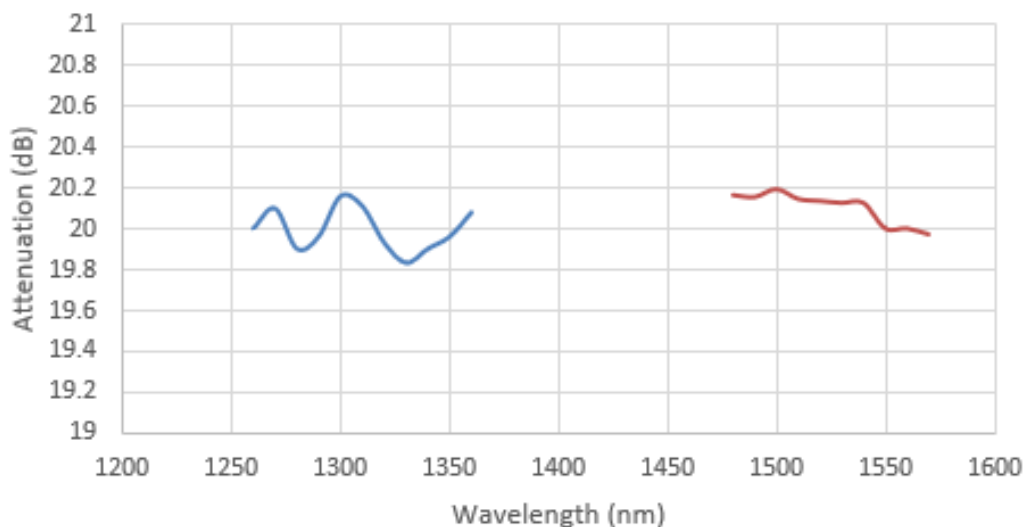
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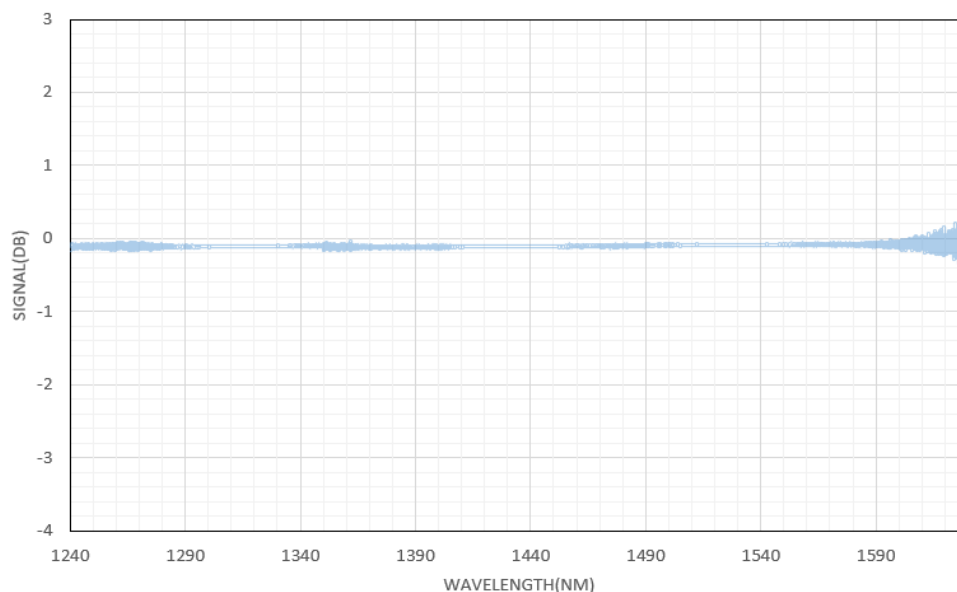
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Typical Attenuation vs. Wavelength for WDL at 20 dB



Typical Insertion Loss vs Wavelength (1240-1630nm)

1x2 MEMS Switch



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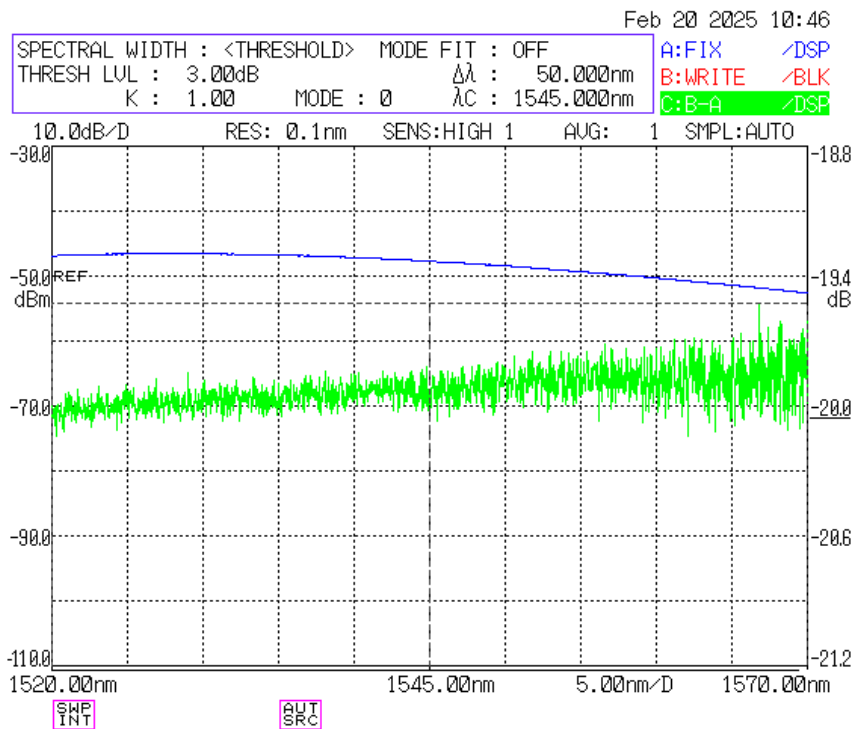
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Typical Wavelength Dependence @20dB Attenuation



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Ordering Information (Part Number)

Prefix	Non-Power State	Test Wavelength	Temperature Range	Package	Fiber Type	Fiber Cover	Fiber Length	Connector ^{[7][8]}
MSOA-	Transparent = 01 Opaque ^[1] = 02	1260~1620 = B 1060 = 1 1310 = 3 1550 = 5 850 = 8 850/1310 = A Special = 0	-5 to 75°C = 1 -40 to 75°C = 2	Package 3 ^[2] = 3 Package 4 ^[3] = 4 Package 5 ^[4] = 5 Package 6 ^[5] = 6 Package 7 ^[6] = 7 Special = 0	SMF-28 = 1 PM1550 = B PM1310 = D PM980 = E PM850 = F MM 50/125 = 5 MM 62.5/125 = 6 Special = 0	Bare fiber = 1 900µm 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 LC = 7 Special = 0

[1]. Opaque means the light is blocked when no electrical power is present.

[2]. Package 3 (see Drawing) is Standard package.

[3]. Package 4 is Package 3 with Temperature compensated function.

[4]. Package 5 (see Drawing) adds Adapting PCB version.

[5]. Package 6 is Package 5 with Temperature compensated function.

[6]. Package 7 is Package 3, and Attenuation is >70 dB version.

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

[8]. 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.

Note:

"transparent" means no attenuation without applying a controlling voltage, the "opaque" means the highest attenuation without applying a controlling voltage.

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