

SFP Variable Optical Attenuator



US patent 8,666,218 and other patents pending)

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Features

- SFP Compact Form
- Hot Pluggable
- Duplex LC Connector
- Optical Power Monitoring
- I2C Communication Interface
- Low Power Consumption

Applications

- Power Control
- Power Regulate
- Instrumentation

Agiltron's etMEMS™ Series SFP VOA is based on a proprietary micro-electro-mechanical mechanism featuring compact design, simple construction, easy direct drive, and excellent optical performance. The SFP VOA integrates a single channel VOA and tap power monitor into MSA compliant compact SFP form factor and provides I2C communication interface for easy system integration.

The device has a built-in firmware that linearizing the attenuation to the control signal. The power tap provides a digital warning when the output optical signal level below certain level. Either normally-open or normally- closed configurations are available.

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength	1250-1650			nm
Insertion Loss ^[1]		1	1.5	dB
Attenuation Range	30	30	50	dB
Polarization Dependent Loss@20dB		0,15	0,3	dB
Wavelength Dependent Loss@10dB		0,3	0,5	dB
Attenuation Resolution			0,1	dB
Polarization Mode Dispersion		0,01	0,05	ps
Return Loss	40			dB
Response Time		5	10	ms
Power consumption ^[2]		30	100	mW
Optical Power Handling		300	500	mW
Operating Temperature	-5		75	°C
Storage Temperature	-40		85	°C

Notes:

[1]. Include both input and output connectors

[2]. For full dynamic range

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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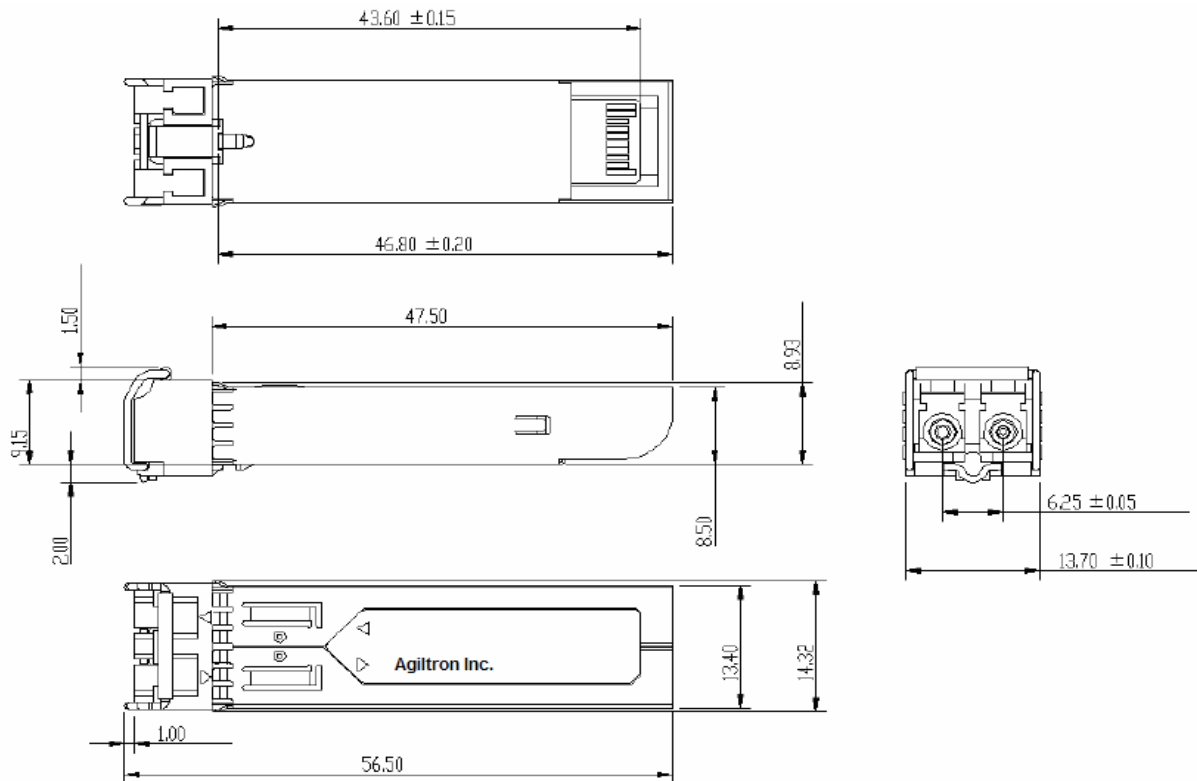
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Mechanical Footprint Dimensions (mm)



All Pin diameter = 0.45mm

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

Electrical Pin Assignment

The electrical pad layout is defined as below per the MSA agreement

20	GND
19	N/C
18	N/C
17	GND
16	3.3V Power
15	3.3V Power
14	GND
13	N/C
12	N/C
11	GND

Top of Board (label Side)

1	GND
2	Fault Alarm
3	Optical Shutter Mode
4	Serial Data
5	Serial Clock
6	GND
7	N/C
8	Loss of Output Power Alarm
9	GND
10	GND

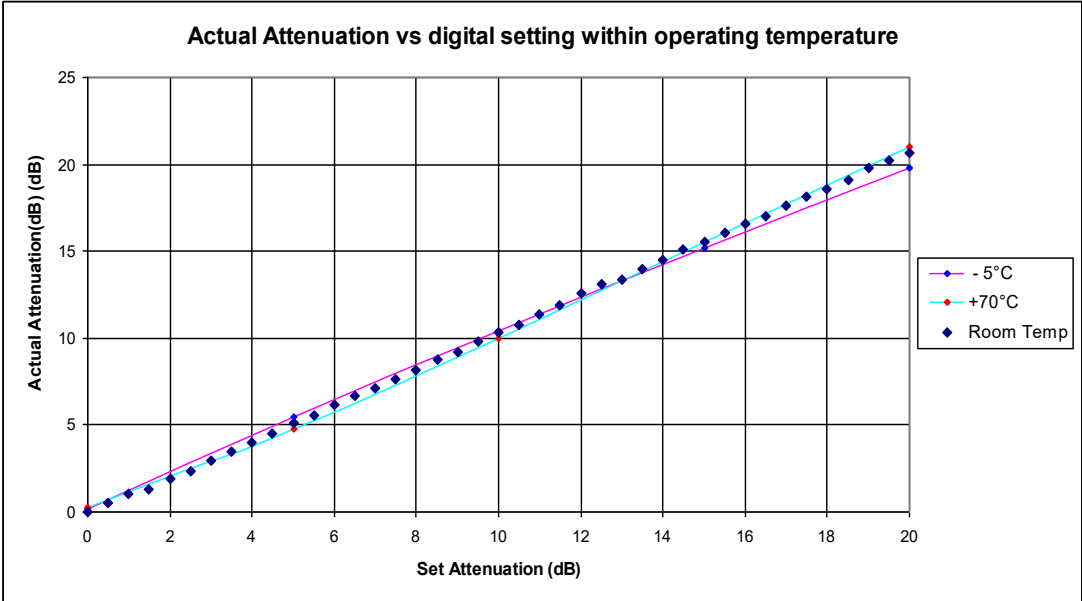
Bottom of Board (as viewed thru top of the board)

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Typical Performance Chart



Ordering Information (Part Number)

	☐ ☐	☐	☐	☐	1	1	0	☐
Prefix	Type	Wavelength	Off State	Mode				Connector ^[1]
SFOA-	Standard = 11	1310 = 3 1550 = 5 C+L = 2 1260~1620 = 8 Special = 0	Transparent = 1 Opaque = 2	Single mode = 1 Multimode = 2				LC/PC = 1 Special = 0

[1]. 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.

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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 ($<5\ \mu\text{m}$) 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.