



Features

- Solid-state
- High speed
- Ultra-high reliability
- Low insertion loss
- Compact

Applications

- Optical blocking
- Configurable operation
- Instrumentation



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Rev 06/11/26

The Nano-speed Broadband Variable Fiber Optical Attenuator (NSBA) provides electrical control of optical power using a patent-pending configuration activated by a voltage signal. Its solid-state optical crystal design eliminates mechanical movement and organic materials, ensuring ultra-high reliability and fast response times. The NSBA supports a wide wavelength range and is packaged with a driver that includes an SMA 0-5V control input and a 12V power supply input. It is bidirectional, with two configurations: normally-transparent, where light passes through without applied voltage, or normally-opaque, where light is blocked without voltage. The wavelength range and attenuation levels depend on the number of electro-optic crystal stages, while response speed is influenced by attenuation level and driver power. Small attenuation levels can achieve response speeds up to MHz.

Specifications

Parameter		Min	Typical	Max	Unit
Central wavelength		960		2300	nm
Insertion Loss ^[1]	1260~1650nm		1	1.5	dB
	960~1100nm		1	1.6	dB
Operation Wavelength Band (3dB @10dB attenuation)		±30		±150	nm
Attenuation Range ^[2]		18	25	32	dB
PDL (SMF VOA only)			0.1	0.3	dB
PMD (SMF VOA only)			0.1	0.3	ps
ER (PMF VOA only)		18	25		dB
Resolution			Continuous		dB
Return Loss		45	50	60	dB
Driver Repeat Rate		100kHz driver	DC	100	kHz
Small Modulation rate ^[3]		0.1		5	MHz
Optic Power Handling ^[4]	Normal power VOA		300		mW
	High power VOA	5	10	20	W
Operating Temperature ^[5]		-5		45	°C
Storage Temperature		-40		85	°C

Notes:

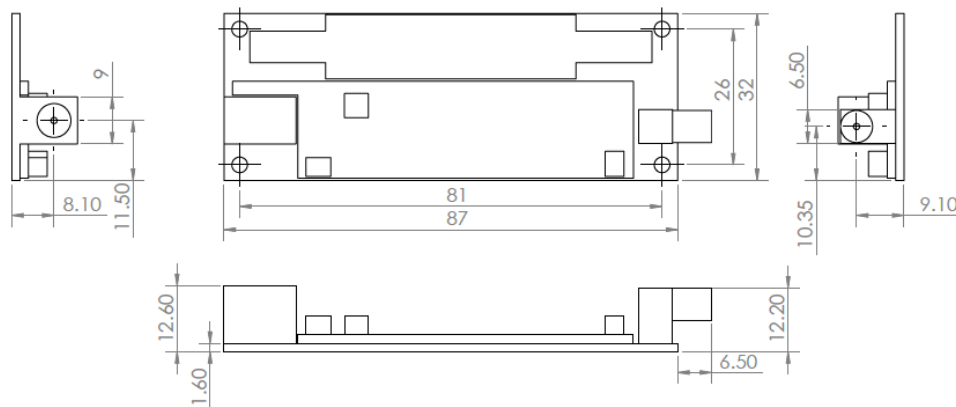
- [1]. Measured with 60nm bandwidth at 1550nm. Without connector. Connector adds 0.3dB each
- [2]. Full attenuation is measured at 5kHz, which may be degraded at the high repeat rate.
- [3]. maximum modulation depth is 5~10%.
- [4]. Defined at 1310nm/1550nm. For the shorter wavelength, the handling power is reduced
- [5]. The VOA can be operated in a wider temperature range from as -10 to 70°C, but some performances such as the maximum attenuation will be degraded.

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](#):

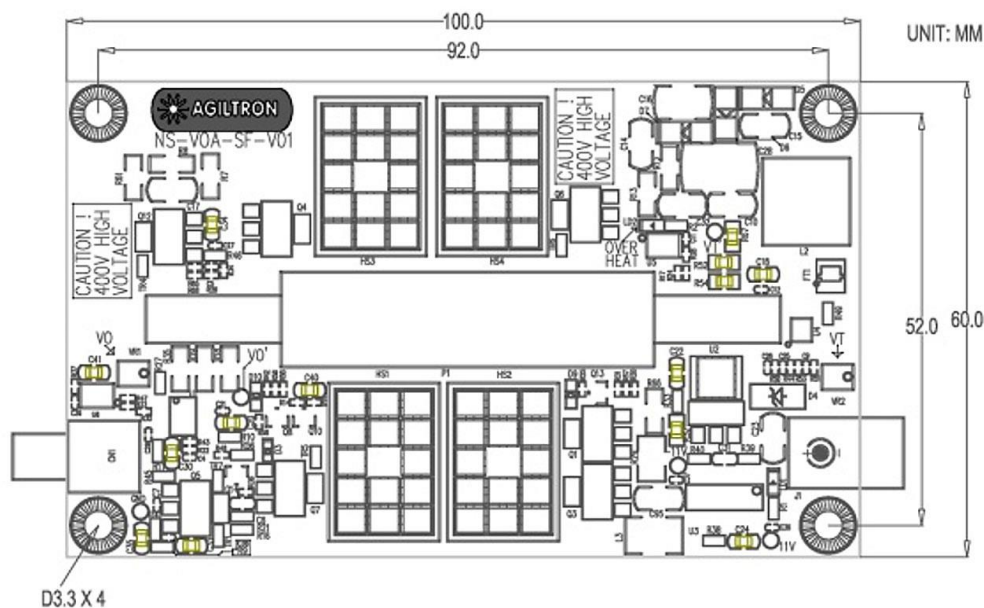
Warning: The device mounted on the PCB is an OEM module designed for system integration only, not for general uses. Do not touch the PCB by hand. The electrical static can kill the chips even without a power plug-in, and unpleasant electrical shock may also be felt. For laboratory use, please buy a protected Turnkey system.

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Module Dimensions (mm) with Driver PCB and Regular Power NSVS



20kHz Driver (87mm x 32mm)



100kHz Driver (100mm x 60mm)

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

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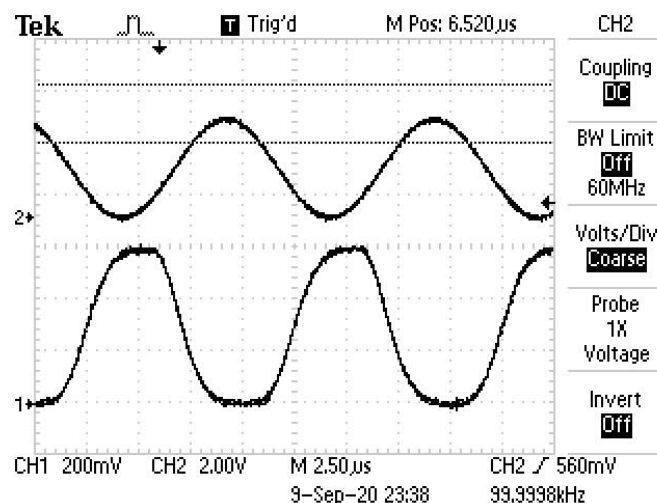
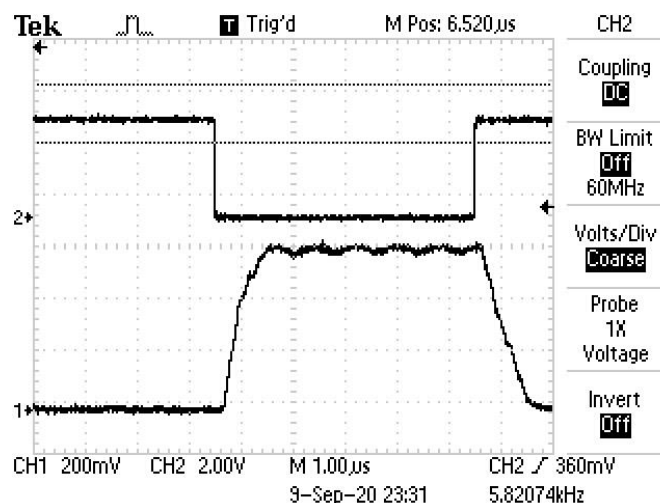
E sales@agiltron.com

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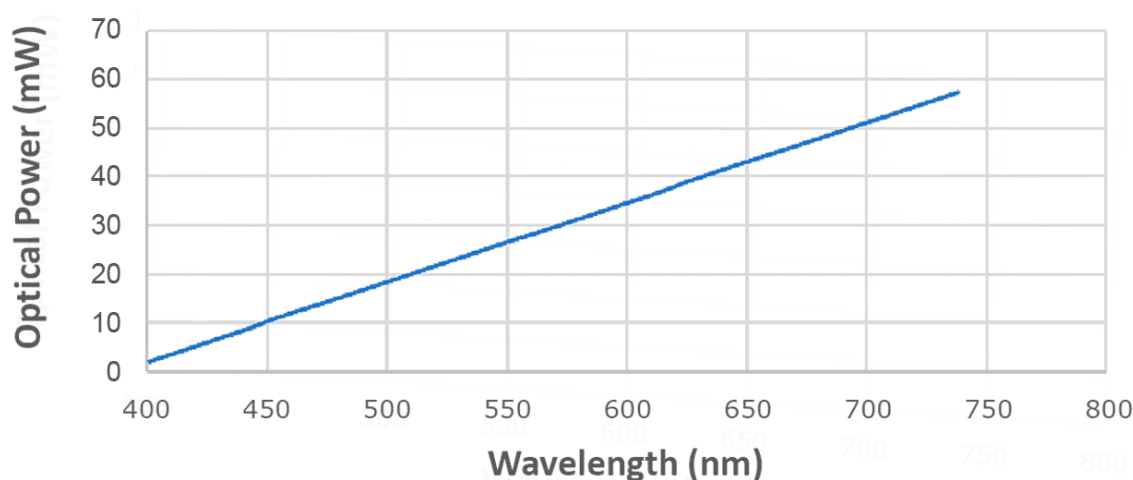
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Typical High Speed Response



Optical Power Handling vs Wavelength for Standard SM Fibers



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Ordering Information (Part Number)

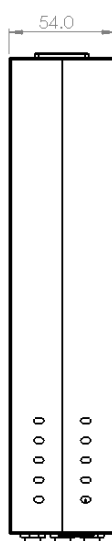
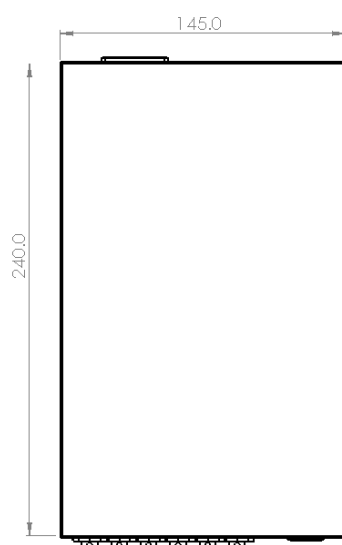
Prefix	Bandwidth	Power	Center Wavelength	Configuration ^[1]	Fiber Type	Fiber Cover	Fiber Length	Connector ^{[2][3]}	PER	Benchtop
NSBA-	±30nm = 1 ±60nm = 2 ±90nm = 3 ±120nm = 4 Special = 0	0.3W = 5 1W = 1 5W = 5 10W = 10	1060 nm = 1 1600 nm = 2 1310 nm = 3 1410 nm = 4 1550 nm = 5 1950 nm = 9 2100 nm = 8 Special = 0	Transparent = 1 Opaque = 2 Special = 0	SMF-28 = 1 HI 1060 = 2 PM 1550 = 5 PM 1400 = C PM 1310 = D PM 980 = E PM 1900 = 9 PM 2000 = 8 Special = 0	Bare fiber = 1 900um tube = 3 Special = 0	0.25 m = 1 0.5 m = 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/APC = 9 LC/UPC = U Special = 0	Non = 1 >18 = 2 >25 = 3 >29 = 4	Non = 1 Yes = 2

Note:

- [1]. "Transparent" indicates no attenuation when no controlling voltage is applied, while "opaque" indicates maximum attenuation under the same condition.
- [2]. A regular connector supports power levels below 5W, while the H connector can handle up to 5W.
Regular fiber connector has PER ~22dB. Connector with PER >27 dB is available using special process
- [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 is available as a special order.

Benchtop Box Mechanical Dimension



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

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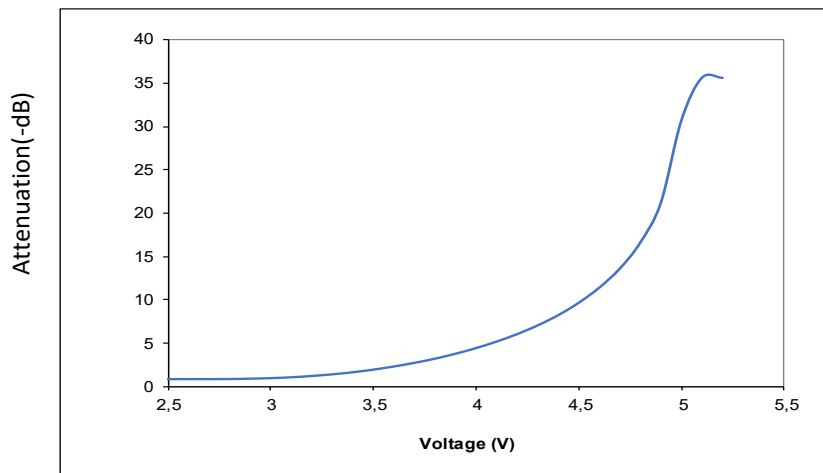
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Typical Attenuation versus Voltage



Operation Instruction

1. **Connect the fiber input and output;** the device supports bidirectional use in either direction.
2. **Plug in the provided power supply.**
3. **Connect the control signal to the SMA connector.**
4. The VOA should attenuate proportionally to the input 0-5V