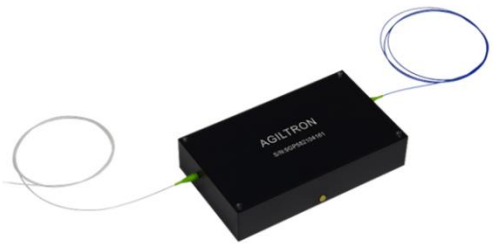
NanoSpeed™ 50dB High-Speed Attenuators

SMF, PMF, High Power, Bidirectional

(Protected by U.S. patent 7,403,677B1 and pending patents)

DATASHEET

BUY NOW



The NSAI series of NanoSpeed™ fiber optic attenuators uniquely feature large attenuation of 50dB, low optical loss, fast response, and high optical power handling. This is achieved by cascading several devices on a PCB board with a single electrical control input and housed inside a metal casing. The NSAI series cascades two devices. The NS fiber-optic devices meet the most demanding reliability requirements for undersea, space, and continuous switching with a longevity of over 25 years. The switch is bidirectional. The NS Series devices are connected to pre-tuned electronic drivers. The control signal is 0-5V via an SMA port, and the power is 12V DC (a wall pluggable is accompanied inside the shipping box).

Applications

- Laser Systems
- Sensor Systems
- Instruments
- Quantum Systems

Features

- 50dB High on/off Ratio
- Solid State High Reliability
- High Speed
- Very Low Optical Loss
- High Optical Power Handling
- Minimal Transit Echoes
- Wide Operation Temperature Range
- Vibration Insensitive

Specifications

Parameter	Min	Typical	Max	Unit
Center Wavelength [1]	780		2300	nm
Insertion Loss [2] 1900 – 2300nm		1.5	2.4	
Insertion Loss [2] 1700 – 1900nm		1.5	2.2	
Insertion Loss [2] 1260 – 1650nm		1.3	1.8	dB
Insertion Loss [2] 960 – 1100nm		2	2.7	
Insertion Loss [2] 780 – 950nm		2	3.1	
Attenuation [3]	50			dB
Wavelength Range		70		nm
Durability	10^{14}			cycle
PDL (SMF)		0.15	0.3	dB
PMD (SMF)		0.1	0.3	ps
ER (PMF)	18	25		dB
Insertion Loss Temperature Dependence		0.25	0.5	dB
Return Loss	45	50	60	dB
Response Time (Rise or Fall)		50	100	ns
Optical Power Handling [4]		0.3	20	W
Repetition Rate [5]	DC		100	kHz
Operating Temperature	-10		50	°C
Storage Temperature	-40		80	°C
Power Consumption			2	W

Notes:

[1] Operation bandwidth is ± 25nm approximately at 1550nm.

[2] Measured without connectors. Each connector adds about 0.25dB loss

[3] Measured at 50kHz, which may be degraded at a higher repeat rate

[4] Defined at 1310nm/1550nm. For the shorter wavelength, the handling power may be reduced.

[5] Currently, only DC-100 kHz is available. Higher frequency is under development

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.**

Rev 02/02/24

© Photonwares Corporation

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

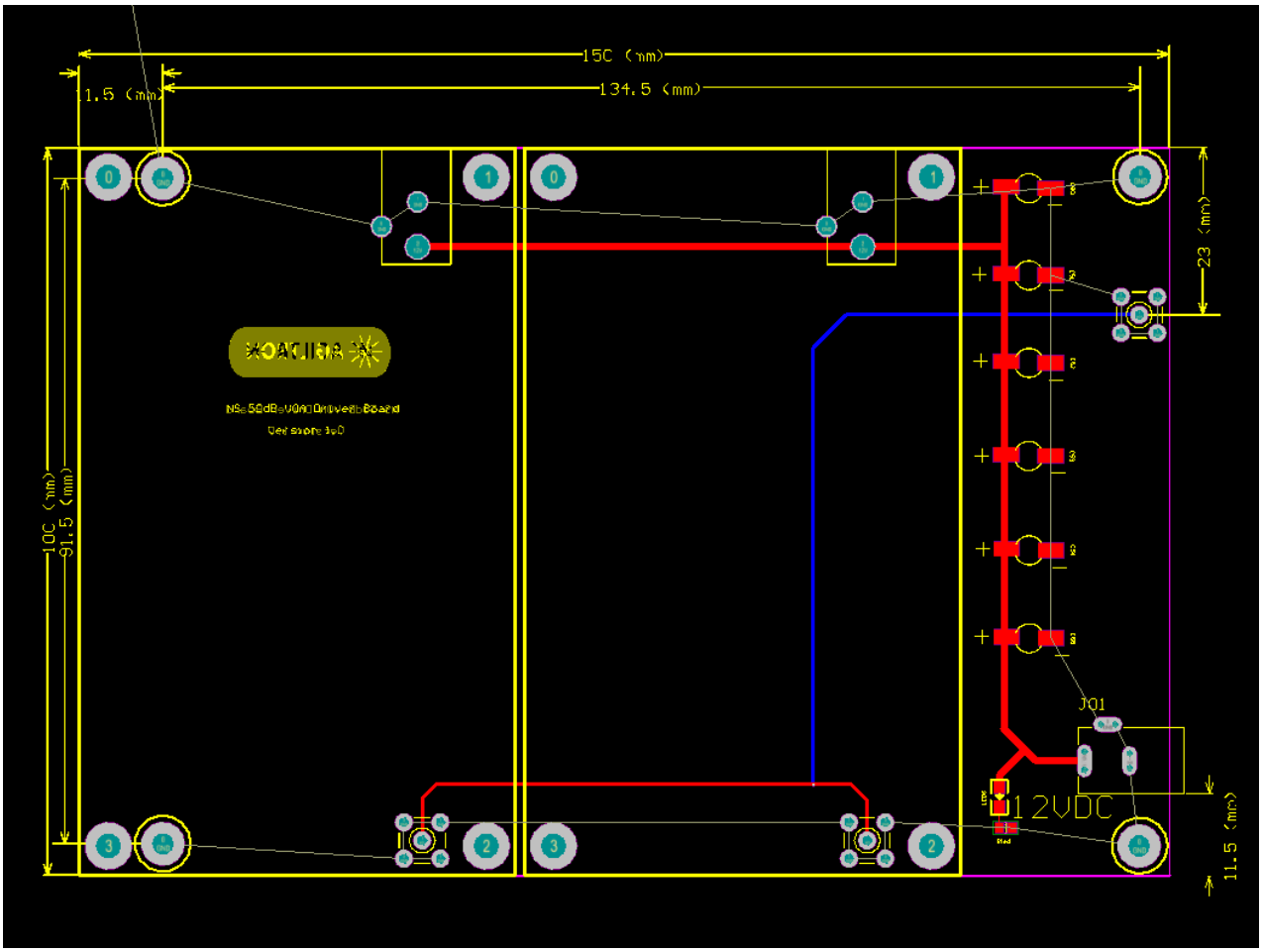
NanoSpeed™ 50dB High-Speed Attenuators

SMF, PMF, High Power, Bidirectional

(Protected by U.S. patent 7,403,677B1 and pending patents)

DATASHEET

Mechanical Dimensions (mm)



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

NanoSpeed™ 50dB High-Speed Attenuators

SMF, PMF, High Power, Bidirectional

(Protected by U.S. patent 7,403,677B1 and pending patents)

DATASHEET

Ordering Information

	1	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Type**	**Wavelength[1]**	**Optical Power[2]**	**Configuration[3]**	**Max Frequency**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector[3]**
NSAI-		1060nm = 1 L Band = 2 1310nm = 3 1410nm = 4 1550nm = 5 980nm = 9 850nm = 8 780nm = 7 1230-1620nm = A[4] Special = 0	Standard = 1 5W = 2 10W = 3 20W = 4 Special = 0	Transparent = 1 Opaque = 2	100kHz = 1 Special = 0	SMF-28 = 1 HI1060 = 2 HI780 = 3 PM1550 = 5 PM980 = 9 PM850 = 8 Special = 0	Bare fiber = 1 0.9mm tube = 3 Special = 0	0.25m = 1 0.5m = 2 1.0 m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 LC/PC = 7 Duplex LC/PC = 8 LC/APC = 9 E2000 APC = A LC/UPC = U Special = 0

[1]. Center wavelength. The high-power switch isn't available for a wavelength shorter than 960nm.

[2]. The standard is **0.3W** for wavelength **>1310nm**, shorter wavelength has less power handling. Regular connectors cannot handle high power. Please contact us for Agiltron' s unique high-power connectors.

[3]. Only 1x1 has the transparent and opaque selection, for 1x2, choose normal transparent.

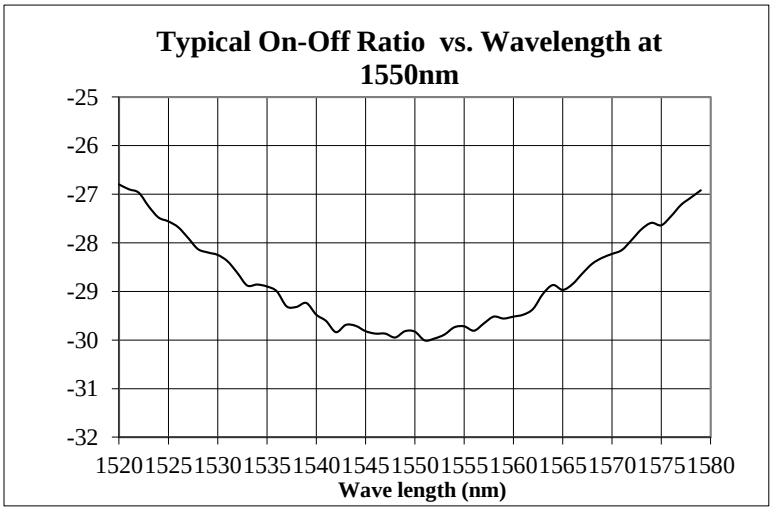
[4]. Use two NS broadband switches. The IL may be higher

Red color indicates special order

NOTE:

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

Typical Wavelength Dependent Response Curve (single stage for reference only)



NanoSpeed™ 50dB High-Speed Attenuators

SMF, PMF, High Power, Bidirectional

(Protected by U.S. patent 7,403,677B1 and pending patents)

DATASHEET

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.

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com