NanoSpeed™
Fiber Optical Small Amplitude Modulator
(Bidirectional)

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

DATASHEET

BUY NOW

The NS Series Fiber Optical Modulator is designed to provide a small level of analog modulation featuring high response linearity, low power consumption, and high speed. It is available for both polarization insensitive and polarization maintaining configurations. A driver with full attenuation is also available. This is achieved using a patent pending non-mechanical configuration and activated via a voltage electrical control signal. The NS Series devices are designed to meet the most demanding operation requirements of ultra-high reliability, vacuum compatible, vibration insensitivity, and fast response time with minimal mechanical footprint. The modulator is bidirectional. It is available in either normally-transparent or normally-opaque configurations.

The device is controlled by ±2.5V signals with a specially designed electronic driver having performance optimized for various repetition rate. We further offer customized electronic driver designs to meet special control requirements.

Features

- High Reliability
- Low Optical Loss
- Polarization Insensitive
- Low Power Consumption
- Compact

Applications

- Satellite Communication
- Network Channel Marking

Specifications

Parameter		Min	Typical	Max	Unit
Central wavelength [2]		780		1650	nm
Insertion Loss [3]	1260~1650nm		1.8 [1]	3.6	dB
	960~1100nm		1.8 [1]	3.6	
	780~960nm (less than 10mW)		2.2 [1]	4.2	
Low Level Modulation Depth			10	15	%
High Level Attenuation [4]				90	%
PDL (SMF)			0.1	0.3	dB
PMD (SMF)			0.1	0.3	ps
ER (PMF)		18	25		dB
Attenuation Resolution			Continuous		dB
Return Loss		45	50	60	dB
Fiber Type			SMF-28, Panda PM, or equivalent		
Low Amplitude Modulation Rate	50kHz driver	DC	50		kHz
	100kHz driver	DC	20		
	1MHz driver [5]	DC	1000		
Optic Power Handling [6]	Standard Vision		300		mW
	High Power Version			20	W
Operating Temperature		-20		70	°C
Storage Temperature		-40		85	°C

Notes:

[1]. The device is optically biased, where the loss can be reduced by a negative control signal at 50kHz driver.

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

[3]. Measured without connectors.

[4]. High attenuation/ modulation mode is selected by a 5V control signal, and is only available at 50kHz driver.

[5]. High power consumption about 2W

[6]. Defined at 1310nm/1550nm. For the shorter wavelength, the handling power may be reduced, please contact us for more information.

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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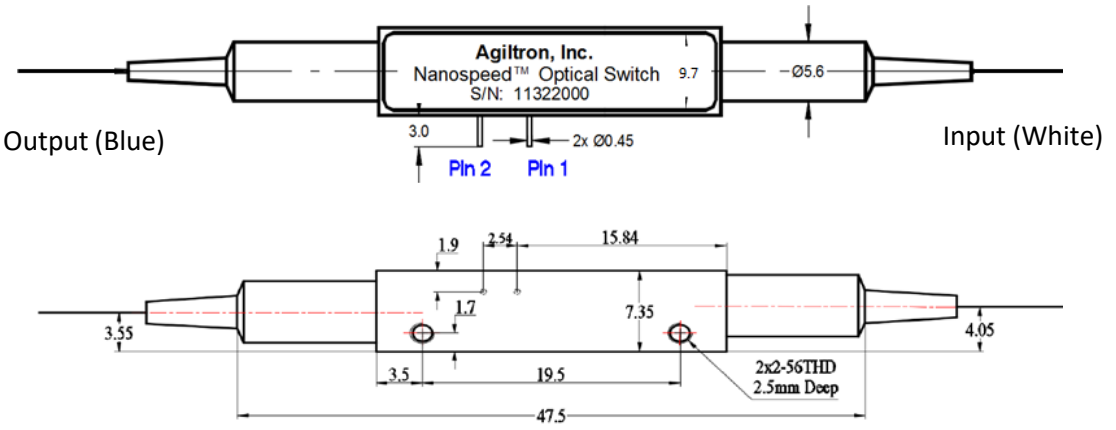
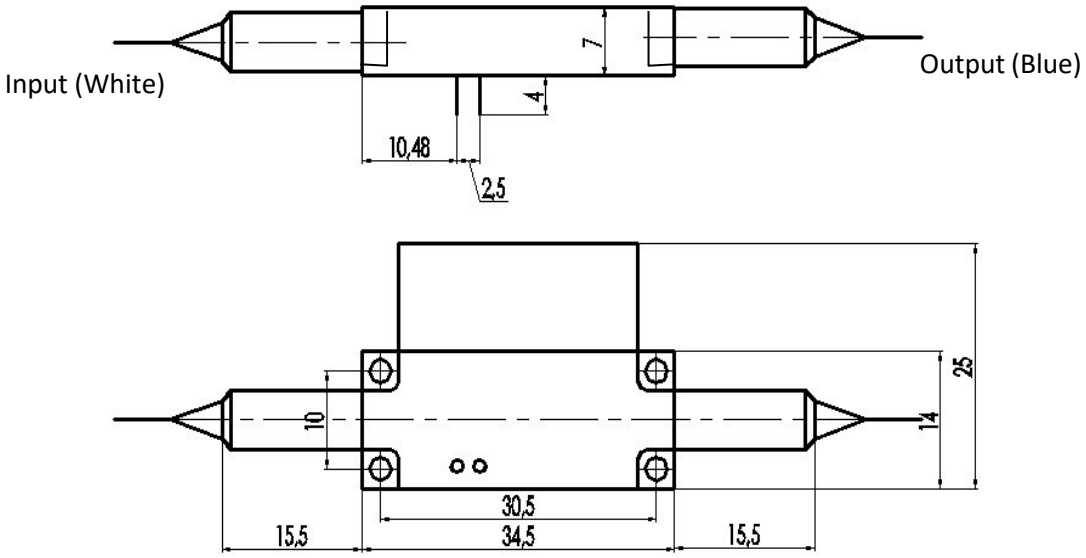
Mechanical Dimensions (mm)



Normal Power version of device w/o driver



High Power version w/o driver（Option 1, 0.5< P < 2W）

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

Electronic driver

Will be updated soon

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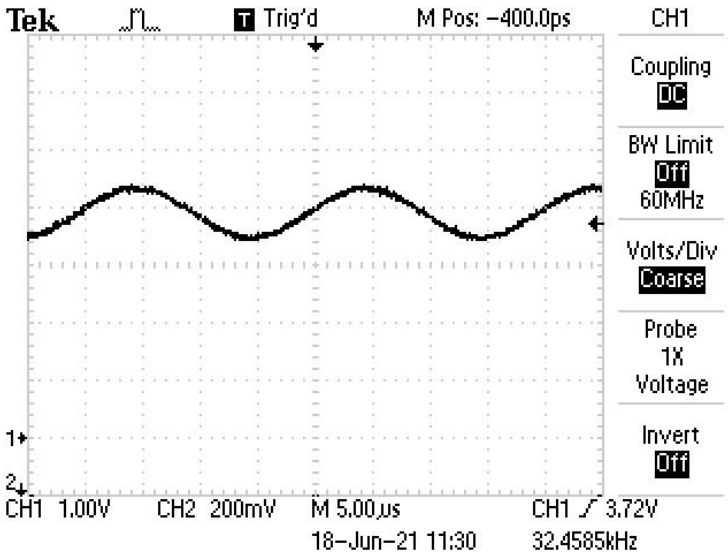
Typical Low Amplitude Modulation



Ordering Information

	1 1	☐	☐	☐	☐	☐	☐	☐
Prefix	**Configuration**	**Optical Power**	**Wavelength**	**Driver Selection[1]**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector**
NSSM-	Standard = 11	Standard = 1 5W = 2 10W = 3 20W = 4	1310 = 3 1550 = 5 1060 = 1 Special = 0	50KHz + HA[2] = 2 100kHz = 3 1MHz = 4 Special = 0	SMF28e = 1 PM 1550 = B PM1310 = D Hi 1060 = 2 Special = 0	Bare = 1 900 µm 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 ST/PC = 6 LC/PC = 7 Duple LC/PC = 8 LC/APC = A LC/UPC = U Special = 0

[1]. For <15% low amplitude modulation in general. All drivers are capable to full modulation at lower modulation rate and higher power consumption

[2]. 50kHz + High Attenuation

NOTE:

- **PM1550** fiber works well for **1310nm** and the short fiber in the switch does not affect system performance. **PM1550** can be spliced with **PM1310**

Operation Manual

1. Connect a control signal to the SMA connector on the PCB.
2. Attach the accompanied power supply (typically a wall-pluggable unit).
3. The device should then function properly.

Note: Do not alter device factory settings.

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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 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.

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