

**BUY NOW****NanoSpeed™****Fiber Optical Small Amplitude Modulator****(Bidirectional)**

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

**Product Description**

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  $\pm 2.5V$  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.

**Performance Specifications**

NanoSpeed Series VOA		Min	Typical	Max	Unit
Central wavelength <sup>[1]</sup>		780		1650	nm
Insertion Loss <sup>[2]</sup>	1260-1650nm		1.8 <sup>[0]</sup>	3.6	dB
	960-1100nm		1.8 <sup>[0]</sup>	3.6	
	780-960nm (less than 10mW)		2.2 <sup>[0]</sup>	4.2	
Low Level Modulation Depth			10	15	%
High Level Attenuation <sup>[3]</sup>				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 <sup>[4]</sup>	DC	1000		
Optic power Handling <sup>[5]</sup>	Standard Vision		300		mW
	High Power Version			5	W
Operating Temperature		-20		70	°C
Storage Temperature		-40		85	°C

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

[1] Operation bandwidth is +/- 25nm approximately at 1550nm.

[2] Measured without connectors.

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

[4] High power consumption about 2W

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

**Features**

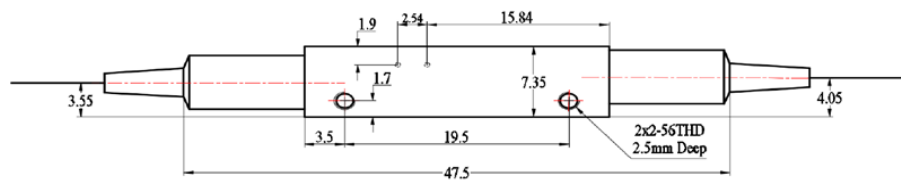
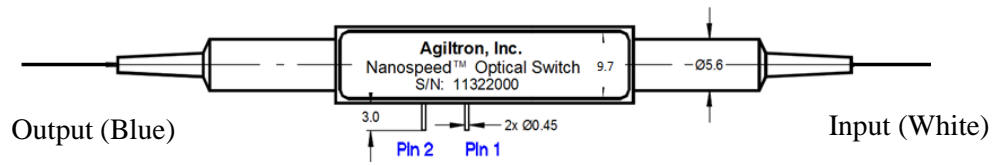
- High Reliability
- Low Optical Loss
- Polarization Insensitive
- Low Power Consumption
- Compact

**Applications**

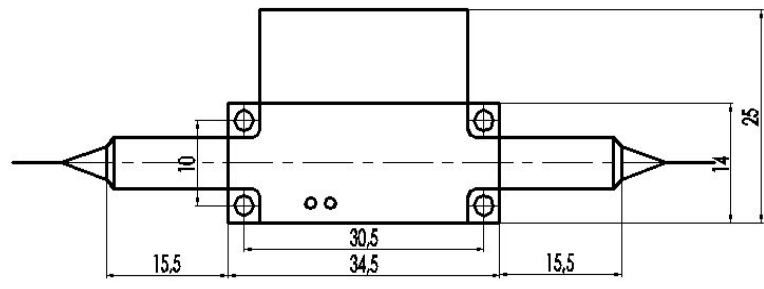
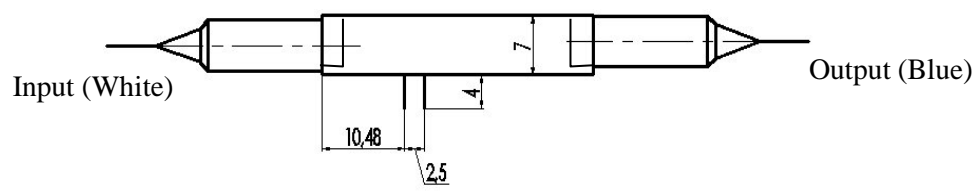
- Satellite Communication
- Network Channel Marking

Revised on 01/04/23  
(Click here for latest revision)

**Dimensions (Unit: 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.

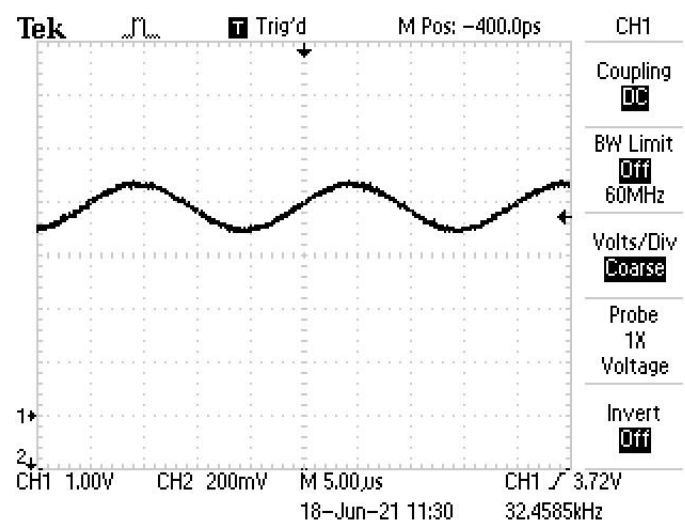
**Electronic driver**

Will be updated soon

# Electronic driver

Will be updated soon

## Typical Low Amplitude Modulation



## Ordering Information

Prefix	Configuration	Optical Power	Wavelength	Driver Selection <sup>[1]</sup>	Fiber Type	Fiber Cover	Fiber Length	Connector
NSSM-	Standard = 11	Standard = 1 High power = 2	1310 = 3 1550 = 5 1060 = 1 Special = 0	50KHz + HA <sup>[2]</sup> = 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 = 8 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

## 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.**

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