

NanoSpeed™ Fiber Optical Polarization Switch

(Low-Loss, Bidirectional, 10ns-100ns, up to 10W)

(Protected by U.S. patents 7,403,677B1; 6,757,101B2; and pending patents)



DATASHEET

[Return to the Webpage](#)



Features

- High Reliability
- High Speed
- Low loss
- Compact

Applications

- Sensor
- Data process
- Instrumentation



The NanoSpeed™ Series polarization switch can quickly switch the incoming SOP between two orthogonal polarization states (SOPs). This is achieved using patented non-mechanical configurations with solid-state all-crystal designs, which eliminates the need for mechanical movement and organic materials and activated via an electrical control signal. The NS fiber optic switch is a fast switch device featuring very low loss, fast response, ultra-high reliability and high optical power handling. The input is PM fiber. The output could be either PM or SM fiber. For PM fiber, the polarizations is aligned with slow axis. The switch is intrinsically bidirectional and selectable for polarization-independent or polarization-maintain by the fiber type.

Agiltron's SWDR driver is highly recommended to this polarization switch, by which the switch can be driven by a 5V TTL signal through SMA input and a 12V power supply (wall pluggable). The rise/fall time is intrinsically related to the crystal properties, and the repetition rate is associated with the driver. There are poor frequency response sections due to the device resonances. The NS devices are shipped mounted on a tuned driver.

The NS series switches respond to a control signal with any arbitrary timing with frequency from DC up to MHz. The switch is usually mounted on a tuned driver prior to shipping. The electrical power consumption is related to the repetition rate the switch is operated.

The dual-stage configuration increases the extinction ratio or cross-talk value.

Specifications

Parameter		Min	Typical	Max	Unit
Insertion Loss ^[1]	1900~2200nm		1.6	2.8	dB
	1700~2300nm		0.8	1.8	
	1260~1650nm		0.6	1.0	
	960~1100nm		0.8	1.3	
	780~960nm		1.2	1.5	
IL Temperature Dependency		0.2	0.25	0.5	dB
Wavelength Range ^[2]	Standard		50		nm
	Broadband		70		
Durability		10 ¹⁴			cycles
Return Loss			50		dB
Polarization Rotation				90	Degree
SOP Tolerance		18	± 2.5	± 4.5	Degree
Extinction Ratio		18			dB
Response Time (Rise, Fall)		10	100	200	ns
Repeat Rate			100	500	kHz
Optic Power Handling ^[3]	Normal power switches		0.3	0.5	W
	High power switches		5	10	W
Operating Temperature ^[4]		-5		45	°C
Storage Temperature		-40		85	°C

Notes:

- [1]. Measured without connectors. **Wavelength < 850nm or > 1700nm is available only in the special version with a long lead time.**
- [2]. @1550nm. Within this range, the spec will be met. The device operates well beyond this range with performance degradation.
- [3]. @1310nm/1550nm. For the shorter wavelength, the handling power may be reduced, please contact us for more information.
- [4]. The switches can be operated in a wider temperature range from as -10 to 70°C, but some performances such as on/off ratio 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: This is an OEM module designed for system integration. Do not touch the PCB by hand. The electrical static can kill the chips even without a power plug-in. Unpleasant electrical shock may also be felt. For laboratory use, please buy a Turnkey system.

Rev 06/15/26

P +1 781-935-1200

E sales@agiltron.com

W www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

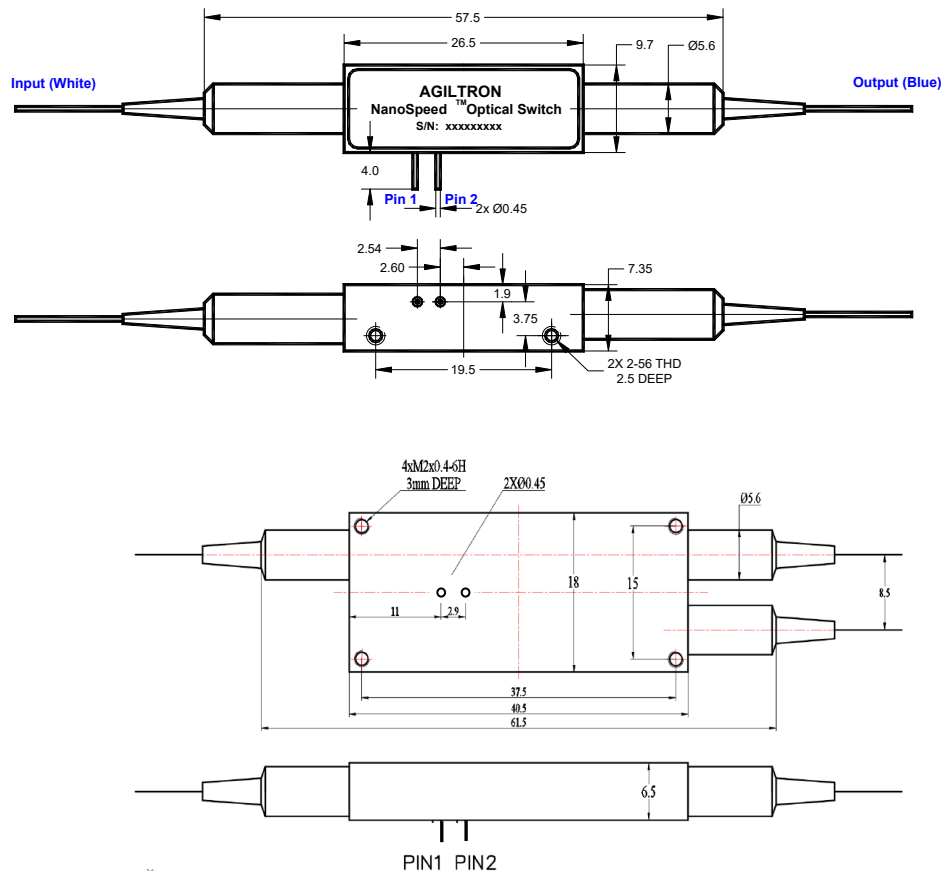
NanoSpeed™ Fiber Optical Polarization Switch

(Low-Loss, Bidirectional, 10ns-100ns, up to 10W)



DATASHEET

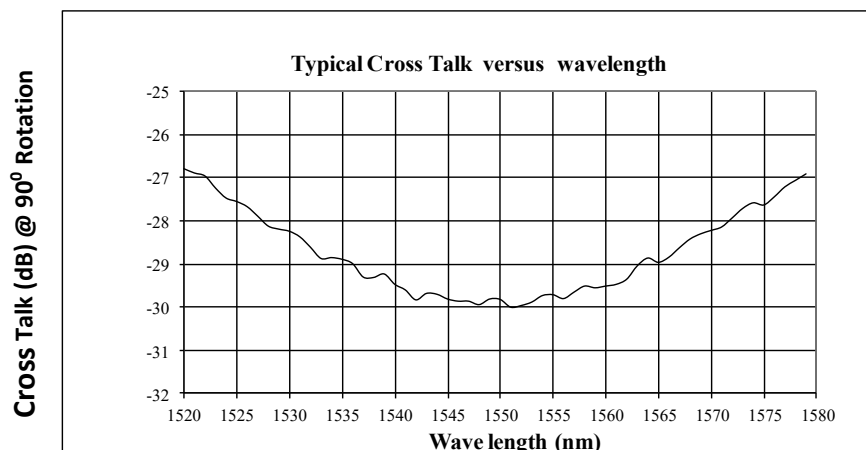
Mechanical Dimensions (Unit: mm)



- [1] Package is for $\lambda \leq 1650\text{nm}$
- [2] Call us for $\lambda > 1650\text{nm}$

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

Typical Wavelength Dependence @ 1550nm



P +1 781-935-1200

E sales@agiltron.com

W www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice. Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

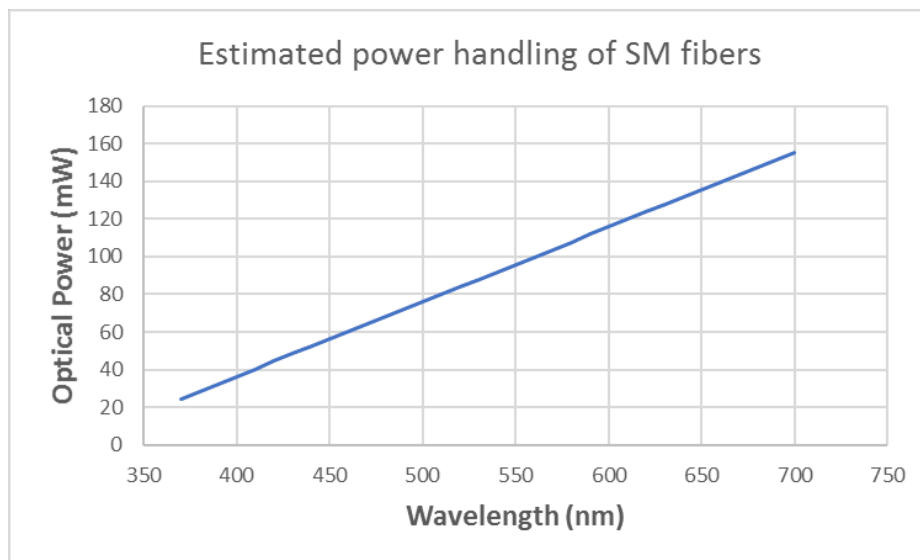
NanoSpeed™ Fiber Optical Polarization Switch

(Low-Loss, Bidirectional, 10ns-100ns, up to 10W)

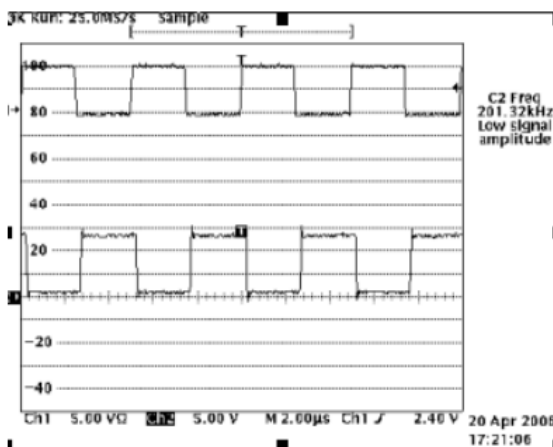
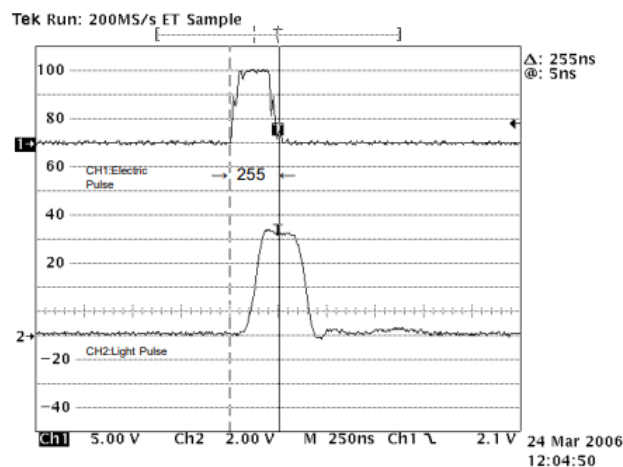
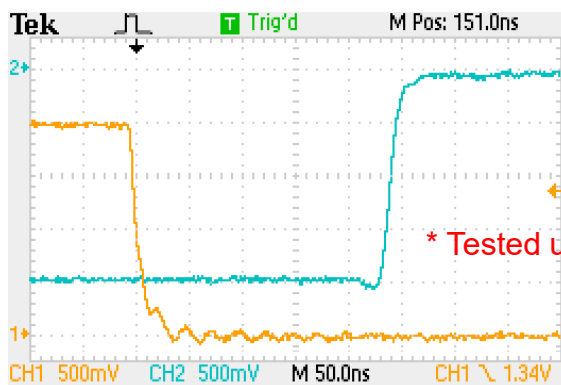


DATASHEET

Optical Power Handling vs Wavelength For Single-Mode Fibers



Fast Speed and Repetition Measurements



P +1 781-935-1200

E sales@agiltron.com

W www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice. Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

NanoSpeed™ Fiber Optical Polarization Switch

(Low-Loss, Bidirectional, 10ns-100ns, up to 10W)



DATASHEET

Ordering Information (Part Number)

Prefix	Speed ^[1]	Wavelength	Power	Input Fiber	Output Fiber	Fiber Cover	Fiber Length	Connector ^[2]	Bandwidth ^[3]	Benchtop
NSPS-	<100ns = 1 <50ns = 2 Special = 0	1060 = 01 2000 = 02 1310 = 03 1550 = 05 1625 = 06 1750 = A 780 = 07 850 = 08 980 = 09 650 = 06 450 = 04 Special = 00	Standard = 1 1W = 2 5W = 3 10W = 4 15W = C 20W = D Special = 0	PM1550 = 5 PM980 = 9 PM850 = 8 SMF28 = 1 HI1060 = 6 HI780 = 7 50/125 ^[3] = M Special = 0	PM1550 = 5 PM1310 = 3 PM980 = 9 PM850 = 8 SMF28 = 1 SMF28 = 1 HI1060 = 6 HI780 = 7 50/125 ^[3] = M 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 ST/PC = 6 LC/PC = 7 LC/APC = 8 E2000APC=9 LC/APC = A LC/UPC = U Special = 0	Regular = 1 Broad = 2	None = 1 Benchtop = B

[1]. This is material limitation, the actual rise/fall time is also related to the driver choice.

[2]. 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.

[3]. Broadband version does not contain waveplate

NS Switch Driver Selection (PCB with SMA control input and 12VDC Power Supply (included))

- 10ns Rise/Fall, 1.7MHz Repetition
- 10ns Rise/Fall, 0.7MHz Repetition
- 50ns Rise/Fall, 0.5 MHz Repetition
- 100ns Rise/Fall, 0.3 MHz Repetition

+1 781-935-1200

sales@agiltron.com

www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

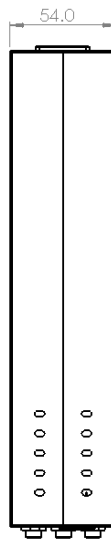
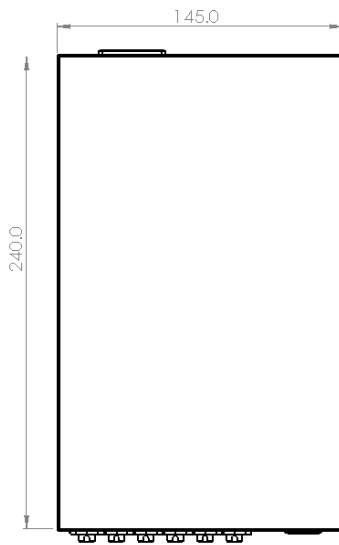
NanoSpeed™ Fiber Optical Polarization Switch

(Low-Loss, Bidirectional, 10ns-100ns, up to 10W)



DATASHEET

Benchtop Box Mechanical Dimension



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

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.

P +1 781-935-1200

E sales@agiltron.com

W www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice.
Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.