

NanoSpeed™

Fiber In and Free-Space Out Fiber Optical Switch (SMF, PMF, High Power, Bidirectional)

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

Features

- Solid-State
- High Speed
- High Reliability
- Low Loss
- Compact

Product Description

The NanoSpeed™ Fiber In and Free-Space Out switches are fast laser beam shutter device featuring very low loss, fast response, and high optical power handling. The design uniquely provides a way to modulate/switch laser beam from a large core fiber. This is achieved using patented non-mechanical configurations with solid-state all-crystal designs, which eliminates the need for mechanical movement and organic materials. The NS fiber-optic switch is designed to meet the most demanding switching requirements of ultra-high reliability, fast response time, and continuous switching operation. The switch is bidirectional. The free space out put has a collimating lens, which can be customer designed. The switch is intrinsically bidirectional and selectable for polarization-independent or polarization-maintain by the fiber type.

The NS Series switch is controlled by 5V TTL signals with a specially designed electronic driver having performance optimized for various repetition rate.

Performance Specifications

NS Fiber-in Free Space Out Switch		Min	Typical	Max	Unit
Central Wavelength ^[1]		450		2340	nm
Bandwidth (1550nm)			±25		nm
Insertion Loss ^[2]			0.6	1.0	dB
On-Off Ratio ^[3]		15	25	35	dB
Durability		10 ¹⁴			cycles
PDL (SMF fiber only)			0.15	0.3	dB
ER (PMF fiber only)		18	25		dB
IL Temperature Dependency			0.25	0.5	dB
Return Loss		45	50	60	dB
Response Time (Rise, Fall)				300	ns
Driver Repeat Rate	100kHz driver	DC	100		kHz
Optic power Handling ^[4]	Normal power		300		mW
	High power			5	W
Operating Temperature		-15		70	°C
Storage Temperature		-40		85	°C

[2] Measured without connectors. For other wavelength, please contact us.

[3] ±25nm, Measured at 5kHz, which may be degraded at higher repeat rate. Measured using a multimode laser with CPR ~14. Higher CPR lowers the on/off ratio

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

Applications

- Sensor
- LiDar
- Instrumentation

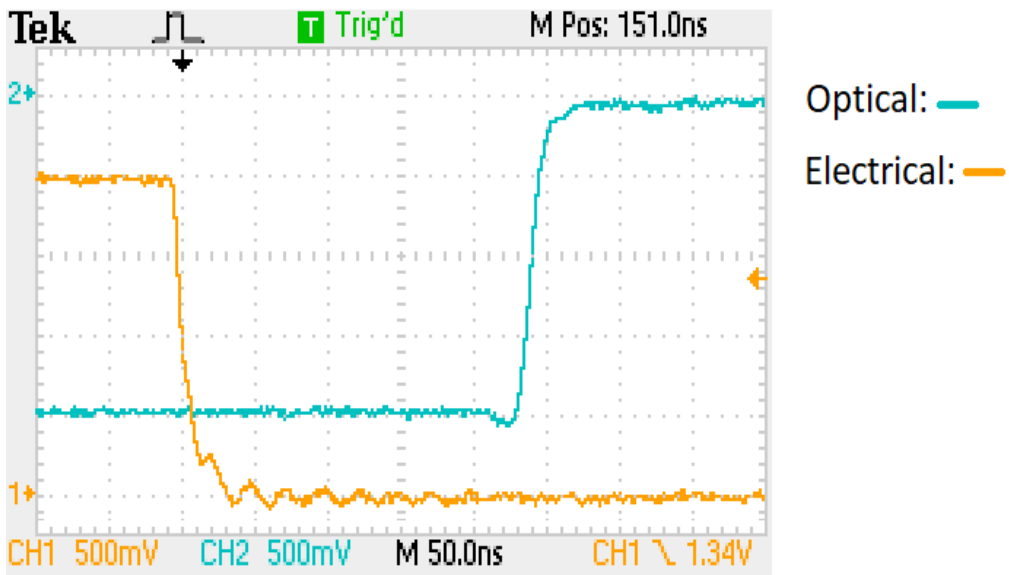


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Mechanical Dimension

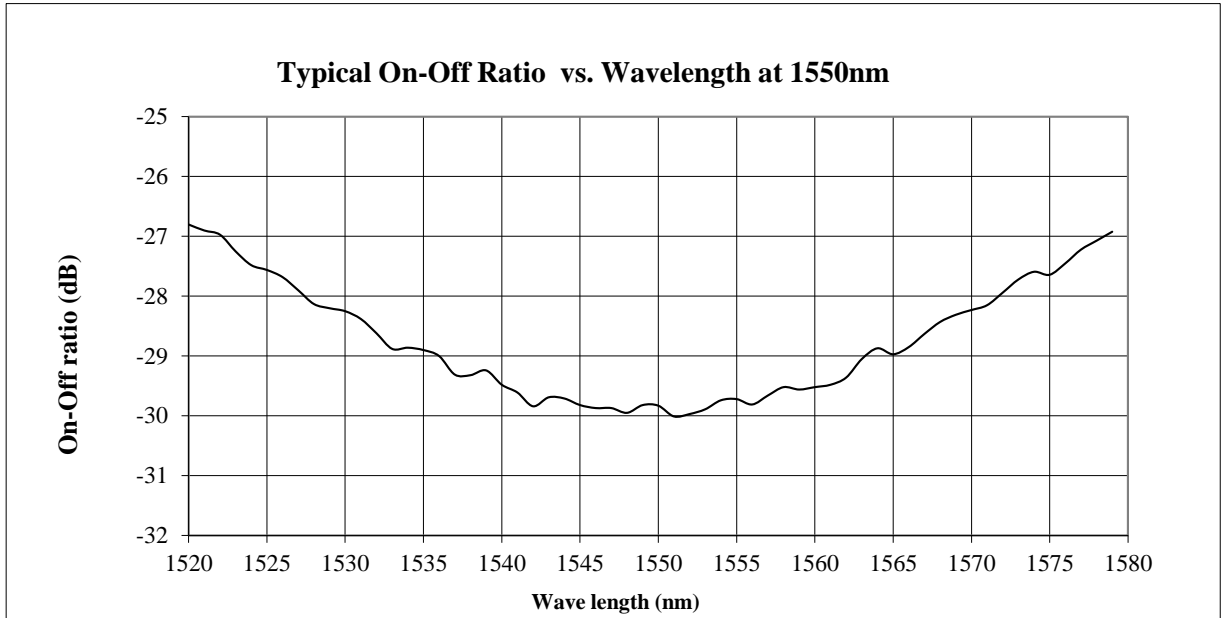
Typical Speed Response Measurement



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Typical Bandwidth



Ordering Information

Prefix	Type	Wavelength ^[1]	Configuration ^[2]	Optical Power	Collimating Lens	Fiber Type	Fiber Cover	Fiber Length	Connector ^[3]
NSFF-	1x1=1 1x2=2	1060nm = 1 2000nm = 2 1310nm = 3 1410nm = 4 1550nm = 5 1625nm = 6 850nm = 8 780nm = 7 650 = E 550 = F 400 = G Special = 0	Normally-On = 1 Normal-Off = 2	Standard = 1 5W = 5 10W = 6 20W = 7 30W = 8	Yes = 1 Special = 0	SMF-28=1 HI1060=2 HI780=3 PM1550=5 PM980=9 50/125=6 105/125=7 200=8 Special=0	Bare Fiber=1 900um 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 Duplex LC=8 LC/APC=9 E2000 APC=A Special=0

[1]. The wavelength with red color can be implemented in the special version with a long lead-time

[2]. Normal off selection only for 1x1 switch

[3]. Please contact for high power connectors

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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.