NanoSpeed™ Fiber Optical Switch Array

8x (1x2, 2x2, SM, PM, Bidirectional)

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

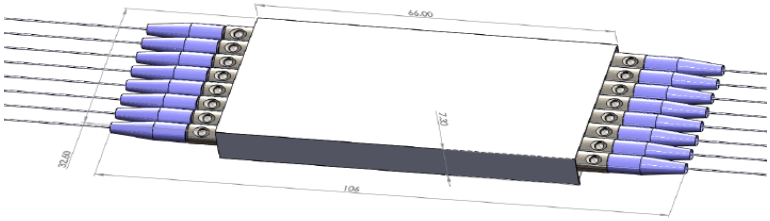
Features

- High Speed
- High Reliability
- Low Loss
- Compact

Product Description

The NS switch redirects an incoming optical signal among two output optical fibers rapidly controlled by a electrical input voltage from 0 to 5V. This array version integrate up to 8 switches in an ultra compact format. Each switch can be configurated as 1x1, 1x2, 2x2. The all-solid-state crystal design provides high reliability. The switch has passed Telcordia reliability qualification tests. It is designed to meet the most demanding requirements of ultra-high reliability, fast response time, and continuous operation.

The unit is mounted on a driving board having a control signal input SMC connector and a wall plug-in power supply. Available with several electronic driver having performance optimized for various repetition rate.



Performance Specifications

Variable Fiber Optical Splitter		Min	Typical	Max	Unit
Central Wavelength		450		2000	nm
Insertion Loss[1]	1260~1650nm		0.6	1	dB
	900~1260nm		0.8	1.3	dB
	760~900nm		1	1.5	dB
	650 -850		1.5	1.9	dB
	450-580		2	2.5	dB
Cross Talk at 100% splitter [2]		20	25	35	dB
Durability		10^{14}			cycles
Response Time (Rise, Fall)		5	50	100	Ns
Repetition Rate [3]		DC	20	1000	kHz
Polarization Dependent Loss			0.1	0.35	dB
IL Temperature Dependency			0.25	0.5	dB
Polarization Mode Dispersion			0.1	0.2	Ps
Return Loss		45	50	60	dB
Operating Temperature		-5		70	°C
Optical Power Handling [3]			300		mW
Storage Temperature		-40		85	°C
Package Dimension			65.8x8.5x8.4		mm

[1] Excluding connectors.
[2] Cross talk is measured at 5kHz, which may be degraded at the high repeat rate.
[3] High repetition rate (up to 100 kHz) is available.
[3] Defined at 1310/1550nm. For the shorter wavelength, the handling power may be reduced.

Applications

- Instrumentation
- Power balance
- Sensor

Revised: 1-27-21

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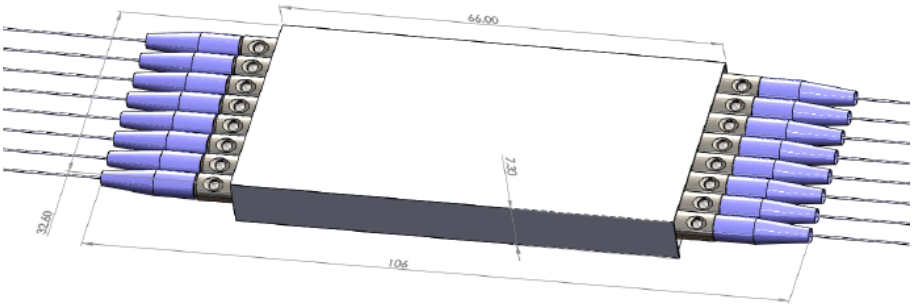
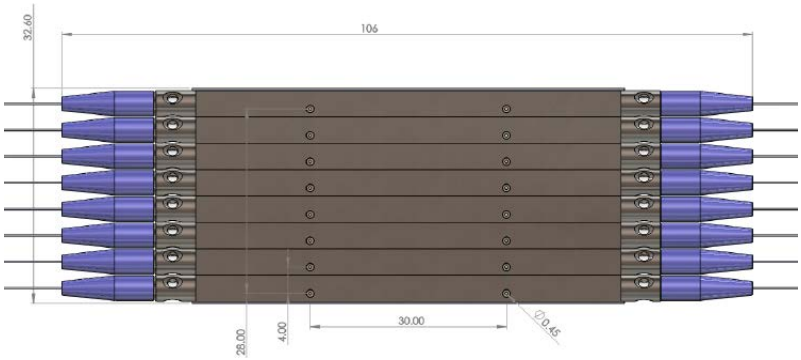
Mechanical Dimensions (mm)

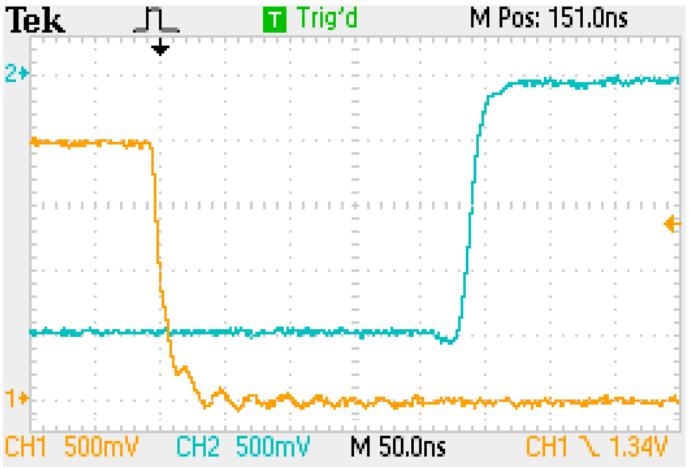




Driving Board Selection

Maximum Repetition Rate	Part Number (P/N)
50kHz	
100kHz	

Typical Speed Response Measurement



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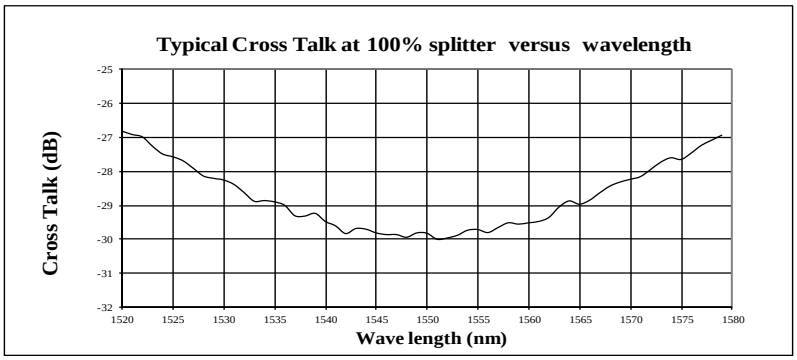
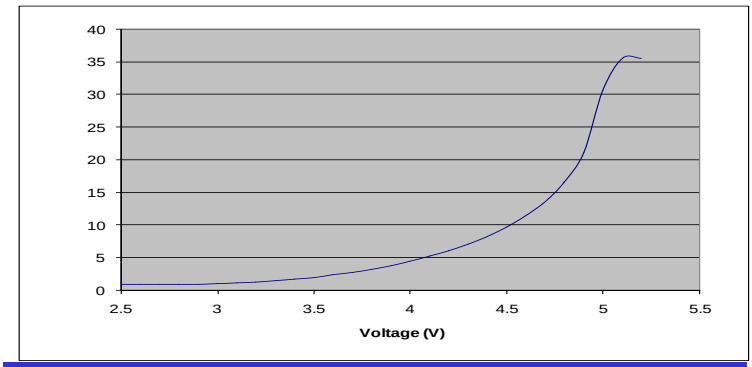
Wavelength Dependence



Typical Attenuation versus Voltage



Ordering Information

NSAS-	☐☐	☐	☐	☐	☐	☐	☐	☐
	Type	**Wavelength**	**Repetition/Rise Time**	**Channel**	**Fiber Type**		**Fiber Length**	**Connector**
	1x2=12 2x2=22	1060=1 2000=2 1310=3 1480=4 1550=5 1625=6 780=7 850=8 650=E 550=F 400=G 1565~1620=L Special=0	50Khz (100ns) =1 100kHz(100ns)= 2 50Khz (50ns) =3 100kHz (50ns)= 4	1 2 3 4 5 6 7 8 9	SMF-28=1 HI1060=2 HI780=3 PM1550/400=4 PM1550/250=5 PM850=8 PM980=9 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 LC Duplex=8 LC/APC=9 Special=0

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Q&A

Q: Does NS device drift over time and temperature?

A: NS devices are based on electro-optical crystal materials that can be influenced to a certain range by the environmental variations. The insertion loss of the device is only affected by the thermal expansion induced miss-alignment. For extended temperature operation, we offer special packaging to -40 -100 ^{0}C. The extinction or cross-talk value is affected by many EO material characters, including temperature-dependent birefringence, Vp, temperature gradient, optical power, at resonance points (electronic). However, the devices are designed to meet the minimum extinction/cross-talk stated on the spec sheets. It is important to avoid a temperature gradient along the device length.

Q: What is the actual applying voltage on the device?

A: 100 to 400V depending on the version.

Q: How does the device work?

A: NS devices are not based on Mach-Zander Interference, rather birefringence crystal's nature beam displacement, in which the crystal creates two different paths for beams with different polarization orientations.

Q: What is the limitation for faster operation?

A: NS devices have been tested to have an optical response of about 300 ps. However, practical implementation limits the response speeds. It is possible to achieve a much faster response when operated at partial extinction value. We also offer resonance devices over 20MHz with low electrical power consumption.

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