

# NanoSpeed™ Ultra-Fast 1x1, 1x2, 2X2 Fiber Optical Switch (9ns rise/fall time, polarization insensitive, all wavelengths)

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

## Product Description

The NS Ultra-Fast Series fiber optical switch is based on a patented electro-optical configuration, featuring low optical loss and wide temperature operation with built-in compensation. The NS fiber optical switch meets the most demanding switching requirements of continuous operations over 25 years and non-mechanical ultra-high reliability (passed Telcordia and space qualifications)

The NS Series switch is mounted on a specially designed electronic driver using a 5V TTL control signal through SMA input and a 25V power supply (wall pluggable).



## Performance Specifications

NanoSpeed P Series Switches		Min	Typical	Max	Unit
Insertion Loss <sup>[1]</sup>	1900-2200nm		0.8	1.8	dB
	1260-1650nm		0.6	1.0	
	960-1100nm		0.8	1.3	
	780-960nm		1.2	1.5	
	520 - 680nm		1.5	2.3	
Cross Talk <sup>[2]</sup>	Single Stage	18	25	30	dB
	Dual Stage	30	36	45	
PDL (SMF Switch only)			0.15	0.3	dB
PMD (SMF Switch only)			0.1	0.3	ps
ER (PMF Switch only)		18	25		dB
IL Temperature Dependency			0.25	0.5	dB
Return Loss		45	50		dB
Optical Rise Time <sup>[3]</sup>			8	10	ns
Optical Fall Time <sup>[3]</sup>			8	10	ns
Repetition Rate		DC		100	kHz
		DC		1000	
Optic power Handling <sup>[4]</sup>	Normal power version		300		mW
	High power version			5	W
Operating Temperature	Standard	-5		75	°C
	Special version	-30		85	
Storage Temperature		-40		100	°C

[1] Measured without connectors.

[2] Cross talk is measured at 100kHz, which may be degraded at the higher repeat rate.

[3] It is defined as the rising or fall time between 10% and 90% of optical intensities.

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

### Features

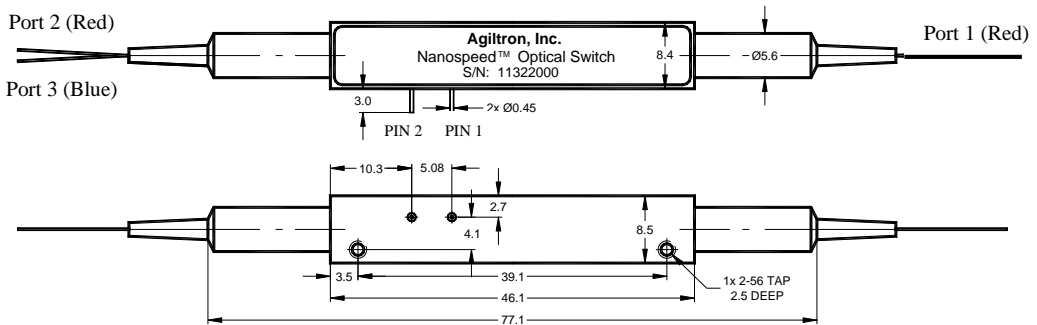
- High Reliability
- High Speed
- Low loss
- Compact

### Applications

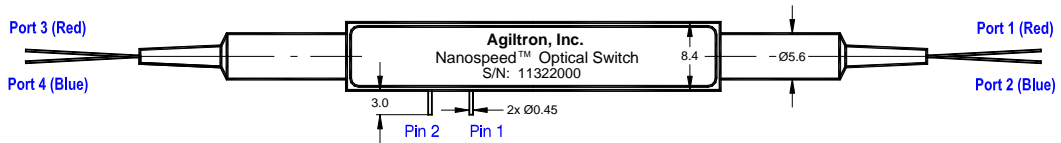
- Optical blocking
- Q-switch
- Data process
- Instrumentation

# NanoSpeed™ Ultra-Fast 1x1, 1x2, 2X2 Fiber Optical Switch (9ns rise/fall time, polarization insensitive, all wavelengths)

## Mechanical Dimensions (Unit: mm)



**1x2 switch**



**2x2 switch**

## Optical Path Driving Table

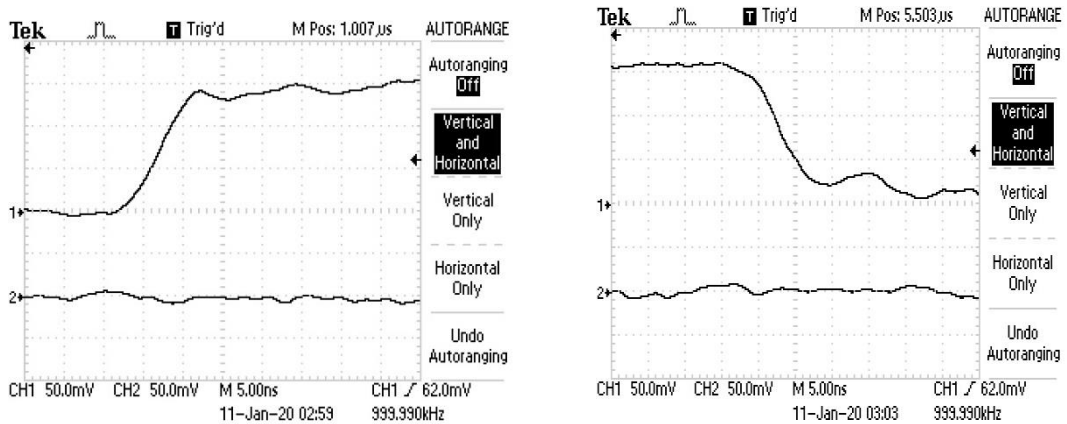
1x1 Optical Path	TTL Signal
ON for normally-open, OFF for normally-close	L (< 0.8V)
OFF for normally-open, ON for normally-close	H (> 3.5V)
* Valid only with SWDR series driver	

1x2 Optical Path	TTL Signal
Port 1 → Port 2	L (< 0.8V)
Port 1 → Port 3	H (> 3.5V)
* Valid only with SWDR series driver	

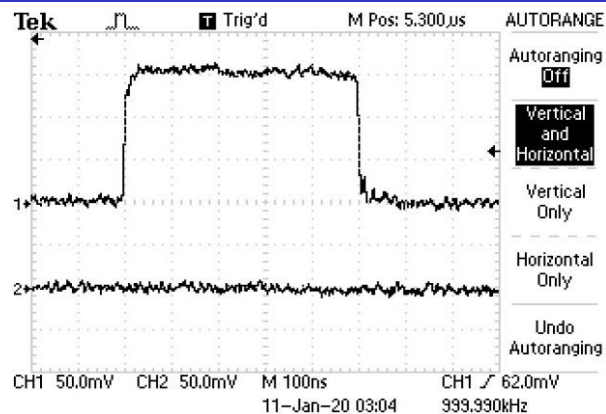
2x2 Optical Path	TTL Signal
Port 1 → Port 3, Port 2 → Port 4	L (< 0.8V)
Port 1 → Port 4, Port 2 → Port 3	H (> 3.5V)
* Valid only with SWDR series driver	

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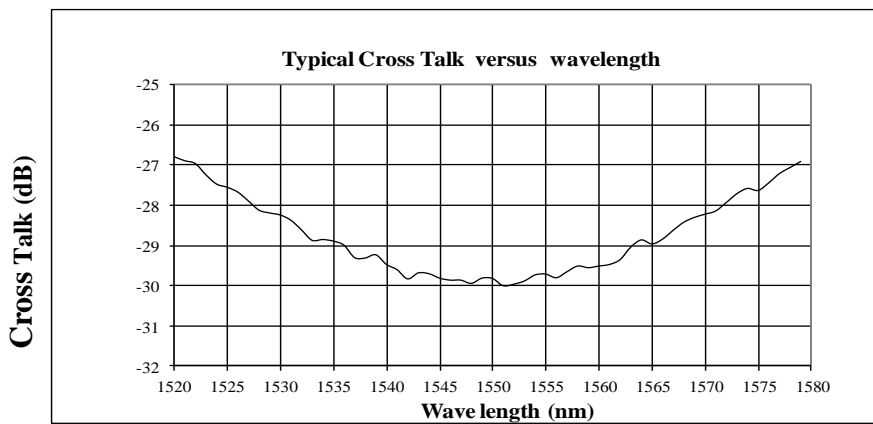
## Typical Rise and Fall Optical Switching Measurement



## Typical Optical Switch Repetition Measurement (1MHz)



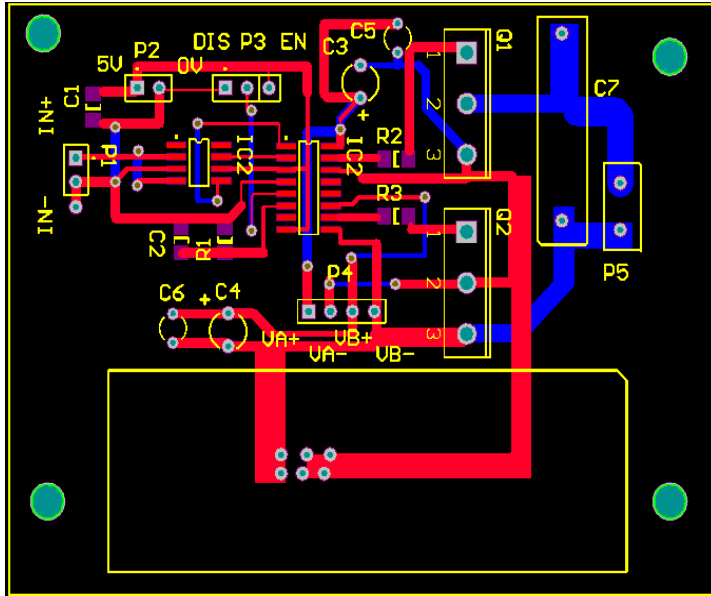
## Typical Wavelength Dependence Extinction Measurement



# NanoSpeed™ Premium 1x1, 1x2, 2X2 Fiber Optical Switch

## Mechanical Dimension (mm)

(To be update soon)



## Ordering Information

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	Type	Wavelength	Grade	Repetition Rate	Fiber Type	Fiber Length	Connector	
NFSW = Normal power version	1x1=11 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	Single=1 Dual =2	100kHz=2 1MHz=6	SMF-28=1 HI1060=2 HI780=3 PM1550/400=4 PM1550/250=5 PM850=8 PM980=9 Special=0	Bare fiber=1 900um loose 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 Special=0