NanoSpeed™
1x2 Dual Stage Fiber Optical Switch
50dB Extinction
(SMF, PMF, High Power)

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

Features

- Solid-State
- High speed
- Ultra-high reliability
- Low insertion loss
- Compact

Applications

- Optical blocking
- Configurable operation
- Instrumentation

Product Description

The NanoSpeed™ F series fiber optic on-off switches are fast shutter device uniquely featuring very low optical loss, fast response, and high optical power handling. The high extinction of 50dB is achieved using a patent pending feedback electro-optical bias control technology, that maintains the optimum performance against drift and environment variations. The NS fiber-optic switch is designed to meet the most demanding switching requirements of ultra-high reliability for undersea, space, continuous switching operation, and longevity over 25 years. The switch is bidirectional. It is well suited to replace acoustic modulator with advantages of low loss, low power consumption, and low cost.

The NS Series switch is controlled by 5V TTL signals with a specially designed electronic driver having performance optimized for various repetition rate. A wall pluggable DC power supply is accompanied with each devices.

PRELIMINARY

Specifications

NanoSpeed Series Bias Control Switch		Min	Typical	Max	Unit
Central wavelength [1]		780		1650	nm
Insertion Loss [2]	1260~1650nm		0.6	1.0	dB
	960~1100nm		0.8	1.3	
Durability		10^{14}			cycles
On-Off Ratio [3]		50	50	55	dB
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	60	dB
Response Time (Rise, Fall)			50	80	ns
Fiber Type			SMF-28, Panda PM, or equivalent		
Driver Repeat Rate	60kHz driver	DC	60		kHz
	300kHz driver	DC	300		
Optic power Handling [4]	Normal power		300		mW
	High power			5	W
Operating Temperature		-5		70	°C
Storage Temperature		-40		85	°C

[1] Operation bandwidth is +/- 25nm approximately at 1550nm.
[2] Measured without connectors. For other wavelength, please contact us.
[3] Measured at 100kHz, which may be degraded at higher repeat rate.
[4] Defined at 1310nm/1550nm. For the shorter wavelength, the handling power may be reduced, please contact us for more information.

RoHS Compliant

Revised: 06/01/22

15 Presidential Way, Woburn, MA 01801 Tel: (781) 9351200 Fax: (781) 935-2040

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Mechanical Dimensions (mm)

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Normal Power Version

TBD

High Power Version

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Optical Path Driving Table

Optical Path	TTL Signal
ON for normal-open or OFF for normal-dark	L (< 0.8V)
OFF for normal-open or ON for normal-dark	H (> 3.5V)

Driving Board Selection

Maximum Repetition Rate	Part Number (P/N)
300kHz	NSDR-F30021211

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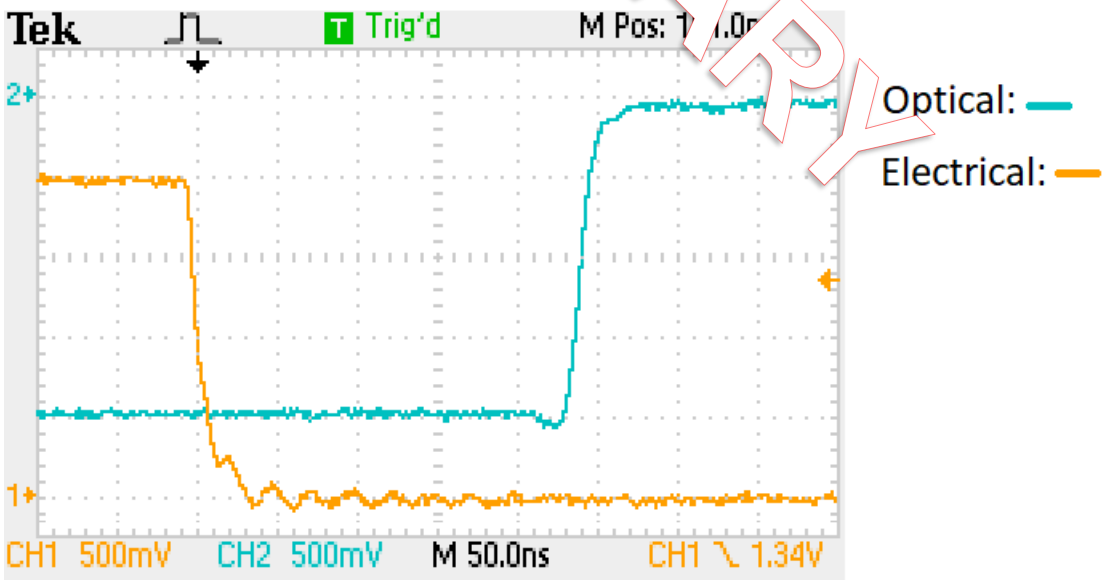
Typical Speed Response Measurement



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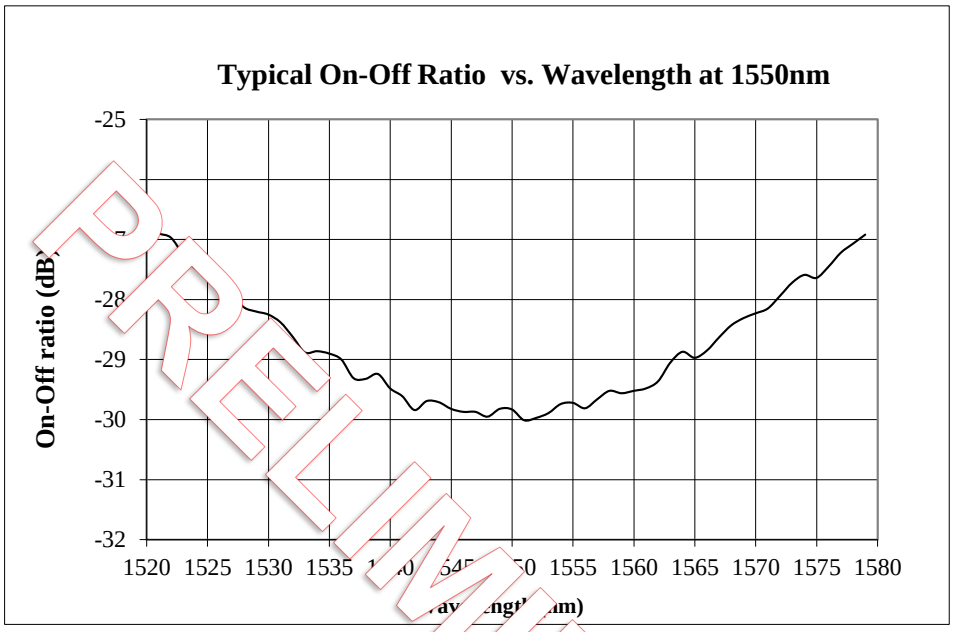
Bandwidth Response Curve (reference only)



PRELIMINARY

Ordering Information

NSSF -	☐	☐	☐ ☐	☐	☐	☐	☐	☐
	Type	Wavelength [1]	Configuration[2]	Stage	Fiber	C[illegible]	Fiber Length	Connector [3]
	1x1=1 1x2=2 2x2=4	1060nm=1 L Band=2 1310nm=3 1410nm=4 1550nm=5 980nm=9 850nm=8 780nm=7 Special=0	Low Power Normal Transparent = 11 Low Power Normal Opaque = 22 High Power Normal Transparent = 33 High Power Normal Opaque = 44	Single 30dB=1 Dual 50dB =2	SMF-28=1 HI1060=2 HI780=3 PM 1550/400=4 PM 1550/250=5 PM980=9 PM850=8 Special=0	Ba[illegible]er=1 [illegible] Special	0.25m=1 [illegible].5m=2 [illegible] m=3 [illegible]ecial=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 Special=0

[1]. High power switch isn't available for the wavelength shorter than 960nm
[2]. Only 1x1 has transparent and opaque selection, for 1x2 and 2x2 choose normal transparent
[3]. There isn't any connector in the high power switches normally. Please contact us for high power connectors.

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Typical Operation Instructions

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.