NanoSpeed™ Ultrafast
Fiber Optical Pulse Generator/Switch 20ns

(700kHz, 350 -2300nm, SMF, PMF, up to 10W optical power)

DATASHEET

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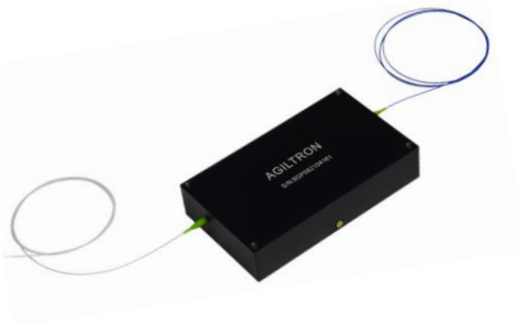

The NS Ultrafast Series fiber-optic switch combines low insertion loss, ultrafast switching speed, and high optical power handling. The NFPG model integrates two cascaded switching elements with a dedicated driver circuit to generate optical pulses as short as 20 ns from a continuous laser input. The switch is based on a patented electro-optic architecture that provides clean, ripple-free switching, excellent temperature stability, and long-term reliability. The device is inherently bidirectional and is available in both polarization-independent and polarization-maintaining fiber configurations. Its solid-state, non-mechanical design eliminates moving parts, ensuring exceptional resistance to vibration and shock while supporting continuous 24/7 operation with an expected service life exceeding 25 years. Each NFPG is supplied as a complete plug-and-play module consisting of the optical switch, an integrated PCB driver, a single 0–5 V TTL trigger input, and an external DC power supply. Optical power is continuously transferred between output ports during switching, ensuring uninterrupted optical transmission without signal dropout. As with all electro-optic devices, some frequency regions may exhibit reduced modulation efficiency due to resonances. These effects are confined to limited narrow frequency bands and do not affect overall device performance across the specified operating range. The module is fully assembled, factory aligned, and shipped with a wall-pluggable power supply for immediate system integration.

Features

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

Applications

- Optical blocking
- Configurable operation
- Instrumentation

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]:

RoHS COMPLIANT

Specifications

Parameter		Min	Typical	Max	Unit
Insertion Loss [1]	1900-2200nm [2]		1.6	2.8	dB
	1700~2300nm		0.8	1.8	
	1260~1650nm		1	1.5	
	850~1100nm		1.6	3	
	780-850nm [2]		2	4.5	
Cross Talk On/Off Ratio [3]		18	22	30	dB
Durability		10^{14}			cycles
PDL (SMF Switch only)			0.15	0.3	dB
PMD (SMF Switch only)			0.1	0.3	ps
ER (PMF Switch only)		18	25	29	dB
IL Temperature Dependency			0.25	0.5	dB
Return Loss		45	50	60	dB
Electrical-Optical Delay				200	ns
Optical Rise/Fall Time [4]		8	10	12	ns
Repetition Rate		DC		700	kHz
Optic power Handling [5]	Normal power version		0.3	0.5	W
	High power version		5	10	W
Operating Temperature range		-20		70	°C
Storage Temperature		-40		100	°C

Notes:

[1]. Measured without connectors. Each connector adds 0.3dB.
[2]. Wavelengths < 850nm or > 1900nm will be implemented in the special version.
[3]. ± 25nm, Cross talk is measured at 100kHz, which may be degraded at the higher repeat rate.
[4]. It is defined as the rising or fall time between 10% and 90% of optical intensities.
[5]. Defined at 1310nm/1550nm. For the shorter wavelength, the handling power is reduced, see graph
[1b]. NPLC version available for high power and low loss that incorporates fiber core enlargement (expensive).

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.**

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Mechanical Dimensions (mm)

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

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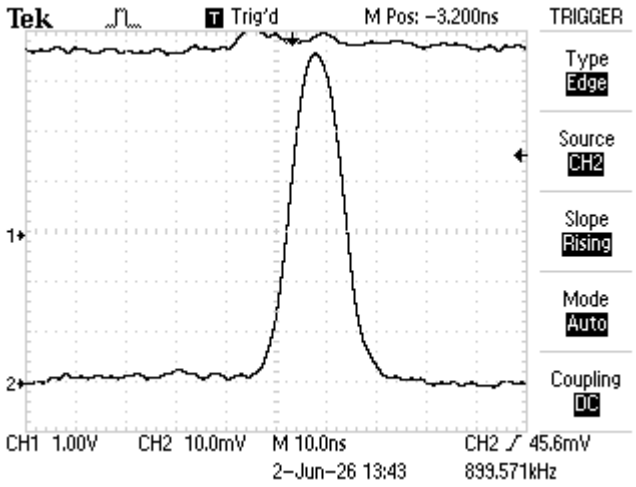
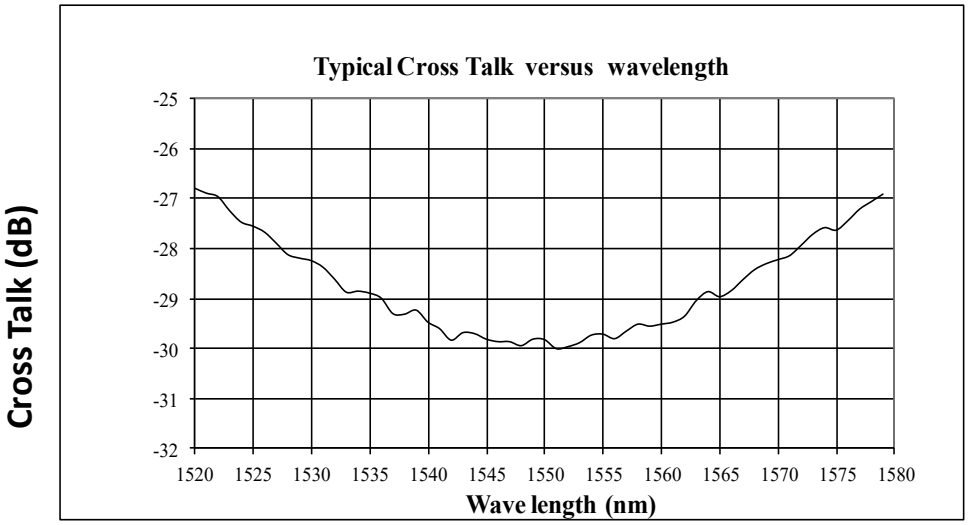
Typical Pulse Generation



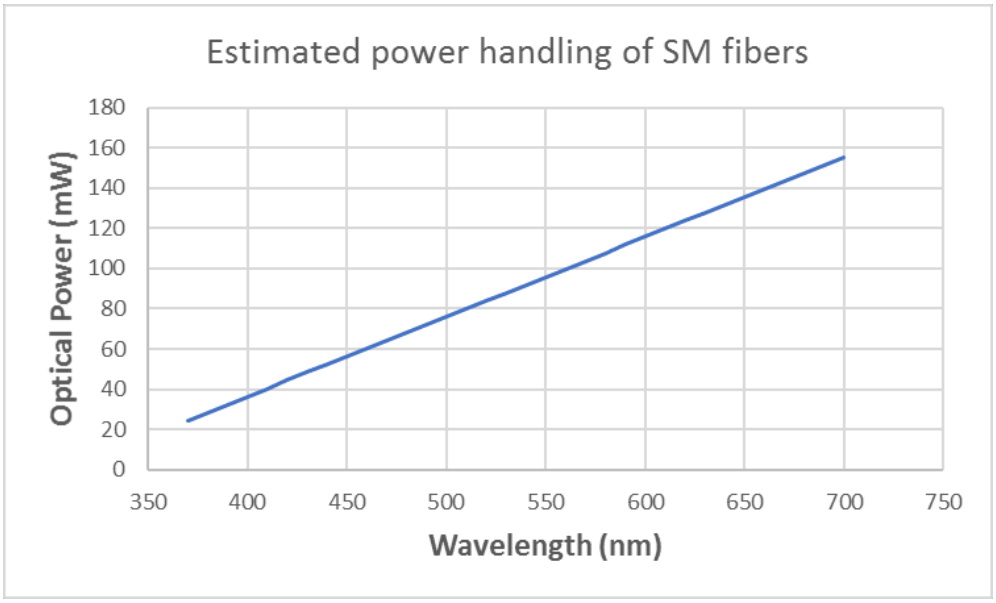
Driving Board

It has an SMA connector for TTL input.
It comes with a 12V wall-pluggable power supply.

Typical Bandwidth Measurement



Optical Power Handling vs Wavelength For Single-Mode Fibers (core size related)



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Ordering Information (Part Number)

	☐☐	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Type**	**Wavelength**	**Power**	**Repetition Rate**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector [1][2]**	**Benchtop**
NFPG-	20ns = 20 Special = 00	1060 = 1 2000 = 2 1310 = 3 1550 = 5 1625 = 6 1750 = A 850 = 8 780 = 7 650 = E 550 = F 450 = G Special = 0	0.3W = 1 5W = 2 10W = A 15W = C 20W = D	700kHz = 1	SMF-28 = 1 Hi1060 = 2 Hi780 = 3 PM1550 = 5 SM600 = 6 SM800 = 8 PM850 = A PM780 = B PM630 = C PM980 = 9 MM50/125 [3]= M 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/APC = A E2000 APC = 9 LC/UPC = U Special = 0	None = 1 Benchtop = B

[1]. High power connector can be ordered separately

[2]. The connector cannot be installed directly onto bare fiber, as it 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 can remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SM28 fiber and decreases further with smaller core fibers.

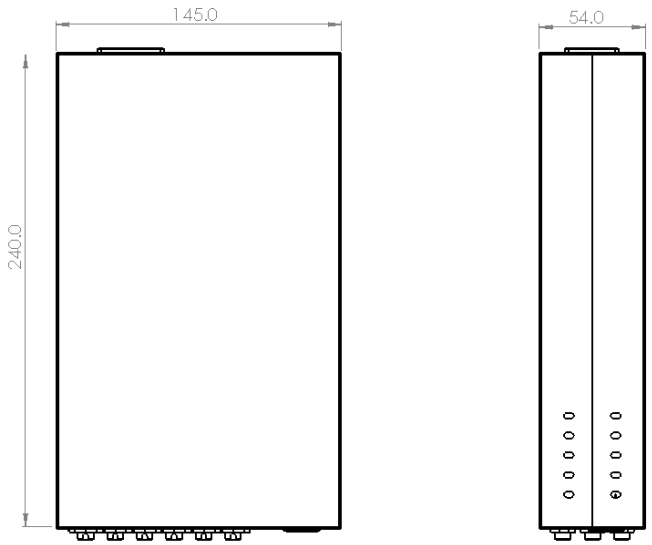
[3]. For laser with mode fill ratio CPR <14

* This unit comes with an integrated driver, and a power supply is included.

Note:

- **Opaque** – light is blocked without applying a voltage
- **Transparent** – light goes through without applying a voltage

Benchtop Box Mechanical Dimension



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