NanoSpeed™ Non-Drift
65dB Extinction, 1x1, 1x2 Fiber Optical Switch
Triple Stage, 1.8dB Loss, SMF, PMF, High Power, Bidirectional

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

DATASHEET

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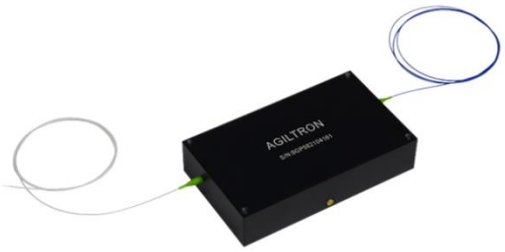

The NSSI series of NanoSpeed™ electro-optical switches delivers low optical loss, over 70 dB on/off extinction, little drift, fast response, and high optical power handling through drift-compensating control technology. Built by cascading multiple switches on a PCB with a protective cover, they operate via 5 V TTL control (SMA input) and a 12 V DC supply. Designed for exceptional reliability — including undersea, space, and continuous-duty applications with lifetimes exceeding 25 years — the intrinsically bidirectional switches are available in polarization-independent or polarization-maintaining fiber configurations and transfer optical power seamlessly between ports with no loss during switching. The Low-Drift series is optimized for repetition rates above 1 Hz, responds to arbitrarily timed control signals, and exhibits power consumption proportional to switching rate, with some drift occurring only when operated at zero switching rate.

Applications

- Laser Systems
- Sensor Systems
- Instruments
- Quantum Systems

Features

- 50dB High on/off Ratio
- Solid State High Reliability
- High Speed
- Very Low Optical Loss
- High Optical Power Handling
- Minimal Transit Echoes
- Wide Operation Temperature Range
- Vibration Insensitive

Specifications

Parameter	Min	Typical	Max	Unit
Center Wavelength [1]	780		2300	nm
Insertion Loss [2] 1900 – 2300nm		2.5	3.5	
Insertion Loss [2] 1700 – 2300nm		1.8	2.2	
Insertion Loss [2] 1260 – 1650nm		2	3	dB
Insertion Loss [2] 960 – 1100nm		2.2	3	
Insertion Loss [2] 780 – 950nm		2.5	3.5	
On/Off Ratio, Cross Talk [3]	62	65	70	dB
Durability	10^{14}			cycle
PDL (SMF)		0.15	0.3	dB
PMD (SMF)		0.1	0.3	ps
ER (PMF)	18	25		dB
Insertion Loss Temperature Dependence		0.25	0.5	dB
Return Loss	45	50	60	dB
Response Time (Rise or Fall)		50	100	ns
Electrical-Optical Delay			250	ns
Optical Power Handling [4]		0.3	20	W
Repetition Rate [5]	0.0001		20	kHz
Operating Temperature	-10		50	°C
Storage Temperature	-40		80	°C
Power Consumption			2	W

Notes:

[1] Operation bandwidth is ±25nm with on/off ~70dB, beyond this range on/off ratio decrease

[2] Measured without connectors. Each connector adds about 0.25dB loss

[3] ±25nm, measured at 50kHz. The time gap between switching should be <10ms to avoid charge built-up at wavelengths shorter than 800nm that may degrade the on/off value.

[4] Defined at 1310nm/1550nm. For the shorter wavelength, the handling power may be reduced.

[5] Currently, only DC-100kHz is available. Higher frequency is under development

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.**

Rev 12/02/25

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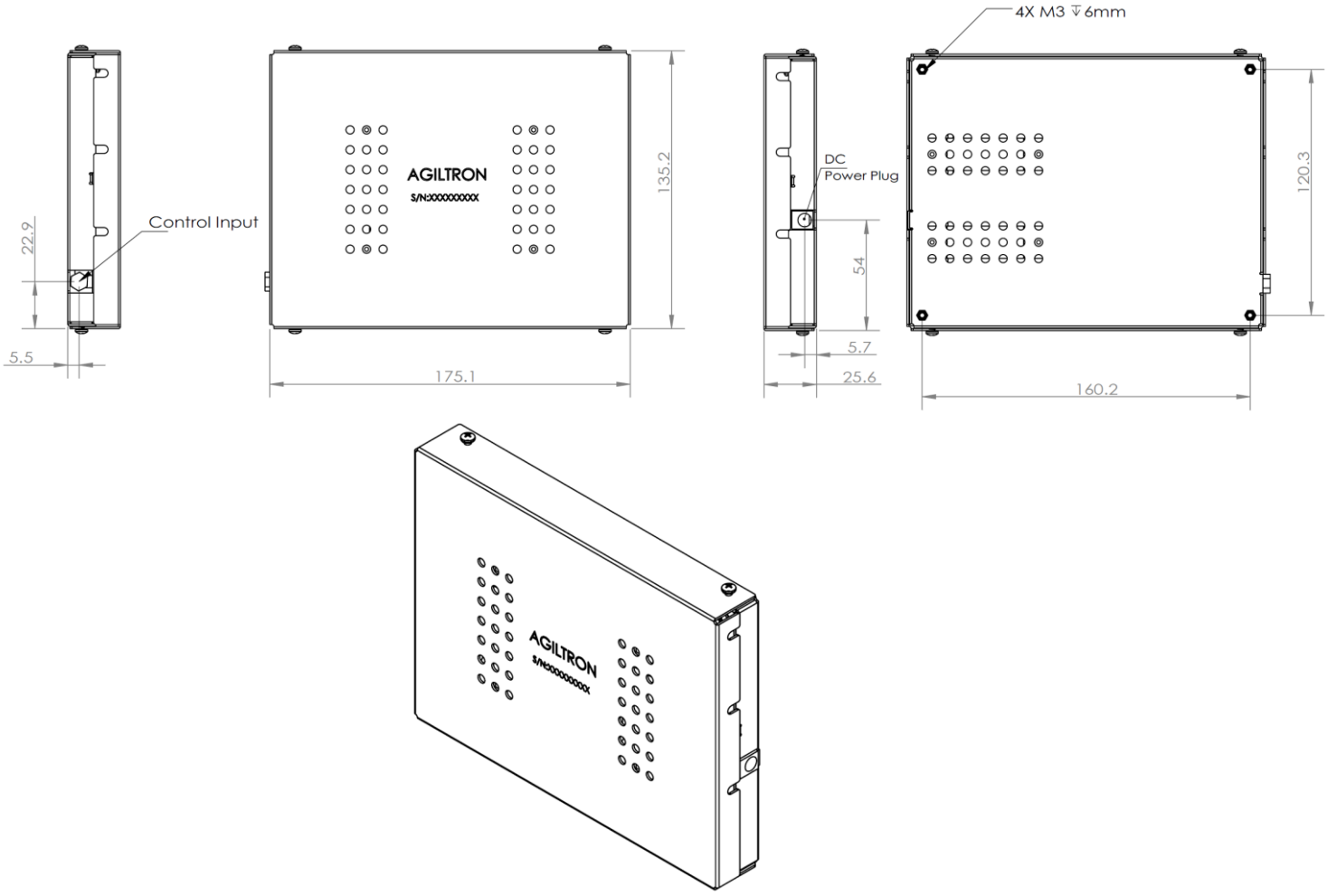
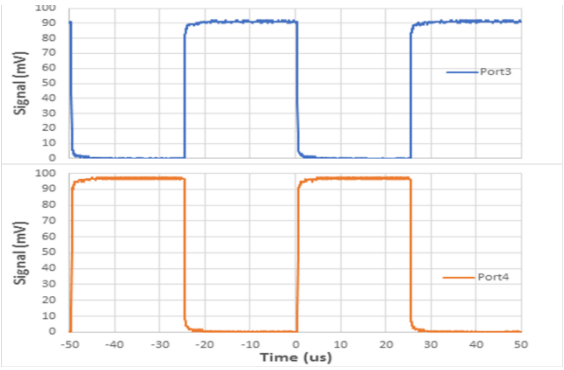
Mechanical Dimensions (mm)

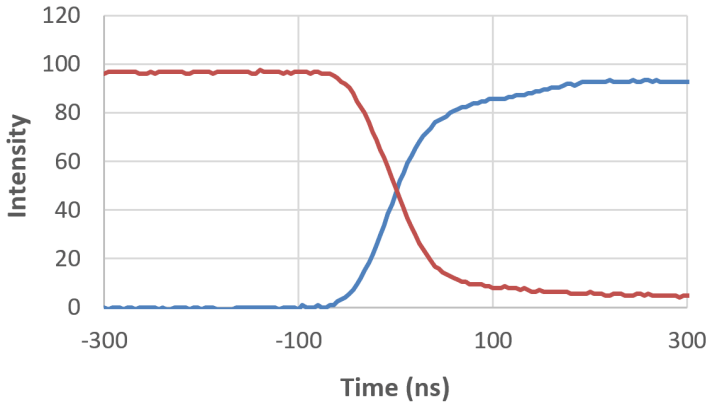


*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

Typical 20KH Switching Between Two Ports



Output Ports Intensity Exchange During Switching



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Ordering Information

	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Type**	**Wavelength [1]**	**Optical Power [2]**	**Configuration**	**Max Frequency**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector**	**Package**
NSN3-	1x1 = 1 1x2 = 2	1060nm = 1 L Band = 2 1310nm = 3 1410nm = 4 1550nm = 5 1750nm = A 2000nm = B 980nm = 9 850nm = 8 780nm = 7 Special = 0	Standard = 1 5W = 2 10W = A 15W = C 20W = D Special = 0	Transparent = 1	20kHz = 2 Special = 0	SMF-28 = 1 HI1060 = 2 HI780 = 3 PM1550 = 5 PM980 = 9 PM850 = 8 Special = 0	Bare fiber = 1 0.9mm 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/PC=8 LC/APC = 9 E2000 APC = A LC/UPC = U Special = 0	Metal Case = 1 PCB = P Benchtop = B

[1]. Center wavelength. The high power switch isn't available for the wavelength shorter than 960nm.

[2]. Regular connectors cannot handle high power. Please contact us for Agiltron's unique high-power connectors.

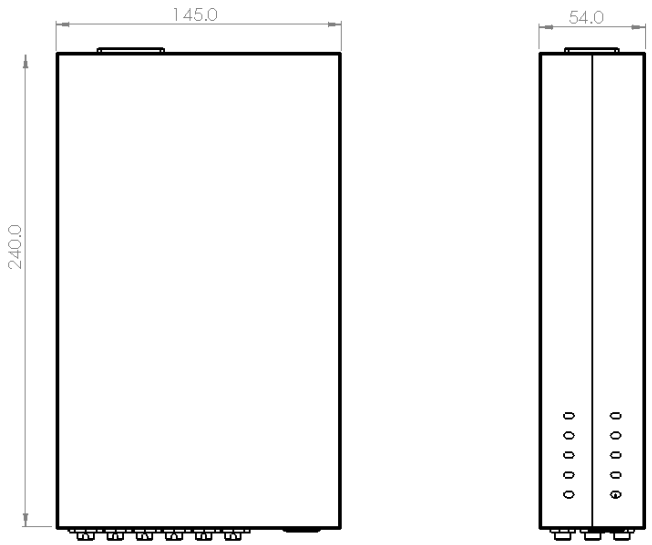
* This unit comes with an integrated driver, and a power supply is included.

Red color indicates special order

Note:

- **PM1550** fiber works well for **1310nm**

Benchtop Box Mechanical Dimension



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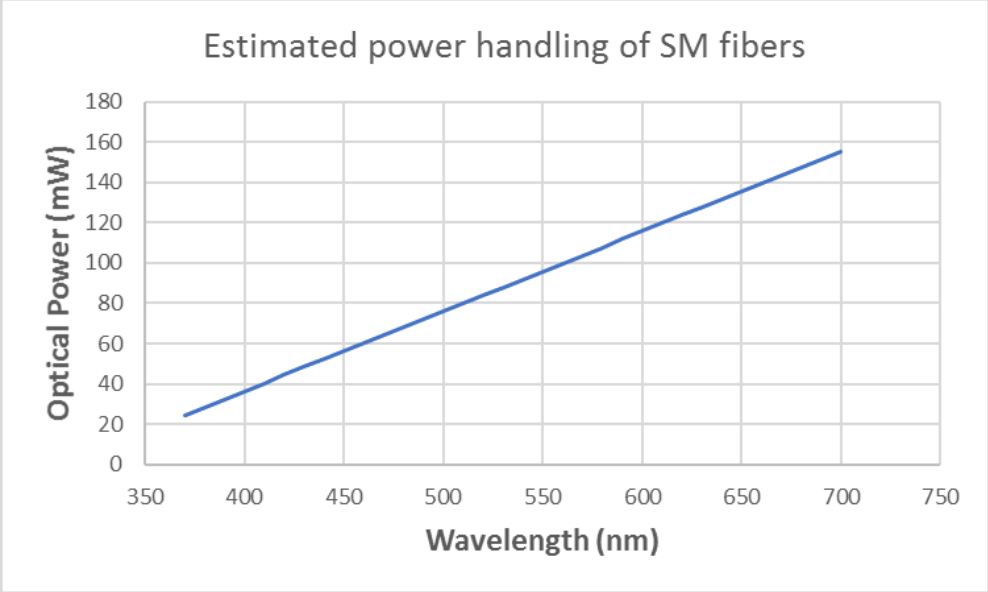
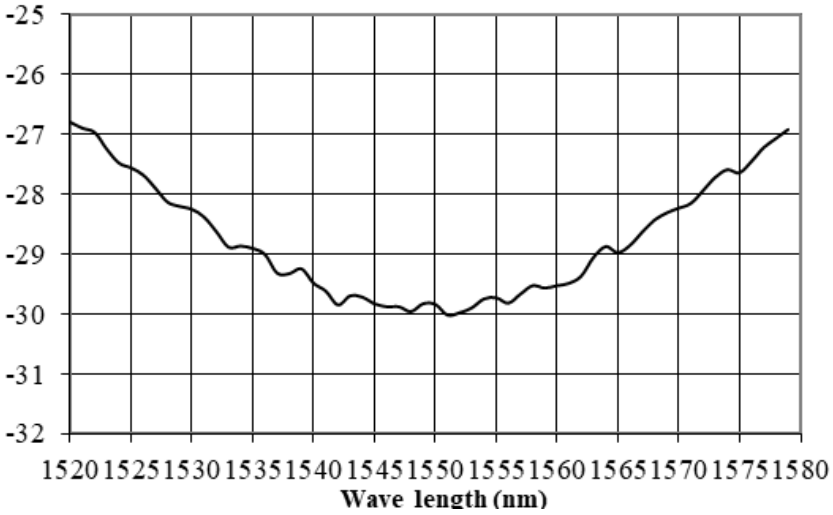
Optical Power Handling vs Wavelength For Single-Mode Fibers



Typical On/Off Ratio (dB) vs Wavelength



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