

NanoSpeed™ 1x2 Solid-State Variable Fiberoptic Splitter (Bidirectional)

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

Product Description

The NS 1x2 Solid-State Variable Fiber Optic Splitter splits an incoming optical signal among two output optical fibers with an electrically variable power ratio. This is achieved using a patent pending non-mechanical configuration. When the electrical control signal is removed, the splitter latches to a pre-determined ratio with a standard version of 100:0. The device is bidirectional, transmitting light in both direction simultaneously. The all-solid-state crystal design eliminates the need for mechanical movement and organic materials. The NS Fiber Optic Splitter is designed to meet the most demanding switching requirements of ultra-high reliability, fast response time, and continuous operation.

The NS Series beam splitter is controlled by 5V TTL signals with a specially designed electronic driver having performance optimized for various repetition rate.

Performance Specifications

| NS 1x2 Splitter | Min | Typical | Max | Unit |
|--|------------------|---------|------|--------|
| Central Wavelength | 780 | | 2000 | nm |
| Insertion Loss ^[1] | 1260~1650nm | 0.6 | 1 | dB |
| | 960~1260nm | 0.8 | 1.3 | dB |
| | 760~960nm | 1 | 1.5 | dB |
| Cross Talk at 100% splitter ^[2] | 20 | 25 | 35 | dB |
| Splitting Variation | Output 1 | 100~0 | | % |
| | Output 2 | 0~100 | | % |
| Type | Continuous | | | |
| Response Time (Rise, Fall) | | | 300 | Ns |
| Durability | 10 ¹⁴ | | | cycles |
| Repetition Rate ^[3] | DC | 5 | 100 | 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 100kHz, 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.

Features

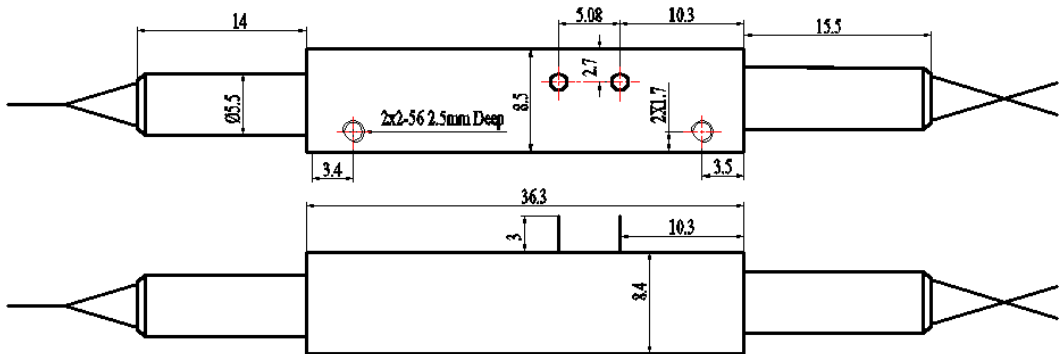
- Solid-State High Speed
- Ultra-High Reliability
- Low Insertion Loss
- Compact

Applications

- Optical Channel Blocking
- System Monitoring
- Instrumentation

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Mechanical Dimensions (mm)



Optical Splitter Driving Table

| Optical Power Ratio | | TTL Signal |
|---------------------|-----------|------------|
| Port # 2 / Port #3 | 100% / 0% | L (< 0.8V) |
| Port # 2 / Port #3 | 0% / 100% | H (> 4.5V) |

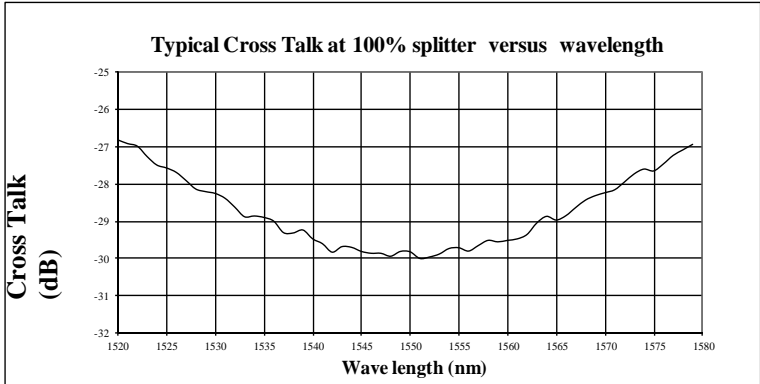
Driving Board Selection

| Maximum Repetition Rate | Part Number (P/N) |
|-------------------------|-------------------|
| 20kHz | NVDR-113235112 |
| 100kHz | NVDR-112221112 |

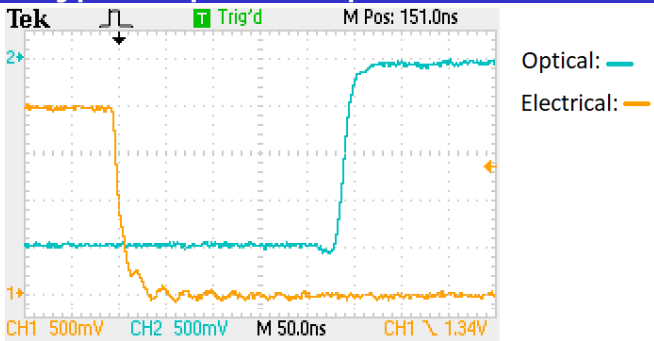
* Note: For customers that prefer to design their own driving circuit, they are responsible for the optical performance. For more technical information, please contact us.

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Bandwidth Measurement



Typical Speed Response Measurement



Ordering Information

| NSSW- | 3 0 | <input type="checkbox"/> | 1 | 1 | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|-------------|---|--------------------------|---------|-----------------------|---|--|--------------------------|--------------------------|
| Type | Wavelength | Configuration | Package | Fiber Type | Fiber Length | Connector | | |
| Splitter=30 | 1060=1 L Band=2 1310=3 1550=5 780=7 850=8 980=9 | | | SMF28e=1 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 °C. The extinction or cross-talk value is affected by many EO material characters, including temperature-dependent birefringence, V_p , 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.