

Switchable Fiber Optical Splitter/Coupler (1x2, 2x2, SM, PM, Bidirectional)

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

Product Description

The Switchable Fiber Optical Splitter in 1x2 format splits an incoming optical signal into two output optical fibers with the capability of switching between two splitting ratios. The initial split ratio should be predefined in design, while the second split ratio will be preset in delivery. When the control signal is low (<0.8V), the splitter sustains in an initial ratio. When apply the high control voltage (3-5V), the splitting ratio will be switched from the initial ratio to the secondary one. The device is bidirectional, transmitting light in both directions simultaneously. In the 2x2 format, the input light from two input will be split into two output in the similar way of 1x2 format, but the splitting ratio is reversed each other between two input light. The switchable Fiber Optic Splitter has passed Telcordia reliability qualification tests as well as aerospace qualifications. It is designed to meet the most demanding requirements of ultra-high reliability, fast response time, and continuous operation. The switch is intrinsically bidirectional and selectable for polarization-independent or polarization-maintain by the fiber type.

The unit is mounted on a driving board having a control signal input SMC connector and a wall plug-in power supply. Available with several drivers having performance optimized for various repetition rate.

Performance Specification

Switchable Ratio Splitter	Min	Typical	Max	Unit
Central Wavelength	450		2000	nm
Insertion Loss ^[1]	1260-1650nm	0.6	1	dB
	900-1260nm	0.8	1.3	dB
	760-900nm	1	1.5	dB
	650-850	1.5	1.9	dB
	450-580	2	2.5	dB
Cross Talk at 100% splitter ^[2]	20	25	35	dB
Durability	10 ¹⁴			cycles
Splitting ratio ^[3]	Initial	0	100	%
	Switching	0	100	%
	Type	Continuous		
Response Time (Rise, Fall)			1000	Ns
Repetition Rate ^[4]	DC		500	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 ^[5]		300		mW
Storage Temperature	-40		85	°C
Package Dimension		65.8x8.5x8.4		mm

[1] Excluding connectors.

[2] ±25nm, Cross talk is measured at 5kHz, which may be degraded at the high repeat rate.

[3] The initial ratio must be predefined. The switching ratio will be preset in delivery.

[4] High repetition rate (up to 1MHz) is available in the premium version, please contact us.

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

Features

- High Speed
- High Reliability
- Low Loss
- Temperature Stable
- Compact

Applications

- Instrumentation
- Power balance
- Sensor

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Mechanical Dimensions (mm)



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

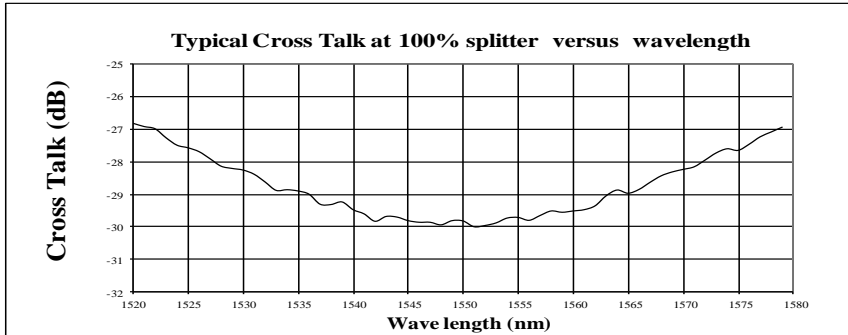
Driving Board Selection

Maximum Repetition Rate	Part Number (P/N)
100kHz	SWDR-11a261111
500kHz	SWDR-11a291111

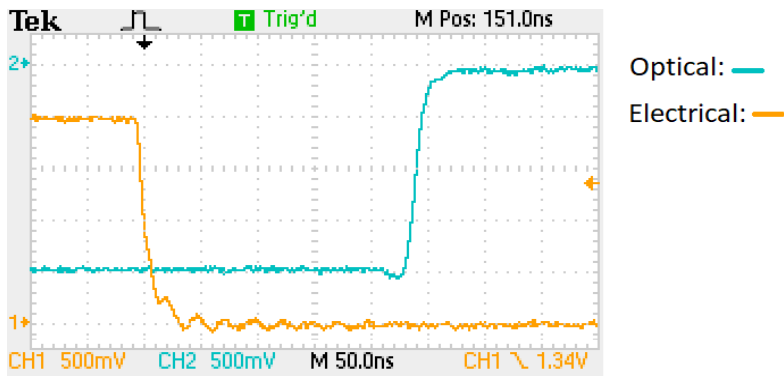
* Note: For customers that prefer to design their own driving circuit, they are responsible for the optical performance. For more technical information, please contact us.

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Wavelength Bandwidth Measurement



Typical Speed Response Measurement



Ordering Information

Prefix	Type	Wavelength	Repetition	Initial split ratio [1]	Switching split ratio [1]	Fiber Type	Fiber Cover	Fiber Length	Connector
NSSS-	1x2 = A 2x2 = B	1060 = 1 L Band = 2 1310 = 3 1550 = 5 780 = 7 850 = 8 980 = 9 Special = 0	100Khz = 1 500kHz = 5 Special = 0	0:100 = A 10:90 = 1 20:80 = 2 30:70 = 3 40:60 = 4 50:50 = 5 60:40 = 6 70:30 = 7 80:20 = 8 90:10 = 9 Special = 0	100:0 = A 90:10 = 1 80:20 = 2 70:30 = 3 60:40 = 4 50:50 = 5 40:60 = 6 30:70 = 7 20:80 = 8 10:90 = 9 Special = 0	SMF-28 = 1 HI1060 = 2 PM 1550 = 5 HI780 = 3 PM980 = 9 PM850 = 5 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 Duplex = 8 LC/APC = 9 E2000 APC = A Special = 0

[1]. Initial and Switched splitting ratios could be combined in arbitrary

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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.

Operation Manual

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.