

NanoSpeed™ 1x4 PM Fiberoptic Power Splitter (Bidirectional)

(Protected by U.S. patents 7,403,677B1; 6,757,101B2; and pending patents)



DATASHEET

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Features

- High Reliability
- Fast Speed
- Low Insertion Loss
- Compact Size
- Low Cost

Applications

- Configurable multi-channel EDFA module
- Instrumentation

The NS Series 1x4 solid-state fiber-optic splitter splits the optical power among four outputs with any power splitting ratio. The input is polarization maintaining (PM) fiber and the outputs are four single mode or PM fibers. This is achieved using patent pending non-mechanical configurations with solid-state all-crystal designs, which eliminates the need for mechanical movement and organic materials, offering the ultra-long lifetime. The NS fiber-optic switch is designed to meet the most demanding switching requirements of fast response time, and continuous switching operation. The switch is bidirectional.

Specifications

Parameter	Min	Typical	Max	Unit
Central Wavelength	450		2000	nm
Insertion Loss ^[1]		0.8	1.3	dB
Cross Talk ^[2]	17	22		dB
Polarization Dependent Loss		0.15	0.35	dB
IL Temperature Dependency		0.25	0.5	dB
Return Loss	45	50	60	dB
Response Time (Rise, Fall)	30		1000	ns
Repetition Rate	DC	5	100 ^[3]	kHz
Operating Temperature	-5		70	°C
Optical Power Handling		300	500	mW
Storage Temperature	-40		85	°C

Notes:

- [1]. Excluding connectors
- [2]. Define @ 100% splitting rate
- [3]. Driver kit is recommended for high operation frequency

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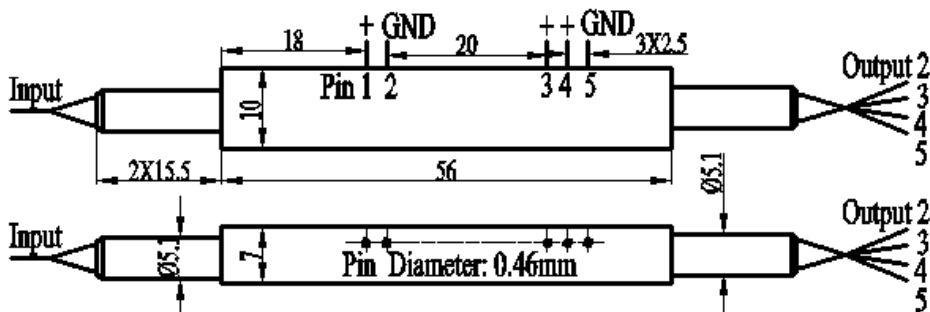
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Mechanical Dimensions (mm)



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

Status Definition

Status ^[1]	Pin Group 1		Pin Group 2		Pin Group 3	
	Pin 1	Pin 2	Pin 3	Pin 5	Pin 4	Pin 5
Input → Output2	0	0	0	0	0	0
Input → Output3	High ^[2]	0	0	0	0	0
Input → Output4	0	0	0	0	High	0
Input → Output5	High	0	High	0	0	0

[1]: The status is shown as 100% splitter from default, but could be at any ratio by applying the different driving voltage and its combinations

[2]: High = V_p w/o driver, or ~5V of TTL with driver

Operation Instruction

1. Plug in the accompanied power supply
2. Plug in a 0-5V control signal to the input SMA connector (golden color). One can use a DC power supply first, and then a function generator. The optical output will change from maximum to minimum or from minimum to maximum depending on which port is measured.
3. Do not adjust settings on the board

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Ordering Information (Part Number)

Prefix	Type	Wavelength	Input Fiber	Output Fiber	Package	Fiber Cover	Fiber Length	Connector ^[2]
NSSP-	1x4 = 14 1x3 = 13	1310nm = 3 1550nm = 5 450nm = 4 550nm = 5 650nm = 6 750nm = 7 850nm = 8 950nm = 9 1060nm = A 1950nm = B Special = 0	PM460 = 4 PM630 = 6 PM780 = 7 PM850 = 8 PM1550 = 1 PM1310 = 3	Select from below table	Standard = 1 Aerospace ^[1] = A	Bare fiber = 1 900um loose tube = 3 Special = 0	0.25m = 1 0.5m = 2 1.0 m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 LC/PC = 7 LC/APC = 9 LC/UPC = U Special = 0

[1]. Aerospace-grade package featuring an aluminum metal casing filled with a specially formulated RTV compound that is both vibration-resistant and thermally conductive, specifically designed to endure repeated thermal shock cycles from -45°C to 90°C.

[2]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber 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 may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

Fiber Type Selection Table:

01	SMF-28	34	PM1550	71	MM 50/125µm
02	SMF-28e	35	PM1950	72	MM 62.5µm
03	Corning XB	36	PM1310	73	105/125µm
04	SM450	37	PM400	74	FG105LCA
05	SM1950	38	PM480	75	FG50LGA
06	SM600	39	PM630	76	STP 50/125
07	780HP	40	PM850	77	IRZS23
08	SM800	41	PM980	78	IRZS32
09	SM980	42	PM780	79	
10	Hi1060	43		80	
11	SM400	44	PM405	81	UV180nm
12		45	PM460		

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters (<5 µm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.