

LightBend™ 1xN High Power Fiber Optic Switch

(Bidirectional, 5 ms, High Power up to 100W CW)

(Protected by U.S. patent 6823102 and pending patents)



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Features

- Low Cost
- Broad Spectral Range
- High Isolation
- High Power
- Epoxy-Free Optical Path
- High Optical Power up to 100W CW

Applications

- Signal management
- Sensor
- Spectroscopy
- High Power Laser
- Instrumentation



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The LBHS Series 1×N Fiber Optic Switch enables high-power optical routing by directing an input signal to a selected output fiber through a precision motor-driven mechanism. The switch achieves fast switching times of less than 5 ms and low insertion loss ~0.3dB. The LBHS is broadband and uncoated, with transmission characteristics equivalent to bare optical fiber. It supports all fiber types and can handle up to 100 W CW optical power when paired with large-core fibers. The switch is bidirectional and offers multiple control interfaces, including TTL, USB, RS232, GPIB, and Ethernet. Note: GPIB and Ethernet interfaces are available only in the 1U rack-mounted configuration.

Specifications

Parameter	Min	Typical	Max	Unit
Operation Wavelength	350		2650	nm
Insertion Loss ^[1]		0.5	1.0	dB
Wavelength Dependent Loss ^[2]		0.1	0.5	dB
Polarization Dependent Loss (SM)		0.03	0.10	dB
Extinction Ratio (PM)	18			dB
Return Loss (APC/UPC)	(SM, PM)	50		dB
	(MM)	35		dB
Cross Talk	50			dB
Operating Voltage		12		VDC
Switching Time ^[3]	0.05		0.5	s
Durability	10 ⁷			cycle
Operating Temperature	0		70	°C
Storage Temperature	-40		85	°C
Optical Power Handling	Standard		0.5	W
	High Power	2	80	W

Notes:

[1]. Exclude connectors.

[2]. Within 100 nm bandwidth.

[3]. Defined for speed between the adjacent channels.

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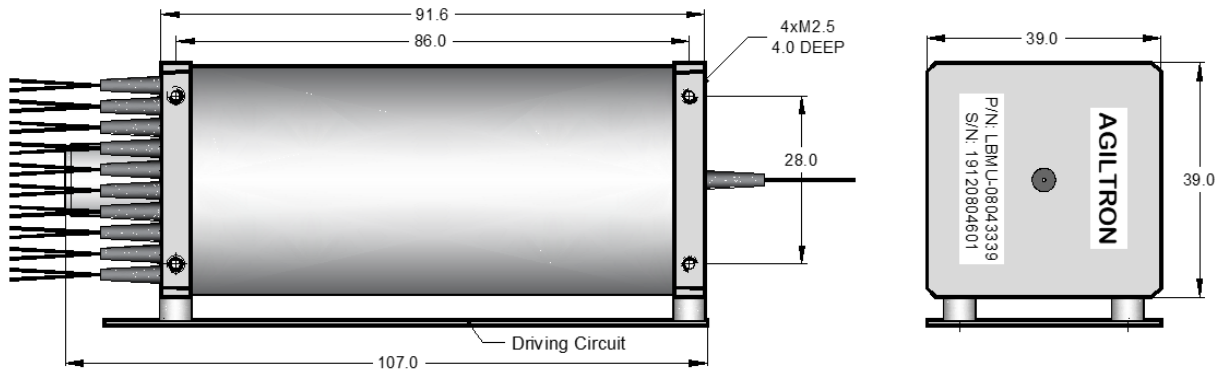
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Mechanical Dimensions (mm)

Package A



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

Electrical Driving Requirement

Computer controlling kit with USB or RS232 or GBIB interfaces and Windows™ GUI

Ordering Information (Part Number)

Prefix	Type	Test Wavelength*	Control	Optical Power	Fiber Type	Fiber Cover	Fiber Length	Connector ^[1]	Package **
LBHS-	1x4 = 04 1x5 = 05 ... 1x8 = 08 ... 1x99 = 99 Special = 00 Dual 1x2 = D2 Dual 1x4 = D4	1060 = 1 450 = 2 1310 = 3 1410 = 4 1550 = 5 650 = 6 780 = 7 850 = 8 1310/1550 = 9 1260~1620 = B Special = 0	TTL = 1 RS232 = 2 USB = 3 Ethernet = 4 GPIO = 5 Special = 0	5 W = 3 10W = 5 30W = 6 50W = 7 70W = 8 80W = 9 Special = 0	MM 50/125 = 5 MM 62.5/125 = 6 105 μm = G 200 μm = H 400 μm = J SM28 = 1 PM1550 = B Special = 0	Bare fiber = 1 0.9mm tube = 3 3mm tube = 4 Special = 0	0.25 m = 1 0.5 m = 2 1.0 m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 5W FC = A 10W FC = B ST/PC = 6 LC/PC = 7 SMA905 = 9 LC/UPC = U Special = 0	Component = 1 Benchtop = 2 1U Rack = 3 2U Rack = 4 Special = 0

[1]. 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.

* The switch is intrinsically broadband. Test wavelength can be selected for qualification. Multiple wavelengths can also be tested at extra cost.

**The component is intended for OEM integration only and is not suitable for laboratory use, as it includes an exposed PCB that is vulnerable to damage from electrostatic discharge (ESD) when handled. For laboratory or standalone operation, benchtop and rack-mounted packages are available as turnkey units with integrated power supplies and full ESD protection.

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Application Notes

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 ($<5\text{ }\mu\text{m}$) 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 handling by expanding the core side at the fiber ends.

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