

# LightBend™ 1x1, 1x2, 2x2 Bypass Multimode Fiber Optic Switch (Bidirectional)

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

## Product Description

The LB 1x1, 1x2, 2x2 Bypass Multimode Fiberoptic switch is a highly integrated single device. Based on an Agiltron's pending patent, the switch is designed especially for protection and restoration applications. The switch is activated by a 5V pulse between two states and latching operation preserves the selected optical path after the drive signal has been removed. The switch has integrated electrical contact based position sensors. The proprietary simple design significantly reduces moving part position sensitivity, offering unprecedented high stability as well as unmatched low cost. Electronic driver is available for this series of switches. The switch is bidirectional.

We offer tight-bend-fiber version, which reduces the minimum bending radius from normal 15 mm to 7 mm. This feature enables smaller overall foot print.



## Performance Specifications

LB 1x1,1x2, 2x2 Bypass MM Switch	Min	Typical	Max	Unit
Wavelength	Single Band	780±20, 850±20, 1060±20, 1310±30, 1550±30		nm
	Dual Band	850 / 1310,		
Insertion Loss <sup>[1], [2]</sup>		0.6	0.9	dB
Wavelength Dependent Loss			0.25	dB
Cross Talk <sup>[1], [2]</sup>	35			dB
Return Loss <sup>[1], [2]</sup>	35			dB
Switching Time		3	10	ms
Repeatability			± 0.02	dB
Durability	10 <sup>7</sup>			Cycles
Operating Optical Power		300	500	mW
Operating Voltage	4.5	5	6	V
Operating Current		30	60	mA
Switch Type	Latching / Non-Latching			
Operating Temperature	0 ~ 70			°C
Storage Temperature	-40 ~ 85			°C
Fiber Type	MM 62.5/125 or MM 50/125			
Package Dimension	30.0L x 30.0W X 8.5H			mm

Notes:

[1]. Within operating temperature and with light source CPR <14 dB.

[2]. Excluding Connectors.

**Warning:** This device must use the reference circuit to driver otherwise it is unstable.

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## Features

- Low Optical Distortions
- 8 Ports Integration
- High Isolation
- High Reliability
- Fail-Safe Latching
- Epoxy-Free Optical Path
- Low Cost

## Applications

- Protection
- Instrumentation

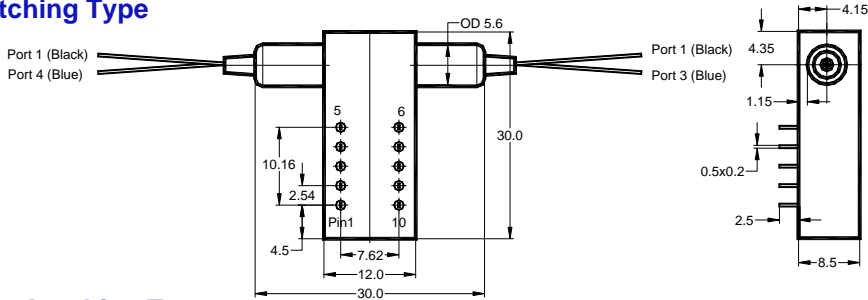


Revised on 06/30/22

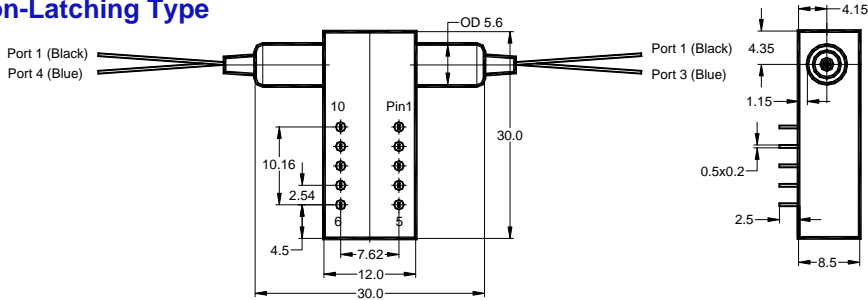
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## Mechanical Dimensions (Unit: mm)

### Latching Type



### Non-Latching Type



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

## Electrical Connector Configurations

The load is a resistive coil which is activated by applying 5V (draw ~ 40mA). However, the current flow direction must be correct otherwise it will cancel the permanent magnet inside causing instability. We strongly recommend to use the reference circuit to avoid major issues. We offer pushbutton elevation driver for verifications or convenient income inspection.

### Latching Type - Single Coil

Application Note: Applying a constant driving voltage increases stability. The switches can also be driven by a pulse mode using Agiltron recommended circuit for energy saving.

#### LB 1x2 MM Switch

Optic Path	Electric Drive				Status Sensor			
	Pin1	Pin10	Pin 5	Pin 6	Pin 2-3	Pin 3-4	Pin 7-8	Pin 8-9
Port 1→Port 2	GND	5V	N/A	N/A	Close	Open	Open	Close
Port 1→Port 3	5V	GND	N/A	N/A	Open	Close	Close	Open

#### LB 2x2 Bypass MM Switch

Optic Path	Electric Drive				Status Sensor			
	Pin1	Pin10	Pin 5	Pin 6	Pin 2-3	Pin 3-4	Pin 7-8	Pin 8-9
Port 1→Port 2 Port 4→Port 3	GND	5V	N/A	N/A	Close	Open	Open	Close
Port 1→Port 3	5V	GND	N/A	N/A	Open	Close	Close	Open



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## Non-Latching Type

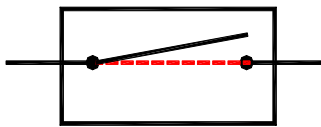
### LB 1x2 MM Switch

Optic Path	Electric Drive				Status Sensor			
	Pin 1	Pin 10	Pin 5	Pin 6	Pin 2-3	Pin 3-4	Pin 7-8	Pin 8-9
Port 1→Port 2	5V	GND	N/A	N/A	Open	Close	Close	Open
Port 1→Port 3	No Power		N/A	N/A	Close	Open	Open	Close

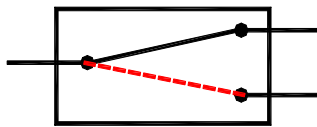
### LB 2x2 Bypass MM Switch

Optic Path	Electric Drive				Status Sensor			
	Pin 1	Pin 10	Pin 5	Pin 6	Pin 2-3	Pin 3-4	Pin 7-8	Pin 8-9
Port 1→Port 2 Port 4→Port 3	5V	GND	N/A	N/A	Open	Close	Close	Open
Port 1→Port 3	No Power		N/A	N/A	Close	Open	Open	Close

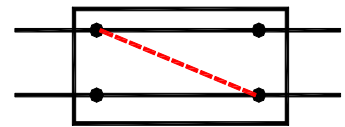
## Functional Diagram



LB 1x1 MM Switch



LB 1x2 MM Switch



LB 2x2 MM Bypass Switch

## Ordering Information

LBSW- <sup>[1]</sup>	Type	Wavelength	Switch	Package	Fiber Type	Fiber Length	Connector	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1x1 Latching=11 1x1 N/O <sup>[2]</sup> =10 1x1 N/C <sup>[3]</sup> =1C 1x2=12 2x1=21 2x2 Bypass=2B Special=00	1060=1 C+L=2 1310=3 1550=5 650=6 780=7 850=8 1310 & 1550=9 850 & 1310 =A Special=0	Latching Type Single Coil=2 Non-latch=3 Special=0	Standard=1 Special=0	MM 50/125=5 MM62.5/125=6 Special=0	Bare fiber=1 900 μm tube=3 Special=0	0.25m=1 0.5m=2 1.0=3 Special=0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC = 7 Duplex LC=8 Special = 0

[1]. N/O: LB 1x1 MM Non-Latching Switch, Normally Open.

[2]. N/C: LB 1x1 MM Non-Latching Switch, Normally Close.

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## Driver Reference Design

