



## *LightBend™* Ultra-Mini 1x1, 1x2, 2x2 Bypass Fiber Optic Switch

(Bidirectional)

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

## **Product Description**

The LB Series Ultra-mini fiber optic switch connects optical channels by redirecting incoming optical signals into selected output fibers, in 1x1, 1x2 and 2x2 Bypass configurations. This is achieved using a patented opto-mechanical configuration and activated via an electrical control signal. Latching operation preserves the selected optical path after the drive signal has been removed. The switch has integrated status contacts to provide an electrical readout of switch position. The new material based advanced design significantly reduces moving part position sensitivity, offering unprecedented high stability as well as an unmatched low cost. It is designed for use in reconfigurable OADM, optical cross-connect system and network switching for fault protection applications. 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

## **Performance Specifications**

LB U-Mini 1x1,1x2, 2x2 BP Switc	h Min	Typical	Max	Unit		
	Single Band	1260~1360 and 1	510~1620	_		
Operation Wavelength	Dual Band	1260~1360 or 15	10~1620	nm		
	Broad Band	1260~1620				
Insertion Loss [1]	-5~+70 °C	0.4	0.7	- dB		
Insertion Loss (1)	-40~+85 °C	0.6	0.9	- GB		
Wassalan eth Dan and dant Land	SW [2]		0.15	- dB		
Wavelength Dependent Loss	DW [3]		0.25			
T	-5~+70 °C		0.25	ID.		
Temperature Dependent Loss	-40~+85 °C		0.40	- dB		
Polarization Dependent Loss			0.1	dB		
Return Loss	55			dB		
Cross Talk	55			dB		
Switching Time		3	10	ms		
Repeatability	-		±0.02	dB		
Durability	10 <sup>7</sup>			Cycle		
Operating Voltage	4.5	5	6	VDC		
Operating Current (Latching/Non-		30	60	mA		
Switching Type	Latching or Non-Latching					
Operating Temperature	-5		+70	- °C		
Operating Temperature	-40	·	+85	= °C		
Storage Temperature	-40		+85	°C		
Optical Power Handling [4]		300	500	mW		
Package Dimension	31.0	DL x 10.0W x 8.0H		mm		

- [1]. Exclude connectors.
- [2]. SW: Single window.
- [3]. DW: Dual window.
- [4]. Continuous operation. For pulse operation call.

### **Features**

- Unmatched Low Cost
- Low Optical Distortions
- Low Cross Talk
- High Reliability
- Epoxy-Free Optical Path

## **Applications**

- Channel Blocking
- Configurable Add/Drop
- System Monitoring
- Instrumentation

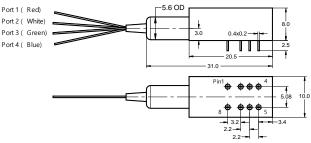


Revised on 5/2/21 (Click here for latest revision)



## LightBend<sup>TM</sup> Ultra-Mini 1x1, 1x2, 2x2 Bypass Fiber Optic Switch

### Mechanical Dimensions (Unit:mm)



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

### **Electrical Driving Requirements**

The load is a resistive coil which is activated by applying 5V (draw ~ 40mA). Agiltron offers a computer control kit with TTL and USB interfaces and Windows<sup>TM</sup> GUI. We also offer RS232 interface as an option - please contact Agiltron sales.

### **Latching Type**

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 Ultra-Mini 1x2 Switch

0 11 1 1 1 1	Electrical Drive		Status Sensor				
Optical Path	Pin 1	Pin 8	Pin 2-3	Pin 3-4	Pin 5-6	Pin 6-7	
Port 1 $\rightarrow$ Port 2	5V Pulse	GND	Open	Close	Close	Open	
Port $1 \rightarrow Port 3$	GND	5V Pulse	Close	Open	Open	Close	

#### LB Ultra-Mini 2x2 Bypass Switch

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Optical Path	Electrical Drive		Status Sensor					
	Pin 1	Pin 8	Pin 2-3 Pin 3-4		Pin 5-6	Pin 6-7		
Port $1 \rightarrow Port 2$ Port $4 \rightarrow Port 3$	5V Pulse	GND	Open	Close	Close	Open		
Port 1 → Port 3	GND	5V Pulse	Close	Open	Open	Close		

#### **Non-Latching Type**

#### LB Ultra-Mini 1x2 Switch

LB Ultra-Mini 1x2 Switch								
Outinal Bath	Electrical Drive		Status Sensor					
Optical Path	Pin1	Pin8	Pin2-3	Pin3-4	Pin5-6	Pin 6-7		
Port $1 \rightarrow Port 2$	5V	GND	Open	Close	Close	Open		
Port $1 \rightarrow Port 3$	No Power		Close	Open	Open	Close		

#### LB Ultra-Mini 2x2 Bypass Switch

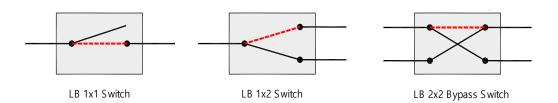
Optical Path	Electrical Drive		Status Sensor				
	Pin1 Pir		Pin2-3	Pin3-4	Pin5-6	Pin 6-7	
Port $1 \rightarrow Port 2$ Port $4 \rightarrow Port 3$	5V	GND	Open	Close	Close	Open	
Port 1 → Port 3	No Power		Close	Open	Open	Close	





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## **Functional Diagram**



## **Ordering Information**

LBUM <sup>[1]</sup> -							
Туре	Wavelength	Switch	Package	Fiber Type		Fiber Length	Connector
1x1 N/D [3] = 1D 1x2=12 2x1=21 2x2 Bypass=22 Special=00		Latching=4 Non-latching=5 Special=0	-40~+85°C=8	Corning XB=2	900µm tube=3	0.5m=2 1.0m=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]. LBUM: LighBend Ultra Mini Switch.
- [2]. N/T: LB 1x1 Non-Latching Switch, Normally Transparence.
- [3]. N/D: LB 1x1 Non-Latching Switch, Normally Dark.





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## **Driver Reference Design**

