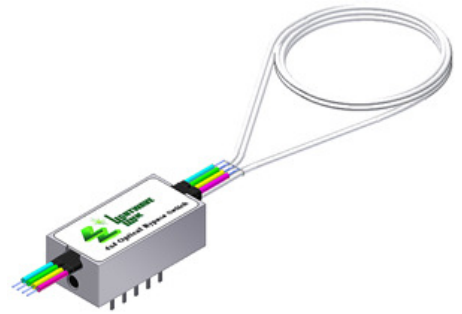


4x4 Optical Bypass Switch

Product Description

The 4x4 Optical Bypass Switch utilizes fiber-to-fiber technology over an angled surface to achieve ultra low losses and crosstalk. It is suitable for all bi-directional protection switching applications where premise-side connectivity is not required in the bypass state. Compact and competitive cost, this optical switch provides excellent performance on your network. Lightwave Link 4x4 optical bypass switch fully complies with RoHS Directive 2002/95/EC (2008/385/EC).



Features

- Compact Format
- Low Return-Loss
- Available in Single Mode / Multi Mode
- PCB Mountable
- Latching Type or Non-Latching Type

Applications

- IPS interface card or external bypass unit
- UTM/ADM
- Optical transmission
- Industrial Ethernet ring switch under power failure or system hang
- Node Bypass Protection

Performance Specification

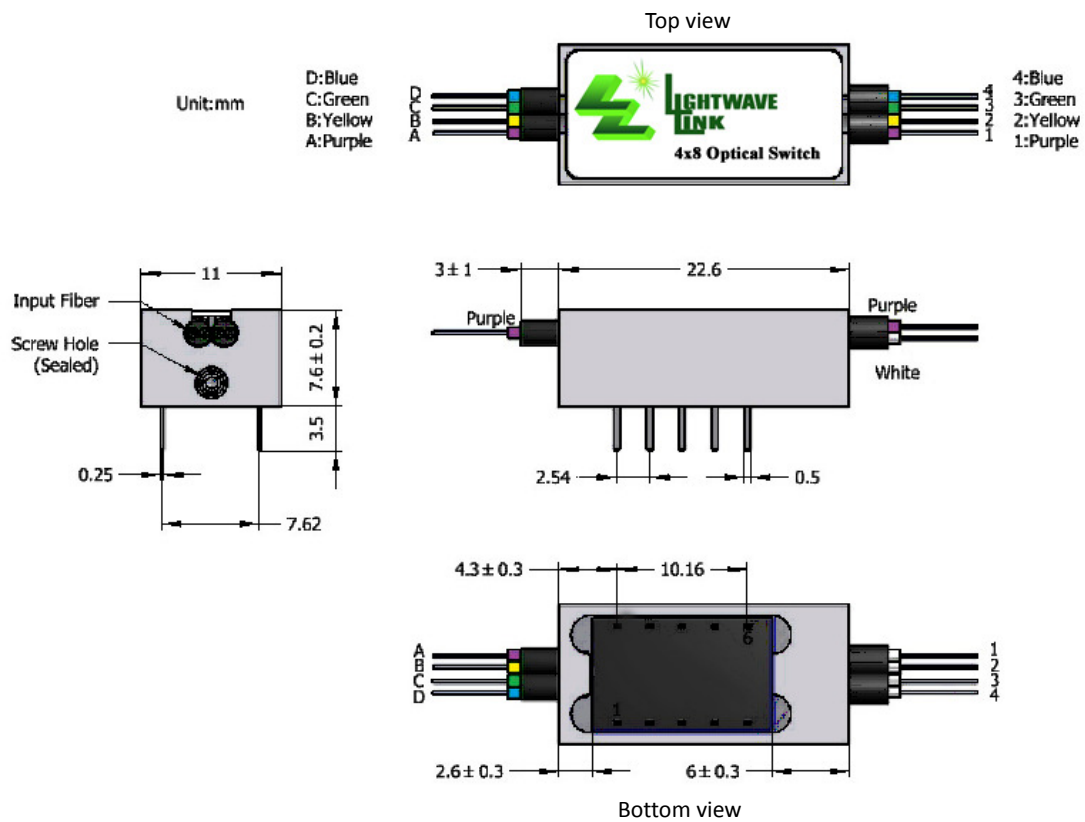
Parameter	9µm Core Single Mode			50µm or 62.5µm Core Multi Mode			Unit
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Wavelength Range ¹	1260~1630			850/1300			nm
Straight Insertion Loss ²			1.0			0.5	dB
Bypass Insertion Loss ²			2.0			1.0	
Return Loss	-50						dB
PDL	0.1						dB
WDL	0.3			0.3			dB
Crosstalk	-80			-80			dB
Repeatability	±0.1			±0.1			dB
Switching Time ³	5			5			ms
Absolute Optical Input Power	500			500			mW
Operating Voltage	4.5	5.0	5.5	4.5	5.0	5.5	VDC
Power Consumption	Latching: 200±10% / Non-Latching: 140±10%						mW
Switching Life Expectancy	3x10 ⁷			3x10 ⁷			Cycles
Operation Temperature-Normal	-5		70	-5		70	°C
Operation Temperature-Special	-20		70	-20		70	°C
Storage Temperature	-40		85	-40		85	°C
Operation Humidity	5		85	5		85	%RH
Storage Humidity	5		85	5		85	%RH
Dimension (H*W*L)	7.6 x 11 x 22.6						mm
Ring Size	≥ 4						cm
Weight ⁴	10						g

1. Special wavelength would be upon request.
2. Optical parameters excluded connectors.
3. A minimum ≥20ms pulse is recommended for latching type of switch.
4. The product weight excluded optical connectors.

Function Diagram

OSW Mode	Optical Path	
Normal Mode	D(Blue) ↔ 4(Blue)	
	C(Green) ↔ 3(Green)	
	B(Yellow) ↔ 2(Yellow)	
	A(Purple) ↔ 1(Purple)	
Bypass Mode	A(Purple) ↔ C(Green)	
	B(Yellow) ↔ D(Blue)	

Physical Dimension




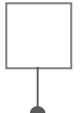
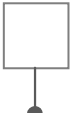
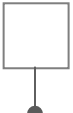
PIN Description

Pin Number	Latching Pin Function	Non-Latching Pin Function
1	Bypass mode activation terminal(+)	N/C
2	Normal mode monitor	Normal mode monitor
3	Monitor common	Monitor common
4	Bypass mode monitor	Bypass mode monitor
5	Bypass mode activation terminal(-)	Normal mode activation terminal(+)
6	Normal mode activation terminal(-)	Normal mode activation terminal(-)
7	Bypass mode monitor	Bypass mode monitor
8	Monitor common	Monitor common
9	Normal mode monitor	Normal mode monitor
10	Normal mode activation terminal(+)	N/C

Operation of the Optical Switch

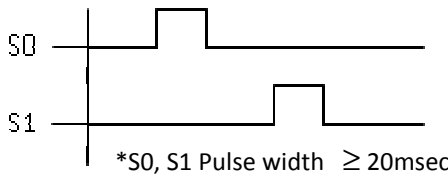
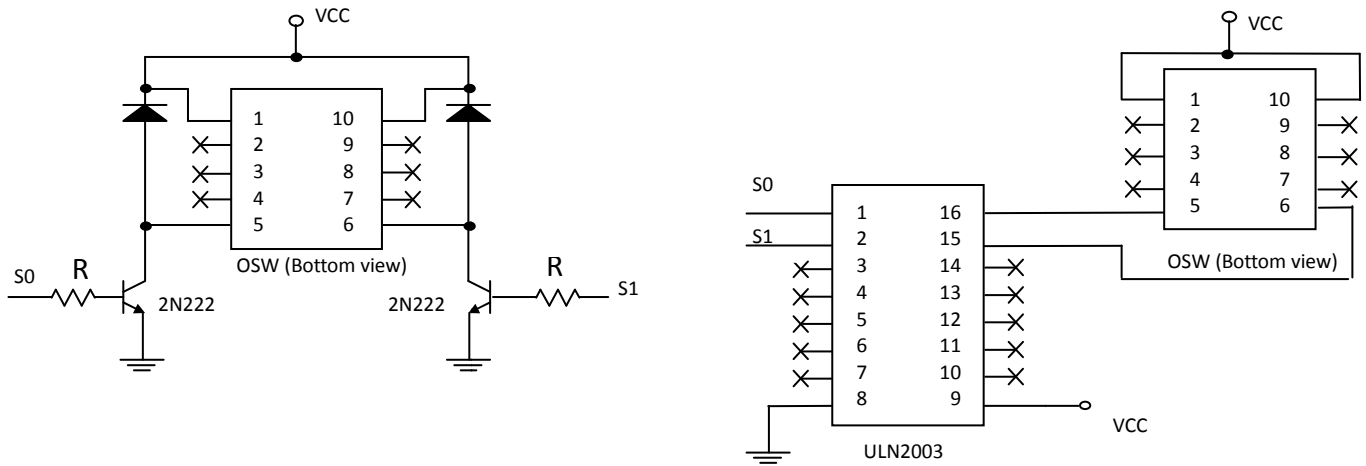
Relay Type	PIN OSW State	1	5	6	10	PIN Connection	Remark
		Latching Type	Bypass Mode	H	L		
Latching Type	Normal Mode	-	-	L	H	2, 3 pin closed ; 3, 4 pin open 8, 9 pin closed ; 7, 8 pin open	
Non-Latching Type	Bypass Mode	-	-	-	-	3, 4 pin closed ; 2, 3 pin open 7, 8 pin closed ; 8, 9 pin open	Default
	Normal Mode	-	H	L	-	2, 3 pin closed ; 3, 4 pin open 8, 9 pin closed ; 7, 8 pin open	

Ordering Information

FOBWB -	4 -	4-				
Product Version	Input	Output	Operation Function	Fiber Type	Fiber Cabling	Connector Type
	No. of Input	No. of Output	L: Latching N: Non-Latching	9: 9/125μm 50: 50/125μm 62: 62.5/125μm	B: Bare fiber L: 900μm loose tube	1: None 2: FC/PC 3: FC/APC 4: SC/APC 5: SC/PC 6: MU/PC 7: ST/PC 8: LC/PC 9: SC/UPC A: MT/RJ B: MU/UPC C: FC/UPC D: LC/APC E: LC/UPC

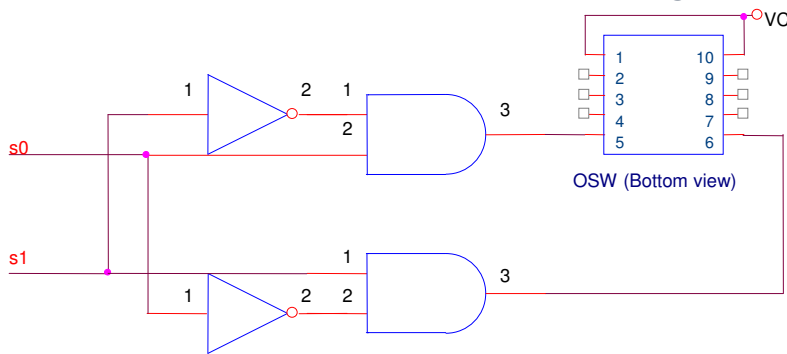
Application Circuitry for Latching Type

To provide sufficient power to switch, two application circuits using 2N2222 BJT and ULN2003 Darlington pair IC are showed below.



S0 = High, S1 = Low. To change the OSW state to Bypass mode.
S0 = Low, S1 = High. To change the OSW state to Normal mode.

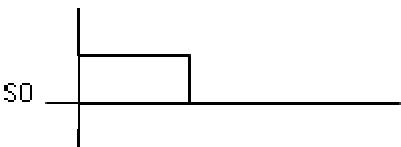
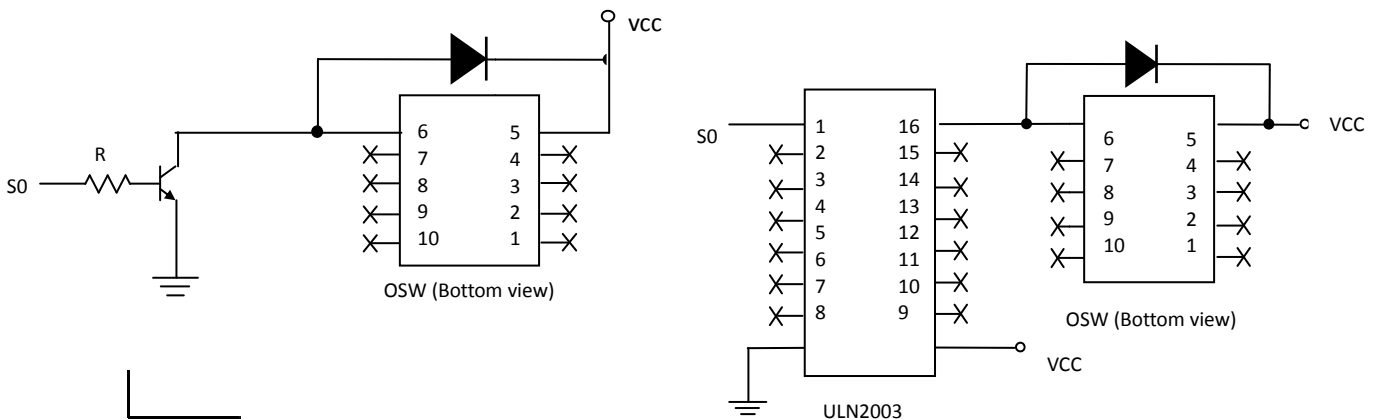
The Recommend Circuitry for S0 and S1 Stand High Level Simultaneously



S0 = High, S1 = High.
The OSW maintains on the last changed state.

Application Circuitry for Non-Latching Type

To provide sufficient power to switch, two application circuits using 2N2222 BJT and ULN2003 Darlington pair IC are showed below.



S0 = Low. To change the OSW state to default mode(Bypass mode).
S0 = High. To change the OSW state to Normal mode.