

MEMS Ultra-Mini 1x2, 2x2 Fiber Optical Switch

Protected by US Patent 20170184840A1 and World Wide Patent PCT/US2015/022117

Product Description

The MEMS Ultra-Mini Series Fiber Optical Switch uses a patented thermal activated micro-mirror, moving-in and -out optical paths, uniquely featuring high stability over wide temperature range without compensation, small size and very long life cycle. The thermal MEMS is insensitive to moisture and ESD without drift issues, providing a high reliability platform for over 25 years continuous operation. The ultra-mini series switches are configured in 1x1, Dual 1x1, Quad 1x1, 1x2, Dual 1x2, Full 2x2, and Dual Full 2x2 with single or multimode fibers. The Ultra-Mini switches are Telcordia standards GR1221 qualified.

Agiltron provides customized design and modular assemblies to meet control and integration applications.

Performance Specifications

MEMS Ultra-Mini Series Switch		Min	Typical	Max	Unit
Operation Wavelength	Single Mode	1260~1360 and / or 1510~1610			nm
	Multimode	810~890 and/or 1260/1360			
Insertion Loss ^{[1], [2]}			0.6	1.0 / 1.2 ^[3]	dB
PDL (Single mode)				0.1	dB
Extinction Ratio	PM fiber	18			dB
Return Loss ^[1]	SM, PM	50			dB
	Multimode	35			
Cross Talk ^[1]	SM, PM	50			dB
	Multimode	35			dB
Switching Time			6	10	ms
Repeatability				±0.05	dB
Repetition Rate				20	Hz
Durability		10 ⁹			Cycle
Power Consumption (activated)				170	mW
Switching Type			Non-Latching		
Operating Temperature ^[5]		-5		70	°C
Storage Temperature		-40		85	°C
Optical Power Handling			300	500	mW
Package Dimension			10L x 6.6W x 4.6H		mm
Fiber Type ^[4]	Single Mode	SMF-28 or equivalent			
	PM	Panda 250 PM or equivalent			
	Multimode	MM 50/125. MM 62.5/125 or equivalent			

[1]. Excluding connectors.

[2]. Multimode IL measured @ Light Source CPR < 14dB.

[3]. Dual band, and Dual 1x2, Full 2x2, Dual Full 2x2.

[4]. PM fiber version only in 1x1 and 1x2 configuration.

[5]. Lower temperature version is available, please call us.

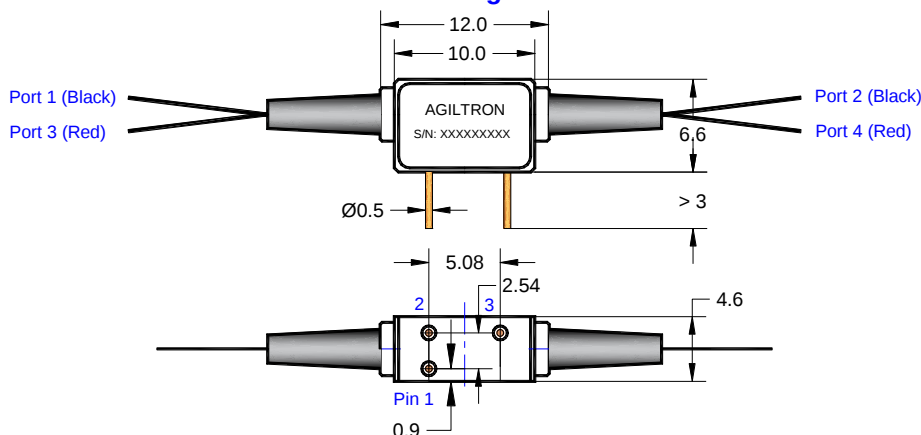


Revision: 5-14-2020

MEMS™ Ultra-Mini Series Fiber Optical Switch

Mechanical Dimension (unit: mm)

MEMS Ultra-Mini Full 2x2 Non-latching Switch

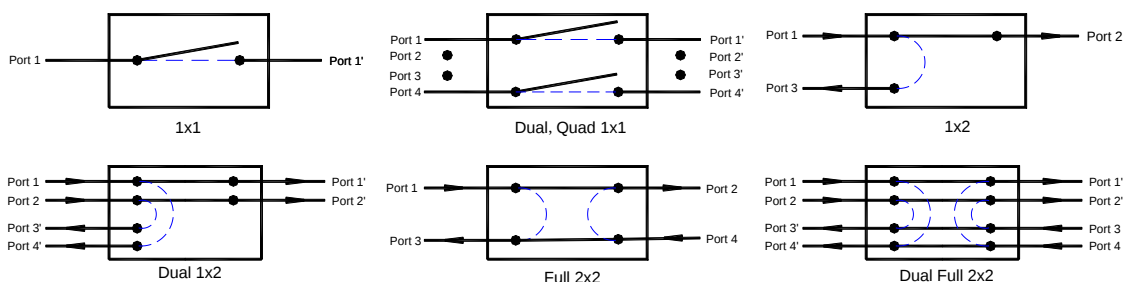


Electrical Driving Requirements

Status	Optical Path				Pin No.		
	1x2	Dual 1X2	Full 2x2	Dual Full 2x2	Pin 1	Pin 2	Pin 3
Status I	Port 1→2	Port 1→1' Port 2→2'	Port 1→2 Port 4→3	Port 1→1' Port 2→2' Port 3→3' Port 4→4'	NC ^[1]	0	+V
Status II	Port 1→3	Port 1→4' Port 2→3'	Port 1→3 Port 4→2	Port 1→4' Port 2→3' Port 3→2' Port 4→1'	NC	0	0

[1]. NC: No electronic Connection. [2]. $4.0 < +V < 5.0$ VDC, Typical is 4.5 VDC.

Functional Diagram



MEMS™ Ultra-Mini Series Fiber Optical Switch

Ordering Information

			2					
	Type	Wavelength	Switch	Package	Fiber Type		Fiber Length	Connector
MISW ^[1]	1x1 N/T ^[5] =1T	1060=1	Non-latching=2	Standard=1 Special=0	SMF-28=1	Bare fiber=1	0.25m=1	None=1
MIDU ^[2]	1x1 N/D ^[6] =1D	1310=3			Panda 250 PM=B	Special=0	0.5m=2	FC/PC=2
MIQU ^[3]	1x2=12	1550=5			MM 50/125=5	1.0m=3	FC/APC=3	
MIPM ^[4]	2x2=22	780=7			MM 62.5/125=6	Special=0	SC/PC=4	
	Special=00	850 =8			Special=0		SC/APC=5	
		1310/1550=9				ST/PC=6	LC=7	
		850/1310=A					Duplex LC=8	
		1260~1620=B					MTP=9	
		Special=0					Special=0	

[1]. **MISW**: MEMS U--MINI 1x1, 1x2, 2x2 **SWITCH**.

[2]. **MIDU**: MEMS U--MINI **DUAL** 1x1, 1x2, 2x2 Switch.

[3]. **MIQU**: MEMS U--MINI **QUAD** 1x1.

[4]. **MIPM**: MEMS U--MINI 1x1, 1x2 **PM** Switch.

[5]. **N/T**: MEMS U--MINI Non-Latching 1x1 Switch, **Normally** Transparence.

[6]. **N/D**: MEMS U--MINI Non-Latching 1x1 Switch, **Normally** Dark.



MEMS 1x1, 1x2, ..., Dual 2x2 Fiber Optical Switch

(*SM & MM: 1x1, 1x2, 2x2, Dual 1x1, Dual 1x2, Dual 2x2, Quad 1x1. *PM: 1x1, 1x2)

10⁹ Switching Cycle Test

We have tested MEMS 1x2 switch at the resonant frequency ~300Hz for more than 40 days, as shown in the attachment, which corresponding over 10⁹ switching cycles. The measurements show little changes in Insertion loss, Cross Talk, Return loss ect, all parameters are within our specs.

