

MEMS Ultra Mini Multiple Series Fiber Optic Switch

(Quad, Octo, Twelve, Sixteen 1x2, Full 2x2 Switch)

(Protected by U.S. pending patents)

Product Description

The MEMS Ultra Mini Multiple Series Switch include Quad, Octo, Twelve, Sixteen 1x2, Full 2x2 Fiber Optic switch, integrates 4, 8, 12, 16 pcs 1x2, Full 2x2 switches in a single super compact format. It is designed for 40G, 100G transceiver bypass application. The device connects optical channels by redirecting incoming optical signals into selected output fibers. This is achieved using a proprietary MEMS configuration and activated via an electrical control signal. It uniquely features rugged thermal activated micro-mirror movement instead of rotation, and the novel design significantly simplify the control electronics, offering unprecedented high stability and an unmatched low cost.

We also offer the built-in driver version, which features a convenient user interface.

Performance Specifications

MEMS U-Mini Multiple 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
Return Loss ^[1]	Single Mode	50		dB
	Multimode	35		
Cross Talk ^[1]	Single Mode	50		dB
	Multimode	35		
Switching Time		10		ms
Repeatability			±0.05	dB
Repetition Rate		10		Hz
Durability		10 ⁹		Cycle
Switching Type		Non-Latching		
Operating Temperature		-5	70	°C
Storage Temperature		-40	85	°C
Optical Power Handling		300	500	mW
Fiber Type	Single Mode	SMF-28 or equivalent		
	Multimode	MM 50/125, MM 62.5/125 or equivalent		

[1]. Excluding connectors.

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

[3]. Dual band.

Features

- High Reliability
- Low Optical Distortions
- Intrinsic tolerance to ESD

Applications

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



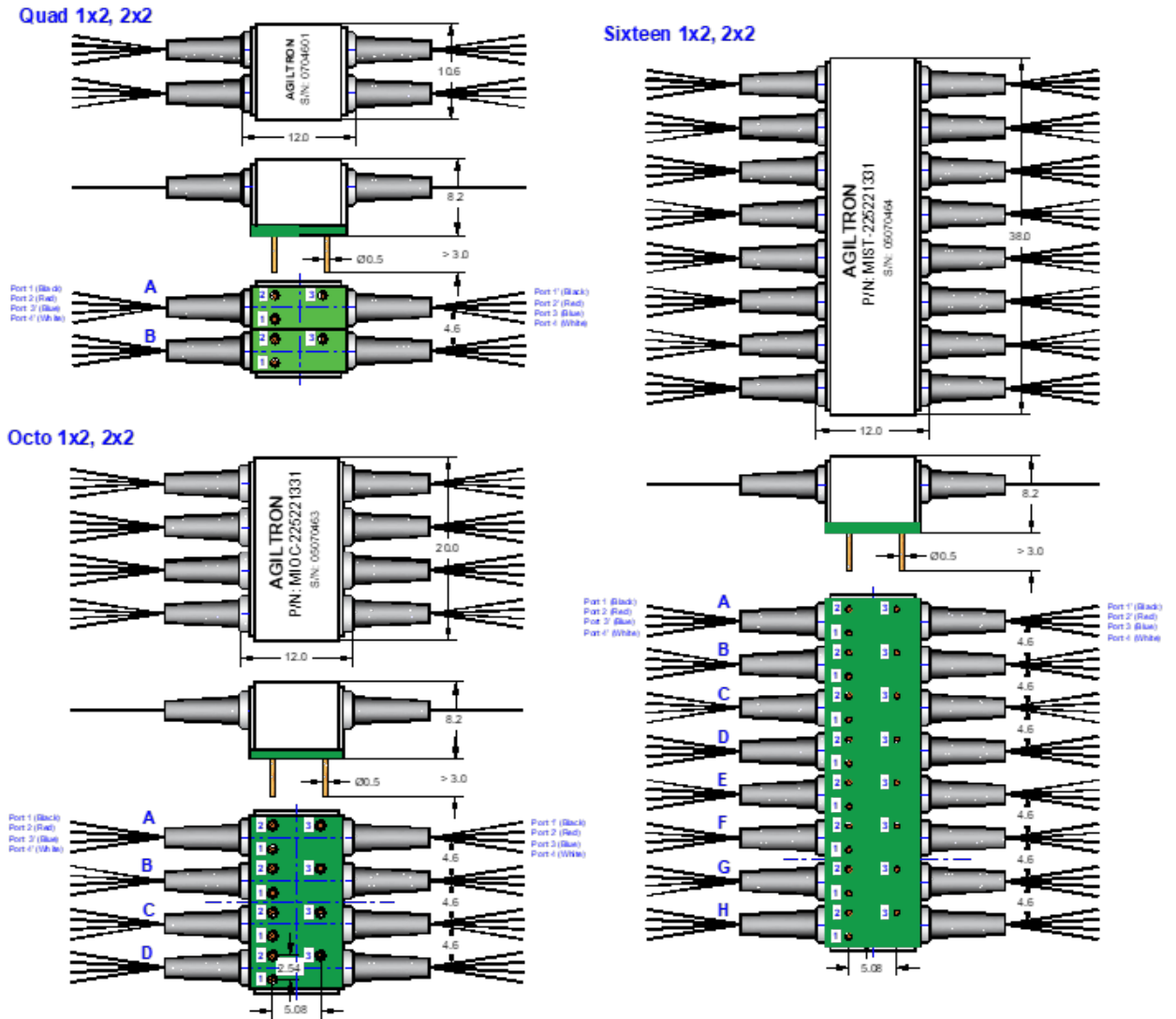
Revised on 5-10-21

MEMS Ultra Mini Multiple Series Fiber Optic Switch

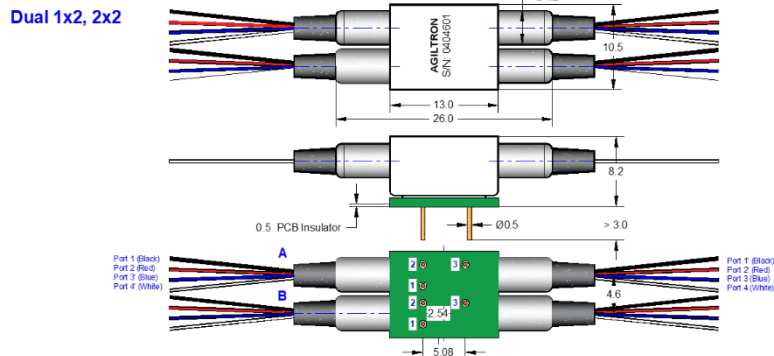
Mechanical Dimensions (Unit: mm)

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

Package 1: Bare fiber version

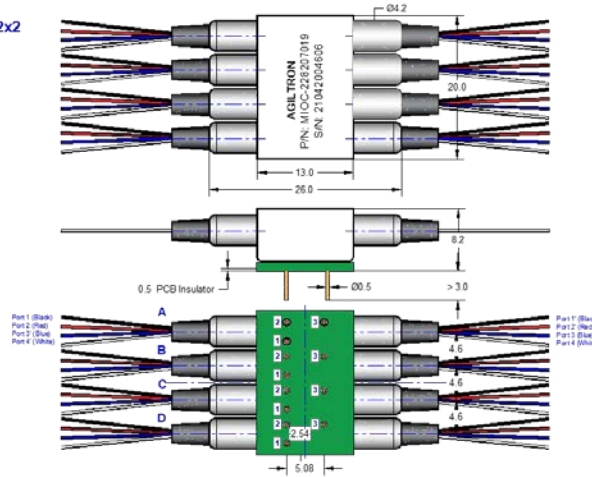


Package 2: With 900 um loose tube version

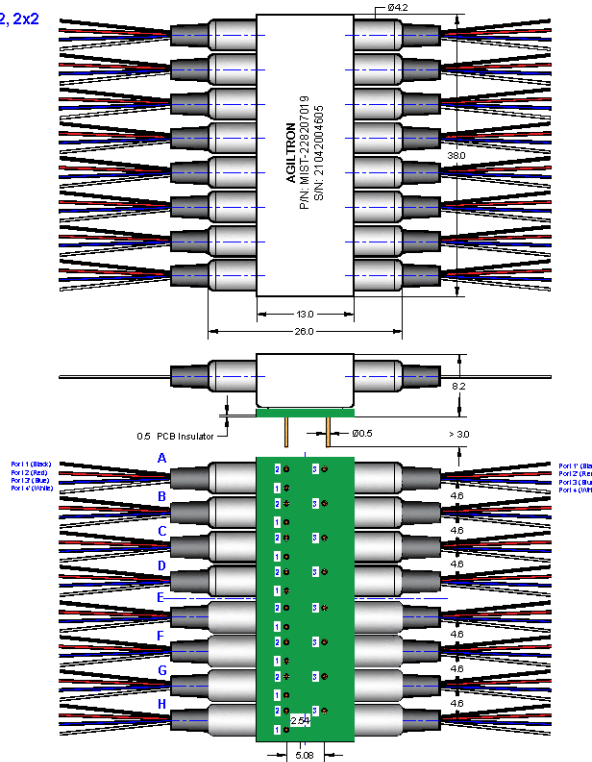


MEMS Ultra Mini Multiple Series Fiber Optic Switch

Octo 1x2, 2x2



Sixteen 1x2, 2x2



Electrical Driving Requirements

Driving Table (For MEMS U-Mini Dual 1x2, 2x2 Switch A, B, ..., H)

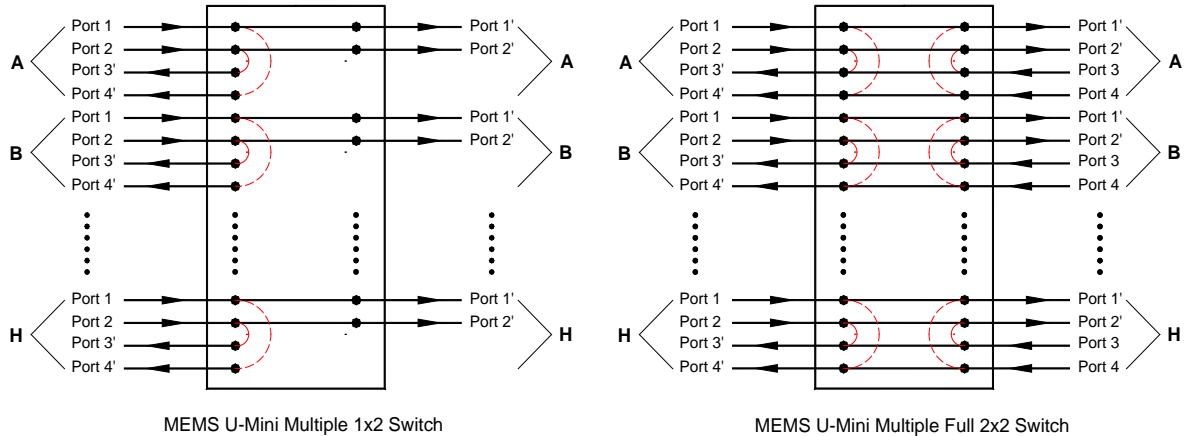
Status	Optical Path for Switch A, B, ..., H		Pin No.		
	1x2	Full 2x2	Pin 1	Pin 2	Pin 3
Status I	Port 1 → 1' Port 2 → 2'	Port 1 → 1', Port 2 → 2' Port 3 → 3', Port 4 → 4'	NC [1]	0V	+V [1]
Status II	Port 1 → 4' Port 2 → 3'	Port 1 → 4', Port 2 → 3' Port 3 → 2', Port 4 → 1'		0V	0V

[1]. NC: No electronic connection. [2]. +V: 3.8~4.5 VDC, Typical is 4.0 VDC. [3]. Each MEMS Chip power consumer is about 170 mW.



MEMS Ultra Mini Multiple Series Fiber Optic Switch

Functional Diagram



Ordering Information

	Type	Wavelength	Switch	Package	Fiber Type	Fiber Length	Connector
MIQD ^[1]	1x2=12	1060=1	Non-Latching=2	Package 1 ^[5] =1	SMF-28=1	Bare fiber=1	None=1
MIOC ^[2]	Full 2x2 =22	1310=3		Package 2 ^[6] =2	MM 50/125=5	900 um tube=3	FC/PC=2
MITW ^[3]		1550=5		Special=0	MM 62.5/125=6	Special=0	FC/APC=3
MIST ^[4]		780=7			Special=0		SC/PC=4
		850=8					SC/APC=5
		1310/1550=9					ST/PC=6
		850/1310=A					LC=7
		1260~1620=B					Duplex LC=8
		Special=0					MTP=9
							Special=0

- [1]. **MIQD**: MEMS U-MINI **QUAD** 1x2, 2x2 Switch.
- [2]. **MIOC**: MEMS U-MINI **OCTO** 1x2, 2x2 Switch.
- [3]. **MITW**: MEMS U-MINI **TWELVE** 1x2, 2x2 Switch.
- [4]. **MIST**: MEMS U-MINI **SIXTEEN** 1x2, 2x2 Switch.
- [5]. Package1 is without 900 um loose tube.
- [6]. Package 2 is with 900 um loose tube.

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, etc., all parameters are within our specs.

