

# etMEMS™ Ultra-Mini Fiber Optical Switch

(Protected by U.S. patent 8,203,775 and pending patents)

## Product Description

The etMEMS™ Series Ultra-Mini Fiber Optical Switch connects optical channels by redirecting incoming optical signals into selected output fibers. This is achieved using a proprietary thermal activated micro-mirror, moving-in and -out optical paths, uniquely featuring ultra small size, rugged. The ultra-mini switches can be directly mounted on printed circuit board with configurations of 1x1, Dual 1x1, Quad 1x1, 1x2, Dual 1x2, Full 2x2, and Dual Full 2x2 Single mode and Multimode

This advanced design offers unprecedented high stability and high reliability as well as low cost advantage.



## Performance Specifications

etMEMS™ 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 <sup>[1], [2]</sup>		0.6	1.0 (1.2 <sup>[3]</sup> )	dB
PDL (Single mode)			0.1	dB
Return Loss <sup>[1]</sup>	Single Mode	50		dB
	Multimode	35		
Cross Talk <sup>[1]</sup>	Single Mode	50		dB
	Multimode	35		
Switching Time		10		ms
Repeatability			±0.05	dB
Repetition Rate			20	Hz
Durability	10 <sup>9</sup>			Cycle
Switching Type		Non-Latching		
Operating Temperature	-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	Single Mode	SMF-28 or equivalent		
	Multimode	MM50/125, MM62.5/125 or equivalent		

[1]. Excluding connectors.

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

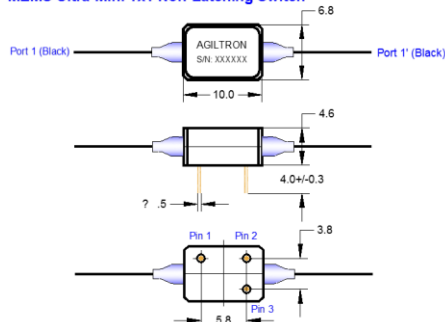
[3]. Dual band, and Dual 1x2, Full 2x2, Dual Full 2x2.



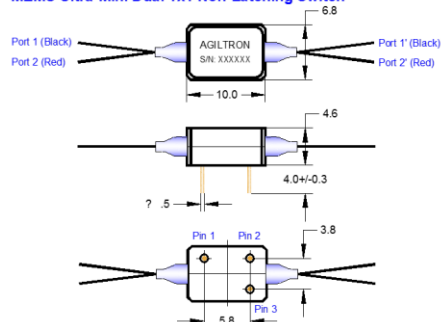
# etMEMS™ Ultra-Mini Fiber optic Switch

## Mechanical Dimensions (Unit: mm)

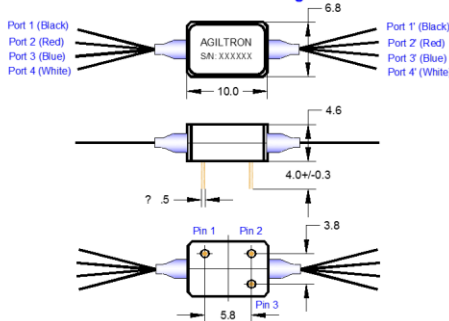
**MEMS Ultra-Mini 1x1 Non-Latching Switch**



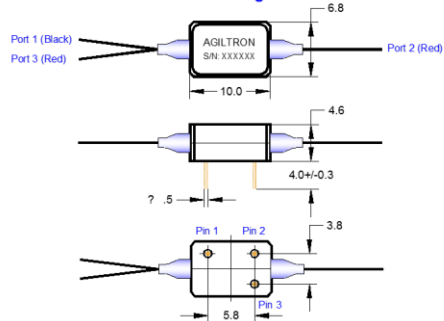
**MEMS Ultra-Mini Dual 1x1 Non-Latching Switch**



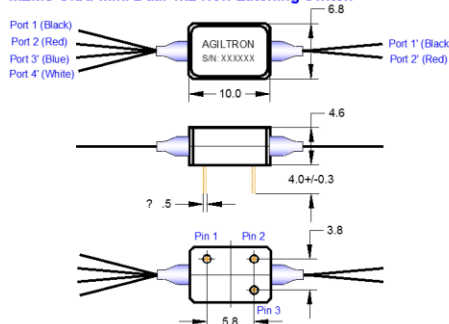
**MEMS Ultra-Mini Quad 1x1 Non-Latching Switch**



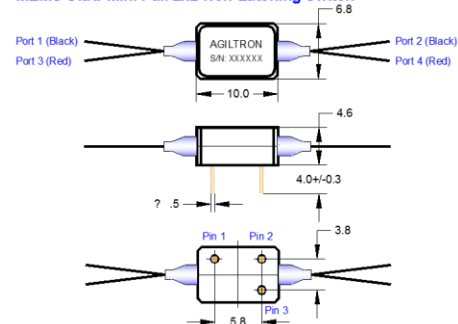
**MEMS Ultra-Mini 1x2 Non-Latching Switch**



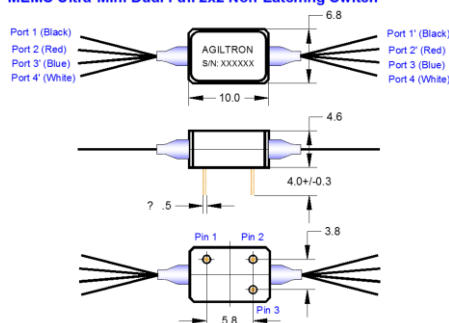
**MEMS Ultra-Mini Dual 1x2 Non-Latching Switch**



**MEMS Ultra-Mini Full 2x2 Non-Latching Switch**



**MEMS Ultra-Mini Dual Full 2x2 Non-Latching Switch**



# etMEMS™ Ultra-Mini Fiber Optical Switch

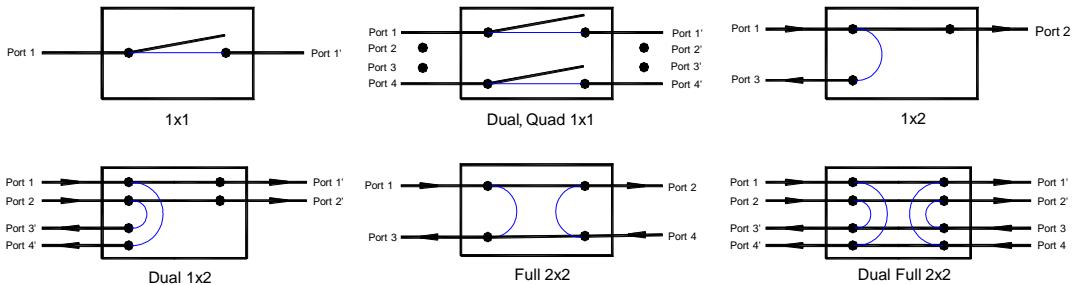
## Electrical Driving Requirements

Status	Optical Path						Pin No.		
	1X1 (Normally Transparence)	1X1 (Normally Dark)	Dual 1X1 (Normally Transparence)	Dual 1X1 (Normally Dark)	Quad 1X1 (Normally Transparence)	Quad 1X1 (Normally Dark)	Pin 1	Pin 2	Pin 3
Status 1	Dark	Port 1→1'	Dark	Port 1→1' Port 2→2'	Dark	Port 1→1' Port 2→2' Port 3→3' Port 4→4'	NC [1]	GND	L [2]
Status 2	Port 1→1'	Dark	Port 1→1' Port 2→2'	Dark	Port 1→1' Port 2→2' Port 3→3' Port 4→4'	Dark	NC	GND	H [3]

Status	Optical Path				Pin No.		
	1x2	Dual 1X2	Full 2x2	Dual Full 2x2	Pin 1	Pin 2	Pin 3
Status 1	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	GND	L
Status 2	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	GND	H

[1]. NC: No electronic connection. [2]. H: 4-5 VDC, Topical is 4.5 VDC. [3]. L<0.8 VDC. [4]. Power Consumption is about 170 mW.

## Functional Diagram



## Ordering Information

MEUM <sup>[1]</sup>	Type	Wavelength	Switch	Package	Fiber Type	Fiber Length	Connector	
□ □ □ □ □ □ □ □ □ □	1x1 N/T <sup>[2]</sup> =001T 1x1 N/D <sup>[3]</sup> =001D Dual 1x1 N/T =DU1T Dual 1x1 N/D =DU1D Quad 1x1 N/T =QU1T Quad 1x1 N/D =QU1D 1x2=0012 Dual 1x2 =DU12 Full 2x2=22 Dual Full 2x2=D2 Special=00	1060=1 1310=3 1550=5 780=7 850 =8 1310/1550=9 850/1310=A 1260-1620=B Special=0	Non-latching=2	Standard=1 Special=0	SMF-28=1 MM50/125=5 MM62.5/125=6 Special=0	Bare fiber=1 900um loose tube=3 Special=0	0.25m=1 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]. MEUM: MEMS Ultra-Mini Switch.  
 [2]. N/T: MEMS Mini Non-Latching Switch, Normally Tansparence.  
 [3]. N/D: MEMS Mini Non-Latching Switch, Normally Dark.

