

# MEMS Dual 1x2, Dual 2x2 Non-Latching Fiber Optical Switch

Single Mode, Multimode, Bidirectional

(Protected by US Patents 10752492, 10730740)



DATASHEET

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The MEMS Non-Latching type Series Fiber Optical Switches provide industrial-leading performance of fast switching speed, latching, low insertion loss, and high reliability, and low cost. The switch connects optical channels using a proprietary thermal activated micro-mirror, moving-in and -out optical paths, uniquely featuring high stability without long-term drift, fail-safe latching, fast setting time, and direct 5V drive convenience. The same format can accommodate configurations of 1x1, Dual 1x1, Quad 1x1, 1x2, Dual 1x2, Full 2x2, and Dual Full 2x2 for both single mode and Multimode fibers. The switches are also available with configurations of 1x1, 1x2 PM.

This device also features a variable attenuation function, allowing the output power of each fiber port to be independently adjusted by varying the applied switching voltage.

## Features

## Specifications

Parameter		Min	Typical	Max	Unit
Operation Wavelength	Single Mode	1260~1610			nm
	Multimode	820~1340 and/or 1260/1360			
Insertion Loss <sup>[1], [2]</sup>	Single band		0.6	1.0	dB
	Dual band			1.2 <sup>[3]</sup>	
Return Loss <sup>[1]</sup>	Single mode	50			dB
	Multimode	35			
Cross Talk On/Off Ratio <sup>[1]</sup>	Single mode	50			dB
	Multimode	35			
PDL				0.2	dB
WDL				0.3	dB
TDL				0.3	dB
Switching Time			10		ms
Repeatability				±0.05	dB
Repetition Rate			10		Hz
Durability		10 <sup>9</sup>			cycle
Switching Type		Non-Latching			
Operating Temperature		-5		70	°C
Storage Temperature		-40		85	°C
Optical Power Handling (CW)			300	500	mW

**Notes:**

- [1]. Excluding connectors.
- [2]. Multimode IL measure @ Light Source CPR<14 dB.
- [3]. Dual band, and Dual 1x2, Dual Full 2x2.

**Note:** The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link](#):

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Rev 11/12/25

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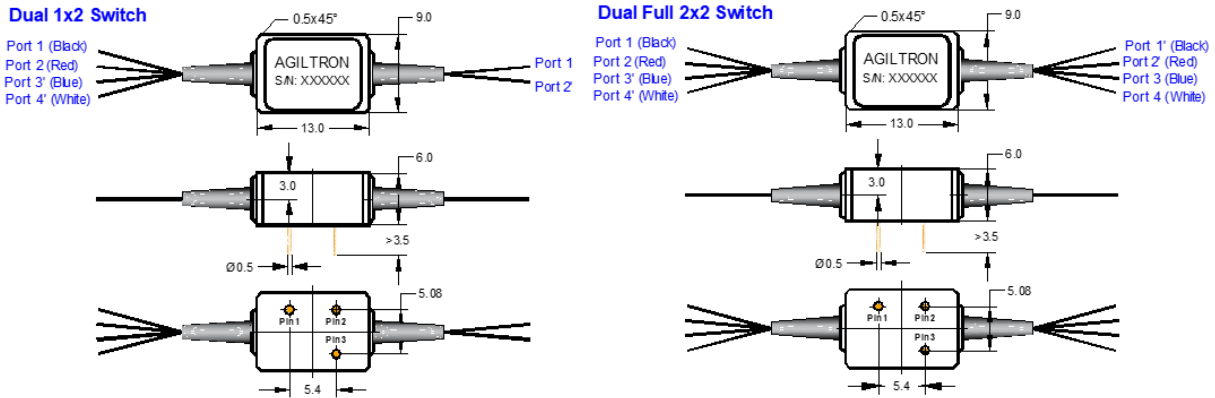
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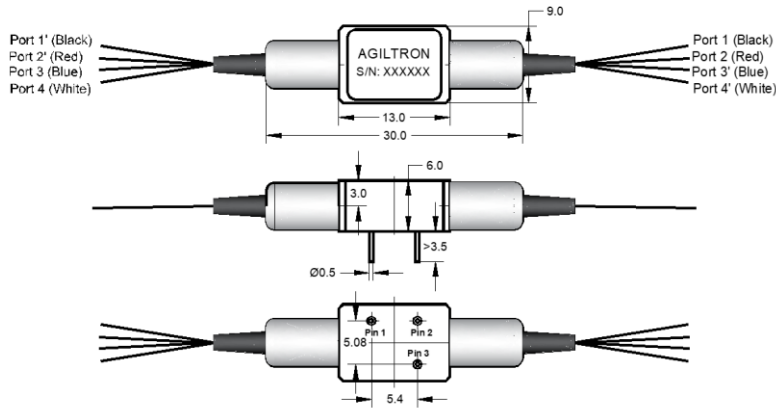
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### Mechanical Dimensions (mm)

#### Package without 900 μm loose tube



#### Package with 900 μm loose tube



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

### Electronic Control Requirements

Status	Optical Path		Pin No.		
	Dual 1X2	Dual 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	0V	+V
Status II	Port 1→4' Port 2→3'	Port 1→4', Port 2→3' Port 3→2', Port 4→1'	NC	0V	0V

- [1]. NC: No electronic connection.
- [2]. +V: 3.8~4.5 VDC, Typical is 4.0 VDC.
- [3]. Power Consumption is about 170 mW.

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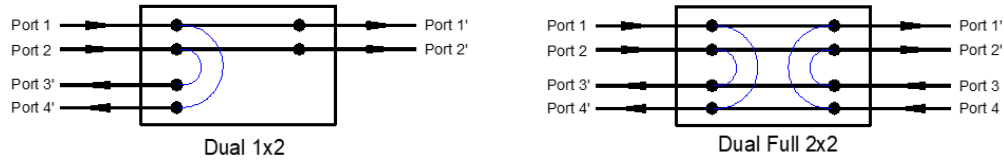


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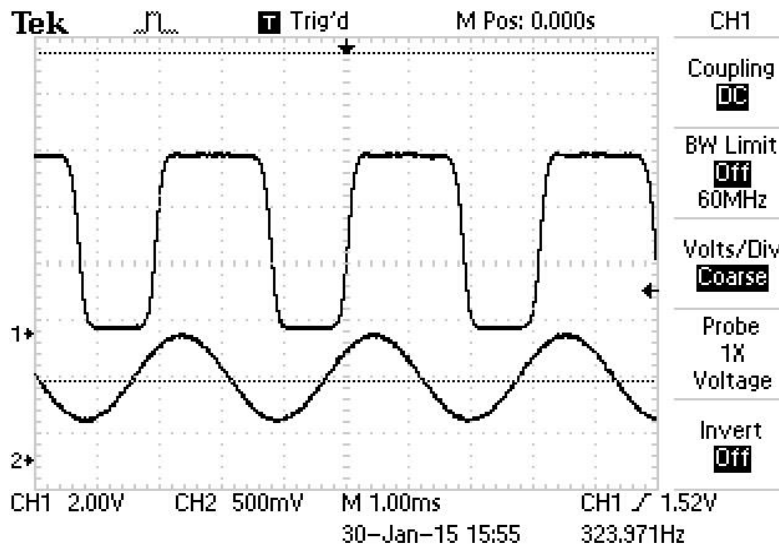
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### Functional Diagram

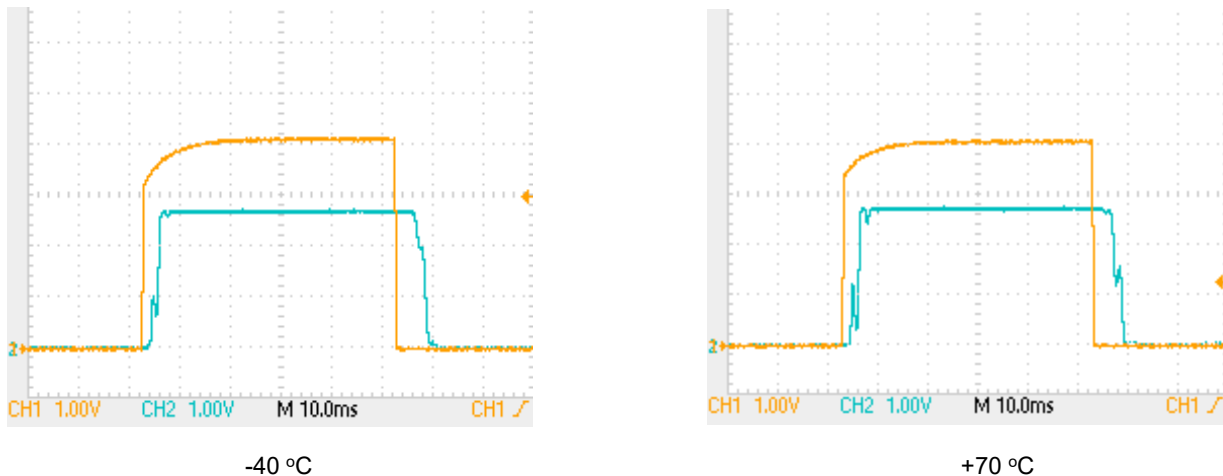


### 10<sup>9</sup> Switching Cycle Test

We have tested MEMS 1x2 switch at the resonant frequency ~300Hz for more than 40 days, as shown in the attachment, which corresponds over 10<sup>9</sup> switching cycles. The measurements show little changes in Insertion loss, Cross Talk, Return loss, etc, all parameters are within our specs.



### Typical Switching Rise/Fall at -40°C and 70°C



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### Ordering Information (Part Number)

Prefix	Type	Wavelength	Switch	Package	Fiber Type	Fiber Cover	Fiber Length	Connector <sup>[4]</sup>
MEDU- <sup>[1]</sup>	1x2 = 12 Full 2x2 = 22 Special = 00	1260~1620 = B 1060 = 1 780 = 7 850 = 8 1310/1550 = 9 820~1340 = A Special = 0	NL <sup>[2]</sup> = 2	Standard = 2 WIP <sup>[3]</sup> = 6 Special = 0	SMF-28 = 1 MM 50/125 = 5 MM 62.5/125 = 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/PC = 7 Duplex LC/PC = 8 LC/APC = A LC/UPC = U Special = 0

[1]. MEDU – MEMS DUAL 1x2, 2x2 Switch.

[2]. Non-latching.

[3]. WIP – With Insulating PCB.

[4]. The connector cannot be installed directly onto bare fiber, as it is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer can remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SM28 fiber and decreases further with smaller core fibers.

### Application Notes

#### Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

#### Fiber Cleanliness

Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

#### Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the handling by expanding the core side at the fiber ends.

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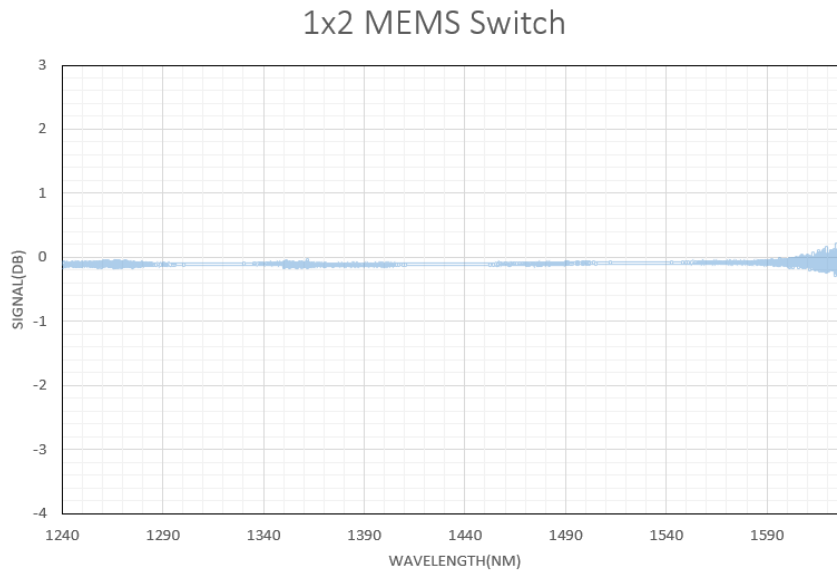
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### Typical Insertion Loss vs Wavelength (1240-1630nm)



### Recommendation Control Circuit

