

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

(Single Mode, Multimode)

(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 ^{[1], [2]}	Singe band	0.6	1.0	dB
	Dual band		1.2 ^[3]	
Return Loss ^[1]	Single mode	50		dB
	Multimode	35		
Cross Talk ^[1]	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 ⁹			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 09/24/24

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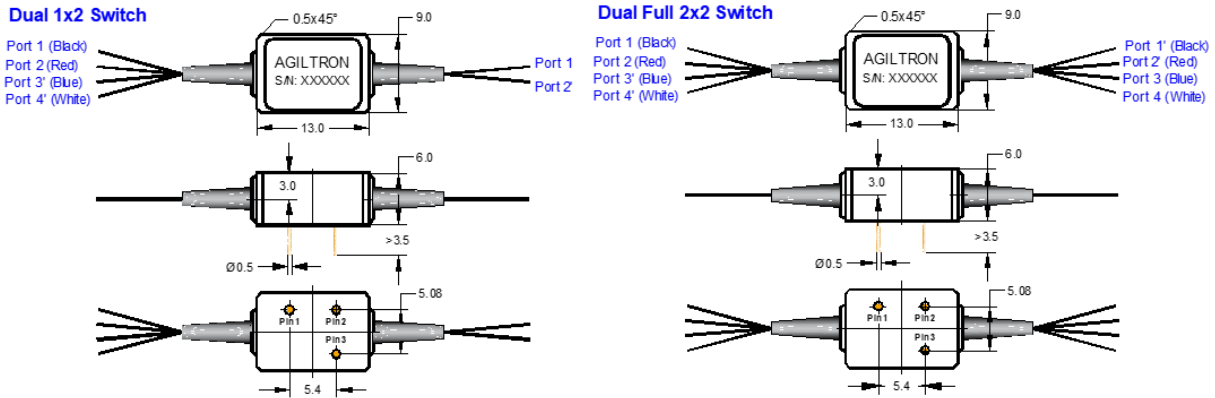
(Single Mode, Multimode)



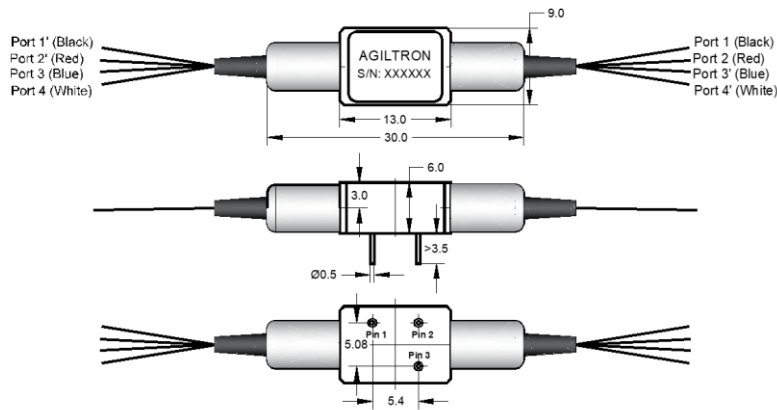
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Mechanical Dimensions (mm)

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.

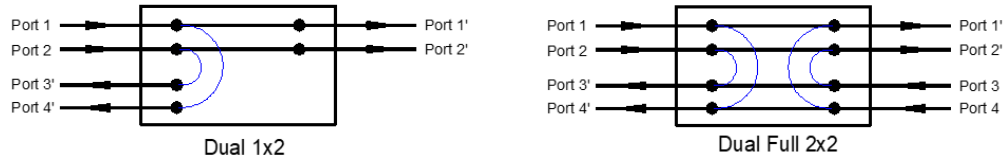
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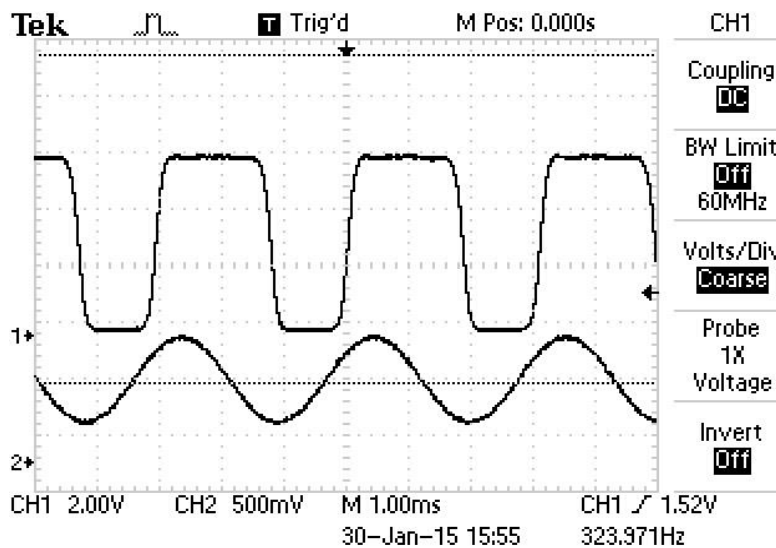
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Functional Diagram

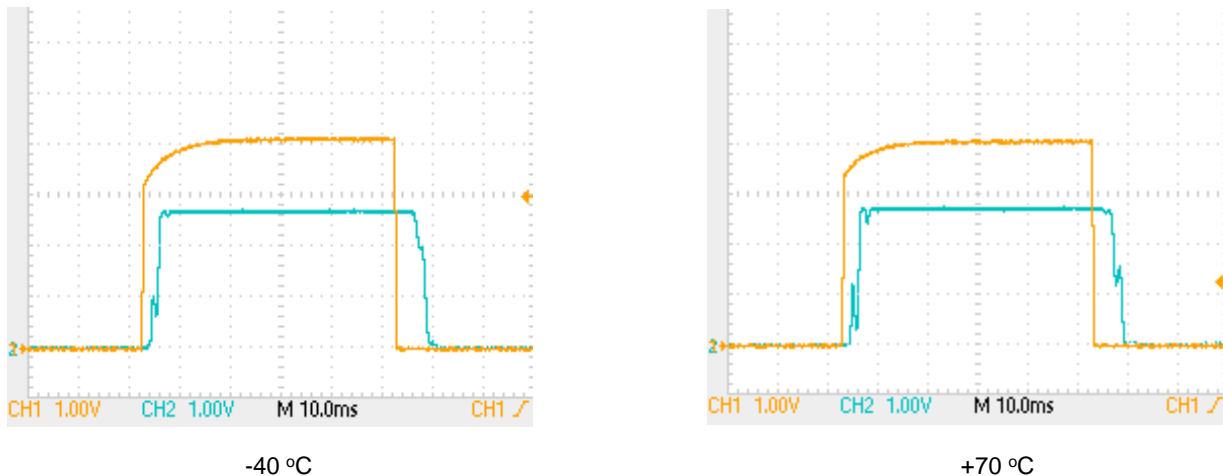


10⁹ Switching Cycle Test

We have tested MEMS 1x2 switch at the resonant frequency ~300Hz for more than 40 days, as shown in the attachment, which corresponds over 10⁹ 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

Prefix	Type	Wavelength	Switch	Package	Fiber Type	Fiber Cover	Fiber Length	Connector
MEDU- ^[1]	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 ^[2] = 2	Standard = 2 WIP ^[3] = 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**.

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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Typical Insertion Loss vs Wavelength (1240-1630nm)

1x2 MEMS Switch

