PHOTONWARES

MEMS Multimode Fiber Optical Switch With High Crosstalk

(Protected by US Patent 10752492B2)

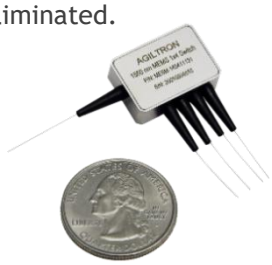
Features

- Hitless
- High Crosstalk
- High Reliability
- ESD Tolerance

Product Description

The MEMS High Crosstalk Multimode Fiber Optical Switch offers unique performance attributes of exceptionally high crosstalk up to 70dB, high stability over a wide temperature range, compact size, long operation life, insensitive to moisture and ESD, high optical power, no short and long-term drifts, and high-reliability for over 25 years of continuous operation. It uses a patented thermal activated MEMS-mirror, moving-in and -out optical paths at a 45 degree angle to direct an incoming light into a selected output fiber without hitting other ports, by which the degradation of multi-fiber collimator due to the laser steering in long period is entirely eliminated.

The switches are Telcordia GR1221 qualified. The switch is conveniently controlled by directly applying a voltage to each mirror actuator.



Performance Specifications

MEMS High Crosstalk Switch		Min	Typical	Max	Unit
Central Wavelength		1260	1550	1620	nm
		700	850	900	
Insertion Loss [1]	1x2		0.6	1.0	dB
	1x3, 1x4		0.8	1.2	dB
Wavelength Dependent Loss			0.1	0.3	dB
Cross Talk [1]		50		80	dB
Return Loss [1]		35			dB
Switching Time [2]			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
Fiber Type			50/125um or equivalent		

[1]. Exclude connectors. Measured using laser with CPR~14dB for 50/125um MM fiber. 0.3dB more in IL for 62.5/125 MM fiber.

[2]. Optical response only. There is some electrical delay

Applications

- Channel Blocking
- Add/Drop
- System Monitoring
- Instrumentation

RoHS Compliant

Revised on 11/27/22

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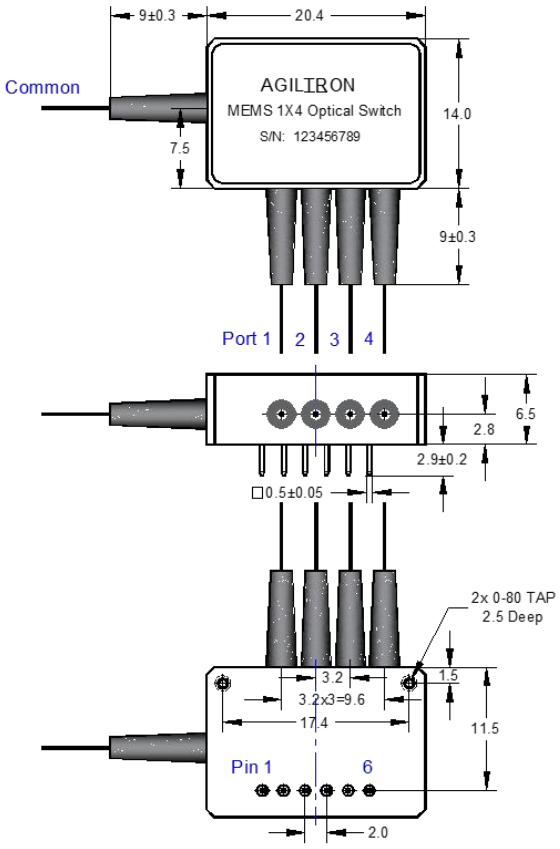
Mechanical Dimensions (Unit: mm) 1x2, 1x3, 1x4



Note:
In standard, 1x2, 1x3 and 1x4 use same package. However, the smaller package for 1x2 or 1x3 can be customized in volume order. Please contact us.

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

Electronic Control Requirements

Optical Path	Pin Number					
	1	2	3	4	5	6
Common ↔ Port 1	+V	0	0	0	0	0
Common ↔ Port 2	0		+V	0		0
Common ↔ Port 3	0		0	+V		0
Common ↔ Port 4	0		0	0		+V

[1]. +V: 4.0~4.5 VDC, Typical is 4.5 VDC. [2]. Each MEMS Chip Power Consumption is about 170mW in max.

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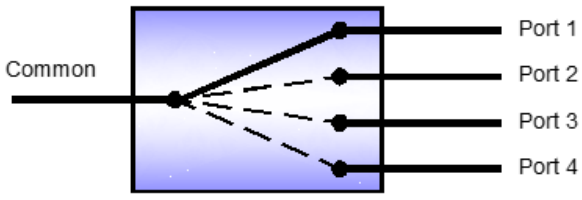
MEMS Multimode Fiber Optical Switch With High Crosstalk

Functional Diagram for 1x4



MEMS 1x4 Series Switch

Ordering Information

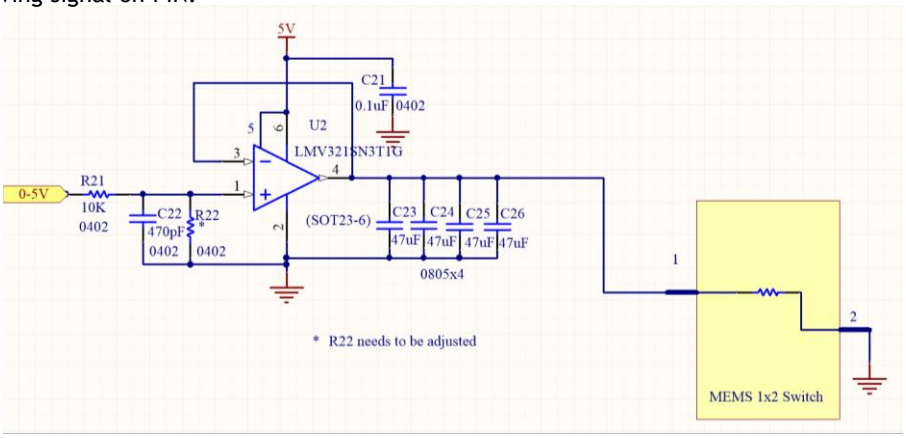
	☐☐	☐	2	1	☐	☐	☐	☐
Prefix	**Type**	**Wavelength**	**Switch**	**Version**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector**
MEMH- [1]	1x2=12 1x3=13 1x4=14 Special=00	1060 = 1 1310 = 3 1550 = 5 750 = 7 850= 8 950 = 9 Special=0	Non-Latching=2	Standard = 1	50/125=5 62.5/125=6 Special=0	Bare fiber=1 900 um 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 LC=7 Special=0

[1]. **MEMS & MMF & High Crosstalk = MEMH**

Note:
In standard, 1x2, 1x3 and 1x4 use same package. However, the smaller package for 1x2 and 1x3 can be customized in volume order. Please contact us.

Recommendation Control Circuit

In order to minimize the overshooting and oscillation in optics, the following circuit is recommended for driving signal on PIN.



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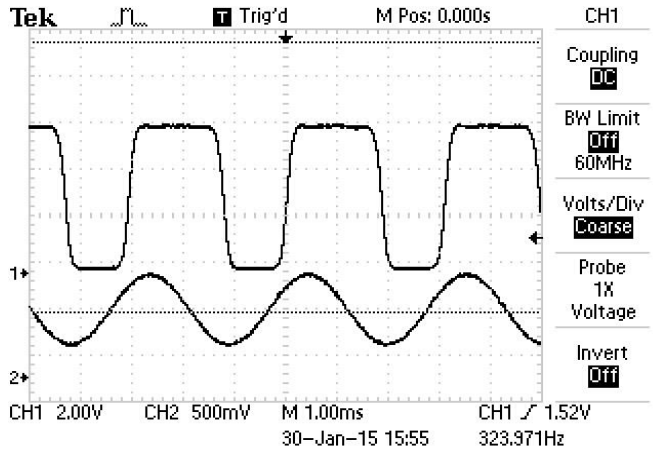
MEMS 1x4 Fiber Optical Switch with High Crosstalk

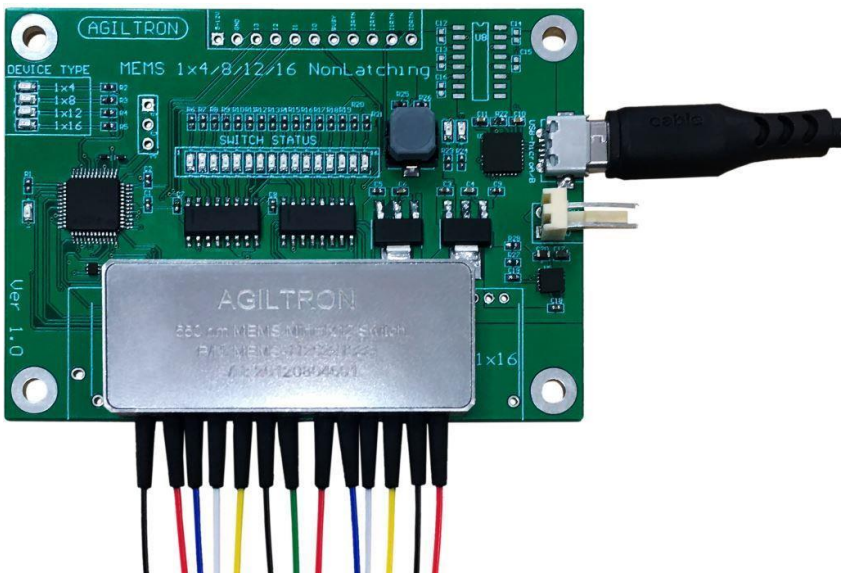
10^9 Switching Cycle Verification

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



Demo Driver

USB RS232/GUI, Pushbutton/LED Channel Indicators
Applicable to Non-latching MEMS-1x4, 1x8, 1x12 and 1x16 ($255)



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MEMS-1x12 on Demo driver