

MEMS Octo Series Fiber Optic Switch

Bidirectional, Octo 1x2, Octo Full 2x2

(Protected by US Patent 10752492B2)



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Features

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

Applications

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

The MEMS Octo Series 1x2, Full 2x2 Fiber Optic switch integrates 8 Full 2×2 switches in a single compact format. It is designed for 40G 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.

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.

Specifications

Parameter		Min	Typical	Max	Unit
Operation Wavelength	Single Mode	1260~1610			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 On/Off Ratio ^[1]	Single Mode	50			dB
	Multimode	35			
Switching Time			5	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.

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Electrical Driving Requirements

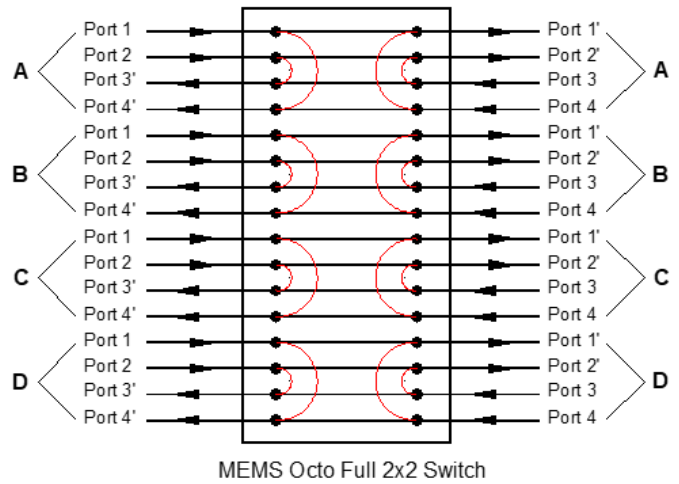
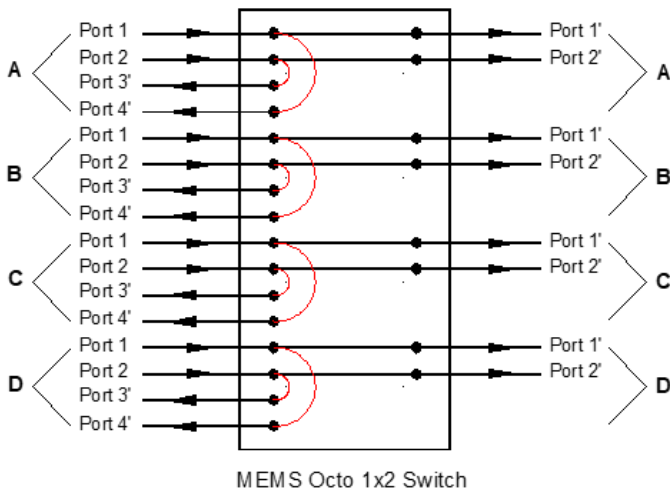
Status	Optical Path		Pin No.			
	Octo 1x2	Octo Full 2x2	Pin 1	Pin 8	Pin 4	Pin 5
Status I	Port 1→1' Port 2→2'	Port 1→1' Port 2→2' Port 3→3' Port 4→4'	+V	0	NC ^[1]	NC
Status II	Port 1→4' Port 2→3'	Port 1→4' Port 2→3' Port 3→2' Port 4→1'	0			

Driving Voltage	Min	Typical	Max	Unit
+V	3.8	4.0	4.5	VDC
Power Consumption		170 ^[2]		mW

[1]. NC: No electronic connection

[2]. For each MEMS Dual 1x2, or Dual Full 2x2 Switch

Functional Diagram



MEMS Octo Series Fiber Optic Switch

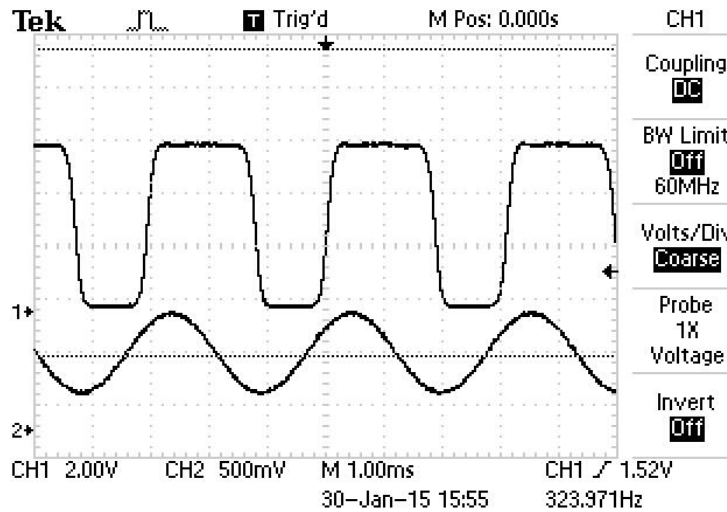
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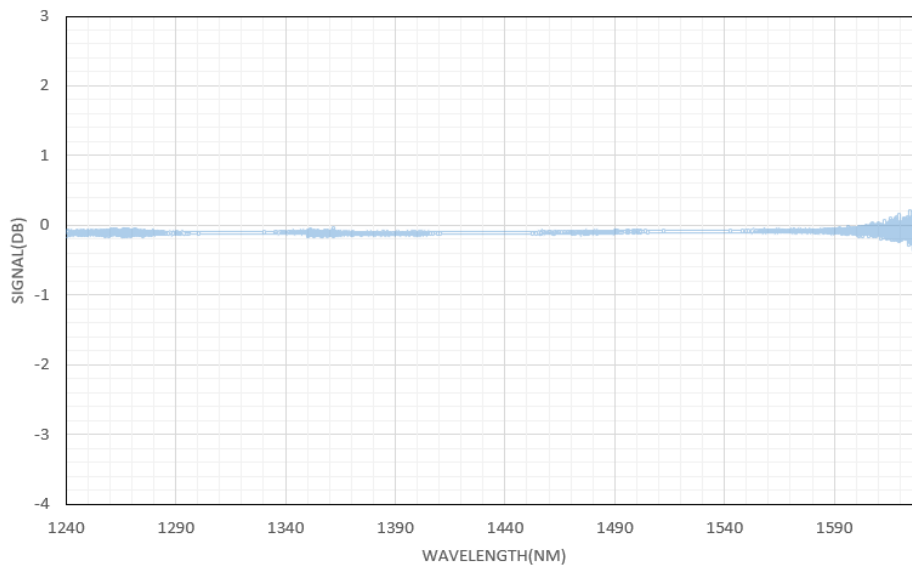
10⁹ Switching Cycle Test

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.



Typical Insertion Loss vs Wavelength (1240-1630nm)

1x2 MEMS Switch



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Ordering Information (Part Number)

Prefix	Type	Wavelength	Switch	Package	Fiber Type	Fiber Cover	Fiber Length	Connector ^[4]
MEMO - ^[1] MEOF - ^[2]	1x2 = 12 2x2 = 22	1260~1620 = B 1060 = 1 780 = 7 850 = 8 1310/1550 = 9 850/1310 = A Special = 0	Non-Latching = 2	Standard = 1 WIP ^[3] = 2 Special = 0	SMF-28 = 1 MM 50/125 = 5 MM 62.5/125 = 6 Special = 0	Bare fiber = 1 900um 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]. **MEMO**: MEMS Octo 1x2 Switch.

[2]. **MEOF**: MEMS Octo Full 2x2 Switch.

[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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Recommendation Control Circuit

