MEMS Latching Type Series Fiber Optical Switch
(1x2, 2x2, Dual 2x2, Quad 1x1. SM, MM, PM)
(Protected by U.S. patent 8,203,775 and pending patents)

Product Description

The MEMS Latching type series Fiber Optical Switch provide industrial leading performance of fast switching speed, latching, low insertion loss, and high reliability, as well as low cost. The switch connects optical channels using a proprietary electric-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.

Performance Specifications

<table>
<thead>
<tr>
<th>eMEMS™ Series Switch</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Wavelength</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Mode</td>
<td>1260<del>1360 and / or 1510</del>1610 nm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multimode</td>
<td>810~890 and / or 1260/1360 nm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM</td>
<td>980, 1060, 1310, 1550 nm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insertion Loss [1], [2]</td>
<td>0.6</td>
<td>1.0</td>
<td>(1.2 [3]) dB</td>
<td>dB</td>
</tr>
<tr>
<td>PDL</td>
<td></td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>SM, PM</td>
<td>50</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Multimode</td>
<td>35</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Cross Talk [1]</td>
<td>SM, PM</td>
<td>50</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Multimode</td>
<td>35</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Extinction Ratio</td>
<td>PM</td>
<td>18</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Switching Time</td>
<td>5</td>
<td>10</td>
<td></td>
<td>ms</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.05</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Repetition Rate</td>
<td>15</td>
<td></td>
<td></td>
<td>Hz</td>
</tr>
<tr>
<td>Durability</td>
<td>10⁹</td>
<td></td>
<td></td>
<td>Cycle</td>
</tr>
<tr>
<td>Switching Type</td>
<td>Latching Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature [4]</td>
<td>-5</td>
<td>70</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40</td>
<td>85</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Optical Power Handling</td>
<td>300</td>
<td></td>
<td></td>
<td>mW</td>
</tr>
<tr>
<td>Package Dimension</td>
<td>13L x 9W x 9H mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiber Type</td>
<td>Single Mode</td>
<td>SMF-28 or equivalent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multimode</td>
<td>MM 50/125, MM 62.5/125 or equivalent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM</td>
<td>Panda 250 PM fiber, or equivalent</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[1]. Excluding connectors.
[2]. Multimode IL measure @ Light Source CPR<14 dB.
[3]. Dual band, and Dual 1x2, Full 2x2, Dual Full 2x2.
[4]. For wide operating temperature, please contact us.
MEMS Latching Type Fiber Optical Switch
1x2, 2x2, Dual 2x2, Quad 1x1.
SM, MM, PM

Mechanical Dimensions  (Unit: mm)

1x1 Switch
Port 1 (Black)
S/N: XXXXXX
Port 1’ (Black)
Port 3 (Red)
> 3.5

Quad 1x1 Switch
Port 1 (Black)
Port 3 (Blue)
Port 4 (White)
S/N: XXXXXX
Port 1’ (Black)
Port 3 (Blue)
> 3.5

Dual 1x2 Switch
Port 1 (Black)
Port 2 (Red)
Port 3 (Blue)
Port 4 (White)
S/N: XXXXXX
Port 1’ (Black)
Port 2’ (Red)
Port 3 (Blue)
Port 4’ (White)
> 3.5

1x2 Switch
Port 1 (Black)
Port 2 (Red)
Port 3 (Red)
Port 4 (White)
S/N: XXXXXX
Port 1’ (Black)
Port 2’ (Red)
Port 3 (Red)
Port 4’ (White)
> 3.5

Dual Full 2x2 Switch
Port 1 (Black)
Port 2 (Red)
Port 3 (Blue)
Port 4 (White)
S/N: XXXXXX
Port 1’ (Black)
Port 2’ (Red)
Port 3 (Blue)
Port 4’ (White)
> 3.5

Full 2x2 Switch
Port 1 (Black)
Port 2 (Red)
Port 3 (Red)
Port 4 (White)
S/N: XXXXXX
Port 1’ (Black)
Port 2’ (Red)
Port 3 (Red)
Port 4’ (White)
> 3.5

AGILTRON
Ø0.5
1.65
1.65
1.65
9.0
Ø0.5
4.0
1.65
4.0
Ø0.5
Ø0.5
9.0
Ø0.5
1.65
13.0

## Electrical Driving Requirements

<table>
<thead>
<tr>
<th>Status</th>
<th>Optical Path</th>
<th>Pin No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pin 1</td>
<td>Pin 2</td>
</tr>
<tr>
<td>Status I Port 1→1'</td>
<td>Port 1→1'</td>
<td>Port 2→2'</td>
</tr>
<tr>
<td>Status II Dark</td>
<td>Dark</td>
<td>Dark</td>
</tr>
</tbody>
</table>

5 VDC \(\text{[1]}\) 0 5V Pulse

5V Pulse \(\text{[2]}\) 0 5V Pulse

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[1]. 5VDC: 5.0±0.2 V. Static 3 mA; During Pulse Current is 100 mA. The switch will remain in its previous light path state, if this voltage is removed (latching).

[2]. 5V Pulse: 5.0±0.2 V. Pulse width is 40±5 ms.
# MEMS Latching Type Fiber Optical Switch

1x2, 2x2, Dual 2x2, Quad 1x1.  
SM, MM, PM

## Ordering Information

<table>
<thead>
<tr>
<th>Type</th>
<th>Wavelength</th>
<th>Switch</th>
<th>Package</th>
<th>Fiber Type</th>
<th>Fiber Length</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>MESW [1]</td>
<td>1060=1, 1310=3, 1550=5, 1620=8</td>
<td>Latching-1</td>
<td>Standard-3</td>
<td>SMF-28=1, MM 50/125=5, MM 62.5/125=6, PM 250=8</td>
<td>Special=0</td>
<td>None-1, FC/PC=2, FC/APC=3, SC/PC=4, SC/APC=5, ST/PC=6, LC=7, Duplex LC=8</td>
</tr>
<tr>
<td>MEDU [2]</td>
<td>1310=3, 1550=5, 1620=8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEQU [3]</td>
<td>1310=3, 1550=5, 1620=8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEPM [4]</td>
<td>1310=3, 1550=5, 1620=8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[1]. MESW: MEMS 1x1, 1x2, 2x2 SWITCH.  
[2]. MEDU: MEMS DUAL 1x1, 1x2, 2x2 Switch.  
[3]. MEQU: MEMS QUAD 1x1 Switch.  
[4]. MEPM: MEMS 1x1, 1x2 PM Switch.
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 etc, all parameters are within our specs.