DiCon’s MEMS 3D Matrix Switch is a proprietary optical switch structure built on DiCon’s industry-proven MEMS mirror technology that enables any input to connect to any output in a stable, non-blocking all-optical cross-connect configuration. Its superior optical performance and reliability make it a versatile solution for routing classical optical signals and sensitive quantum information.

FEATURES
• No dithering or active alignment artifacts
• High Reliability / Stability
• Lifetime > 1 Billion Switch Cycles
• Available in any MxN configuration up to 16x16
• Proven MEMS Technology

APPLICATIONS
• Quantum Computing / Communication
• Cyber Surveillance
• Data Center Network
• Configurable Test & Measurement

OPERATING PRINCIPLE
**MEMS 3D SWITCH MODULE - SX1**

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>SX1</th>
<th>SX1H</th>
</tr>
</thead>
<tbody>
<tr>
<td>SX1</td>
<td>3D Switch</td>
<td></td>
</tr>
<tr>
<td>SX1H</td>
<td>High Stability 3D Switch</td>
<td></td>
</tr>
</tbody>
</table>

**Switch Configuration**

MxN Specify

- M\(\leq 16\), N\(\leq 16\) (For SMF)
- M\(\leq 12\), N\(\leq 12\) (For PM)

**Alignment Type**

P Opaque

**Fiber Type**

- G 9/125 \(\mu\)m SMF
- PM13 Corning PM 1300 Fiber
- PM15 Corning PM 1550 Fiber

*Other fiber options available upon request*

**Wavelength Range**

- O 1260-1360 nm
- E 1360-1460 nm
- S 1460-1530 nm
- C 1530-1570 nm
- L 1570-1625 nm
- U 1625-1675 nm

*Multiple wavelength ranges can be supported. Use ‘/’ to add multiple ranges. For example: For 1260 - 1360 nm & 1530 - 1570 nm use O/C*

**Control Interface**

U I2C/RS232/USB

**Start Up State**

0 Channel 0 (Off state)

**Fiber Jacket**

- L 900 \(\mu\)m Loose Tube Fiber (For PM Type Only)
- B 250 \(\mu\)m Bare Fiber (For PM Fiber Only)
- T 900 \(\mu\)m Tight Buffer (For 9/125 \(\mu\)m SMF Only)

*Other fiber options available upon request*

**Connector Type**

- FC FC/UPC
- FC/APC FC/APC
- LC LC/UPC
- LC/APC LC/APC
- SC SC/UPC
- SC/APC SC/APC
- N None

*Other connector types available upon request*

**Connector Key Orientation**

- S Slow Axis
- F Fast Axis
- N None

**Pigtail Length**

- T 1 Meter
- X Specify X Meters

*Tolerance is +/- 0.05 m

Please contact DiCon Fiberoptics to discuss any special requirements not defined above.

DiCon Fiberoptics, Inc.  0423D-240320  www.diconfiberoptics.com
# MEMS 3D SWITCH MODULE - SX1

## Optical Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SX1</th>
<th>SX1H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength Range</td>
<td>1260 to 1675 nm</td>
<td></td>
</tr>
<tr>
<td>Insertion Loss(^1) (IL)</td>
<td>0.5 dB typ.</td>
<td>0.9 dB max.</td>
</tr>
<tr>
<td>Stability(^4,5)</td>
<td>0.02 dB typ.</td>
<td>0.05 dB max.</td>
</tr>
<tr>
<td>Stability</td>
<td>0.004 dB typ.</td>
<td>0.01 dB max.</td>
</tr>
<tr>
<td>Crosstalk</td>
<td>-85 dB typ.</td>
<td>-60 dB max.</td>
</tr>
<tr>
<td>Back Reflection</td>
<td>-55 dB typ.</td>
<td>-45 dB max.</td>
</tr>
<tr>
<td>Wavelength Dependent Loss (WDL)(^6)</td>
<td>0.1 dB typ.</td>
<td>0.4 dB max.</td>
</tr>
<tr>
<td>Polarization Dependent Loss (PDL)(^7)</td>
<td>0.1 dB typ.</td>
<td>0.25 dB max.</td>
</tr>
<tr>
<td>Polarization Extinction Ratio (PER)(^8)</td>
<td>20 dB typ.</td>
<td>18 dB Min.</td>
</tr>
<tr>
<td>Switching Time</td>
<td>25 ms max.</td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td>10(^9) cycles min.</td>
<td></td>
</tr>
<tr>
<td>Repeatability(^9)</td>
<td>0.06 dB max.</td>
<td></td>
</tr>
<tr>
<td>Optical Power</td>
<td>500 mW max.</td>
<td></td>
</tr>
<tr>
<td>Fiber Type</td>
<td>9/125 μm, SMF-28 Singlemode Fiber / Panda Fiber</td>
<td></td>
</tr>
</tbody>
</table>

1. Specifications are without connector loss. IL adds 0.2 dB for one pair connector loss.
2. All measurements taken at room temperature for the set wavelength band index.

## Environmental Temperature Specifications

<table>
<thead>
<tr>
<th>Condition</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating</td>
<td>10 to 50°C</td>
</tr>
<tr>
<td>Storage</td>
<td>-40 to 85°C</td>
</tr>
</tbody>
</table>

## Electrical Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SX1</th>
<th>SX1H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Type</td>
<td>RS-232, I²C or USB</td>
<td></td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>12 VDC</td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SX1</td>
<td>3.8 W max. Operation 6.5 W max. Start Up</td>
<td></td>
</tr>
<tr>
<td>SX1H</td>
<td>22 W max. Operation 35 W max. Start Up</td>
<td></td>
</tr>
<tr>
<td>Connector type</td>
<td>Samtec P/N:STMM-108-02-G-D</td>
<td></td>
</tr>
<tr>
<td>Mating Connector</td>
<td>Samtec P/N:TCSD-08-01-F-N</td>
<td></td>
</tr>
</tbody>
</table>

1. Specifications are without connector loss. IL adds 0.2 dB for one pair connector loss.
2. All measurements taken at room temperature for the set wavelength band index.

Note: Each wavelength band has its own wavelength band index, which can be set to optimize the optical performance for that band. Only one wavelength band index can be selected at a time. The provided wavelength band index will be 1310nm, 1550nm & 1625nm for the full band version. Set a nearby wavelength band index to have the best performance if the selected band has no wavelength band index.

3. For multi-band operation, add up to 0.2 dB IL max over entire range.
4. Stability is defined as the difference between highest and lowest insertion loss for a given connection, over a given period.
5. Defined over 10 second period using 10 kHz sample rate.
6. The Wavelength Dependent Loss (WDL) is measured from CWL +/- 20nm.
7. Polarization Dependent Loss (PDL) is for single-mode fiber.
8. Polarization Extinction Ratio with connectors is 18 dB typ., 14 dB min.
9. Repeatability is defined over 100 cycles.
10. Extended operational temperature ranges are available.

Please contact DiCon Fiberoptics to discuss any special requirements not defined above.

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MEMS 3D SWITCH MODULE - SX1
MECHANICAL SPECIFICATIONS

Dimensions in mm

SX1

SAMTEC CONNECTOR
P/N: STMM-108-02-G-D
MATING CONNECTOR
P/N: TCSD-08-01-F-N

SX1H

SAMTEC CONNECTOR
P/N: STMM-108-02-G-D
MATING CONNECTOR
P/N: TCSD-08-01-F-N