



FIBER OPTIC 1xN SWITCH *coaxial design*

OVERVIEW

Sercalo's fiber optic 1xN switches are bidirectional opto-mechanical switches based on a coaxial design where a single MEMS mirror redirects light from a common fiber to one of N ports. The MEMS technology results in low insertion loss and low crosstalk between channels while keeping a constant switching performance over life.

The switch is available in several different variants to simplify integration in existing systems and reduce development cost. The miniature packages withstands rugged environments and is well suited for direct mounting on printed circuit boards.

The hermetically sealed MEMS and the laser welded fiber collimator guarantee broad temperature range and superior long-term stability. No epoxy is present in the optical path.

The component is compliant to Telcordia 1221 reliability standards and RoHS requirements 2015/863/EU.

FEATURES

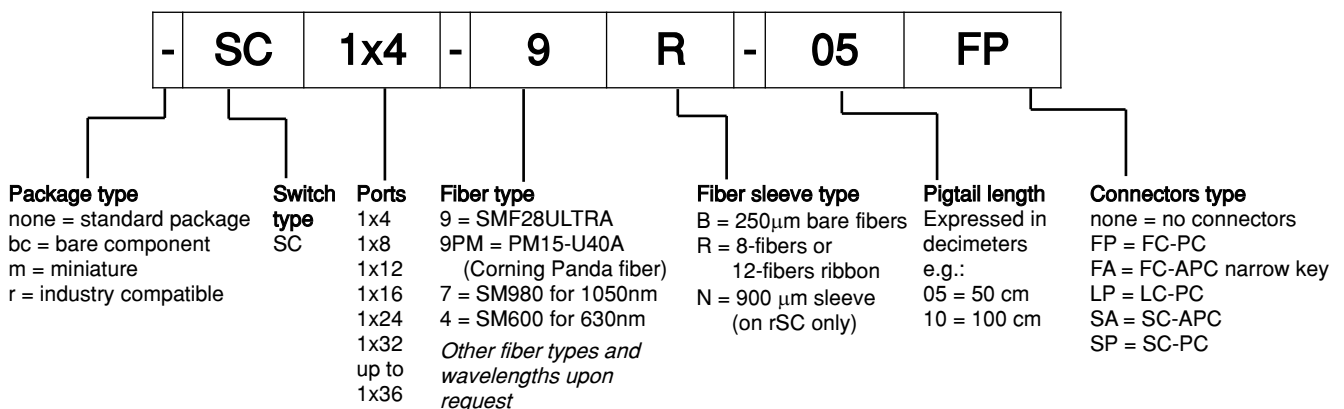
- Low insertion loss
- Reliable
- Up to 1x36 optical ports
- UART, I²C/SMBus and parallel interface
- Ethernet interface available on request
- RoHS compliant

APPLICATIONS

- Optical network switching
- Instrumentation
- Test and measurement

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ORDERING INFORMATION



Sercalo's COAXIAL TYPE 1xN switch is non-latching: at power-off it breaks the optical connection and routing of the common port is not defined. The component is bidirectional, the common port can be used as input or output. The **PM Panda version** is offered up to 1x4 ports.

The switch is available in four different variants:

SC: standard size – ribbon fibers

mSC: miniature size – small driver board: 7x40 mm

rSC: compatible with industry pinout

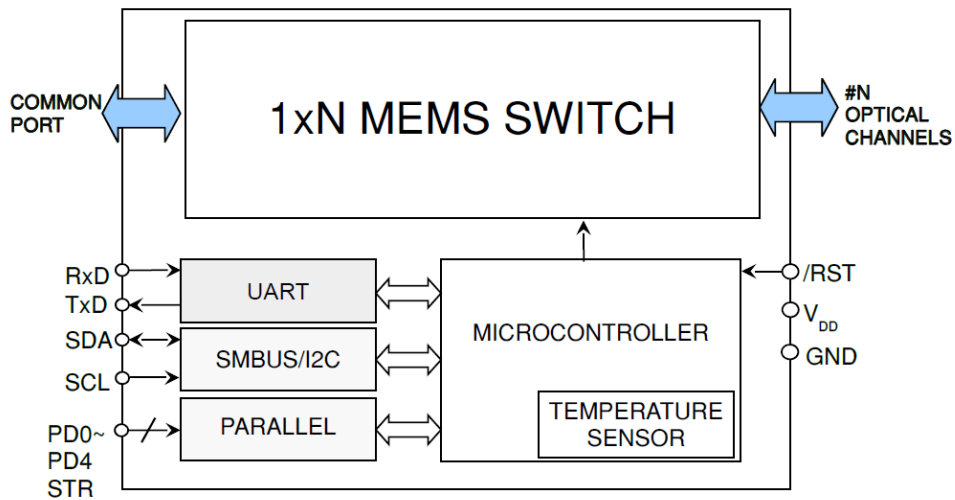
bcSC: bare optical component

TECHNICAL SPECIFICATIONS

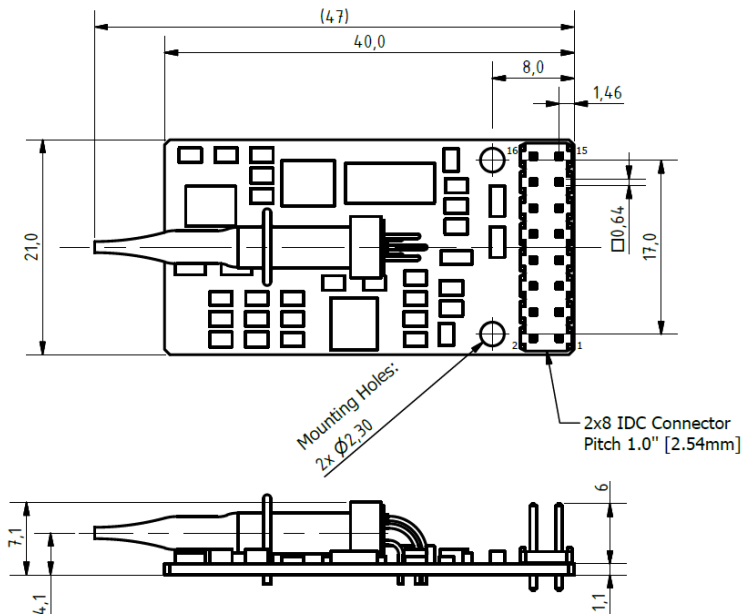
| | Unit | Min | Typ | Max |
|------------------------------------------------------|--------|-----------------------------|--------------|--------|
| Optical Specifications | | | | |
| Wavelength range | nm | 1250 | | 1670 |
| Insertion loss up to 1x4 ¹ | dB | | 0.4 | 1.0 |
| Insertion loss up to 1x16 ¹ | dB | | 0.8 | 1.2 |
| Insertion loss up to 1x24 ¹ | dB | | 1.0 | 1.5 |
| Insertion loss up to 1x36 ¹ | dB | | 1.2 | 2.0 |
| Crosstalk | dB | 50 | 60 | |
| Polarization dependent loss | dB | | | 0.1 |
| Return loss | dB | 50 | 55 | |
| Wavelength dependent loss (one band) | dB | | | 0.2 |
| Wavelength dependent loss (1250–1670 nm) | dB | | 0.5 | 1.0 |
| Temperature dependent loss | dB | | | 0.2 |
| Maximum optical power level ² | mW | | | 500 |
| Switching time | ms | | 5 | 10 |
| Cycle rate | Hz | | 10 | 50 |
| Repeatability ³ | dB | | | 0.01 |
| Durability | cycles | | No wear out | |
| Optical Specifications (PM fiber - up to 1x4) | | | | |
| Polarization extinction ratio | dB | 20 | | |
| Electrical Specifications (SC, mSC, rSC) | | | | |
| Supply voltage | V | 4.75 | 5 | 5.25 |
| Power consumption, normal mode | mW | | | 150 |
| Power consumption, standby | mW | | 40 | |
| UART speed | baud | 9600 | | 115200 |
| SMBus/I ² C bus speed | kbps | | | 400 |
| Input logic level low | V | | 0 | 0.6 |
| Input logic level high | V | 2.4 | 5 | |
| Output logic level low | V | | 0 | 0.6 |
| Output logic level high | V | 2.6 | 3.3 | |
| Reset inactive voltage ⁴ | V | 2.4 | 5 | |
| Reset active voltage | V | | 0 | 0.9 |
| Reset pulse duration | µs | 15 | | |
| Electrical Specifications (bcSC) | | | | |
| Driving voltage | V | 0 | | |
| Driving voltage damage threshold | V | | | 45 |
| Electrostatic discharge tolerance ⁵ | V | | | 50 |
| Package | | | | |
| Operating temperature | °C | -10 | | 70 |
| Storage temperature | °C | -40 | | 85 |
| Operation humidity (non condensing) | % r.h. | 0 | | 95 |
| Pigtail length | cm | 50 | | 100 |
| Dimensions | SC | mm | 40 x 21 x 7 | |
| | mSC | mm | 40 x 7 x 7.5 | |
| | rSC | mm | 68 x 30 x 9 | |
| | bcSC | mm | ∅6 x 35 | |
| ROHS Compliance | | 2015/863/EU (no exceptions) | | |

¹ Values at 25 °C at 1550 nm, without connectors. For operation over several bands 1250 to 1670 add 0.5 dB. ² It is recommended to turn off the laser during switch transients when switching optical power above 100 mW. ³ For constant temperature and polarization. ⁴ Through onboard pull-up resistor. ⁵ The bare optical component is not protected against ESD.

FUNCTIONAL BLOC DIAGRAM

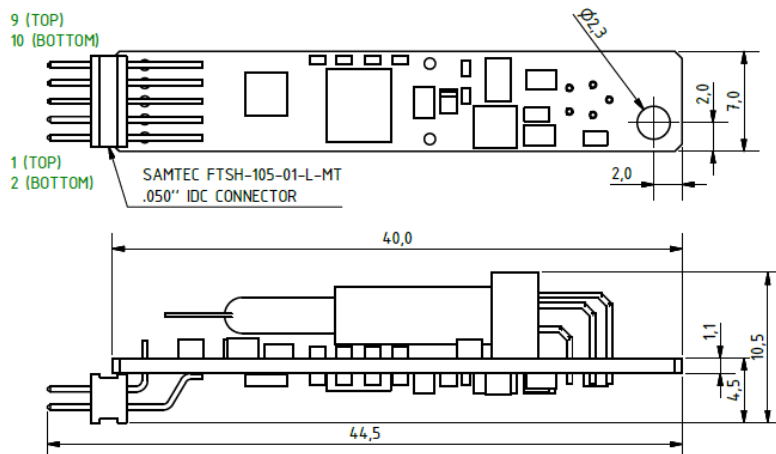


SC STANDARD SIZE – DIMENSIONS AND PINOUT



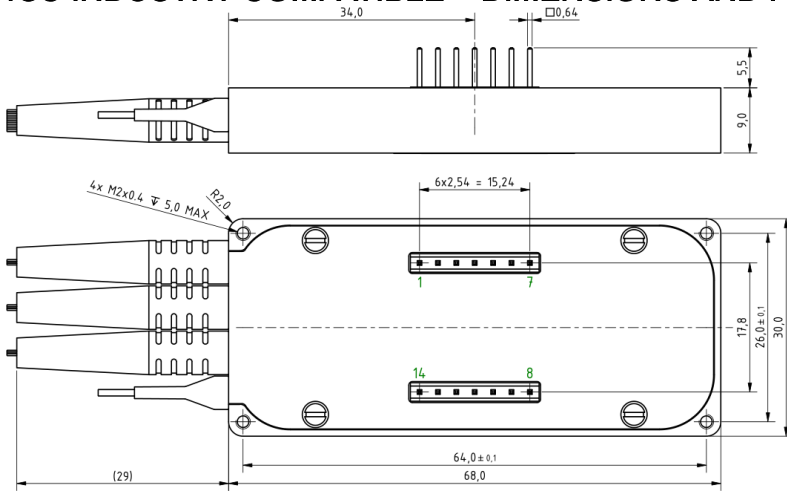
| Pin number | Description |
|------------|-----------------------------------|
| 1 | Parallel PD3 |
| 2 | Parallel PD4 |
| 3 | Parallel PD1 |
| 4 | Parallel PD2 |
| 5 | Parallel STROBE/ENABLE |
| 6 | Parallel PD0 |
| 7 | Ground (GND) |
| 8 | Supply voltage (V _{DD}) |
| 9 | Reserved |
| 10 | UART TX |
| 11 | Reserved |
| 12 | UART RX |
| 13 | System reset (RST) |
| 14 | SMBus/I ² C SDA |
| 15 | SMBus/I ² C SCL |
| 16 | Ground (GND) |

mSC MINIATURE – DIMENSIONS AND PINOUT



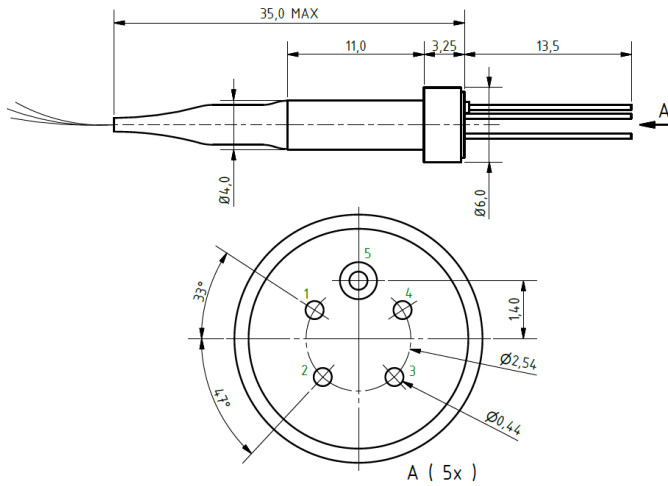
| Pin number | Description |
|------------|-------------------------------------|
| 1 | I/F mode |
| 2 | Supply voltage (V _{DD}) |
| 3 | System reset (RST) |
| 4 | Ground (GND) |
| 5 | SMBus/I ² C A0 |
| 6 | SMBus/I ² C A2 / UART RX |
| 7 | SMBus/I ² C A1 / UART TX |
| 8 | SMBus/I ² C SCL |
| 9 | SMBus/I ² C A3 |
| 10 | SMBus/I ² C SDA |

rSC INDUSTRY COMPATIBLE – DIMENSIONS AND PINOUT



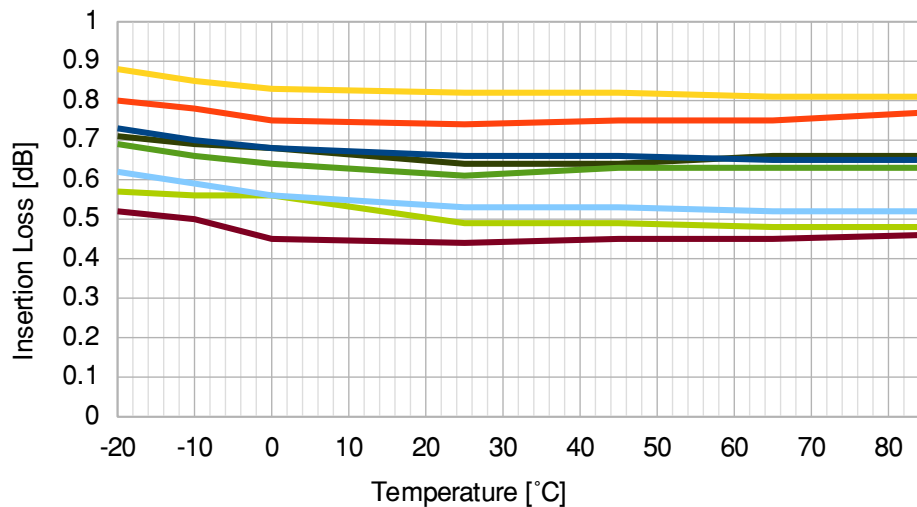
| Pin number | Description |
|------------|-----------------------------------------|
| 1 | I/F mode 1 |
| 2 | Supply voltage (V_{DD}) |
| 3 | Parallel strobe |
| 4 | Ground (GND) |
| 5 | Parallel D0 / SMBus/I ² C A0 |
| 6 | SMBus/I ² C SDA / UART TX |
| 7 | SMBus/I ² C SCL / UART RX |
| 8 | I/F mode 0 |
| 9 | Parallel D2 / SMBus/I ² C A2 |
| 10 | Done |
| 11 | Ground (GND) |
| 12 | Parallel D1 / SMBus/I ² C A1 |
| 13 | Parallel D3 / SMBus/I ² C A3 |
| 14 | System reset (RST) |

bcSC BARE OPTICAL COMPONENT – DIMENSIONS AND PINOUT

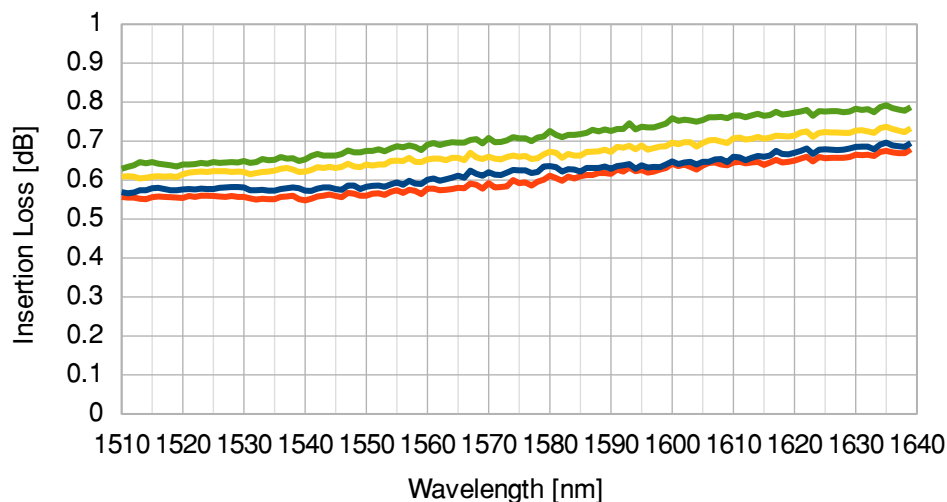


| Pin number | Description |
|------------|-------------|
| 1 | Axis X- |
| 2 | Axis Y- |
| 3 | Axis X+ |
| 4 | Axis Y+ |
| 5 | Common |

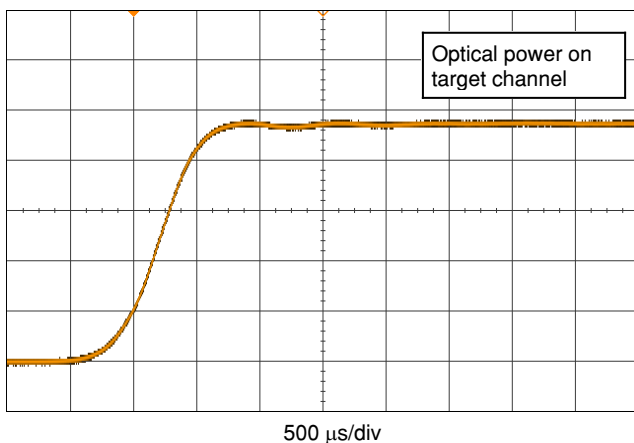
INSERTION LOSS vs. TEMPERATURE (SC 1x8)



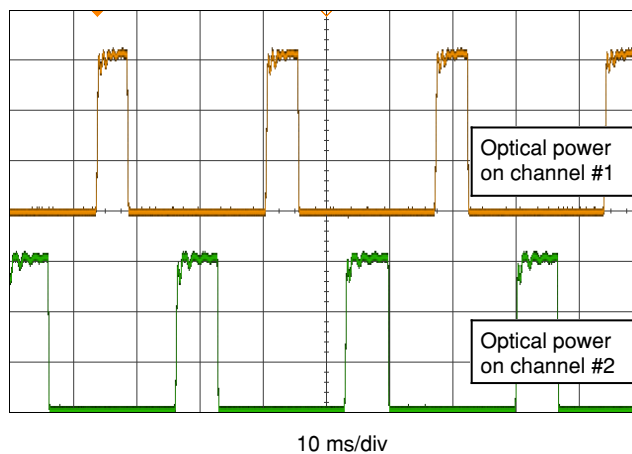
WAVELENGTH DEPENDENT LOSS (SC 1x4)



OPTICAL RESPONSE TIME



CONTINUOUS SWITCH OPERATION



Ordering Information:



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