

# FIBER OPTIC mSC 1xN / 2xN SWITCH *coaxial design*

## OVERVIEW

**Sercalo's** fiber optic 1xN and 2xN 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 2x256 optical ports
- UART, I<sup>2</sup>C/SMBus and parallel interface
- Ethernet interface available on request
- RoHS compliant

## APPLICATIONS

- Optical network switching
- Instrumentation
- Test and measurement

### Contact

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## ORDERING INFORMATION

-	SC	1x4	-	9	R	-	05	FP
<b>Package type</b> none = standard package bc = bare component m = miniature r = industry compatible	<b>Switch type</b> SC	<b>Ports</b> 1x4 1x8 1x12 1x16 1x24 1x36 up to 2x256	<b>Fiber type</b> 9 = SMF28ULTRA 9PM = PM15-U40A (Corning Panda fiber) 7 = SM980 for 1050nm 4 = SM600 for 630nm <i>Other fiber types and wavelengths upon request</i>	<b>Fiber sleeve type</b> B = 250um bare fibers R = 8-fibers or 12-fibers ribbon N = 900 μm sleeve (on rSC only)	<b>Pigtail length</b> Expressed in decimeters e.g.: 05 = 50 cm 10 = 100 cm	<b>Connectors type</b> none = no connectors FP = FC-PC FA = FC-APC narrow key LP = LC-PC SA = SC-APC SP = SC-PC		

Information:

800 Village Walk #316

### Ordering Information:



800 Village Walk #316  
Guilford, CT 06437  
Ph: 203-401-8093

Email orders to: [sales@xsoptix.com](mailto:sales@xsoptix.com)  
Fax orders to: 800-878-7282

**sercalo**

**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, 900 µm sleeved fibers and connectors

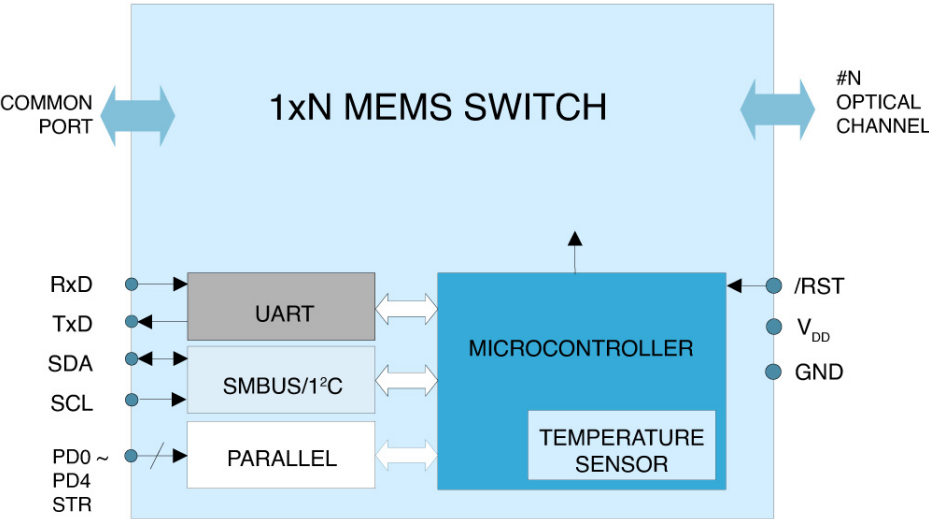
**bcSC**: bare optical component

## TECHNICAL SPECIFICATIONS

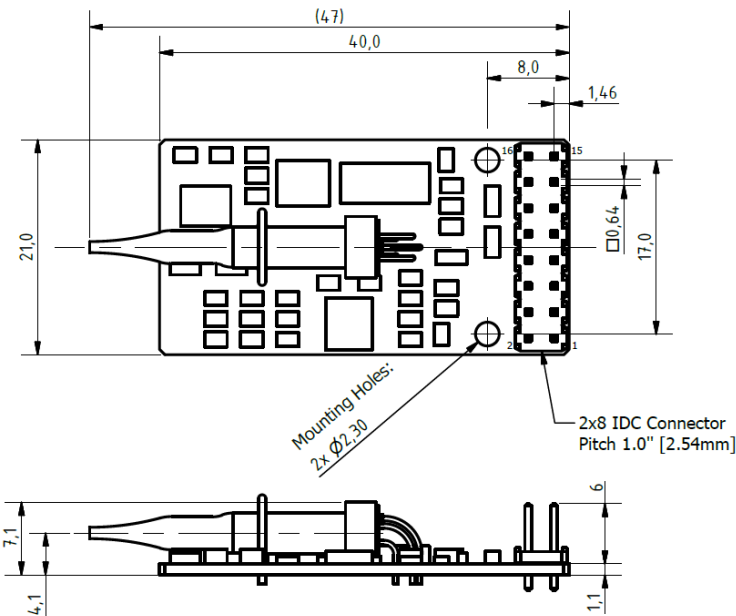
		Unit	Min	Typ	Max
<b>Optical Specifications</b>					
Wavelength range		nm	1250		1670
Insertion loss up to 1x4 <sup>1</sup>		dB		0.4	1.0
Insertion loss up to 1x16 <sup>1</sup>		dB		0.8	1.2
Insertion loss up to 1x24 <sup>1</sup>		dB		1.0	1.5
Insertion loss up to 1x36 <sup>1</sup>		dB		1.2	2.0
Crosstalk		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 <sup>2</sup>		mW			500
Switching time		ms		5	10
Cycle rate		Hz		10	50
Repeatability <sup>3</sup>		dB			0.01
Durability		cycles	No wear out		
<b>Optical Specifications (PM fiber - up to 1x4)</b>					
Polarization extinction ratio		dB	20		
<b>Electrical Specifications (SC, mSC, rSC)</b>					
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 <sup>2</sup> 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 <sup>4</sup>		V	2.4	5	
Reset active voltage		V		0	0.9
Reset pulse duration		μs	15		
<b>Electrical Specifications (bcSC)</b>					
Driving voltage		V	0		
Driving voltage damage threshold		V			45
Electrostatic discharge tolerance <sup>5</sup>		V			50
<b>Package</b>					
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	Ø6 x 35		
ROHS Compliance			2015/863/EU (no exceptions)		

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

FUNCTIONAL BLOC DIAGRAM

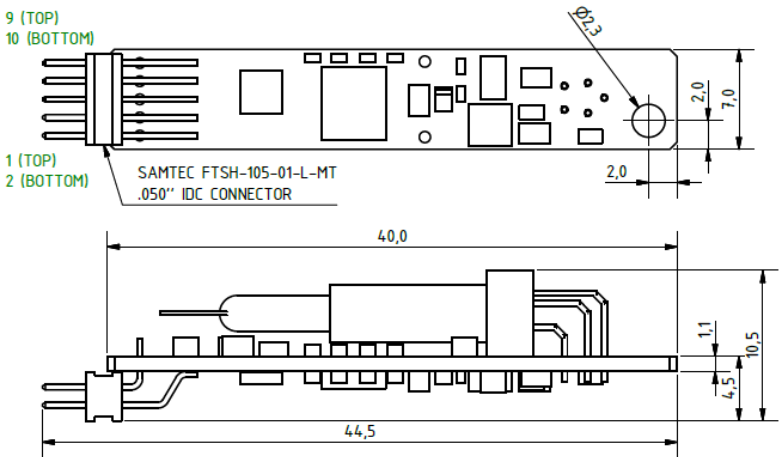


SC STANDARD SIZE – DIMENSIONS AND PINOUT



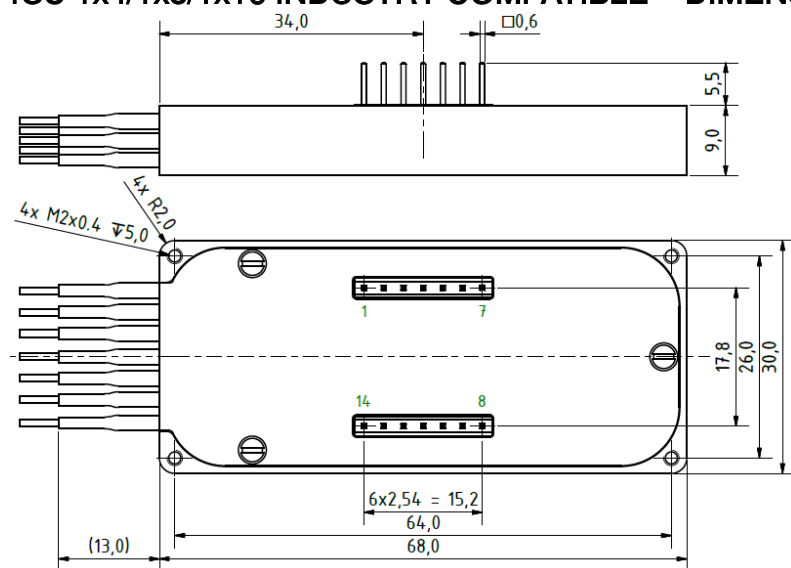
Pin number	Description
1	Parallel PD3
2	Parallel PD4
3	Parallel PD1
4	Parallel PD2
5	Parallel STROBE/ENABLE
6	Parallel PD0
7	Ground (GND)
8	Supply voltage (V <sub>DD</sub> )
9	Reserved
10	UART TX
11	Reserved
12	UART RX
13	System reset (RST)
14	SMBus/I <sup>2</sup> C SDA
15	SMBus/I <sup>2</sup> C SCL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

mSC MINIATURE – DIMENSIONS AND PINOUT



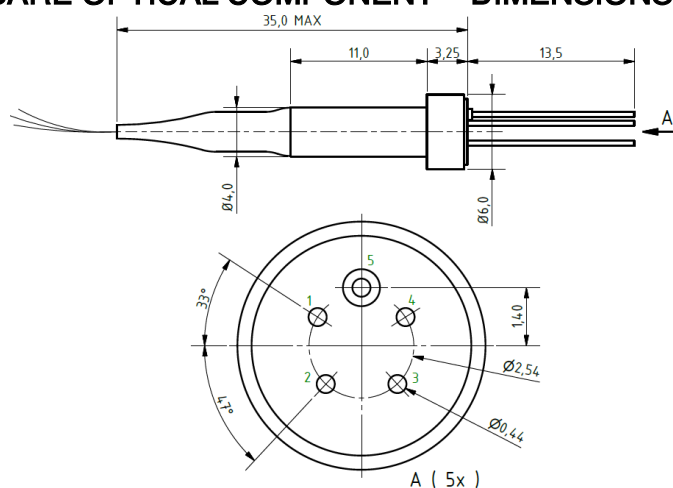
Pin number	Description
1	I/F mode
2	Supply voltage (V <sub>DD</sub> )
3	System reset (RST)
4	Ground (GND)
5	SMBus/I <sup>2</sup> C A0
6	SMBus/I <sup>2</sup> C A2 / UART RX
7	SMBus/I <sup>2</sup> C A1 / UART TX
8	SMBus/I <sup>2</sup> C SCL
9	SMBus/I <sup>2</sup> C A3
10	SMBus/I <sup>2</sup> C SDA

## rSC 1x4/1x8/1x16 INDUSTRY COMPATIBLE – DIMENSIONS AND PINOUT



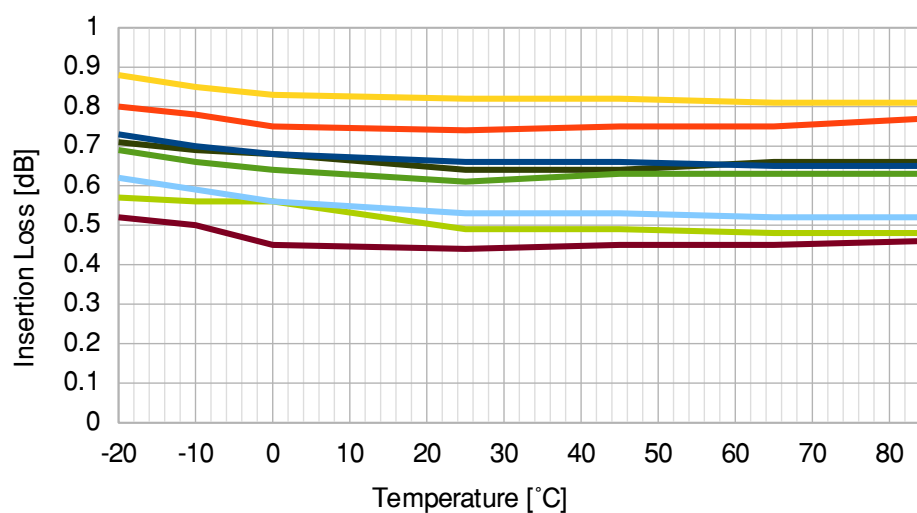
Pin number	Description
1	Not connected
2	Supply voltage (V <sub>DD</sub> )
3	Parallel strobe
4	Signal ground
5	Parallel D0 / SMBus/I <sup>2</sup> C A0
6	SMBus/I <sup>2</sup> C SDA
7	SMBus/I <sup>2</sup> C SCL
8	I/F mode
9	Parallel D2 / SMBus/I <sup>2</sup> C A2
10	Done
11	Case ground
12	Parallel D1 / SMBus/I <sup>2</sup> C A1
13	Parallel D3 / SMBus/I <sup>2</sup> C A3
14	System reset (RST)

## bcSC BARE OPTICAL COMPONENT – DIMENSIONS AND PINOUT

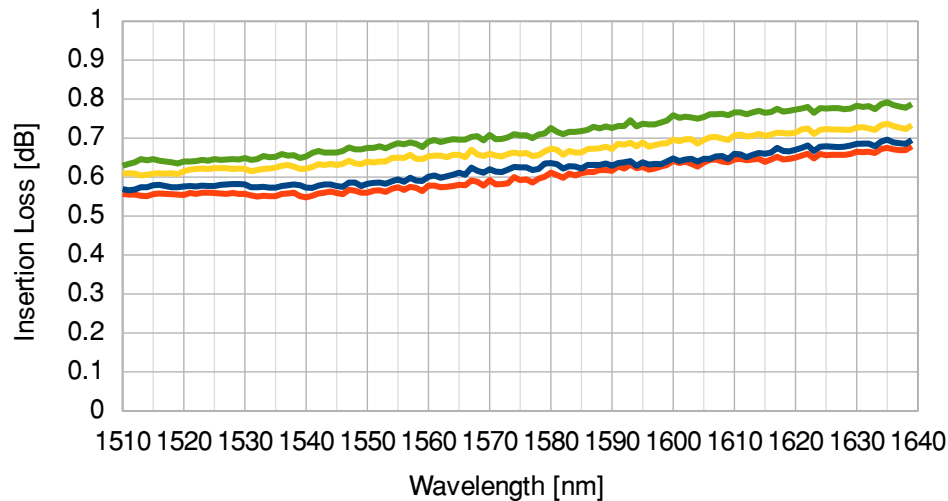


Pin number	Description
1	Axis X-
2	Axis Y-
3	Axis X+
4	Axis Y+
5	Common

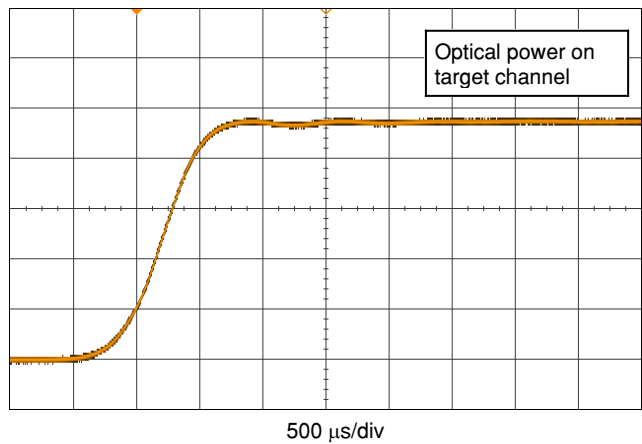
## INSERTION LOSS vs. TEMPERATURE (SC 1x8)



WAVELENGTH DEPENDENT LOSS (SC 1x4)



OPTICAL RESPONSE TIME



CONTINUOUS SWITCH OPERATION

