

# 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 underlying MEMS technology results in low insertion loss and low crosstalk between channels while keeping a constant switching performance. The switch communicates over a UART or I<sup>2</sup>C/SMBus. A TTL/CMOS-compatible parallel interface is also available for switches with up to 24 ports.

The MEMS component is hermetically sealed. The laser welded collimator guarantees high temperature and long term stability. The part complies with Telcordia 1221 reliability standards. No epoxy is present in the optical path. The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards.

The component is compliant to ROHS requirements 2011/65/EU.

## APPLICATIONS

- *Telecom*
- *Instrumentation*
- *Test and measurement*

## FEATURES

- Low insertion loss
- Reliable
- UART, I<sup>2</sup>C/SMBus and parallel interface
- Ethernet interface available on request
- ROHS compliant

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**Sercalo's** COAXIAL TYPE 1xN switch is non latching and breaks the optical connection at power-off, i.e. the common port is not routed to any port. The component works bidirectional, the common port can be used as input or output of the light signal. The optical assembly is laser welded and offers excellent stability over temperature and time.

## TECHNICAL SPECIFICATIONS for *Single Mode fiber*

	Unit	Min	Typ	Max
<b>Optical Specifications</b>				
Wavelength range <sup>1</sup>	nm	1250		1670
Insertion loss 1x4 <sup>2</sup>	dB		0.4	1.0
Insertion loss 1x8 to 1x16 <sup>2</sup>	dB		0.6	1.5
Insertion loss 1x24 to 1x36 <sup>2</sup>	dB		0.6	2.0
Crosstalk	dB	50	60	
Polarisation dependent Loss	dB			0.1
Return Loss	dB	50	55	
Wavelength dep. Loss (one band)	dB			0.2
Wavelength dep.Loss (1250-1650 nm)	dB		0.5	1.0
Temperature dependent Loss	dB			0.2
Switching time	ms		5	10
Cycle Rate	Hz		10	50
Repeatability <sup>3</sup>	dB			0.01
Durability	cycles	No wear out		
<b>Electrical Specifications</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
Logic level low	V		0	0.6
Logic level high	V	2.4	5	
Reset inactive voltage <sup>4</sup>	V	2.4	5	
Reset active voltage	V		0	0.9
Reset pulse duration	µs	15		
<b>Package</b>				
Operation temperature	°C	-10		70
Storage temperature	°C	-40		85
Operation humidity (non condensing)	% r.h.	0		95
Pigtail length	cm	50		100
Weight	g	75		
Dimensions	mm	40 x 21 x 8		
ROHS Compliance		2011/65/EU (no exceptions)		

<sup>1</sup> Insertion loss is optimized for one band. If the switch is operated over all four bands add 0.5 dB to IL. Band is selectable over software between 1310, 1550 nm and 1625 nm <sup>2</sup> Values at 25°C at 1310 or 1550 nm, without connectors. <sup>3</sup>For constant temperature and polarization. <sup>4</sup>Through onboard pull-up resistor.

## ORDERING INFORMATION

SC	1x8	-	9	R
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**Switch type:**  
SC = 1250 – 1670 nm

**Network:**  
1x4, 1x8,  
1x12, 1x16,  
1x24, 1x32,  
1x36

**Fiber type:**  
9 = SMF28ULTRA  
7 = SM980 for 1050 nm  
4 = SM400 for 630 nm  
other fiber types and  
wavelengths upon request

**Fiber sleeve type:**  
B = 250 µm bare fibers  
R = 8-fibers or 12-fibers ribbon with  
250 µm acrylate coating

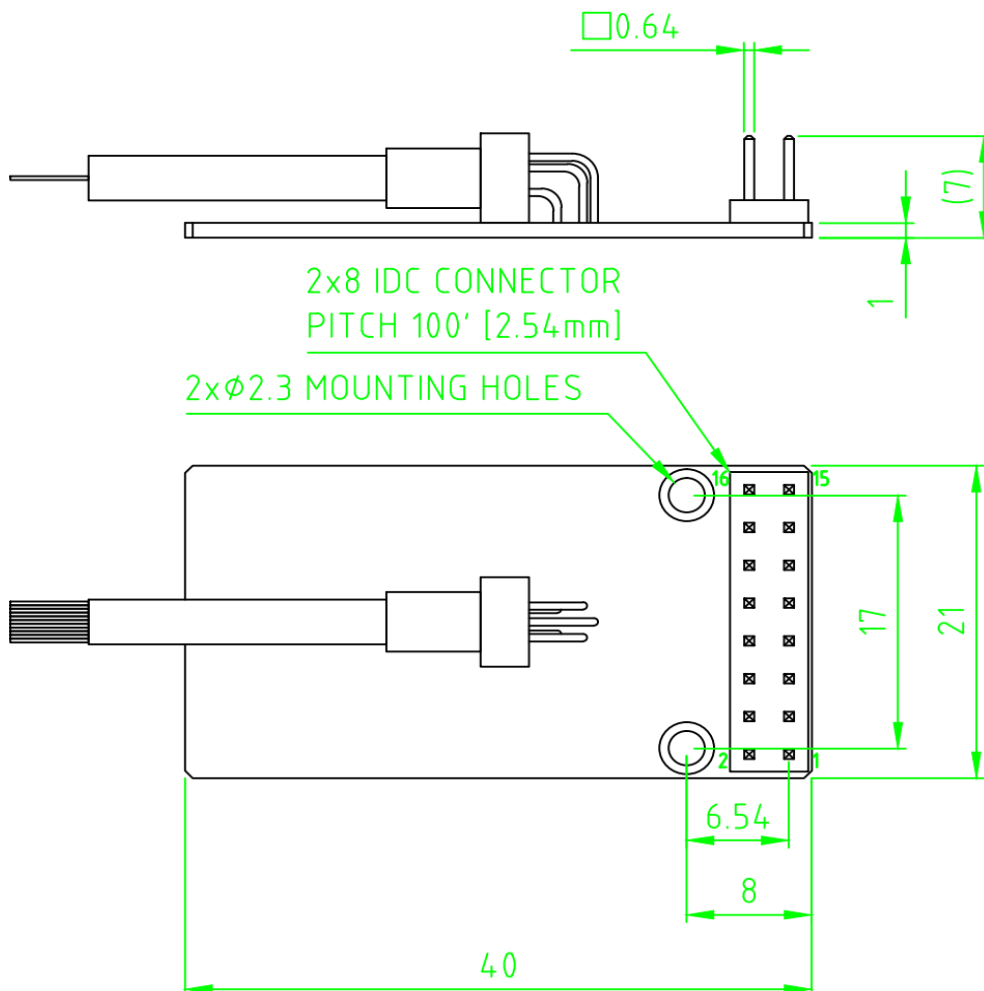
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## CONNECTOR PINOUT

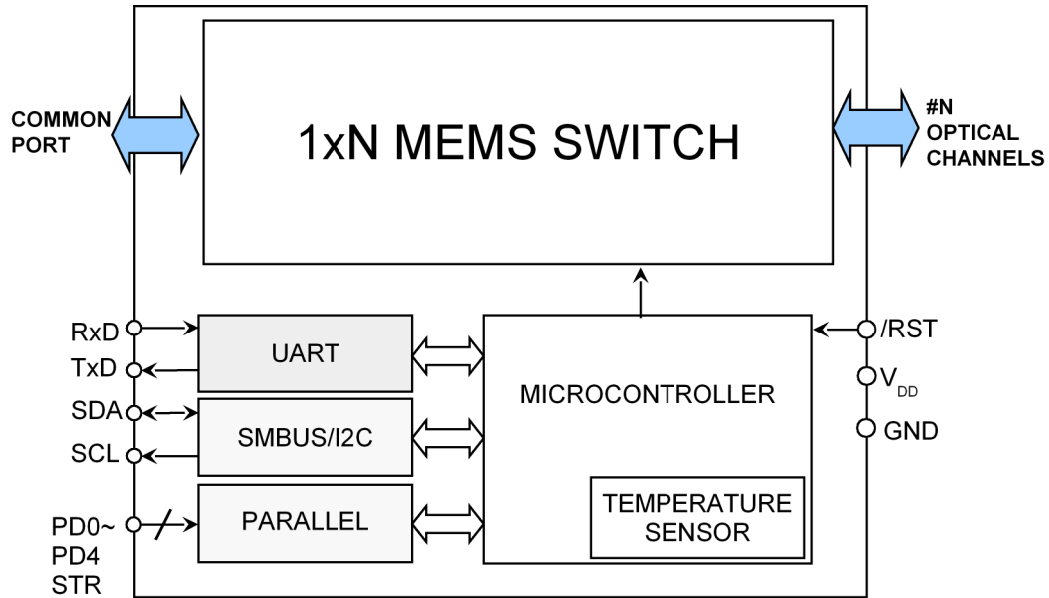
Pin number	Description
1	Parallel PD3
2	Parallel PD4
3	Parallel PD1
4	Parallel PD2
5	Parallel STROBE/ENABLE
6	Parallel PD0
7	Ground (GND)
8	Supply voltage (V <sub>DD</sub> )
9	Reserved <sup>4</sup>
10	UART TX data
11	Reserved <sup>4</sup>
12	UART RX data
13	System reset (/RST)
14	SMBus/I <sup>2</sup>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

<sup>4</sup>Let reserved pins unconnected.

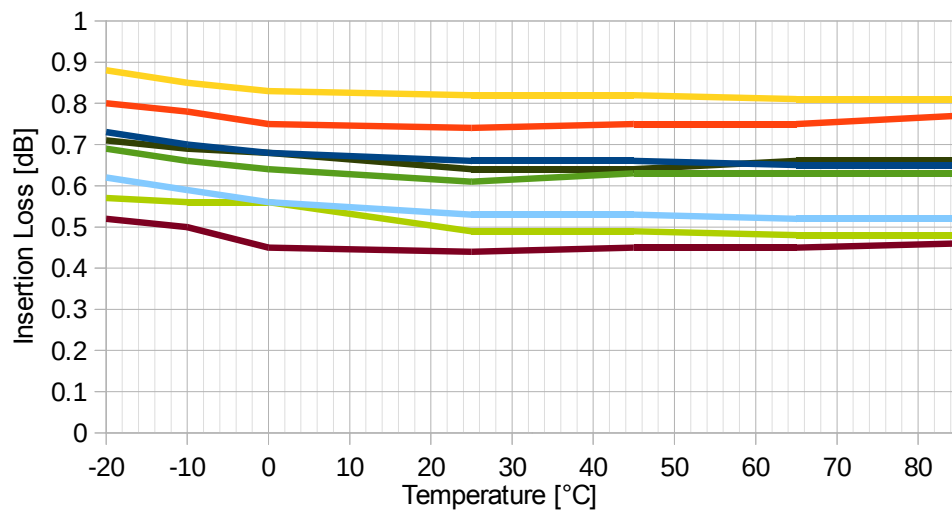
## PRODUCT DIMENSIONS (IN MILLIMETERS)



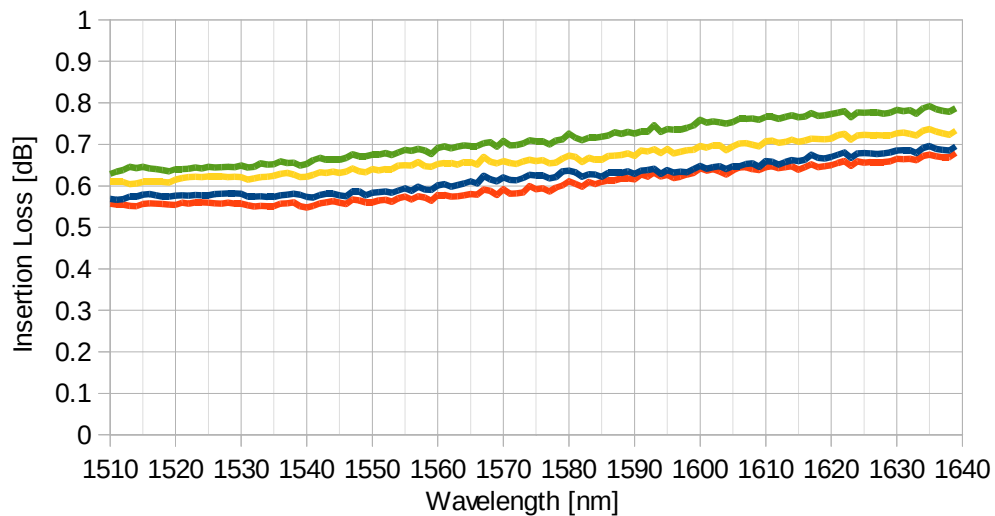
## FUNCTIONAL BLOC DIAGRAM



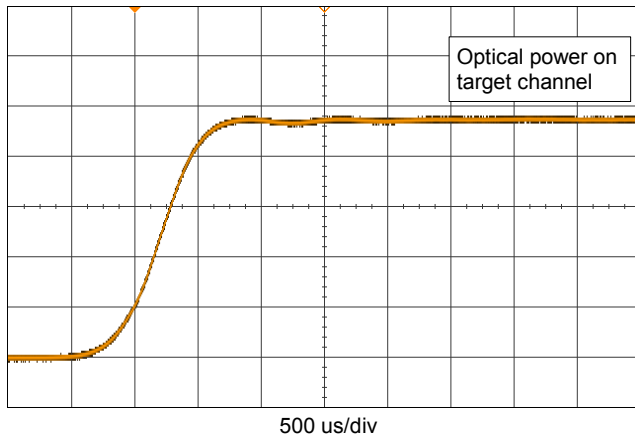
## INSERTION LOSS vs. TEMPERATURE (SC 1x8)



## WAVELENGTH DEPENDENT LOSS (SC 1x4)



## OPTICAL RESPONSE TIME



## CONTINUOUS SWITCH OPERATION

