SCBU FIBER OPTIC SWITCH

Customizable fiber optic solution

OVERVIEW

sercalo's fiber optic SCBU NxM switches are bidirectional opto-mechanical switches based on coaxial design where a matrix of MEMS mirrors redirects light from N inputs to M outputs. The optical networks can be based on a strictly non-blocking matrix (from 4x4 up to 16x16 ports) or on a tree structure (up to 1x1116 ports).

The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards.

The underlying MEMS technology results in low insertion loss and low crosstalk between channels while keeping a constant switching performance over life. The hermetically sealed MEMS and the laser welded collimators guarantee broad temperature range and superior long term stability. The part is designed to conform to Telcordia 1221 reliability standards. No epoxy is present in the optical path.

FEATURES

- Fast switching time
- Low insertion loss
- Up to 16x16 or 1x1116 optical ports
- Compact design
- UART, I²C/SMBus and USB interfaces
- Custom networks available on request
- RoHS compliant

APPLICATIONS

- Optical network reconfiguration
- Optical network protection and restoration
- Instrumentation
- Test and measurement

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ORDERING INFORMATION

SCBU	16x16	- 9	N	- 05	FP

Switch type:
SCBU
1250–1670 nm

Network:
4x4, 8x8, 16x16 (matrix) or from 1x2 up to 1x1116 (tree)

Fiber type
9 = SMF28ULTRA
7 = SM980 for 1050nm
4 = SM400 for 630nm

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
N = 900 μm sleeve

Pigtail length
Expressed in decimeters
e.g.:
05 = 50 cm
10 = 100 cm

Connectors type:
none = no connectors
FP = FC-PC
FA = FC-APC narrow key
LP = LC-PC
LA = LC-APC
SP = SC-PC
SA = SC-APC

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DESCRIPTION

sercalo's SCBU fiber optic switches are based on a strictly non-blocking bidirectional architecture. An additional status where the channels are disconnected is available. The switch is non latching: at power-off it breaks the optical connection and routing of ports is not defined. The component is bidirectional, i.e. the common port can be used as input or output of the light signal.

TECHNICAL SPECIFICATIONS for Single mode fiber

|		Unit	Min	Typ	Max
Optical Specifications					
Wavelength range		nm	1250		1670
Insertion loss (matrix)[1]	4x4	dB		0.8	2.0
	8x8, 16x16	dB		1.6	3.0
Insertion loss (tree)[1]	1x16	dB		0.8	1.2
	1x36	dB		1.2	2.0
	1x72	dB		1.6	3.0
	1x540	dB		2.2	3.5
	1x1116	dB		2.4	4.0
Crosstalk		dB	50	60	
Polarisation dependent loss		dB		0.1	0.18
Return loss		dB	50	55	
Wavelength dep. loss (one band)		dB			0.2
Wavelength dep. 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		1	20
Repeatability[3]		dB			0.01
Durability		cycles		No wear out	
Electrical Specifications					
Supply voltage		V	4.75	5	5.25
Power consumption (each submodule), normal mode		mW			150
Power consumption (total), standby		mW		40	
UART speed		baud	9600		115200
SMBus/I²C bus speed		kbps			400
Logic level low		V		0	0.6
Logic level high		V	2.4	5	
Reset inactive voltage[4]		V	2.4	5	
Reset active voltage		V		0	0.9
Reset pulse duration		ms	15		
Package					
Operation temperature		˚C	-10		70
Storage temperature		˚C	-40		85
Operation humidity (non condensing)		% r.h.	0		95
Pigtail length		cm	50		100
Dimensions	small size	mm		72 x 140 x 16	
	medium size	mm		100 x 180 x 16	
	large size	mm		185 x 180 x 16	
RoHS Compliance				2015/863/EU (no exceptions)	

[1] Values at 1550nm or 1310nm at 25 ˚C, without connectors. [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.
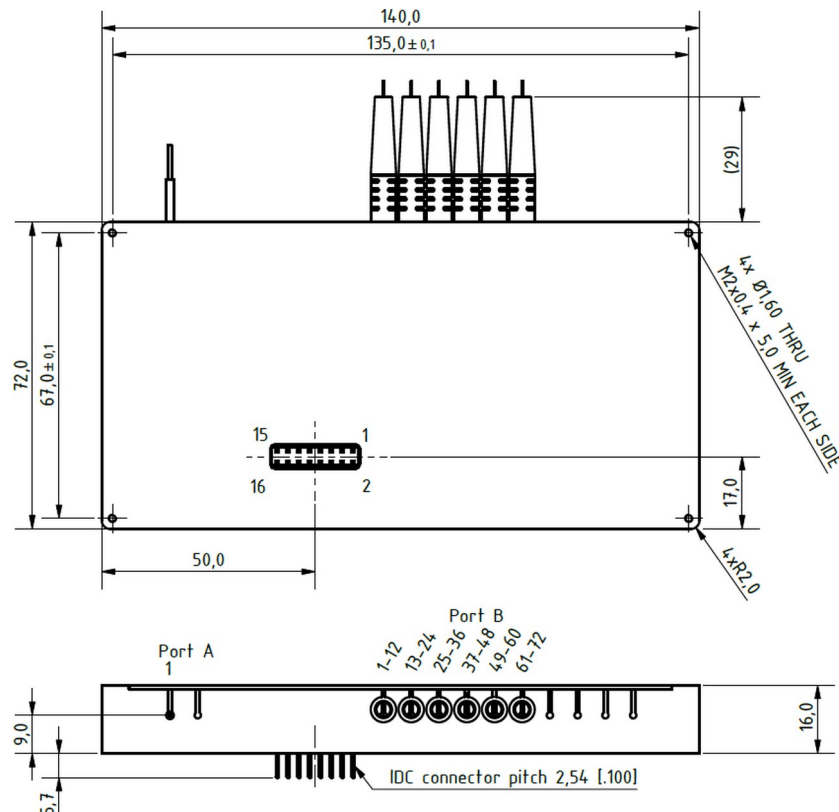
CONNECTOR PINOUT

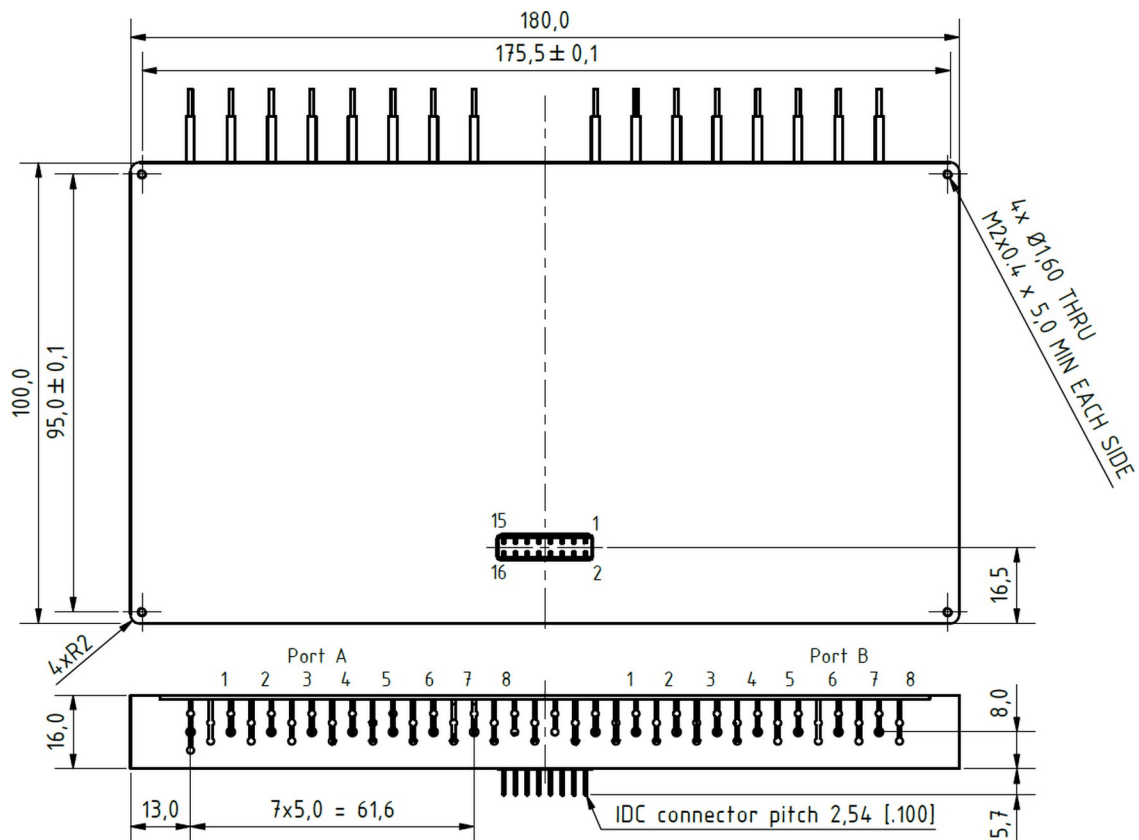| Pin number	Description	Pin number	Description
1	Ground (GND)	9	Supply voltage (V_{DD})
2	SMBus/I^{2}C SCL	10	Ground (GND)
3	SMBus/I^{2}C SDA	11	Reserved
4	System reset (/RST)	12	USB D-
5	UART RX data	13	Reserved
6	Reserved	14	USB D+
7	UART TX data	15	Reserved
8	Reserved	16	Reserved

FUNCTIONAL BLOC DIAGRAM
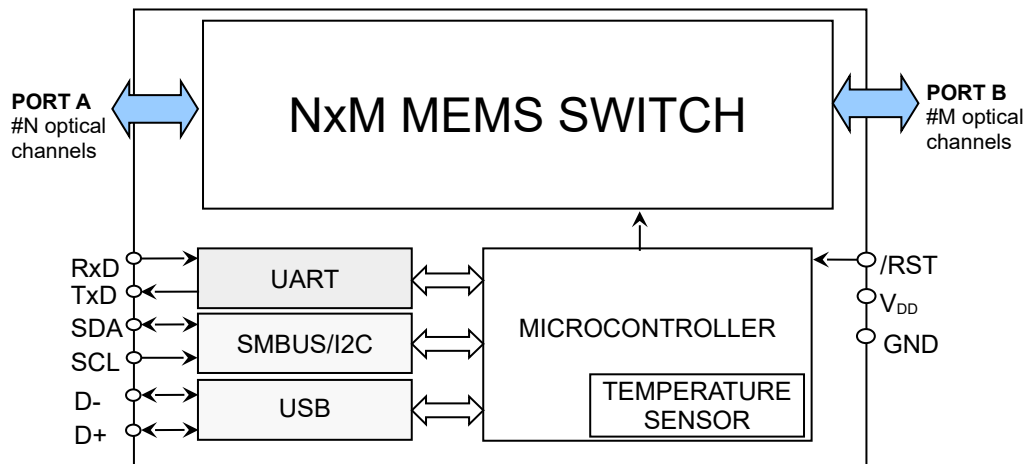
DIMENSIONS SCBU small size (example 1x72 switch)

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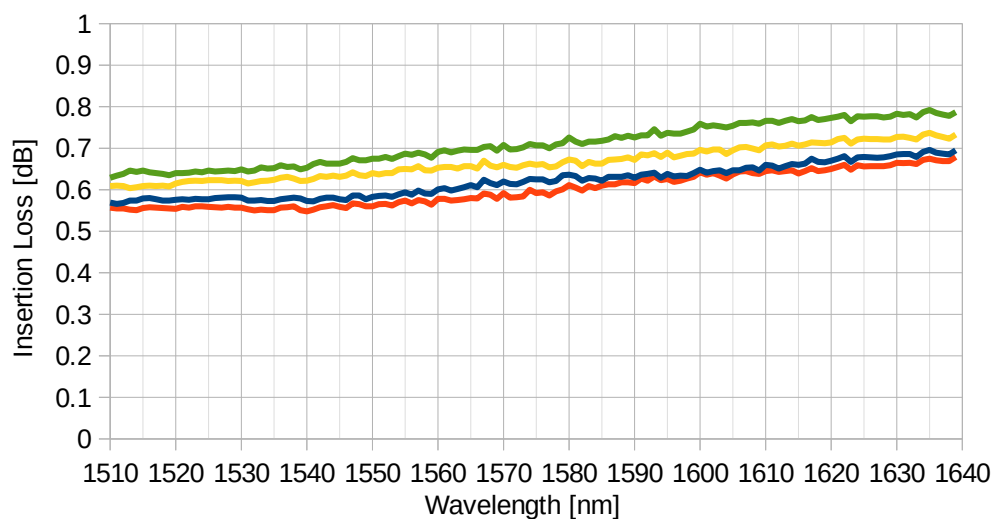## DIMENSIONS SCBU medium size (example 8x8 matrix network)

180,0

175,5 ± 0,1

100,0

95,0 ± 0,1

4x Ø1,60 THRU
M2x0.4 x 5,0 MIN EACH SIDE

15 1
16 2

16,5

4xR2

Port A
1 2 3 4 5 6 7 8

Port B
1 2 3 4 5 6 7 8

8,0

16,0

13,0

7x5,0 = 61,6

IDC connector pitch 2,54 [.100]

5,7

DIMENSIONS SCBU large size (example 16x16 matrix network)

180,0

175,0 ± 0,1

185,0

180,0 ± 0,1

4x Ø1,60 THRU
M2x0.4 x 5,0 MIN EACH SIDE

15 1
16 2

31,8

4xR2.0

Port A
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16

Port B
1 3 5 7 9 11 13 15
2 4 6 8 10 12 14 16

16,0

14,5

15x3,5=52,5

IDC connector pitch 2,54 [.100]

5,7

10,0

12,0

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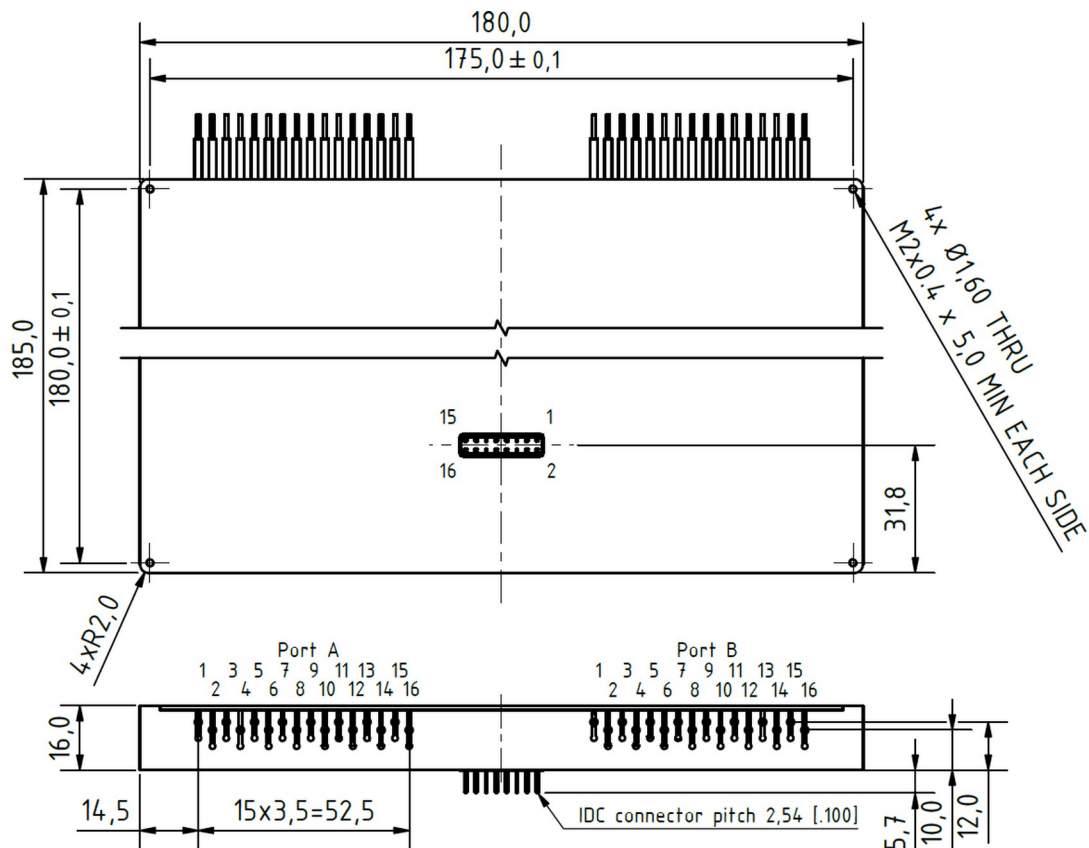
INSERTION LOSS vs. TEMPERATURE (SCBU 1x8)

Insertion Loss [dB] vs. Temperature [°C]
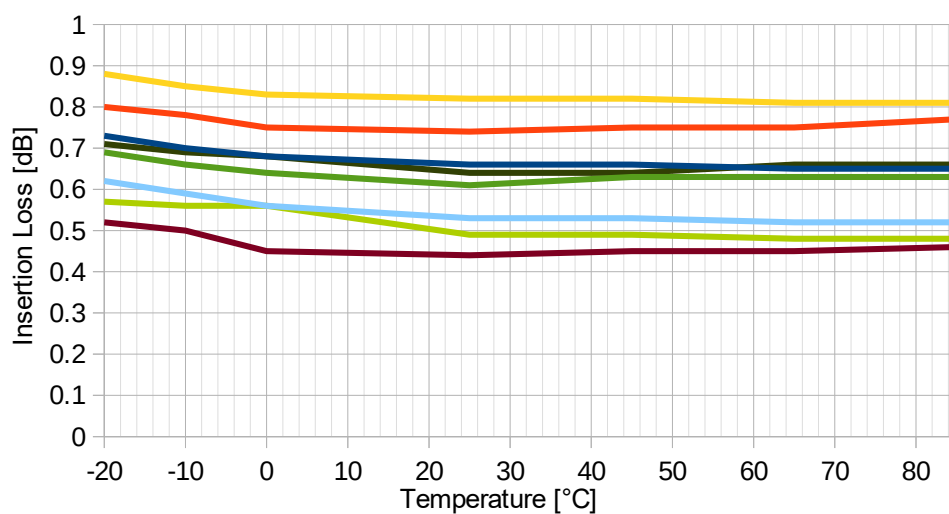
WAVELENGTH DEPENDENT LOSS (SCBU 1x4)

Insertion Loss [dB] vs. Wavelength [nm]

OPTICAL RESPONSE TIME

Optical power on target channel

500 µs/div
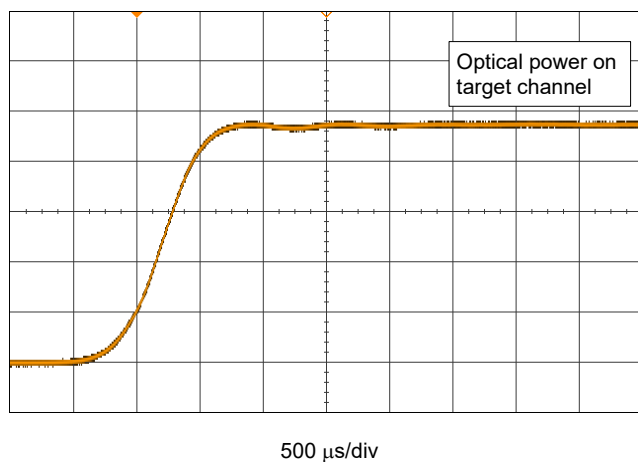
CONTINUOUS SWITCH OPERATION

Optical power on channel #1

Optical power on channel #2

10 ms/div

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