FAST FIBER OPTIC 1x2 SWITCH

OVERVIEW

The *SW* fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component is designed for fast switching between two single mode fiber ports. The switch is available in 1x1, 2x1, 4x1, 8x1 and 2x2 variants. The highly reliable switching mechanism uses an integrated micromirror and features below 1 ms switching time and only 0.5 dB insertion loss.

The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards. The switch is qualified according to Telcordia GR 1221.

APPLICATIONS

- Optical Reconfiguration
- Protection Switching
- Network Restoration

FEATURES

- reliable
- 0.5 dB insertion loss
- 1 ms response time
- 60 dB crosstalk
- miniature size
- non-latching

ORDERING INFORMATION

SW1x2-9N

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DESCRIPTION

The non-latching switch modules are fast and reliable switches designed for single mode fiber instrumentation. The device is based on the latest silicon MEMS technology and uses a micro-mechanical mirror to switch light. Operated by an electrostatic actuator, the switch features fast switching below 1 ms and high crosstalk attenuation above 50 dB. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

With 0 V on the drive pin (No 2) the switch is in its bar state (port 1 – port 3). When 5 V are applied to the drive pin, the micromirror is moved out of the optical path, which puts the switch into its cross state (port 1 – port 4). At power off, i.e. when either the supply voltage or the drive signal falls to 0 V, the switch returns into its bar state.

TECHNICAL SPECIFICATIONS

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	1240		1640
Insertion Loss	dB		0.5	0.9
Crosstalk	dB		75	50
Backreflection	dB		55	50
Polarisation Dependent Loss	dB		0.04	0.10
Switching Time	ms		0.5	1
Switching Voltage	V			5
Fiber Pigtail	μm		9/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		5	
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		45 x 24 x 9.5	

PIN CONNECTIONS

1 Supply 5V
2 Drive Signal 5V TTL
3 Ground 0V

view from pin side
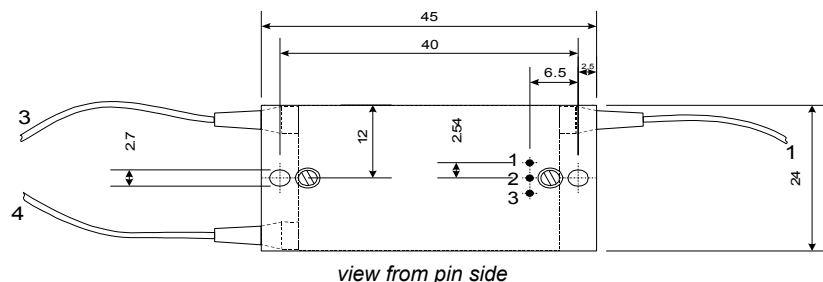
ORDERING INFORMATION

SW2x1-9N
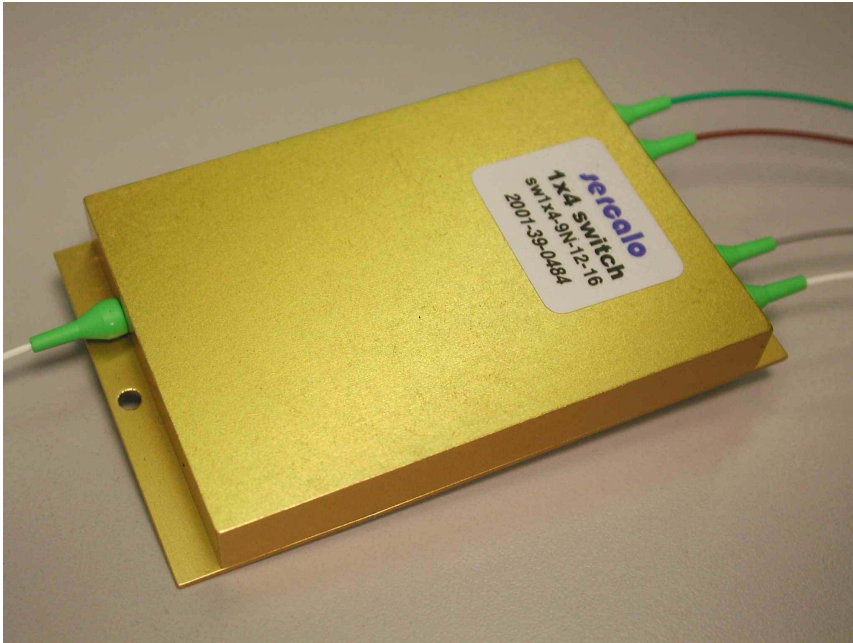
FAST
FIBER OPTIC
1x4 SWITCH

OVERVIEW

The *SW* 1x4 switch is a very fast opto-mechanical switch working over both telecom wavelength windows from 1240 nm to 1600 nm. The highly reliable switching mechanism is based on micromechanical mirrors and features below 1 ms switching time and only 1.0 dB insertion loss.

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

FEATURES

- reliable
- 1.0 dB insertion loss
- 1 ms response time
- 60 dB crosstalk
- non-latching

APPLICATIONS

- Source Selection
- Protection Switching
- Monitoring
- Wavelength provisioning

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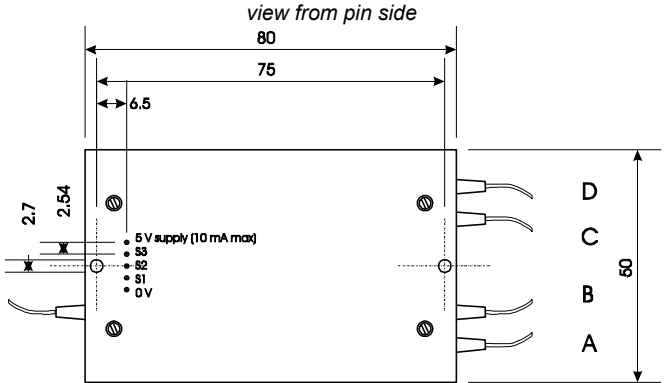**ORDERING INFORMATION**
SW1x4-9N

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DESCRIPTION

The non-latching 1x4 switch modules are fast and reliable switches designed for single mode fiber instrumentation and communication equipment. The device is based on MEMS technology and uses micro-mechanical mirrors to redirect the light. The underlying MEMS technology allows to achieve a constant switching quality over billions of actuation cycles. The switch features fast switching below 1 ms and high crosstalk attenuation above 60 dB. Repeatability is better than 0.01 dB. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

TECHNICAL SPECIFICATIONS

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	1240		1640
Insertion Loss	dB		0.5	1.0
Crosstalk	dB		75	60
Backreflection	dB		55	50
Polarisation Dependent Loss	dB			0.10
Switching Time	ms		0.5	1
Switching Voltage	V			5
Fiber Pigtail	μm		9/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		10	50
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		80 x 50 x 9.5	

ELECTRICAL SPECIFICATIONS

Supply: 4.5 - 5.5 V, 10 mA max
S1 – S3: CMOS or TTL levels, 0 mA

Optical Port Selection

S1	S2	S3	Port
0V	0V	x	A
5V	x	5V	B
5V	x	0V	C
0V	5V	x	D

view from pin side

80
75
6.5
2.7
2.54
5 V supply (10 mA max)
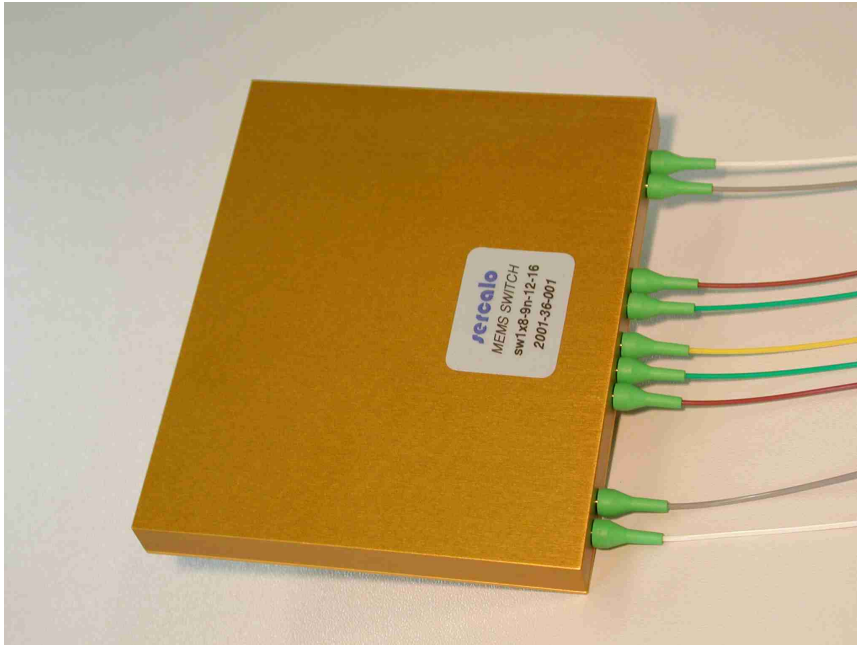S3
S2
S1
0V
D
C
B
A
50

ORDERING INFORMATION
SW1x4-9N

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FAST FIBER OPTIC 1x8 SWITCH

OVERVIEW

The *SW 1x8* fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component makes an optical connection between an optical port and either one of 8 input or output lines. The highly reliable switching mechanism use integrated micromirrors and features below 1 ms switching time and below 1.2 dB insertion loss. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

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

APPLICATIONS

- Optical Reconfiguration
- Instrumentation
- Provisioning

FEATURES

- reliable
- 1.2 dB insertion loss
- 1 ms response time
- 60 dB crosstalk
- miniature size
- non-latching

ORDERING INFORMATION

SW1x8-9N

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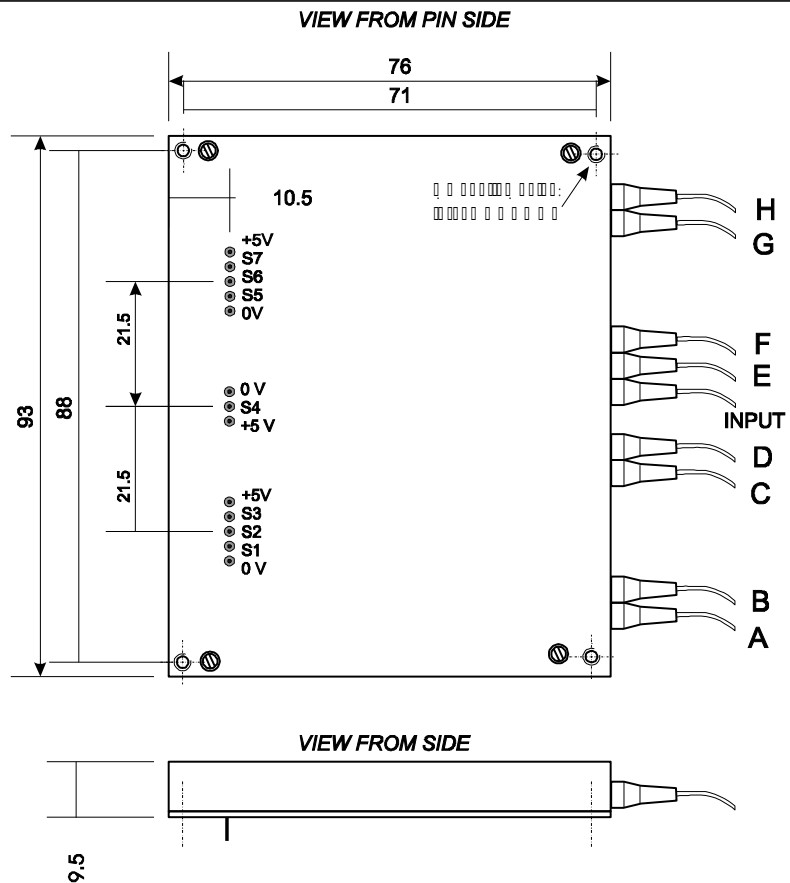www.sercalo.com   e-mail:info@sercalo.com

TECHNICAL SPECIFICATIONS

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	1240		1640
Insertion Loss	dB		0.8	1.2
Crosstalk	dB		75	60
Backreflection	dB		55	50
Polarisation Dependent Loss	dB			0.10
Switching Time	ms		0.5	1
Switching Voltage	V			5
Fiber Pigtail	μm		9/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		40	
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		76 x 93 x 9.5	

Optical Port Selection

S2	S3	S4	S5	S6	S7	Port
0	5	x	5	x	x	x	A
5	x	0	5	x	x	x	B
5	x	5	5	x	x	x	C
0	0	x	5	x	x	x	D
x	x	x	0	0	0	x	E
x	x	x	0	5	x	5	F
x	x	x	0	5	x	0	G
x	x	x	0	0	5	x	H

0 = 0 V (TTL or CMOS level)
5 = 5 V (TTL or CMOS level)
x = 0 V or 5 V

VIEW FROM PIN SIDE

VIEW FROM SIDE

ORDERING INFORMATION

SW1x8-9N

FAST FIBER OPTIC 1x13 SWITCH

OVERVIEW

The *SW* fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component makes an optical connection between an optical port and either one of 13 input or output lines. A 1x12 variant is also available. The highly reliable switching mechanism uses integrated micromirrors and features below 1 ms switching time and below 1.5 dB insertion loss. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

The small package withstands rugged environments and is well suited for direct mounting on printed circuit boards. The switch is built by cascading 1x2 switches which are qualified according to Telcordia GR1221.

FEATURES

- reliable
- 1.0 dB insertion loss
- 1 ms response time
- 60 dB crosstalk
- miniature size
- non-latching

APPLICATIONS

- Optical Reconfiguration
- Instrumentation
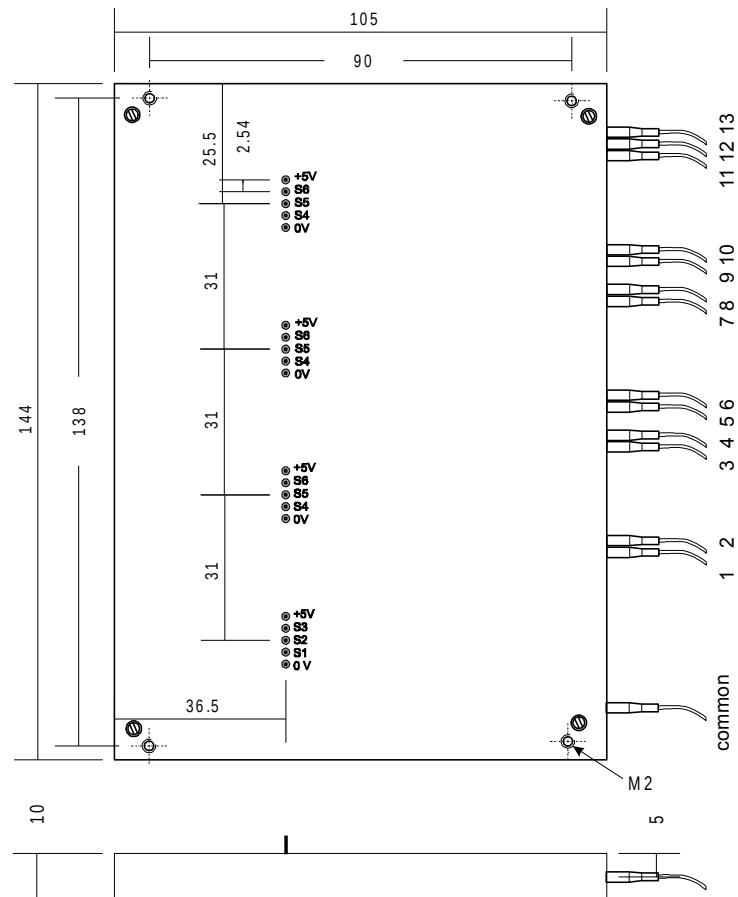- Provisioning

TECHNICAL SPECIFICATIONS

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	1240		1640
Insertion Loss	dB		1.0	1.5
Crosstalk	dB		75	60
Backreflection	dB		55	45
Polarisation Dependent Loss	dB			0.15
Repeatability[1]	dB			0.002
Switching Time	ms		0.5	1
Switching Voltage	V			5
Fiber Pigtail	μm		9/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	MW		150	
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	Mm		144 x 105 x 10	

[1] value for constant temperature and polarisation

Optical Port Selection

S1	S2	S3	S4	S5	S6	Port
0	5	x	0	0	x	1
0	5	x	5	x	5	2
0	5	x	5	x	0	3
0	5	x	0	5	x	4
5	x	0	0	0	x	5
5	x	0	5	x	5	6
5	x	0	5	x	0	7
5	x	0	0	5	x	8
5	x	5	0	0	x	9
5	x	5	5	x	5	10
5	x	5	5	x	0	11
5	x	5	0	5	x	12
0	0	x	x	x	x	13

0 = 0 V (TTL or CMOS level)
5 = 5 V (TTL or CMOSlevel)
x = 0 V or 5 V

ORDERING INFORMATION

SW1x13-9N

SW1x12-9N (without port 13)

FAST FIBER OPTIC 1x16 SWITCH

OVERVIEW

The *SW* fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component makes an optical connection between an optical port and either one of 16 input or output lines. The highly reliable switching mechanism use integrated micromirrors and features below 1 ms switching time and below 1.5 dB insertion loss. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

The switching mechanism offers the reliability of a solid state device; it neither wears out nor degrades over time. Even after billions of cycles the switching quality stays constant. The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards.

APPLICATIONS

- Optical Reconfiguration

- Instrumentation

- Provisioning

FEATURES

- reliable

- 1.0 dB insertion loss
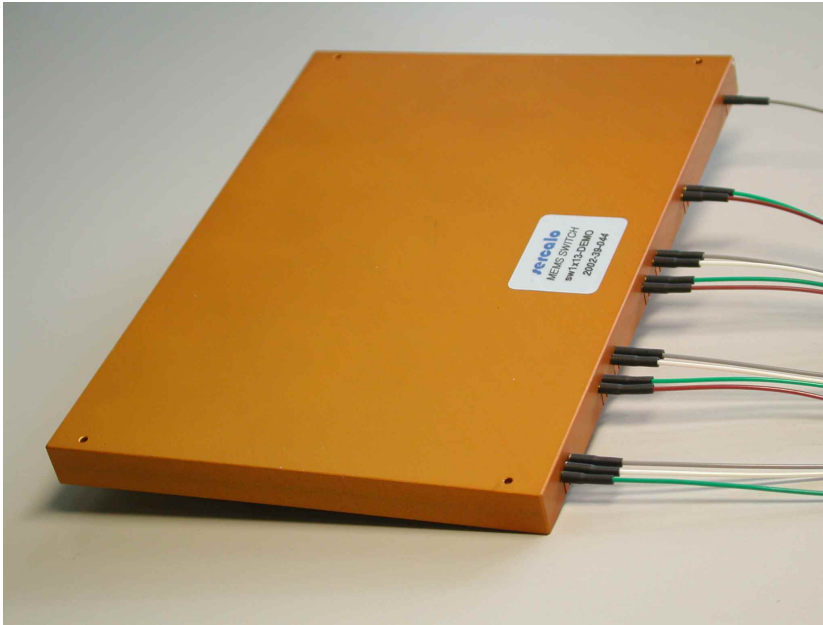
- 1 ms response time

- 60 dB crosstalk

- miniature size

- non-latching

ORDERING INFORMATION

SW1x16-9N

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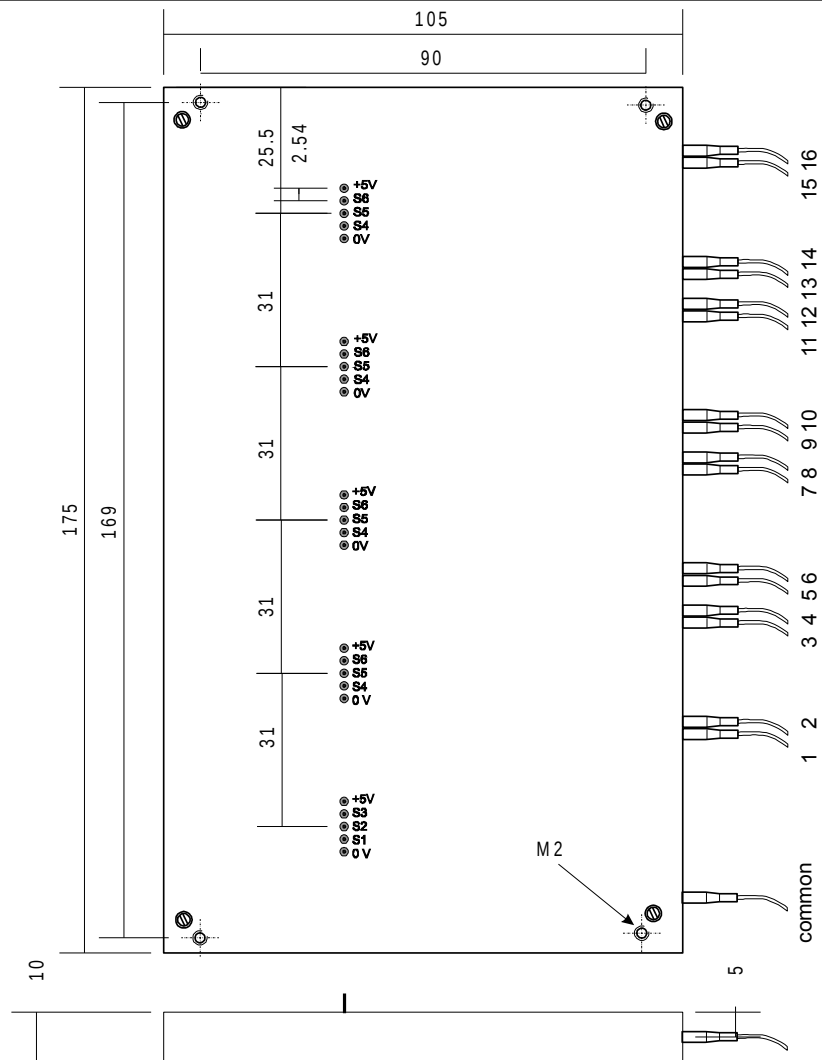
TECHNICAL SPECIFICATIONS

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	1240		1640
Insertion Loss	dB		1.0	1.6
Crosstalk	dB		75	60
Backreflection	dB		55	50
Polarisation Dependent Loss	dB			0.12
Repeatability[1]	dB			0.002
Switching Time	ms		0.5	1
Switching Voltage	V			5
Fiber Pigtail	μm		9/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		190	
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		175 x 105 x 10	

[1] *value for constant temperature and polarisation*

Optical Port Selection

S1	S2	S3	S4	S5	S6	Port
0	5	x	0	0	x	1
0	5	x	5	x	5	2
0	5	x	5	x	0	3
0	5	x	0	5	x	4
5	x	0	0	0	x	5
5	x	0	5	x	5	6
5	x	0	5	x	0	7
5	x	0	0	5	x	8
5	x	5	0	0	x	9
5	x	5	5	x	5	10
5	x	5	5	x	0	11
5	x	5	0	5	x	12
0	0	x	0	0	x	13
0	0	x	5	x	5	14
0	0	x	5	x	0	15
0	0	x	0	5	x	16

0 = 0 V (TTL or CMOS level)
5 = 5 V (TTL or CMOSlevel)
x = 0 V or 5 V

FAST
FIBER OPTIC
1x24 SWITCH

OVERVIEW

The SW fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component makes an optical connection between an optical port and either one of 24 input or output lines. The highly reliable switching mechanism use integrated micromirrors and features below 1 ms switching time and below 2.0 dB insertion loss. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

The switching mechanism offers the reliability of a solid state device; it neither wears out nor degrades over time. Even after billions of cycles the switching quality stays constant. The small package withstands rugged environments and is well suited for direct mounting on printed circuit boards.

APPLICATIONS

- Optical Reconfiguration
- Instrumentation
- Provisioning

FEATURES

- reliable
- 1.5 dB insertion loss
- 1 ms response time
- 60 dB crosstalk
- miniature size
- non-latching

ORDERING INFORMATION

SW1x24-9N (smf 28, single mode fiber)

SW1x24-50N (50 um core, graded index)

SW1x24-62N (62.5 um core, graded index)

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TECHNICAL SPECIFICATIONS *(Single Mode Variant)*

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	1250		1650
Insertion Loss	dB		1.4	2.0
Crosstalk	dB		60	50
Backreflection	dB		55	45
Polarisation Dependent Loss	dB			0.25
Repeatability[1]	dB			0.002
Switching Time	ms		0.5	1
Switching Voltage	V			5
Fiber Pigtail	µm		SMF28 or 50/125/900 62/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		200	
Operation Temperature	℃	0		70
Storage Temperature	℃	-40		85
Size (L x W x H)	mm		206 x 105 x 10	

[1] value for constant temperature and polarisation

ELECTRICAL CONNECTION

Optical port selection table

1	2	3	4	5	Port
0	x	5	0	5	1
0	x	5	5	0	2
0	x	5	5	5	3
0	x	5	0	0	4
5	0	5	0	5	5
5	0	5	5	0	6
5	0	5	5	5	7
5	0	5	0	0	8
5	5	0	0	5	9
5	5	0	5	0	10
5	5	0	5	5	11
5	5	0	0	0	12
5	5	5	0	0	13
5	5	5	5	5	14
5	5	5	5	0	15
5	5	5	0	5	16
5	0	0	0	0	17
5	0	0	5	5	18
5	0	0	5	0	19
5	0	0	0	5	20
0	x	0	0	0	21
0	x	0	5	5	22
0	x	0	5	0	23
0	x	0	0	5	24

0 = 0 V (TTL or CMOS level)
5 = 5 V (TTL or CMOSlevel)
x = 0 V or 5 V

sercalo

MECHANICAL OUTLINE

105

90

11

+5V
5
4
3
2
1
0V

15.0

6.0

2.5

31.0

20

2.5

23 24 · 13

19 20 21 22

15 16 17 18

11 12 13 14

206

200

VIEW FROM PIN SIDE

7 8 9 10

3 4 5 6

Contact Pin:
length: 4 ± 0.5 mm
diameter: 0.59 mm
pitch: 2.54 mm
centering: 0.2 mm
rubber insulation:
ø 1.7 mm

M2

common 1 2

10

5

10

SIDE VIEW

FAST
FIBER OPTIC
1x32 SWITCH

OVERVIEW

The SW fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component makes an optical connection between an optical port and either one of 32 input or output lines. The highly reliable switching mechanism use integrated micromirrors and features below 1 ms switching time and below 2.5 dB insertion loss. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

The switching mechanism offers the reliability of a solid state device; it neither wears out nor degrades over time. Even after billions of cycles the switching quality stays constant. The small package withstands rugged environments and is well suited for direct mounting on printed circuit boards.

FEATURES

- reliable
- 2.5 dB insertion loss
- 1 ms response time
- 60 dB crosstalk
- miniature size
- non-latching

APPLICATIONS

- Optical Reconfiguration
- Instrumentation
- Provisioning

ORDERING INFORMATION

SW1x32-9N (smf 28, single mode fiber)

SW1x32-50N (50 um core, graded index)

SW1x32-62N (62.5 um core, graded index)

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TECHNICAL SPECIFICATIONS *(Single Mode Variant)*

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	1250		1650
Insertion Loss	dB		1.5	2.5
Crosstalk	dB		60	50
Backreflection	dB		55	45
Polarisation Dependent Loss	dB			0.25
Repeatability[1]	dB			0.002
Switching Time	ms		0.5	1
Switching Voltage	V			5
Fiber Pigtail	μm		SMF28 or 50/125/900 62/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		200	
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		206 x 105 x 10	

[1] *value for constant temperature and polarisation*

sercalo

ELECTRICAL CONNECTION

Optical port selection table

1	2	3	4	5	Port
0	0	0	0	5	1
0	0	0	5	0	2
0	0	0	5	5	3
0	0	0	0	0	4
5	0	5	0	5	5
5	0	5	5	0	6
5	0	5	5	5	7
5	0	5	0	0	8
0	5	5	0	5	9
0	5	5	5	0	10
0	5	5	5	5	11
0	5	5	0	0	12
5	5	0	0	5	13
5	5	0	5	0	14
5	5	0	5	5	15
5	5	0	0	0	16
5	5	5	0	0	17
5	5	5	5	5	18
5	5	5	5	0	19
5	5	5	0	5	20
0	5	0	0	0	21
0	5	0	5	5	22
0	5	0	5	0	23
0	5	0	0	5	24
5	0	0	0	0	25
5	0	0	5	5	26
5	0	0	5	0	27
5	0	0	0	5	28
0	0	5	0	0	29
0	0	5	5	5	30
0	0	5	5	0	31
0	0	5	0	5	32

0 = 0 V (TTL or CMOS level)
5 = 5 V (TTL or CMOSlevel)
x = 0 V or 5 V

MECHANICAL OUTLINE

105

90

15.0

6.3

+5V
5 4 3 2 1 0V

268

262

10

2.5

31.0

20

2.5

VIEW FROM PIN SIDE

Contact Pin:
length: 4 ± 0.5 mm
diameter: 0.59 mm
pitch: 2.54 mm
centering: 0.2 mm
rubber insulation:
ø 1.7 mm

M2

31 32

27 28 29 30

23 24 25 26

19 20 21 22

15 16 17 18

11 12 13 14

7 8 9 10

3 4 5 6

common 1 2

5

SIDE VIEW
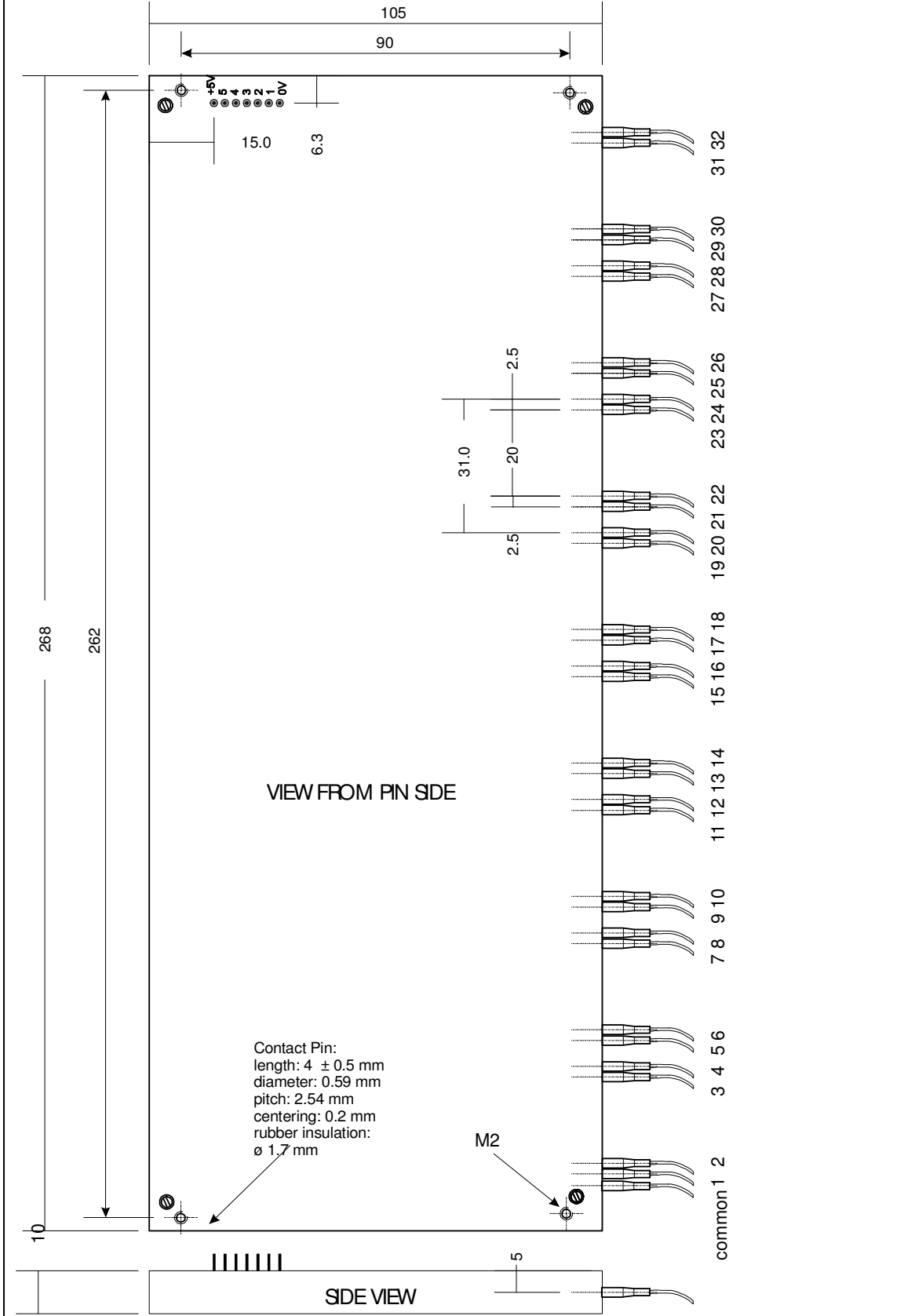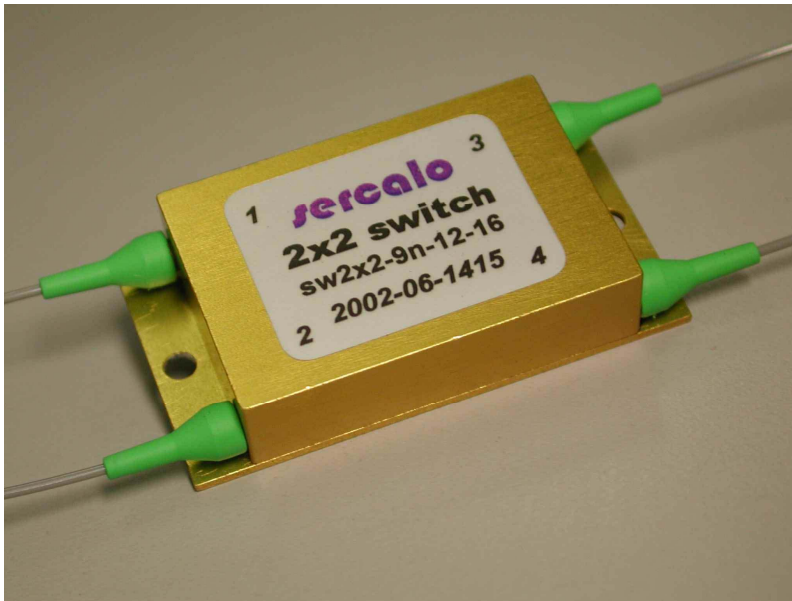
FAST
FIBER OPTIC
2x2 SWITCH

OVERVIEW

The **sercalo** *sw* switches are very fast optomechanical switches based on the MEMS technology. The component is designed for optical cross connect switching in single mode fiber networks. The highly reliable switching mechanism uses an integrated micromirror and features 0.5 ms switching time and only 0.5 dB insertion loss.

The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards. The switch is qualified according to Telcordia GR 1221.

FEATURES

- reliable
- 0.5 dB insertion loss
- 0.5 ms response time
- 60 dB crosstalk
- miniature size
- non-latching

APPLICATIONS

- Optical Reconfiguration
- Protection Switching
- Network Restoration

ORDERING INFORMATION
SW2x2-9N
SW2x1-9N (without port 2)

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DESCRIPTION

The *sercalo* non-latching sw switch modules are fast and reliable switches designed for single mode fiber communication networks. The device is based on the latest silicon technology and uses a micro-mechanical mirror to switch light. Operated by an electro-static actuator, the switch features fast switching below 1 ms and high crosstalk attenuation above 50 dB. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

With 0 V on the drive pin (No 2) the switch is in its bar state. When 5 V are applied to the drive pin, the micromirror is moved out of the optical path, which puts the switch into its cross state. At power off, i.e. when either the supply voltage or the drive signal falls to 0 V, the switch returns into its bar state. The switching mechanism offers the reliability of a solid state device; it neither wears out nor degrades over time. Even after billions of cycles the switching quality stays constant.

TECHNICAL SPECIFICATIONS

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	1240		1640
Insertion Loss	dB		0.5	0.9
Crosstalk	dB		75	50
Backreflection	dB		55	50
Polarisation Dependent Loss	dB		0.04	0.10
Switching Time	ms		0.4	1
Fiber Pigtail	µm		9/125/900	
Durability	cycles		no wear out	
Package				
Supply Voltage	V	4.0	5	5.25
Power Consumption	mW		5	25
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		45 x 24 x 9.5	

PIN CONNECTIONS
1 Supply 5 V
2 Drive Signal 5 V TTL
3 Ground 0 V

view from pin side
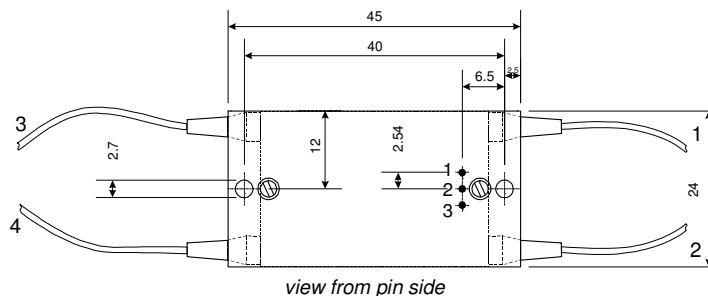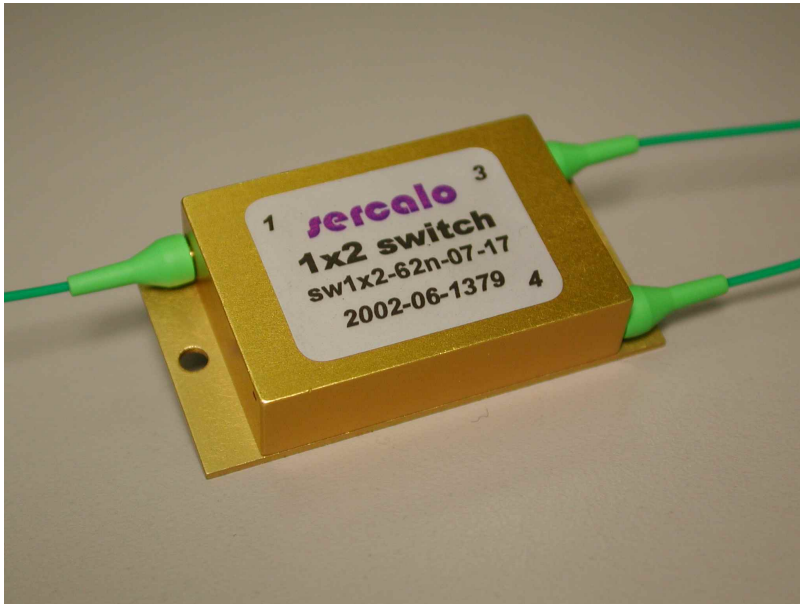
MULTIMODE
FIBER OPTIC
1x2 SWITCH

OVERVIEW

The **sercalo** *sw* switches are very fast optomechanical switches based on the MEMS technology. The component is designed for optical switching in multimode fiber networks and is available in 2x1, 2x2, 1x4 and 1x8 variants. The highly reliable switching mechanism uses an integrated micromirror and features fast switching time below 4 ms and below 0.9 dB insertion loss.

The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards. The switch is qualified according to Telcordia GR 1221.

FEATURES

- reliable
- 0.5 dB insertion loss
- 2 ms response time
- 50 dB crosstalk
- miniature size
- 62.5 or 50 μm GI fiber
- non-latching

APPLICATIONS

- Optical Reconfiguration
- Protection Switching
- Instrumentation

ORDERING INFORMATION
SW2x1-62n   (62 μm core fiber)
SW2x1-50n   (50 μm core fiber)

Contact:
Sercalo microtechnology ltd
Landstrasse 151, 9494 Schaan
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Tel. +423 237 57 97   Fax. +423 237 57 48
www.sercalo.com   e-mail: info@sercalo.com

DESCRIPTION

The **sercalo** non-latching sw switch modules are fast and reliable switches designed for single mode and multimode fiber communication networks. The device is based on the latest silicon technology and uses a micro-mechanical mirror to switch light. Operated by an electrostatic actuator, the switch features fast switching and high crosstalk attenuation above 50 dB. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.
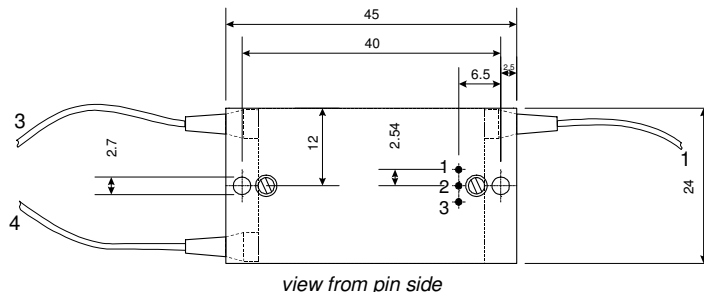
With 0 V on the drive pin (No 2) the switch is in its bar state. When 5 V are applied to the drive pin, the micromirror is moved out of the optical path, which puts the switch into its cross state. At power off, i.e. when either the supply voltage or the drive signal falls to 0 V, the switch returns into its bar state. The switching mechanism offers the reliability of a solid state device; it neither wears out nor degrades over time. Even after billions of cycles the switching quality stays constant.

TECHNICAL SPECIFICATIONS *(Multimode Variant)*

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	700		1700
Insertion Loss	dB		0.4	1.0
Crosstalk	dB		55	45
Backreflection	dB		45	35
Polarisation Dependent Loss	dB		0.04	0.10
Repeatability	dB			0.001
Switching Time	ms		2	20
Fiber Pigtail	μm		62.5/125/900 or 50/125/900	
Durability	cycles		no wear out	
Package				
Supply Voltage	V	4.0	5	5.25
Power Consumption	mW		5	40
Operation Temperature	℃	0		70
Storage Temperature	℃	-40		85
Size (L x W x H)	mm		45 x 24 x 9.5	

PIN CONNECTIONS
1 Supply 5 V
2 Drive Signal 5 V TTL
3 Ground 0 V

view from pin side

ORDERING INFORMATION
SW2x1-62n   (62.5 μm core fiber)
SW2x1-50n   (50 μm core fiber)
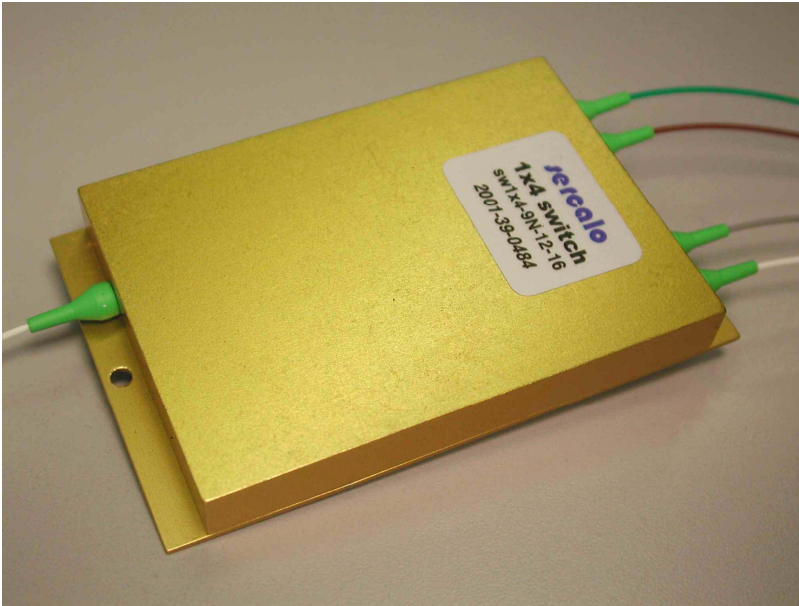
Multimode
FIBER OPTIC
1x4 SWITCH

OVERVIEW

The 1x4 switch is a very fast opto-mechanical switch working over the spectrum from 700 nm to 1700 nm. The component is designed for optical switching in multimode fiber systems and is available in 2x1, 2x2, 1x4 and 1x8 variants. The highly reliable switching mechanism uses integrated micromirrors and features fast switching time below 5 ms and below 1.5 dB insertion loss.

The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards. The switch submodules are qualified according to Telcordia GR 1221.

FEATURES

- Reliable
- 0.7 – 1.7 um range
- 1.0 dB insertion loss
- 4 ms response time
- 50 dB crosstalk
- non-latching

APPLICATIONS

- Test and Measurement
- Sensor Switching
- Wavelength provisioning

ORDERING INFORMATION
SW1x4-50N (50 um core fiber)
SW1x4-62N (62.5 um core fiber)

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DESCRIPTION

The non-latching 1x4 switch modules are fast and reliable switches designed for multimode fiber instrumentation and communication equipment. The device is based on the latest silicon MEMS technology and uses micro-mechanical mirrors to redirect the light. The absence of fatigue and wear-out allows to achieve a constant switching quality even after billions of actuation cycles. The switch features fast switching below 5 ms and high crosstalk attenuation above 45 dB. Repeatability is better than 0.001 dB. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.
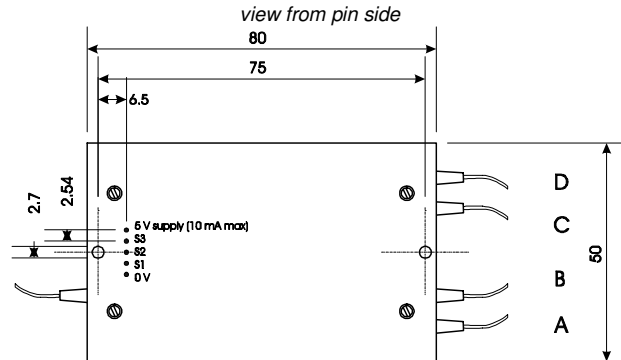
TECHNICAL SPECIFICATIONS	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	700		1700
Insertion Loss	dB		1.0	1.5
Crosstalk	dB		55	45
Backreflection	dB		45	35
Polarisation Dependent Loss	dB			0.15
Repeatability	dB			0.001
Switching Time	ms		2	20
Switching Voltage	V			5
Fiber Pigtail	µm		50/125/900 62.5/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		10	50
Operation Temperature	℃	0		70
Storage Temperature	℃	-40		85
Size (L x W x H)	mm		80 x 50 x 9.5	

ELECTRICAL SPECIFICATIONS
Supply: 4.5 - 5.5 V, 10 mA max
S1 – S3: CMOS or TTL levels, 0 mA

Optical Port Selection

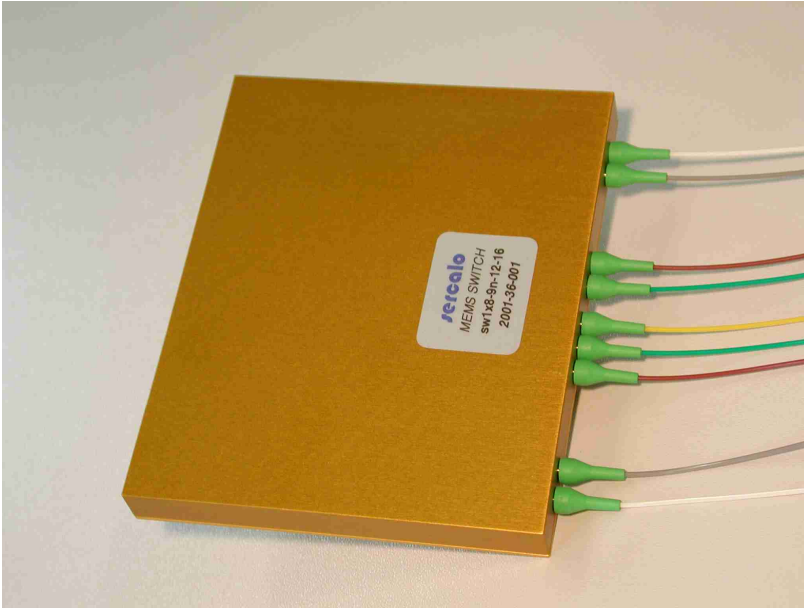| S1	S2	S3	Port
0V	0V	x	A
5V	x	5V	B
5V	x	0V	C
0V	5V	x	D

view from pin side

ORDERING INFORMATION
SW1x4-62N (62.5 um graded index fiber)
SW1x4-50N (50 um graded index fiber)

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Multimode FIBER OPTIC 1x8 SWITCH

OVERVIEW

The SW 1x8 switch is a very fast opto-mechanical switch working over the spectrum from 700 nm to 1700 nm. The component is designed for optical switching in multimode fiber systems and is available in 2x1, 2x2, 1x4 and 1x8 variants. The highly reliable switching mechanism uses integrated micromirrors and features fast switching time below 5 ms and below 2 dB insertion loss.

The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards. The switch submodules are qualified according to Telcordia GR 1221.

FEATURES

- reliable
- 0.7 –1.7 um range
- 5 ms response time
- 2 dB insertion loss
- 50 dB crosstalk
- small size
- non-latching

APPLICATIONS

- Optical Reconfiguration
- Instrumentation
- Test and Measurement
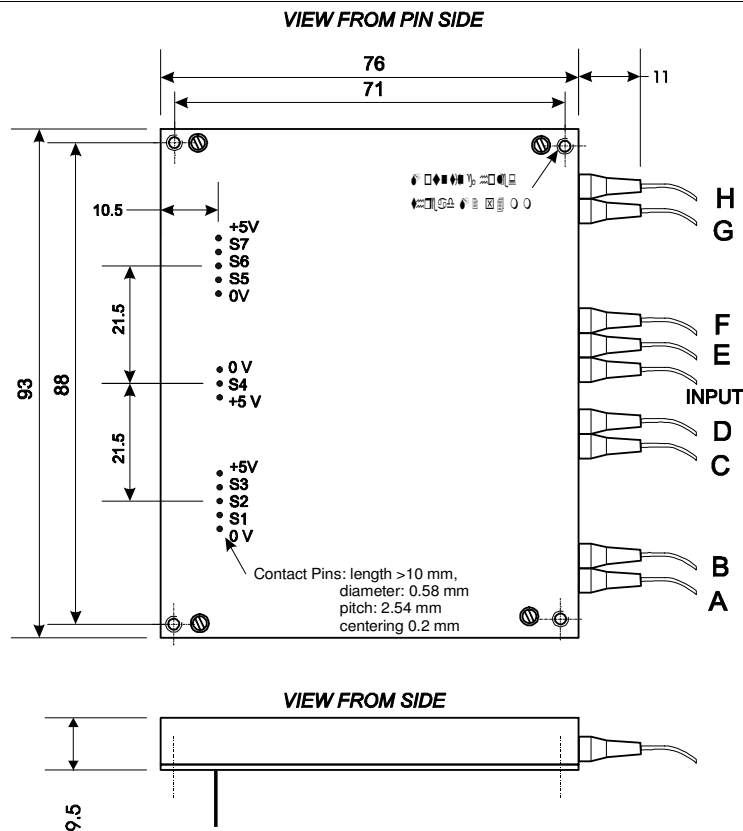
TECHNICAL SPECIFICATIONS *(Multimode Variant)*

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	700		1700
Insertion Loss[1]	dB		0.5	1.6
Crosstalk	dB		55	45
Backreflection	dB		45	35
Polarisation Dependent Loss	dB		0.07	0.20
Switching Time	ms		2	20
Switching Voltage	V			5
Fiber Pigtail	μm		50/125/900 62.5/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		40	
Operation Temperature	℃	0		70
Storage Temperature	℃	-40		85
Size (L x W x H)	mm		76 x 93 x 9.5	

[1] measured at 1310 or 1550 nm. At 850 nm ILmax = 3.0 dB.

Optical Port Selection

S1	S2	S3	S4	S5	S6	S7	Port
0	5	x	5	x	x	x	A
5	x	0	5	x	x	x	B
5	x	5	5	x	x	x	C
0	0	x	5	x	x	x	D
x	x	x	0	0	0	x	E
x	x	x	0	5	x	5	F
x	x	x	0	5	x	0	G
x	x	x	0	0	5	x	H

0 = 0 V (TTL or CMOS level)
5 = 5 V (TTL or CMOS level)
x = 0 V or 5 V

VIEW FROM PIN SIDE

76
71
11
10.5
+5V
S7
S6
S5
0V
21.5
0 V
S4
+5 V
21.5
+5V
S3
S2
S1
0 V
93
88
9.5

Contact Pins: length >10 mm,
diameter: 0.58 mm
pitch: 2.54 mm
centering 0.2 mm

H
G
F
E
INPUT
D
C
B
A

VIEW FROM SIDE

ORDERING INFORMATION

SW1x8-62N (62.5 um graded index fiber)

SW1x8-50N (50 um graded index fiber)
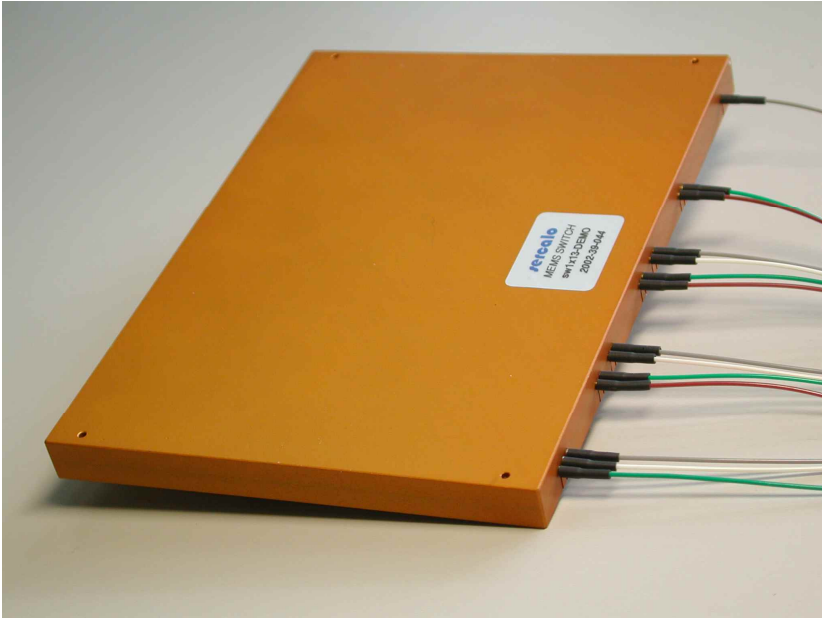
Multimode
**FIBER OPTIC
1x13 SWITCH**

OVERVIEW

The SW fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component makes an optical connection between an optical port and either one of 13 input or output lines. The highly reliable switching mechanism uses integrated micromirrors and features below 10 ms switching time and below 1.4 dB insertion loss. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

The switching mechanism offers the reliability of a solid state device; it neither wears out nor degrades over time. Even after billions of cycles the switching quality stays constant. The small package withstands rugged environments and is well suited for direct mounting on printed circuit boards. The switch is built by cascading 1x2 switches which are qualified according to Telcordia GR1221.

FEATURES

- reliable
- 1.4 dB insertion loss
- 5 ms response time
- 60 dB crosstalk
- miniature size
- non-latching

APPLICATIONS

- Optical Reconfiguration
- Instrumentation
- Provisioning

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TECHNICAL SPECIFICATIONS *(multimode variant)*

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	600		1700
Insertion Loss	dB		1.0	1.4
Crosstalk	dB		55	45
Backreflection	dB		45	35
Polarisation Dependent Loss	dB			0.25
Repeatability[1]	dB			0.002
Switching Time	ms		5	10
Switching Voltage	V			5
Fiber Pigtail	μm		62/125/900 or 50/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		150	
Operation Temperature	℃	0		70
Storage Temperature	℃	-40		85
Size (L x W x H)	mm		144 x 105 x 10	

[1] *value for constant temperature and polarisation*

Optical Port Selection

S1	S2	S3	S4	S5	S6	Port
0	5	x	0	0	x	1
0	5	x	5	x	5	2
0	5	x	5	x	0	3
0	5	x	0	5	x	4
5	x	0	0	0	x	5
5	x	0	5	x	5	6
5	x	0	5	x	0	7
5	x	0	0	5	x	8
5	x	5	0	0	x	9
5	x	5	5	x	5	10
5	x	5	5	x	0	11
5	x	5	0	5	x	12
0	0	x	x	x	x	13

0 = 0 V (TTL or CMOS level)
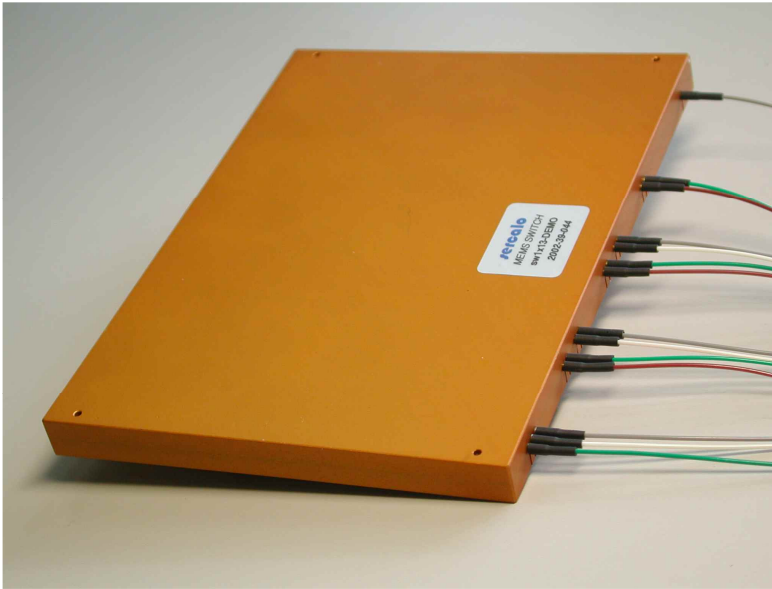5 = 5 V (TTL or CMOSlevel)
x = 0 V or 5 V

ORDERING INFORMATION
SW1x13 - 62n (62.5 um fiber)
SW1x13 - 50n (50 um fiber)
SW1x12 - 62n (without port 13)

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MULTIMODE FIBER OPTIC 1x16 SWITCH

OVERVIEW

The *sw* fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component makes an optical connection between an optical port and either one of 16 input or output lines. The switch is available for single and multimode fibers. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

The switching mechanism offers the reliability of a solid state device. The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards.

The switch is built by cascading 1x2 switches which are qualified according to Telcordia GR1221.

APPLICATIONS

• Optical Reconfiguration

• Instrumentation

• Provisioning

FEATURES

• reliable

• 1.5 dB insertion loss

• 5 ms response time

• 50 dB crosstalk

• miniature size

• non-latching

ORDERING INFORMATION

SW1x16-62N (62.5 um core)

SW1x16-50N (50 um core)

Contact:
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Landstrasse 151, 9494 Schaan
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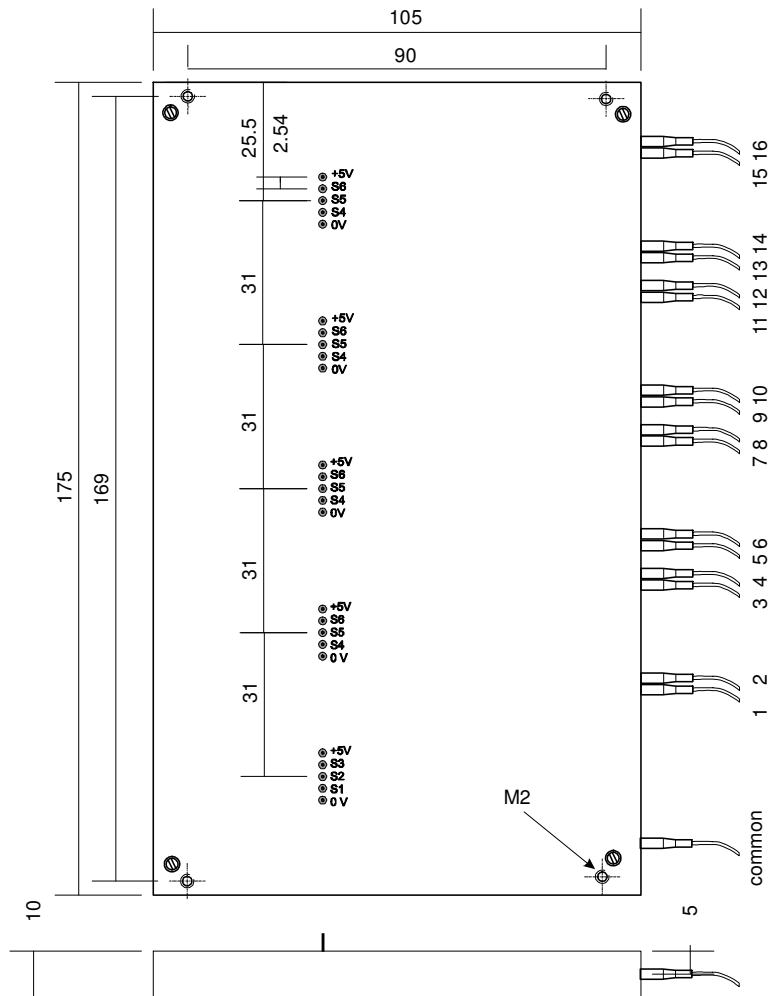www.sercalo.com   e-mail:info@sercalo.com
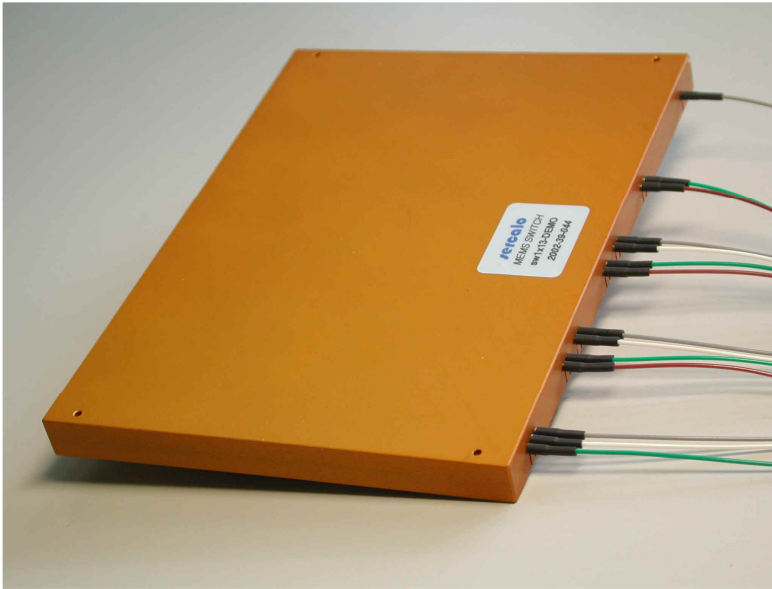
TECHNICAL SPECIFICATIONS *(MULTIMODE VARIANT)*

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	600		1700
Insertion Loss	dB		1.2	1.6
Crosstalk	dB		55	45
Backreflection	dB		45	35
Polarisation Dependent Loss	dB			0.3
Switching Time	ms		2	20
Switching Voltage	V			5
Fiber Pigtail	μm		50/125/900 62.5/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		75	150
Operation Temperature	℃	0		70
Storage Temperature	℃	-40		85
Size (L x W x H)	mm		175 x 105 x 10	

Optical Port Selection

S1	S2	S3	S4	S5	S6	Port
0	5	x	0	0	x	1
0	5	x	5	x	5	2
0	5	x	5	x	0	3
0	5	x	0	5	x	4
5	x	0	0	0	x	5
5	x	0	5	x	5	6
5	x	0	5	x	0	7
5	x	0	0	5	x	8
5	x	5	0	0	x	9
5	x	5	5	x	5	10
5	x	5	5	x	0	11
5	x	5	0	5	x	12
0	0	x	0	0	x	13
0	0	x	5	x	5	14
0	0	x	5	x	0	15
0	0	x	0	5	x	16

0 = 0 V (TTL or CMOS level)
5 = 5 V (TTL or CMOSlevel)
x = 0 V or 5 V

FAST
FIBER OPTIC
1x24 SWITCH

Multimode Variant

OVERVIEW

The **sercalo** fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component makes an optical connection between an optical port and either one of 24 input or output lines. The highly reliable switching mechanism use integrated micromirrors and features below 5 ms switching time and below 2.5 dB insertion loss. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

The switching mechanism offers the reliability of a solid state device; it neither wears out nor degrades over time. Even after billions of cycles the switching quality stays constant. The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards.

The switch is built by cascading 1x2 switches which are qualified according to Telcordia GR1221.

APPLICATIONS

- Optical Reconfiguration
- Instrumentation
- Provisioning

FEATURES

- reliable
- 1.2 dB insertion loss
- 5 ms response time
- 60 dB crosstalk
- miniature size
- non-latching

ORDERING INFORMATION

SW1x24-50N (50 um core, graded index)

SW1x24-62N (62.5 um core, graded index)

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TECHNICAL SPECIFICATIONS *(Multimode Variant)*

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	700		1700
Insertion Loss	dB		1.2	2.0
Crosstalk	dB		60	45
Backreflection	dB		45	35
Polarisation Dependent Loss	dB			0.25
Repeatability[1]	dB			0.002
Switching Time	ms		2	20
Switching Voltage	V			5
Fiber Pigtail	µm		50/125/900 or 62/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		200	
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		206 x 105 x 10	

[1] *value for constant temperature and polarisation*

ELECTRICAL CONNECTION

Optical port selection table

1	2	3	4	5	Port
0	x	5	0	5	1
0	x	5	5	0	2
0	x	5	5	5	3
0	x	5	0	0	4
5	0	5	0	5	5
5	0	5	5	0	6
5	0	5	5	5	7
5	0	5	0	0	8
5	5	0	0	5	9
5	5	0	5	0	10
5	5	0	5	5	11
5	5	0	0	0	12
5	5	5	0	0	13
5	5	5	5	5	14
5	5	5	5	0	15
5	5	5	0	5	16
5	0	0	0	0	17
5	0	0	5	5	18
5	0	0	5	0	19
5	0	0	0	5	20
0	x	0	0	0	21
0	x	0	5	5	22
0	x	0	5	0	23
0	x	0	0	5	24

0 = 0 V (TTL or CMOS level)
5 = 5 V (TTL or CMOSlevel)
x = 0 V or 5 V

sercalo

MECHANICAL OUTLINE

105

90

11

15.0

6.0

+5V
5
4
3
2
1
0V

2.5

31.0

20

2.5

23 24 13

19 20 21 22

15 16 17 18

206

200

VIEW FROM PIN SIDE

11 12 13 14

7 8 9 10

Contact Pin:
length: 4 ± 0.5 mm
diameter: 0.59 mm
pitch: 2.54 mm
centering: 0.2 mm
rubber insulation:
ø 1.7 mm

M2

3 4 5 6

common 1 2

10

5

10

SIDE VIEW

FAST
FIBER OPTIC
1x32 SWITCH

OVERVIEW

The **sercalo** fiber optic switch is a very fast opto-mechanical switch based on the MEMS technology. The component makes an optical connection between an optical port and either one of 32 input or output lines. The highly reliable switching mechanism use integrated micromirrors and features below 20 ms switching time and below 2.0 dB insertion loss. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.

The switching mechanism offers the reliability of a solid state device; it neither wears out nor degrades over time. Even after billions of cycles the switching quality stays constant. The small package withstands rugged environments and is well suited for direct mounting on printed circuit boards.

FEATURES

- reliable
- 2.0 dB insertion loss
- 5 ms response time
- 60 dB crosstalk
- miniature size
- non-latching

APPLICATIONS

- Optical Reconfiguration
- Instrumentation
- Provisioning

ORDERING INFORMATION

SW1x32-9N (smf 28, single mode fiber)

SW1x32-50N (50 um core, graded index)

SW1x32-62N (62.5 um core, graded index)

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TECHNICAL SPECIFICATIONS *(Multi Mode Variant)*

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	700		1700
Insertion Loss	dB		1.5	2.0
Crosstalk	dB		60	50
Backreflection	dB		35	30
Repeatability[1]	dB			0.002
Switching Time	ms		5	20
Switching Voltage	V			5
Fiber Pigtail	μm		SMF28 or 50/125/900 62/125/900	
Durability	cycles		no wear out	
Package				
Power Consumption	mW		200	
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		206 x 105 x 10	

[1] *value for constant temperature and polarisation*

sercalo

ELECTRICAL CONNECTION

Optical port selection table

1	2	3	4	5	Port
0	0	0	0	5	1
0	0	0	5	0	2
0	0	0	5	5	3
0	0	0	0	0	4
5	0	5	0	5	5
5	0	5	5	0	6
5	0	5	5	5	7
5	0	5	0	0	8
0	5	5	0	5	9
0	5	5	5	0	10
0	5	5	5	5	11
0	5	5	0	0	12
5	5	0	0	5	13
5	5	0	5	0	14
5	5	0	5	5	15
5	5	0	0	0	16
5	5	5	0	0	17
5	5	5	5	5	18
5	5	5	5	0	19
5	5	5	0	5	20
0	5	0	0	0	21
0	5	0	5	5	22
0	5	0	5	0	23
0	5	0	0	5	24
5	0	0	0	0	25
5	0	0	5	5	26
5	0	0	5	0	27
5	0	0	0	5	28
0	0	5	0	0	29
0	0	5	5	5	30
0	0	5	5	0	31
0	0	5	0	5	32

0 = 0 V (TTL or CMOS level)
5 = 5 V (TTL or CMOSlevel)
x = 0 V or 5 V

sercalo

MECHANICAL OUTLINE

105

90

+5V
5
4
3
2
1
0V

15.0

6.3

2.5

31.0

20

2.5

268

262

VIEW FROM PIN SIDE

Contact Pin:
length: 4 ± 0.5 mm
diameter: 0.59 mm
pitch: 2.54 mm
centering: 0.2 mm
rubber insulation:
ø 1.7 mm

M2

10

5

SIDE VIEW

31 32

27 28 29 30

23 24 25 26

19 20 21 22

15 16 17 18

11 12 13 14

9 10

7 8

4 5 6

3

common 1 2

MULTIMODE
FIBER OPTIC
2x2 SWITCH

OVERVIEW

The *sw* switches are very fast optomechanical switches based on the MEMS technology. The component is designed for optical switching in multimode fiber networks and is available in 2x1, 2x2, 1x4 and 1x8 variants. The highly reliable switching mechanism uses an integrated micromirror and features fast switching time below 4 ms and below 1.0 dB insertion loss.

The miniature package withstands rugged environments and is well suited for direct mounting on printed circuit boards. The switch is qualified according to Telcordia GR 1221.

FEATURES

- reliable
- 1.0 dB insertion loss
- 2 ms response time
- 50 dB crosstalk
- miniature size
- 62.5 and 50 µm fiber
- non-latching

APPLICATIONS

- Optical Reconfiguration
- Protection Switching
- Instrumentation

ORDERING INFORMATION
SW2x2-62n (62.5 um core fiber)
SW2x2-50n (50 um core fiber)
SW2x1-62n (without port 2)

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DESCRIPTION

The non-latching sw switch modules are fast and reliable switches designed for single mode and multimode fiber communication networks. The device is based on the latest silicon technology and uses a micro-mechanical mirror to switch light. Operated by an electrostatic actuator, the switch features fast switching and high crosstalk attenuation above 50 dB. The switch is powered by a 5 V supply voltage. A 5 V TTL or CMOS drive signal is used to control the switching state.
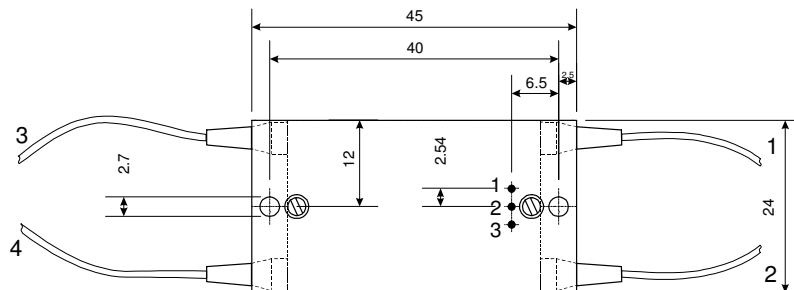
With 0 V on the drive pin (No 2) the switch is in its bar state. When 5 V are applied to the drive pin, the micromirror is moved out of the optical path, which puts the switch into its cross state. At power off, i.e. when either the supply voltage or the drive signal falls to 0 V, the switch returns into its bar state. The switching mechanism offers the reliability of a solid state device; it neither wears out nor degrades over time. Even after billions of cycles the switching quality stays constant.

TECHNICAL SPECIFICATIONS *(Multimode Variant)*

	Unit	Min	Typ	Max
Switch				
Wavelength Range	nm	600		1700
Insertion Loss	dB		0.5	1.0
Crosstalk	dB		55	45
Backreflection	dB		45	35
Polarisation Dependent Loss	dB		0.04	0.10
Repeatabiliy	dB			0.001
Switching Time	ms		2	20
Fiber Pigtail	μm		62.5/125/900 or 50/125/900	
Durability	cycles		no wear out	
Package				
Supply Voltage	V	4.0	5	5.25
Power Consumption	mW		5	40
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		45 x 24 x 9.5	

PIN CONNECTIONS
1. Supply 5 V
2. Drive Signal 5 V TTL
3. Ground 0 V

ORDERING INFORMATION
SW2x2-62n (62.5 um core fiber)
SW2x2-50n (50 um core fiber)