

MEMS-SWITCH-Cubes

> 1x1, 1x2, 2x2, 1x4, for special fibers (SF Series)

Overview

The SF-series are opto-mechanical switches for the most demanding applications in fiber optic sensor systems and instrumentation. The switch is available in 1x1, 1x2, 2x2 and 1x4 variants and offers solid state reliability, accurate precision and fast response time. The switch mechanism is available in either latching or non latching variants and has a very fast response time below 1 ms and below 1.5 dB insertion loss. The single mode switch is available for a number of specialty fibers covering design wavelengths such as 488 nm, 515 nm, 633 nm, 680 nm, 780 nm, 830 nm, 980 nm and 1064 nm.

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
- specialty fibers
- 1.5 dB insertion loss
- 1 ms response time
- low PDL
- 60 dB crosstalk
- miniature size
- 2x2, 2x1, 1x1 variants

Applications

- Instrumentation
- Source selection

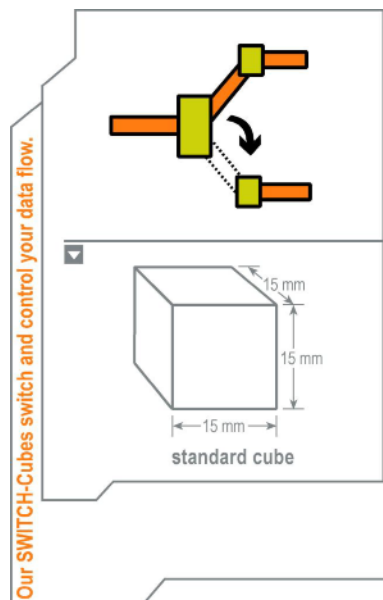
Description

The Mems-Switches are composed of an optical subsystem and an electrical driver interface. The optical switching function is realized by a silicon MEMS chip, on which a mirror can be moved in and out of the optical path by electrostatic actuation. In the latching SF-L variants a bistable suspension mechanism keeps the last selected state in power off. In the non-latching SF-N variants the switch returns into the bar state when electrical power is removed.

To operate the switch 5V and 0V are applied on the supply pins, which are used by the internal DC-DC converter to supply a high voltage for the actuator control. CMOS or TTL logic levels on the control pins switch the high voltage on the electrostatic actuator.

To set the switch state in the latching variant, pin 2 respectively pin 3 are set to logic high (5V) for 10 ms and the corresponding switch state is selected. At rest pins 3 and 4 should be pulled to 0 V and must not be floating.

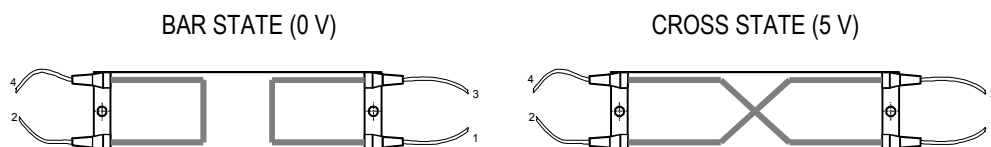
V 10.0
1/4



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In the non-latching variant only pin 2 is used to set the state of the switch. To set the cross state pin 3 must be at logic high. When pin 3 goes to logic low, or at power off, the switch returns into the bar state. Technology by Sercalo™.



Technical Specifications

	Unit	Min	Typ	Max
Optical Switch				
Wavelength Range	nm	Cut off	~ Cut off +200 nm	
Insertion Loss ₁	dB		0,7	1,5
Crosstalk	dB		75	60
Backreflection	dB		55	50
Polarisation Dependent Loss	dB		0,02	0,05
Repeatability ₂	dB			0,001
Switching Time	ms		0,5	1
Durability	cycles		3 billion	
Package				
Voltage	V	4	5	5,25
Power Consumption	mW	0	5	10
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H)	mm		40 x 16,5 x 9,5	

₁ excluding connectors loss.

₂ value for constant temperature and polarisation

PIN Connections

- 1 5 V supply, (2 mA)
- 2 selector 0 V: Bar
5 V: Cross
- 3 ground 0 V

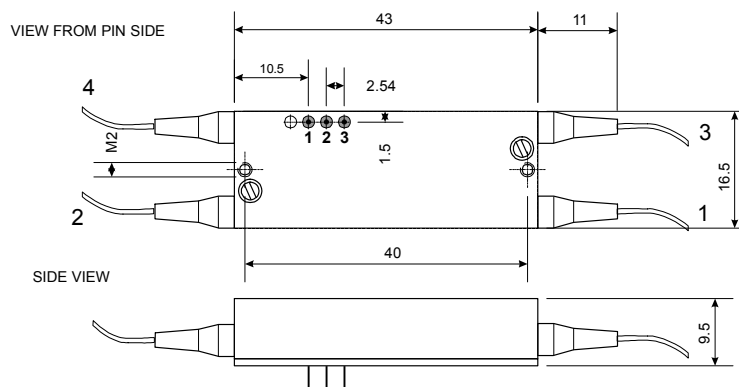


Figure 1: Pin layout SF-N2x2: non-latching

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- 1 5 V supply
- 2 bar select
- 3 cross select
- 4 ground 0 V
- 5 sensor output
- 6 sensor output

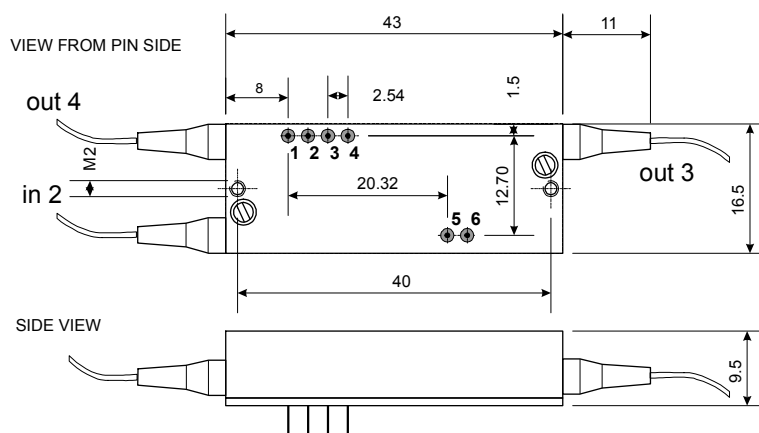


Figure 2: Pin layout MO1x2: latching with position monitor. Without monitor, pins 5,6 are omitted.

Optical port selection:

1: 2ms pulse, 5V CMOS / TTL

0: 0V

x: 0V or 5V

S1	S2	S3	S4	S5	S6	Port
1	x	1	0	x	0	B
0	0	x	x	1	1	A
0	1	x	x	0	1	D
1	x	0	1	x	0	C

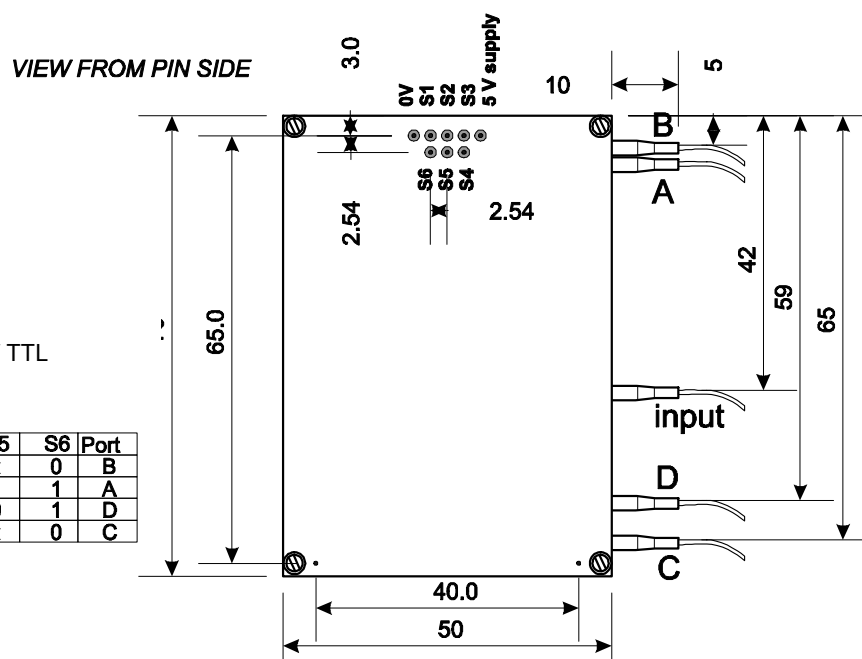


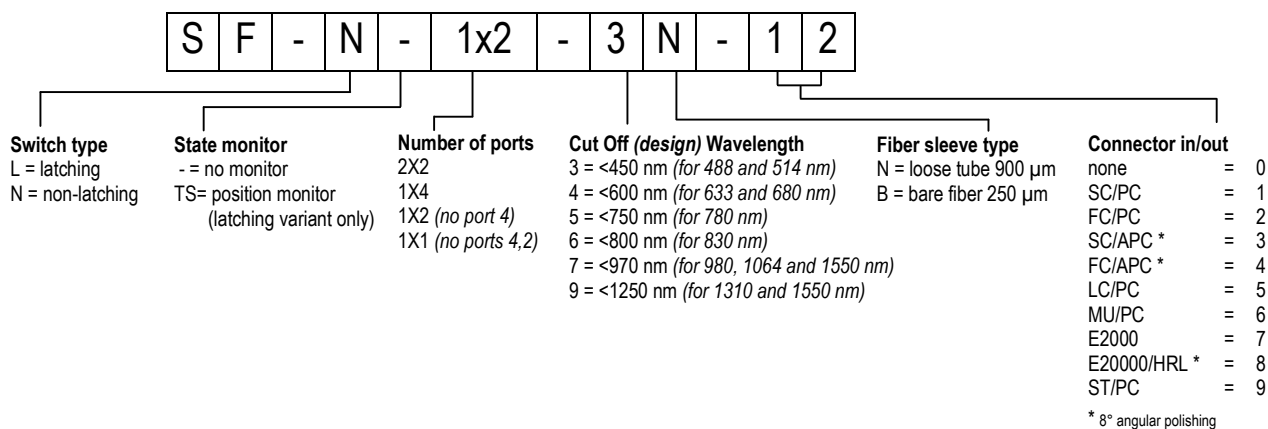
Figure 3: Pin layout SF1x4: latching. In the non-latching variant pins S4, S5, S6 are omitted.

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Ordering Information



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