MINIATURE FIBER OPTIC MEMS SWITCH

extended temperature range

OVERVIEW

The *sx* series are miniature opto-mechanical switches for fiber optic communication systems and submodules. The switch is available in latching variants, with 1x1, 2x1, 2x2. The switch offers smallest size, ease of integration and the established reliability of Sercalo's MEMS components.In the sx switches the optical switching function is realised by a silicon MEMS chip, on which a mirror can be moved in and out of the optical path by electrostatic actuation.

The miniature SX switch is available as latching variant where a bistable suspension mechanism keeps the last selected state in power off.

The package is one of the smallest in the industry. It is optimized for low cost production while maintaining high reliability. The component meets Telcordia 1221 quality standards.

FEATURES

- 23 x 10 x 6 mm size
- TTL or CMOS logic
- latching
- 2x2, 2x1, 1x1 variants
- single or multimode fiber

APPLICATIONS

- Protection Switching
- Reconfiguration
- Optical Subsystems
- Array integration

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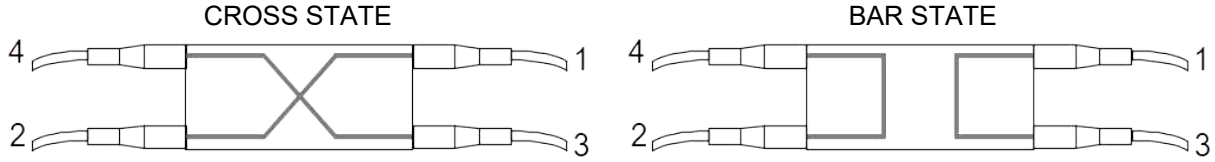
DESCRIPTION

To operate the switch 5V and 0V are applied on pins 1 and 2, which are used by the internal DC-DC converter to supply a high voltage for the actuator control. CMOS or TTL logic levels on pins 3-4 control the electrostatic actuator. To set the switch state pin 3 respectively pin 4 are set to logic high (5V) for 60 ms (to assure switching at – 40°C) and the corresponding switch state is selected. At rest pins 3 and 4 should be pulled to 0 V and must not be floating.

When operating the switch below outside the regular temperature range, i.e. below -5°C. Both the switching time and the insertion loss gradually increase above the specified limit. At -40°C the switching time can



TECHNICAL SPECIFICATIONS *(for single mode fibres[1])*

	Unit	Min	Typ	Max
Switch				
Wavelength Range[1]	nm	1240		1640
Insertion Loss[2,4]	dB		0.4	1.0
Crosstalk[1]	dB		75	60
Return Loss[1]	dB		55	50
Polarisation Dependent Loss	dB		0.03	0.07
Repeatability[3]	dB			0.002
Switching Time[1,4]	ms		1	10
Durability	cycles		10^9	
Integrated Driver				
Supply Voltage *Vcc (pin 1)*	V	3.2	3.3 or 5	5.25
Current Consumption *Icc (pin 1)*	mA		1	45
Logic Level Low *(pins 3, 4)*	V			0.3
Logic Level High *(pins 3, 4)*	V	3.0		
Selection Pulse Width	ms	10	20	
Package				
Operation Temperature	°C	-15		85
Operation Temperature (degraded performance)	°C	-40		85
Storage Temperature	°C	-40		85
Size (L x W x H) – for single	mm		23.2 x 10.1 x 6.0	

[1] ***for multimode****: range: 600 – 1700 nm; IL @ 1300 nm: <1.0 dB max; CT max: >40 dB; RL max: 35 dB; resp. time: <20ms.*

[2]value @ 25 °C, without connectors. [3]for constant temperature and polarisation. [4]Degraded performance when temperature is below -5°C: switching time increases up to 50 ms and Insertion loss up to 2 dB. This degradation is reversible.

ORDERING INFORMATION

SXLAetr	-	1x2	-	9	B	-	*10*	-	*LCPC*

Switch type	**Variants**	**Fibre type**	**Sleeve type**	**pigtail length**	**Port No & Connector type**
SXLAetr= latching optimized for extended temperature range	2x2	9 = SMF28Ultra		10 = 100 cm	- = no connectors
	1x2 *(no port 4)*	50= MM 50	B = bare fiber	03 = 30 cm	LCPC
	1x1 *(no ports 4,2)*	62= MM 62			

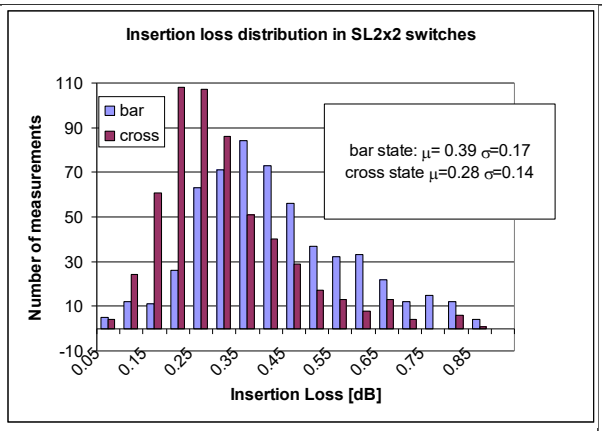


Figure 1: Insertion loss distribution

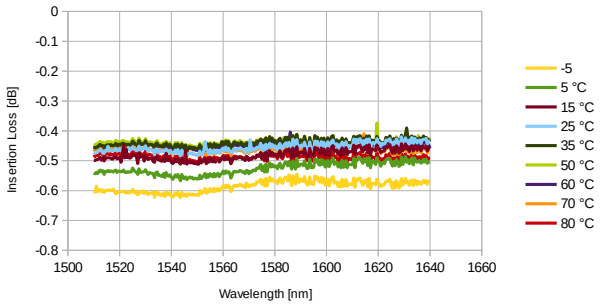
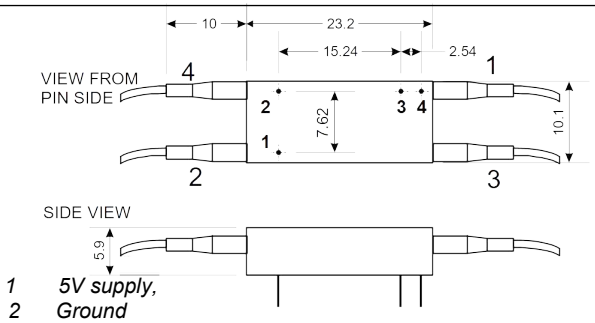
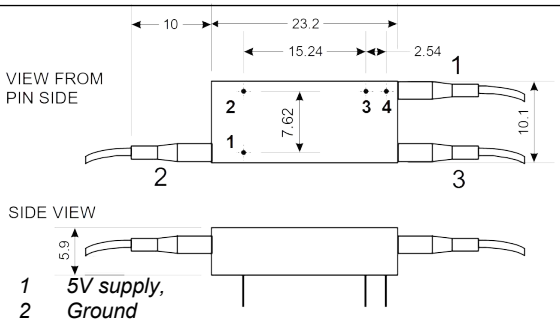


Figure 2: spectral response over temperature



1 5V supply,
2 Ground
3 CR select, 5 V, 10 ms pulse sets cross state
4 BR select, 5 V, 10 ms pulse sets bar state

Figure 3: Pin layout SXLA2x2 latching



1 5V supply,
2 Ground
3 CR select, 5 V, 10 ms pulse sets cross state
4 BR select, 5 V, 10 ms pulse sets bar state

Figure 4: Pin layout SXLA2x1 latching

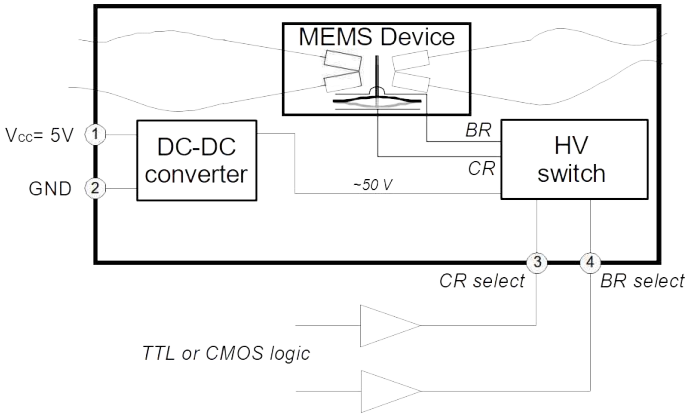


Figure 5: Electrical Schematic Diagram

Ordering Information:

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