

## **MINIATURE FIBER OPTIC MEMS SWITCH**

### **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.

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. It is compliant to RoHS requirements 2015/863/E.

### **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

#### **Contact**

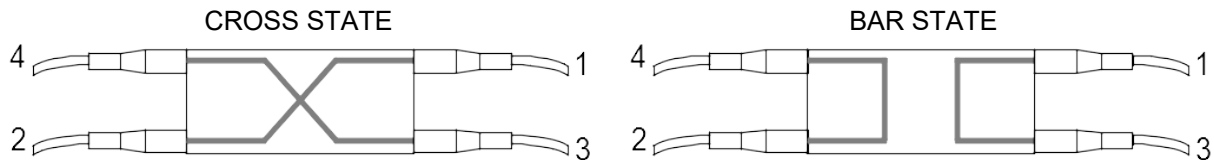
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## DESCRIPTION

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 non-latching type (i.e. SXNA) is not recommended for new designs.

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 20 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.



## TECHNICAL SPECIFICATIONS (for single mode fibres<sup>1</sup>)

	Unit	Min	Typ	Max
<b>Switch</b>				
Wavelength Range <sup>1</sup>	nm	1240		1640
Insertion Loss <sup>2</sup>	dB		0.4	1.0
Crosstalk <sup>1</sup>	dB		75	60
Return Loss <sup>1</sup>	dB		55	40
Polarisation Dependent Loss	dB		0.03	0.07
Repeatability <sup>3</sup>	dB			0.002
Switching Time <sup>1</sup>	ms		2	10
Durability	cycles		10 <sup>9</sup>	
<b>Integrated Driver</b>				
Supply Voltage <i>V<sub>cc</sub></i> (pin 1)	V	3.2	3.3 or 5	5.25
Current Consumption <i>I<sub>cc</sub></i> (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	
<b>Package</b>				
Operation Temperature	°C	0		70
Storage Temperature	°C	-40		85
Size (L x W x H) – for single	mm		23.2 x 10.1 x 6.0	

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

<sup>2</sup>value @ 25 °C, without connectors. <sup>3</sup>for constant temperature and polarisation.

## ORDERING INFORMATION

Switch type	Variants	Fibre type	Sleeve type	pigtail length	Port No & Connector type
SXLA = latching SXNA = non-latching	2x2 1x2 (no port 4) 1x1 (no ports 4,2)	9 = SMF28 X = bend insensitive fiber B = bare fiber 50= MM 50 62= MM 62 OM4 = MM50-om4	N = Loose Tube (0.9 mm) B = bare fiber	10 = 100 cm 03 = 30 cm	NC= no connector FP= FC-PC FA=FC-APC (narrow key) LP=LC-PC LA=LC-APC

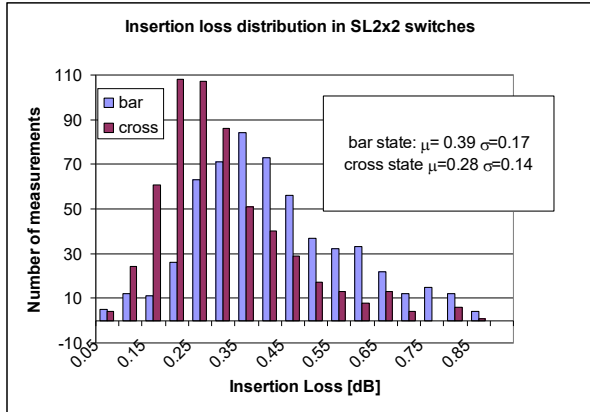


Figure 1: Insertion loss distribution

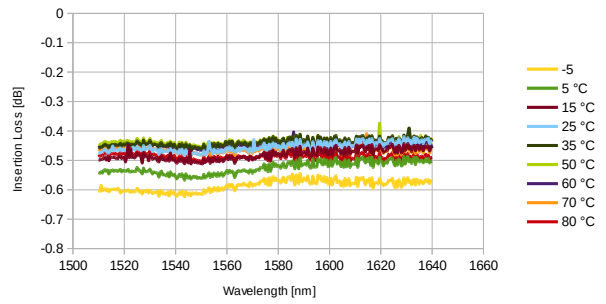
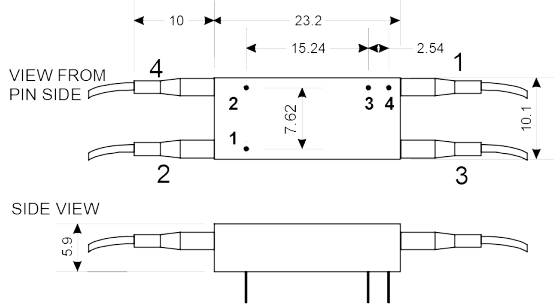
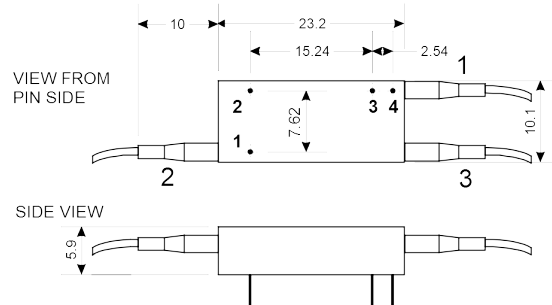


Figure 2: spectral response over temperature



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 SXL2x2 latching



5. 5V supply,
6. Ground
7. CR select, 5 V, 10 ms pulse sets cross state
8. BR select, 5 V, 10 ms pulse sets bar state

Figure 4: Pin layout SXL2x1 latching

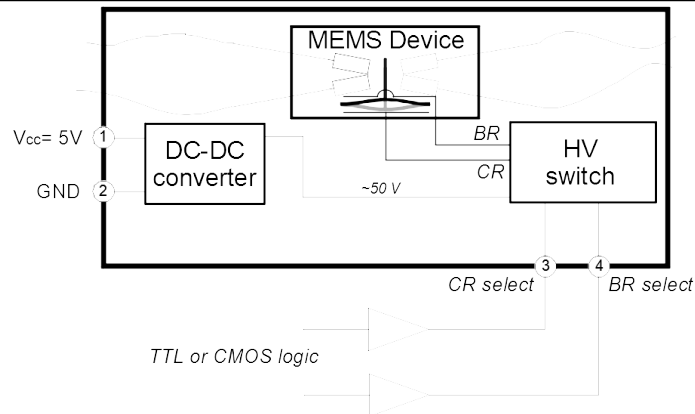


Figure 5: Electrical Schematic Diagram