

Centre-Off Switch

A precision, moving fiber, optical switch, the Center-Off C012 utilizes direct fiber-to-fiber coupling over an angled gap to achieve ultra low losses and wavelength independence. It is suitable for all bi-directional switching applications where lasers must remain powered and a safety shutter must be provided between the laser and user interface. Compact and comprehensive, the Center-Off 1X2 switch provides excellent value per dollar by combining a 1X2 and shutter in one package.

Note: This switch is equipped with internal “dump” fibers that dissipate idling laser energy. External dump fibers and some level of customization may be required for power levels of +30dBm or higher (consult factory for details).

FEATURES

- Combines 1X2 & 1X1 On/Off Shutter in One Package
- Compact Format (with cables on one side)
- High-Power Fiber-to-Fiber Coupling
- Multimode or Singlemode
- Wavelength Independent from Visible to NIR
- PCB Mountable
- Returns to “Off” state when not powered
- High Reliability



LOW LOSS

This switch achieves high transmission by physically moving fibers to align with other fibers. For multimode, losses are typically less 1.0dB @ 532nm (with air-gap).

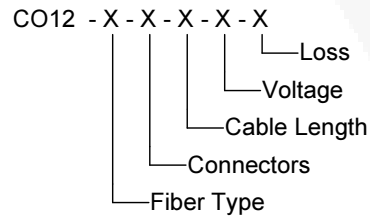
WAVELENGTH INDEPENDENCE

Wavelength independence is another benefit of the moving fiber design. Because there are no mirrors, lenses, AR coatings, or epoxy, the same switch can be used for multiple wavelengths.

BIPOLAR DRIVER

The C012 requires a bipolar drive to switch between State 1 and State 2. When power is removed the switch returns to an “Off-State” where all fiber paths are routed to internal “dump fibers” within the package.

ORDERING INFORMATION



Fiber Type

- M4** Multimode 50/125 SI, NA=0.22 (400nm – 1550nm)
- M5** Multimode 105/125 SI, NA=0.22 (400nm – 1550nm)

Other Fibers Available (subject to additional qualification):

- M1** Multimode 62.5/125 Graded Index, (≥850nm typical use)
- M2** Multimode 50/125 GI (≥850nm typical use)
- S1** Singlemode 9/125, Corning SMF-28 or equivalent

Connectors

- NC** none (Standard)
Also known as pigtailling
- FC** FC/PC
- SC** SC/PC
- ST** ST/PC
- LC** LC/PC
- STU** ST/UPC
Ultra polish
- DLC** Duplex LC/PC

Cable Length

- 1** 1.0 Meter (Standard)
- 2** 0.5 Meter
- 3** 2.0 Meters

Voltage:

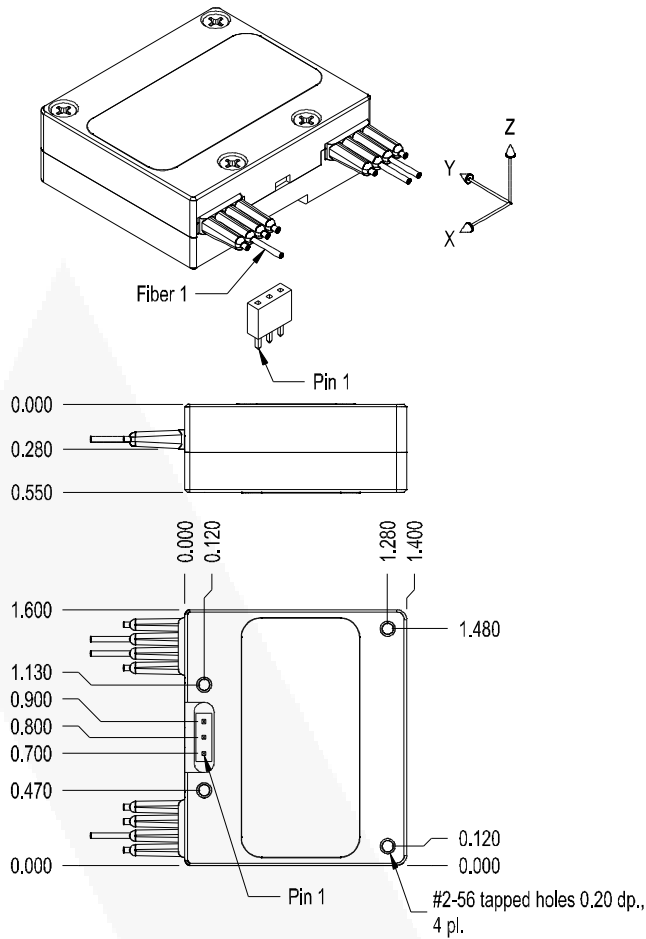
- 5H** 5V, 50ohm (Standard)
Requires a minimum of 4.2V. Low voltages will result in reduced switch speed.

Loss

- N** Normal
Utilizes an air gap for maximum power handling
- L** Low
Utilizes a discrete amount of matching fluid in the fiber gap for lowest loss at modest power levels.



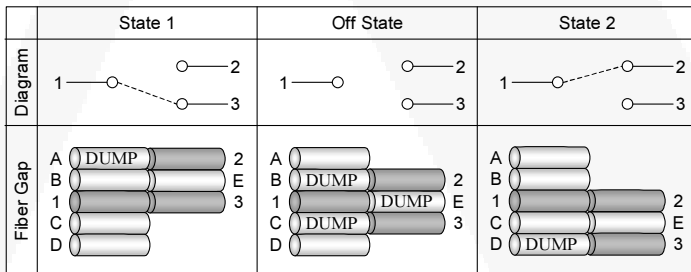
DRAWINGS



ELECTRICAL CONNECTIVITY

Pin	State 1	Off State	State 2
1	V+	Gnd	V=0
2	N/C	N/C	N/C
3	V=0	Gnd	V+

FIBER CONNECTIVITY



*Fibers A-E denote "dump fibers" that dissipate waste laser energy within the package.

SWITCH SPECIFICATION SUMMARY

Optical Characteristics		Multimode Step Index 50/125 or 105/125 μm		Units	Notes
		Low Loss	Normal Loss		
Insertion Loss 1310 nm	Typical	0.1	0.5	dB	1
	Maximum	0.2	0.7		
Insertion Loss 850 nm	Typical	0.2	0.6	dB	1
	Maximum	0.3	0.9		
Insertion Loss 532 nm	Typical	0.3	0.8	dB	1
	Maximum	0.5	1.0		
Back Reflection	Typical	55	40	dB	2
	Minimum	45	30		
Cross-talk	Max	-55		dB	3
Isolation	Min			dB	4
	Typical	5			
Switching Time	Max at 25 $^{\circ}\text{C}$	7		ms	5
	Max 0 to 70 $^{\circ}\text{C}$	10			

Stability		Multimode Step Index 50/125 or 105/125 μm		Units	Notes
		Low Loss	Normal Loss		
Lifetime Drift	Max @ 10 ⁶ cycles	+/-0.2		dB	
	Max @ 10 ⁸ cycles	+/-0.2			
Repeatability	Maximum	0.01		dB	
Optical Power	Maximum	+20	+27	dBm	7
Temperature Range	Operational	0 to 70 $^{\circ}\text{C}$		$^{\circ}\text{C}$	
	Storage	-30 to 70 $^{\circ}\text{C}$			
Relative Humidity	Non-condensing	90		%	
Vibration	Maximum (power on)	20		G's	8
Shock	Maximum (non-operational)	50		G's	9

Fiber & Cable		Units	Notes
Fiber Types	Multimode Step Index 50/125 or 105/125 μm	μm	
Cable Type (Tight Buffer)	900	μm	10
Connector Types Available	Pigtail (standard), FC, SC, ST, LC		
Lead Lengths	1 (standard), 0.5, 2	meter	

Electrical	5V (standard)	Units	Notes
Electrical Drive Requirement	Bi-Polar with Off-State		
Design voltage	5	volts	
Typical current	100	mA	
Switch Voltage	4.2 - 6.0	volts	
Coil Resistance	50 \pm 10%	ohm	
Electrical Interface	3 pin header 0.1 spacing		11

Packaging	Value	Units	Notes
Width	1.6	Inches	
Depth	1.4	Inches	
Height	0.55	Inches	
Weight (Excluding connectors)	1.6	Ounces	

Table 1: Switch Specification Summary

Specifications are subject to change without notification

NOTES:

1. Insertion loss is measured without connectors
2. Back Reflection measured with standard 8" off-axis fiber gap (16" also available)
3. Cross-talk is specified for any two fibers not in optical alignment, State 1 or State 2
4. Isolation is specified as IL in optical paths 1-2, 1-3 or 2-1 & 3-1 in "Off State"
5. The switch has a typical electrical to optical transition time of about 3 ms with a settling time of about 2 ms at the design drive voltage.
6. At the extremes of temperature, the settling time can increase by up to 3 ms.
7. Optical power levels are specified with steady state optical power (hot switching).
8. Optical continuity maintained in State 1 or State 2 as powered. **NOTE:** Switch can pulse temporarily to State 1 or State 2 when in the Off-State if acceleration in "X direction" exceeds 5 G's.
9. Half-sine impulse, any axis
10. Black PVC buffer is standard for 50/125um GI.
11. The switch has three 0.025" square pins on 0.100" centers recessed into the body designed for use with a low profile socket (SAMTEC #SSA-103-S-G or equivalent). One socket is supplied with each switch.

