

Fiber-Fiber™ LIDAR Optical Switch 1x4 PM



(Protected by pending patents)

DATASHEET

BUY NOW



The FF Series fiber optic switch connects optical channels by a MEMS fiber to fiber direct coupling platform and activated via an electrical relay. The advanced design offers unprecedented low optical loss, little wavelength dependence with no coatings, high power handling, high reliability/longevity, high polarization extinction ratio, as well as unmatched low cost. Since, there is no optical coated interfaces, no reflections and nor etalon effects from these switches. Latching operation preserves the selected optical path after the driver signal has been removed. The switch has integrated electrical position sensors. The switch is bidirectional and conveniently controllable by 5V TTL.

Using no lens, the FF Series switch can accommodate all type of fibers, including SM. MM, PM, double cladding, bendable, large core, small core.

Features

- Low Loss
- High Isolation
- High Power
- High Return Loss
- No Etalon Effects
- Low Cost

Applications

- LIDAR
- Reflective Sensor

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength		1550		nm
Insertion Loss ^[1]		0.8	1.3	dB
Wavelength Dependent Loss		0.01	0.01	dB
Return Loss ^[2]		70		dB
Polarization Extinction Ratio ^[2]	18	24	33	dB
Cross Talk	60	65	70	dB
Switching Time		5	7	ms
Repetition		5	10	Hz
Repeatability			± 0.1	dB
Durability	10 ⁸			cycles
Operating Optical Power (CW)			0.5 ^[3]	W
Operating Voltage	4	4.5	5	VDC
Actuation Current (Latching/Non-Latching)		30	60	mA
Switching Type	Latching / Non-Latching			
Operating Temperature	-40		80	°C
Storage Temperature	-50		90	°C

Notes:

- [1]. Excluding Connectors
- [2]. Measured with nothing connected to output FC/APC connectors
- [3]. Higher power is feasible with special order

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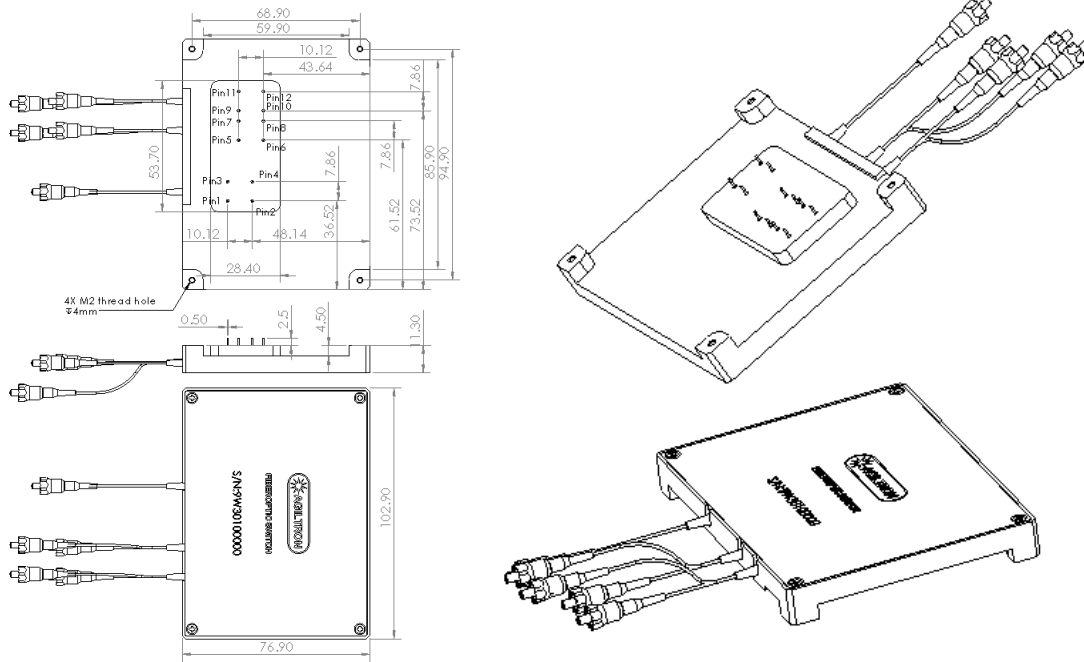
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Mechanical Dimensions (mm)



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

Electrical Connector Configurations

The load is a resistive coil which is activated by applying 5V (draw ~ 40mA). Agiltron offers a computer control kit with TTL and USB interfaces and Windows™ GUI. We also offer RS232 interface as an option – please contact Agiltron sales.

Application Note: Applying a constant driving voltage increases stability. The switches can also be driven by a pulse mode using Agiltron recommended circuit for energy saving.

Optical Path	Electric Drive	
	Pin 2	Pin 3
Port 1 → Port 2	5V	0
Port 1 → Port 3	0	5V

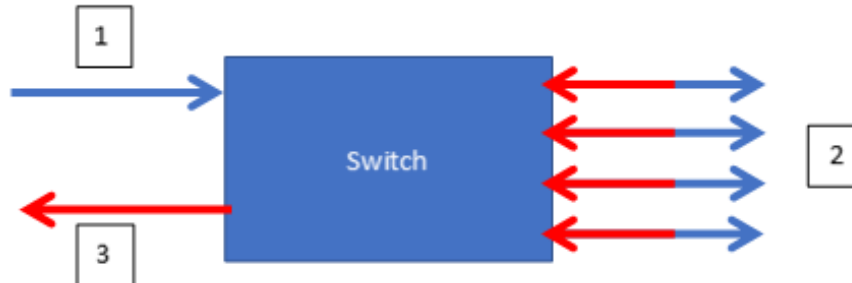
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Optical Functional



Ordering Information

Prefix	Configuration	Switch	Tested Wavelength ^[1]	Optical Power	Fiber Type	Fiber Cover	Fiber Length	Connector
FFLW-	2x4 = 24 2x5 = 25 2x6 = 26 2x8 = 28 2x12 = 22	Latching = 2 Non-latch = 3	488 = 4 532 = 5 630 = 6 780 = 7 850 = 8 980 = 9 1060 = 1 1310 = 3 1550 = C 2000 = 2 Special = 0	0.5W = 1 Higher power = 0	SM28 = 1 PM 1550 = 2 PM 1310 = 3 PM 780 = 7 PM 350 = 6 PM 400 = 4 PM 980 = 9	Bare fiber = 1 0.9mm tube = 3 Special = 0	0.25m = 1 0.5m = 2 1.0m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 Duplex LC/PC = 8 MTP = 9 LC/UPC = U Special=0

[1]. The device is ultra-broadband limited by the fiber transmission. However, we only test at one selected wavelength to save cost. If customer needs to test at several wavelengths, the selection is special =0 with added cost.

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

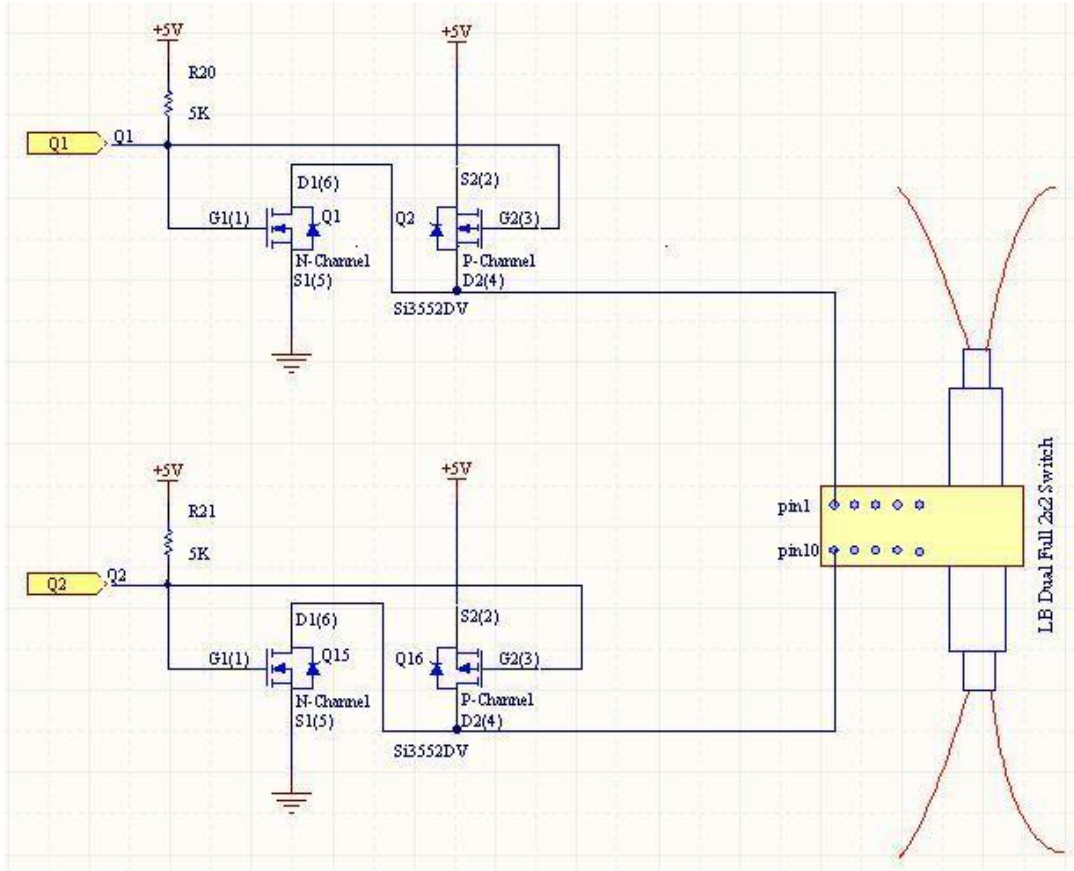
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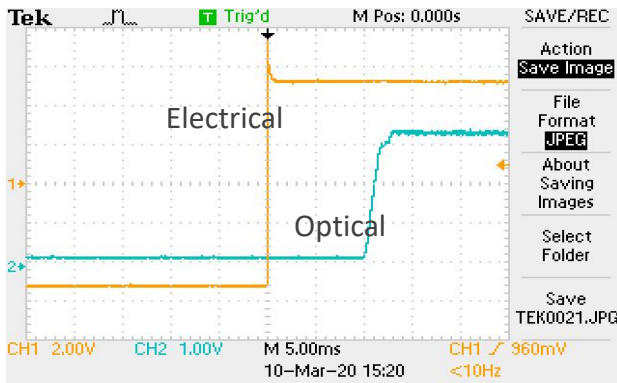
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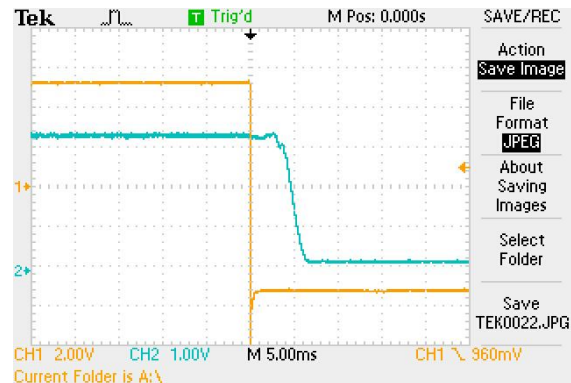
Driver Reference Design



Response Speed



Rise



Fall