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# CrystaLatch™ 1x6 Fiber Optical Reflection Switch for LIDAR Sensor Applications (SM, PM, High Power)

(Protected by U.S. patents 7224860, 6757101, 6577430 and pending patents)

## Product Description

The CL 1x6 Series Fiber Optical Reflection Switch connects optical channels by redirecting an incoming optical signal into a selected output fiber at the same time collect the reflected signal into a dedicate sensor port. This proprietary configuration is designed for sensor and LIDAR application, minimizing optical loss and eliminating the need for additional circulator or coupler. The switching is achieved using patented non-mechanical configurations and activated via an electrical control signal. Latching operation preserves the selected optical path after the drive signal has been removed.

This series of reflective switches are designed to meet the most demands of continuous operation without wear-out, longevity without fail, and live operation under vibration/shock, as well as -40 °C operation. Electronic driver is available for this series of switches.



## Features

- High Speed
- Non-Mechanical
- High Reliability
- Fail-Safe Latching
- Low Insertion Loss
- Rugged
- Compact
- Cost Effective
- Direct Low Voltage Drive

## Performance Specifications

CL 1x6 Reflection Series Switch	Min	Typical	Max	Unit
Operation Wavelength <sup>[1]</sup>	1520	1550	1580	nm
	1295	1310	1325	
Insertion Loss <sup>[2]</sup>		1.2	2.0	dB
Cross Talk <sup>[2]</sup>	40	50		dB
Return Loss <sup>[2]</sup>	50	55		dB
PDL (SM Series Switch only)		0.15	0.25	dB
Extinction Ratio (PM Series Switch only)	18	25		dB
Directivity <sup>[3]</sup>	45	50		dB
PMD (SM Series Switch only)			0.2	ps
Switch Speed (Rise, Fall)	5	50	200	µs
Repetition Rate		2K		Hz
Durability	10 <sup>14</sup>			cycle
Optical Power Handling	High Power Series Switch	3	5	W
	Others	300	500	mW
Switch type		Latching		
Operating Temperature <sup>[4]</sup>	-5		70	°C
Storage Temperature	-40		85	°C
Fiber Type	SMF-28, Panda PM, or equivalent			
Package Dimension	72L x 37W x 7.8H			mm

## Applications

- Optical Sensing
- Optical Signal Routing
- Instrumentation

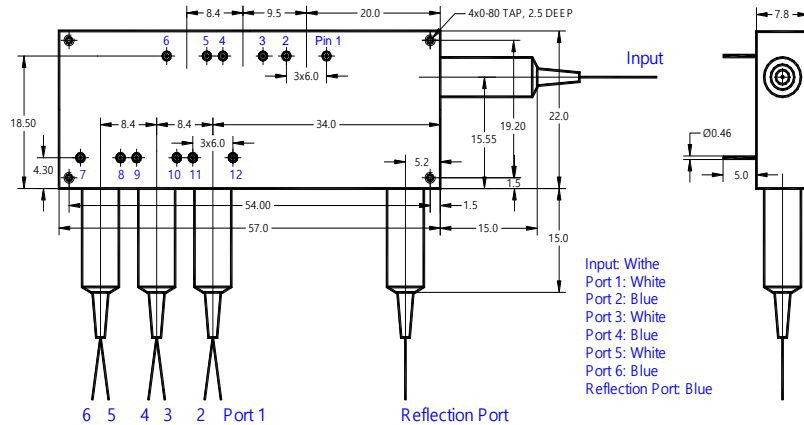
[1]. Same specs switches at L band are available, please contact us.  
 [2]. Measured without connectors.  
 [3]. Defined as the optical power at the sensor port when light is launched into the input.  
 [4]. Operating temperature -40-85 °C version is available as special.



Revised on 5/2/21  
 (Click here for latest revision)

# CrystaLatch™ 1x6 Fiber Optical Reflection Switch for LIDAR Sensor Applications

## Mechanical Dimensions (Unit: mm)



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

## Electrical Driving Information

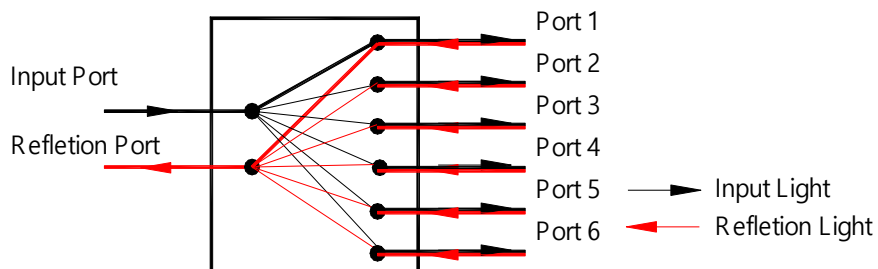
Each switching point is actuated by applying a voltage pulse. Applying one polarity pulse, one light path will be connected and latched to the position. Applying a reversed polarity pulse, another light path will be connected and latched to the position after pulse removed.

Parameter	Minimum	Typical	Maximum	Unit
Resistance (each group)	15	18	22	Ω
Switch Voltage	2.25	2.5	2.75 [1]	V
Pulse Duration	0.2	0.3	0.5	ms

[1]. Over this value will damage the device.

- 1) Driving kit with USB or RS232 with Windows™ GUI or TTL interfaces is available.
- 2) Driving table can be provided per request for the customers to design/build their own driving circuit.

## Functional Diagram



CL 1x6 PM High Power Reflection Switch

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## Ordering Information

			2	1				
	Configuration	Wavelength	Switch	Package	Fiber Type		Fiber Length	Connector <sup>[5]</sup>
CLRS <sup>[1]</sup>	1x2=12	1310nm=3	Dual Stage=2	Standard=1	SFM-28=1	Bare fiber=1	0.25m=1	None=1
CLPR <sup>[2]</sup>	1x3=13	1550nm=5		Special=0	Panda PM	900µm loose tube=3	0.5m=2	FC/PC=2
CLHR <sup>[3]</sup>	1x4=14	Special=0			250=B	Special=0	1.0m=3	SC/APC=3
CPHR <sup>[4]</sup>	1x5=15				Special=0		Special=0	SC/APC=4
	1x6=16							ST/PC=6
	Special=00							LC=7
								Duplex LC=8
								MTP =9
								Special=0

- [1]. CLRS: CrystaLatch Dual Stage Reflection Switch.
- [2]. CLPR: CrystaLatch Dual Stage PM Reflection Switch.
- [3]. CLHR: CrystaLatch Dual Stage High Power Reflection Switch.
- [4]. CPHR: CrystaLatch Dual Stage PM High Power Reflection Switch.
- [5]. There isn't any connector in the high power switches normally. Please contact us for high power connectors.

