

MEMS 1x5, 1x6 PM Fiber Optical LiDAR Switch

(Built-In Reflection Port with High Isolation)
(Protected by US Patent 10752492B2)

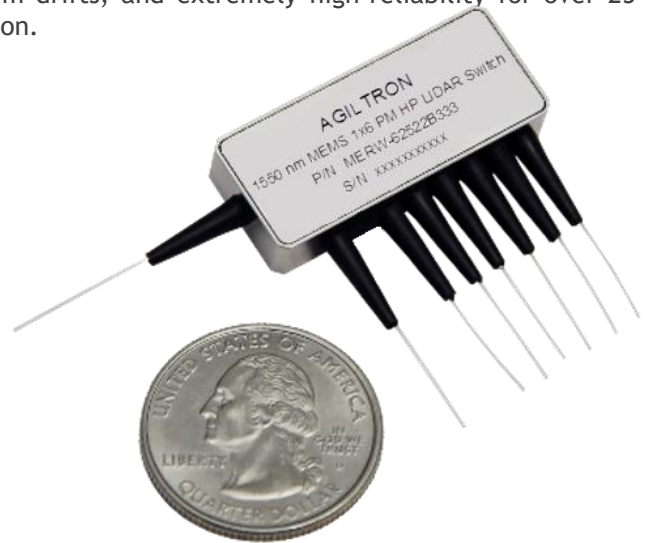
Product Description

Features

- High Reliability
- ESD Tolerance

The MEMS 1x5, 1x6 Series Polarization Maintain Fiber Optical LiDAR Switch uses a patented thermal activated micro-mirror, moving-in and -out optical paths at a 45 degree angle to direct an incoming light into a selected output fiber. It uniquely offers unprecedented high stability over a wide temperature range, compact size, exceptionally long operation life, insensitive to moisture and ESD, no short and long-term drifts, and extremely high-reliability for over 25 years of continuous operation.

Moreover, it uniquely provides the receiving signal with over 60dB isolation from the probe laser beam via a proprietary patent pending configuration. The switches are Telcordia GR1221 qualified. The switch is conveniently controlled by directly applying a low voltage to each mirror actuator.



Performance Specifications

MEMS Series LiDAR Switch	Min	Typical	Max	Unit
Operation Wavelength	1260		1620	nm
Insertion Loss ^[1]	0.8	1.1	1.5	dB
Reflection Signal Isolation ^[2]	58		62	dB
Polarization Extinction Ratio	18	25		dB
Cross Talk ^[1]	50			dB
Switching Time		10		ms
Repeatability		±0.05		dB
Repetition Rate		10		Hz
Durability	10 ⁹			Cycle
Switching Type		Non-Latching		
Operating Temperature	-10		70	°C
Storage Temperature	-40		85	°C
Optical Power Handling		300		mW

[1]. Excluding connectors.

[2]. Measured between input and reflection port, while output port is angled

Applications

- Channel Routing
- Configurable Add/Drop
- System Monitoring
- Instrumentation

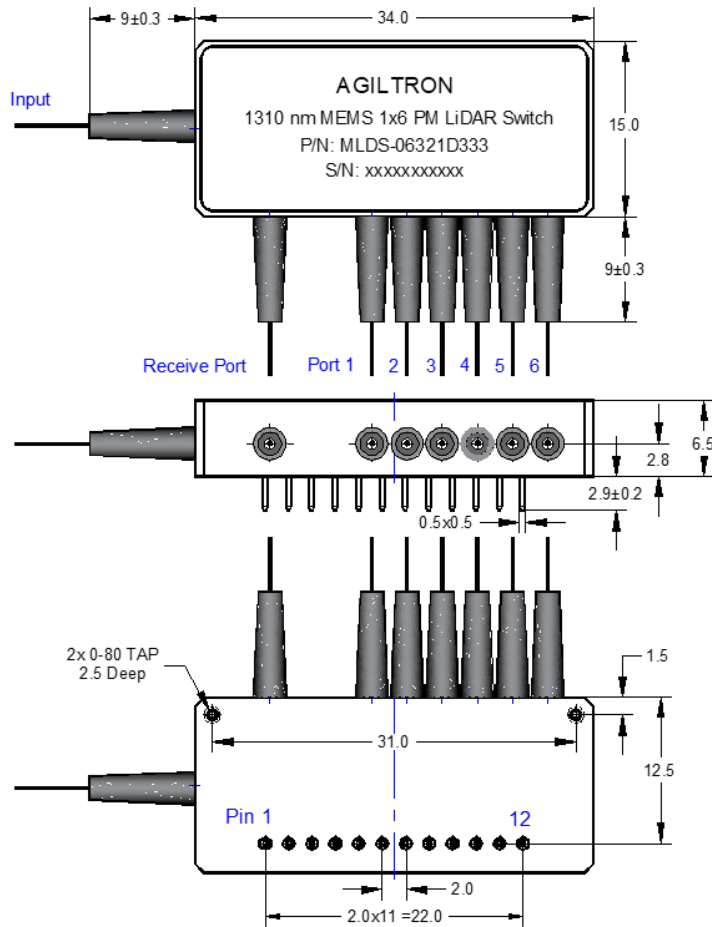


Revised on 11/27/22

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Mechanical Dimensions (Unit: mm)



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

Driving Table and Requirement

Optical Path	Pin Number											
	1	2	3	4	5	6	7	8	9	10	11	12
IN → P1 & P1 → R	+V	0	0	0	0	0	0	0	0	NC	NC	NC
IN → P2 & P2 → R	0		+V	0		0	0					
IN → P3 & P3 → R	0		0	+V		0	0					
IN → P4 & P4 → R	0		0	0		+V	0					
IN → P5 & P5 → R	0		0	0		0	+V					
IN → P6 & P6 → R	0		0	0		0	0					

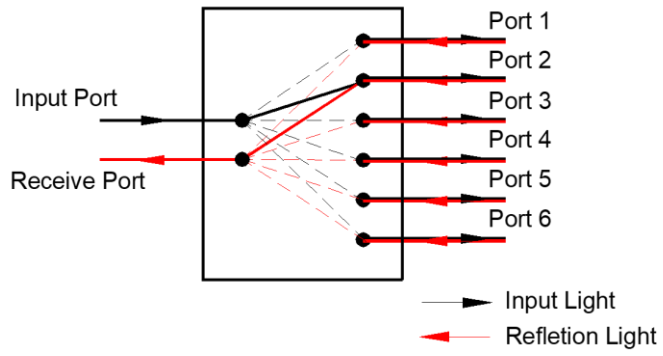
[1]. NC: No electronic connection. [2]. +V: 3.8-4.5 VDC, Typical is 4.0 VDC. [3]. Each MEMS Chip Power Consumption is less than 170 mW.



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Functional Diagram

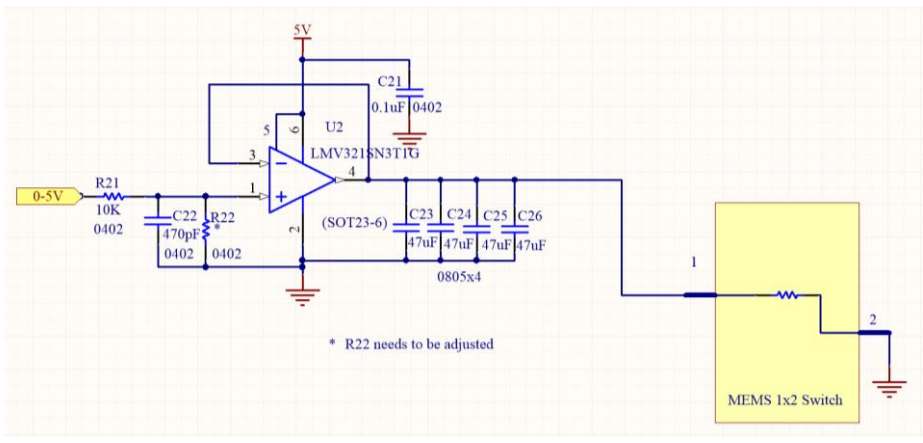


Ordering Information

Prefix	Type	Wavelength	Switch	Version	Fiber Type	Fiber Cover	Fiber Length	Connector
MLDS- ^[1]	1x5=05 1x6=06 Special=00	1310=3 1550=5 1310/1550=9 Special=0	Non-Latching=2	Standard=1 Special=0	PM1550=B PM1310=D Special=0	Bare fiber=1 900 um 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 LC=7 Special=0

[1]. MLDS: MEMS LiDAR Switch.

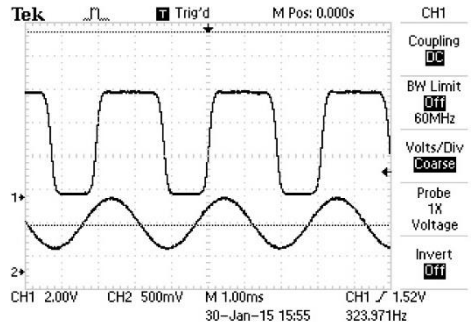
Recommendation Control Circuit



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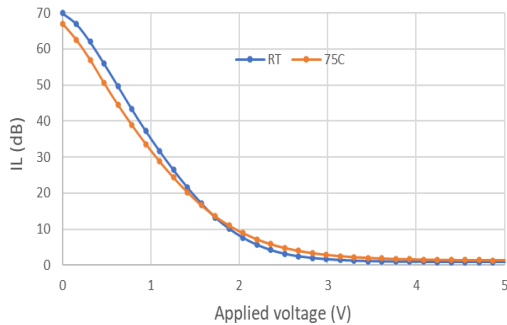
10⁹ Switching Cycle Verification

We have tested MEMS 1x2 switch at the resonant frequency ~300Hz for more than 40 days, as shown in the attachment, which corresponding over 10⁹ switching cycles. The measurements show little changes in Insertion loss, Cross Talk, Return loss, all parameters are within our specs.



VOA Capability on Port

The attenuation in each channel can be implemented in this MEMS switch without sacrificing the switch performances. The attenuation is realized by the applied voltage, as shown in the following figure (typical).



Demo Driver

USB RS232/GUI, Pushbutton/LED Channel Indicators
Applicable to Non-latching MEMS-1x4, 1x8, 1x12 and 1x16 (\$255)

