Integrated Solid State Variable Photonic Time Delay

(Patent Protected)

DATASHEET

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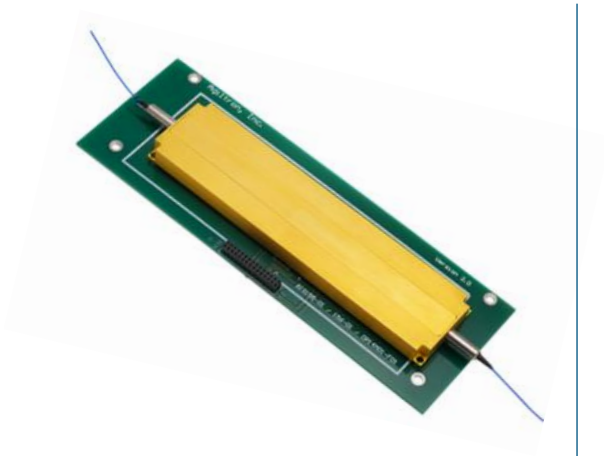

The SSTD Series photonic time delay selectively routes optic signal through N delay segments whose delay time increase successively by a power of 2. Since each switching element allows the signal to either connect or bypass a delay segment, a delay T may be inserted which can take any value, in increments of □T, up to the maximum value T. This is achieved using a patent pending non-mechanical configuration and activated via an electrical control signal. Latching operation preserves the selected optical path after the drive signal has been removed. All solid-state configuration eliminates the need for mechanical movement and organic materials. The device is designed to meet the most demanding switching requirement of ultra-high reliability and fast response time.

Features

- High Speed
- Non-Mechanical
- High Reliability
- Fail-Safe Latching
- Low Power Consumption

Applications

- Phase-Array Antennas
- Instrumentation

Specifications

Parameter		Min	Typical	Max	Unit
Wavelength band		1535	1550	1565	nm
Insertion Loss [1]	(4-bit version)		2.8	3.5	dB
	(5-bit version)		3.4	4.0	
Cross Talk On/Off Ratio		22	28		dB
Switching Time (fall, rise)			50	200	µs
Repetition Rate				1	kHz
Delay Time Range				300	ps
Intrinsic Delay [2]				2	ns
PDL (SMF version)		0.15	0.35	0.80	dB
ER (PMF version)		18			
Polarization Mode Dispersion			0.1	0.2	ps
Return Loss		50	55	60	dB
Operating Temperature		0		60	°C
Optical Power Handling			400		mW
Storage Temperature		-40		85	°C
Fiber Type		SMF-28 or Panda PM or equivalent			

Notes:

[1]. Exclude connector. L band version is available.

[2]. Including in/out fiber (15cm on each side).

* Final dimension will be determined per total time delay.

Rev 01/03/26

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Electrical Driving Requirements

Parameter	Minimum	Typical	Maximum	Unit
Switch Voltage	2.3	2.5	2.8	V
Switch Current	120	140	160	mA
Pulse Duration	0.2	0.3	0.5	ms

For each switching core

Evaluation kit with TTL and RS232 or USB interface and Windows™ GUI also available

PIN arrangement and package size will be finalized after TD confirmation.

Prototype Picture (4-bit version)

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

Ordering Information (Part Number)

	88	☐	☐	1	☐	☐	0	☐
Prefix	**Type**	**Wavelength**	**Configuration**	**Package**	**Fiber Type**	**Fiber Cover**	**Delay Range**	**Connector[2]**
SSTD- [1]		1550nm = 5 1310nm = 3 Special = 0	4-bit = 1 5-bit = 2	Standard = 1	SFM-28 = 1 PM1550 = 5 Special = 0	Bare fiber = 1 0.9mm tube = 3 Special = 0	Customized = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 LC/APC = A LC/UPC = U Special = 0

[1]. SSTD: Solid State Time Delay.
[2]. The connector cannot be installed directly onto bare fiber, as it is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer can remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SM28 fiber and decreases further with smaller core fibers.

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Application Notes

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.