High Speed Fiber Optical Phase Modulators-Low Voltage Thin Film Lithium Niobate

DATASHEET

BUY NOW

The Thin Film Lithium Niobate Fiberoptic Modulators (TLNM) series offers advantageous features of a low driving half-wave voltage of 2.8 V and broadband high speed of up to 40GHz. These improvements over the traditional Lithium Niobate Fiberoptic Modulators are achieved by more efficient smaller and shorter waveguides made possible by thin film LiNbO3. Its low operating voltage makes it more efficient to convert RF signal into optical and convenient to use a function generator as the driver for laboratory applications. It has a bias control section that integrates with a micron heater, a photodetector for feedback control that maintains a constant optical bias point. The high-speed modulation control is through an SMA connector, and the bias control is through pins. Custom special design is also available.

Features

- Low Half-Wave Voltage ~2.8V
- Up to 40GHz Speed

Applications

- Radar
- RoF
- Laboratory Uses
- Concept Proving
- Instrumentation

Specifications

Parameter		Min	Typical	Max	Unit
Operation Wavelength		1520		1567	nm
Insertion Loss			4.5	5.5	dB
Return Loss		27		40	dB
Optical Input Power				10	dBm
RF Driving Voltage		3.3 (1kHz)	4 (1GHz)		V
Vp at 50kHz		2.8		3	V
3dB Bandwidth S21 (from 2GHz)		DC	20	40	GHz
RF Return Loss S11(10MHz to 40 GHz)				10	dB
RF Port Resistance (DC)				50	Ω
RF Input Power				30	dBm
Bias Port Resistance (DC)				1	MΩ
Heater Bias Voltage		0		4	V
RF Swing Voltage	X2:4	-4.46		+4.46	V
	X2:5	-891		+891	
ER RMS Voltage	X2:4			3.16	V
	X2:5			6.30	
Operating Temperature		-1		60	°C
Storage Temperature		-45		85	°C

Notes:

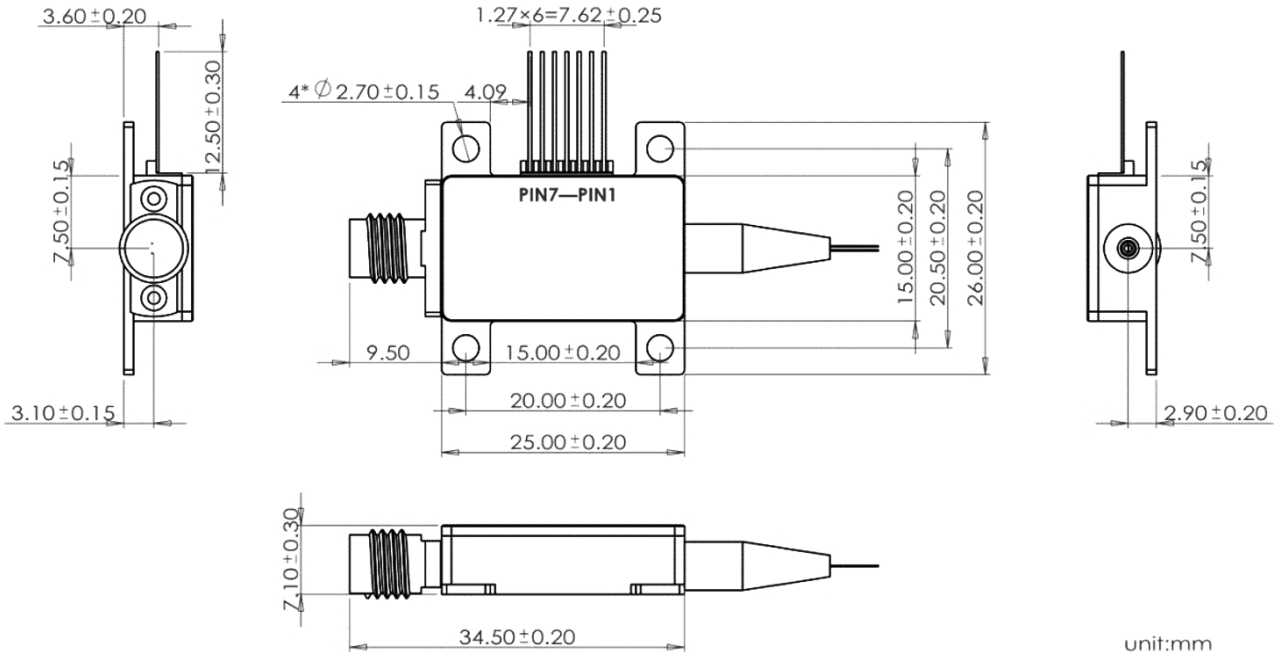
Over the maximum power input will burn the device over time

Rev 08/22/24

High Speed Fiber Optical Phase Modulators-Low Voltage Thin Film Lithium Niobate

DATASHEET

Dimensions (mm)



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

Electrical Connection

PIN	Symbol	Description
1	-	N/A
2	-	N/A
3	-	N/A
4	-	N/A
5	-	N/A
6	-	N/A
7	-	N/A
RF	RF connector*	2.92mm connector
In	Input fiber	FC/APC, PMF
Out	Output fiber	FC/APC, PMF

Ordering Information

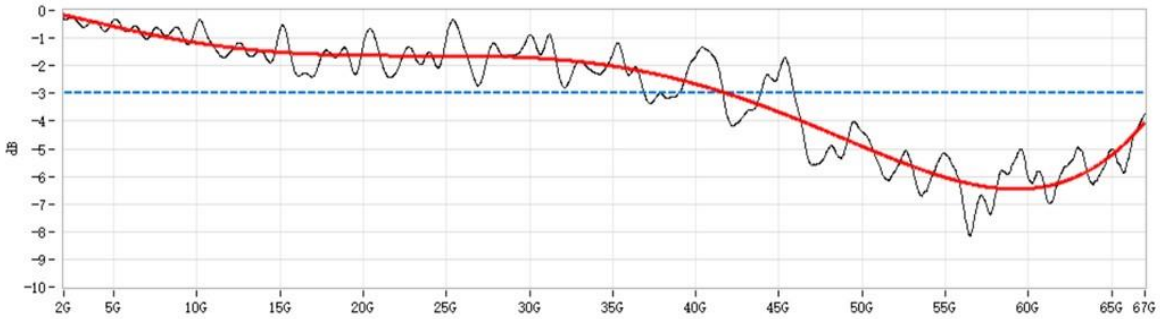
	2	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Configuration**	**Auto Bias Controller**	**Wavelength**	**Frequency**	**Input Fiber**	**Output Fiber**	**Cable**	**Fiber Length**	**Connector**
TLNM-	Phase = 2	No = 1 Yes = 2 Special = 3	1520-1570nm = 2	20GHz = 2 40GHz = 4 50GHz = 5 60GHz = 6	PM1550 = 5	PM1550 = 5 SMF28e = 1	0.9mm tube = 1 Special = 0	0.5m = 1 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 Special = 0

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

High Speed Fiber Optical Phase Modulators-Low Voltage Thin Film Lithium Niobate

DATASHEET

Typical RF S21 Performance



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.

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com