

# Fiber Optical Phase Modulator



10MHz, 10 GHz, 1550 nm

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The LNPM is a high-performance, fiber-coupled phase modulator with operating frequencies ranging from DC to 10 GHz, covering the C-band wavelength. It is constructed using optical waveguides on X-cut LiNbO<sub>3</sub> material and is coupled with polarization-maintaining input and output fibers. We offer two versions of low frequency 10MHz and high frequency 10GHz

## Features

- X-cut LiNaO3 Waveguide
- High Polarization Extinction Ratio
- High Optical Power Handling
- PM Input & Output

## Specifications

Parameter	Min	Typical	Max	Unit
Input Optical Power			100	mW
Operating Wavelength	1525		1570	nm
Insertion Loss		3	4	dB
Polarization Extinction Ratio	20			dB
Optical Return Loss	40			dB
S21Bandwidth	7	8		GHz
S11 Return Loss	-9			dB
RF V <sub>rt</sub> @ 1 GHz		7.2	8	V
RF Input Power			25	Vpp
Impedance		50		Ω
Operating Temperature	0		70	° C
Storage Temperature	-40		80	° C
Operating Humidity	0		90	%

## Applications

- Coherent Communications
- Optical Chirping
- Optical Sensing
- FM Spectroscopy
- Frequency Shifting
- Laser Linewidth Broadening

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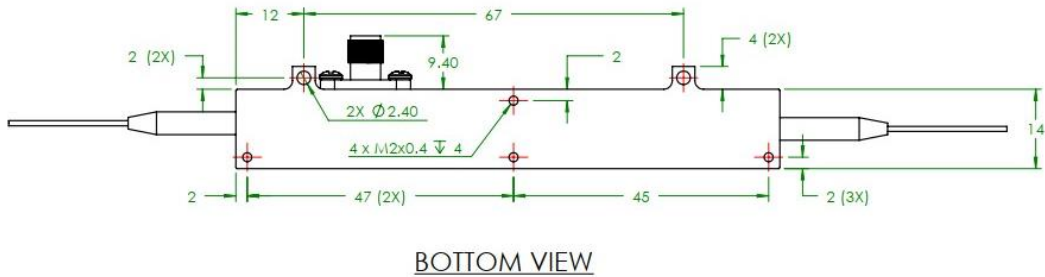
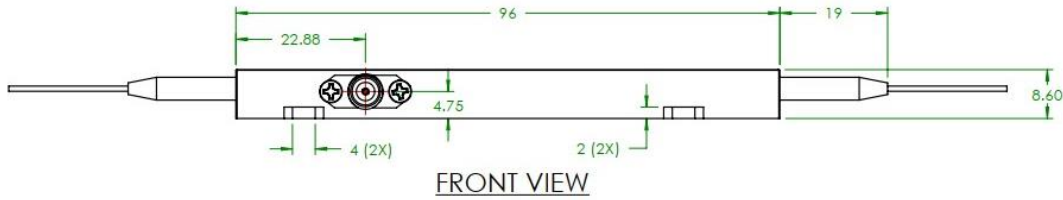
Rev 09/24/24

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## Dimensions (mm)



Unit: 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*	2.92 mm female

## Ordering Information

Prefix	Configuration	Wavelength	Frequency	Input Fiber	Output Fiber	Cable	Fiber Length	Connector
LNPM-	Phase = 2	1525 - 1570nm = 2	10GHz = 1 10MHz = 2	PM1550 = 5	PM1550 = 5	0.9mm Tube = 1	0.5m = 1 Special = 0	FC/APC = 3 FC/PC = 2  Special = 0

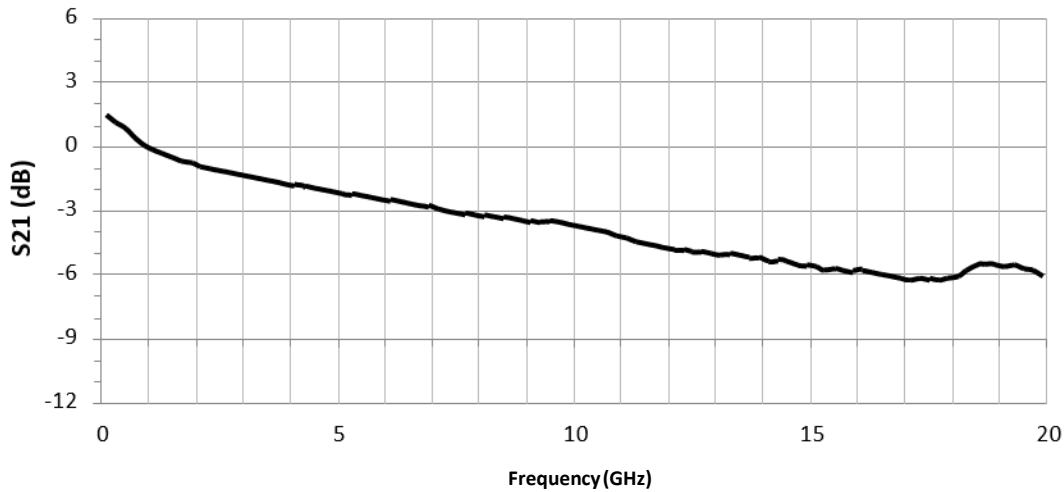
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### TYPICAL EO RESPONSE



### 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  $\mu\text{m}$ ) 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 handling by expanding the core side at the fiber ends.