Fiber Optical Phase Modulator

10 GHz, 1310 nm

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The LNPM is a high-performance, fiber-coupled phase modulator with operating frequencies ranging from DC to 10GHz, covering the 1270–1370 nm wavelength band. It is constructed using optical waveguides on high-efficiency X-cut $LiNbO_3$ material and is coupled with polarization-maintaining input and output fibers.

A phase modulator does not require bias control. Using a phase modulator together with a polarizer to construct an intensity modulator may result in unstable operation due to birefringence.

Note: This component is intended for OEM system integration and is not designed for standalone laboratory use. Units supplied without a protective benchtop enclosure are provided without warranty, as they are susceptible to damage from improper handling, installation, or operation.

Features

- 10GHz Bandwidth
- X-cut APE Process
- Low Insertion Loss
- Low Drive Voltage
- 1270 nm to 1370 nm
- Minimal Back Reflections
- Chip PER over 60dB

Applications

- Optical Chirping
- Research & Development
- Laser Linewidth Broadening
- FM Spectroscopy
- Frequency Shifting

Specifications

Parameter	Min	Typical	Max	Unit
Input Optical Power			50	mW
Operating Wavelength	1270		1370	nm
Insertion Loss			4	dB
Polarization Extinction Ratio	20			dB
Optical Return Loss	30			dB
S21 Bandwidth		8	10	GHz
Vπ @10GHz		8.8		V
RF Input Power			30	Vpp
Impedance		50		Ω
Operating Temperature	-55	8.8	75	°C
Storage Temperature	-60		90	°C
Operating Humidity	0	50	90	%

RoHS COMPLIANT

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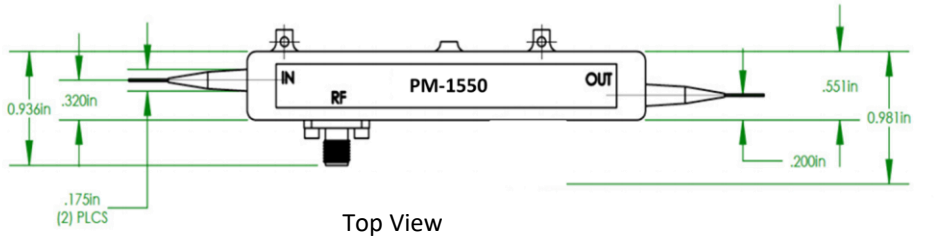
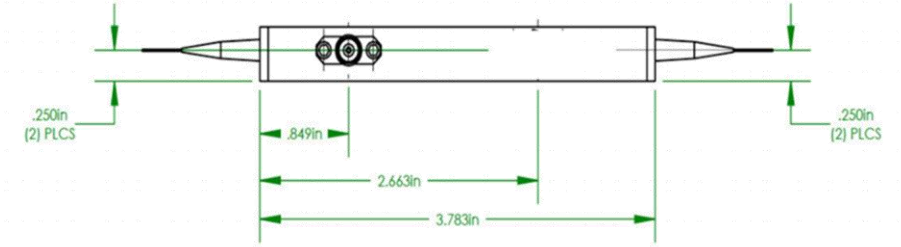
Dimensions (mm)



Top View



Side View

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*	K Connector

Ordering Information (Part Number)

	2	1	☐	☐	☐	☐	☐	☐	☐
Prefix	**Configuration**		**Wavelength**	**Frequency**	**Input Fiber**	**Output Fiber**	**Cable**	**Fiber Length**	**Connector[1]**
LNPM-	Phase = 2		1310nm =3	10GHz = 2	PM 1310= 3	PM 1310= 3	0.9mm Tube = 1	0.5m = 1 Special = 0	FC/APC = 3 FC/PC = 2 Special = 0

[1]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber 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 may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

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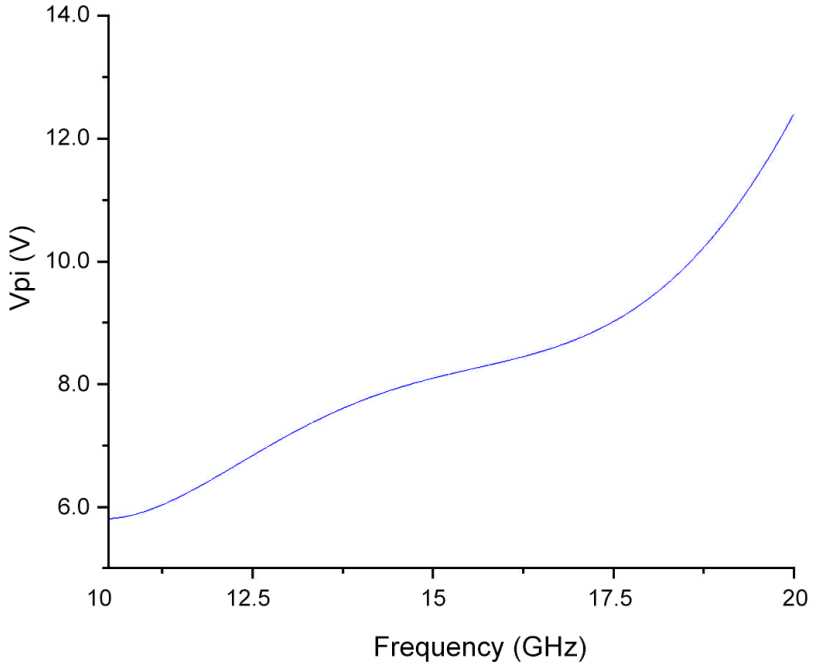
Vp vs Frequency



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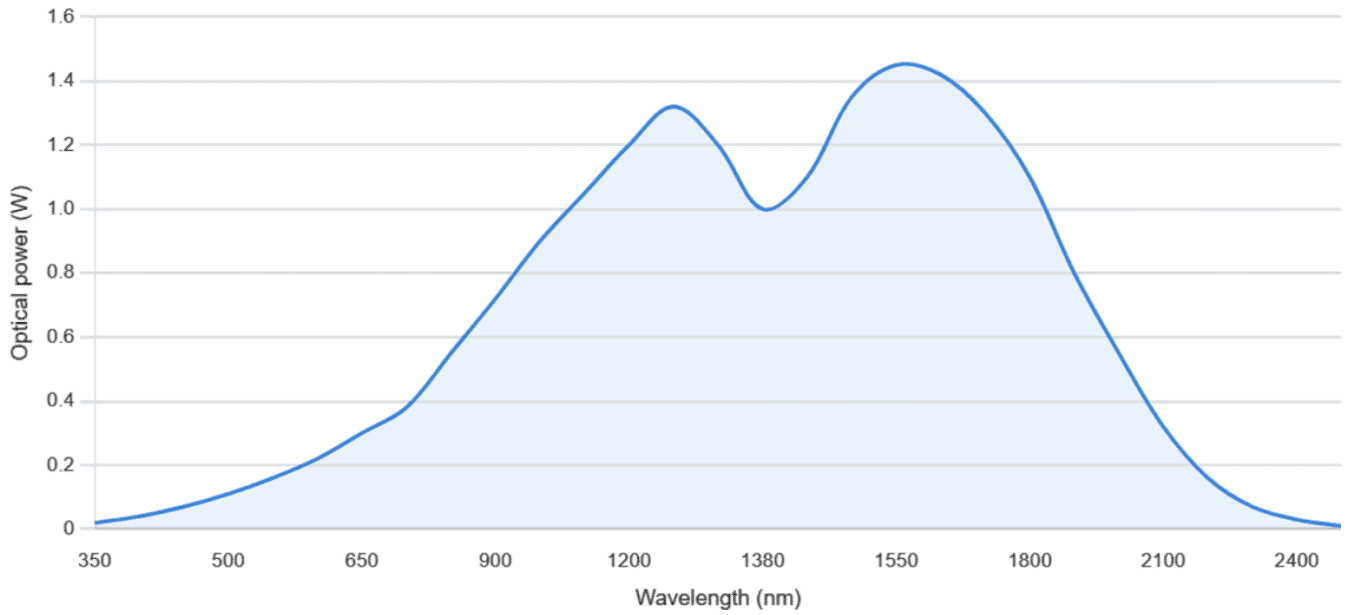
Regular Single Mode / Polarization Maintaining Fiber Optical Power Handing vs Wavelength



Single mode fiber optical power is limited by nonlinear effects in addition to absorption that increase loss and generate heat. The curve shows the approximate safe CW power envelope for standard single-mode fiber. Actual limits depend on fiber design, core size, length, and laser characteristics. Specialty fibers can significantly increase the power limit.

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