



FEATURES

- Low insertion loss
- Low V_{π}
- 2 μ m specific design

APPLICATIONS

- LIDAR
- Gas sensing
- Spectral broadening
- Spectroscopy
- Seed source
- Research & development

OPTIONS

- 1550, 1000, 800 nm band versions
- Hermetic sealing

RELATED EQUIPMENTS

- Intensity modulator
- 2 MHz to 500 MHz amplifiers
- Matched RF amplifiers
- Spectral Broadening ModBox

The MPX2000 and MPZ2000 are phase modulators specially designed for phase modulation in the 2.0 μ m wavelength band from low frequencies to 10 GHz and above. The MPX/MPZ2000 incorporate 2.0 μ m specific waveguides and are pigtailed with 2.0 μ m polarization maintaining fibers.

MPX2000-LN-0.1 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	1900	2000	2200	nm
Electro-optical bandwidth	100	150	-	MHz
V_{π} RF @50 kHz	-	5	-	V
Insertion loss	-	3	-	dB

Specifications given at 25 °C, 2050 nm

MPZ2000-LN-10 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	1900	2050	2200	nm
Electro-optical bandwidth	10	12	-	GHz
V_{π} RF @50 kHz	-	5	-	V
Insertion loss	-	3	4	dB

Specifications given at 25 °C, 2050 nm

MPX2000-LN-0.1
150 MHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optic bandwidth	S_{21}	RF electrodes	100	150	-	MHz
$V\pi$ RF @50 kHz	$V\pi$ RF _{50 kHz}	RF electrodes	-	3.5	-	V
RF input impedance	Z_{in-RF}	-	-	10	-	k Ω

Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Waveguide process	-	-	Ti diffusion			
Operating wavelength	λ	-	1900	2000	2200	nm
Insertion loss	IL	Without connectors	-	3	5	dB
Optical return loss	ORL	-	-40	-45	-	dB

All specifications given at 25 °C, 2050 nm, unless differently specified

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Min	Max	Unit
Modulation voltage range	EV_{in}	-20	20	V
Optical input power	OP_{in}	-	20	dBm
Operating temperature	OT	0	+70	°C
Storage temperature	ST	-40	+85	°C

Modulator
MPZ2000-LN-10

10 GHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optic bandwidth	S_{21}	-	10	12	-	GHz
Ripple S_{21}	ΔS_{21}	-	-	0.5	1	dB
Electrical return loss	ES_{11}	-	-	-12	-10	dB
$V\pi$ RF @50 kHz	$V\pi_{RF_{50\text{ kHz}}}$	-	-	6.5	7.5	V
Impedance matching	Z_{in-RF}	-	-	50	-	Ω

 50 Ω RF input

Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Waveguide process	-	-	Ti diffusion			
Operating wavelength	λ	-	1900	2000	2200	nm
Insertion loss	IL	Without connectors	-	3	4	dB
Optical return loss	ORL	-	-40	-45	-	dB

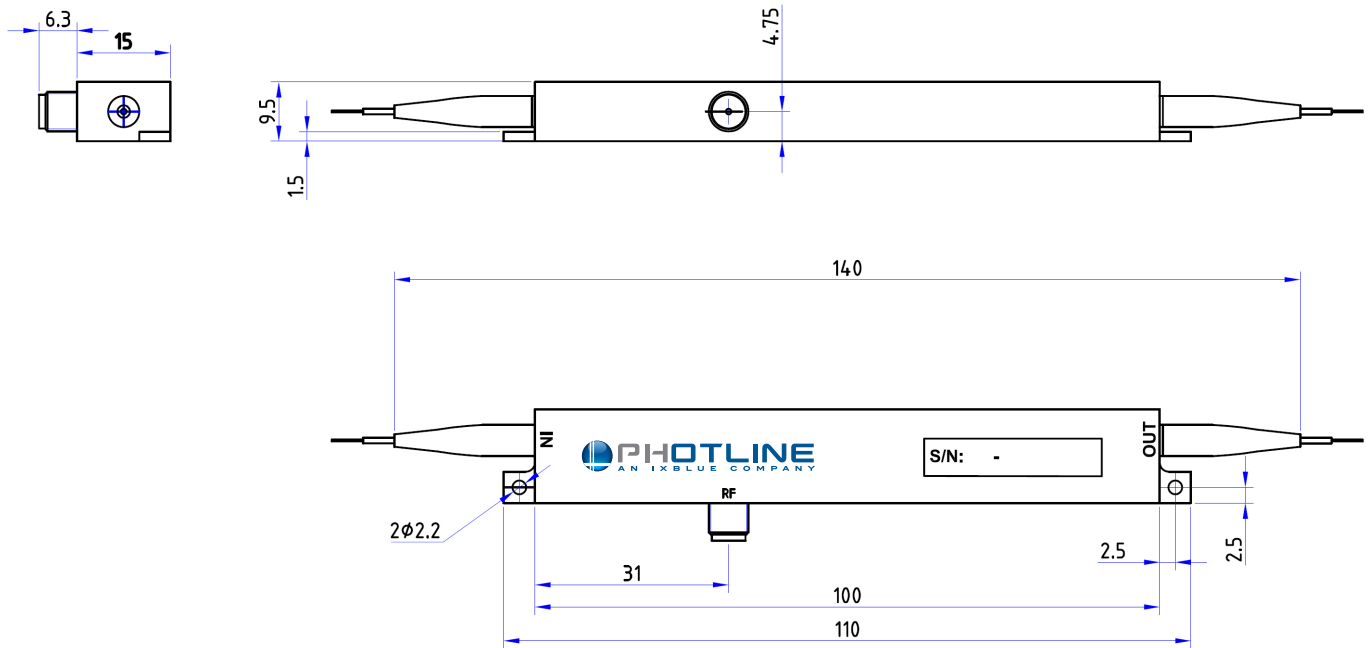
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Mechanical Diagram and Pinout All measurements in mm



Port	Function	Note
IN	Optical input port	2000 nm Polarization maintaining fiber, Nufern PM1950 length : 1.5 meter
OUT	Optical output port	2000 nm Polarization maintaining fiber, Nufern PM1950 length : 1.5 meter
RF	RF input port	Wiltron female K (SMA compatible)

Ordering information

MPX2000-LN-0.1-Y-Z-AB-CD MPZ2000-LN-10-Y-Z-AB-CD

Y = Input fiber : P Polarization maintaining S Standard single mode

Z = Input fiber : P Polarization maintaining S Standard single mode

AB = Output connector : 00 bare fiber FA FC/APC FC FC/SPC

CD = Output connector : 00 bare fiber FA FC/APC FC FC/SPC

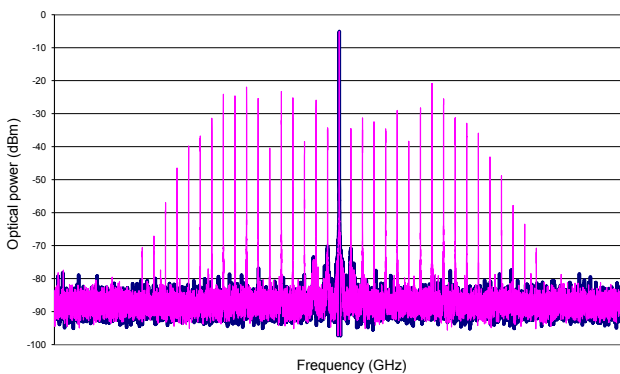
Note : optical connectors are Senko with narrow key or equivalent

Related equipments : Spectral Broadening ModBoxes

The spectral broadening of optical signals is a solution to suppress the Stimulated Brillouin Scattering (SBS) caused in optical fibers by high fluxes of highly coherent light.

The SBS degrades the signal integrity and prevents the proper transmission through the fiber. Under certain conditions, when amplification occurs for instance, the SBS can lead to the destruction of the fiber and the optical components along or forward the fiber. When the temporal coherence of the signal is destroyed, the SBS power threshold is significantly increased and thus its effects can be eliminated.

The Spectral Broadening ModBoxes achieve the spectral broadening of the optical signal by modulating its phase via the mean of a very efficient LiNbO₃ phase modulator and creating a number of lines over a spectral width that can reach several hundreds GHz.



The spectrally broadened optical signal



The spectral broadening ModBox

About us

Photline is a member of the **ixBlue** group of companies and a provider of Fiber Optics Modulation Solutions based on the company LiNbO₃ modulators and high-speed electronics modules. Photline Technologies offers high speed and high data rate modulation solutions for the telecommunication industry and the defense, aerospace, instruments and sensors markets. The products offered by the company include : comprehensive range of intensity and phase modulators (800 nm, 1060 nm, 1300 nm, 1550 nm, 2000 nm), RF drivers and modules, transmitters and modulation units.

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