

FEATURES

- High optical power : 100 mW
- High Bandwidth version > 10 GHz
- High stability
- Low V_{π}
- Low insertion loss

APPLICATIONS

- Interferometric based sensor
- Spectral broadening
- Frequency shifting
- Laser combining
- Pound-Drever-Hall locking (PDH)

OPTIONS

- 20 GHz version
- Hermetic sealing
- 800 nm, 1300 nm band versions

RELATED EQUIPMENTS

- Matched RF amplifiers
- NIR-MX-LN intensity modulators

The NIR-MPX series are phase modulators especially designed to operate in the 1000 nm wavelength band. They are available with various modulation bandwidths, from low frequency to 10 GHz and beyond.

Like all Photline Technologies Near InfraRed (NIR) modulators, the NIR-MPX series use a proton exchanged based waveguide process that confers them an unparalleled stability and a high photo-refractive threshold.

NIR-MPX-LN-0.1 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	980	-	1150	nm
Electro-optical bandwidth	-	150	-	MHz
V_{π} RF @50 kHz	-	2.5	-	V
Insertion loss	-	3	-	dB

Specifications given at 25 °C, 1060 nm

NIR-MPX-LN-02 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	980	-	1150	nm
Electro-optical bandwidth	2	-	-	GHz
V_{π} RF @50 kHz	-	3	-	V
Insertion loss	-	3	-	dB

Specifications given at 25 °C, 1060 nm

NIR-MPX-LN-05 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	980	-	1150	nm
Electro-optical bandwidth	5	-	-	GHz
V_{π} RF @50 kHz	-	4.5	-	V
Insertion loss	-	3	-	dB

Specifications given at 25 °C, 1060 nm

NIR-MPX-LN-10 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	980	-	1150	nm
Electro-optical bandwidth	-	12	-	GHz
V_{π} RF @50 kHz	-	5.5	-	V
Insertion loss	-	3	-	dB

Specifications given at 25 °C, 1060 nm

NIR-MPX-LN-0.1 150 MHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optic bandwidth	S_{21}	RF electrodes, from 2 GHz	-	150	-	MHz
V_{π} RF @50 kHz	$V_{\pi RF_{50\text{ kHz}}}$	RF electrodes	-	2.5	3	V
RF input impedance	Z_{in-RF}	-	-	10 000	-	Ω

Optical Characteristics All specifications given at 25°C, 1060 nm, unless differently specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Waveguide process	-	-	Proton exchange			
Operating wavelength	λ	-	980	1060	1150	nm
Insertion loss	IL	Without connectors	-	3	4	dB
Optical return loss	ORL	-	-40	-45	-	dB

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

NIR-MPX-LN-02

2 GHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optic bandwidth	S_{21}	-	2	-	-	GHz
Ripple S_{21}	ΔS_{21}	-	-	0.5	1	dB
Electrical return loss	ES_{11}	-	-	-12	-10	dB
V_{π} RF @50 kHz	$V_{\pi RF_{50\text{ kHz}}}$	-	-	3	4	V
RF input impedance	Z_{in-RF}	-	-	50	-	Ω

Optical Characteristics All specifications given at 25°C, 1060 nm, unless differently specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Waveguide process	-	-	Proton exchange			
Operating wavelength	λ	-	980	1060	1150	nm
Insertion loss	IL	Without connectors	-	3	4	dB
Optical return loss	ORL	-	-40	-45	-	dB

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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

NIR-MPX-LN-05 5 GHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optic bandwidth	S_{21}	-	5	-	-	GHz
Ripple S_{21}	ΔS_{21}	-	-	0.5	1	dB
Electrical return loss	ES_{11}	-	-	-12	-10	dB
V_{π} RF @50 kHz	$V_{\pi RF_{50\text{ kHz}}}$	-	-	4.5	5.5	V
RF input impedance	Z_{in-RF}	-	-	50	-	Ω

Optical Characteristics All specifications given at 25°C, 1060 nm, unless differently specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Waveguide process	-	-	Proton exchange			
Operating wavelength	λ	-	980	1060	1150	nm
Insertion loss	IL	Without connectors	-	3	4	dB
Optical return loss	ORL	-	-40	-45	-	dB

Absolute Maximum Ratings

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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

NIR-MPX-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_{π} RF @50 kHz	$V_{\pi RF_{50\text{ kHz}}}$	-	-	5.5	6.5	V
RF input impedance	Z_{in-RF}	-	-	50	-	Ω

Optical Characteristics All specifications given at 25°C, 1060 nm, unless differently specified

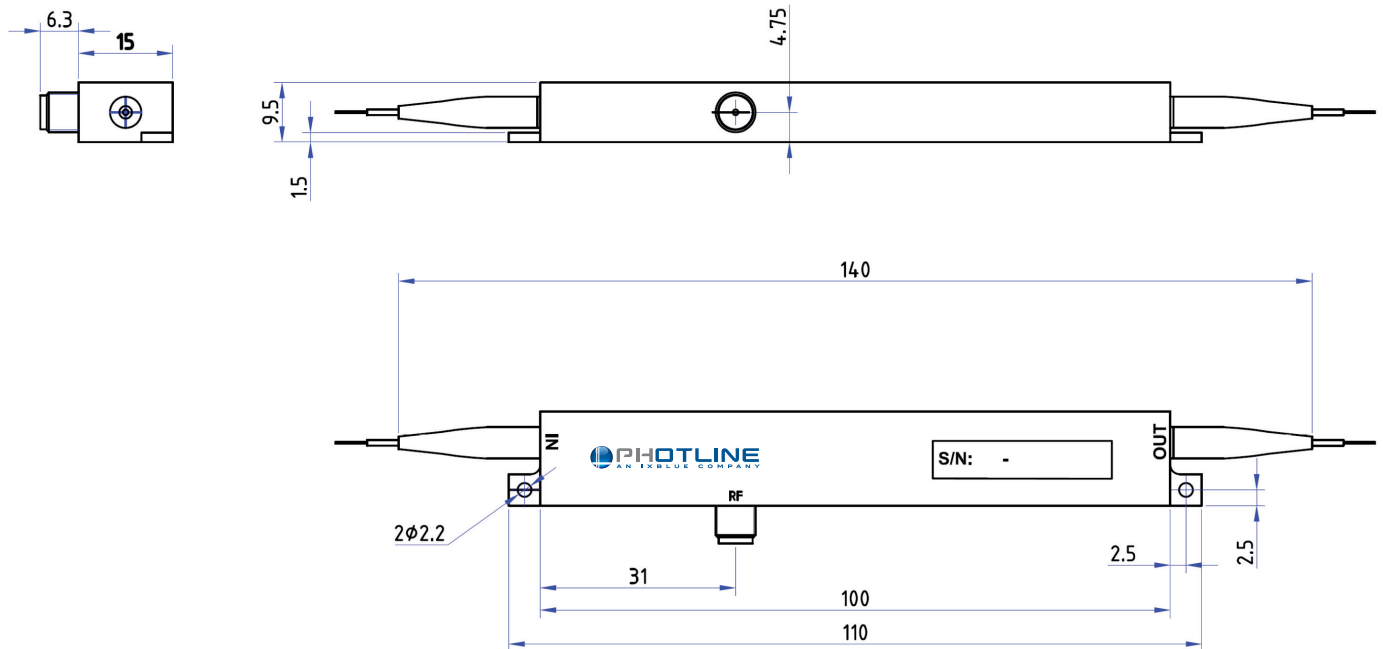
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Waveguide process	-	-	Proton exchange			
Operating wavelength	λ	-	980	1060	1150	nm
Insertion loss	IL	Without connectors	-	3	4	dB
Optical return loss	ORL	-	-40	-45	-	dB

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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

Mechanical Diagram and Pinout All measurements in mm



Port	Function	Note
IN	Optical input port	Polarization maintaining fiber, Corning PM 98-U25A, Length 1.5 meter. Buffer diameter 900 μm
OUT	Optical output port	Polarization maintaining fiber, Corning PM 98-U25A, Length 1.5 meter. Buffer diameter 900 μm
RF	RF input port	Wiltron female K

Ordering information

NIR-MPX-LN-XX-Y-Z-AB-CD

XX = Bandwidth : 0.1 150 MHz 02 2 GHz 05 5 GHz 10 10 GHz

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

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.