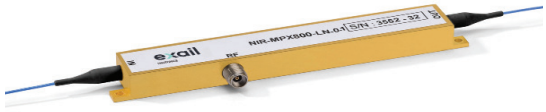
MODULATOR

NIR-MPX950-LN Series

950 nm band Phase Modulators

The Exail NIR-MPX950 series are phase modulators especially designed to operate in the 950 nm wavelength band. They are available with various modulation bandwidth, from low frequency to 20 GHz and beyond.

Like all Exail Near InfraRed (NIR) modulators, the NIR-MPX950 series use a proton exchanged based waveguide process that confers them an unparalleled stability and a high photo-refractive threshold.



Features

- High optical power handling
- Wide bandwidth
- High stability
- Low Vπ
- Low insertion loss

Applications

- Beam Combining
- Interferometric based sensors
- Quantum optics
- Frequency shifting
- Pound-Drever-Hall locking (PDH)
- Spectrum Broadening

Options

- 850 nm and 1060 nm versions
- Space grade version

Related Equipments

- RF amplifiers
- NIR-MX950-LN intensity modulators
- Reference transmitter Modbox-VNA
- 30ps optical pulse Modbox-PG

NIR-MPX950-LN-0.1 series Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	850	900	950	nm
Usable electro-optical bandwidth	-	300	-	MHz
Vπ RF @50 kHz	-	2.2		V
Insertion loss	-	3.5		dB

NIR-MPX950-LN-05 series Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	850	900	950	nm
Usable electro-optical bandwidth	-	10	-	GHz
Vπ RF @50 kHz	-	3.5		V
Insertion loss	-	3.5		dB

NIR-MPX950-LN-10 series Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	850	900	950	nm
Usable electro-optical bandwidth	-	16	-	GHz
Vπ RF @50 kHz	-	4.5		V
Insertion loss	-	3.5		dB

NIR-MPX950-LN-20 series Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	850	900	950	nm
Usable electro-optical bandwidth	-	20	-	GHz
Vπ RF @50 kHz	-	4.5		V
Insertion loss	-	3.5		dB

NIR-MPX950-LN-0.1

300 MHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optical (EO) bandwidth	S_{21}	-	100	150	-	MHz
Usable EO bandwidth	S_{21}	-		300	-	MHz
Vπ RF @50 kHz	$V\pi_{RF\ 50\ kHz}$	-	-	2.2	3.2	V
RF input impedance	Z_{in-RF}	-	-	10 000	-	Ω

Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Wavelength	-	-	Proton exchange			
Operating wavelength	λ	-	850	900	950	nm
Insertion loss	IL	Without optical connectors*	-	3.5	5.5	dB
Optical return loss	ORL	-	-40	-45	-	dB

All specifications given at 25°C, 944 nm, unless differently specified.
(*) Consider an extra-loss up to 0.6 dB for each FC/APC optical connector

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 (CW mode)	OP_{in}	-	14	dBm
Operating temperature	OT	0	+70	°C
Storage temperature	ST	-40	+85	°C

NIR-MPX950-LN-05

10 GHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optical (EO) bandwidth	S_{21}	RF electrodes, from 2 GHz	5	-	-	GHz
Usable electro-optical bandwidth	S_{21}	RF electrodes, from 2 GHz	-	10	-	GHz
Ripple S_{21}	ΔS_{21}	-	-	0.5	1	dB
Electrical return loss	S_{11}	-	-	-12	-10	dB
Vπ RF @50 kHz	$V\pi_{RF\ 50\ kHz}$	-	-	3.5	4.5	V
RF input impedance	Z_{in-RF}	-	-	50	-	Ω

Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Wavelength	-	-	Proton exchange			
Operating wavelength	λ	-	850	900	950	nm
Insertion loss	IL	Without optical connectors*	-	3.5	5.5	dB
Optical return loss	ORL	-	-40	-45	-	dB

All specifications given at 25°C, 944 nm, unless differently specified.
(*) Consider an extra-loss up to 0.6 dB for each FC/APC optical connector

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
RF input power (CW mode)	EV_{in}	-	+28	dBm
Optical input power (CW mode)	OP_{in}	-	14	dBm
Operating temperature	OT	0	+70	°C
Storage temperature	ST	-40	+85	°C

NIR-MPX950-LN-10

16 GHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optical (EO) bandwidth	S_{21}	RF electrodes, from 2 GHz	10	12	-	GHz
Usable electro-optical bandwidth	S_{21}	RF electrodes, from 2 GHz	-	16	-	GHz
Ripple S_{21}	ΔS_{21}	-	-	0.5	1	dB
Electrical return loss	S_{11}	-	-	-12	-10	dB
Vπ RF @50 kHz	$V\pi_{RF\ 50\ kHz}$	-	-	4.5	5.5	V
RF input impedance	Z_{in-RF}	-	-	50	-	Ω

Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Wavelength	-	-	Proton exchange			
Operating wavelength	λ	-	850	900	950	nm
Insertion loss	IL	Without optical connectors*	-	3.5	5.5	dB
Optical return loss	ORL	-	-40	-45	-	dB

All specifications given at 25°C, 944 nm, unless differently specified.
(*) Consider an extra-loss up to 0.6 dB for each FC/APC optical connector

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
RF input power (CW mode)	EV_{in}	-	+28	dBm
Optical input power (CW mode)	OP_{in}	-	14	dBm
Operating temperature	OT	0	+70	°C
Storage temperature	ST	-40	+85	°C

NIR-MPX950-LN-20

20 GHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optical (EO) bandwidth	S_{21}	RF electrodes, from 2 GHz	16	20	-	GHz
Usable electro-optical bandwidth	S_{21}	RF electrodes, from 2 GHz	-	20	-	GHz
Ripple S_{21}	ΔS_{21}	-	-	0.5	1	dB
Electrical return loss	S_{11}	-	-	-12	-10	dB
Vπ RF @50 kHz	$V\pi_{RF\ 50\ kHz}$	-	-	4.5	5.5	V
RF input impedance	Z_{in-RF}	-	-	50	-	Ω

Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Wavelength	-	-	Proton exchange			
Operating wavelength	λ	-	850	900	950	nm
Insertion loss	IL	Without optical connectors*	-	3.5	5.5	dB
Optical return loss	ORL	-	-40	-45	-	dB

All specifications given at 25°C, 944 nm, unless differently specified.
(*) Consider an extra-loss up to 0.6 dB for each FC/APC optical connector

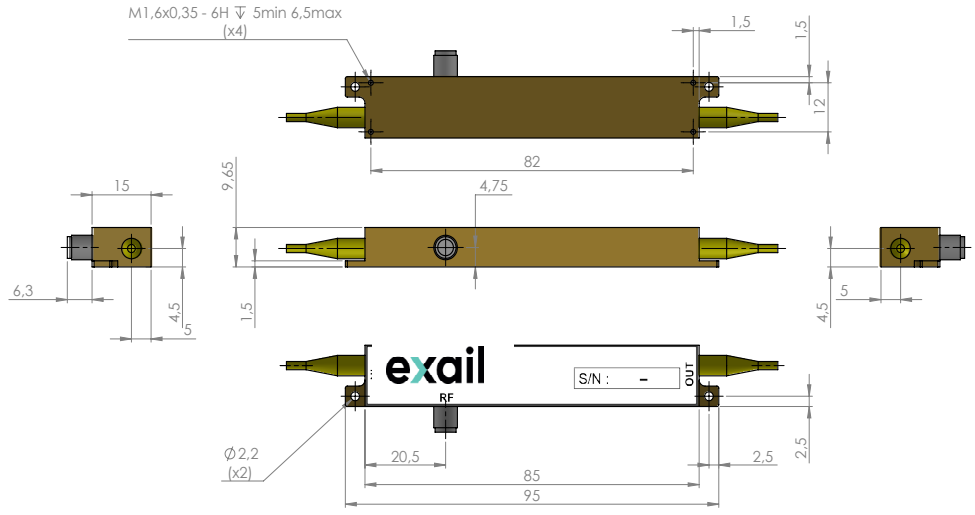
Absolute Maximum Ratings

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
RF input power (CW mode)	EV_{in}	-	+28	dBm
Optical input power (CW mode)	OP_{in}	-	14	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-U25D Length: 1.5 meter, buffer diameter: 900 µm
OUT	Optical output port	Polarization maintaining fiber Corning PM 98-U25D Length: 1.5 meter, buffer diameter: 900 µm
RF	RF input port	Female K

Ordering information

NIR-MPX950-LN-□-00-□-□-□-□

- Bandwidth : **0.1** (150 MHz), **05** (5 GHz),
- Input fiber: **P** Polarization mainatining
- Output fiber: **P** Polarization mainatining
- Input connector: **00** (bare fiber), **FA** (FC/APC), **FC** (FC/SPC)
- Output connector: **00** (bare fiber), **FA** (FC/APC), **FC** (FC/SPC)

08_2023_ED6 / 00023628-A / 00023630-A / 00023632-A / 00002777-A

About us