MODULATOR

NIR-MX950-LN-20

950 nm band 20 GHz Intensity Modulators

The NIR-MX950-LN-20 is a 20 GHz intensity modulator especially designed for operation in the 950 nm wavelength band.

NIR-MX950 Mach-Zehnder modulators offer engineers working in the 950 nm band the intrinsec and unparalleled benefits of $LiNbO_3$ modulation: high bandwidth, high contrast and ease of use.



NIR-MX950-LN-20 Intensity Modulators use proton exchange waveguide process on a doped $LiNbO_3$ substrat. This unique combination confers them an unparalleled stability and a superior optical power handling.

Features

- High Bandwidth
- X-cut for high stability
- High optical power handling
- Low drive voltage
- Low insertion loss

Applications

- Quantum optics
- Pulse generation / picking

Options

- 950 nm band modulators versions

Related Equipments

- RF amplifiers
- MBC Automatic Bias Controllers
- NIR-MPX950 Phase Modulators

NIR-MX950-LN-20 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	850	900	960	nm
Insertion loss	-	5	-	dB
Optical input power	-	-	14	dBm
Electro-optical bandwidth	-	25	-	GHz
Vπ RF @50 kHz	-	3.5	-	V
Electrical return loss	-	12	-	dB

Specifications given at 25 °C, 950 nm

NIR-MX950-LN-20

20 GHz Intensity Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optical bandwidth @-3 dB	S_{21}	RF electrodes, from 2 GHz	20	25	-	GHz
Ripple S_{21}	ΔS_{21}	RF electrodes, f < 20 GHz	-	0.5	1	dB
Electrical return loss	S_{11}	RF electrodes, f < 20 GHz	-	-13	-10	dB
Vπ RF @50 kHz	$V\pi_{RF\ 50\ kHz}$	RF electrodes	-	3.5	4.5	V
Vπ DC electrodes	$V\pi_{DC}$	DC electrodes	-	4.3	5	V
Impedance matching	Z_{in-RF}	-	-	50	-	Ω
DC input impedance	Z_{in-DC}	-	-	1	-	MΩ

Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Operating wavelength	λ	-	850	900	960	nm
Insertion loss	IL	Without connectors*	-	5	6.5	dB
DC extinction ratio	ER	Measured with narrow source linewidth < 200 MHz	20	25	-	dB
Optical return loss	ORL	-	-40	-45	-	dB
Chirp	α	-	-0.1	0	0.1	-

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

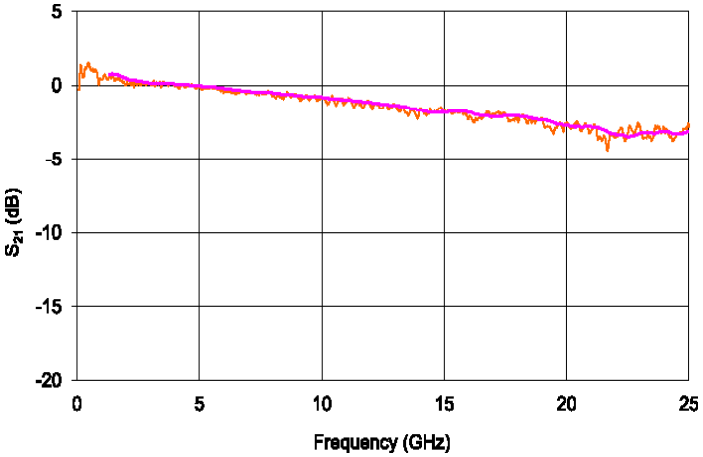
Absolute Maximum Ratings

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.

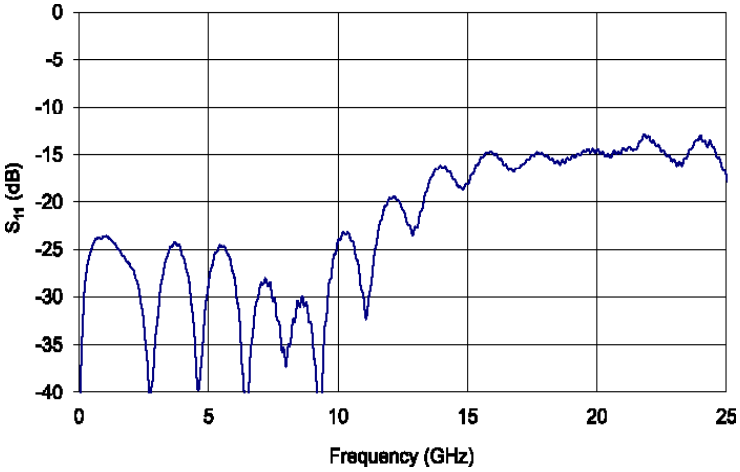
Parameter	Symbol	Min	Max	Unit
RF input power	EP_{in}	-	28	dBm
Bias Voltage	V_{bias}	-20	+20	V
Optical input power	OP_{in}	-	14	dBm
Operating temperature	OT	0	+70	°C
Storage temperature	ST	-40	+85	°C

NIR-MX950-LN-20

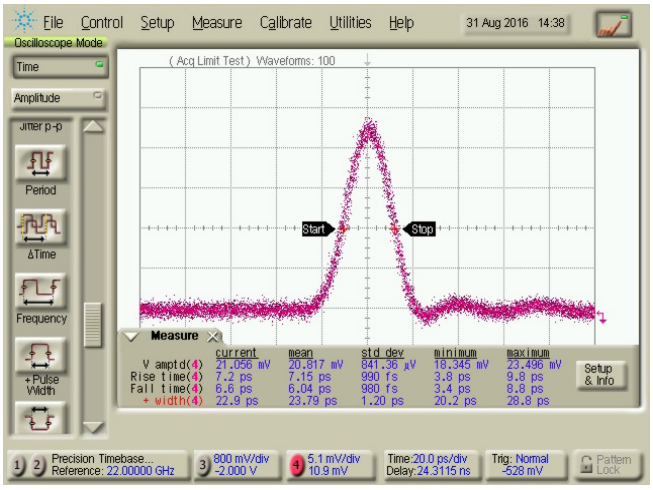
NIR-MX950-LN-20 Typical S_{21} Curve



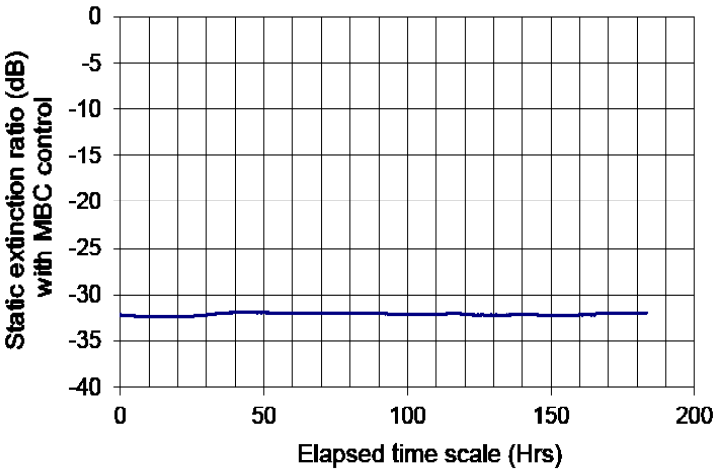
NIR-MX950-LN-20 Typical S_{11} Curve



NIR-MX950-LN-20: 30 ps Square Pulse

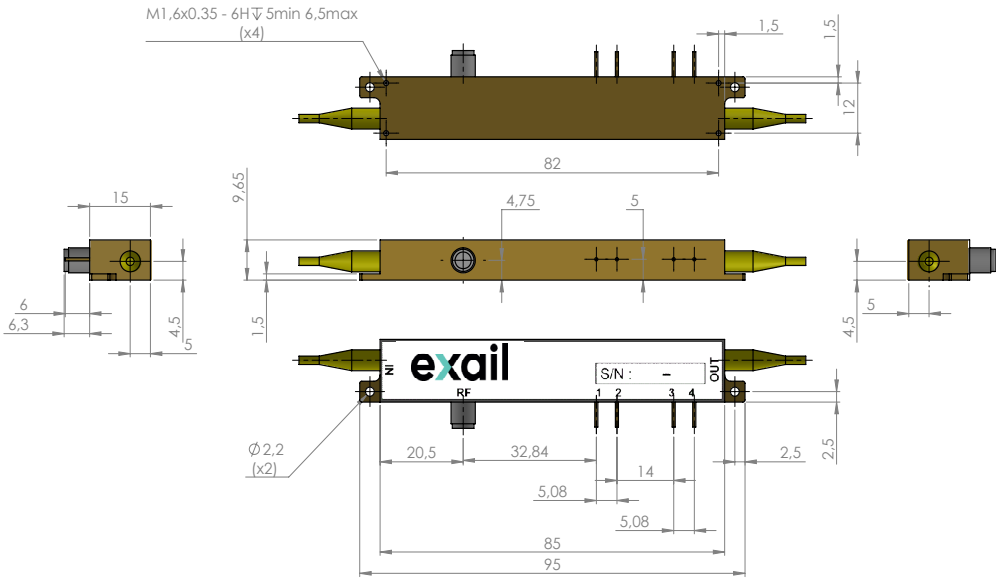


Stability with Time and Temperature



Mechanical Diagram and Pinout

All measurements in mm



Port	Function	Note
IN	Optical input port	Polarization maintaining fiber Corning PM 85-U25D Length: 1.5 meter, buffer diameter: 900 µm
OUT	Optical output port	Polarization maintaining fiber Corning PM 85-U25D Length: 1.5 meter, buffer diameter: 900 µm
RF	RF input port	Female K
1	Ground	Pin feed through diameter 1.0 mm
2	DC	Pin feed through diameter 1.0 mm
3, 4	Photodiode cathode, anode	Pin feed through diameter 1.0 mm

Ordering information

Input fiber: P Polarization maintaining

Output fiber: P Polarization maintaining

Input connector: **00** (bare fiber), **FA** (FC/APC), **FC** (FC/SPC)

Output connector: **00** (bare fiber), **FA** (FC/APC, FC (FC/SPC)

NIR-MX950-LN-20-00 - □-□-□-□

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