



## FEATURES

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

## APPLICATIONS

- Quantum optics
- 850 nm 100 GbE testing
- Pulse generation / picking

## OPTIONS

- High extinction ratio > 30 dB
- Lower insertion loss
- 950 nm band modulators versions

## RELATED EQUIPMENTS

- RF amplifiers
- MBC Automatic Bias Controllers
- NIR-MPX800 Phase Modulators
- ModBox-850nm-28Gb/s-NRZ

The NIR-MX800-LN series are 10 GHz and 20 GHz intensity modulators especially designed for operation in the 800 nm wavelength band.

NIR-MX800 Mach-Zehnder modulators offer engineers working in the 800 nm band the intrinsic and unparalleled benefits of LiNbO<sub>3</sub> modulation: high bandwidth, high contrast and ease of use.

NIR-MX800 series Intensity Modulators use proton exchange waveguide process on a doped LiNbO<sub>3</sub> substrat. This unique combination confers them an unparalleled stability and a superior optical power handling.

## NIR-MX800-LN-10 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	780	-	850	nm
Insertion loss	-	4.5	-	dB
Optical input power	-	-	14	dBm
Electro-optical bandwidth	-	12	-	GHz
V <sub>π</sub> RF @50 kHz	-	3.5	-	V
Electrical return loss	-	12	-	dB

Specifications given at 25 °C, 780 nm or 850 nm

## NIR-MX800-LN-20 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	780	-	850	nm
Insertion loss	-	4.5	-	dB
Optical input power	-	-	14	dBm
Electro-optical bandwidth	-	25	-	GHz
V <sub>π</sub> RF @50 kHz	-	3.5	-	V
Electrical return loss	-	12	-	dB

Specifications given at 25 °C, 780 nm or 850 nm

## NIR-MX800-LN-10 10 GHz Intensity Modulator

### Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optic bandwidth	$S_{21}$	RF electrodes, from 2 GHz	10	12	-	GHz
Ripple $S_{21}$	$\Delta S_{21}$	RF electrodes, $f < 10$ GHz	-	0.5	1	dB
Electrical return loss	$S_{11}$	RF electrodes	-	-12	-10	dB
$V_{\pi}$ RF @ 50 kHz	$V_{\pi RF_{50\text{ kHz}}}$	RF electrodes	-	3.5	4.5	V
$V_{\pi}$ DC electrodes	$V_{\pi DC}$	DC electrodes	-	3.5	4.5	V
impedance matching	$Z_{in-RF}$	-	-	50	-	$\Omega$
DC input impedance	$Z_{in-DC}$	-	-	1	-	$M\Omega$

### Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Operating wavelength	$\lambda$	-	780	800	850	nm
Insertion loss	IL	Without connectors	-	4.5	5.5	dB
DC extinction ratio	ER	Measured with narrow source linewidth $< 200$ MHz	20	22	-	dB
Optical return loss	ORL	-	-40	-45	-	dB
Chirp	$\alpha$	-	-0.1	0	0.1	-

All specifications given at 25 °C, 780 nm or 850 nm.

### Absolute Maximum Ratings

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-MX800-LN-20 20 GHz Intensity Modulator

### Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optic bandwidth	$S_{21}$	RF electrodes, from 2 GHz	20	25	-	GHz
Ripple $S_{21}$	$\Delta S_{21}$	RF electrodes, $f < 20$ GHz	-	0.5	1	dB
Electrical return loss	$S_{11}$	RF electrodes, $f < 20$ GHz	-	-13	-10	dB
$V\pi$ RF @ 50 kHz	$V\pi_{RF_{50\text{ kHz}}}$	RF electrodes	-	3.5	4.5	V
$V\pi$ DC electrodes	$V\pi_{DC}$	DC electrodes	-	3.9	4.5	V
impedance matching	$Z_{in-RF}$	-	-	50	-	$\Omega$
DC input impedance	$Z_{in-DC}$	-	-	1	-	$M\Omega$

### Optical Characteristics

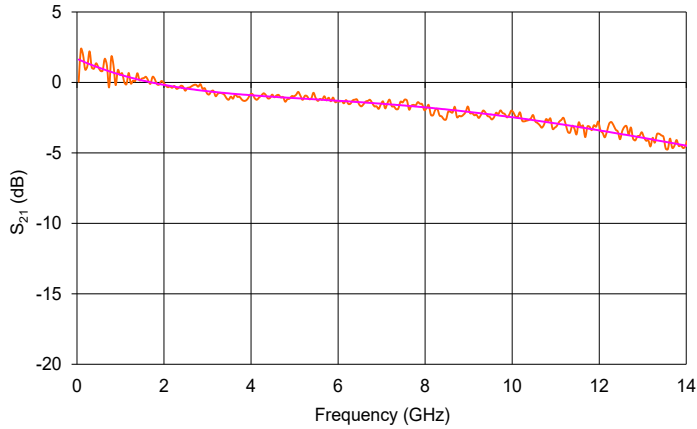
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Operating wavelength	$\lambda$	-	780	800	850	nm
Insertion loss	IL	Without connectors	-	4.5	5.5	dB
DC extinction ratio	ER	Measured with narrow source linewidth $< 200$ MHz	20	22	-	dB
Optical return loss	ORL	-	-40	-45	-	dB
Chirp	$\alpha$	-	-0.1	0	0.1	-

All specifications given at 25 °C, 780 nm or 850 nm.

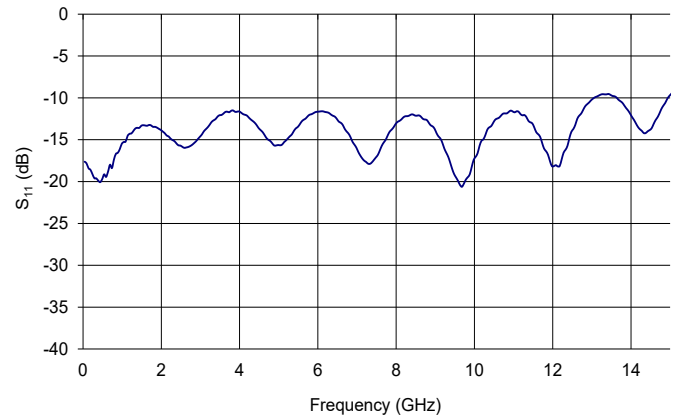
### Absolute Maximum Ratings

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

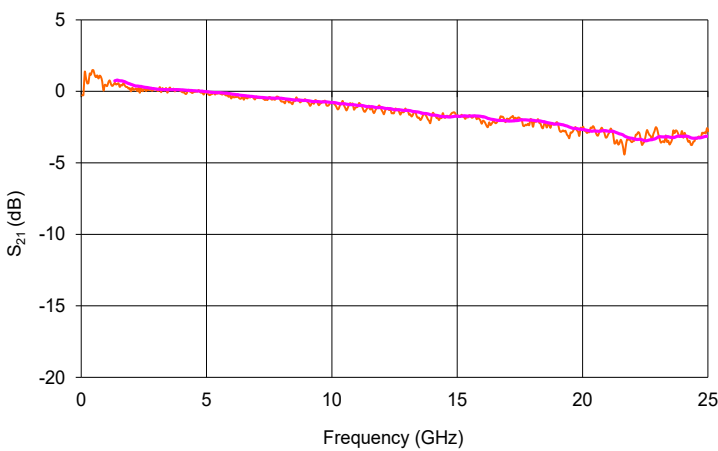
NIR-MX800-LN-10 Typical  $S_{21}$  Curve



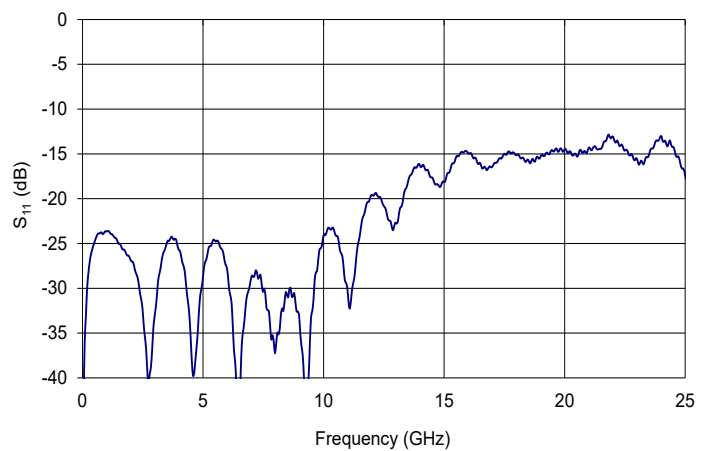
NIR-MX800-LN-10 Typical  $S_{11}$  Curve



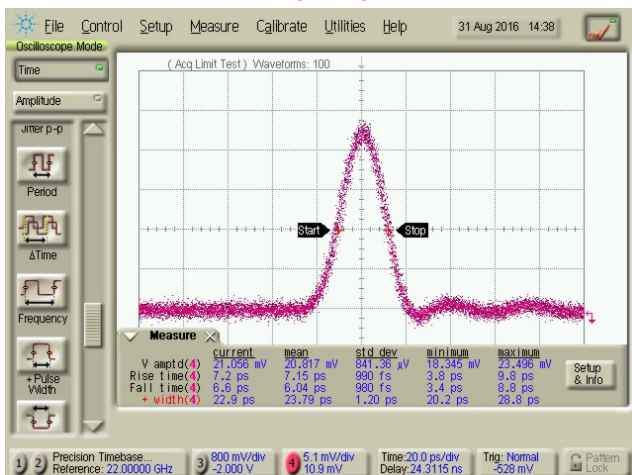
NIR-MX800-LN-20 Typical  $S_{21}$  Curve



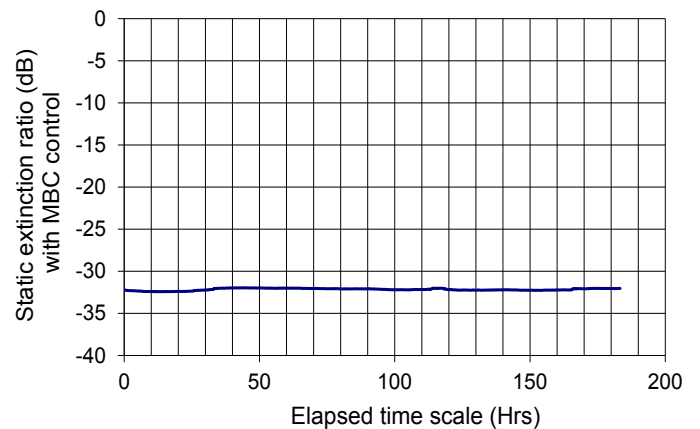
NIR-MX800-LN-20 Typical  $S_{11}$  Curve



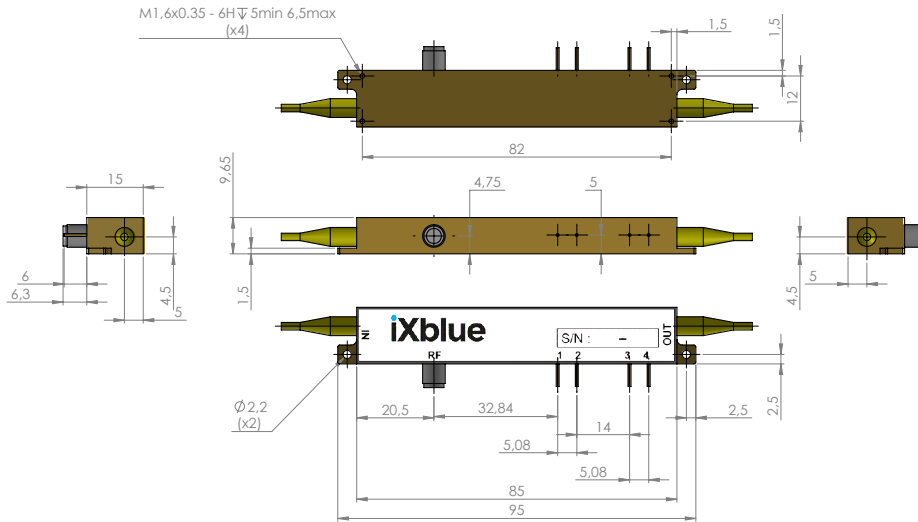
NIR-MX800-LN-20: 30 ps Square Pulse



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 mm
OUT	Optical output port	Polarization maintaining fiber, Corning PM 85-U25D, Length 1.5 meter. Buffer diameter 900 mm
RF	RF input port	Wiltron female K
1	Ground	Pin feed through diameter 1.0 mm
2	DC	Pin feed through diameter 1.0 mm
3,4	Not connected	Pin feed through diameter 1.0 mm

**Ordering information**

**NIR-MX800-LN-BW-00-Y-Z-AB-CD**

BW = Bandwidth : 10 10 GHz 20 20 GHz  
 00 = No monitoring PD  
 Y = Input fiber : P Polarization maintaining  
 Z = Output fiber : P Polarization maintaining  
 AB = Input connector : 00 bare fiber FA FC/APC FC FC/SPC (slow axis parallel to connector key)  
 CD = Output connector : 00 bare fiber FA FC/APC FC FC/SPC (slow axis parallel to connector key)  
 Note : optical connectors are Senko with narrow key or equivalent

**About us**

ixblue Photonics produces specialty optical fibers and Bragg gratings based fiber optics components and provides optical modulation solutions based on the company lithium niobate (LiNbO<sub>3</sub>) modulators and RF electronic modules.

ixblue Photonics serves a wide range of industries: sensing and instruments, defense, telecommunications, space and fiber lasers as well as research laboratories all over the world.

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