



FEATURES

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

APPLICATIONS

- Pulse generation / picking
- Carrier suppression
- Quantum optics

OPTIONS

- 1060 nm band versions
- Hermetic sealing

RELATED EQUIPMENTS

- RF amplifiers
- MBC-DG Automatic Bias Controllers
- NIR-MPX800 phase modulators

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

Like all Photline Technologies Near InfraRed (NIR) modulators, the NIR-MX800 series use a proton exchanged based waveguide process that confers them an unparalleled stability and a high photo-refractive threshold.

NIR-MX800-LN-10 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	780	-	850	nm
Insertion loss	-	3.5	-	dB
Optical input power	-	-	13	dBm
Electro-optical bandwidth	-	12	-	GHz
V π RF @50 kHz	-	3.5	-	V
Electrical return loss	-	12	-	dB

Specifications given at 25 °C, 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	-	-	13	dBm
Electro-optical bandwidth	-	25	-	GHz
V π RF @50 kHz	-	3.5	-	V
Electrical return loss	-	12	-	dB

Specifications given at 25 °C, 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}	ΔS_{21}	RF electrodes, $f < 10$ GHz	-	0.5	1	dB
Electrical return loss	ES_{11}	RF electrodes	-	-12	-10	dB
V_{π} RF @50 kHz	$V_{\pi RF_{50\text{ kHz}}}$	RF electrodes	-	3.5	4.5	V
V_{π} DC electrodes	$V_{\pi DC}$	DC electrodes	-	3.5	4.5	V
RF input impedance	Z_{in-RF}	-	-	40	-	Ω
DC input impedance	Z_{in-DC}	-	-	1	-	M Ω

Optical Characteristics

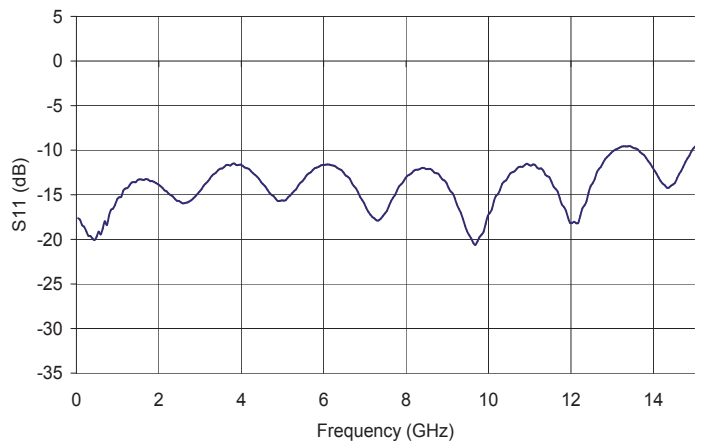
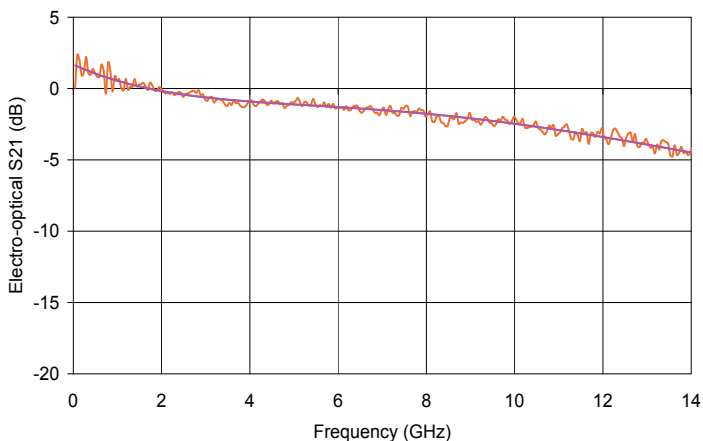
All specifications given at 25 °C, 850 nm, unless different specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Operating wavelength	λ	-	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	α	-	-0.1	0	0.1	-

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}	-	13	dBm
Operating temperature	OT	0	+70	°C
Storage temperature	ST	-40	+85	°C

S_{21} & S_{11} Parameter Curves at RF input port



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 S21	ΔS_{21}	RF electrodes, $f < 20$ GHz	-	0.5	1	dB
Electrical return loss	ES_{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
RF input impedance	Z_{in-RF}	-	-	50	-	Ω
DC input impedance	Z_{in-DC}	-	-	1	-	M Ω

Optical Characteristics

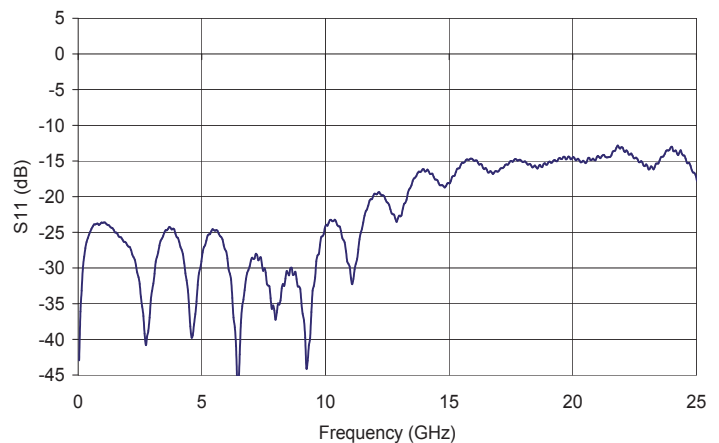
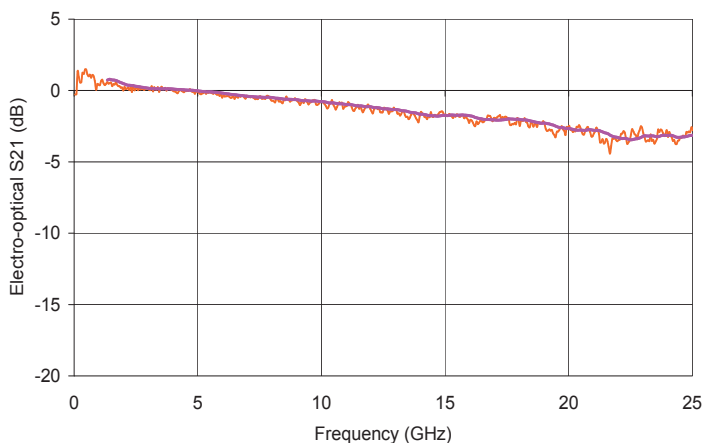
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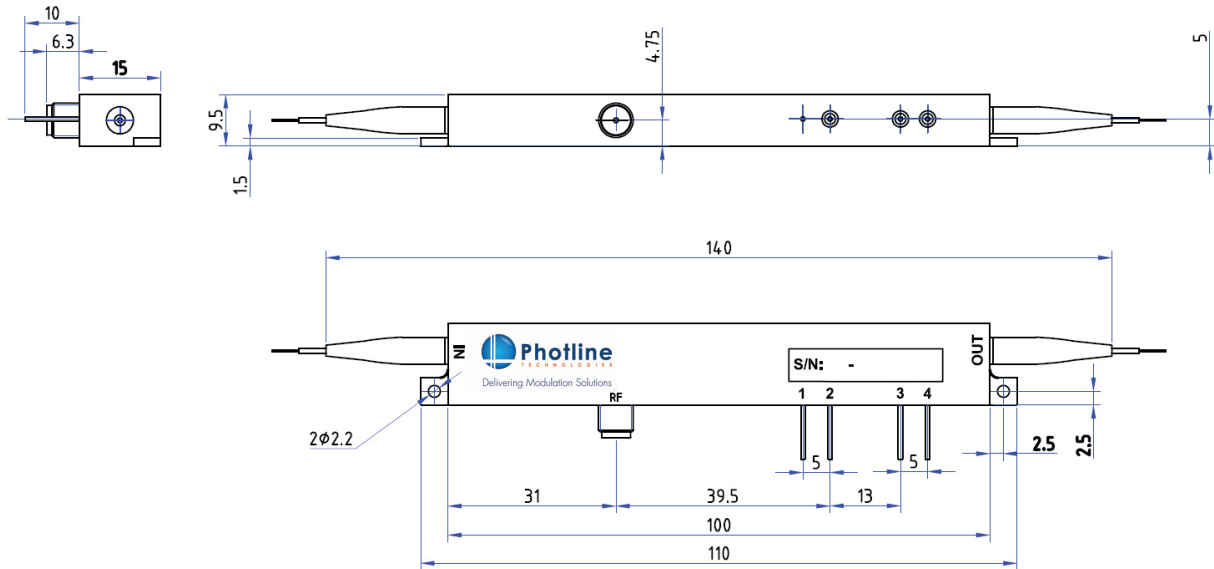
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Operating wavelength	λ	-	780	800	850	nm
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Absolute Maximum Ratings

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Storage temperature	ST	-40	+85	°C

S21 & S11 Parameter Curves at RF input port



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
1	Ground	Pin feed through diameter 1.0 mm
2	DC	Pin feed through diameter 1.0 mm
3	Photodiode cathode	Pin feed through diameter 1.0 mm
4	Photodiode anode	Pin feed through diameter 1.0 mm

Ordering information
NIR-MX800-LN-BW-Y-Z-AB-CD

BW = Bandwidth : 10 10 GHz 20 20 GHz

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

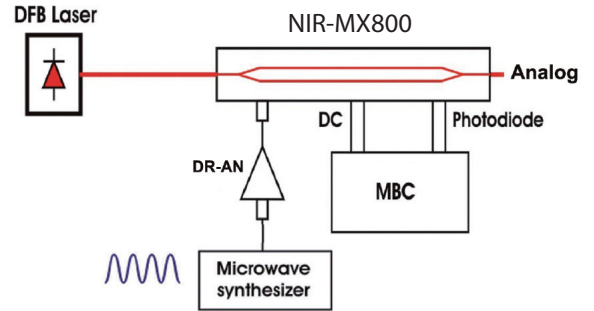
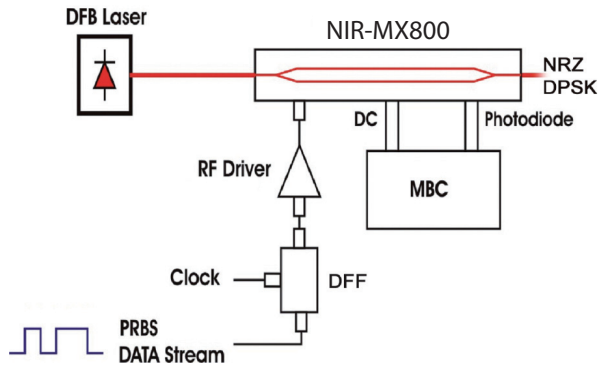
Z = Input fiber : P Polarisation maintaining S Standard single mode

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 Seikoh-Giken with narrow key or equivalent

Related equipments



OOK-NRZ, DPSK transmission

DR-DG series amplifiers are designed to drive NIR-MX800-LN at one and two times $V\pi$ for NRZ and DPSK modulation scheme.

MBC-DG-BT is an automatic bias controller that locks the operating point of the NIR-MX800-LN modulators.

DFF-DG-30 is a D-type Flip Flop module intended for NRZ retiming and reshaping PRBS data-stream.



Carrier suppressed / Analog modulation

DR-AN amplifiers series are a wideband amplifiers modules designed for analog applications at frequencies up to 40 GHz.

MBC-DG-BT is an automatic bias controller designed to lock the operating point of the NIR-MX800-LN modulators.



Modboxes are a family of turnkey optical transmitters and external benchtop units for telecommunication applications.

ModBoxes for 10 Gb/s up to 28 Gb/s NRZ, RZ, DPSK, Stressed Eyes, Multi-channel, Analogue Optical Modulation Units are designed to generate high performances transmission and reception system.

About us

Photline Technologies is a provider of Fiber Optics Modulation Solutions based on the company LiNbO_3 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.