Photline Technologies

MX-LN-10/20 Lithium Niobate 10 & 20 Gb/s Intensity Modulators

Description

The MX-LN series of intensity modulators is a complete family of high performance modulators designed for integration in transmission systems and modules at 10 Gb/s or 20 Gb/s.

These modulators are built with titanium in-diffused lithium niobate waveguides that offer long-term stability and temperature independent performance.

MX-LN series boasts a chirp-free x-cut design which makes these modulators ideal for long and ultra-long haul transmission.

Whether for point to point or for Dense Wavelength Division Multiplexing (DWDM) optical transmissions, these modulators operate equally well with return-to-zero (RZ), non return-to-zero (NRZ) and duobinary modulation formats.

Features

- Extended bandwidth for efficient FEC implementation and 12.5 Gb/s effective bit rate (MX–LN-10) or 25 Gb/s bit rate (MX-LN-20)
- SONET OC-192 and SDH STM-64 compatible (MX-LN-10)
- Optimized for NRZ and RZ modulation schemes
- Broad wavelength range for DWDM transmission; work in C and L bands
- Bias electrode separated from RF input for easy implementation (no need for bias T)
- Low drive voltage

Options

- Internal monitoring photodiode
- Choice of input and output fibers
- 1300 nm version
- CMD model with integrated RF driver
- MXPE model with very high extinction ratio for specific applications

Related Equipments

- Optimized external RF drivers : DR-GA series
- Bias Voltage Controller : MBC-1000
- ModBox's

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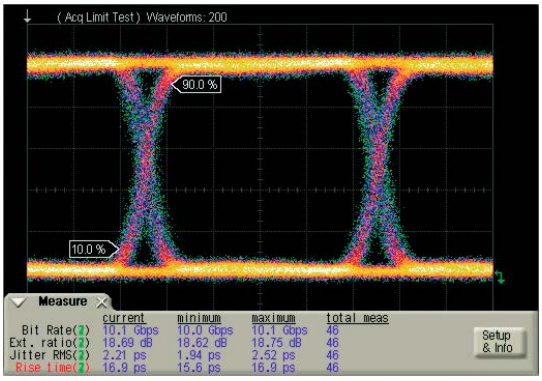
Specifications

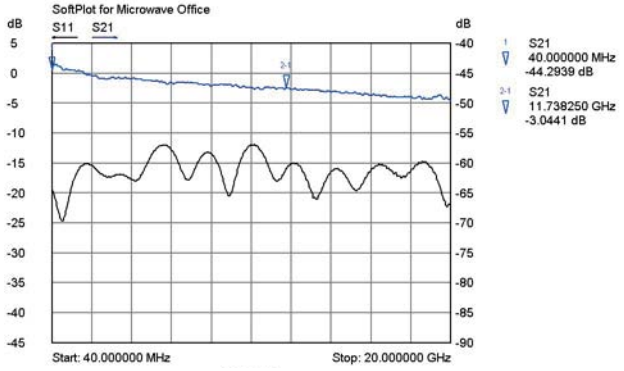
Electrical		Min	Typ	Max
V_π DC electrodes	V		6.5	7
MX-LN-10 V_π RF electrodes @ 50 kHz	V		5.1	5.5
MX-LN-10 V_π RF electrodes @ 10 Gb/s PRBS	V		5.5	6
MX-LN-20 V_π RF electrodes @ 20 GHz	V		7.5	8
MX-LN-10 electro-optic bandwidth S_{21} @-3 dB	GHz	10	12	
MX-LN-20 electro-optic bandwidth S_{21} @-3 dB	GHz	18	20	
Ripple	dB		0.5	1
Electrical return loss S_{11} 0-20 GHz	dB		-12	-10
Input resistance RF connector	Ω		40	
Input resistance DC connector	Ω		>1 M	
Internal photodiode responsivity (ref: input power)(1)	A/W	0.015	0.025	0.035
Optical				
Crystal	Lithium Niobate X-Cut Y-Prop			
Waveguide process	Titanium indiffusion			
Insertion loss	dB		-4	-5
Optical return loss	dB		<-40	
Wavelength dependent loss (1480-1600 nm)	dB		0.5	1
DC extinction ratio	dB	20	22	
MX-LN-10 dynamic extinction ratio @ 10 Gb/s PRBS NRZ	dB	13	14	
Chirp parameter		-0.1	0	0.1
MX-LN-10 BER power penalty @ 850 ps/nm, 10 Gb/s PRBS	dB	1.1	1.2	1.3
Extinction ratio of internal photodiode(1)	dB		3	6
Interfaces				
Input fiber	Polarization maintaining , SM-15-P-8/125UV/UV-400 length : 1.5 meter, buffer diameter : 900 µm			
Output fiber	Single mode type , SMF-28 length : 1.5 meter, buffer diameter : 900 µm			
Output fiber (option)	Polarization maintaining , SM-15-P-8/125UV/UV-400 length : 1.5 meter, buffer diameter : 900 µm			
Package size	100 x 15 x 9.5 mm^3			
Input RF connector	Wiltron Female K			
DC connectors	pin feed through diameter 1.0 mm			
Photodiode connectors (1)	pin feed through diameter 1.0 mm			
Environmental				
Operating temperature	0°C to +70°C			
Storage temperature	-40°C to +85°C			
Maximum ratings				
Maximum voltage on DC input	±20 V			
Maximum RF input power	+28 dBm			
Maximum optical input power	+20 dBm			

(1) : when option internal photodiode is selected

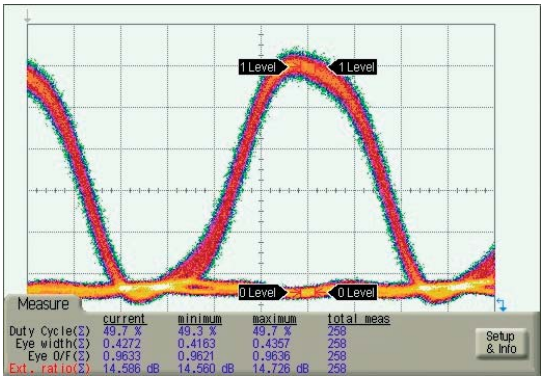
Typical curves



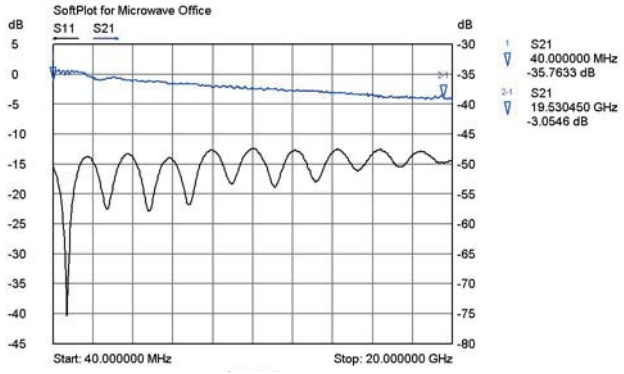
10 Gb/s NRZ eye diagram



MX-LN-10 electro-optic bandwidth

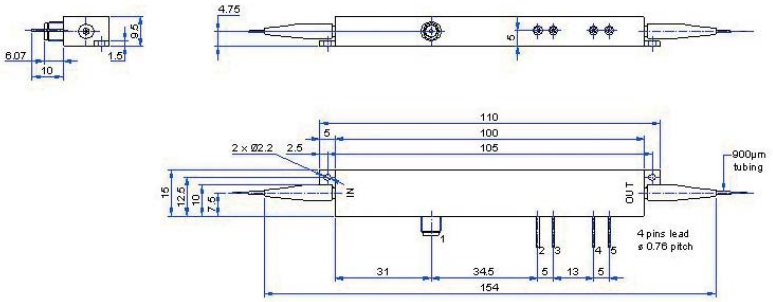


10 Gb/s RZ eye diagram



MX-LN-20 electro-optic bandwidth

Package footprint



1 RF INPUT
2 GROUND
3 BIAS INPUT
4 PHOTODIODE CATHODE
5 PHOTODIODE ANODE

dimensions in mm

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Ordering information

MX-LN-BW-XX-Y-Z-AB-CD

BW : **10** bandwidth ≥12 GHz ; **20** bandwidth ≥18 GHz
XX : **00** no photodiode; **PD** internal monitoring photodiode
Y : input fiber : **P** polarisation maintening; **S** standard single mode
Z : output fiber : **P** polarisation maintening; **S** standard single mode
AB : input connector : **00** bare fiber; **FA** : FC/APC; **FC** : FC/SPC
CD : output connector : **00** bare fiber; **FA** : FC/APC; **FC** : FC/SPC

About us

Photline Technologies is a provider of modulation solutions for high data rate optical networks and high bandwidth optical applications.

Photline family of components allow system manufacturers to gain competitiveness by offering excellence in performance together with maximum value per euro and dollar, per cm^3 of occupied space and per mW of used power.

Also available from Photline

Products	Series	
Intensity modulators	MX-LN MXPE-LN NIR-MX-LN	10, 20 and 40 Gb/s very high extinction ratio modulators 1000 nm region specific
QPSK modulators	QPSK-LN	40 Gb/s and 20 Gb/s QPSK modulators
Phase modulators (1300 nm & 1550 nm)	MPZ-LN	Low frequencies, 10 Gb/s and 20 Gb/s
RF drivers for modulators	DR-GA	10 Gb/s, 20 Gb/s and 40 Gb/s
1000 nm Intensity and Phase Modulators	NIR-LN	03 GHz, 10 GHz and 20 GHz
Modulator Bias Controllers	MBC	MBC-1000 : benchtop-instrument, MBC-Card : OEM board
Transmitters	ModBox's	Integrated benchtop transmitters and modulation units

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