MPX1300 and MPZ1300 series

Low frequencies to 20 GHz Phase Modulators

The iXblue MPX1300 and MPZ1300 series are lithium niobate ($LiNbO_3$) phase modulators specially designed for operation in the 1310 nm wavelength band. Thanks to their O-Band optimized optical waveguides design and their 1310 nm selected fibers, the MPX1300 and MPZ1300 can be claimed genuine 1310 nm phase modulators.

- The MPZ1300-LN-10 is ideally suited for wide bandwidth operation up to 20 GHz.
- The MPX1300-LN-0.1 has a high impedance input optimized for modulation frequencies up to 300 MHz.



Designed using state-of-the-art and proven lithium niobate technology, MPX1300 and MPZ1300 series phase modulators are easy to operate and to integrate. These modulators come with a comprehensive range of options (DC Coupled, High Electric Power) to offer the highest performance for a wide range of applications from laboratory experiments to demanding industrial systems.

FEATURES

- · Low and wide EO bandwidth
- · Full O-Band operation
- Low Vπ
- · Low insertion loss

APPLICATIONS

- · Side bands generation
- Laser Combining
- · Interferometric sensing
- · Frequency shifting / broadening
- · Quantum Key Distribution (QKD)
- · Pound-Drever-Hall locking (PDH)
- · High data rate telecommunications

OPTIONS

- DC coupled
- · Low residual intensity modulation
- · High electrical input power capability
- · Optical E and S bands version

RELATED EQUIPMENTS

- · Matched RF amplifiers
- · MX, MXAN, MXER intensity modulators
- · Short optical pulse ModBox

MPX1300-LN-0.1 Phase Modulators Highlights

Parameter	
Operating wavelength	1270 nm - 1360 nm
Usable Electro-optical bandwidth	300 MHz
Vπ RF @50 kHz	3 V
Insertion loss	3 dB

MPZ1300-LN-10 Phase Modulators Highlights

Parameter		
Operating wavelength	1270 nm - 1360 nm	
Usable electro-optical bandwidth	20 GHz	
Vπ RF @50 kHz	4 V	
Insertion loss	3.3 dB	

iXblue

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MODULATOR | MPX1300-LN AND MPZ1300-LN SERIES | 2/4

MPX1300-LN-0.1

Up to 300 MHz Phase Modulator

Electrical Characteristics

Parameter	Symbol	Condition	Min	Тур	Max	Unit
Electro-optical bandwidth	S ₂₁	-	-	150	- XXX	MHz
Usabe electro-optical bandwidth	S ₂₁	-	-	300	-	MHz
Vπ RF @50 kHz	$V\pi_{_{RF50\;kHz}}$	· 15	-	3	3.5	V
RF Input Impedance	Z_{in-RF}	- & L	-	10 000	-	Ω

Optical Characteristics

Parameter	Symbol	Condition	Min	Тур	Max	Unit
Crystal	7	- <u>,</u>	Lithium I	Niobate X-Cut	: Y-Prop	
Waveguide process	<u> </u>	- 883	Ti diffusi	on		
Operating wavelength	λ		1270	1310	1360	nm
Insertion loss	IL	Without optical connectors	-	3	4	dB
Optical return loss	ORL		-40	-45	_{_}	dB

All specifications given at 25 °C, 1310 nm, unless differently specified.

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	OP _{in}	×2.	+20	dBm	
Operating temperature	OT	0	+70	°C	
Storage temperature	ST	-40	+85	°C	

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MODULATOR | MPX1300-LN AND MPZ1300-LN SERIES | 3/4

MPZ1300-LN-10

Up to 20 GHz Phase Modulator

Electrical Characteristics

Davamantar	Cymabal	Condition	Min	T. (10	May	Unit
Parameter	Symbol	Condition	Min	Тур	Max	Offic
Electro-optical bandwidth	S ₂₁	-	10	12	-	GHz
Usable electro-optical bandwidth	S ₂₁	-	-	20	- X	GHz
Ripple S ₂₁	ΔS_{21}	-	-	0.5	1	dB
Electrical return loss	S ₁₁		-	-17	-13	dB
		HEP option	-	-14	-10	dB
Vπ RF @50 kHz	$V\pi_{_{RF50kHz}}$	- 354	-	3.3	4	V
Vπ RF @10 GHz	$V\pi_{_{RF10GHz}}$	_1(0)	-	4.5	5.5	V
RF impedance matching	Z _{in-RF}	3-	-	50	-	Ω
Vπ DC electrodes	$V\pi_{DC}$	DCC option, housing #B	-	3.3	6	V
DC port impedance matching	$Z_{\text{in-DC}}$	DCC option, housing #B	1	? <u>-</u>	-	ΜΩ

Optical Characteristics

Parameter	Symbol	Condition	Min	Тур	Max	Unit
Crystal	-	- 32.7	Lithium I	Niobate Z-Cut	Y-Prop	
Waveguide process	-	- 28/57	Ti diffusio	on		
Operating wavelength	λ	·	1270	1310	1350	nm
Insertion loss	IL	Without optical connectors	-	2.5	3.5	dB
Optical return loss	ORL	-3)?	-40	-45	-	dB

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Absolute Maximum Ratings

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Parameter	Symbol	Condition	Min	Тур	Max	Unit
RF input power	EP _{in}	- 35	-	-	+28	dBm
High electrical input power option	HEP_{in}	HEP option	-	-	+33	dBm
	OP_in	For optimal performance	ce -		+12	dBm
Optical input power		Before failure	-	- 355	+20	dBm
Bias voltage range	V _{DCC}	DCC option, housing #E	3 -15	-	+15	V
Operating temperature	ОТ	-	0	-	+70	°C
Storage temperature	ST	-	-40	-	+85	°C

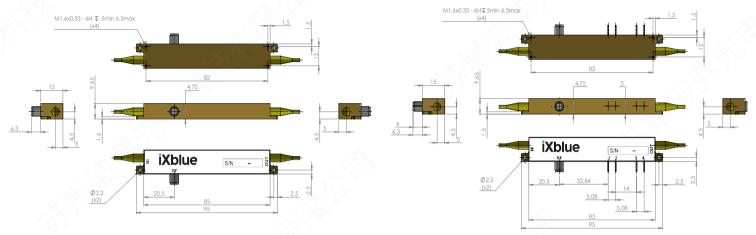
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Mechanical Diagram and Pinout

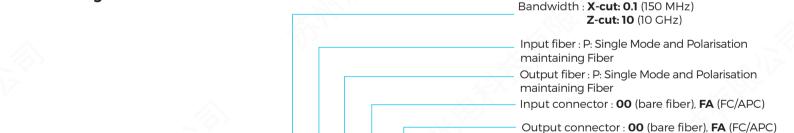
All measurements in mm



Housing #A: Standard Modulator housing

Housing #B: Modulator housing with DCC

Port	Function	Housing	Note	
IN	Optical input port	#A & #B	Polarization maintaining fiber 1310 nm, PM13-U25D, length: 1.5 meter, Buffer diameter: 900 µm	
OUT	Optical output port	#A & #B	Polarization maintaining fiber 1310 nm, PM13-U25D, length: 1.5 meter, Buffer diameter: 900 µm	
RF	RF input port	#A & #B	Female K (SMA comptatible)	
PINS 1/2	Ground / DC	#B	Pin feed through diameter 1.0 mm	



About us

Ordering information

iXblue Photonics produces specialty optical fibers and Bragg gratings based fiber optics components and provides optical modulation solutions based on the company lithium niobate $(LiNbO_3)$ 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.

MPZ1300-LN-10-00-П-П-П-П-П

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