



## FEATURES

- Superior extinction ratio
- High bandwidth
- X-cut for high stability
- Low insertion loss

## APPLICATIONS

- Carrier Suppression Single Side Band
- QPSK, QAM, OFDM

## RELATED EQUIPMENTS

- Analog driver DR-AN
- MBC-IQ Automatic Bias Controller
- ModBox-QAM, ModBox-CS-SSB

The MXIQER-LN-30 optical IQ modulator is a high bandwidth, low insertion loss, high extinction ratio Dual Parallel Mach-Zehnder Modulator. ixblue proprietary "Magic Junction" (patent n° US2008193077) confers it an unmatched low insertion loss with high optical extinction ratio, and its X-cut design guarantees high stability and zero chirp in a wide range of operational conditions.

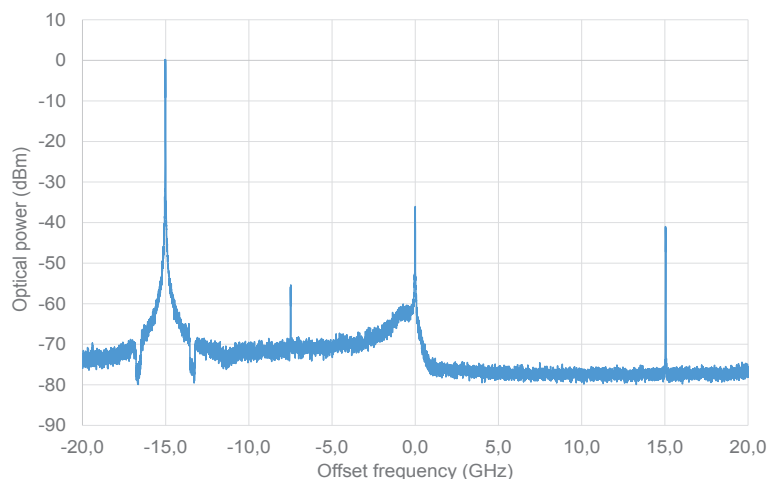
The MXIQER modulator is key device in all applications where a combination of high extinction and high bandwidth is required, such as complex modulation schemes QPSK, QAM, OFDM and Single Side Band optical signal generation with high suppression ratio of main carrier.

## MXIQER-LN-30 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	1530	1550	1580	nm
Insertion loss	-	5	7	dB
Carrier attenuation	32	40	-	dB
Side-Band attenuation	32	40	-	dB
Electro-optical bandwidth	20	25	-	GHz

Specifications given at 25 °C, 1550 nm

## Optical CS-SSB modulation with carrier and subcarrier suppressions



## 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	-	0.5	1	dB
Electrical return loss	$S_{11}$	RF electrodes, 0 - 20 GHz	-	-12	-10	dB
$V_{\pi}$ RF @ 50 kHz	$V_{\pi RF_{50\text{ kHz}}}$	RF <sub>1</sub> & RF <sub>2</sub> electrodes	-	6	7	V
$V_{\pi}$ DC <sub>1,2</sub> electrodes	$V_{\pi DC_{1,2}}$	DC <sub>1</sub> & DC <sub>2</sub> electrodes	-	7	7.5	V
$V_{\pi}$ DC <sub>3</sub> electrodes	$V_{\pi DC_3}$	DC <sub>3</sub> electrodes	-	7.5	8.5	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	$\lambda$	-	1530	1550	1580	nm
Insertion loss	IL	Without connectors	-	5	7	dB
Carrier attenuation	C-SER	Measured at 1550 nm and 15 GHz	32	40	-	dB
Side-Band attenuation	SB-SER		32	40	-	dB
Optical return loss	ORL	-	-40	-45	-40	dB
Chirp	$\alpha$	-	-0.1	0	-0.1	-

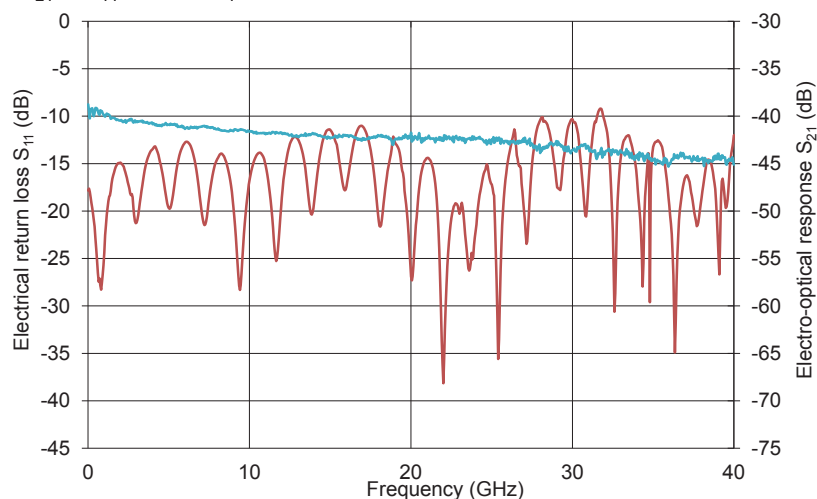
All specifications given at 25°C, 1550 nm, unless differently specified

## Absolute Maximum Ratings

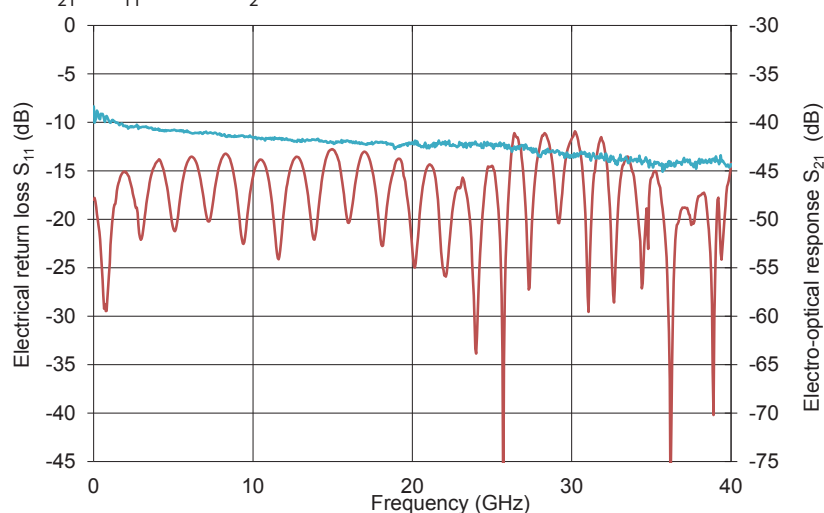
Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

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

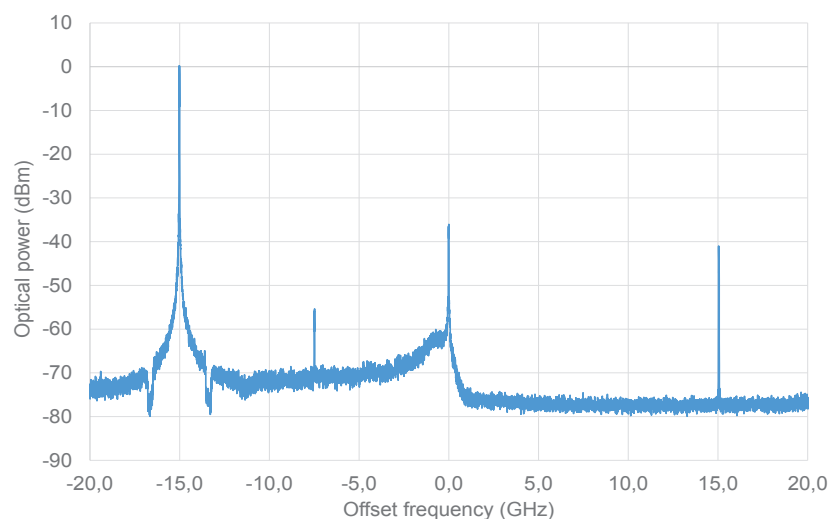
Typical Curve  $S_{21}$  &  $S_{11}$  from RF<sub>1</sub> Electrode



Typical Curve  $S_{21}$  &  $S_{11}$  from RF<sub>2</sub> Electrode

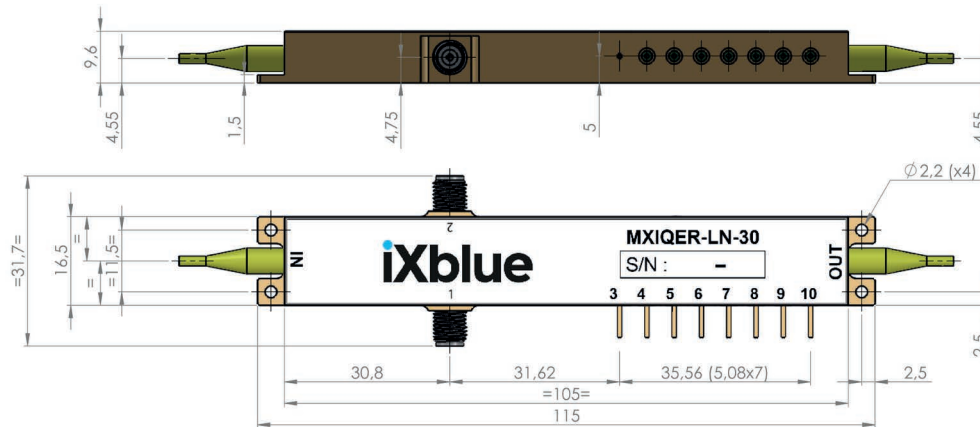


Optical CS-SSB modulation with carrier and subcarrier (modulation @15 GHz)



## Mechanical Diagram and Pinout

All measurements in mm



Port	Function	Note
IN / OUT	Optical input port / Optical output port	Polarization maintaining 1550 nm Corning PM 15-U25D length: 1.5 meter, buffer diameter: 900 $\mu$ m
1 / 2	RF <sub>1</sub> input port / RF <sub>2</sub> input port	Wiltron female K (SMA compatible)
3	Ground	Pin feed through diameter 1.0 mm
4 / 5 / 6	DC <sub>1</sub> / DC <sub>2</sub> / DC <sub>3</sub>	Pin feed through diameter 1.0 mm
7 / 8	Photodiode 1 cathode / anode	Pin feed through diameter 1.0 mm
9 / 10	Photodiode 2 cathode / anode	Pin feed through diameter 1.0 mm

## Ordering information

### MXIQER-LN-30-PD-Y-Z-AB-CD

Y = Input fiber : P Polarisation maintaining  
 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/SPCNote : optical

## 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.