

**MODULATOR**

# MXIQ-LN-30

## 1550 nm wide bandwidth IQ Modulator

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

The Exail MXIQ-LN-30 modulator is a key device dedicated to complex modulation scheme such as QPSK, QAM and OFDM up to 56 Gbaud.


**Features**

- Wide bandwidth
- X-cut for high stability
- Low insertion loss

**Applications**

- QPSK, QAM, OFDM

**Related Equipments**

- Analog driver DR-AN-HO
- MBC-IQ Automatic Bias Controller
- ModBox-IQ

**MXIQ-LN-30 Performance Highlights**

Parameter	Min	Typ	Max	Unit
Operating wavelength	1530	1550	1580	nm
Insertion loss	-	5	7	dB
Electro-optical bandwidth	20	25	-	GHz
Usable EO bandwidth	30	40	-	GHz

Specifications given at 25 °C, 1550 nm



**MODULATOR | MXIQ-LN-30 | 2/4**

# MXIQ-LN-30

**Electrical Characteristics**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optical bandwidth	$S_{21}$	RF electrodes, from 2 GHz	20	25	-	GHz
Usable EO bandwidth	$S_{21}$	-	30	40	-	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	-	5	6	V
$V_{\pi}$ DC <sub>1,2</sub> electrodes	$V_{\pi_{DC, 1,2}}$	DC <sub>1</sub> & DC <sub>2</sub> electrodes	-	6	7	V
$V_{\pi}$ DC <sub>3</sub> electrodes	$V_{\pi_{DC, 3}}$	DC <sub>3</sub> electrodes	-	9.5	10.5	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 optical connectors <sup>(1)</sup>	-	5	7	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.  
<sup>(1)</sup> Consider an extra-loss up to 0.25 dB for each FC/APC optical connector

**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.

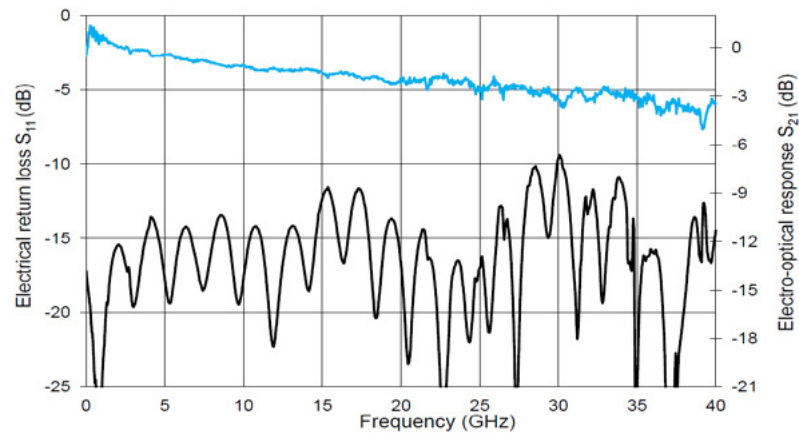
Parameter	Symbol	Min	Max	Unit
RF input power	$EP_{in}$	-	28	dBm
Bias Voltage	$V_{bias}$	-20	+20	V
Optical input power	$OP_{in}$	-	20	dBm
Operating temperature	OT	0	+70	°C
Storage temperature	ST	-40	+85	°C



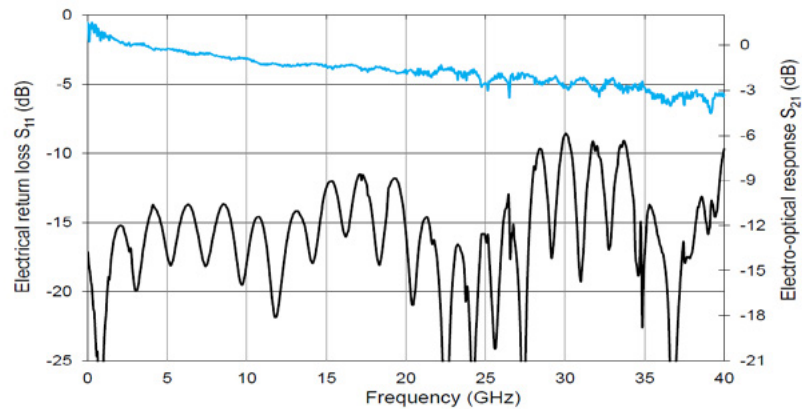
MODULATOR | **MXIQ-LN-30** | 3/4

## MXIQ-LN-30

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



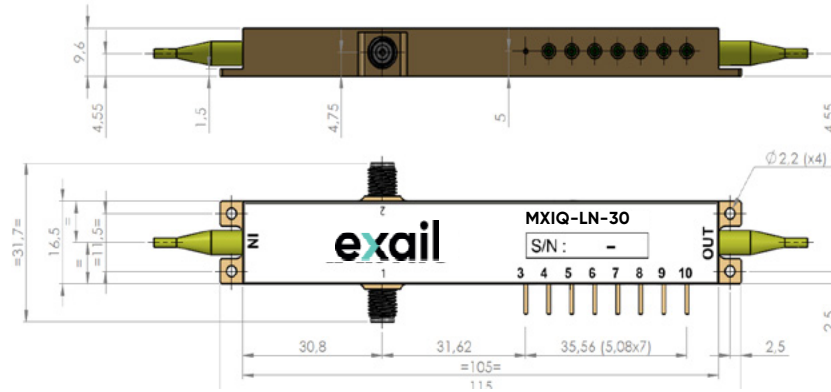
Typical Curve  $S_{21}$  &  $S_{11}$  from RF<sub>2</sub> Electrode



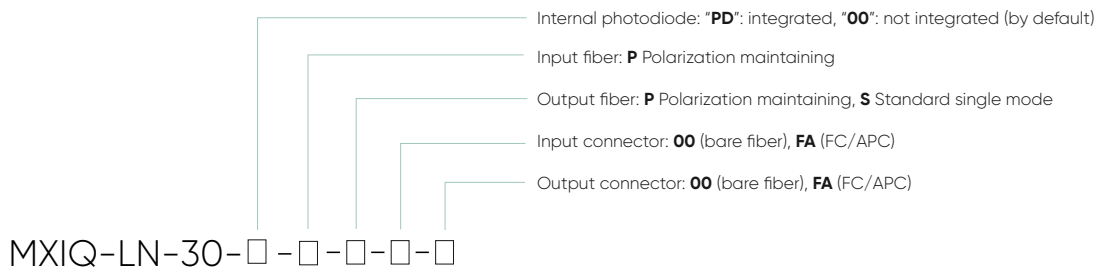
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**MODULATOR | MXIQ-LN-30 | 4/4**
**Mechanical Diagram and Pinout**

All measurements in mm



Port	Function	Note
IN	Optical input port	Polarization maintaining fiber Corning PM 15-U25D Length: 1.5 meter, buffer diameter: 900 $\mu$ m
OUT	Optical output port	Polarization maintaining fiber Corning PM 15-U25D Length: 1.5 meter, buffer diameter: 900 $\mu$ m
1, 2	RF1 input port / RF2 input port	Female K (SMA compatible)
3	Ground	Pin feed through diameter 1.0 mm
4, 5, 6	DC2 / DC1 / DC3	Pin feed through diameter 1.0 mm
7, 8	Photodiode 1 anode / cathode	Pin feed through diameter 1.0 mm
9, 10	Photodiode 2 cathode / anode	Pin feed through diameter 1.0 mm

**Ordering information**


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