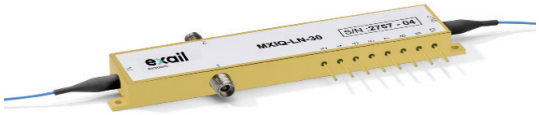
MODULATOR

MXIQ-LN-series

1550 nm wide bandwidth IQ Modulator

The Exail MXIQ-LN series are a wide bandwidth, low insertion loss Dual Parallel Mach-Zehnder Modulators. 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-series modulator are key devices 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
- Bandwidth 10 GHz, 30 GHz

Applications

- QPSK, QAM, OFDM

Related Equipments

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

MXIQ-LN-10 Performance Highlights

Parameter	Min	Typ	Max	Unit
Operating wavelength	1530	1550	1580	nm
Insertion loss	-	5	7	dB
Electro-optical bandwidth	10	12	-	GHz
Usable EO bandwidth	20	-	-	GHz
Vπ RF @50 kHz	-	3.8	-	V

Specifications given at 25 °C, 1550 nm

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
Vπ RF @50 kHz	-	5	-	V

Specifications given at 25 °C, 1550 nm

MXIQ-LN-10

Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optical bandwidth	S_{21}	RF electrodes, from 2 GHz	10	12	-	GHz
Usable EO bandwidth	S_{21}	-	20	-	-	GHz
Ripple S_{21}	ΔS_{21}	RF electrodes	-	0.5	1	dB
Electrical return loss	S_{11}	RF electrodes, 0 - 20 GHz	-	-12	-10	dB
Vπ RF @50 kHz	$V\pi_{RF\ 50\ kHz}$	RF_1 & RF_2 electrodes	-	3.8	4.5	V
Vπ $DC_{1,2}$ electrodes	$V\pi_{DC\ 1,2}$	DC_1 & DC_2 electrodes	-	6	7	V
Vπ DC_3 electrodes	$V\pi_{DC\ 3}$	DC_3 electrodes	-	9.5	10.5	V
Impedance matching	Z_{in-RF}	-	-	50	-	Ω
DC input impedance	Z_{in-DC}	-	1	-	-	MΩ

Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Crystal	-	-	Lithium Niobate X-Cut Y-Prop			
Operating wavelength	λ	-	1530	1550	1580	nm
Insertion loss	IL	Without optical connectors [1]	-	5	7	dB
Optical return loss	ORL	-	-40	-45	-	dB
Chirp	α	-	-0.1	0	+0.1	-

All specifications given at 25 °C, 1550 nm, unless differently specified.
[1] 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

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}	ΔS_{21}	RF electrodes	-	0.5	1	dB
Electrical return loss	S_{11}	RF electrodes, 0 - 20 GHz	-	-12	-10	dB
Vπ RF @50 kHz	$V\pi_{RF\ 50\ kHz}$	RF_1 & RF_2 electrodes	-	5	6	V
Vπ $DC_{1,2}$ electrodes	$V\pi_{DC\ 1,2}$	DC_1 & DC_2 electrodes	-	6	7	V
Vπ DC_3 electrodes	$V\pi_{DC\ 3}$	DC_3 electrodes	-	9.5	10.5	V
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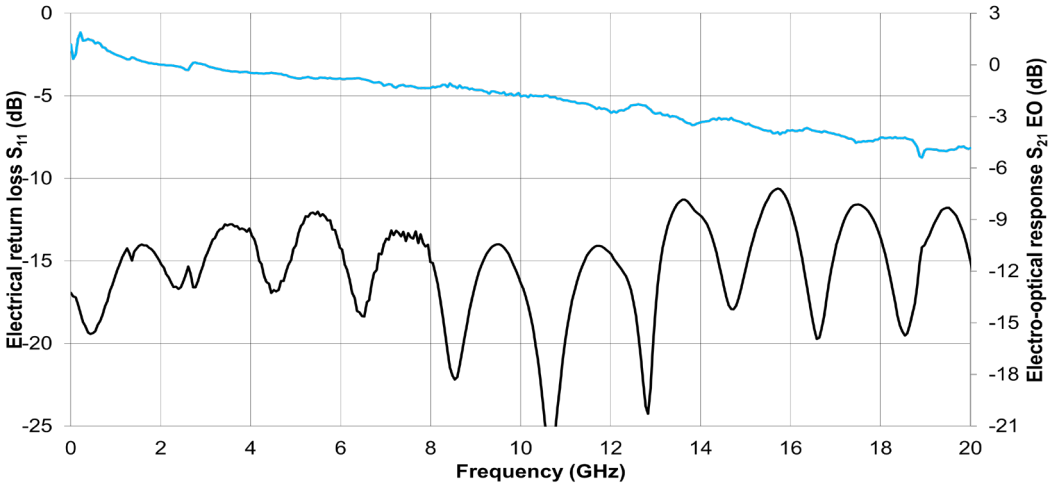
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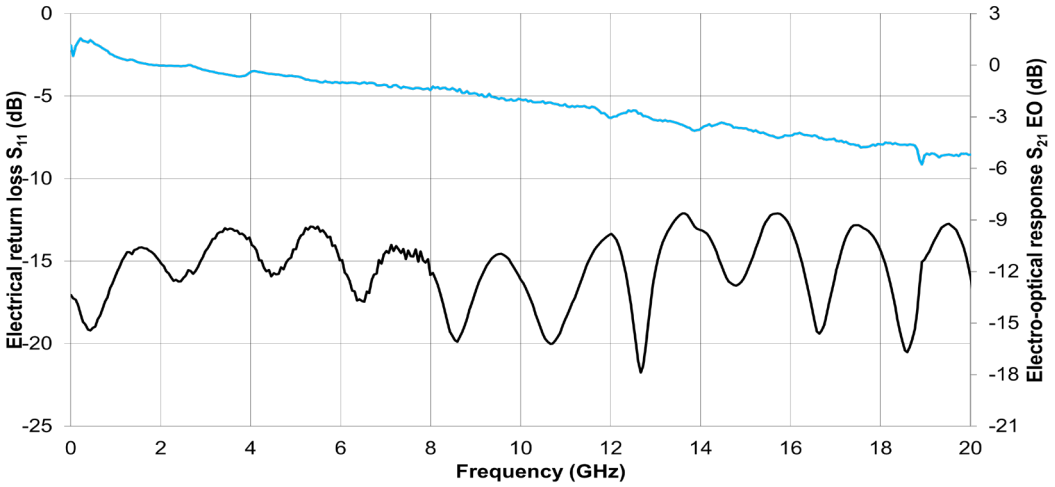
Parameter	Symbol	Min	Max	Unit
RF input power	EP_{in}	-	28	dBm
Bias Voltage	V_{bias}	-20	+20	V
Optical input power	OP_{in}	-	20	dBm
Operating temperature	OT	0	+70	°C
Storage temperature	ST	-40	+85	°C

MXIQ-LN-10

Typical Curve S_{21} & S_{11} from RF_1 Electrode

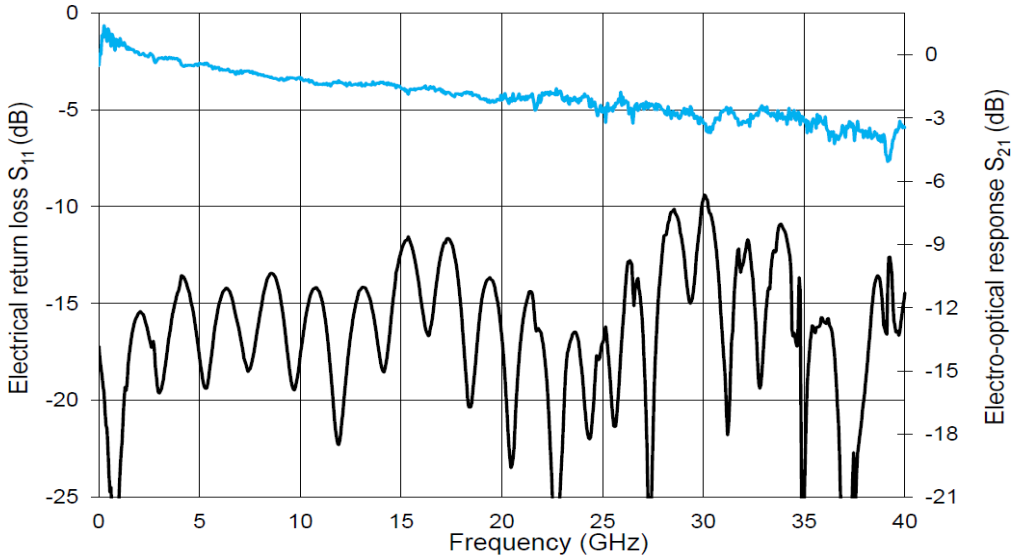


Typical Curve S_{21} & S_{11} from RF_2 Electrode

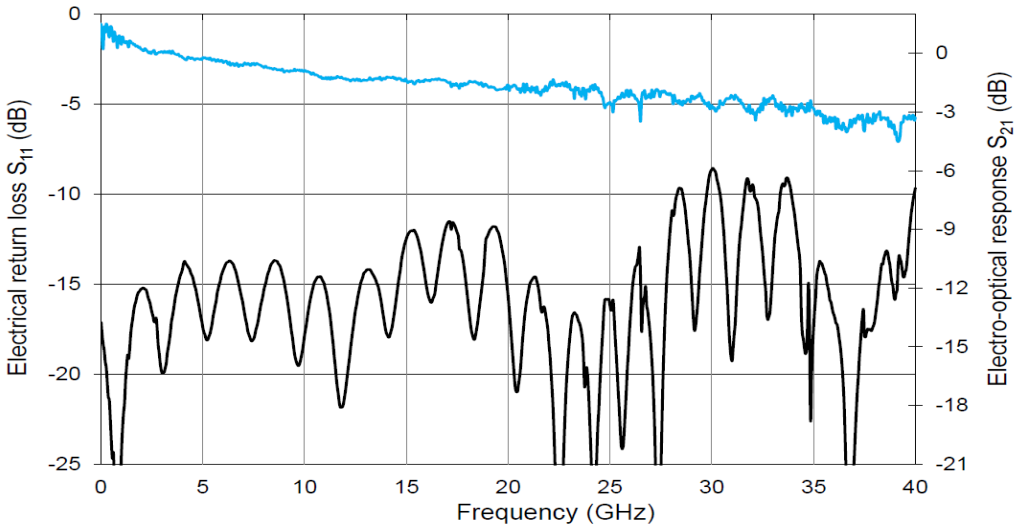


MXIQ-LN-30

Typical Curve S_{21} & S_{11} from RF_1 Electrode

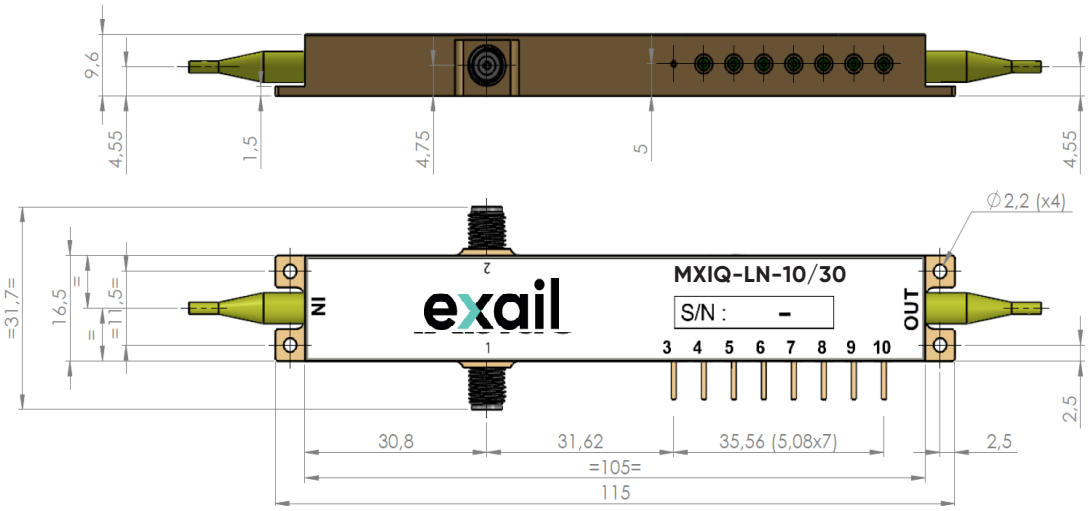


Typical Curve S_{21} & S_{11} from RF_2 Electrode



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 µm
OUT	Optical output port	Polarization maintaining fiber Corning PM 15-U25D Length: 1.5 meter, buffer diameter: 900 µm
1, 2	RF1 input port / RF2 input port	Female K (SMA comptatible)
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

MXIQ-LN- □ - □ - □ - □ - □ - □

- EO Bandwidth: **10** (10 GHz), **30** (30 GHz)
- Internal photodiode: "**PD**": integrated, "**00**": not integrated (by default)
- Input fiber: **P** Polarization maintaining
- Output fiber: **P** Polarization maintaining, **S** Standard single mode
- Input connector: **00** (bare fiber), **FA** (FC/APC)
- Output connector: **00** (bare fiber), **FA** (FC/APC)

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