



LMD-S-20-R



DEVICE

20 GHz Lightwave Modulator with Driver, 1310 nm

OVERVIEW

The Optilab LMD-S-20-R is a high performance analog lightwave transmitter designed for broad bandwidth RF over Fiber (RfOF) applications, up to 20 GHz and beyond. Utilizing an external laser input (DFB, tunable laser, fiber laser, etc.), this optical seed couples directly into a 20 GHz optical modulator, with a broadband 20 GHz RF driver to maximize the RF link gain performance. Paired with one of Optilab's high speed photoreceivers, RfOF optical links can be established seamlessly into existing electrical RF networks. The LMD-S-20-R incorporates a built-in Automatic Bias Control board which allows for stable long-term operation, with up to 4 bias operating modes and adjustable RF gain through the front panel interface and LabVIEW software.

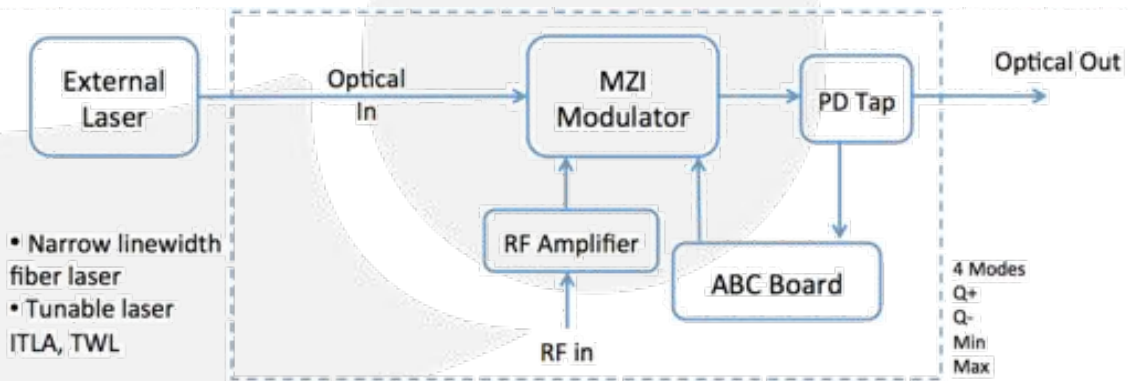
FEATURES

- 1270 nm to 1330 nm wavelength range
- Auto bias mode for analog, NRZ, RZ, BPSK
- Accepts external laser via PM input
- 20 GHz analog 3 dB bandwidth
- Integrated modulator driver
- 23 Gb/s digital transmission
- Customizable options:
 - PM output fiber
 - Low Drive modulator, for RZZ, pulse generation

USE IN

- Optical communications to 23 Gb/s
- Active mode lock (PM version)
- Picosecond pulse generation
- Analog photonics link
- RF/IF signal distribution
- Satellite communication
- 20 GHz RfOF transmission

FUNCTIONAL DIAGRAM





LMD-S-20-R

SPECIFICATIONS

Operating Wavelength	1270 nm to 1330 nm
Laser Source	External input, DFB, tunable laser
Optical Input Level	+17 dBm max.
RF Return Loss	> 10 dB @ 10 GHz
Impedance	50Ω
Analog Frequency Range	20 kHz to 20 GHz
Optical Insertion Loss	5 dB typ., 6 dB max.
S21 Bandwidth, 3 dB	18 GHz typ.
Modulator Bias Mode	4 Automatic bias control modes, selectable by software
Modulator V _{PI} (half wave)	5.5 V typ. @ 10 GHz; 2.5 V typ. @ 10 GHz (low drive for RZ or BPSK)

GENERAL

MODULATION

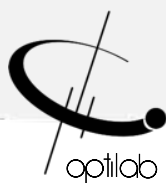
Input RF Voltage Range	250 mV to 750 mV typ.
Modulator Driver Output Voltage	3.5 V p-p, 7.7 V p-p, adjustable
Rise Time/Fall Time	< 40 ps
Digital Bit/Rate	23 Gb/s max.
Optical Extinction Ratio	11 dB @ 12 Gb/s

MECHANICAL

Operating Temperature	-10 °C to +60 °C
Storage Temperature	-50 °C to +90 °C
Power Supply Requirements	110/220 VAC, 50 - 60 Hz
Optical Connectors	FC/APC, others optional
Fiber Type	PANDA input, SMF-28 output; PANDA input/output (PM version)
RF Input Connector	SMA Connector
Remote Control	USB 2.0 software included
Alarm	Bias mode status, over temperature
Dimensions	424 mm x 425 mm x 44 mm

BIAS CONTROL MODE

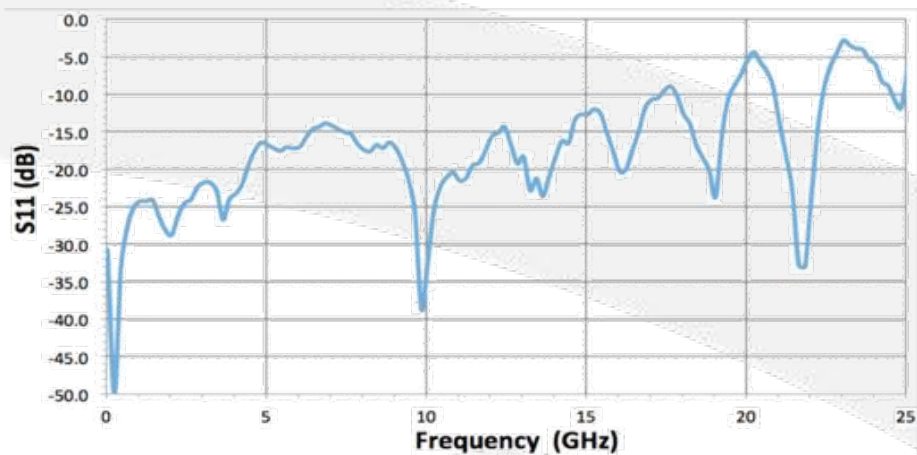
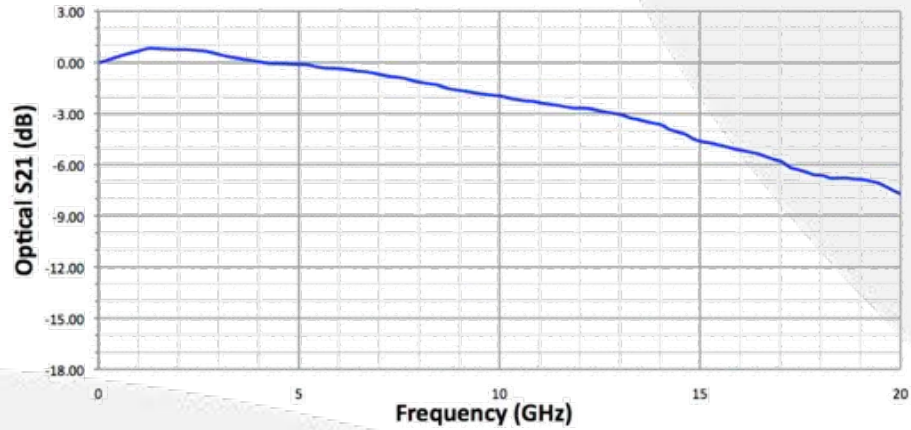
Mode	Operation Conditions	Modulation Format
Q+	Set to quadrature point of positive slope	Analog, NRZ
Q-	Set to quadrature point of negative slope	Analog, NRZ
Min.	Set to min. point of modulator curve	Pulse, RZ, BPSK
Max.	Set to max. point of modulator curve	Pulse, RZ





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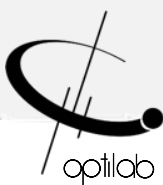
TYPICAL S21 AND S11 BANDWIDTH



ORDERING
OPTIONS

LMD-S-20-R-XX

- PM: Polarization Maintaining Output
- XX HE: High Extinction Ratio Modulator
- LD: Low Drive Modulator

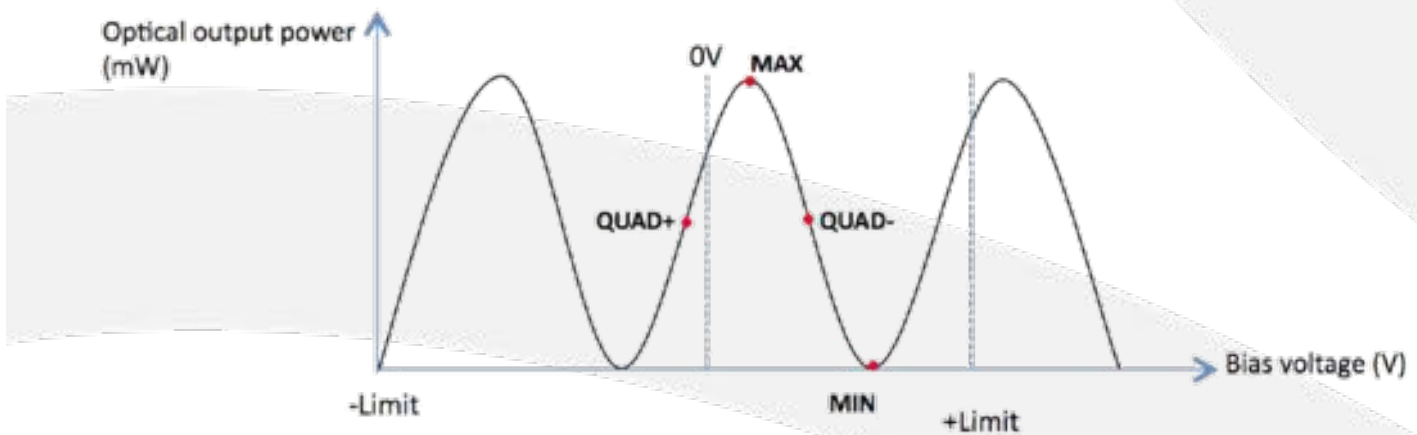




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BIAS SETTING MODES FOR LMD-S-20-R

Based on a sophisticated phase measurement of a small dither signal, the LMD-S-20-R provides four selectable operating modes: quadrature (Quad +), inverted quadrature (Quad -), minimum (Min), or maximum (Max) points.



REMOTE LABVIEW INTERFACE

Optilab offers remote interface via Labview software, for parameter adjustment and status monitoring, contact Optilab for more details.





LMD-S-20-R

DETAILED LAYOUT



No.	Feature
1	RF Power Indicator
2	RF In
3	Optical In
4	Optical Out
5	RF Key Switch
6	LCD Display
7	Interface Buttons
8	USB Socket
9	Fans
10	AC input Socket and Main Power Switch

MECHANICAL DRAWING

