

40 GHz Bandwidth Lightwave Transmitter Module

The LT-40-M is a 40 GHz bandwidth lightwave transmitter module designed for RF over fiber, antenna remoting and broadband RF transmission applications.

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Product Description

The LT-40-M is a 40 GHz bandwidth lightwave transmitter module designed for RF over fiber, antenna remoting and broadband RF transmission applications using single mode optical fiber. This module uses a low noise, narrow linewidth, 1550 nm distributed feedback (DFB) laser diode as Continuous Wave (CW) light source. An ultra-broadband Lithium Niobate (LiNbO_3) optical modulator is employed to provide the linear modulation capability that has a modulation bandwidth of up to 40 GHz. This externally modulated transmitter design provides a high spur-free dynamic range and high input intercept point performances. The LT-40-M can also be used for digital transmission when driven by a wideband modulator driver. This compact module can be used in conjunction with the LR-45 to make an efficient RFoF link.

Features

- Useful Bandwidth up to 45 GHz
- Highly Linear for Analog Transmission
- High Spur-Free Dynamic Range
- Low RIN, Narrow Linewidth DFB Laser
- Broadband LiNbO_3 Modulator
- Status Monitoring: RS-232 (standard)

Applications

- Optical Communication to 44 Gb/s
- Wideband RF over Fiber
- RF/IF Signal Distribution
- Antenna Remoting
- Optical Delay Lines
- Satellite Communication

PRODUCT SPECIFICATIONS

General Specifications

Operating Wavelength	1550 nm \pm 10 nm, ITU wavelength available
Optical Output Level	+4 dBm to +8 dBm
Optical Return Loss	50 dB typ.
Linewidth (FWHM)	1 MHz typ.
DFB Side Mode Suppression Ratio	50 dB typ.
Relative Intensity Noise (RIN)	-145 dB/Hz max.
Impedance	50 Ω
Frequency Response Flatness	\pm 0.5 dB in any 1GHz bandwidth
VSWR	2.0 : 1 max.
Input Damage Level	26 dBm max.

Analog Specifications

Analog Bandwidth	0.01 to 40 GHz
1 dB comp. Level	+20 dBm typ.
Input IP3	26 dBm @ 10 GHz
2nd Harmonics Distortion	-70 dBc typ.
RF Link Gain @ 2 GHz**	-18 dB
RF Link Gain @ 40 GHz**	-21 dB
IM3 Distortion	< -90 dBc max.
	*0 dBm Optical Input to PD-30
	**5 mW Optical Input to PD-30

Digital Specifications

Modulation Bandwidth	Up to 44 Gb/s
Data Format	NR, RZ
Drive Voltage Requirement	7.5 V p-p

Ordering Information

LT-40-x-yy-M

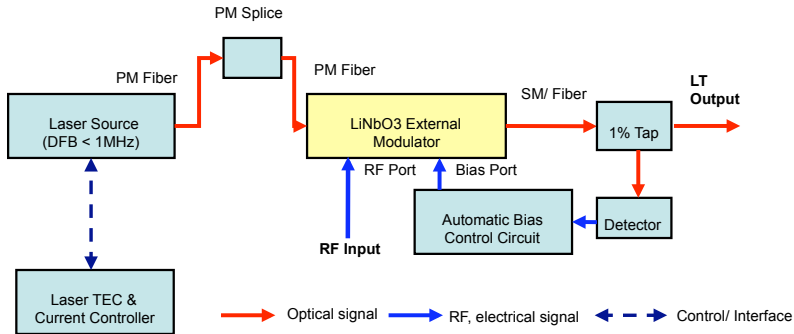
x	Optical Output Level (+4 to +6 dBm)
yy	Wavelength Grid Number TTU



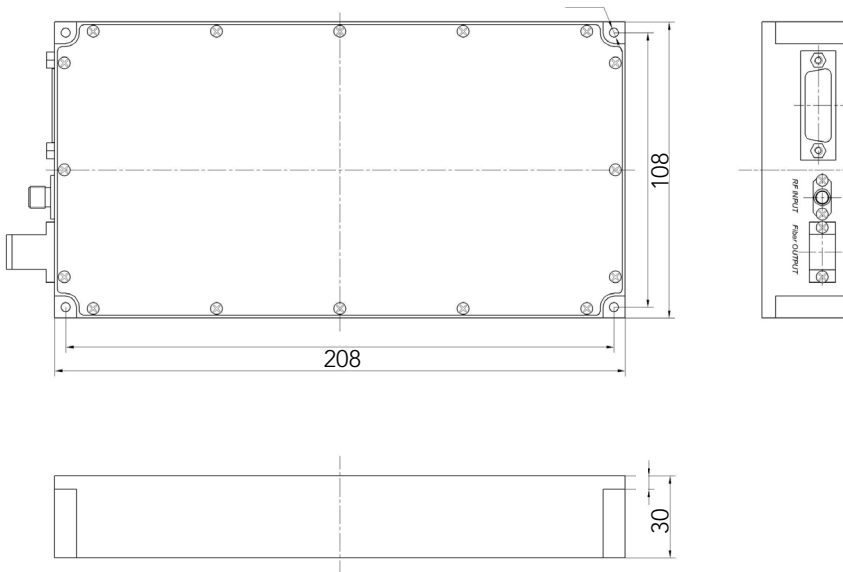
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Additional Information

The DFB laser's temperature stability is controlled with the use of an internal TEC. The optical modulator is controlled via a high precision bias controller to ensure the operation is set to quadrature. This design enables LT-40-M to provide with the lowest distortion and wide modulation bandwidth. The transmitter provides status monitoring through an RS-232 serial port interface.

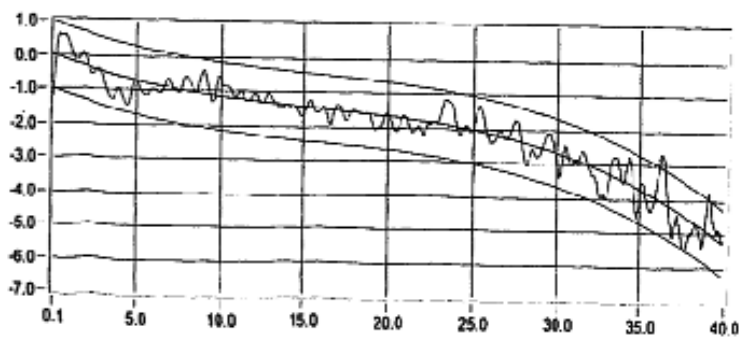


Typical Block Diagram



Calibration Data

S21 RF Port



Typical S21 Response¹

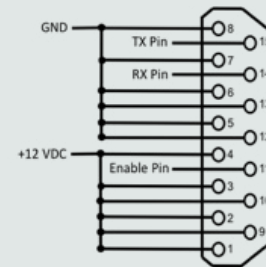
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Mechanical Specifications

Operating Temperature	-40° C to +70° C
Storage Temperature	-55° C to +85° C
Power Supply Requirements	+12 V DC, 2 A max.
Optical Connector	SC/APC, FC/APC Optional
RF Input Connector	K Connector Female, 50 Ω
DC Connector	DB-15
Local Alarm	LED: Optional Input Power
Remote Alarms	RS-232 Interface (Optional)
Dimensions	208 mm x 108 mm x 30 mm
Accessories Included	110 V - 240 V AC Adaptor and RS-232 Cable

Housing Precision Machined Aluminum, Anodized

PIN Out Diagram



DB-15 Connector

Pins 1, 2, 3, 4, 9, 10	12 VDC
Pin 5, 6, 7, 8, 12, 13	Ground
Pin 11	Enable, short this pin to Ground to enable optical output power to the laser diode
Pin 14	RX, pin for receiving data via RS-232
Pin 15	TX, pin for transmitting data via RS-232

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x Optical Output Level (+4 to +6 dBm)
yy Wavelength Grid Number TTU

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