

# 50 GHz Lightwave Transmitter Modulator for RFoF

#### OVERVIEW The Optilab LTC-50 is a high performance Lightwave Transmitter Modulator designed for analog photonics applications from DC to 50 GHz. This unit includes a 50 GHz optical intensity modulator and an Automatic Bias Control (ABC) board with four different operating modes. The integrated internal DFB laser makes it a versatile solution for RFoF system integration. Contact Optilab for more information.

#### FEATURES

- 31 GHz S21 bandwidth modulator
- 1520 nm to 1610 nm wavelength range
- Automatic Bias Control w/ 4 mode operation
- Internal DFB laser up to 50 mW

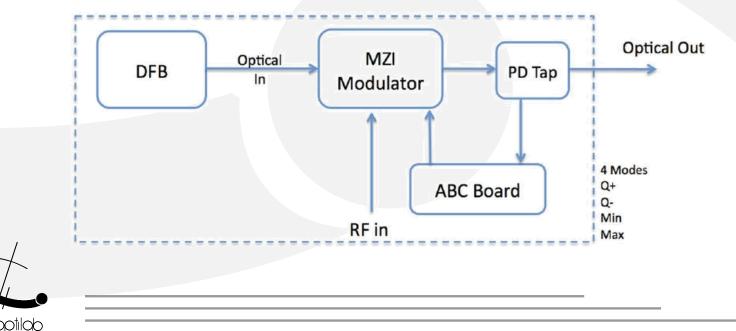
- Customizable Options:
  - Low Drive Voltage
  - PM output
  - High Extinction Ratio (> 30 dB)
  - Temp. Qualified (-55°C to +75°C)

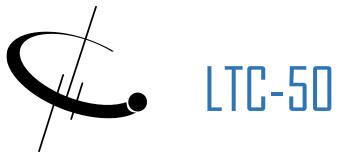
#### USE IN

- Sub-nanosecond pulse generation
  - Optical communications to 50 Gb/s
  - 43 GHz RFoF transmission

- Analog photonics
- RF/IF signal distribution
- Satellite communication

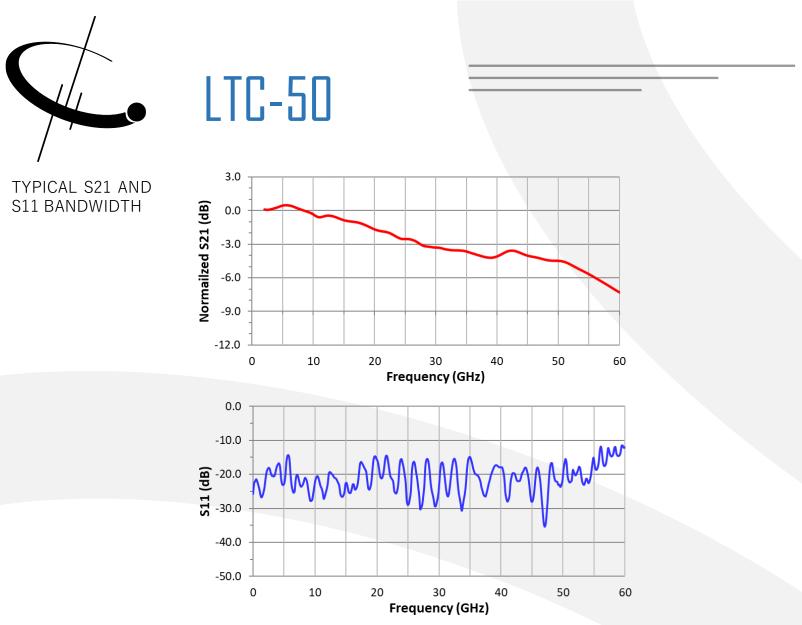
#### FUNCTIONAL DIAGRAM





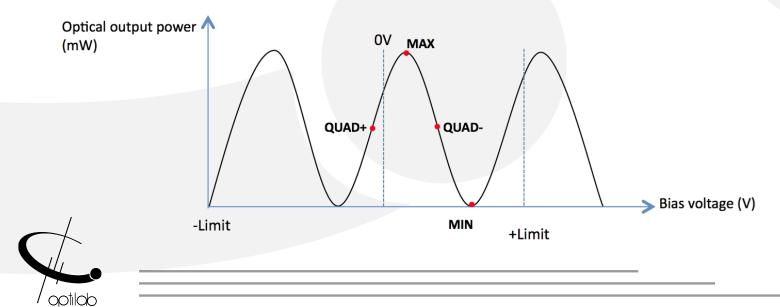
SPECIFICATIONS   Operating Wavelength   1520 mm to 1610 mm     Laser Source   Internal DFB laser, 1550 ± 10 nm; other wavelengths and narrow linewidth <1 MHz are available     Laser Power Level   20, 30, 40, 50 mW     RF Return Loss   \$ -10 dB @ 20 GHz     Impedance   500     Operating Frequency Range   DC to 50 GHz     Input RF Voltage   27 dBm max.     Optical Output Level   6.5 dBm typ. With 20 mW DFB     S21 Bandwidth   31 GHz typ. @ -3 dB, 55 GHz typ. @ -6 dB     Modulator Bias Mode   4 Automatic bias control modes, selectable by software     Extinction Ratio   25 dB typ.: > 30 dB (HE version)     Modulator Voltage VPI   3 V typ. @ 10 GHz typ.     Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (TQ version)   -55 °C to +75 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Card     Optical Connector   FL/APC     MECHANICAL   Fiber Type   SMF-28 output PANDA output (PM version)     RF Input Connector   V connector   V connector				
Alser Source   and narrow linewidth <1 MHz are available	SPECIFICATIONS	Operating Wavelength	1520 nm to 1610 nm	
and narrow linewidth <1 MHz are available	GENERAL		Internal DFB laser, 1550 ± 10 nm; other wavelengths	
MECHANICAL   RF Return Loss   \$ -10 dB @ 20 GHz     Impedance   500     Operating Frequency Range   DC to 50 GHz     Input RF Voltage   27 dBm max.     Optical Output Level   6.5 dBm typ. Wth 20 mW DFB     S21 Bandwidth   31 GHz typ. @ -3 dB, 55 GHz typ. @ -6 dB     Modulator Bias Mode   4 Automatic bias control modes, selectable by software     Extinction Ratio   25 dB typ.: > 30 dB (HE version)     Modulator Voltage VPI   3 V typ. @ 10 GHz typ     Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (TQ version)   -55 °C to +75 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Cord     Optical Connector   FC/APC     MECHANICAL   Fiber Type   SMF-28 output: PANDA output (PM version)		Laser Source	and narrow linewidth <1 MHz are available	
GENERAL   Impedance   50Ω     Operating Frequency Range   DC to 50 GHz     Input RF Voltage   27 dBm max.     Optical Output Level   6.5 dBm typ. With 20 mW DFB     S21 Bandwidth   31 GHz typ. @ -3 dB, 55 GHz typ. @ -6 dB     Modulator Bias Mode   4 Automatic bias control modes, selectable by software     Extinction Ratio   25 dB typ.: > 30 dB (HE version)     Modulator Voltage VPI   3 V typ. @ 10 GHz typ     Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (rIQ version)   -55 °C to +75 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Card     Optical Connector   FC/APC     MECHANICAL   Fiber Type   SMF-28 output PANDA output (PM version)		Laser Power Level	20, 30, 40, 50 mW	
GENERAL   Operating Frequency Range   DC to 5D GHz     Input RF Voltage   27 dBm max.     Optical Output Level   6.5 dBm typ. With 20 mW DFB     S21 Bandwidth   31 GHz typ. @ -3 dB, 55 GHz typ. @ -6 dB     Modulator Bias Mode   4 Automatic bias control modes, selectable by software     Extinction Ratio   25 dB typ.: > 30 dB (HE version)     Modulator Voltage VPI   3 V typ. @ 10 GHz typ     Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (TQ version)   -55 °C to +75 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Cord     Optical Connector   FL/APC     MECHANICAL   Fiber Type   SMF-28 output: PANDA output (PM version)		RF Return Loss	≤ -10 dB @ 20 GHz	
Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (TQ version)   -55 °C to +75 °C     Storage Temperature   -60 °C     Optical Connector   -60 °C     Operating Temperature   -60 °C     Operating Temperature   -60 °C     Operating Temperature   -50 °C to +90 °C     Operating Temperature   -60 °C     Optical Connector   FC/APC     Piber Type   SMF-28 output: PANDA output (PM version)		Impedance	50Ω	
Input RF Voltage   27 dBm max.     Optical Output Level   6.5 dBm typ. With 20 mW DFB     S21 Bandwidth   31 GHz typ. @ -3 dB, 55 GHz typ. @ -6 dB     Modulator Bias Mode   4 Automatic bias control modes, selectable by software     Extinction Ratio   25 dB typ.; > 30 dB (HE version)     Modulator Voltage VPI   3 V typ. @ 10 GHz typ     Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (TQ version)   -55 °C to +75 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Card     Optical Connector   FC/APC     MECHANICAL   Fiber Type   SMF-28 output; PANDA output (PM version)		Operating Frequency Range	DC to 50 GHz	
S21 Bandwidth   31 GHz typ. @ -3 dB, 55 GHz typ. @ -6 dB     Modulator Bias Mode   4 Automatic bias control modes, selectable by software     Extinction Ratio   25 dB typ.; > 30 dB (HE version)     Modulator Voltage VPI   3 V typ. @ 10 GHz typ     Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (rQ version)   -55 °C to +75 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Cord     Optical Connector   FC/APC     Fiber Type   SMF-28 output; PANDA output (PM version)		Input RF Voltage	27 dBm max.	
S21 Bandwidth   31 GHz typ. @ -3 dB, 55 GHz typ. @ -6 dB     Modulator Bias Mode   4 Automatic bias control modes, selectable by software     Extinction Ratio   25 dB typ.: > 30 dB (HE version)     Modulator Voltage VPI   3 V typ. @ 10 GHz typ     Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (TQ version)   -55 °C to +75 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Cord     Optical Connector   FC/APC     MECHANICAL   Fiber Type   SMF-28 output: PANDA output (PM version)		Optical Output Level	6.5 dBm typ. With 20 mW DFB	
Extinction Ratio   25 dB typ.: > 30 dB (HE version)     Modulator Voltage VPI   3 V typ. ID GHz typ     Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (TQ version)   -55 °C to +75 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Cord     Optical Connector   FC/APC     MECHANICAL   Fiber Type			31 GHz typ. 🛽 - 3 dB, 55 GHz typ. 🗏 - 6 dB	
Modulator Voltage VPI   3 V typ. III GHz typ     Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (TQ version)   -55 °C to +75 °C     Operating Temperature   -60 °C to +90 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Cord     Optical Connector   FC/APC     Fiber Type   SMF-28 output; PANDA output (PM version)		Modulator Bias Mode	4 Automatic bias control modes, selectable by software	
Operating Temperature (standard)   -30 °C to +60 °C     Operating Temperature (TQ version)   -55 °C to +75 °C     Operating Temperature   -60 °C to +90 °C     Storage Temperature   -60 °C to +90 °C     Power Supply Requirements   AC Power Cord     Optical Connector   FC/APC     Fiber Type   SMF-28 output; PANDA output (PM version)		Extinction Ratio	25 dB typ.; > 30 dB (HE version)	
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MECHANICAL Fiber Type				
Power Supply Requirements AC Power Cord   Optical Connector FC/APC   Fiber Type SMF-28 output; PANDA output (PM version)				
MECHANICAL Fiber Type SMF-28 output; PANDA output (PM version)				
MECHANICAL Fiber Type SMF-28 output: PANDA output (PM version)				
	MECHANICAE		V connector	
4 Pin Malex			4 Pin Molex	
Power Connector (AC Option Available)		Power Connector	(AC Option Available)	
Remote Control USB 2.0 software included		Remote Control	USB 2.0 software included	
Alarm LED bias mode status		Alarm	LED bias mode status	
Dimensions 241 mm x 152 mm x 41 mm		Dimensions	241 mm x 152 mm x 41 mm	
Mode Operation Conditions	BIAS CONTROL MODE	Mode Operation Condi	tions	
BLAS CONTROL Q+ Set to quadrature point of positive slope for linear analog modulation		Q+ Set to quadrature poin	t of positive slope for linear analog modulation	
DIAG CONTINCE				
Min. Set to min. point of operation for pulse generation or digital modulation		Min. Set to min. point of op		
Max. Set to max. point of operation for pulse generation or digital modulation		Max. Set to max. point of op	eration for pulse generation or digital modulation	





#### BIAS SETTING MODES FOR LTC

Based on sophisticated phase measurement of this small dither signal, LTC-50 provides four selectable operating modes: quadrature (Quad +), inverted quadrature (Quad -), minimum (Min), or maximum (Max) points.







**ORDERING OPTIONS** 

### LTC-50-XX-YY

- PM: Polarization Maintaining XX HE: High Extinction Ratio
- YΥ DC: DC +/- 5V Power Supply (Option 1) AC: AC 100/240 VAC (Option 2)

Option 1 : DC +/- 5V



## Option 2: 100/240 VAC



