



LTB3441 622 Mb/sec P2MP OLT 2X10 SFF B-PON Transceiver, 20 km

The LTB3441 B-PON OLT transceiver module has been designed for low cost point to multi point (P2MP) Fiber to the Home, Business or Curb (FTTx) systems employing high-speed burst mode TDM receivers/transmitters in 622 Mb/sec symmetrical duplex data links. The device is based on the ITU-T G.983.1 and G.983.3 PON specification for bi-directional communications over a single fiber and incorporates a high performance 1310 nm CW mode F-P transmitter and 1490 nm burst mode P-I-N receiver. It is capable of serving up to 16 subscribers in advanced TDM P2MP FTTH equipment over distances of up to 20 km. The LVTTTL compatible Tx Disable feature controls the laser transmitter and the signal detect feature provides an indication of the status of the receiver. The industry standard 2x10 small form factor (SFF) package incorporates a pigtail fiber with SC/APC or SC/PC connector, and is fabricated with a rugged die cast metal housing and cage assembly and operates over the commercial temperature range from 0 to 70 degrees Centigrade.



Applications

- Access Networks
- Fiber to the Home, Curb, Office (FTTx)
- Point to Multi Point Service (P2MP)

Features

- Single fiber, full duplex operation
- Single 3.3 volt DC supply
- Dual wavelength (WDM) bi-directional transmission
 - 1490 nm 622 Mb/s CW mode transmitter
 - 1310 nm 622 Mb/s burst mode receiver

- ITU-T G.983.1 and G.983.3 PON compliant
 - Internal Tx automatic power control (APC)
 - Internal Tx Alarm to monitor the laser performance
- Differential LVPECL interface:
 - Data Input / Data Output
- Single Ended LVTTTL control interface:
 - Tx Alarm, Tx disable
 - Rx Alarm
- Commercial Operating temperature range: 0 to 70 °C

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units
Ambient Operating Temperature	T _{amb}	0	25	70	°C
DC Supply Voltage	V _{CC}	3.135	3.3	3.465	Volts
Module Supply Current	I _{IN}	-	150	200	mA
Module Power Dissipation	P _D	-	500	700	mW
Signaling Speed +/- 100 ppm	S	-	1.25	-	GBd
Useful Reach (32 :1 Split)	D	-	10	-	km
Useful Reach (16 :1 Split)	D	-	20	-	km

Ordering Information

Part Number	Package Option (X)	
LTB3441 X	A	Pigtail, no connector
	B	Pigtail, SC/APC
	C	Pigtail, SC/PC



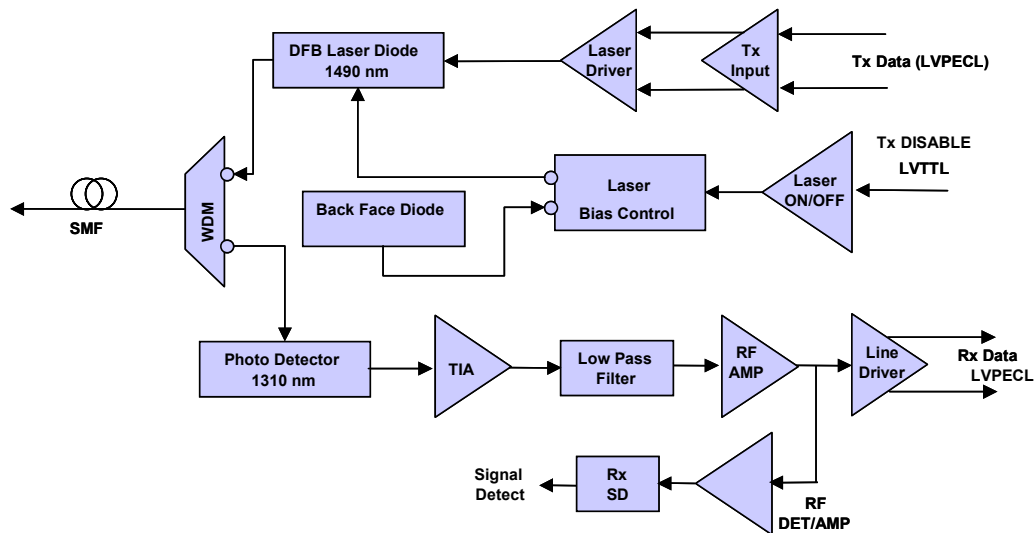
Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	T_{stg}	-40	+85	°C	Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device.
Operating Temperature	T_o	-40	+85	°C	
Relative Humidity - Storage	RH_s	0	95	%	
Relative Humidity - Operating	RH_o	0	85	%	The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.
DC Supply Voltage	V_{CC}	0	3.6	V	
Soldering Temperature	T_{slid}	0	260	°C	
Soldering Duration	t_{slid}	0	10	sec	

Absolute Maximum Ratings: Control Function Logic Levels					
Tx_DISABLE Logic HIGH State	Tx_DIS	-	$V_{CC}+0.5$	V	LVTTTL
Rx_SD	Rx_SD	-	$V_{CC}+0.5$	V	LVTTTV

Transmitter Electrical Specifications						
Parameter	Symbol	Min	Typ	Max	Unit	Conditions / Notes
Tx DC Supply Current	I_{CC}	-	-	150	mA	
Tx_Data Differential Input Voltage	V_{IH}, V_{IL}	300	-	-	mV p-p	LVPECL Tx_DATA Electrical Signal
Tx_DIS = HIGH (Transmitter OFF)	V_{OH}	2.4	-	3.3	V	LVTTTL
Tx_DIS = LOW (Transmitter ON)	V_{OL}	0	-	0.8	V	LVTTTL

Receiver Electrical Specifications						
Rx DC Supply Current	I_{RX}	-	-	125	mA	
Rx_Data Differential Output Voltage	V_{IH}, V_{IL}	600	-	1900	mV p-p	
Rx_Data Output Rise / Fall Time	t_r / t_f	-	156	260	ps	20% to 80%

LTB3441 Block Diagram

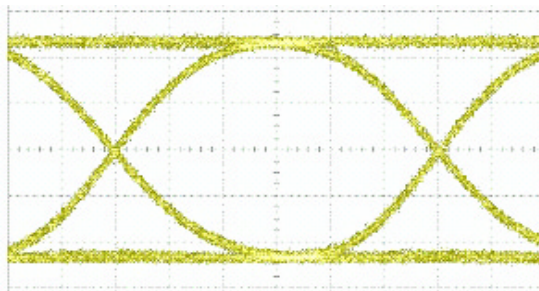




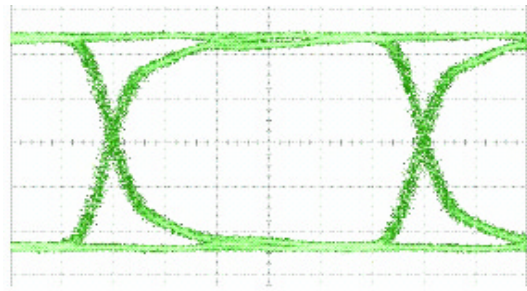
Transmitter Optical Specification						
Parameter	Symbol	Min	Typ	Max	Units	Conditions / Notes
Transmitter Type		1490 DFB CW Mode				
Average Output Power (9/125 μ SMF)	Pout	-5	-	+2	dBm	
Optical Output with Tx OFF	Pout	-	-	-45	dBm	
Optical Rise and Fall Time	t _r / t _f	-	500	600	ps	20% to 80%
Tx Wavelength	λ	1480	1490	1500	nm	
Spectral Line Width	Δλ	-	-	3.5	nm	
Extinction Ratio	ER	8.2	10	-	dB	
Relative Intensity Noise	RIN	-	-	-113	dB/Hz	
Optical Return Loss	RL	-	-	15	dB	
Total Jitter	Tj	-	-	0.2	UI	
Optical Cross Talk	C _{RT}	-	40	-	dB	
Transmit Reflectance	RFL	-	-	-12	dB	

Receiver Optical Specifications						
Parameter	Symbol	Min	Typ	Max	Units	Conditions / Notes
Receiver Type		1310 nm P-I-N/TIA Burst Mode				
Optical Signal Indicator		Signal Detect				
Wavelength	λ	1260	1310	1360	nm	
Received Optical Power	Pin	-28	-	-3	dBm	BER<10 ⁻¹⁰ , 1250 Mb/s, PRBS 2 ²³ -1
Maximum Input Optical Power	Pin(max)	-	-	4	dBm	Damage Threshold
Receiver Sensitivity	Pin	-	-	-28	dBm	
Receiver Reflectance	RFL	-	-	-12	dB	

Eye Diagram



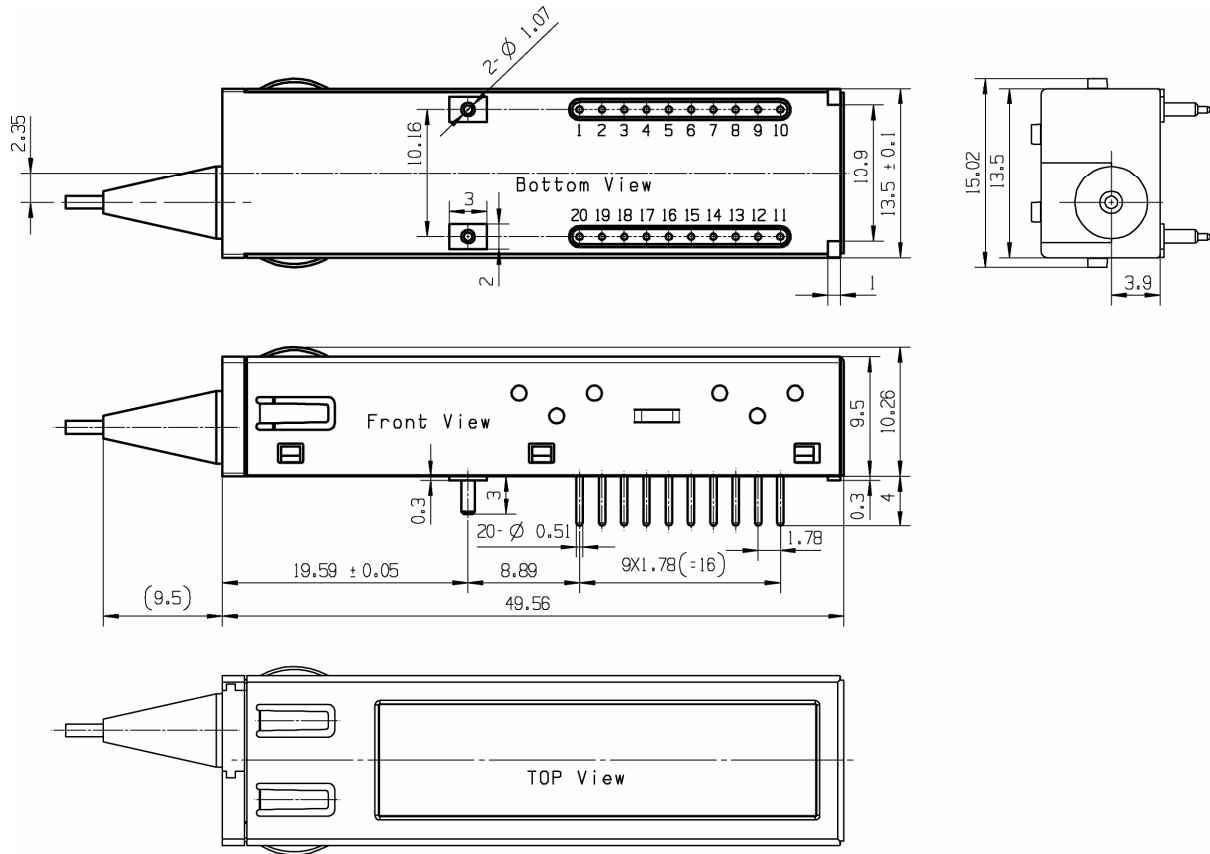
- Transmitter Test Conditions**
- Optical Output Power = 0 dBm
 - Test Pattern = 2²³-1 NRZ PRBS



- Receiver Test Conditions**
- Optical Input Power = -20 dBm
 - Test Pattern = 2²³-1 NRZ PRBS



2x10 SFF Outline Drawing (Fiber Pigtail)





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Regulatory Information

Eye Safety

The transceiver is a Class 1 eye-safe device according to FDA 21CFR1040.10 and IEC 60825-2.

Electromagnetic Interference (EMI), Immunity and Product Safety

The transceiver is ESD safe (electrical pins) when tested according to MIL-STD-883, Method 3015.7 and ESD safe (optical connector) when tested according to IEC 61000-4-2. The device is immune to strong RF fields when tested in accordance with IEC 61000-4-3. The device complies with (US) FCC, Part 15, Subpart J; (Europe) CENELEC EN 55022; (Canada) Class B (CISPR22A); and (Japan) VCCI Class 1. The device has been designed to conform to product safety requirements including UL1950, CSA 22.2, and IEC 60950-1, and has been designed to meet the flammability requirements of UL94.

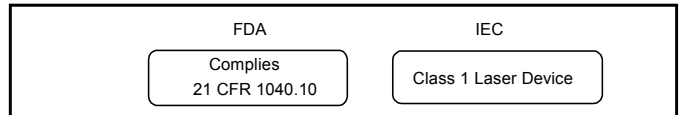
Notice

The factory has made all adjustments to this device prior to shipment. No adjustments or modifications to the device are required or permitted. Any adjustment, modification or tampering of the device voids the product warranty. The US Food and Drug Administration may consider that any adjustment or modification to this device is an act of manufacturing and therefore will require that the device be recertified in accordance with 21 CFR 1040.10 Subpart j.

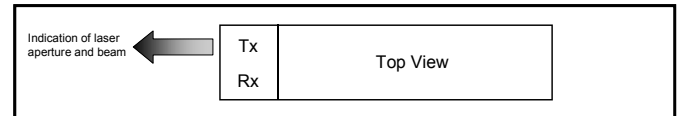
Laser Radiation Information

Wavelength	1490 nm
FDA Total Pout: 7 mm aperture at 20 cm distance	< 790 microwatts
IEC Total Pout : 7 mm aperture at 10 cm distance	< 10,000 microwatts
Beam Divergence	17.25°

Required Label



Laser Emission



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