

## LT-74D73D-PG

**(RoHS Compliant)**

**3.3V, 1.25 Gbps 1490 nm Continuous-Mode TX / 1.25 Gbps 1310 nm Burst-Mode RX  
2X5 SFF Package, GE-PON OLT Transceiver (IEEE 802.3ah-2004 1000BASE PX10)**

### FEATURES

- | Optical Line Terminal (OLT) for IEEE 802.3ah-2004 1000BASE-PX10
- | 1-Fiber Bi-directional 1.25 Gbps WDM Transceiver for 20 km communication
- | 1490 nm Continuous-Mode Transmitter
- | 1310 nm Burst-Mode (BM) Receiver
- | **Resetless BM Receiver Design**
- | BM RX with Transceiver Settling Time less than 400 ns
- | High Resistance of BM RX to DC Optical Background
- | 0 to 70°C Operating Temperature
- | 2x5 SFF Package with SC/PC Pigtail
- | Single +3.3 V Power Supply
- | RoHS Compliant
- | Transmitter: AC Coupling Input
- | Receiver: DC Coupling Output
- | LVPECL Differential Inputs and Outputs
- | LVTTL TX Shutdown Input
- | LVTTL TX Laser Failure Alarm Output
- | Wave Solderable and Aqueous Washable
- | Class 1 Laser International Safety Standard IEC-60825 Compliant

### DESCRIPTION

LT-74D73D is an optical transceiver for optical line terminal (OLT) for IEEE 802.3ah-2004 1000BASE-PX10 applications. The LT-74D73D is high performance module for single fiber communications by using 1490 nm continuous-mode transmitter and 1310 nm high sensitivity burst-mode receiver with settling time less than 400 ns. The transmitter section uses a 1490 nm DFB laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated 1310 nm burst-mode Avalanche photodetector preamplifier mounted in an optical header and a burst-mode limiting post-amplifier IC. **Unlike the conventional BM RX, the RX does not requires reset pulse to receive optical data packets with different optical power.** LVPECL interface is used for differential inputs and outputs. A LVTTTL logic interface simplifies interface to external circuitry.

### LASER SAFETY

This single mode transceiver is a Class 1 laser product. It complies with IEC-60825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.

### APPLICATIONS

- | Gigabit Ethernet PON System

### ORDER INFORMATION

P/No	Class	TX				RX				Temp (°C)	Package	RoHS Compliant
		Type	Speed (Gb/s)	λ (nm)	Power (dBm)	Type	Speed (Gb/s)	λ (nm)	Sens. (dBm)			
LT-74D73D-PG	PX10	CNT	1.25	1490 DFB	2 / -3	BM, 2R	1.25	1310	-3 / -24	0 / 70	SFF 2X5 Pig.	Yes

NOTE: 1. LT-XXXXXX-PWXG, SC/PC pigtail with fiber length 50 cm.

2. BM: Burst Mode; CNT: Continuous Mode; SFF: Small Form Factor Package.

**Absolute Maximum Ratings**

Parameter	Symbol	Min.	Max.	Unit	Notes
Power Supply Voltage	V <sub>cc</sub>	0	4	V	
Input Voltage		GND	V <sub>cc</sub>	V	
Output Current	I <sub>out</sub>	0	30	mA	
Operating Case Temperature	T <sub>opr</sub>	0	70	°C	With air flow 1m/sec
Storage Temperature	T <sub>stg</sub>	-40	85	°C	
Soldering Temperature			260	°C	10 seconds on leads only
Tension of Fiber			500	g	
Bending Radius of Fiber		30		mm	

Stress in excess of the maximum absolute ratings can cause permanent damage to the module.

**Recommended Operating Conditions**

Parameter	Symbol	Min.	Max.	Unit	Notes
Power Supply Voltage	V <sub>cc</sub>	3.13	3.47	V	3.3 V +/- 5%
Operating Case Temperature	T <sub>opr</sub>	0	70	°C	With air flow 1m/sec
Supply Current	I <sub>cc TX+RX</sub>		300	mA	

**Transmitter Specifications ( 0°C < T<sub>opr</sub> < 70°C, 3.13V < V<sub>cc</sub> < 3.47V )**

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
<b>Optical</b>						
Optical Transmit Power	P <sub>o</sub>	-3		2	dBm	1
Output Center Wavelength	λ	1480		1500	nm	
Output Spectrum Width	Δ λ			1	nm	-20 dB Width
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	E <sub>R</sub>	9			dB	
Data Rate			1.25		Gb/s	
Optical Rise Time				0.26	ns	20% to 80% Values
Optical Fall Time				0.26	ns	20% to 80% Values
Relative Intensity Noise	RIN			-120	dB/Hz	
Total Jitter				0.15	ns	
<b>Electrical</b>						
Data Input Current – Low		-350			μA	
Data Input Current – High				350	μA	
Differential Input Voltage	V <sub>IH</sub> - V <sub>IL</sub>	150		2000	mV	
Data Input Voltage – Low	V <sub>IL</sub> - V <sub>CC</sub>	-2.0		-1.58	V	2
Data Input Voltage -- High	V <sub>IH</sub> - V <sub>CC</sub>	-1.1		-0.74	V	2
Shutdown Input Voltage -- Low	V <sub>TSHDN,L</sub>	0		0.5	V	TX Output Disable
Shutdown Input Voltage -- High	V <sub>TSHDN,H</sub>	2.0		V <sub>cc</sub>	V	TX Output Enable
Shut Off Time for Tx Shutdown	t <sub>DIS</sub>		30		μs	

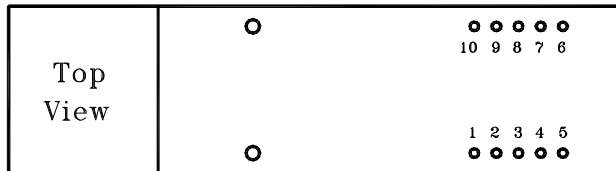
- Output power is power coupled into a 9/125 μm single mode fiber.
- These inputs are compatible with 10K, 10KH and 100K ECL and LVPECL inputs.

Receiver Characteristics ( 0°C < Topr < 70°C, 3.13V < Vcc < 3.47V )

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
<b>Optical</b>						
Sensitivity	Sen			-24	dBm	3
Saturation Optical Power	Sat	-3			dBm	3
Wavelength of Operation		1260		1360	nm	4
Data Rate			1.25		Gb/s	
Settling Time		400			ns	5, 6
DC Optical Tolerance		Sen +3			dB	
Optical Return Loss		20			dB	
<b>Electrical</b>						
Data Output Voltage – Low	V <sub>OL</sub> - V <sub>CC</sub>	-2.0		-1.58	V	7
Data Output Voltage – High	V <sub>OH</sub> - V <sub>CC</sub>	-1.1		-0.74	V	7
Rest Between Packet		Resetless				

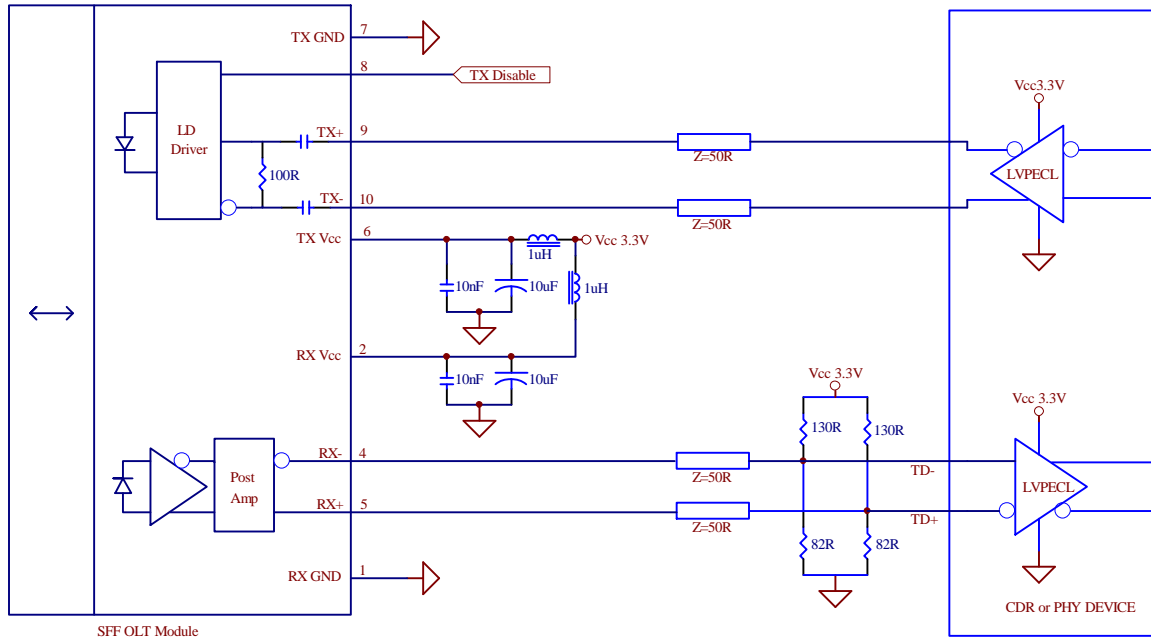
- Sensitivity and saturation levels at BER 1E-12 @ 2<sup>7</sup>-1 @ ER=10. The burst packet data pattern follows 8B10B protocol.
- At least 30 dB optical isolation for the wavelength 1480 to 1500 nm.
- No reset is needed.
- The optical power difference between neighboring packets is up to 15 dB.
- These inputs are compatible with 10K, 10KH and 100K ECL and LVPECL outputs.

## CONNECTION DIAGRAM



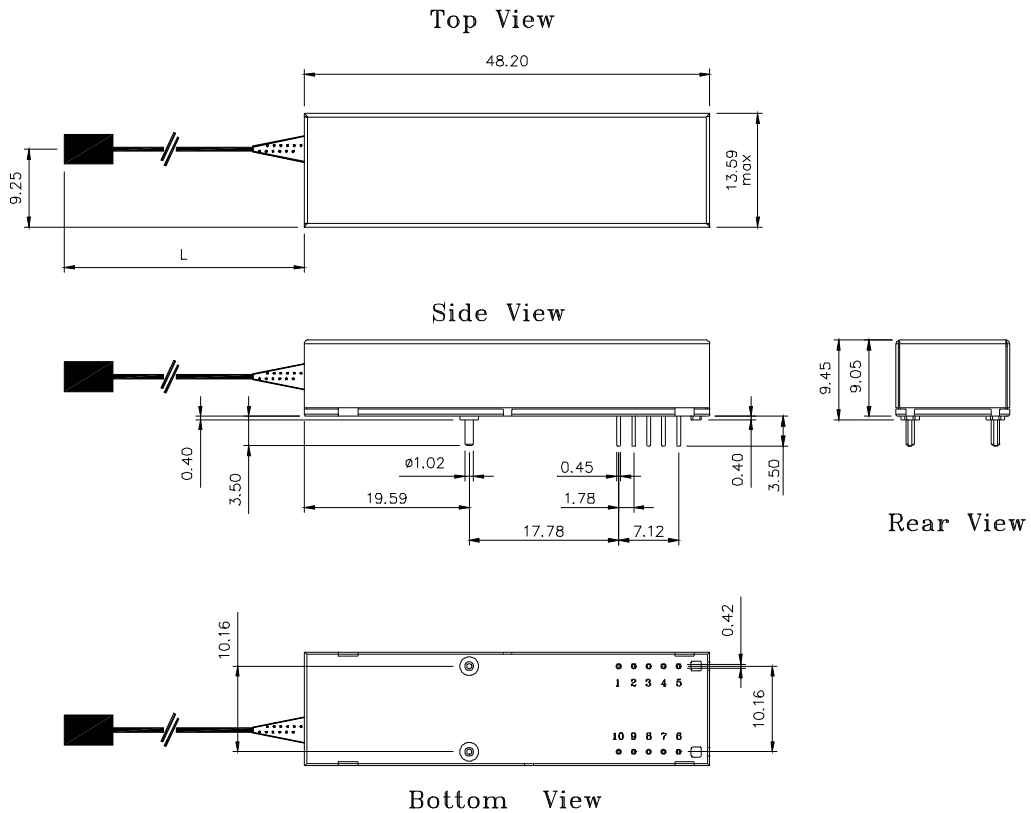
PIN	Signal Name	Description	PIN	Signal Name	Description
1	RX Ground	Receiver Ground. Connect this pin to ground plane.	10	TD-	Negative transmitter data In. Internally terminated for LVPECL. AC coupled.
2	RX Vcc	RX power supply input. Connect to 3.3 V power supply	9	TD+	Positive transmitter data In. Internally terminated for LVPECL. AC coupled.
3	NC	No connection	8	TxDis	Transmitter Disable. TX is disabled when this pin is low. Internally pulled to "High"..
4	RX OUT (-)	Negative RX output, Differential LVPECL. DC coupled.	7	TX Ground	Transmitter Ground. Directly connect this plan to ground plane
5	RX OUT (+)	Positive RX output, Differential LVPECL. DC Coupled.	6	TX Vcc	TX power supply input. Connect to 3.3 V power supply
MS	MS	Mounting Studs. Connect to Chassis Ground			

## RECOMMENDED CIRCUIT SCHEMATIC



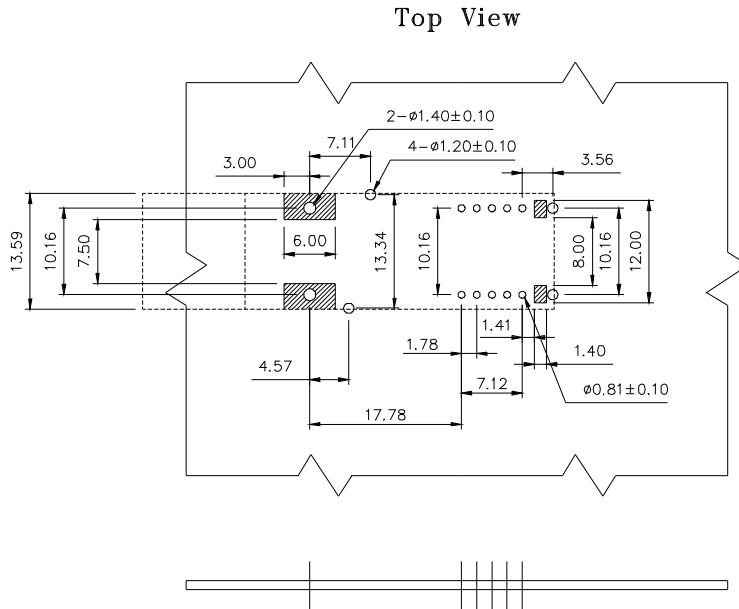
## PACKAGE DIAGRAM

Units in mm



**Note:** Specifications subject to change without notice. The 50 +/- 3 cm long pigtail with a SC/PC connector is standard. If non-standard pigtail is required, please make a contact with Optoway Technology Inc.

RECOMMENDED CIRCUIT BOARD LAYOUT



Notes:

1. This figure describes the recommended circuit board layout for the SFF OLT Transceiver.
2. The hatched areas are keep-out areas reserved for housing standoff. No metal traces or ground connection in keep-out area.
3. The mounting studs should be solder to chassis ground for mechanical integrity.