

preliminary



# 1.25Gbps Burst Mode GEPON ONU Bi-Directional Single-Fiber SFF Transceiver

## Features

- Compliant with IEEE 802.3ah
- Burst mode transmitter
- Continuous mode receiver
- Industrial standard SFF 2 X 5 pin footprint
- SC/ST/FC connector interface
- Transmitter disable function
- Receiver signal detect function
- Single supply 3.3V



## Specifications

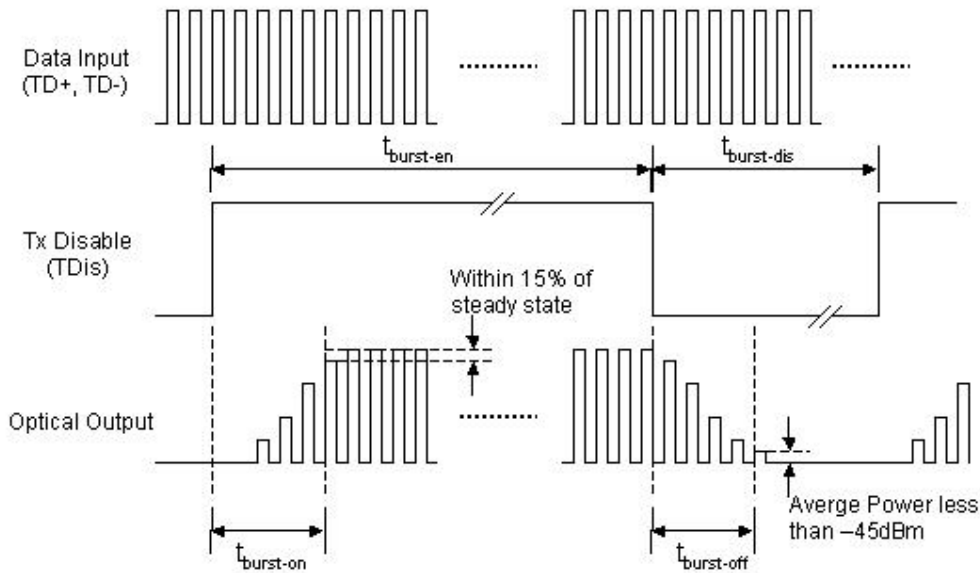
Parameter	Symbol	Min.	Typ.	Max.	Unit
<b>Transmitter</b>					
Data Rate (NRZ)	B	-	1.25	-	Gb/s
Optical Output Power (avg.) <sup>(1)(2)(3)</sup>	P <sub>O</sub>	-3	-	+2	dBm
Extinction Ratio	ER	6	-	-	dB
Optical Wavelength	λ <sub>C</sub>	1270	1310	1360	nm
Spectral Width					
1310nm FP LD (RMS)	Δλ	-	-	2.5	nm
1310nm DFB LD (-20dB)	Δλ	-	-	1	nm
Side Mode Suppression Ratio					
1310nm DFB LD	SMSR	30	-	-	dB
Output Rise Time (20-80%)	t <sub>r</sub>	-	-	0.26	ns
Output Fall Time (20-80%)	t <sub>f</sub>	-	-	0.26	ns
Burst Turn On Time <sup>(8)</sup>	t <sub>burst-on</sub>	-	-	64	ns
Burst Turn Off Time <sup>(8)</sup>	t <sub>burst-off</sub>	-	-	64	ns
Burst Enable Time <sup>(8)</sup>	t <sub>burst-en</sub>	600	-	-	ns
Burst Disable Time <sup>(8)</sup>	t <sub>burst-dis</sub>	100	-	-	ns
Data Input <sup>(6)</sup>	V <sub>IL</sub> V <sub>IH</sub>	V <sub>CC</sub> -1.810 V <sub>CC</sub> -1.165	- -	V <sub>CC</sub> -1.475 V <sub>CC</sub> -0.88	V
Tx Disable Input	V <sub>DI(L)</sub> V <sub>DI(H)</sub>	0 2	- -	0.8 V <sub>CC</sub>	V
Optical Output Power (avg.) of Tx Disable	P <sub>Off</sub>	-	-	-45	dBm
Supply Voltage	V <sub>CC</sub>	3.10	3.3	3.50	V
Supply Current	I <sub>CC</sub>	-	-	110	mA

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Parameter	Symbol	Min.	Typ.	Max.	Unit
<b>Receiver</b>					
Data Rate (NRZ)	B	-	-	1.3	Gb/s
Optical Input (avg.) Sensitivity <sup>(1)(5)</sup>	$P_{IN}$	-	-	-25	dBm
Saturation	$P_{SAT}$	-3	0	-	dBm
Optical Wavelength	$\lambda$	1100	-	1600	nm
Output Rise Time (20-80%)	$t_r$	-	-	0.4	ns
Output Fall Time (20-80%)	$t_f$	-	-	0.4	ns
Data Output <sup>(6)</sup>	$V_{OL}$ $V_{OH}$	$V_{CC} - 1.840$ $V_{CC} - 1.045$	- -	$V_{CC} - 1.62$ $V_{CC} - 0.88$	V
Signal Detect Asserted (avg.)	$P_A$	-	-	-25	dBm
Signal Detect Deasserted (avg.)	$P_D$	-35	-	-	dBm
Hysteresis	$P_{HYS}$	-	2	-	dB
Supply Voltage	$V_{CC}$	3.10	3.3	3.50	V
Supply Current	$I_{CC}$	-	-	100	mA

Note:

- (1) With 0.275 NA, 9/125 $\mu$ m fiber.
- (2) Driven with a differential signal.
- (3) Class 1 eye safe per FDA and IEC.
- (4) Eye mask diagram is compliant to IEEE802.3ah Eye Diagram
- (5)  $2^7 - 1$  PRBS, BER=  $10^{-12}$ .
- (6) Compatible with LVPECL logic levels.
- (7) The transmitter output should not be viewed directly.
- (8) Timing parameter define :





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## Absolute Maximum Ratings

Parameter	Min.	Max.	Unit
Operating Temperature	0	70	°C
Storage Temperature	-40	85	°C
Lead Soldering Limits	-	240/10	°C/sec
Supply Voltage	-0.2	4	V

## Ordering Information

T R □ □ R 4 9 - 3 - 3 - 2 □ □ □ 3 N □ 1

### Data Coupling & SD Output Level :

Symbol	Tx Coupling	Rx Coupling	SD
G	DC	DC	PECL
H	DC	DC	TTL
I	DC	AC	PECL
J	DC	AC	TTL

### Connector Type :

SC : SC Connector  
FC : FC Connector  
ST : ST Connector

### Package Type :

P : Pigtail  
R : Receptacle

### Transmitter Wavelength / Laser Type :

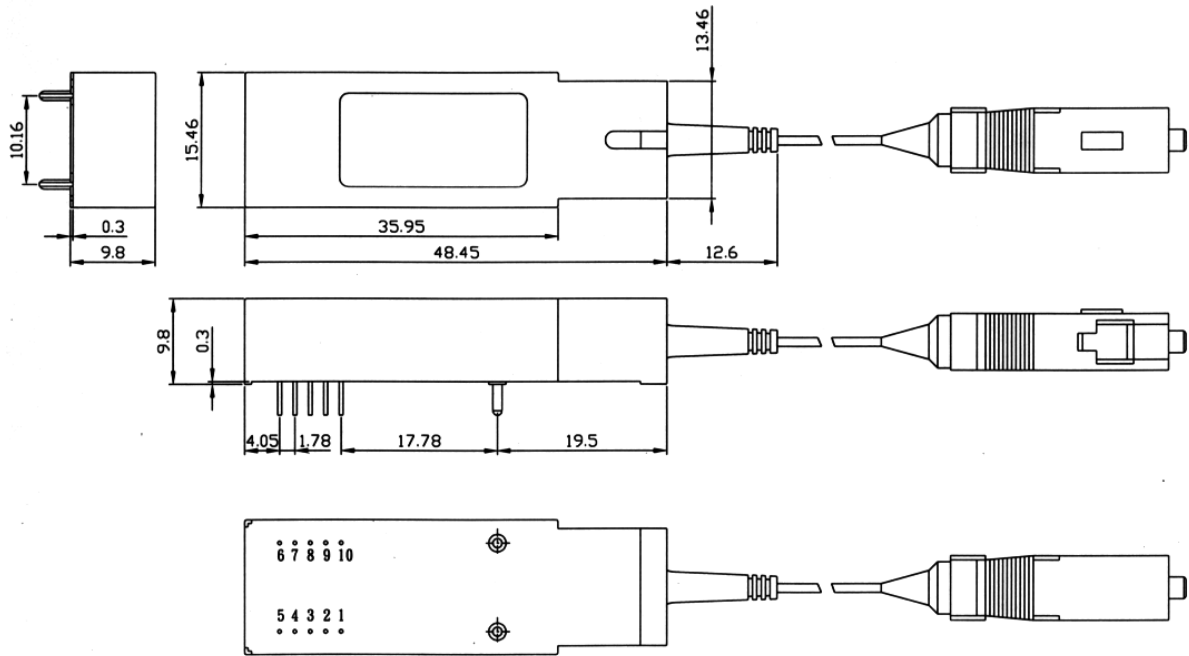
13 : 1310nm (FP LD)  
31 : 1310nm (DFB LD)

Part Number	Laser Type	Transmission distance	Compliant to IEEE 802.3ah
TR13R49-3-3-2□□□3N□1	1310nm, FP	≥10Km	1000BASE-PX-ONU-A
TR31R49-3-3-2□□□3N□1	1310nm, DFB	≥20Km	1000BASE-PX-ONU-B

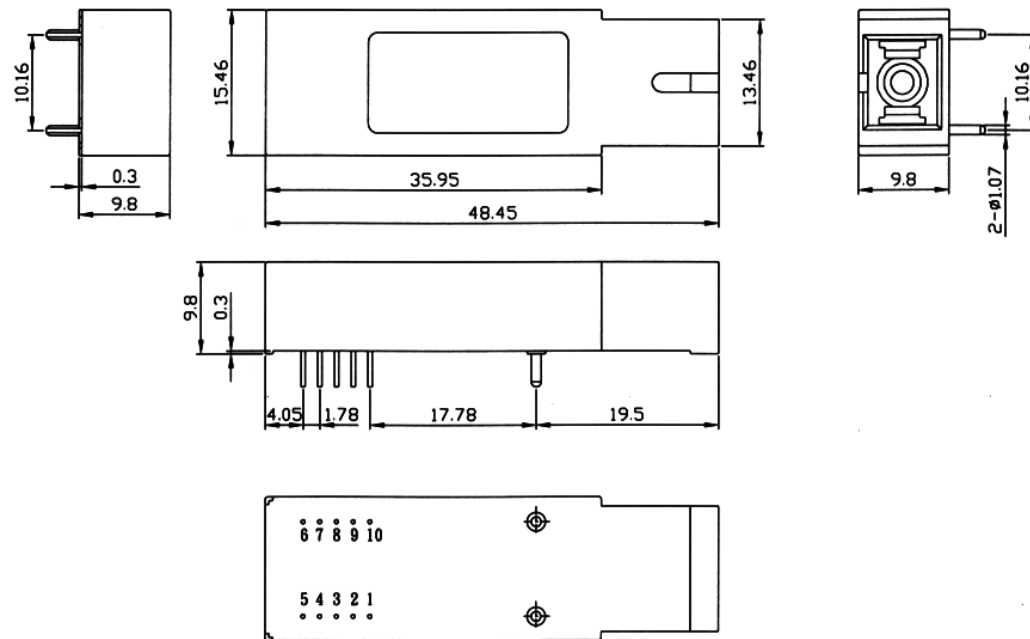
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## Outline Drawing

### Pigtail 2x5 pins SFF



### Receptacle 2x5 pins SFF



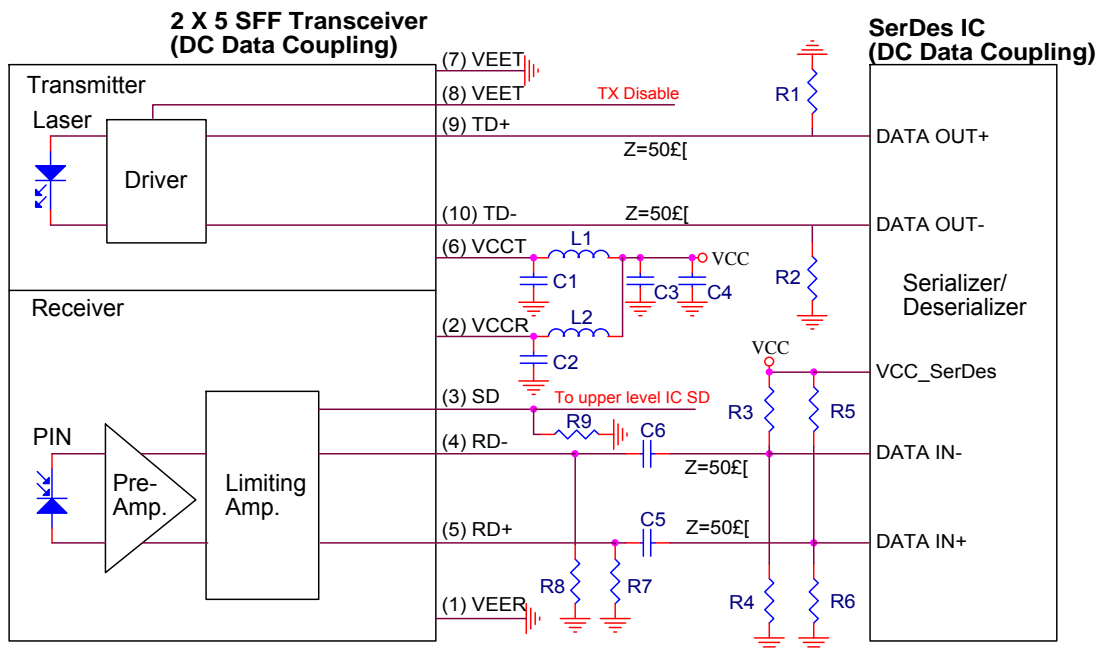
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## Pinout Description

Pin No.	Symbol	Description
1	V <sub>EER</sub>	Receiver Ground
2	V <sub>CCR</sub>	Receiver Power Supply
3	SD	Receiver Signal Detect
4	RD-	Receiver Data Out (Inverted)
5	RD+	Receiver Data Out
6	V <sub>CCT</sub>	Transmitter Power Supply
7	V <sub>EET</sub>	Transmitter Ground
8	TD <sub>is</sub>	Input Logic Low Level to Switch Laser "ON" Input Logic High Level to Switch Laser "OFF"
9	TD+	Transmitter Data in
10	TD-	Transmitter Data In (Inverted)

## Application Notes

### Recommended DC Coupling Interface Circuit;G



L1=L2=1£gH or ferrite bead  
 C1=C2=C3=C5=C6=0.1£gF  
 C4=10£gF  
 R1, R2, R3, R4, R5, R6 depends on SerDes IC specification.  
 (Consult the SerDes IC application information)  
 R7=R8=270£[  
 R9=510£[

#### NOTE;G

1. Transmission line characteristic impedance Z=50£[.
2. R1, R2, R3, R4, R5, R6 as close to SerDes IC as possible
3. R7, R8 as close to 2X5 Transceiver as possible.