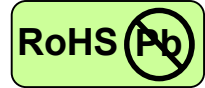


# 1000BASE-PX10-ONU Transceiver



SFF 2x5, Single SC Connector, 1310nm FP LD, RoHS Compliant



## Features

- TX:1310nm FP LD Burst Mode
- RX:1490nm PIN CW Mode
- Upstream:1.25Gbps, Downstream:1.25Gbps
- Single +3.3V Power Supply
- RoHS Compliant and Lead-free
- PECL Differential Electrical Interface
- Compliant with Multi-Source Agreement (MSA) Small Form Factor (SFF) 2x5 Footprint
- Single SC/UPC Connector
- Compliance with IEEE 802.3ah 1000BASE-PX10-U
- Eye Safety  
Designed to meet Laser Class 1 comply with EN60825-1

## Applications

- Gigabit Ethernet Passive Optical Networks (GE-PON) ONU side.
- Gigabit Ethernet Point-to-Point Bi-directional Transmission.
- Burst mode application.
- FTTx broadband access system.

## Description

The CT-1212TEF-HF4C from Coretek Opto Corp. is the high performance and cost-effective module for serial optical data communication applications specified for single mode of 1.25 Gb/s. It operates with +3.3V power supply. The module is intended for single mode fiber, operates at a nominal wavelength of Tx: 1310nm / Rx: 1490nm and complies with Multi-Source Agreement (MSA) Small Form Factor (SFF) 2x5 footprint. Each module consists of a bi-directional optical subassembly that combines a transmitter with a receiver and an electrical subassembly. All of them are housed in a metal package and the combination produces a reliable component.

The module is a single fiber connector transceiver designed for use in gigabit Ethernet passive optical network (GE-PON) ONU applications. The transmitter is operating at burst mode and the receiver is operating at continuous mode. The characteristics are performed in accordance with Telcordia Specification GR-468-CORE.

## EMC

Most equipment utilizing high-speed transceivers will be required to meet the following requirements:

- 1) FCC in the United States
- 2) CENELEC EN55022 (CISPR 22) in Europe

To assist the customer in managing the overall equipment EMC performance, the transceivers have been designed to satisfy FCC class B limits and provide good immunity to radio-frequency electromagnetic fields.

## Eye Safety

The transceivers have been designed to meet Class 1 eye safety and comply with EN 60825-1.

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## Product Information

Model Number	Operating Voltage & SD IN/OUT	Burst Control	TX	RX	Output Power	Sensitivity
CT-1212TEF-HF4C	3.3V LVTTTL AC/AC	LVTTTL (Enable:Logic "1")	1310 nm FP	1490 nm	-1~ +4 dBm	≤-26 dBm

## ABSOLUTE MAX RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Storage Temperature	T <sub>S</sub>	-40	85	°C	
Supply Voltage	V <sub>CC</sub>	0	3.6	V	
Lead Soldering Temperature/Time	T <sub>SOLD</sub>		260	°C	10 sec on lead

## OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Ambient Operating Temperature	T <sub>A</sub>	0		70	°C	
Supply Voltage	V <sub>CC</sub>	3.1		3.5	V	

## ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
<b>Transmitter</b>					
Transmitter Supply Current	I <sub>CCT</sub>		200	mA	
Transmitter Data Input Differential Voltage	V <sub>ID</sub>	0.2	1.6	V	
LVTTTL Transmit Burst Input Voltage - Low	V <sub>IL</sub>	0	0.8	V	
LVTTTL Transmit Burst Input Voltage - High	V <sub>IH</sub>	2.4	3.3	V	
<b>Receiver</b>					
Receiver Supply Current	I <sub>CCR</sub>		120	mA	
Receiver Data Output Differential Voltage	V <sub>OD</sub>	0.4	1.6	V	
LVTTTL Signal Detect Output Voltage – Low	V <sub>OL</sub>	0	0.8	V	
LVTTTL Signal Detect Output Voltage – High	V <sub>OH</sub>	2.4	3.3	V	

## TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Optical Output Power	P <sub>o</sub>	-1		4	dBm	1
Extinction Ratio	ER	9			dB	
Center Wavelength	λ <sub>c</sub>	1270	1310	1350	nm	
Spectral Width (RMS)	Δλ		Compliant with IEEE 802.3ah			
Optical Rise,Fall time (20%-80%)	t <sub>r</sub> , t <sub>f</sub>			260	psec	2
TX burst on time	T <sub>on</sub>			32	ns	
TX burst off time	T <sub>off</sub>			32	ns	
Output Eye		Compliant with IEEE802.3z, IEEE802.3ah				

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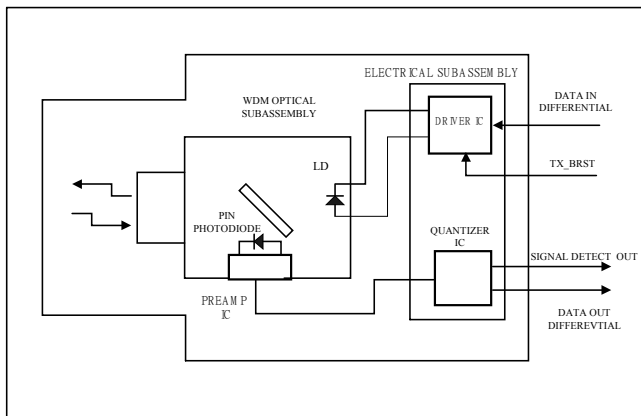
## RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Maximum Input Optical Power	$P_{max}$	-3			dBm	3
Receiver Sensitivity	$P_{min}$			-26	dBm	3
Operating Wavelength	$\lambda$	1480		1500	nm	
Return Loss	RL			-12	dB	
Signal Detect - Asserted	$P_A$			-25	dBm	4
Signal Detect - Deasserted	$P_D$	-40			dBm	5
Signal Detect - Hysteresis	$P_A - P_D$	0.5		5.0	dB	

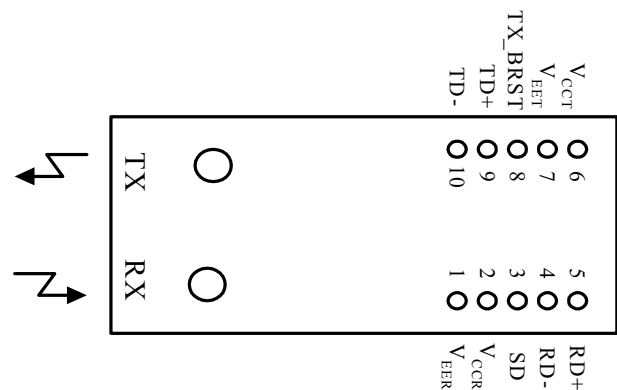
### Notes:

1. Measured average power coupled into 9/125  $\mu$  m single mode fiber.
2. These are 20-80% values.
3. Measured with  $2^7-1$  PRBS at  $BER < 10^{-12}$
4. Measured on transition – low to high
5. Measured on transition – high to low

## BLOCK DIAGRAM OF TRANSCEIVER



## PIN OUT DIAGRAM OF TRANSCEIVER



## PIN OUT TABLE

Pin	Symbol	Functional Description
Mounting Posts		
The mounting posts are provided for transceiver mechanical attachment to the circuit board. They should not be connected to the circuit ground but can be connected to the chassis ground.		
1	$V_{EER}$	Receiver Signal Ground
2	$V_{CCR}$	Receiver Power Supply
3	SD	Signal Detect is a TTL output. A high level indicates a received optical signal
4	RD-	Receiver Data Inverted Differential Output
5	RD+	Receiver Data Non-inverted Differential Output
6	$V_{CCT}$	Transmitter Power Supply
7	$V_{EET}$	Transmitter Signal Ground
8	TX_BRST	Transmitter Burst Control
9	TD+	Transmitter Data Non-inverted Differential Input
10	TD-	Transmitter Data Inverted Differential Input

## TRANSMITTER OPERATING FUNCTION TABLE

Vcc	TX_BRST	Data Input	Optical Power
Vcc<3.0V	X	X	OFF
	High	Yes	ON
Vcc>3.0V	High	No	Other
	Low	X	OFF

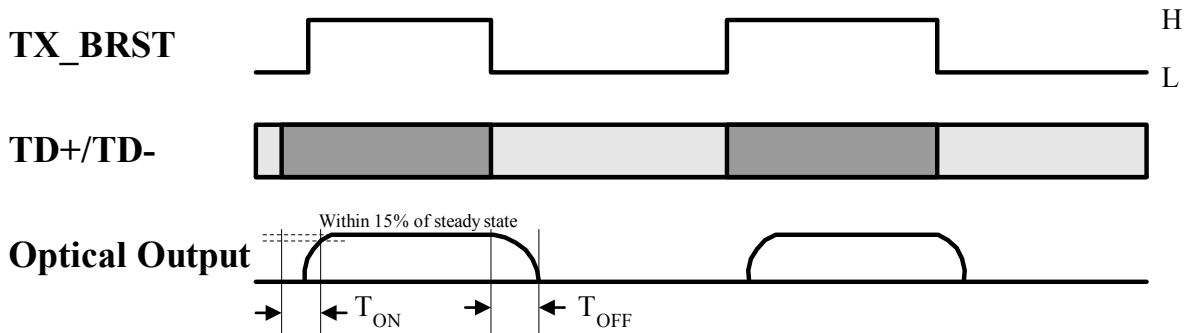
X=Don't care

High=Logic High Level , Low = Logic Low Level

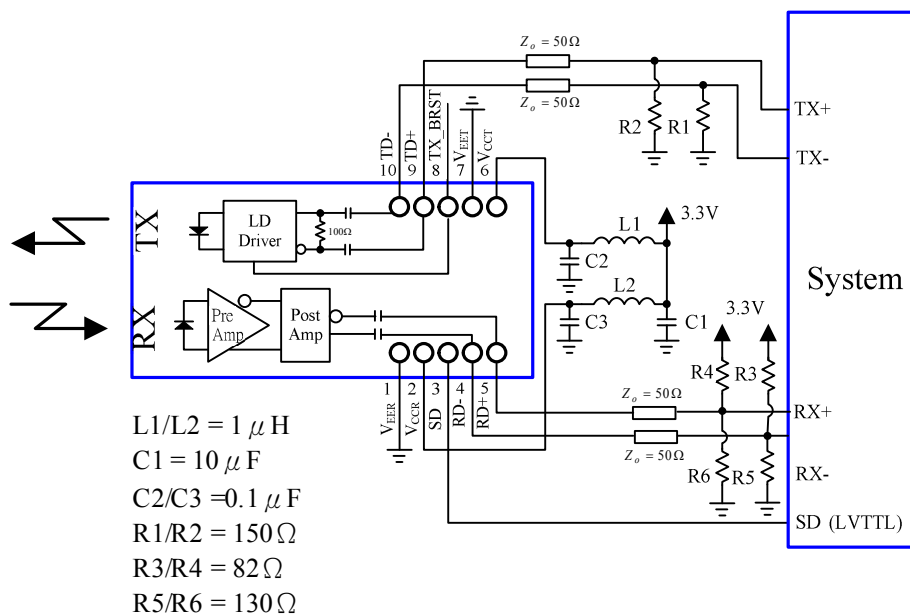
Yes= Data Input, No = No Data Input

OFF = Optical Power is less than -45dBm

Other = Optical Power is less than +7.5dBm



## RECOMMENDED CIRCUIT SCHEMATIC

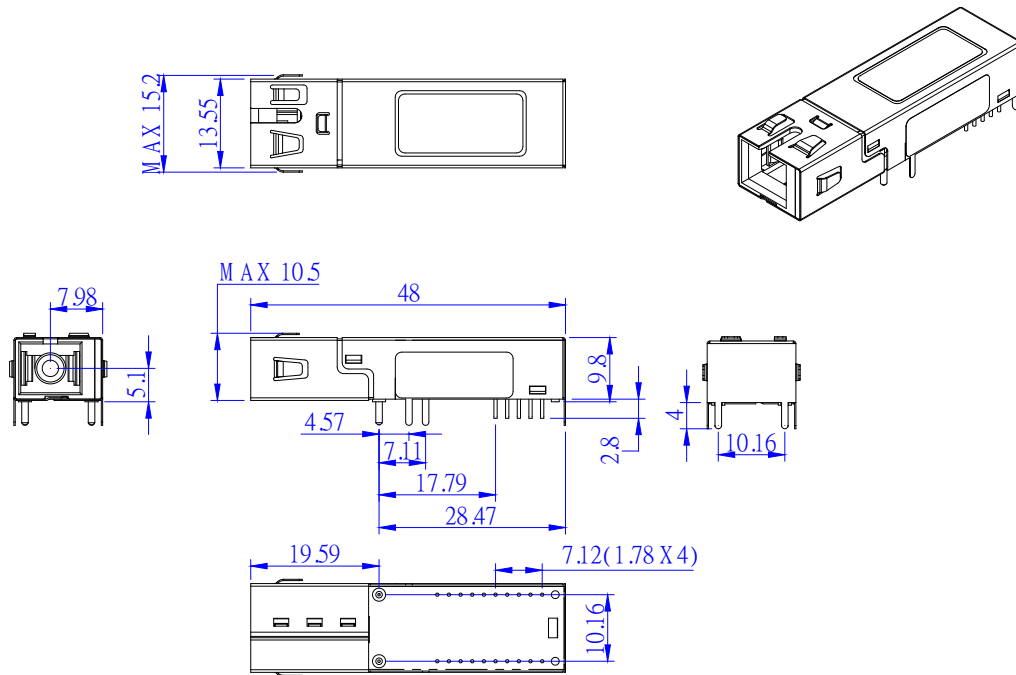


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## MECHANICAL DIMENSIONS

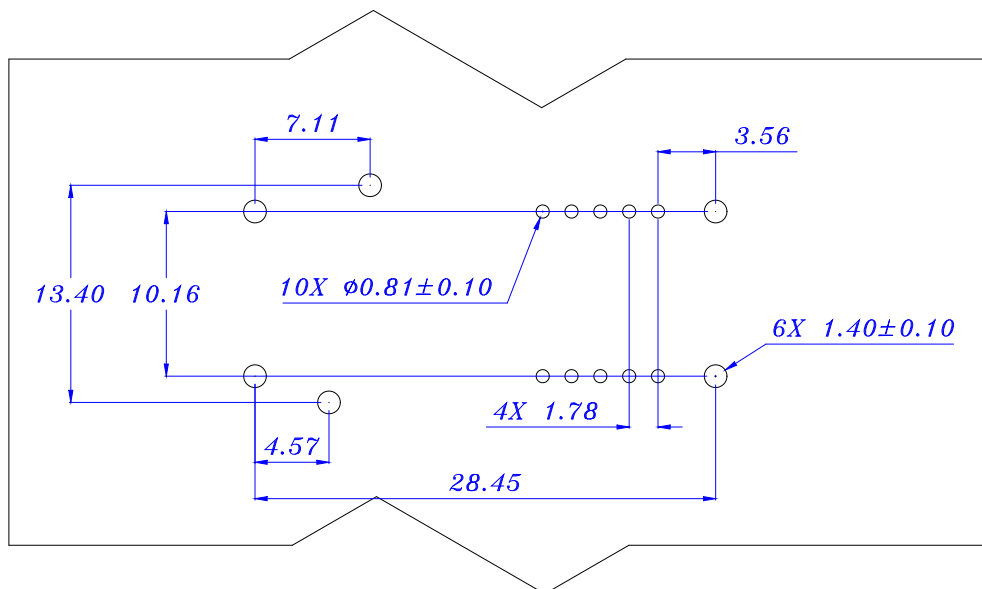
Units in mm



All dimensions are  $\pm 0.1$ mm unless otherwise specified.

## RECOMMENDED SFF HOST BOARD LAYOUT

Units in mm



### Claim:

CORETEK Opto Corp. reserves the right to make changes in the specification described hereinafter without prior notice.