

# 1.25 Gb/s, SFP LC, Dual BiDi TX 1490/RX1310 nm Single Mode, 20 km Distance

## Description

This compact SFP has dual-channel Bi-Directional (BiDi) optics for single mode applications. This module increases by 4x instantly the total bandwidth capacity of an existing fiber cable infrastructure. Built upon OptixCom's BiDi technology, this compact design has set a new standard for increasing port density requirement in the networking industry.

This optical transceiver integrates two BiDi channels transmitting at 1490 nm and receiving at 1310 nm wavelength. It operates at 1.25 Gb/s with 20 km of transmission distance and > 14 dB power budget.

The product is compliant with CSFP MSA Option 2 and SFF-8472. It's RoHS compliant.

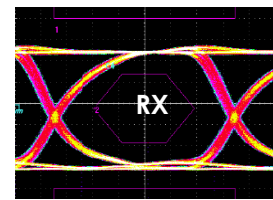
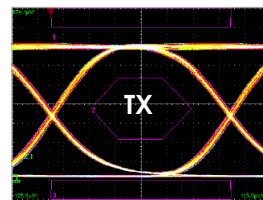


Lead-Free

## CBD-1250T4R3-AT20K



1.25 Gb/s, 2<sup>7</sup>-1 NRZ Data Eye pattern



## Key Features

- 2x Bi-Directional channels in one SFP package
- Single Mode, 1.25 Gb/s
- TX 1490/RX 1310 nm wavelength
- > 14 dB power budget, 20 km reach
- Single 3.3 V power supply
- Z-axis hot pluggable
- Compliant with CSFP MSA Option 2
- Dual LC connector optical interface
- AC coupling LVPECL differential I/O logics
- -40–85 °C extended temperatures available
- RoHS compliant

## Applications

- ✓ Fiber Channel, Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect

## Ordering Information

**Part Number:** CBD-1250T4R3-AT20K

### Description:

1.25 Gb/s, Single Mode, SFP Dual BIDI Optical Transceiver, TX 1490 nm/RX 1310 nm, 20 km reach, 0 -70°C.

\* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., CBD-1250T4R3-AT20K-T.

## Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-40	25	85	°C
Data Rate	---	1.25	1.3	Gb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	500	550	mA

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	$T_{st}$	-40	85	°C
Supply Voltage	$V_{CC}$	-0.5	4.0	V
Input Voltage	$V_{IN}$	-0.5	$V_{CC} + 0.3$	V
Output Current	$I_o$	---	50	mA
Soldering Temperature (10 sec. on leads)	$T_{sd}$	---	260	°C

### Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage <sup>1</sup>	$\Delta V_i$	0.4	---	1.8	V
Differential Input Impedance <sup>2</sup>	$Z$	---	100	---	ohm
Optical Output Power <sup>3</sup>	$P_o$	-5	---	0	dBm
Optical Wavelength	$\lambda_o$	1470	1490	1510	nm
Rise/Fall Time (20%~80%)	$T_r/T_f$	---	---	0.16	ns
Extinction Ratio	$ET$	9	---	---	dB
TX Disable Power	$P_{TD}$	---	---	-30	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
TX Disable Voltage – High	$V_{DH}$	2.0	---	$V_{CC}$	V
TX Disable Voltage – Low	$V_{DL}$	0	---	0.8	V
TX Fault Output – High	$V_{FH}$	2.0	---	$V_{CC}$	V
TX Fault Output – Low	$V_{FL}$	0	---	0.8	V
TX Disable Assert Time	$T_{ass}$	---	---	10	μs
TX Disable Deassert Time	$T_{disass}$	---	---	1.0	ms
Time to Initialize	$T_{as}$	---	---	300	ms
TX Fault from Fault to Assertion	$T_{fault}$	---	---	100	μs
TX Disable Time to Start Reset	$T_{reset}$	10	---	---	μs

Notes:

1. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.
3. Output of coupling optical power into 9/125 μm SMF.

**Class 1 Laser Product  
Complies with  
21 CFR 1040.10 and 1040.11**



**Receiver Electro-Optical Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Impedance	Z	---	100	---	Ohm
Differential Output Voltage <sup>1</sup>	$\Delta V_o$	0.4	---	1.8	V
Optical Wavelength	$\lambda_o$	1390	1310	1330	nm
Receiver Overload	$P_{max}$	0	---	---	dBm
Receiver Sensitivity <sup>2</sup>	$P_I$	---	---	-19	dBm
Optical Return Loss	OL	12	---	---	dB
RX Signal Loss – Deasserted	$P_{RL-}$	-30	---	---	dBm
RX Signal Loss – Asserted	$P_{RL+}$	---	---	-19	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	4	dB
RX Signal Loss Assert Time	$T_{RL+}$	---	---	100	$\mu$ s
RX Signal Loss Deassert Time	$T_{RL-}$	---	---	100	$\mu$ s
RX Signal Loss Output - High	$V_{RL+}$	2.0	---	$V_{CC}$	V
RX Signal Loss Output - Low	$V_{RL-}$	0	---	0.8	V

Notes:

1. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.
2. Test at 1.25 Gb/s, 2<sup>7</sup> – 1 PRBS data pattern, and > 1x10<sup>-12</sup> of Bit-Error-Rate (BER)

**PIN Assignment and Description**

CSFP MSA option 2

