

**1.25 Gb/s, 1x9 SC Package, BIDI
TX1310/RX1550, TX1550/RX1310 nm
Single mode, 15 – 60 km Distance**



Description

The bi-directional (BIDI) transceiver product is unique in that only one single fiber (single mode or multimode) is required to transmit and receive signals simultaneously. That means the total bandwidth capacity of an existing cable infrastructure can be doubled instantly. The typical design of a BIDI transceiver uses a 1310 nm LD to transmit and 1550 nm PD to receive, and vice versa for the matching one (1310 nm to receive and 1550 nm to transmit) at the other end to make a complete link.

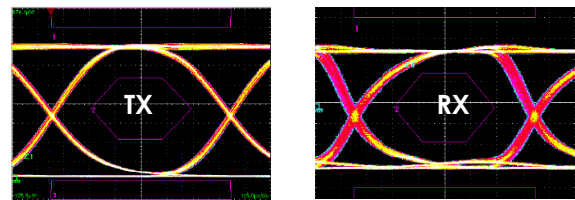
OptixCom's BIDI transceivers utilize advanced filter optics to separate the two wavelength with more than 45 dB of isolation. The products use industry standard 1x9 pluggable package. These transceivers operate at 1.25 Gb/s for 15 - 60 km transmission distance with single mode fibers. The products are RoHS compliant.



**BD9-1250T3R5-ATXXK
BD9-1250T5R3-ATXXK
(XX = 15, 25, 40, 60)**



1.25 Gb/s, 2⁻⁷-1 NRZ Data Eye pattern



Key Features

- Single mode, 1.25 G/s data rate
- TX 1310/RX 1550 and TX 1550/RX1310 matching pair
- 15 - 60 km reach and single 3.3 V power supply
- 12 – 24 dB power budget
- Industry standard 1x9 pluggable package
- Single SC connector optical interface
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- -40–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ FTTH, FTTX, Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter, bus extension
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: BD9-1250T3R5-ATXXK
Description:
 1.25 Gb/s single mode, 1x9 BIDI Transceiver, TX 1310 nm and RX 1550 nm, XX km reach, 0 – 70 °C.

Part Number: BD9-1250T5R3-ATXXK
Description:
 1.25 Gb/s single mode, 1x9 BIDI Transceiver, TX 1550 nm and RX 1310 nm, XX km reach, 0 – 70 °C.

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., BD9-1250T3R5-AT15K-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 |

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} | V |
| Operating Current | I_{op} | --- | 400 | mA |
| Output Current | I_o | --- | 50 | mA |
| Soldering Temperature (10 sec. on leads) | T_{sd} | --- | 260 | °C |

Transmitter Electro-Optical Characteristics (DFB Laser)

| Parameter | Symbol | Min. | Typical | Max. | Units |
|---|--------------|------|---------|------|---------|
| Differential Input Voltage ¹ | ΔV_i | 0.3 | --- | 2.0 | V |
| Differential Input Impedance ² | Z | --- | 100 | --- | ohm |
| Relative Intensity Noise | RIN | --- | --- | -120 | dB/Hz |
| Rise/Fall Time (20% - 80%) | T_r/T_f | --- | --- | 260 | ps |
| Data Input Current - High | I_{IH} | --- | --- | 350 | μA |
| Data Input Current - Low | I_{IL} | -350 | --- | --- | μA |
| Side Mode Suppression Ratio | SMSR | 30 | --- | --- | dB |

General Receiver Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Units |
|---|--------------------|------|---------|----------|-------|
| Differential Output Voltage ¹ | ΔV_o | 1.0 | --- | 1.8 | V |
| Differential Input Impedance ² | Z | --- | 100 | --- | Ohm |
| Optical Return Loss | OL | 14 | --- | --- | dB |
| Rise/Fall Time (20% - 80%) | T_r/T_f | --- | --- | 350 | ps |
| Signal Detect Hysteresis | $P_{SD+} - P_{SD}$ | 1 | --- | --- | dB |
| Crosstalk | | --- | --- | -45 | dB |
| Signal Detect Output - High | V_{SD+} | 2.4 | --- | V_{cc} | V |
| Signal Detect Output - Low | V_{SD-} | 0 | --- | 0.5 | V |

Notes:

1. Module is designed for AC LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

Transmitter Electro-Optical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Units |
|--|-----------------|------|---------|------|-------|
| Optical Output Power ¹ | P_o | -9 | --- | -3 | dBm |
| Optical Wavelength (BD9-1250T3R5-AT15K) | λ_o | 1280 | 1310 | 1355 | nm |
| Optical Wavelength (BD9-1250T5R3-AT15K) | λ_o | 1530 | 1550 | 1570 | nm |
| Extinction Ratio | ET | 9 | --- | --- | dB |
| Spectral Width (rms) (BD9-1250T3R5-AT15K) | $\Delta\lambda$ | --- | --- | 2.5 | nm |
| Spectral Width (-20dB) (BD9-1250T5R3-AT15K) | $\Delta\lambda$ | --- | --- | 1 | nm |

Receiver Electro-Optical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Units |
|--|-------------|------|---------|------|-------|
| Optical Wavelength (BD9-1250T3R5-AT15K) | λ_c | 1500 | --- | 1600 | nm |
| Optical Wavelength (BD9-1250T5R3-AT15K) | λ_c | 1260 | --- | 1360 | nm |
| Receiver Overload | P_{max} | -3 | --- | --- | dBm |
| Receiver Sensitivity ² | P_I | --- | --- | -21 | dBm |
| Signal Detect– Asserted | P_{SD+} | --- | --- | -21 | dBm |
| Signal Detect– Deasserted | P_{SD-} | -35 | --- | --- | dBm |

Notes:

1. Output of coupling optical power into 9/125 μ m SMF.
2. Test at 1.25 Gb/s, 2⁷ – 1 PRBS data pattern, and > 1x10⁻¹² of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

