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

OptixCom
Connect with Light

1x9 Bi-Directional (BiDi) Transceivers

Lead-Free

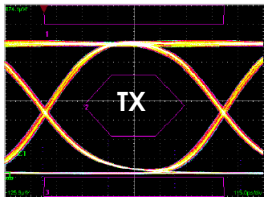
BD9-1250T3R5-AT*XX*K
BD9-1250T5R3-AT*XX*K
(*XX* = 15, 25, 40, 60)

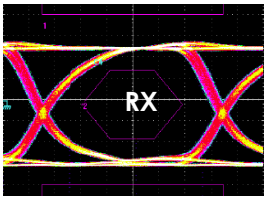
Description

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.

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-AT***XX***K
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-AT***XX***K
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

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	V_{CC}	-0.5	4.0	V
Input Voltage	V_{IN}	-0.5	V_{CC}	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	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%)	*Tr/Tf*	---	---	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%)	*Tr/Tf*	---	---	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	-3	---	+2	dBm
Optical Wavelength (BD9-1250T3R5-AT40K)	λ_O	1280	1310	1340	nm
Optical Wavelength (BD9-1250T5R3-AT40K)	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	9	---	---	dB
Spectral Width (-20dB) (BD9-1250T3R5-AT40K)	$\Delta\lambda$	---	---	1	nm
Spectral Width (-20dB) (BD9-1250T5R3-AT40K)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Wavelength (BD9-1250T3R5-AT40K)	λ_C	1500	---	1600	nm
Optical Wavelength (BD9-1250T5R3-AT40K)	λ_C	1260	---	1360	nm
Receiver Overload	P_{max}	-2	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-23	dBm
Signal Detect– Asserted	P_{SD+}	---	---	-23	dBm
Signal Detect– Deasserted	P_{SD-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ 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

Underwriters Laboratories

TÜVRheinland

Lead-Free