155 Mb/s, 2x5 SFF Package, BIDI
TX 1310/RX 1550, TX 1550/RX 1310 nm
Single mode, 15 – 80 km Distance

OptixCom
Connect with Light

2x5 Bi-Directional (BiDi) Transceivers

Description

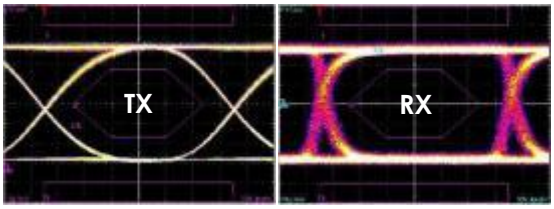
The bi-directional (BIDI) transceiver product is unique in that only one single fiber (single mode or multimode) is required to transmit and receive signals simultaneously. That means the total bandwidth capacity of an existing cable infrastructure can be doubled instantly. The typical design of a BIDI 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 2x5 SFF pluggable package. These transceivers operate at 155 Mb/s for 15 - 80 km transmission distance with single mode fibers. The products are RoHS compliant.

Lead-Free

BD5-155T3R5-DP*XX*K
BD5-155T5R3-DP*XX*K
(*XX* = 15, 25, 40, 60, 80)

155 Mb/s, 2^{23}-1 NRZ Data Eye Pattern



Key Features

- Single mode, 155 M/s data rate
- TX 1310/RX 1550 and TX 1550/RX1310 matching pair
- 15 - 60 km reach and single 3.3 V power supply
- 17 – 33 dB power budget
- Industry standard 2x5 pluggable package
- Single SC connector optical interface
- DC coupling LVPECL differential I/O logics
- LVPECL Signal detect to monitor optical signals
- -40–85 °C extended temperatures available
- RoHS compliant

Applications

- ✓ FTTH, FTTX, ATM/SONET OC-3, SDH STM-1
- ✓ 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: BD5-155T3R5-DP***XX***K
Description:
155 Mb/s, Single mode, 2x5 BIDI Transceiver, TX 1310 nm and RX 1550 nm, ***XX*** km reach, 0 – 70 °C.

Part Number: BD5-155T5R3-DP***XX***K
Description:
155 Mb/s, Single mode, 2x5 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., BD5-155T3R5-DP15K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-40	25	85	°C
Data Rate	---	155	200	Mb/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	*Vcc*	-0.5	4.0	V
Input Voltage	*VIN*	-0.5	Vcc	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.3	---	1.6	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Rise/Fall Time (10% - 90%)	*Tr/Tf*	---	1	2	ns
Data Input Current - High	*IIH*	---	---	350	µA
Data Input Current - Low	*IIL*	-350	---	---	µA
Data Input Voltage – High	*VIH*	Vcc - 1.1	---	Vcc – 0.7	V
Data Input Voltage - Low	*VIL*	Vcc – 2.0	---	Vcc - 1.6	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Power	*PDP*	---	---	-45	dBm

General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage [1]	*ΔVo*	0.3	---	1.6	V
Differential Input Impedance [2]	*Z*	---	100	---	Ohm
Optical Return Loss	*OL*	14	---	---	dB
Rise/Fall Time (10% - 90%)	*Tr/Tf*	---	1	2	ns
Signal Detect Hysteresis	*PSD+ - PSD*	1	---	---	dB
Crosstalk		---	---	-45	dB
Signal Detect Output - High	*VSD+*	Vcc - 1.1	---	Vcc – 0.7	V
Signal Detect Output - Low	*VSD-*	Vcc – 2.0	---	Vcc - 1.6	V
Data Output Voltage – High	*VOH*	Vcc - 1.1	---	Vcc – 0.7	V
Data Output Voltage – Low	*VOL*	Vcc – 2.0	---	Vcc - 1.6	V

Notes:

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

Transmitter Electro-Optical Characteristics (DFB Laser)

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-5	---	0	dBm
Optical Wavelength (BD5-155T3R5-DP60K)	λ_O	1280	1310	1355	nm
Optical Wavelength (BD5-155T5R3-DP60K)	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	10	---	---	dB
Spectral Width (rms) (BD5-155T3R5-DP60K)	$\Delta\lambda$	---	---	2.5	nm
Spectral Width (-20 dB) (BD5-155T5R3-DP60K)	$\Delta\lambda$	---	---	1	nm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength (BD5-155T3R5-DP60K)	λ_C	1480	---	1600	nm
Operating Wavelength (BD5-155T5R3-DP60K)	λ_C	1260	---	1360	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-34	dBm
Signal Detect– Asserted	P_{SD+}	---	---	-34	dBm
Signal Detect– Deasserted	P_{SD-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 155 Mb/s, 2^{23} – 1 PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.
4. Maximum supply current for the transceiver from Vcc is 250 mA.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

Underwriters Laboratories

TÜVRheinland

Lead-Free