

# 10 Gb/s, XFP LC Package, BIDI TX 1490/RX1550, TX 1550/RX1490 nm Single Mode, 80 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. This long range BIDI transceiver uses EML 1490 nm LD to transmit and 1550 nm APD to receive, and vice versa for the matching one (1490 nm to receive and 1550 nm to transmit) at the other end to make a complete link.

OptixCom's SFP+ transceivers are compliant with XFP Multi-Source Agreement (MSA). The BIDI transceivers utilize advanced filter optics to separate the two wavelength with low power consumption of < 3W. These transceivers operate at 10 Gb/s for 80 km transmission distance with single mode fibers. The products are RoHS compliant.



Lead-Free

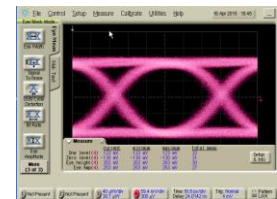
**BD6-10000T4R5-AT80K**  
**BD6-10000T5R4-AT80K**



10 Gb/s, 2<sup>31</sup>-1 NRZ data eye pattern

**TX**

**RX**



## Key Features

- Single mode, 10 G/s data rate
- TX1490/RX1550 & TX1550/RX1490 nm pair
- > 24 dB power budget for 80 km
- Single LC connector optical interface
- 30-pin Z-axis hot pluggable connector
- AC coupling CML differential I/O logics
- Compliant with XFP MSA standard
- Compliant with IEEE 802.3ae, 10GBASE-SW/SR
- Compliant with 10G FC Fiber Channel
- RoHS compliant

## Applications

- ✓ 10G Fiber Channel,
- ✓ 10 Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Data Communication for SAN and LAN
- ✓ Central offices routers and switches
- ✓ Computer cluster cross-connect

## Ordering Information

**Part Number:** BD6-10000T4R5-AT80K

10 Gb/s, Single Mode, XFP BIDI Transceiver, TX 1490 nm and RX 1550 nm, 80 km reach, 0 – 70 °C.

**Part Number:** BD6-10000T5R4-AT80K

10 Gb/s, Single Mode, XFP BIDI Transceiver, TX 1550 nm and RX 1490 nm, 80 km reach, 0 – 70 °C.

\* Add "-T" in the Part Number for -40–85 °C extended temperature range, i.e., BD6-10000T4R5-AT80K-T.

## Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
	- T Transceivers	-40	25	85
Data Rate	9.95	---	11	Gb/s
Supply Voltage (3.3V)	3.13	3.3	3.47	V
Supply Current	---	700	850	mA

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### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	$T_{st}$	-40	85	°C
Supply Voltage @ 3.3V	$V_{CC}$	-0.3	3.8	V
Input Voltage	$V_{IN}$	-0.5	$V_{CC}$	V
Relative Humidity	$R.H.$	5	95	%

### Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage <sup>1</sup>	$\Delta V_i$	0.2	---	1.2	V
Differential Input Impedance <sup>2</sup>	$Z$	---	100	---	ohm
Optical Power	$P_o$	0	---	+4	dBm
Optical Wavelength (BD6-10000T4R5-AT80K)	$\lambda_o$	1480	1490	1500	nm
Optical Wavelength (BD6-10000T5R4-AT80K)	$\lambda_o$	1540	1550	1560	nm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	0.3	nm
TX Disable Asserted	$P_{OFF}$	---	---	-30	dBm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB
Extinction Ratio	$ET$	7.5	---	---	dB
Rise/Fall Time (20% - 80%)	$T_r/T_f$	---	---	40	ps
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	$V_{FH}$	2.4	---	$V_{CC}$	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. 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.
3. Output of coupling optical power into 9/125 μm SMF.

### Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage <sup>1</sup>	$\Delta V_o$	0.3	---	0.8	V
Differential Input Impedance <sup>2</sup>	$Z$	---	100	---	Ohm
Optical Wavelength (BD4-1000T4R5-AT80K)	$\lambda_c$	1540	1550	1560	nm
Optical Wavelength (BD4-1000T5R4-AT80K)	$\lambda_c$	1480	1490	1500	nm
Receiver Overload	$P_{max}$	-6	---	---	dBm
Receiver Sensitivity <sup>3</sup>	$P_I$	---	---	-24	dBm
RX Signal Loss – Asserted	$P_{RL+}$	---	---	-25	dBm
RX Signal Loss – Deasserted	$P_{RL-}$	-35	---	---	dBm
Rise/Fall Time (20% - 80%)	$T_r/T_f$	---	---	40	ps
RX Signal Loss Output - High	$V_{RL+}$	2.0	---	$V_{CC}$	V
RX Signal Loss Output - Low	$V_{RL-}$	0	---	0.8	V
RX Signal Loss Assert Time	$T_{RL+}$	---	---	100	$\mu$ s
RX Signal Loss Deassert Time	$T_{RL-}$	---	---	100	$\mu$ s
Serial ID Clock Rate	$f_c$	---	---	100	kHz

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.
3. Test at 10 Gb/s,  $2^{31} - 1$  PRBS data pattern, and  $> 1 \times 10^{-12}$  of Bit-Error-Rate (BER).