

# 10 Gb/s, 1310 nm Single Mode, 10 km X2 Dual SC Package



## Description

OptixCom's X2 fiber optics transceiver is designed with advanced 1310 nm DFB laser and high speed electronics to achieve the optimum performance for optical interconnect applications. It is compliant with the X2 Multi-Source Agreement (MSA).

X2 uses the same 70-pin electrical connector as XENPAK and supports implementations of XENPAK's four lane XAUI (10 Gigabit attachment unit interface) at both Ethernet (3.125 Gb/sec) and/or Fiber Channel (3.1875 Gb/sec) rates.

The transceiver uses duplex SC connector for the optical interface and is hot pluggable in the z-axis. The transceiver has 4-13 dB of power budget and reaches up to 10 km of transmission distance with single mode fibers. The product is RoHS compliant. Total power consumption is < 4W.



Lead-Free

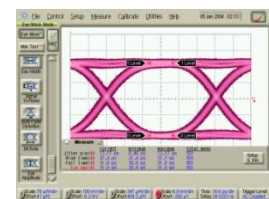
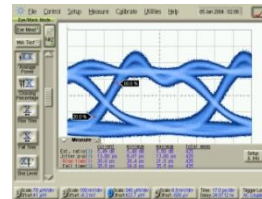
## X2-10000LX-AT10K



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

TX

RX



## Key Features

- Standard XAUI interface with 3Gb/s per channel
- 1310 nm single mode, 10 km, 10 Gb/s data rate
- >4 dB power budget
- Duplex SC connector optical interface
- 70-pin Z-axis hot pluggable connector
- AC coupling CML differential I/O logics
- Compliant with X2 MSA standard
- Compliant with IEEE 802.3ae, 10GBASE-LW/LR
- Compliant with 10G FC Fiber Channel Standard
- RoHS compliant

## Applications

- ✓ 10G Fiber Channel & Ethernet
- ✓ OC192/STM-64 for SONET/SDH
- ✓ High speed I/O for file server
- ✓ Data Communication for SAN and LAN
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

## Ordering Information

**Part Number:** X2-10000LX-AT10K

### Description:

1310 nm 10 Gb/s, single mode, X2 fiber optics transceiver, 10 km reach, 0-70°C

## Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	9.95	---	11.3	Gb/s
Adaptable Power Supply	1.15	1.2	1.25	V
Power Supply Vcc	3.1	3.3	3.5	V
Power Dissipation	---	3.5	4	W

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	$T_{st}$	-40	85	°C
Adaptable Power Supply (APS)	$V_{aps}$	0	1.5	V
Supply Voltage @ 3.3V	$V_{cc}$	-0.5	4.0	V
Humidity	$R.H.$	0	85	%

### Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
XAUI Data Rate	$X_{DR}$	---	3.125	---	Gb/s
XAUI Baud Rate Tolerance	$X_{BRT}$	-100	---	+100	ppm
Differential Input Voltage <sup>1</sup>	$\Delta V_i$	0.2	---	1.6	V
Differential Input Impedance <sup>2</sup>	$Z$	---	100	---	ohm
Optical Output Power <sup>3</sup>	$P_o$	-8.2	---	+0.5	dBm
Transmitter & Dispersion Penalty	$TDP$	---	---	3.2	dB
Optical Wavelength	$\lambda_o$	1290	1310	1330	nm
Extinction Ratio	$ET$	3.5	---	---	dB
Total Output Jitter	$TOJ$	---	---	0.35	UI
Total Deterministic Output Jitter	$TDJ$	---	---	0.17	UI
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB

Notes:

1. Module is designed for AC coupling. DC voltage will be filtered by internal capacitors.
2. Single ended will be 50 ohm for each signal line.
3. Output of coupling optical power into 9/125  $\mu$ m SMF.
4. Refer to OptixCom "X2 Design Reference Guide" or IEEE 802.3ae for more design details.

**Receiver Electro-Optical Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	$\lambda_c$	1260	---	1600	nm
Receiver Sensitivity <sup>1</sup>	$P_I$	-14.4	---	+0.5	dBm
Receiver Sensitivity in OMA <sup>1</sup>	$P_{IOMA}$	---	---	-12.6	dBm
RX Stressed Sensitivity in OMA <sup>1</sup>	$P_{SOMA}$	---	---	-10.3	dBm
Differential Output Voltage	$\Delta V_o$	0.8	---	1.6	V
Differential Input Impedance <sup>2</sup>	$Z$	---	100	---	Ohm

Notes:

1. Test at 10 Gb/s, 2<sup>31</sup> – 1 PRBS data pattern, and > 1x10<sup>-12</sup> of Bit-Error-Rate (BER).
2. Single ended will be 50 ohm for each signal line.
3. Refer to OptixCom “X2 Design Reference Guide” or IEEE 802.3ae for more design details.

**Electrical Signal Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Units
1.2 V CMOS					
Input High Voltage	$V_{IL(MAX)}$	---	---	0.36	V
Input Low Voltage	$V_{IH(MIN)}$	0.84	---	1.25	V
Capacitance		---	---	320	pF
Pull Up Resistance	$R_{pull}$	10k	---	22k	Ohm
MDIO I/O					
Output Low Voltage	$V_{OL}$	-0.3	---	0.2	V
Output Low Current	$I_{OL}$	---	---	4	mA
Input High Voltage	$V_{IH}$	0.84	---	1.5	V
Input Low Voltage	$V_{IL}$	-0.3	---	0.36	V
Pull-Up Supply Voltage	$V_{PULL}$	1.14	1.2	1.26	
Input Capacitance	$C_{IN}$	---	---	10	pF
Load Capacitance	$C_{LOAD}$	---	---	470	pF
External Pull-Up Resistance	$E_{pull}$	200	---	---	Ohm

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

