10 Gb/s, 40 - 80 km
CWDM 1470 - 1610 nm
X2 Dual SC Package

OptixCom
Connect with Light
10G X2 Optical Transceivers

Description

OptixCom's X2 CWDM fiber optics transceiver is designed with advanced EA-DFB laser and high speed electronics receiver that covers the wavelength spectrum from 1470 nm to 1610 nm, with industry standard 20 nm spacing. 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 >15 dB of power budget for 40 km and >24 dB for 80 km of transmission distance with single mode fibers. The product is RoHS compliant. Total power consumption is < 4W.

Lead-Free

X2-10000CEX-AT40K-*XX*
X2-10000CEX-AT80K-*XX*

Key Features

- Standard XAUI interface with 3Gb/s per channel
- CWDM 1470 - 1610 nm, 10 Gb/s data rate
- > 15 dB power budget for 40 km
- > 24 dB power budget for 80 km
- 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-ER/ZR
- Compliant with 10G FC Fiber Channel Standard
- RoHS compliant

Ordering Information

Part Number: X2-10000CEX-AT40K-***XX***

CWDM, 1470 - 1610 nm 10 Gb/s, single mode, X2 fiber optics transceiver, 40 km, 1***XX***0 nm wavelength, 0 -70°C

Part Number: X2-10000CEX-AT80K-***XX***

CWDM, 1470 - 1610 nm 10 Gb/s, single mode, X2 fiber optics transceiver, 80 km, 1***XX***0 nm wavelength, 0 -70°C

XX specifies the wavelength described below. For example, X2-10000CEX-AT40K-57 is the 1570 nm CWDM module.

XX	Wavelength	*XX*	Wavelength
47	1470 nm	55	1550 nm
49	1490 nm	57	1570 nm
51	1510 nm	59	1590 nm
53	1530 nm	61	1610 nm

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

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	9.95	---	11.3	Gb/s
Supply Voltage (3.3V)	3.1	3.3	3.5	V
Supply Voltage (5V)	4.75	5	5.25	V
Adaptable Power Supply	1.15	1.2	1.25	V
Module Power Dissipation	---	---	4	W

Phone: (949) 679-5712 Fax: (949) 420-2134
17901 Von Karman Avenue, Suite 600,
Irvine, CA 92614, USA
Email: Support@OptixCom.com

http://www.OptixCom.com
http://www.OpticalTransceiver.com

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-20	85	°C
Supply Voltage @ 3.3V	*Vcc3*	-0.5	4.0	V
Supply Voltage @ 5V	*Vcc5*	-0.5	6.0	V
Supply Voltage (APS)	*Vaps*	0	1.5	V
Humidity	*R.H.*	0	85	%

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
XAUI Data Rate	*XDR*	---	3.125	---	Gb/s
XAUI Baud Rate Tolerance	*XBRT*	-100	---	+100	ppm
Differential Input Voltage [1]	*ΔVi*	0.2	---	1.6	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Optical Wavelength	λ_O	-6.5	λ_C	+6.5	nm
Side Mode Suppression Ratio	*SMSR*	30	---	---	dB

General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage	*ΔVo*	0.8	---	1.6	V
Operating Wavelength	λ_C	1260	---	1620	nm
Differential Input Impedance [2]	*Z*	---	100	---	Ohm
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	40	ps

Notes:

1. Module is designed for AC coupling. DC voltage will be filtered by internal capacitor.
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.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

Underwriters Laboratories

TÜVRheinland

Lead-Free

Phone: (949) 679-5712 Fax: (949) 420-2134
17901 Von Karman Avenue, Suite 600,
Irvine, CA 92614, USA
Email: Support@OptixCom.com

http://www.OptixCom.com
http://www.OpticalTransceiver.com

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1] (X2-10000CEX-AT40K-XX)	P_O	-1	---	+2	dBm
Optical Output Power [1] (X2-10000CEX-AT80K-XX)	P_O	0	---	+4	dBm
Side Mode Suppression Ratio	*SMSR*	30	---	---	dB
Extinction Ratio	*ET*	9	---	---	dB
Center Wavelength – 1470 nm	λ_C	1464.5	1470	1477.5	nm
Center Wavelength – 1490 nm	λ_C	1484.5	1490	1497.5	nm
Center Wavelength – 1510 nm	λ_C	1504.5	1510	1517.5	nm
Center Wavelength – 1530 nm	λ_C	1524.5	1530	1537.5	nm
Center Wavelength – 1550 nm	λ_C	1544.5	1550	1557.5	nm
Center Wavelength – 1570 nm	λ_C	1564.5	1570	1577.5	nm
Center Wavelength – 1590 nm	λ_C	1584.5	1590	1597.5	nm
Center Wavelength – 1610 nm	λ_C	1604.5	1610	1617.5	nm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.

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_{LOD}	---	---	470	pF
External Pull-Up Resistance	E_{pull}	200	---	---	Ohm

X2-10000CEX-AT40K-XX

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Receiver Sensitivity [1]	*PI*	-15.8	---	-1.0	dBm
Receiver Sensitivity in OMA [1]	*PIOMA*	---	---	-14.1	dBm
RX Stressed Sensitivity in OMA [1]	*PSOMA*	---	---	-12	dBm
Reflectance	*Rrx*	---	---	-26	dB

X2-10000CEX-AT80K-XX

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Receiver Sensitivity [1]	*PI*	-24	---	-7	dBm
Receiver Sensitivity in OMA [1]	*PIOMA*	---	---	-22	dBm
RX Stressed Sensitivity in OMA [1]	*PSOMA*	---	---	-19	dBm
Reflectance	*Rrx*	---	---	-26	dB

1. Test at 10 Gb/s, $2^{31} - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

Underwriters Laboratories

TÜVRheinland

Lead-Free

Phone: (949) 679-5712 Fax: (949) 420-2134
17901 Von Karman Avenue, Suite 600,
Irvine, CA 92614, USA
Email: Support@OptixCom.com