10 Gb/s, 40 - 80 km
DWDM ITU Channels 17 - 61
XFP Dual LC Package

OptixCom
Connect with Light
10G Small Form Pluggable (XFP) Transceivers

Lead-Free

XFP-10000DX-AT40K-*XX*
XFP-10000DX-AT80K-*XX*

Description

OptixCom's DWDM XFP fiber optics transceiver s are designed with high performance EML laser and APD receiver. They are used in 100 GHz channel spacing DWDM systems. It is compliant with 10G Ethernet and Fiber Channel for datacom applications and SONET/SDH for telecom applications. Our transceivers cover the ITU channels from 17 to 61. It is compliant with XFP Multi-Source Agreement (MSA) INF-8077i.

The transceiver uses duplex LC connector for the optical interface. It is hot pluggable in the z-axis with a 30-pin connector. The transceiver has > 15 dB power budget for 40 km, and > 23 dB for 80 km of transmission distance with standard single mode fibers. The product is RoHS compliant. Total power consumption is < 3.5W.

Key Features

- Cover ITU channels 17-61, 10 Gb/s data rate.
- > 15 dB power budget for 40 km
- > 23 dB power budget for 80 km
- Duplex 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-LW/LR
- Compliant with 10G FC Fiber Channel Standard
- RoHS compliant

Ordering Information

Part Number: XFP-10000DX-AT40K-***XX***
Description:
DWDM, 10 Gb/s, single mode, XFP fiber optics transceiver, 40 km, ***XX*** ITU channel code 17-61, -5 -70°C.

Part Number: XFP-10000DX-AT80K-***XX***
Description:
DWDM, 10 Gb/s, single mode, XFP fiber optics transceiver, 80 km, ***XX*** ITU channel code 17-59, -5 -70°C

XX specifies ITU channel code associated with the wavelength For example, XFP-10000DX-AT40K-17 is the 1ITU-17 channel with the 1563.86 nm wavelength and 191.7 THz frequency.

Applications

- ✓ 10G Fiber Channel, 10 Gigabit Ethernet
- ✓ SONET OC-192/SDH STM-64
- ✓ 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	-5	25	70	°C
Data Rate	9.95	---	11.3	Gb/s
Supply Voltage (3.3V)	3.13	3.3	3.47	V
Supply Voltage (5V)	4.75	5.0	5.25	V
Supply Voltage (1.8V)	1.71	1.8	1.89	V

U.S.A. Office: Optix Communications, Inc.
17901 Von Karman Avenue, Suite 600,
Irvine, CA 92614
Tel: (949) 679-5712 Fax: (949) 420-2134

http://www.OptixCom.com
http://www.OpticalTransceiver.com
Email: Support@OptixCom.com

Germany Office: OptixCom GmbH
Magdeburger Strasse 18, 66121
Saarbruecken, Germany
Tel: +49 (0)681 4013-5172

DWDM ITU Grid Wavelength Guide

ITU Code	Frequency (THz)	Wavelength (nm)	ITU Code	Frequency (THz)	Wavelength (nm)
17	191.7	1563.86	40	194.0	1545.32
18	191.8	1563.05	41	194.1	1544.53
19	191.9	1562.23	42	194.2	1543.73
20	192.0	1561.42	43	194.3	1542.94
21	192.1	1560.61	44	194.4	1542.14
22	192.2	1559.79	45	194.5	1541.35
23	192.3	1558.98	46	194.6	1540.56
24	192.4	1558.17	47	194.7	1539.77
25	192.5	1557.36	48	194.8	1538.98
26	192.6	1556.56	49	194.9	1538.19
27	192.7	1555.75	50	195.0	1537.40
28	192.8	1554.94	51	195.1	1536.61
29	192.9	1554.13	52	195.2	1535.82
30	193.0	1553.33	53	195.3	1535.04
31	193.1	1552.52	54	195.4	1534.25
32	193.2	1551.72	55	195.5	1533.47
33	193.3	1550.92	56	195.6	1532.68
34	193.4	1550.12	57	195.7	1531.90
35	193.5	1549.32	58	195.8	1531.12
36	193.6	1548.52	59	195.9	1530.33
37	193.7	1547.72	60	196.0	1529.55
38	193.8	1546.92	61	196.1	1528.77
39	193.9	1546.12			

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage (3.3/5.0/1.8 V)	V_{CC}	-0.5	4.0/6.0/2.0	V
Input Voltage	V_{IN}	-0.5	V_{CC}	V
Operating Current (3.3/5.0/1.8 V)	*Iop*	---	400/350/750	mA
Output Current	*Io*	---	50	mA

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	ΔVi	0.2	---	0.8	V
Differential Input Impedance [2]	Z	---	100	---	ohm
Spectral Width (-20 dB)	$\Delta\lambda$	---	0.1	0.3	nm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB
Channel Spacing	Δf	---	100	---	GHz
Total Jitter	Tj	---	---	0.1	UI
Relative Intensity Noise	RIN	---	---	-130	dB/Hz
TX Fault Output – Low	V_{FL}	0	---	0.5	V
TX Fault Output – High	V_{FH}	2.4	---	V_{CC}	V
TX Disable Voltage – Low	V_{DL}	0	---	0.5	V
TX Disable Voltage – High	V_{DH}	2.4	---	V_{CC}	V
TX Disable Deassert Time	$Tdisass$	---	---	1.0	ms
TX Disable Assert Time	$Tass$	---	---	10	µs
TX Fault from Fault to Assertion	$Tfault$	---	---	100	µs
TX Disable Time to Start Reset	$Treset$	10	---	---	µs
Time to Initialize	Tas	---	---	300	ms

General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage[1]	ΔVo	0.4	---	0.8	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	27	---	---	dB
Rise/Fall Time (20% - 80%)	Tr/Tf	---	---	40	ps
Dispersion Penalty		---	---	2	dB
RX Signal Loss Output - High	V_{RL+}	2.4	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.5	V
RX Signal Loss Assert Time	T_{RL+}	---	---	100	µs
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	µs

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 "XFP Design Reference Guide" or IEEE 802.3ae for more design details.

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-1	---	+2	dBm
Extinction Ratio	ET	8.2	---	---	dB
TX Disable Asserted	P_{OFF}	---	---	-30	dBm
Center Wavelength (Start of Life)	λ_C	λ_C - 25	λ_C	λ_C + 25	pm
Center Wavelength (End of Life)	λ_C	λ_C - 100	λ_C	λ_C + 100	pm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1528	---	1564	nm
Receiver Overload	P_{max}	--	---	-1	dBm
Receiver Sensitivity [2]	P_I	---	---	-16	dBm
Receiver Sensitivity in OMA [2]	P_I	---	---	-14.1	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-22	dBm
RX Signal Loss – Deasserted	P_{RL-}	-28	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. 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

U.S.A. Office: Optix Communications, Inc.
17901 Von Karman Avenue, Suite 600,
Irvine, CA 92614
Tel: (949) 679-5712 Fax: (949) 420-2134

http://www.OptixCom.com
http://www.OpticalTransceiver.com
Email: Support@OptixCom.com

Germany Office: OptixCom GmbH
Magdeburger Strasse 18, 66121
Saarbruecken, Germany
Tel: +49 (0)681 4013-5172

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-1	---	+3	dBm
Extinction Ratio	ET	8.2	---	---	dB
TX Disable Asserted	P_{OFF}	---	---	-30	dBm
Center Wavelength (Start of Life)	λ_C	λ_C - 25	λ_C	λ_C + 25	pm
Center Wavelength (End of Life)	λ_C	λ_C - 100	λ_C	λ_C + 100	pm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1528	---	1564	nm
Receiver Overload	P_{max}	--	---	-7	dBm
Receiver Sensitivity [2]	P_I	---	---	-24	dBm
Receiver Sensitivity in OMA [2]	P_I	---	---	-23	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-34	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. 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

U.S.A. Office: Optix Communications, Inc.
17901 Von Karman Avenue, Suite 600,
Irvine, CA 92614
Tel: (949) 679-5712 Fax: (949) 420-2134

http://www.OptixCom.com
http://www.OpticalTransceiver.com
Email: Support@OptixCom.com

Germany Office: OptixCom GmbH
Magdeburger Strasse 18, 66121
Saarbruecken, Germany
Tel: +49 (0)681 4013-5172