

**10 Gb/s, 40 - 80 km
CWDM 1470 - 1610 nm
SFP+ Dual LC Package**



Description

OptixCom's CWDM SFP+ fiber optics transceiver s are designed with high performance EML laser and APD receiver that cover the wavelength spectrum from 1470 nm to 1610 nm, with industry standard 20 nm spacing. It is compliant with 10G Ethernet and Fiber Channel for datacom applications and SONET/SDH for telecom applications. It is compliant with SFP+ Multi-Source Agreement (MSA).

The transceiver uses duplex LC connector for the optical interface. 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.



Lead-Free

SFP-10000CX-AT40K-XX
SFP-10000CX-AT80K-XX



Key Features

- CWDM 1470 - 1610 nm, 10 Gb/s data rate
- > 15 dB power budget for 40 km
- > 23 dB power budget for 80 km
- Duplex LC connector optical interface
- Z-axis hot pluggable
- AC coupling LVPECL differential I/O logics
- SFF-8431MSA Compliant
- TTL Signal detect to monitor optical signals
- Single 3.3 V power supply
- RoHS compliant

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

Ordering Information

Part Number: SFP-10000CX-AT40K-XX
Description:

CWDM, 1470 - 1610 nm, 10 Gb/s, single mode, SFP+ fiber optics transceiver, 40 km, 1XX0 nm wavelength, 0-70°C

Part Number: SFP-10000CX-AT80K-XX
Description:

CWDM, 1470 - 1610 nm, 10 Gb/s, single mode, SFP+ fiber optics transceiver, 80 km, 1XX0 nm wavelength, 0-70°C

XX specifies the wavelength described below. For example, SFP-10000CX-AT40K-57 is the 1570 nm module.

<u>XX</u>	Wavelength	<u>XX</u>	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

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	9.95	---	11.3	Gb/s
Supply Voltage	3.13	3.3	3.47	V

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	T_{st}	-40	85	°C
Supply Voltage	V_{cc}	-0.5	4.0/6.0/2.0	V
Input Voltage	V_{IN}	-0.5	V_{cc}	V
Operating Current	I_{op}	---	400/350/750	mA
Output Current	I_o	---	50	mA

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage ¹	ΔV_i	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
Relative Intensity Noise	RIN	---	---	-130	dB/Hz
Total Jitter	T_j	---	---	0.1	UI
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	T_{disass}	---	---	1.0	ms
TX Disable Assert Time	T_{ass}	---	---	10	μs
TX Fault from Fault to Assertion	T_{fault}	---	---	100	μs
TX Disable Time to Start Reset	T_{reset}	10	---	---	μs
Time to Initialize	T_{as}	---	---	300	ms

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.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11



General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage	ΔV_o	0.4	---	0.8	V
Differential Input Impedance ¹	Z	---	100	---	Ohm
Optical Return Loss	OL	27	---	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	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	---	0.8	V
RX Signal Loss Assert Time	T_{RL+}	---	---	100	μ s
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	μ s

Notes:

- Single ended will be 50 ohm for each signal line.

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power ¹ (SFP-10000CX-AT40K-XX)	P_o	-1	---	+3	dBm
Optical Output Power ¹ (SFP-10000CX-AT80K-XX)	P_o	0	---	+4	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	0.1	0.3	nm
Extinction Ratio	ET	8.2	---	---	dB
TX Disable Asserted	P_{OFF}	---	---	-30	dBm
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:

- Output of coupling optical power into 9/125 μ m SMF.

SFP-10000CX-AT40K-XX

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_c	1260	---	1620	nm
Receiver Overload	P_{max}	--	---	-1	dBm
Receiver Sensitivity ¹	P_I	---	---	-16	dBm
Receiver Sensitivity in OMA ¹	P_I	---	---	-14	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-18	dBm
RX Signal Loss – Deasserted	P_{RL-}	-28	---	---	dBm

SFP-10000CX-AT80K-XX

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_c	1260	---	1620	nm
Receiver Overload	P_{max}	--	---	-3	dBm
Receiver Sensitivity ¹	P_I	---	---	-23	dBm
Receiver Sensitivity in OMA ¹	P_I	---	---	-22	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-34	---	---	dBm

1. Test at 10 Gb/s, 2³¹ – 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

