

# 10 Gb/s, 1310 nm Single mode, 2-20 km SFP+ Dual LC Connector



## Description

OptixCom's 10 Gb/s SFP+ fiber optics transceiver is designed with advanced 1310 nm FP laser and high speed electronics to achieve the optimum performance for optical interconnect applications. It is compliant with 10G Ethernet and Fiber Channel for the datacom and SONET/SDH for telecom applications. The optical connector interface is dual LC.

The module is compliant with SFP+ Multi-Source Agreement (MSA). The transceiver has > 6 dB power budget for 2-10 km of transmission distance with standard single mode fibers. The product is RoHS compliant. Total power consumption is < 2W.



**SFP-10000LX-ATXXK**  
(XX = 2, 10, 20)



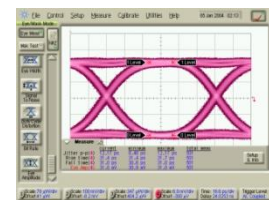
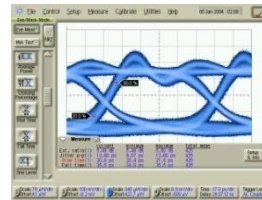
## Key Features

- 1310 nm single mode, 2-10 km, 10 Gb/s
- > 6 dB power budget for 2-10 km
- > 12 dB power budget for 20 km
- Duplex LC connector optical interface
- Z-axis hot pluggable
- AC coupling LVPECL differential I/O logics
- SFF-8431 MSA Compliant
- TTL Signal detect to monitor optical signals
- Single 3.3 V power supply
- RoHS compliant

## Applications

- ✓ Fiber Channel 1X, 2X, 4X, 8X, and 10X
- ✓ IEEE 802.3z 10 Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Data Communication for SAN and LAN
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect

10 Gb/s, 2<sup>23</sup>-1 NRZ data eye pattern  
TX RX



## Ordering Information

**Part Number:** SFP-10000LX-ATXXK

### Description:

1310 nm ,10 Gb/s, single mode, SFP+ fiber optics transceiver, XX km reach, 0 - 70°C.

XX = 2, 10, 20

## Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	1	---	10	Gb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	350	450	mA

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### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	$T_{st}$	-40	85	°C
Supply Voltage	$V_{CC}$	-0.5	4.0	V
Input Voltage	$V_{IN}$	-0.5	$V_{CC}$	V
Operating Current	$I_{op}$	---	500	mA
Output Current	$I_o$	---	50	mA
Soldering Temperature (10 sec. on leads)	$T_{sd}$	---	260	°C

### Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage <sup>1</sup>	$\Delta V_i$	0.4	---	1.2	V
Differential Input Impedance <sup>2</sup>	$Z$	---	100	---	ohm
Optical Output Power <sup>3</sup>	$P_o$	-8.2	---	0.5	dBm
Optical Wavelength	$\lambda_o$	1285	1310	1345	Nm
Relative Intensity Noise	$RIN$	---	---	-128	dB/Hz
OMA	OMA	-5.2	---	---	dBm
TX Disable Power	$P_{TD}$	---	---	-30	dBm
Side Mode Suppression Ratio	SMSR	30	---	---	dB
TX Disable Voltage – High	$V_{DH}$	2.4	---	$V_{CC}$	V
TX Disable Voltage - Low	$V_{DL}$	0	---	0.5	V
TX Fault Output - High	$V_{FH}$	2.4	---	$V_{CC}$	V
TX Fault Output - Low	$V_{FL}$	0	---	0.5	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. Applied to AC LVPECL I/O 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.
4. Optical eye diagram is compliant with IEEE 802.3z and 1x/2x/4X/8X/10X FC standards.

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



**Receiver Electro-Optical Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Impedance	$Z$	---	100	---	Ohm
Differential Output Voltage <sup>1</sup>	$\Delta V_o$	0.3	---	0.9	V
Operating Wavelength	$\lambda_c$	1260	---	1600	nm
Receiver Overload	$P_{max}$	0.5	---	---	dBm
Receiver Sensitivity <sup>2</sup> (@10 Gb/s)	$P_I$	---	---	-14.4	dBm
Receiver Sensitivity <sup>2</sup> (OMA)	$P_I$	---	---	-12.6	dBm
Stressed Receiver Sensitivity <sup>2</sup> (OMA)	$P_I$	---	---	-10.3	dBm
Optical Return Loss	$OL$	12	---	---	dB
RX Signal Loss – Deasserted	$P_{RL-}$	-30	---	---	dBm
RX Signal Loss – Asserted	$P_{RL+}$	---	---	-15	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1.0	---	---	dB
RX Signal Loss Assert Time	$T_{RL+}$	---	---	100	$\mu$ s
RX Signal Loss Deassert Time	$T_{RL-}$	---	---	100	$\mu$ s
RX Signal Loss Output - High	$V_{RL+}$	2.4	---	$V_{cc}$	V
RX Signal Loss Output - Low	$V_{RL-}$	0	---	0.5	V

Notes:

1. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.
2. Test at 10 Gb/s, 2<sup>23</sup> – 1 PRBS data pattern, and > 1x10<sup>-12</sup> of Bit-Error-Rate (BER).

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



**Transmitter Electro-Optical Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power <sup>1</sup>	$P_o$	-8.2	---	+0.5	dBm
Optical Modulation Amplitude (OMA)	$P_o$	-5.2	---	---	dBm
Optical Wavelength	$\lambda_o$	1285	1310	1345	Nm
Extinction Ratio	ET	8.2	---	---	dB

**Receiver Electro-Optical Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	$\lambda_c$	1270	---	1600	nm
Receiver Overload	$P_{max}$	0.5	---	---	dBm
Receiver Sensitivity <sup>2</sup>	$P_i$	---	---	-14.4	dBm
Receiver Sensitivity in OMA	$P_{iOMA}$	---	---	-12.6	dBm
Stressed Receiver Sensitivity in OMA	$P_{iS}$	---	---	-10.3	dBm
Dispersion Penalty		---	---	2	dB
Signal Detect– Deasserted	$P_{SD-}$	-25	---	---	dBm
Signal Detect– Asserted	$P_{SD+}$	---	---	-15	dBm

Notes:

1. Output of coupling optical power into 9/125  $\mu$ m SMF.
2. Test at 10 Gb/s,  $2^{31} - 1$  PRBS data pattern, and  $> 1 \times 10^{-12}$  of Bit-Error-Rate (BER).

Class 1 Laser Product  
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21 CFR 1040.10 and 1040.11

