Small Form Pluggable (SFP) Optical Transceivers

OPTIXCOM
Connect with Light

Features

- 850/1310 nm multimode, 1310/1550 nm single mode, CWDM
- 155 Mb/s to 4.25 Gb/s, 150 m to 150 km
- Duplex LC connector, Z-axis hot pluggable
- AC coupling LVPECL differential I/O, TTL signal detect
- SFF-8472 MSA and RoHS Compliant

Applications

- ✓ FTTH, FTTX, ATM/SONET, SDH, Ethernet, Fiber Channel
- ✓ High speed I/O bus extension, systems interconnects
- ✓ Data Communication for SAN and LAN
- ✓ Routers and switches, computer cluster cross-connect
- ✓ Industrial control links and media converters

Products Selection Guide

Part Number *	Wavelength	Data Rate	Power Budget	Distance**	Temp. Range
155 Mb/s, 1.25 Gb/s – 4.25 Gb/s Multimode Applications					
SFP-155LX-AT2K	1310 nm	155 Mb/s	>11 dB	2 km	0 – 70/-40 – 85°C
SFP-155SX-AT2K	850 nm	155 Mb/s	>14 dB	2 km	0 – 70/-40 – 85°C
SFP-1250LX-AT2K	1310 nm	1.25 Gb/s	>11 dB	2 km	0 – 70/-40 – 85°C
SFP-1250SX-AT500M	850 nm	1.25 Gb/s	>8.5 dB	500 m	0 – 70/-40 – 85°C
SFP-2125SX-AT300M	850 nm	2.125 Gb/s	>8 dB	300 m	0 – 70/-40 – 85°C
SFP-4250SX-AT500M	850 nm	4.25 Gb/s	>6 dB	500 m	0 – 70/-40 – 85°C
155 Mb/s, 1310 nm, Single Mode Applications, 20 – 60 km					
SFP-155LX-AT20K	1310 nm	155 Mb/s	>15 dB	20 km	0 – 70/-40 – 85°C
SFP-155LX-AT40K	1310 nm	155 Mb/s	>24 dB	40 km	0 – 70/-40 – 85°C
SFP-155LX-AT60K	1310 nm	155 Mb/s	>30 dB	60 km	0 – 70/-40 – 85°C
155 Mb/s, 1550 nm, Single Mode Applications, 80 – 150 km					
SFP-155EX-AT80K	1550 nm	155 Mb/s	>27 dB	80 km	0 – 70/-40 – 85°C
SFP-155EX-AT100K	1550 nm	155 Mb/s	>30 dB	100 km	0 – 70/-40 – 85°C
SFP-155EX-AT120K	1550 nm	155 Mb/s	>35 dB	120 km	0 – 70/-40 – 85°C
SFP-155EX-AT150K	1550 nm	155 Mb/s	>38 dB	150 km	0 – 70°C
1.25 Gb/s, 1310 nm, Single Mode Applications, 10 – 50 km					
SFP-1250LX-AT10K	1310 nm	1.25 Gb/s	>11 dB	10 km	0 – 70/-40 – 85°C
SFP-1250LX-AT20K	1310 nm	1.25 Gb/s	>14 dB	20 km	0 – 70/-40 – 85°C
SFP-1250LX-AT40K	1310 nm	1.25 Gb/s	>19 dB	40 km	0 – 70/-40 – 85°C
SFP-1250LX-AT50K	1310 nm	1.25 Gb/s	>24 dB	50 km	0 – 70/-40 – 85°C

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Products Selection Guide (Cont'd)

Part Number *	Wavelength	Data Rate	Power Budget	Distance**	Temp. Range
1.25 Gb/s, 1550 nm, Single Mode Applications, 30 – 120 km					
SFP-1250EX-AT30K	1550 nm	1.25 Gb/s	>12 dB	30 km	0 – 70/-40 – 85°C
SFP-1250EX-AT60K	1550 nm	1.25 Gb/s	>20 dB	60 km	0 – 70/-40 – 85°C
SFP-1250EX-AT80K	1550 nm	1.25 Gb/s	>24 dB	80 km	0 – 70/-40 – 85°C
SFP-1250EX-AT80K	1550 nm	1.25 Gb/s	>31 dB	120 km	0 – 70/-20 – 85°C
1.25 Gb/s, Single Mode 1270 – 1450 nm, CWDM Applications, 40 – 100 km					
SFP-1250CLX-AT40K-YY	1270 - 1450 nm	1.25 Gb/s	18 dB	40 km	0 – 70 °C
SFP-1250CLX-AT60K-YY	1270 - 1450 nm	1.25 Gb/s	24 dB	60 km	0 – 70 °C
SFP-1250CLX-AT80K-YY	1270 - 1450 nm	1.25 Gb/s	27 dB	80 km	0 – 70 °C
SFP-1250CLX-AT100K-YY	1270 - 1450 nm	1.25 Gb/s	30 dB	100 km	0 – 70 °C
1.25 Gb/s, Single Mode 1470 – 1610 nm, CWDM Applications, 60 – 120 km					
SFP-1250CEX-AT60K-YY	1470 - 1610 nm	1.25 Gb/s	20 dB	60 km	0 – 70 °C
SFP-1250CEX-AT80K-YY	1470 - 1610 nm	1.25 Gb/s	24 dB	80 km	0 – 70 °C
SFP-1250CEX-AT100K-YY	1470 - 1610 nm	1.25 Gb/s	27 dB	100 km	0 – 70 °C
SFP-1250CEX-AT120K-YY	1470 - 1610 nm	1.25 Gb/s	30 dB	120 km	0 – 70 °C
155 Mb/s – 2.7 Gb/s, 1310 nm, Single Mode Applications, 5 – 50 km					
SFP-2670LX-AT5K	1310 nm	155Mb/s - 2.7Gb/s	>11 dB	5 km	0 – 70 °C
SFP-2670LX-AT20K	1310 nm	155Mb/s - 2.7Gb/s	>15 dB	20 km	0 – 70 °C
SFP-2670LX-AT50K	1310 nm	155Mb/s - 2.7Gb/s	>26 dB	50 km	0 – 70 °C
155 Mb/s – 2.7 Gb/s, 1550 nm, Single Mode Applications, 30 – 110 km					
SFP-2670EX-AT30K	1550 nm	155Mb/s - 2.7Gb/s	>15 dB	30 km	0 – 70 °C
SFP-2670EX-AT50K	1550 nm	155Mb/s - 2.7Gb/s	>20 dB	50 km	0 – 70 °C
SFP-2670EX-AT80K	1550 nm	155Mb/s - 2.7Gb/s	>26 dB	80 km	0 – 70 °C
SFP-2670EX-AT90K	1550 nm	155Mb/s - 2.7Gb/s	>28 dB	90 km	0 – 70 °C
SFP-2670EX-AT110K	1550 nm	155Mb/s - 2.7Gb/s	>30 dB	110 km	0 – 70 °C
4.25 Gb/s, 1310 nm, Single Mode Applications, 4 – 30 km					
SFP-4250LX-AT4K	1310 nm	4.25 Gb/s	>9 dB	4 km	0 – 70/-40 – 85°C
SFP-4250LX-AT10K	1310 nm	4.25 Gb/s	>10 dB	10 km	0 – 70/-40 – 85°C
SFP-4250LX-AT30K	1310 nm	4.25 Gb/s	>18 dB	30 km	0 – 70/-40 – 85°C

*: Add "-T" in the Part Number for products with extended temperature range -40–85 °C. For example, SFP-155LX-AT15K-T.
YY indicates wavelength selection for the 1270 - 1450 nm CWDM transceivers. See data sheet for details.
YY indicates wavelength selection for the 1470 – 1610 nm CWDM transceivers. See data sheet for details.

**: The indicated distance is for reference only, not guaranteed specifications. The actual transmission distance depends on system configuration and power budget. For single mode fibers, the typical loss is 0.25 dB/km @ 1550 nm and 0.35 dB/km @ 1310 nm.

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Description

OptixCom's SFP transceiver offers advanced optical interconnect solution for general data communication links. This multimode transceiver is designed with low cost, high performance 1310 nm LED light source. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). It operates at 155 Mb/s and reaches 2 km of transmission distance with multimode fibers and >11 dB of power budget. This product is RoHS compliant.

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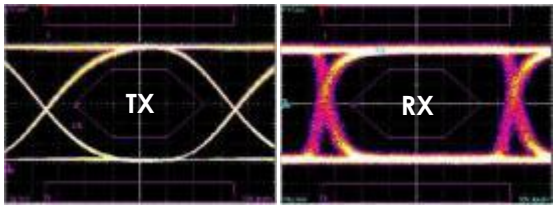
SFP-155LX-AT2K

155 Mb/s, 2^{23}-1 NRZ data eye pattern



Key Features

- 1310 nm multimode, 155 Mb/s
- >11 dB power budget, 2 km reach
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- Single 3.3V power supply
- -40–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ FTTH, FTTX, ATM/SONET OC-3, SDH STM-1
- ✓ Fast Ethernet
- ✓ High speed I/O for file server
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: SFP-155LX-AT2K

Description:

1310 nm 155 Mb/s, multimode, SFP Fiber Optics Transceiver, 2 km reach, 0-70°C

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-155LX-AT2K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-40	25	85	°C
Data Rate	---	155	200	Mb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	200	250	mA

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	6.0	V
Input Voltage	V_{IN}	-0.5	Vcc	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	ΔVi	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Optical Output Power [3]	P_O	-20	---	-14	dBm
Optical Wavelength	λ_O	1270	1310	1380	nm
Extinction Ratio	*ET*	10	---	---	dB
Spectral Width (RMS)	$\Delta\lambda$	---	---	4	nm
Duty Cycle Distortion	*Tdc*	---	---	0.6	ns
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	1.3	ns
Data Dependent Jitter	T_{DJ}	---	---	0.6	ns
Random Jitter	T_{RJ}	---	---	0.6	ns
TX Disable Voltage – High	V_{DH}	2.0	---	Vcc	V
TX Disable Voltage - Low	V_{DL}	0	---	0.8	V
TX Fault Output - High	V_{FH}	2.0	---	Vcc	V
TX Fault Output - Low	V_{FL}	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	µs

Notes:

1. Module is designed for AC 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 50/125 or 62.5/125 µm MMF.
4. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1600	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [1]	P_I	---	---	-31	dBm
Differential Output Voltage	ΔV_O	0.4	---	1.8	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	12	---	---	dB
Rise/Fall Time (10% - 90%)	T_r/T_f	---	1	2	ns
RX Signal Loss – Asserted	P_{RL+}	---	---	-31	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	---	dB
Serial ID Clock Rate	f_C		---	100	kHz
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	V
RX Signal Loss Assert Time	T_{RL+}	---	---	100	µs
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	µs

Notes:

1. Test at 155 Mb/s, $2^{23} - 1$ PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
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21 CFR 1040.10 and 1040.11

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Description

OptixCom's SFP transceiver offers advanced optical interconnect solution for general data communication links. This multimode fiber optics transceiver is designed with high performance 850 nm VCSEL light source. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). It operates at 155 Mb/s and reaches 2 km of transmission distance with multimode fibers and >14 dB of power budget. This product is RoHS compliant.

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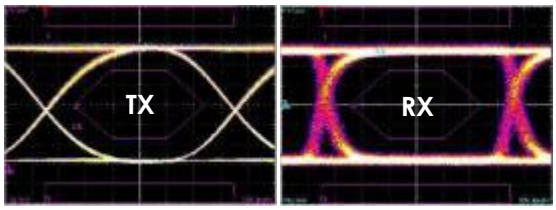
SFP-155SX-AT2K

155 Mb/s, 2^{23}-1 NRZ data eye pattern



Key Features

- 850 nm multimode, 155 Mb/s
- >14 dB power budget, 2 km reach
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant with DDM function
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- Single 3.3V power supply
- -20–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ FTTH, FTTX, ATM/SONET OC-3, SDH STM-1
- ✓ Fast Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: SFP-155SX-AT2K

Description:

850 nm 155 Mb/s, multimode, SFP Fiber Optics Transceiver, 2 km reach, 0-70°C

* Add "-T" in the Part Number for extended temperature range -20–85 °C, i.e., SFP-155SX-AT2K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-20	25	85	°C
Data Rate	---	155	200	Mb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	150	200	mA

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	6.0	V
Input Voltage	*VIN*	-0.5	Vcc	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	2.0	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Optical Output Power [3]	*Po*	-10	---	-4	dBm
Optical Wavelength	*λo*	830	850	860	nm
Extinction Ratio	*ET*	9	---	---	dB
Spectral Width (rms)	*Δλ*	---	---	0.85	nm
Total Jitter	*TJ*	---	---	1	ns
Rise/Fall Time (10% - 90%)	*Tr/Tf*	---	---	2	ns
TX Disable Voltage – High	*VDH*	2.4	---	Vcc	V
TX Disable Voltage - Low	*VDL*	0	---	0.5	V
TX Fault Output - High	*VFH*	2.4	---	Vcc	V
TX Fault Output - Low	*VFL*	0	---	0.5	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	µs

Notes:

1. Module is designed for AC 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 50/125 or 62.5/125 µm MMF.
4. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	770	---	860	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [1]	P_I	---	---	-24	dBm
Differential Output Voltage	ΔV_O	0.5	---	1.2	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	12	---	---	dB
Rise/Fall Time (10% - 90%)	T_r/T_f	---	1	2	ns
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	---	dB
Serial ID Clock Rate	f_C		---	100	kHz
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. Test at 155 Mb/s, $2^{23} - 1$ PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
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Description

OptixCom's SFP transceiver offers advanced optical interconnect solution for general data communication links. This multimode transceiver is designed with low cost, high performance 1310 nm FP laser. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The is compliant with SFP Multi-Source Agreement (MSA). This product can be used at 1.0625 Gb/s for Fiber Channel or 1.25 Gb/s for Gigabit Ethernet applications. It offers 2 km of transmission distance with multimode fibers and >10 dB of power budget. This product is RoHS compliant.

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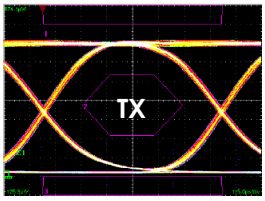
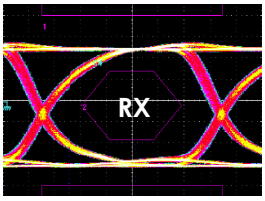
SFP-1250LX-AT2K

1.25 Gb/s, 2^7-1 NRZ Data Eye Pattern





Key Features

- 1310 nm multimode, 1.0625/1.25 Gb/s data rates
- >10 dB power budget, 2 km reach
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- Single 3.3V power supply
- -40–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ Fiber Channel, Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: SFP-1250LX-AT2K

Description:

1310 nm 1.0625/1.25 Gb/s, multimode, SFP Fiber Optics Transceiver, 2 km reach, 0-70°C.

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-1250LX-AT2K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-40	25	85	°C
Data Rate	---	1.25	1.3	Gb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	200	250	mA

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	V_{CC}	-0.5	6.0	V
Input Voltage	V_{IN}	-0.5	V_{CC}	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	ΔV_i	0.4	---	2.0	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Optical Output Power [3]	P_O	-9	---	-1	dBm
Optical Wavelength	λ_O	1270	1310	1355	nm
Extinction Ratio	*ET*	9	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	4	nm
Relative Intensity Noise	*RIN*	---	---	-120	dB/Hz
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	260	ps
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	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	µs
Total Jitter	*Tj*	---	---	227	ps

Notes:

1. Module is designed for AC LVPECL 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 62.5/125 or 50/125µm MMF.
4. Optical eye diagram is compliant with IEEE 802.3z standard.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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http://www.OpticalTransceiver.com

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-1	---	---	dBm
Receiver Sensitivity [1]	P_I	---	---	-19	dBm
Differential Output Voltage	ΔV_O	0.5	---	1.2	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	12	---	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	350	ps
RX Signal Loss – Asserted	P_{RL+}	---	---	-19	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1.0	---	---	dB
Stressed Receiver Sensitivity		---	---	-17	dBm
RX Signal Loss Assert Time	T_{RL+}	---	---	100	µs
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	µs
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. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
Complies with
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Description

OptixCom's SFP transceiver offers advanced optical interconnect solution for general data communication links. This single mode transceiver is designed with high performance 1310 nm laser. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). It operates at 155 Mb/s for 20 - 60 km transmission distance with single mode fibers. The products are RoHS compliant.

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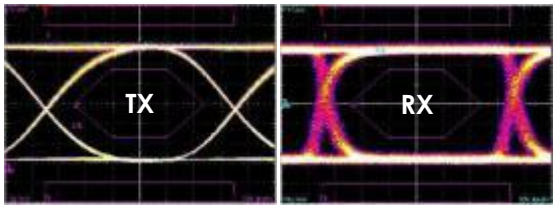
SFP-155LX-AT*XX*K
(*XX* = 20, 40, 60)

155 Mb/s, 2^{23}-1 NRZ Data Eye Pattern



Key Features

- 1310 nm single mode, 155 Mb/s
- 20 – 60 km reach, 15 – 30 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- Single 3.3V power supply
- -40–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ FTTH, FTTX, ATM/SONET OC-3, SDH STM-1
- ✓ Fast Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: SFP-155LX-AT***XX***K

Description:

1310 nm, 155 Mb/s, single mode, SFP Fiber Optics Transceiver, ***XX*** km reach, 0-70°C

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-155LX-AT15K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-40	25	85	°C
Data Rate	---	155	200	Mb/s
Supply Voltage	3.1	3.3	3.5	V

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	4.0	V
Input Voltage	*VIN*	-0.5	Vcc	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Relative Intensity Noise	*RIN*	---	---	-120	dB/Hz
Rise/Fall Time (10% - 90%)	*Tr/Tf*	---	1	2	ns
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	µs

Notes:

1. Module is designed for AC LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage [1]	ΔV_O	0.4	---	1.2	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	14	---	---	dB
Rise/Fall Time (10% - 90%)	Tr/Tf	---	1	2	ns
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	---	dB
Serial ID Clock Rate	f_C		---	100	kHz
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	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 LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-15	---	-8	dBm
Optical Wavelength	λ_O	1260	1310	1360	nm
Extinction Ratio	ET	9	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	4	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-30	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-32	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 155 Mb/s, 2^{23} – 1 PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-8	---	0	dBm
Optical Wavelength	λ_O	1260	1310	1360	nm
Extinction Ratio	ET	8.2	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	4	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-32	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-34	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 155 Mb/s, 2^{23} – 1 PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-5	---	0	dBm
Optical Wavelength	λ_O	1270	1310	1355	nm
Extinction Ratio	ET	10	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	2.5	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-35	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-35	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 155 Mb/s, 2^{23} – 1 PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.
4. Maximum supply current for the transceiver from Vcc is 220 mA.

Class 1 Laser Product
Complies with
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Description

OptixCom's SFP transceiver offers advanced optical interconnect solution for general data communication links. This single mode transceiver is designed with high performance 1550 nm laser. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). It operates at 155 Mb/s for 80 - 150 km transmission distance with single mode fibers. The products are RoHS compliant.

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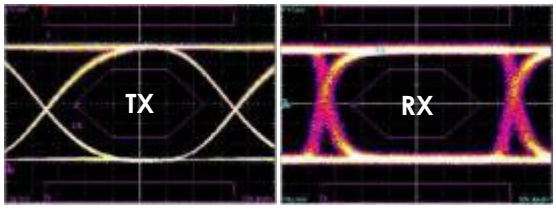
SFP-155EX-AT*XX*K
(*XX* = 80, 100, 120, 150)

155 Mb/s, 2^{23}-1 NRZ Data Eye Pattern



Key Features

- 1550 nm single mode, 155 Mb/s
- 80 –150 km reach, 27 – 38 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- Single 3.3V power supply
- -40–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ FTTH, FTTX, ATM/SONET OC-3, SDH STM-1
- ✓ Fast Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: SFP-155EX-AT***XX***K

Description:

1550 nm, 155 Mb/s, single mode, SFP Fiber Optics Transceiver, ***XX*** km reach, 0-70°C

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-155EX-AT80K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-40	25	85	°C
Data Rate	---	155	200	Mb/s
Supply Voltage	3.1	3.3	3.5	V

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	4.0	V
Input Voltage	*VIN*	-0.5	Vcc	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Relative Intensity Noise	*RIN*	---	---	-120	dB/Hz
Rise/Fall Time (10% - 90%)	*Tr/Tf*	---	1	2	ns
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	µs

Notes:

1. Module is designed for AC LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage [1]	ΔV_O	0.4	---	1.8	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	14	---	---	dB
Rise/Fall Time (10% - 90%)	Tr/Tf	---	1	2	ns
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	---	dB
Serial ID Clock Rate	f_C		---	100	kHz
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	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 LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-5	---	0	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	8.2	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-32	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-32	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 155 Mb/s, 2^{23} – 1 PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.
4. Maximum supply current for the transceiver from Vcc is 200 mA.

Class 1 Laser Product
Complies with
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-5	---	0	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	10	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-35	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-35	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 155 Mb/s, 2^{23} – 1 PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	10	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-35	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-35	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 155 Mb/s, 2^{23} – 1 PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	+1	---	+5	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	10	---	---	dB
Side Mode Suppression Ratio	$SMSR$	35	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1580	nm
Receiver Overload	P_{max}	-10	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-37	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-37	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 155 Mb/s, 2^{23} – 1 PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with Telcordia GR-253-CORE and ITU-T G-957 standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Description

OptixCom's SFP transceiver offers advanced optical interconnect solution for general data communication links. This single mode transceiver is designed with high performance 1310 nm laser. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). This product can be used at 1.0625 Gb/s for Fiber Channel or 1.25 Gb/s for Gigabit Ethernet applications with 10 - 50 km transmission distance using single mode fibers. The products are RoHS compliant.

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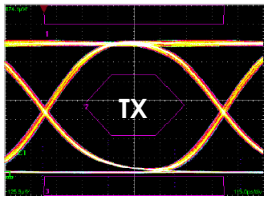
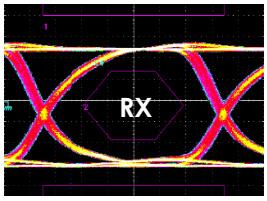
SFP-1250LX-AT*XX*K
(*XX* = 10, 20, 40, 50)

1.25 Gb/s, 2^7-1 NRZ Data Eye Pattern





Key Features

- 1310 nm single mode, 1.0625/1.25 Gb/s data rates
- 10 – 50 km reach, 11 – 24 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- Single 3.3V power supply
- -40–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ Fiber Channel, Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: SFP-1250LX-AT***XX***K

Description:

1310 nm 1.0625/1.25 Gb/s, single mode, SFP Fiber Optics Transceiver, ***XX*** km reach, 0-70°C

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-1250LX-AT10K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-40	25	85	°C
Data Rate	---	1.25	1.3	Gb/s
Supply Voltage	3.1	3.3	3.5	V

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	4.0	V
Input Voltage	*VIN*	-0.5	Vcc	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Relative Intensity Noise	*RIN*	---	---	-120	dB/Hz
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	260	ps
Side Mode Suppression Ratio	*SMSR*	30	---	---	dB
Total Jitter	*Tj*	---	---	227	ps
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	µs

Notes:

1. Module is designed for AC LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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Email: Support@OptixCom.com

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General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage [1]	ΔV_O	0.4	---	1.8	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	14	---	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	350	ps
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	---	dB
Serial ID Clock Rate	f_C		---	100	kHz
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	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 LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-9	---	-3	dBm
Optical Wavelength	λ_O	1270	1310	1355	nm
Extinction Ratio	ET	9	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	4	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-20	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-20	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 250 mA.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-9	---	-3	dBm
Optical Wavelength	λ_O	1270	1310	1355	nm
Extinction Ratio	ET	9	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	4	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-23	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-5	---	0	dBm
Optical Wavelength	λ_O	1280	1310	1340	nm
Extinction Ratio	ET	9	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-24	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Optical Wavelength	λ_O	1280	1310	1340	nm
Extinction Ratio	ET	7	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-2	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-24	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Description

OptixCom's SFP transceiver offers advanced optical interconnect solution for general data communication links. This single mode transceiver is designed with high performance 1550 nm laser. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). This product can be used at 1.0625 Gb/s for Fiber Channel or 1.25 Gb/s for Gigabit Ethernet applications with 30 - 120 km transmission distance using single mode fibers. The products are RoHS compliant.

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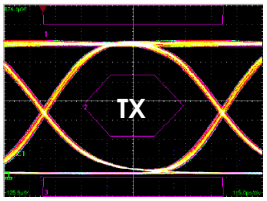
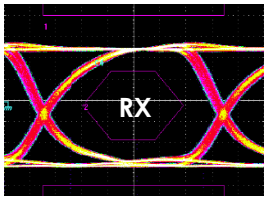
SFP-1250EX-AT*XX*K
(*XX* = 30, 60, 80, 120)

1.25 Gb/s, 2^7-1 NRZ Data Eye Pattern





Key Features

- 1550 nm single mode, 1.0625/1.25 Gb/s data rates
- 30 – 120 km reach, 19 – 31 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- Single 3.3V power supply
- -40–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ Fiber Channel, Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: SFP-1250EX-AT***XX***K

Description:

1550 nm 1.0625/1.25 Gb/s, single mode, SFP Fiber Optics Transceiver, ***XX*** km reach, 0-70°C

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-1250EX-AT30K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-40	25	85	°C
Data Rate	---	1.25	1.3	Gb/s
Supply Voltage	3.1	3.3	3.5	V

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	4.0	V
Input Voltage	*VIN*	-0.5	Vcc	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Relative Intensity Noise	*RIN*	---	---	-120	dB/Hz
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	260	ps
Side Mode Suppression Ratio	*SMSR*	30	---	---	dB
Total Jitter	*Tj*	---	---	227	ps
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	µs

Notes:

1. Module is designed for AC LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
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General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage [1]	ΔV_O	0.4	---	1.8	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	14	---	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	350	ps
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	---	dB
Serial ID Clock Rate	f_C	---	---	100	kHz
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	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 LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-9	---	-3	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	9	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-21	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-21	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 250 mA.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-4	---	+1	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	9	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-24	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 250 mA.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	9	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-24	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	9	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-9	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-31	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-32	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Description

OptixCom's SFP transceiver offers advanced optical interconnect solution for general data communication links. This multimode fiber optics transceiver is designed with high performance 850 nm VCSEL light source. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). This product can be used at 1.0625 Gb/s for Fiber Channel or 1.25 Gb/s for Gigabit Ethernet applications. The transceiver reaches more than 500 meters of transmission distance with high-grade multimode fibers and >8.5 dB of power budget. The products are RoHS compliant.

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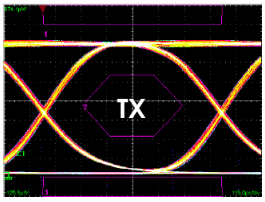
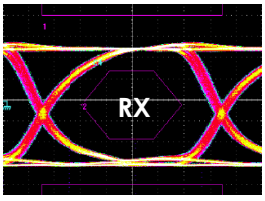
SFP-1250SX-AT500M

1.25 Gb/s, 2^7-1 NRZ Data Eye Pattern





Key Features

- 850 nm multimode, 1.0625/1.25 Gb/s data rates
- > 8.5 dB power budget, 500 m reach
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- AC coupling LVPECL differential I/O logics
- Single 3.3 V power supply
- TTL or PECL signal detect to monitor optical signals
- -40–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ Fiber Channel, Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect

Ordering Information

Part Number: SFP-1250SX-AT500M

Description:

850 nm 1.0625/1.25 Gb/s, multimode, SFP fiber optics transceiver, 500 m reach, 0-70°C

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-1250SX-AT500M-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-20	25	85	°C
Data Rate	---	1.25	1.3	Gb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	200	300	mA

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	6.0	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	ΔVi	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Optical Output Power [3]	*Po*	-9.5	---	-4	dBm
Optical Wavelength	λo	830	850	860	nm
Extinction Ratio	*ET*	9	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	0.85	nm
Relative Intensity Noise	*RIN*	---	---	-117	dB/Hz
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	260	ps
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	µs
Total Jitter	*Tj*	---	---	227	ps

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 50/125 µm or 62.5/125 µm MMF.
4. Optical eye diagram is compliant with IEEE 802.3z standard.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	770	---	860	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [1]	P_I	---	---	-18	dBm
Differential Output Voltage [2]	ΔV_O	0.4	---	1.8	V
Differential Input Impedance	Z	---	100	---	Ohm
Optical Return Loss	OL	12	---	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	350	ps
RX Signal Loss – Asserted	P_{RL+}	---	---	-18	dBm
RX Signal Loss – Deasserted	P_{RL-}	-30	---	---	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1.0	---	---	dB
Stressed Receiver Sensitivity	P_{IS}	---	---	-13	dBm
RX Signal Loss Assert Time	T_{RL+}	---	---	100	µs
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	µs
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	V

Notes:

1. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER)
2. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.

Typical Transmission Distance for Multimode Fibers @ 850 nm

Data Rate	Fiber Type	Distance (m)	Data Rate	Fiber Type	Distance (m)
1.0625 Gb/s	50 µm, 2000 MHz*km	860	2.125 Gb/s	50 µm, 2000 MHz*km	500
	50 µm, 500 MHz*km	500		50 µm, 500 MHz*km	300
	50 µm, 400 MHz*km	450		50 µm, 400 MHz*km	260
	62.5 µm, 200 MHz*km	300		62.5 µm, 200 MHz*km	150
	62.5 µm, 160 MHz*km	250		62.5 µm, 160 MHz*km	120
1.25 Gb/s	50 µm, 500 MHz*km	550	10 Gb/s	50 µm, 2000 MHz*km	300
	50 µm, 400 MHz*km	500		50 µm, 500 MHz*km	150
	62.5 µm, 200 MHz*km	275		62.5 µm, 200 MHz*km	75
	62.5 µm, 160 MHz*km	220		62.5 µm, 160 MHz*km	---

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Description

OptixCom's SFP transceiver offers advanced optical interconnect solution for general data communication links. This multimode fiber optics transceiver is designed with high performance 850 nm VCSEL light source. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). This product can be used at 2.125 Gb/s for 2x Fiber Channel applications. The transceiver reaches more than 300 meters of transmission distance with high-grade multimode fibers and >8 dB of power budget. The products are RoHS compliant.

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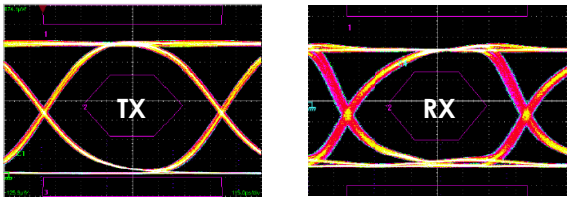
SFP-2125SX-AT300M

2.125 Gb/s, 2^7-1 NRZ Data Eye Pattern



Key Features

- 850 nm multimode, 2.125 Gb/s data rate
- >8 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- AC coupling LVPECL differential I/O logics
- > 300 m at 2.125 Gb/s with high-grade MMF
- Compliant with 2X Fiber Channel
- TTL Signal detect function to monitor optical signals
- Single 3.3 V power supply
- -40–85 °C operating temperatures available
- RoHS compliant

Applications

- ✓ 2x Fiber Channel, Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect

Ordering Information

Part Number: SFP-2125SX-AT300M

Description:
850 nm 2.125 Gb/, multimode, SFP fiber optics transceiver, 300 m reach, 0-70°C

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-2125SX-AT300M-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	---	2.125	2.2	Gb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	200	300	mA

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	3.6	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	ΔVi	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Optical Output Power [3]	*Po*	-10	---	-3	dBm
Optical Wavelength	λo	830	850	860	nm
Extinction Ratio	*ET*	9	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	0.85	nm
Relative Intensity Noise	*RIN*	---	---	-117	dB/Hz
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	150	ps
Total Jitter	*Tj*	---	---	120	ps
TX Disable Asserted	*POFF*	---	---	-35	dBm
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tini*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	µs

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 50/125 µm or 62.5/125 µm MMF.
4. Optical eye diagram is compliant with Fiber Channel standard.

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Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	770	---	860	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [1]	P_I	---	---	-18	dBm
Differential Output Voltage	ΔV_O	0.4	---	1.8	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	12	---	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	220	ps
RX Signal Loss – Asserted	P_{SD+}	---	---	-18	dBm
RX Signal Loss – Deasserted	P_{SD-}	-30	---	---	dBm
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	V
RX Signal Loss Assert Time	T_{RL+}	---	---	100	µs
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	µs

Notes:

1. Test at 2.125 Gb/s, 2^{23} – 1 PRBS data pattern, and > $1x10^{-10}$ of Bit-Error-Rate (BER).
2. Single ended will be 50 ohm for each signal line.

Typical Transmission Distance for Multimode Fibers @ 850 nm

Data Rate	Fiber Type	Distance (m)	Data Rate	Fiber Type	Distance (m)
1.0625 Gb/s	50 µm, 2000 MHz*km	860	2.125 Gb/s	50 µm, 2000 MHz*km	500
	50 µm, 500 MHz*km	500		50 µm, 500 MHz*km	300
	50 µm, 400 MHz*km	450		50 µm, 400 MHz*km	260
	62.5 µm, 200 MHz*km	300		62.5 µm, 200 MHz*km	150
	62.5 µm, 160 MHz*km	250		62.5 µm, 160 MHz*km	120
1.25 Gb/s	50 µm, 500 MHz*km	550	10 Gb/s	50 µm, 2000 MHz*km	300
	50 µm, 400 MHz*km	500		50 µm, 500 MHz*km	150
	62.5 µm, 200 MHz*km	275		62.5 µm, 200 MHz*km	75
	62.5 µm, 160 MHz*km	220			

Class 1 Laser Product
Complies with
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Description

OptixCom's CWDM transceivers are designed with high performance DFB laser and cover the wavelength spectrum from 1270 nm to 1450 nm, with industry standard 20 nm spacing. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). This product can be used at 1.0625 Gb/s for Fiber Channel or 1.25 Gb/s for Gigabit Ethernet applications. They offer 40 - 100 km of transmission distance with single mode fibers. The products are RoHS compliant.

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SFP-1250CLX-AT*XX*K-*YY*
(*XX* = 40, 60, 80, 100)

Key Features

- 1270 - 1450 nm single mode, 1.0625/1.25 Gb/s
- 40 – 100 km with 20 - 30 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- Single 3.3 V power supply
- RoHS compliant

Ordering Information

Part Number: SFP-1250CLX-AT***XX***K-***YY***

Description:

CWDM 1270 - 1450 nm 1.0625/1.25 Gb/s SFP Fiber Optics Transceiver, ***XX*** km reach, 1***YY***0 nm wavelength, 0 - 70°C.

* ***YY*** specifies the wavelength described below. For example, SFP-1250CLX-ATXXK-27 is the 1270 nm module.

YY	**Wavelength**	***YY***	**Wavelength**
27	1270 nm	37	1370 nm
29	1290 nm	39	1390 nm
31	1310 nm	41	1410 nm
33	1330 nm	43	1430 nm
35	1350 nm	45	1450 nm

Applications

- ✓ 1X Fiber Channel and Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ 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	---	1.25	1.3	Gb/s
Supply Voltage	3.1	3.3	3.5	V

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	6.0	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Side Mode Suppression Ratio	*SMSR*	30	---	---	dB
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	260	ps
Relative Intensity Noise	*RIN*	---	---	-120	dB/Hz
TX Disable Asserted	*POFF*	---	---	-45	dBm
Total Jitter	*Tj*	---	---	227	ps
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	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

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. Optical eye diagram is compliant with IEEE 802.3z standard.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage [1]	ΔV_O	0.4	---	1.8	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	12	---	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	350	ps
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	---	dB
Serial ID Clock Rate	f_C	---	---	100	kHz
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	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 LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-5	---	0	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Extinction Ratio	ET	9	---	---	dB
Center Wavelength – 1270 nm	λ_C	1264.5	1270	1277.5	nm
Center Wavelength – 1290 nm	λ_C	1284.5	1290	1297.5	nm
Center Wavelength – 1310 nm	λ_C	1304.5	1310	1317.5	nm
Center Wavelength – 1330 nm	λ_C	1324.5	1330	1337.5	nm
Center Wavelength – 1350 nm	λ_C	1344.5	1350	1357.5	nm
Center Wavelength – 1370 nm	λ_C	1364.5	1370	1377.5	nm
Center Wavelength – 1390 nm	λ_C	1384.5	1390	1397.5	nm
Center Wavelength – 1410 nm	λ_C	1404.5	1410	1417.5	nm
Center Wavelength – 1430 nm	λ_C	1424.5	1430	1437.5	nm
Center Wavelength – 1450 nm	λ_C	1444.5	1450	1457.5	nm

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 [2]	P_I	---	---	-23	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-23	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Extinction Ratio	ET	9	---	---	dB
Center Wavelength – 1270 nm	λ_C	1264.5	1270	1277.5	nm
Center Wavelength – 1290 nm	λ_C	1284.5	1290	1297.5	nm
Center Wavelength – 1310 nm	λ_C	1304.5	1310	1317.5	nm
Center Wavelength – 1330 nm	λ_C	1324.5	1330	1337.5	nm
Center Wavelength – 1350 nm	λ_C	1344.5	1350	1357.5	nm
Center Wavelength – 1370 nm	λ_C	1364.5	1370	1377.5	nm
Center Wavelength – 1390 nm	λ_C	1384.5	1390	1397.5	nm
Center Wavelength – 1410 nm	λ_C	1404.5	1410	1417.5	nm
Center Wavelength – 1430 nm	λ_C	1424.5	1430	1437.5	nm
Center Wavelength – 1450 nm	λ_C	1444.5	1450	1457.5	nm

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 [2]	P_I	---	---	-24	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Extinction Ratio	ET	9	---	---	dB
Center Wavelength – 1270 nm	λ_C	1264.5	1270	1277.5	nm
Center Wavelength – 1290 nm	λ_C	1284.5	1290	1297.5	nm
Center Wavelength – 1310 nm	λ_C	1304.5	1310	1317.5	nm
Center Wavelength – 1330 nm	λ_C	1324.5	1330	1337.5	nm
Center Wavelength – 1350 nm	λ_C	1344.5	1350	1357.5	nm
Center Wavelength – 1370 nm	λ_C	1364.5	1370	1377.5	nm
Center Wavelength – 1390 nm	λ_C	1384.5	1390	1397.5	nm
Center Wavelength – 1410 nm	λ_C	1404.5	1410	1417.5	nm
Center Wavelength – 1430 nm	λ_C	1424.5	1430	1437.5	nm
Center Wavelength – 1450 nm	λ_C	1444.5	1450	1457.5	nm

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 [2]	P_I	---	---	-27	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-27	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Extinction Ratio	ET	9	---	---	dB
Center Wavelength – 1270 nm	λ_C	1264.5	1270	1277.5	nm
Center Wavelength – 1290 nm	λ_C	1284.5	1290	1297.5	nm
Center Wavelength – 1310 nm	λ_C	1304.5	1310	1317.5	nm
Center Wavelength – 1330 nm	λ_C	1324.5	1330	1337.5	nm
Center Wavelength – 1350 nm	λ_C	1344.5	1350	1357.5	nm
Center Wavelength – 1370 nm	λ_C	1364.5	1370	1377.5	nm
Center Wavelength – 1390 nm	λ_C	1384.5	1390	1397.5	nm
Center Wavelength – 1410 nm	λ_C	1404.5	1410	1417.5	nm
Center Wavelength – 1430 nm	λ_C	1424.5	1430	1437.5	nm
Center Wavelength – 1450 nm	λ_C	1444.5	1450	1457.5	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1620	nm
Receiver Overload	P_{max}	-8	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-30	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-30	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 320 mA.

Class 1 Laser Product
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Description

OptixCom's CWDM transceivers are designed with high performance DFB laser and cover the wavelength spectrum from 1470 nm to 1610 nm, with industry standard 20 nm spacing. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). This product can be used at 1.0625 Gb/s for Fiber Channel or 1.25 Gb/s for Gigabit Ethernet applications. They offer 60 - 120 km of transmission distance with single mode fibers. The products are RoHS compliant.

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SFP-1250CEX-AT*XX*K-*YY*
(*XX* = 60, 80, 100, 120)

Key Features

- 1470 - 1610 nm single mode, 1.0625/1.25 Gb/s
- 60 – 120 km with 20 - 30 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant with DDM function
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- Single 3.3 V power supply
- RoHS compliant

Ordering Information

Part Number: SFP-1250CEX-AT***XX***K-***YY***

Description:

CWDM 1470 - 1610 nm, 1.0625/1.25 Gb/s SFP Fiber Optics Transceiver, ***XX*** km reach, 1***YY***0 nm wavelength, 0 - 70°C.

* ***YY*** specifies the wavelength described below. For example, SFP-1250CEX-ATXXK-47 is the 1470 nm module.

YY	**Wavelength**	***YY***	**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

- ✓ 1X Fiber Channel and Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ 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	---	1.25	1.3	Gb/s
Supply Voltage	3.1	3.3	3.5	V

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	6.0	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Side Mode Suppression Ratio	*SMSR*	30	---	---	dB
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	260	ps
Relative Intensity Noise	*RIN*	---	---	-120	dB/Hz
TX Disable Asserted	*POFF*	---	---	-45	dBm
Total Jitter	*Tj*	---	---	227	ps
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	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

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. Optical eye diagram is compliant with IEEE 802.3z standard.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage [1]	ΔV_O	0.4	---	1.8	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	12	---	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	350	ps
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	---	dB
Serial ID Clock Rate	f_C	---	---	100	kHz
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	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 LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-4	---	+1	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
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

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 [2]	P_I	---	---	-24	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 µm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product
Complies with
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
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

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 [2]	P_I	---	---	-24	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-24	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 µm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
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

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 [2]	P_I	---	---	-27	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-27	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 µm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
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

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1620	nm
Receiver Overload	P_{max}	-9	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-30	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-30	dBm
RX Signal Loss – Deasserted	P_{RL-}	-35	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 µm SMF.
2. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 320 mA.

Class 1 Laser Product
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Description

OptixCom's multi-rate fiber optics transceiver is designed for OC3/OC12/FC/GbE/2xFC/OC48 applications with data rate up to 2.7 Gb/s. This single mode module uses high performance 1310 nm laser and is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). The transceiver reaches 5 - 50 km of distance with standard single mode fibers and 11 - 26 dB of power budget. The products are RoHS compliant.

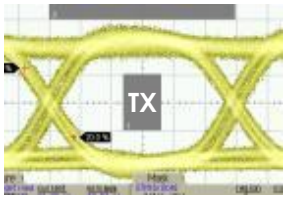
Lead-Free

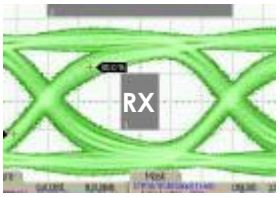
SFP-2670LX-AT*XX*K
(*XX* = 5, 20, 50)

Key Features

- 1310 nm single mode
- Multi-rate 155 Mb/s to 2.67 Gb/s
- 5 – 50 km with 11 – 26 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- AC coupling LVPECL differential I/O logics
- SFF-8472 MSA Compliant with DDM function
- TTL Signal detect to monitor optical signals
- Single 3.3 V power supply
- RoHS compliant

2.5 Gb/s, 2^{23}-1 NRZ Data Eye Pattern





Applications

- ✓ OC3/OC12/FC/GbE/2xFC/OC48
- ✓ High speed I/O for file server
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Bus extension
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: SFP-2670LX-AT***XX***K

Description:

1310 nm single mode, multi-rate 155Mb/s - 2.7 Gb/s SFP Transceiver, ***XX*** km reach. 0 - 70°C.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	---	---	2.67	Gb/s
Supply Voltage	3.1	3.3	3.5	V

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	5.0	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	2.0	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Relative Intensity Noise	*RIN*	---	---	-120	dB/Hz
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	160	ps
Total Jitter	*Tj*	---	---	0.1	UIp-p
TX Disable Asserted	*POFF*	---	---	-45	dBm
TX Fault Output - High	*VFH*	2.4	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.5	V
TX Disable Voltage – High	*VDH*	2.4	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.5	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	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.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage [1]	ΔV_O	0.5	---	1.2	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	27	---	---	dB
Rise/Fall Time	Tr/Tf	---	---	250	ps
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
Serial ID Clock Rate	f_C	---	---	100	kHz

Notes:

1. Module is designed for AC LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-9	---	-3	dBm
Optical Wavelength	λ_O	1270	1310	1355	nm
Extinction Ratio	ET	8.2	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	2.5	nm

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-3	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-20	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-20	dBm
RX Signal Loss – Deasserted	P_{RL-}	-30	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 2.5 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 250 mA.

Class 1 Laser Product
Complies with
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-5	---	0	dBm
Optical Wavelength	λ_O	1280	1310	1355	nm
Extinction Ratio	*ET*	8.2	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Side Mode Suppression Ratio	*SMSR*	30	---	---	dB

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-20	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-20	dBm
RX Signal Loss – Deasserted	P_{RL-}	-30	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 2.5 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product
Complies with
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-2	---	+3	dBm
Optical Wavelength	λ_O	1280	1310	1355	nm
Extinction Ratio	*ET*	8.2	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Side Mode Suppression Ratio	*SMSR*	30	---	---	dB

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-8	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-28	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-28	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 2.5 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 350 mA.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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Description

OptixCom's multi-rate fiber optics transceiver is designed for OC3/OC12/FC/GbE/2xFC/OC48 applications with data rate up to 2.7 Gb/s. This single mode module uses high performance 1550 nm DFB laser and is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). The transceiver reaches 30 - 110 km of distance with standard single mode fibers and 15 - 30 dB of power budget. The products are RoHS compliant.

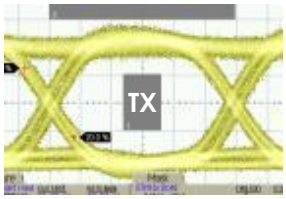
Lead-Free

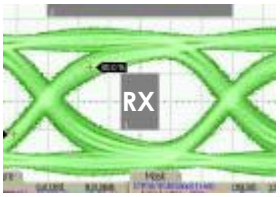
SFP-2670EX-AT*XX*K
(*XX* = 30, 50, 80, 90, 110)

Key Features

- 1550 nm single mode
- Multi-rate 155 Mb/s to 2.67 Gb/s
- 30 – 110 km with 15 – 30 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- AC coupling LVPECL differential I/O logics
- SFF-8472 MSA Compliant with DDM function
- TTL Signal detect to monitor optical signals
- Single 3.3 V power supply
- RoHS compliant

2.5 Gb/s, 2^{23}-1 NRZ Data Eye Pattern





Ordering Information

Part Number: SFP-2670EX-AT***XX***K

Description:

1550 nm single mode, multi-rate 155Mb/s - 2.7 Gb/s SFP Transceiver, ***XX*** km reach. 0 - 70°C.

Applications

- ✓ OC3/OC12/FC/GbE/2xFC/OC48
- ✓ High speed I/O for file server
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Bus extension
- ✓ 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	---	---	2.67	Gb/s
Supply Voltage	3.1	3.3	3.5	V

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	5.0	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

General Transmitter Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	2.0	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Relative Intensity Noise	*RIN*	---	---	-120	dB/Hz
Rise/Fall Time (20% - 80%)	*Tr/Tf*	---	---	160	ps
Total Jitter	*Tj*	---	---	0.1	UIp-p
TX Disable Asserted	*POFF*	---	---	-45	dBm
TX Fault Output - High	*VFH*	2.4	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.5	V
TX Disable Voltage – High	*VDH*	2.4	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.5	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	10	---	---	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.

Class 1 Laser Product
Complies with
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General Receiver Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage [1]	ΔV_O	0.5	---	1.2	V
Differential Input Impedance [2]	Z	---	100	---	Ohm
Optical Return Loss	OL	27	---	---	dB
Rise/Fall Time	Tr/Tf	---	---	250	ps
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
Serial ID Clock Rate	f_C	---	---	100	kHz

Notes:

1. Module is designed for AC LVPECL coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.

Class 1 Laser Product
Complies with
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-5	---	0	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	8.2	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-20	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-20	dBm
RX Signal Loss – Deasserted	P_{RL-}	-30	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 2.5 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-1	---	+4	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	8.2	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-21	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-21	dBm
RX Signal Loss – Deasserted	P_{RL-}	-30	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 2.5 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	-2	---	+3	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	*ET*	8.2	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Side Mode Suppression Ratio	*SMSR*	30	---	---	dB

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-8	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-28	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-28	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 2.5 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	8.2	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-8	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-28	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-28	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 2.5 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
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Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power [1]	P_O	0	---	+5	dBm
Optical Wavelength	λ_O	1530	1550	1570	nm
Extinction Ratio	ET	8.2	---	---	dB
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_C	1260	---	1610	nm
Receiver Overload	P_{max}	-8	---	---	dBm
Receiver Sensitivity [2]	P_I	---	---	-30	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-30	dBm
RX Signal Loss – Deasserted	P_{RL-}	-45	---	---	dBm

Notes:

1. Output of coupling optical power into 9/125 μm SMF.
2. Test at 2.5 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

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Description

OptixCom's multi-rate fiber optics transceiver is designed for 1X, 2X, 4X FC, GbE, and OC48 applications with data rate up to 4.25 Gb/s. This multimode fiber optics transceiver is designed with high performance 850 nm VCSEL light source. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). The transceiver reaches more than 500 meters of transmission distance with high-grade multimode fibers and >6 dB of power budget. The products are RoHS compliant.

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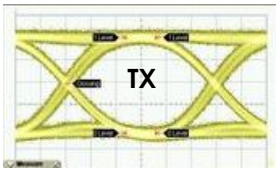
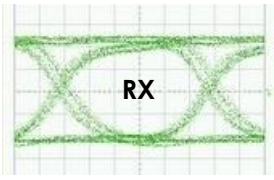
SFP-4250SX-AT500M

4.25 Gb/s, 2^7-1 NRZ Data Eye Pattern





Key Features

- 850 nm multimode,
- Multi-rate from 1.0625 to 4.25 Gb/s
- > 6 dB power budget, 500 m reach
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA
- AC coupling LVPECL differential I/O logics
- Single 3.3 V power supply
- TTL or PECL signal detect to monitor optical signals
- -40–85 °C operating temperatures available
- RoHS compliant

Ordering Information

Part Number: SFP-4250SX-AT500M

Description:

850 nm 1.0625 to 4.25 Gb/s, multimode, SFP fiber optics transceiver, 500 m reach, 0-70°C

* Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-4250SX-AT500M-T.

Applications

- ✓ Fiber Channel, Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Industrial Control Link
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
- T Transceivers	-40	25	85	°C
Data Rate	---	---	4.25	Gb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	150	200	mA

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	6.0	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	ΔVi	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Optical Output Power [3]	*Po*	-9	---	-3	dBm
Optical Wavelength	λo	830	850	860	nm
Relative Intensity Noise	*RIN*	---	---	-118	dB/Hz
Spectral Width (rms)	$\Delta\lambda$	---	---	0.85	nm
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	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 50/125 µm MMF.
4. Optical eye diagram is compliant with IEEE 802.3z and 1x/2x/4X FC standards.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Impedance	Z	---	100	---	Ohm
Differential Output Voltage [1]	ΔV_O	0.4	---	1.8	V
Operating Wavelength	λ_C	770	---	860	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2] (@4.25 Gb/s)	P_I	---	---	-15	dBm
Receiver Sensitivity [2] (@2.125 Gb/s)	P_I	---	---	-18	dBm
Receiver Sensitivity [3] (1.0625 Gb/s)	P_I	---	---	-20	dBm
Optical Return Loss	OL	12	---	---	dB
RX Signal Loss – Deasserted	P_{RL-}	-30	---	---	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-20	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1.0	---	---	dB
RX Signal Loss Assert Time	T_{RL+}	---	---	100	µs
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	µs
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	V

Notes:

1. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.
2. Test at 4.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER)
3. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER)

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Description

OptixCom's multi-rate fiber optics transceiver is designed for Gigabit Ethernet and 1X/2X/4X Fiber Channel applications with data rate up to 4.25 Gb/s. This single mode module uses high performance 1310 nm FP laser and is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). The transceiver reaches 4 km of distance with standard single mode fibers and 9 dB of power budget. The products are RoHS compliant.

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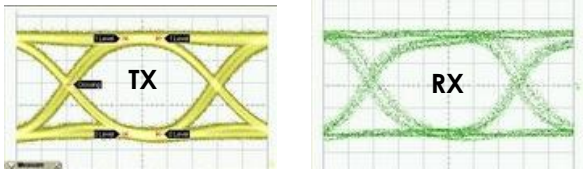
SFP-4250LX-AT4K

4.25 Gb/s, 2^{23}-1 NRZ Data Eye Pattern



Key Features

- FC 1X, 2X, and 4X compliant
- IEEE 802.3 Gigabit Ethernet compliant
- Multi-rate 1.0625 to 4.25Gb/s
- 4 km with 9 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- AC coupling LVPECL differential I/O logics
- SFF-8472 MSA Compliant with DDM function
- TTL Signal detect to monitor optical signals
- Single 3.3 V power supply
- RoHS compliant

Applications

- ✓ Fiber Channel 1X, 2X, and 4X
- ✓ IEEE 802.3z 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

Ordering Information

Part Number: SFP-4250LX-AT4K

Description:

1310 nm 1.0625 to 4.25 Gb/s, single mode, SFP fiber optics transceiver, 4 km reach, 0 - 70°C.

Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-4250LX-AT4K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	1	---	4.25	Gb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	---	300	mA

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	6.0	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Optical Output Power [3]	*Po*	-8	---	0	dBm
Optical Wavelength	*λo*	1285	1310	1345	nm
Relative Intensity Noise	*RIN*	---	---	-118	dB/Hz
OMA	*OMA*	290	---	---	µW
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	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 FC standards.

Class 1 Laser Product
Complies with
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Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Impedance	Z	---	100	---	Ohm
Differential Output Voltage [1]	ΔV_O	0.4	---	1.8	V
Operating Wavelength	λ_C	1260	---	1600	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2] (@4.25 Gb/s)	P_I	---	---	-17	dBm
		---	---	0.029	mW/OMA
Receiver Sensitivity [2] (@2.125 Gb/s)	P_I	---	---	-21	dBm
		---	---	0.015	mW/OMA
Receiver Sensitivity [2] (@1.0625 Gb/s)	P_I	---	---	-22	dBm
		---	---	0.015	mW/OMA
Optical Return Loss	OL	12	---	---	dB
RX Signal Loss – Deasserted	P_{RL-}	-30	---	---	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-20	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1.0	---	---	dB
RX Signal Loss Assert Time	T_{RL+}	---	---	100	µs
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	µs
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	V

Notes:

1. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.
2. Test at 4.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER)
3. Test at 1.25 Gb/s, $2^7 - 1$ 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

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Lead-Free

Phone: (949) 679-5712 Fax: (949) 420-2134
17901 Von Karman Avenue, Suite 600,
Irvine, CA 92614, USA
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Description

OptixCom's multi-rate fiber optics transceiver is designed for Gigabit Ethernet and 1X/2X/4X Fiber Channel applications with data rate up to 4.25 Gb/s. This single mode module uses high performance 1310 nm DFB laser and is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). The transceiver reaches 10 km of distance with standard single mode fibers and 10 dB of power budget. The products are RoHS compliant.

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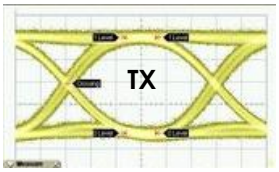
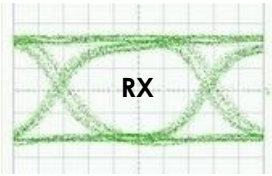
SFP-4250LX-AT10K

4.25 Gb/s, 2^{23}-1 NRZ Data Eye Pattern





Key Features

- FC 1X, 2X, and 4X compliant
- IEEE 802.3 Gigabit Ethernet compliant
- Multi-rate 1.0625 to 4.25Gb/s
- 10 km with 10 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- AC coupling LVPECL differential I/O logics
- SFF-8472 MSA Compliant with DDM function
- TTL Signal detect to monitor optical signals
- Single 3.3 V power supply
- RoHS compliant

Applications

- ✓ Fiber Channel 1X, 2X, and 4X
- ✓ IEEE 802.3z 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

Ordering Information

Part Number: SFP-4250LX-AT10K

Description:

1310 nm 1.0 to 4.25 Gb/s, single mode, SFP fiber optics transceiver, 10 km reach, 0 - 70°C.

Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-4250LX-AT4K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	1	---	4.25	Gb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	---	300	mA

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	*Tst*	-40	85	°C
Supply Voltage	*Vcc*	-0.5	6.0	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage [1]	*ΔVi*	0.4	---	1.8	V
Differential Input Impedance [2]	*Z*	---	100	---	ohm
Optical Output Power [3]	*Po*	-8	---	0	dBm
Optical Wavelength	*λo*	1285	1310	1345	nm
Relative Intensity Noise	*RIN*	---	---	-118	dB/Hz
OMA	*OMA*	290	---	---	µW
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	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 FC standards.

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

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Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Impedance	Z	---	100	---	Ohm
Differential Output Voltage [1]	ΔV_O	0.4	---	1.8	V
Operating Wavelength	λ_C	1260	---	1600	nm
Receiver Overload	P_{max}	0	---	---	dBm
Receiver Sensitivity [2] (@4.25 Gb/s)	P_I	---	---	-18	dBm
		---	---	0.029	mW/OMA
Receiver Sensitivity (@2.125 Gb/s)	P_I	---	---	-21	dBm
		---	---	0.015	mW/OMA
Receiver Sensitivity [3] (@1.0625 Gb/s)	P_I	---	---	-22	dBm
		---	---	0.015	mW/OMA
Optical Return Loss	OL	12	---	---	dB
RX Signal Loss – Deasserted	P_{RL-}	-30	---	---	dBm
RX Signal Loss – Asserted	P_{RL+}	---	---	-20	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1.0	---	---	dB
RX Signal Loss Assert Time	T_{RL+}	---	---	100	µs
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	µs
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	V

Notes:

1. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.
2. Test at 4.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER)
3. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER)

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The module is compliant with SFP Multi-Source Agreement (MSA). The transceiver reaches 30 km of distance with standard single mode fibers and 18 dB of power budget. The products are RoHS compliant.

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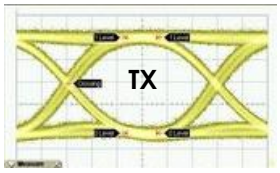
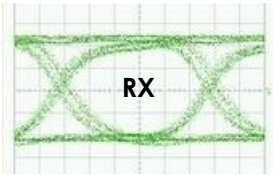
SFP-4250LX-AT30K

4.25 Gb/s, 2^{23}-1 NRZ Data Eye Pattern





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- FC 1X, 2X, and 4X compliant
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- Duplex LC connector optical interface
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- AC coupling LVPECL differential I/O logics
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Applications

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- ✓ IEEE 802.3z Gigabit Ethernet
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- ✓ Central offices routers and switches
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Ordering Information

Part Number: SFP-4250LX-AT30K

Description:

1310 nm 1.0 to 4.25 Gb/s, single mode, SFP fiber optics transceiver, 30 km reach, 0 - 70°C.

Add "-T" in the Part Number for extended temperature range -40–85 °C, i.e., SFP-4250LX-AT30K-T.

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	1	---	4.25	Gb/s
Supply Voltage	3.1	3.3	3.5	V
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Parameter	Symbol	Min.	Max.	Units
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Supply Voltage	*Vcc*	-0.5	6.0	V
Input Voltage	*VIN*	-0.5	*Vcc*	V
Operating Current	*Iop*	---	400	mA
Output Current	*Io*	---	50	mA
Soldering Temperature (10 sec. on leads)	*Tsd*	---	260	°C

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Parameter	Symbol	Min.	Typical	Max.	Units
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Optical Output Power [3]	*Po*	0	---	+5	dBm
Optical Wavelength	*λo*	1285	1310	1345	nm
Relative Intensity Noise	*RIN*	---	---	-118	dB/Hz
OMA	*OMA*	290	---	---	µW
TX Disable Voltage – High	*VDH*	2.0	---	*Vcc*	V
TX Disable Voltage - Low	*VDL*	0	---	0.8	V
TX Fault Output - High	*VFH*	2.0	---	*Vcc*	V
TX Fault Output - Low	*VFL*	0	---	0.8	V
TX Disable Assert Time	*Tass*	---	---	10	µs
TX Disable Deassert Time	*Tdisass*	---	---	1.0	ms
Time to Initialize	*Tas*	---	---	300	ms
TX Fault from Fault to Assertion	*Tfault*	---	---	100	µs
TX Disable Time to Start Reset	*Treset*	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.
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Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1.0	---	---	dB
RX Signal Loss Assert Time	T_{RL+}	---	---	100	µs
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	µs
RX Signal Loss Output - High	V_{RL+}	2.0	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.8	V

Notes:

1. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.
2. Test at 4.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER)
3. Test at 1.25 Gb/s, $2^7 - 1$ PRBS data pattern, and > $1x10^{-12}$ of Bit-Error-Rate (BER)

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