

155 Mb/s, SFP Package
1550 nm Single mode
20 – 120 km Distance

Description

OptoC'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 supports serial ID functionality and Digital Diagnostic Monitoring (DDM) interface through the 2-wire serial bus. It is compliant with SFP Multi-Source Agreement (MSA). It operates at 155 Mb/s for 20 - 120 km transmission distance with single mode fibers. The products are RoHS compliant.



Lead-Free

SFP-155EX-ATXXX
 (XX = 20, 100, 120)



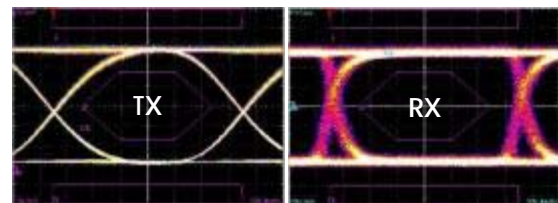
Key Features

- 1550 nm single mode, 155 Mb/s
- 20 –120 km reach, 19 – 35 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 3.3V 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

155 Mb/s, 2²³-1 NRZ Data Eye Pattern



Ordering Information

Part Number: SFP-155EX-ATXXX

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-AT20K-T.

* Add "-D" in the Part Number for DDM, i.e., SFP-155EX-AT20K-D.

* Add "-TD" in the Part Number for both options. i.e., SFP-155EX-AT20K-TD.

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

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	T_{st}	-40	85	°C
Supply Voltage	V_{cc}	-0.5	4.0	V
Input Voltage	V_{IN}	-0.5	V_{cc}	V
Operating Current	I_{op}	---	400	mA
Output Current	I_o	---	50	mA
Soldering Temperature (10 sec. on leads)	T_{sd}	---	260	°C

General Transmitter 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
Relative Intensity Noise	RIN	---	---	-120	dB/Hz
Rise/Fall Time (10% - 90%)	T_r/T_f	---	1	2	ns
TX Disable Voltage - High	V_{DH}	2.4	---	V_{cc}	V
TX Disable Voltage - Low	V_{DL}	0	---	0.5	V
TX Fault Output - High	V_{FH}	2.4	---	V_{cc}	V
TX Fault Output - Low	V_{FL}	0	---	0.5	V
TX Disable Assert Time	T_{ass}	---	---	10	μs
TX Disable Deassert Time	T_{disass}	---	---	1.0	ms
Time to Initialize	T_{as}	---	---	300	ms
TX Fault from Fault to Assertion	T_{fault}	---	---	100	μs
TX Disable Time to Start Reset	T_{reset}	10	---	---	μs

Notes:

1. 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	0.5	---	1.2	V
Differential Input Impedance ²	Z	---	100	---	Ohm
Optical Return Loss	OL	14	---	---	dB
Rise/Fall Time (10% - 90%)	T_r/T_f	---	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+}	2.4	---	V_{CC}	V
RX Signal Loss Output - Low	V_{RL-}	0	---	0.5	V
RX Signal Loss Assert Time	T_{RL+}	---	---	100	μ s
RX Signal Loss Deassert Time	T_{RL-}	---	---	100	μ s

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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 Complies with
 21 CFR 1040.10 and 1040.11




Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Optical Output Power ¹	P_o	-15	---	-8	dBm
Optical Wavelength	λ_o	1530	1550	1570	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}	0	---	---	dBm
Receiver Sensitivity ²	P_I	---	---	-34	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 μ m SMF.
2. Test at 155 Mb/s, 2²³ – 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 21 CFR 1040.10 and 1040.11
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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 μ m SMF.
2. Test at 155 Mb/s, 2²³ – 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	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 μ m SMF.
2. Test at 155 Mb/s, 2²³ – 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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