

100G Pluggable Small Form (CFPx) Optical Transceivers



Features

- 100 Gb/s CFP2, and CFP4 package
- 4x 25 Gb/s CWDM LR4 channels for 100 Gb/s
- Compliant with CFP MSA, IEEE 802.3ba, 100GBASE-LR4
- Compliant with ITU-T G.959.1, OIF CEI-28G-VSR
- Dual LC optical connector
- 56-pin connector z-axis hot pluggable for CFP4
- 104-pin connector z-axis hot pluggable for CFP2



100 Gb/s CFP2 Package



100 Gb/s CFP4 Package

Applications

- ✓ 100G Fiber Channel and Ethernet
- ✓ Data Communication for SAN and LAN
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Products Selection Guide					
Part Number	Wavelength	Data Rate	Power Budget	Distance*	Temp. Range
100 Gb/s, 1296, 1300, 1305 and 1309 nm, CFP2 Single Mode Application					
CP2-100GLX4-AT10K	4x CWDM	100 Gb/s	>6 dB	10 km	0 – 70°C
100 Gb/s, 1296, 1300, 1305 and 1309 nm, CFP4 Single Mode Application					
CP4-100GLX4-AT10K	4x CWDM	100 Gb/s	>6 dB	10 km	0 – 70°C

*: 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.

100 Gb/s (4x25 Gb/s), 10 km CWDM LR4, Singlemode CFP2 Dual LC Package



Description

OptixCom's 100 Gb/s CFPx optical transceiver is designed to operate with 4x CWDM channels for up to 10 km of transmission distance. The transceiver uses 1296, 1300, 1305 and 1309 nm EML laser wavelengths, with each wavelength running at 25 Gb/s. They are then multiplexed together into a single channel to achieve 100 Gb/s of data transmission.

On the receiver side, the 100 Gb/s data signal is demultiplexed and converted to the same 4x CWDM channels as the transmitter side. It is compliant with 100G Ethernet standard and CFP Multi-Source Agreement (MSA) with Management interface clock and data lines (MDIO) management interface.

The transceiver uses dual LC connector for single mode applications. It is hot pluggable in the z-axis with a 104-pin connector for CFP2 package. The product is RoHS compliant. Total power consumption is < 6W.

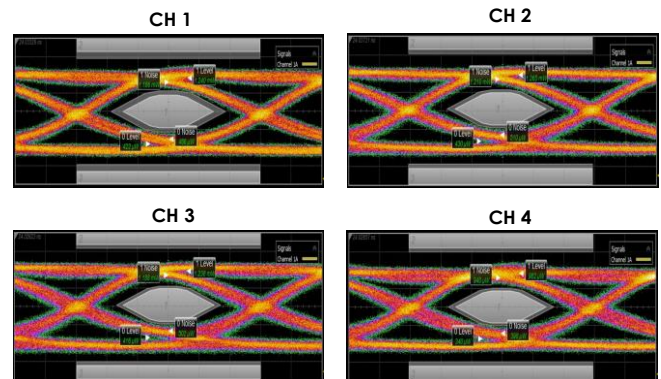


Lead-Free

CP2-100GLX4-AT10K



4 x 25 Gb/s Channels, 2³¹-1 NRZ Data Eye Pattern



Key Features

- 4x CWDM channels 1296, 1300, 1305 and 1309 nm .
- 100 Gb/s, 25 Gb/s for each LR4 wavelength
- 10 km transmission distance for SMF
- Duplex LC single mode interface connector
- Built-in CDR, no external reference clock required.
- 104-pin Z-axis hot pluggable connector
- Compliant with CFP MSA standard
- Compliant with IEEE 802.3ba, 100GBASE-LR4
- Compliant with ITU-T G.959.1, OIF CEI-28G-VSR
- Single 3.3V power supply
- RoHS compliant

Applications

- ✓ 100G Fiber Channel and Ethernet
- ✓ Data Communication for SAN and LAN
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: CP2-100GLX4-AT10K

Description:

CFP2, 4x CWDM LR4, 100 Gb/s, single mode, dual LC fiber optics transceiver, 10 km reach, 0-70°C

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	103	---	112	Gb/s
Supply Voltage	3.2	3.3	3.4	V
Supply Current	---	---	1800	mA

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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	T_{st}	-40	85	°C
Supply Voltage	V_{cc}	-0.3	3.6	V
Input Voltage	V_{IN}	$V_{cc}-0.3$	$V_{cc}+0.3$	V
Relative Humidity	$R.H.$	5	95	%

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage ¹	ΔV_i	0.3	---	1.2	V
Differential Input Impedance ²	Z	---	100	---	ohm
Optical Output Power per Lane ³	P_o	-4.3	---	4.5	dBm
Total Optical Output Power	P_T	---	---	10.5	dBm
Transmitter & Dispersion Penalty	TDP	---	---	2.2	dB
OMA Each Lane	OMA	-1.3	---	4.5	dBm
OMA Difference bet. Lanes	OMA_D	---	---	5	dBm
Optical Wavelength 1	λ_o	1294.53	1295.56	1296.59	nm
Optical Wavelength 2	λ_o	1299.02	1300.05	1301.09	nm
Optical Wavelength 3	λ_o	1303.54	1304.58	1305.63	nm
Optical Wavelength 4	λ_o	1308.09	1309.14	1310.19	nm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB
Relative Intensity Noise	RIN	---	---	-130	dB/Hz
Transmitter Reflectance	T_{ref}	---	---	-12	dB
Extinction Ratio	ET	4	9	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	10	---	---	ps
TX Disable Asserted	P_{OFF}	---	---	-30	dBm
TX Enabled Assert Time	T_{TAss}	---	---	20	ms
TX Disabled Deassert Time	T_{TDis}	---	---	100	μs
Reset Initial Assert Time	T_{rsass}	---	---	2.5	s

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 MMF.
4. Refer to OptixCom "CFP Design Reference Guide" for more design details.

Control Signals Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
3.3V LVCMOS					
Input Voltage – Logic High	V_{DH}	2.0	---	V_{CC}	V
Input Voltage – Logic Low	V_{DL}	0	---	0.4	V
Output Voltage – Logic High	V_{OH}	2.0	---	V_{CC}	V
Output Voltage – Logic Low	V_{OL}	0	---	0.2	V
1.2V LVCMOS					
Input Voltage – Logic High	V_{DH}	0.9	---	1.5	V
Input Voltage – Logic Low	V_{DL}	0	---	0.4	V
Output Voltage – Logic High	V_{OH}	0.9	---	1.5	V
Output Voltage – Logic Low	V_{OL}	0	---	0.2	V
Output High Current	I_{OH}	---	---	-4	mA
Output Low Current	I_{OL}	4	---	---	mA
MDC Clock Rate	f_{mdc}	0.1	---	4	MHz
Common Mode Noise (rmv)	V_{CMN}	---	---	17.5	mV
Common Mode Voltage	V_{CM}	-0.3	---	2.8	V

Note:

1. Refer to OptixCom website for more technical details with "CFP Design Reference Guide" or "CFP MSA CFP2 Hardware Specification".

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage	ΔV_o	0.3	---	1.2	V
Differential Input Impedance ¹	Z	---	100	---	Ohm
Operating Wavelength	λ_c	1250	---	1360	nm
Ave. Receiver Power Each Lane	P_{ave}	-10.6	---	4.5	dBm
RX Power Difference bet. Lanes	P_{ave_D}	---	---	5.5	dBm
OMA RX Sensitivity per Lane ²	PI_{OMA}			-8.6	dBm
Stressed RX Sensitivity in OMA	PI_S	---	---	-6.8	dBm
Receiver Reflectance	OL	---	---	-26	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	10	---	---	ps
RX Signal Loss – Asserted	P_{SD+}	---	---	-12	dBm
RX Signal Loss – Deasserted	P_{SD-}	-30	---	---	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	---	---	4	dB
RX LOS Assert Time	T_{RL+}	---	---	100	μ s
RX LOS Deassert Time	T_{RL-}	---	---	100	μ s

Notes:

1. Single ended will be 50 ohm for each signal line.
2. Test at 25 Gb/s, 2³¹ – 1 PRBS data pattern, and > 1x10⁻¹² of Bit-Error-Rate (BER).
3. Refer to OptixCom website for more technical details with “CFP Design Reference Guide” or “CFP MSA CFP2 Hardware Specification”.

100 Gb/s (4x25 Gb/s), 10 km CWDM LR4, Singlemode CFP4 Dual LC Package

Description

OptixCom's 100 Gb/s CFPx optical transceiver is designed to operate with 4x CWDM channels for up to 10 km of transmission distance. The transceiver uses 1296, 1300, 1305 and 1309 nm EML laser wavelengths, with each wavelength running at 25 Gb/s. They are then multiplexed together into a single channel to achieve 100 Gb/s of data transmission.

On the receiver side, the 100 Gb/s data signal is demultiplexed and converted to the same 4x CWDM channels as the transmitter side. It is compliant with 100G Ethernet standard and CFP Multi-Source Agreement (MSA) with Management interface clock and data lines (MDIO) management interface.

The transceiver uses dual LC connector for single mode applications. It is hot pluggable in the z-axis with a 56-pin connector for CFP4 package. The product is RoHS compliant. Total power consumption is < 6W.

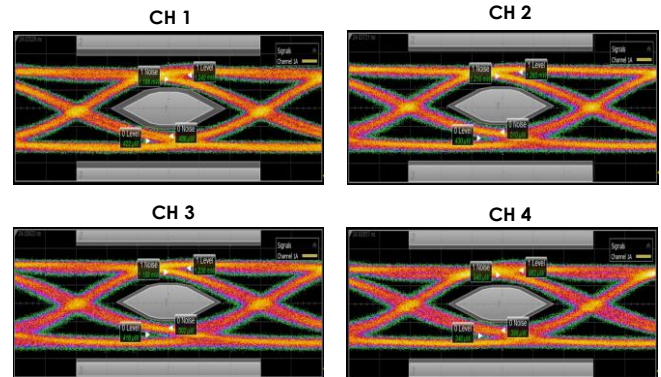


Lead-Free

CP4-100GLX4-AT10K



4 x 25 Gb/s Channels, 2³¹-1 NRZ Data Eye Pattern



Key Features

- 4x CWDM channels 1296, 1300, 1305 and 1309 nm.
- 100 Gb/s, 25 Gb/s for each LR4 wavelength
- 10 km transmission distance for SMF
- Duplex LC single mode interface connector
- Built-in CDR, no external reference clock required.
- 56-pin Z-axis hot pluggable connector
- Compliant with CFP MSA standard
- Compliant with IEEE 802.3ba, 100GBASE-LR4
- Compliant with ITU-T G.959.1, OIF CEI-28G-VSR
- Single 3.3V power supply
- RoHS compliant

Applications

- ✓ 100G Fiber Channel and Ethernet
- ✓ Data Communication for SAN and LAN
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Ordering Information

Part Number: CP4-100GLX4-AT10K

Description:

CFP4, 4x CWDM LR4, 100 Gb/s, single mode, dual LC fiber optics transceiver, 10 km reach, 0-70°C

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	103	---	112	Gb/s
Supply Voltage	3.2	3.3	3.4	V
Supply Current	---	---	1800	mA

Absolute Maximum Ratings

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Supply Voltage	V_{cc}	-0.3	3.6	V
Input Voltage	V_{IN}	$V_{cc}-0.3$	$V_{cc}+0.3$	V
Relative Humidity	$R.H.$	5	95	%

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Differential Input Impedance ²	Z	---	100	---	ohm
Optical Output Power per Lane ³	P_o	-4.3	---	4.5	dBm
Total Optical Output Power	P_T	---	---	10.5	dBm
Transmitter & Dispersion Penalty	TDP	---	---	2.2	dB
OMA Each Lane	OMA	-1.3	---	4.5	dBm
OMA Difference bet. Lanes	OMA_D	---	---	5	dBm
Optical Wavelength 1	λ_o	1294.53	1295.56	1296.59	nm
Optical Wavelength 2	λ_o	1299.02	1300.05	1301.09	nm
Optical Wavelength 3	λ_o	1303.54	1304.58	1305.63	nm
Optical Wavelength 4	λ_o	1308.09	1309.14	1310.19	nm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB
Relative Intensity Noise	RIN	---	---	-130	dB/Hz
Transmitter Reflectance	T_{ref}	---	---	-12	dB
Extinction Ratio	ET	4	9	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	10	---	---	ps
TX Disable Asserted	P_{OFF}	---	---	-30	dBm
TX Enabled Assert Time	T_{TAss}	---	---	20	ms
TX Disabled Deassert Time	T_{TDis}	---	---	100	μs
Reset Initial Assert Time	T_{rsass}	---	---	2.5	s

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 MMF.
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Input Voltage – Logic High	V_{DH}	2.0	---	V_{CC}	V
Input Voltage – Logic Low	V_{DL}	0	---	0.4	V
Output Voltage – Logic High	V_{OH}	2.0	---	V_{CC}	V
Output Voltage – Logic Low	V_{OL}	0	---	0.2	V
1.2V LVCMOS					
Input Voltage – Logic High	V_{DH}	0.9	---	1.5	V
Input Voltage – Logic Low	V_{DL}	0	---	0.4	V
Output Voltage – Logic High	V_{OH}	0.9	---	1.5	V
Output Voltage – Logic Low	V_{OL}	0	---	0.2	V
Output High Current	I_{OH}	---	---	-4	mA
Output Low Current	I_{OL}	4	---	---	mA
MDC Clock Rate	f_{mdc}	0.1	---	4	MHz
Common Mode Noise (rmv)	V_{CMN}	---	---	17.5	mV
Common Mode Voltage	V_{CM}	-0.3	---	2.8	V

Note:

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Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage	ΔV_o	0.3	---	1.2	V
Differential Input Impedance ¹	Z	---	100	---	Ohm
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Ave. Receiver Power Each Lane	P_{ave}	-10.6	---	4.5	dBm
RX Power Difference bet. Lanes	P_{ave_D}	---	---	5.5	dBm
OMA RX Sensitivity per Lane ²	PI_{OMA}			-8.6	dBm
Stressed RX Sensitivity in OMA	P_{IS}	---	---	-6.8	dBm
Receiver Reflectance	OL	---	---	-26	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	10	---	---	ps
RX Signal Loss – Asserted	P_{SD+}	---	---	-12	dBm
RX Signal Loss – Deasserted	P_{SD-}	-30	---	---	dBm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	---	---	4	dB
RX LOS Assert Time	T_{RL+}	---	---	100	μ s
RX LOS Deassert Time	T_{RL-}	---	---	100	μ s

Notes:

1. Single ended will be 50 ohm for each signal line.
2. Test at 25 Gb/s, 2³¹ – 1 PRBS data pattern, and > 1x10⁻¹² of Bit-Error-Rate (BER).
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