WTCFP2-100-LR4C CFP2 LR4 Transceiver

100Gb/s LAN-WDM SMF 10km / Product Overview 3



Part Number WTCFP2-100-LR4C	Reach 10km SMF	Temperature 0°C~+70°C

1. Product Overview

WincoTek 100G CFP2 LR4 optical Transceiver integrates receiver and transmitter path on one module. In the transmit side, four lanes of serial data streams are recovered, retimed, and passed to four laser drivers. The laser drivers control four EMLs (Electric-absorption Modulated Lasers) with center wavelength of 1296 nm, 1300nm, 1305nm and 1309 nm. The optical signals are multiplexed to a single –mode fiber through an industry standard LC connector. In the receive side, the four lanes of optical data streams are optically de-multiplexed by the integrated optical de-multiplexer. Each data stream is recovered by a PIN photo-detector and trans-impedance amplifier, retimed. This module features a hot-pluggable electrical interface, low power consumption and MDIO management interface.

The module provides an aggregated signaling rate from 103.125 Gbps to 111.81 Gbps. It is compliant with IEEE 802.3ba 100GBASE-LR4 and ITU-T G.959.1 4I1-9D1F , and OIF2010.404.08 CEI-28G-VSR electrical specifications. The MDIO management interface complies with IEEE 802.3ba standard. The transceiver complies with CFP MSA CFP2 Hardware Specification Rev. 1.0, CFP MSA Management Interface Specification, and OIF CEI-28G-VSR standards.

Features

- Compliant with 100GBASE-LR4 and 4I1-9D1F
- Support line rates from 103.125 Gbps to 111.81 Gbps
- Integrated LAN WDM EML TOSA / ROSA for up to 10 km reach over SMF
- Digital Diagnostics Monitoring Interface
- Duplex LC optical receptacle
- No external reference clock
- Single 3.3 V power supply
- Case operating temperature range:0°C to 70°C
- Power dissipation < 9W
- STANDARD
- Compliant to IEEE 802.3ba and ITU-T G959.1
- Compliant to CFP MSA CFP2 Hardware Specification

Applications

- Data Center &100G Ethernet
- ITU-T OTU4

2. Ordering Information

Part Number	Data Rate (Gbps)	Laser	Transmission Distance(km)	Temperature (oC) (Operating Case)
WTCFP2-100-LR4C	103.1Gb/s	LWDM	10km SMF	0°C~+70°C

3. Absolute Maximum Ratings

Parameter	Symbol	Min	Typical	Max	Units	Notes
Storage Temperature	Ts	-40	-	85	ºC	
Relative Humidity	RH	5	-	95	%	
Power Supply Voltage	VCC	-0.3	-	4	V	
Signal Input Voltage		Vcc-0.3	-	Vcc+0.3	V	
Receive Input Optical Power (Damage threshold)	Pdmg			5.0	dBm	

4. Optical Parameters

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter
Signaling Speed per Lane			25.78125 ± 100 ppm		Gbps	
Wavelength Assignment	λ0	1294.53	1295.56	1296.59	nm	
Wavelength Assignment	λ1	1299.02	1300.05	1301.09	nm	
Wavelength Assignment	λ2	1303.54	1304.58	1305.63	nm	
Wavelength Assignment	λ3	1308.09	1309.14	1310.19	nm	
Total Output. Power	POUT			10.5	dBm	
Transmit OMA per Lane		-1.3		4.5	dBm	
Average Launch Power Per lane		-4.3		4.5	dBm	
SMSR		30			dB	
Optical Extinction Ratio	ER	4			dB	
Average launch Power off per lane	Poff			-30	dBm	
RIN	RIN			-130	dB/Hz	
Output Eye Mask definition{X1，X2，X3，Y1，Y2，Y3}	{0.25，0.4，0.45，0.25，0.28，0.4}	{0.25，0.4，0.45，0.25，0.28，0.4}	{0.25，0.4，0.45，0.25，0.28，0.4}	{0.25，0.4，0.45，0.25，0.28，0.4}	{0.25，0.4，0.45，0.25，0.28，0.4}	1
Receiver	Receiver	Receiver	Receiver	Receiver	Receiver	Receiver
Signaling Speed per Lane			25.78125 ± 100 ppm		Gbps	
Wavelength Assignment		1294.53	1295.56	1296.59	nm	
Wavelength Assignment		1299.02	1300.05	1301.09	nm	
Wavelength Assignment		1303.54	1304.58	1305.63	nm	
Wavelength Assignment		1308.09	1309.14	1310.19	nm	

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Receive Power (OMA) per Lane	ROMA			4.5	dBm	
Average Input Power per Channel	RXPx	-10.6		4.5	dBm	2
Receiver Sensitivity (OMA) per Lane	Rxsens			-8.6	dBm	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-12	dBm	
Receiver Reflectance	Rr			-26	dB	

5. Optical Parameters

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter
Signaling Speed per Lane			27.9525± 20 ppm		Gbps	
Wavelength Assignment	λ0	1294.53	1295.56	1296.59	nm	
Wavelength Assignment	λ1	1299.02	1300.05	1301.09	nm	
Wavelength Assignment	λ2	1303.54	1304.58	1305.63	nm	
Wavelength Assignment	λ3	1308.09	1309.14	1310.19	nm	
Total Output. Power	POUT			8.9	dBm	
Average Launch Power Per lane		-2.5		2.9	dBm	
SMSR		30			dB	
Optical Extinction Ratio	ER	7			dB	
Average launch Power off per lane	Poff			-30	dBm	
Output Eye Mask definition{X1，X2，X3，Y1，Y2，Y3}	{0.25，0.4，0.45，0.25，0.28，0.4}	{0.25，0.4，0.45，0.25，0.28，0.4}	{0.25，0.4，0.45，0.25，0.28，0.4}	{0.25，0.4，0.45，0.25，0.28，0.4}	{0.25，0.4，0.45，0.25，0.28，0.4}	3
Receiver	Receiver	Receiver	Receiver	Receiver	Receiver	Receiver
Signaling Speed per Lane			27.9525± 20 ppm		Gbps	
Wavelength Assignment		1294.53	1295.56	1296.59	nm	
Wavelength Assignment		1299.02	1300.05	1301.09	nm	
Wavelength Assignment		1303.54	1304.58	1305.63	nm	
Wavelength Assignment		1308.09	1309.14	1310.19	nm	
Average Input Power per Channel	RXPx	-8.8		2.9	dBm	

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Equivalent Sensitivity per Channel	Rxsens			-10.3	dBm	4
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-12	dBm	
Receiver Reflectance	Rr			-26	dB	

6. Electrical Characteristics

Parameter	Symbol	Symbol	Min	Typ.	Typ.	Max	Max	Unit	Unit	Notes
Supply currents and voltages	Supply currents and voltages	Supply currents and voltages	Supply currents and voltages	Supply currents and voltages	Supply currents and voltages	Supply currents and voltages	Supply currents and voltages	Supply currents and voltages	Supply currents and voltages	Supply currents and voltages
Voltage	Vcc	Vcc	3.2	3.3	3.3	3.4	3.4	V	V	With Respect to GND
Supply current	Icc	Icc				2.7	2.7	A	A	
Power dissipation	Pwr	Pwr				9.0	9.0	W	W	
Power dissipation (low power mode)	Plp	Plp				2.0	2.0	W	W	
Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS	Low speed control and sense signals, 3.3 V LVCMOS
Outputs low voltage	Outputs low voltage	VOL					0.2	0.2	V	
Output high voltage	Output high voltage	VOH	Vcc-0.2	Vcc-0.2					V	
Input low voltage	Input low voltage	VIL	-0.3	-0.3			0.8	0.8	V	
Input high voltage	Input high voltage	VIH	2	2			Vcc3+ 0.3	Vcc3+ 0.3	V	
Input leakage current	Input leakage current	IIN	-10	-10			10	10	μA	
Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS	Low speed control and sense signals, 1.2 V LVCMOS
Outputs low voltage	Outputs low voltage	VOL	-0.3	-0.3			0.2	0.2	V	
Output high voltage	Output high voltage	VOH	1.0	1.0			1.5	1.5	V	
Output low current	Output low current	IOL	4	4					mA	
Output high current	Output high current	IOH					-4	-4	mA	
Input low voltage	Input low voltage	VIL	-0.3	-0.3			0.36	0.36	V	
Input high voltage	Input high voltage	VIH	0.84	0.84			1.5	1.5	V	

Parameter	Symbol	Symbol	Min	Typ.	Typ.	Max	Max	Unit	Unit	Notes
Input leakage current	Input leakage current	IIN	-100	-100			100	100	μA	
Input capacitance	Input capacitance	C					10	10	pF	
MDC clock rate	MDC clock rate		0.1	0.1			4	4	MHz	

7. Electrical Characteristics

Parameter	Symbol	Min	Max	Unit	Notes
Transmitter electrical input from host	Transmitter electrical input from host	Transmitter electrical input from host	Transmitter electrical input from host	Transmitter electrical input from host	Transmitter electrical input from host
Differential voltage pk-pk		100	1200	mV	
Common mode noise (rms)			17.5	mV	
Differential termination mismatch			10	%	
Transition time		10		ps	20/80%
Common mode voltage		-0.3	2.8	V	
Eye width	EW15	0.46		UI	At10-15probability
Eye height	EH15	100		mV	At 10-15 probability
Receiver electrical output to host	Receiver electrical output to host	Receiver electrical output to host	Receiver electrical output to host	Receiver electrical output to host	Receiver electrical output to host
Differential voltage pk-pk		100	1200	mV	
Common mode noise (rms)			17.5	mV	
Differential termination mismatch			10	%	
Transition time		9.5		ps	20/80%
Vertical eye closure	VEC		6.5	dB	
Eye width	EW15	0.57		UI	At 10-15 probability
Eye height	EH15	240	mV		At 10-15 probability

8. Pin Descriptions

Pin no.	Name	Logic	Description
1		GND	Module ground
2	CML	(TX_MCLKn)	No connect
3	CML	(TX_MCLKp)	No connect
4		GND	Module ground
5		N.C.	No connect

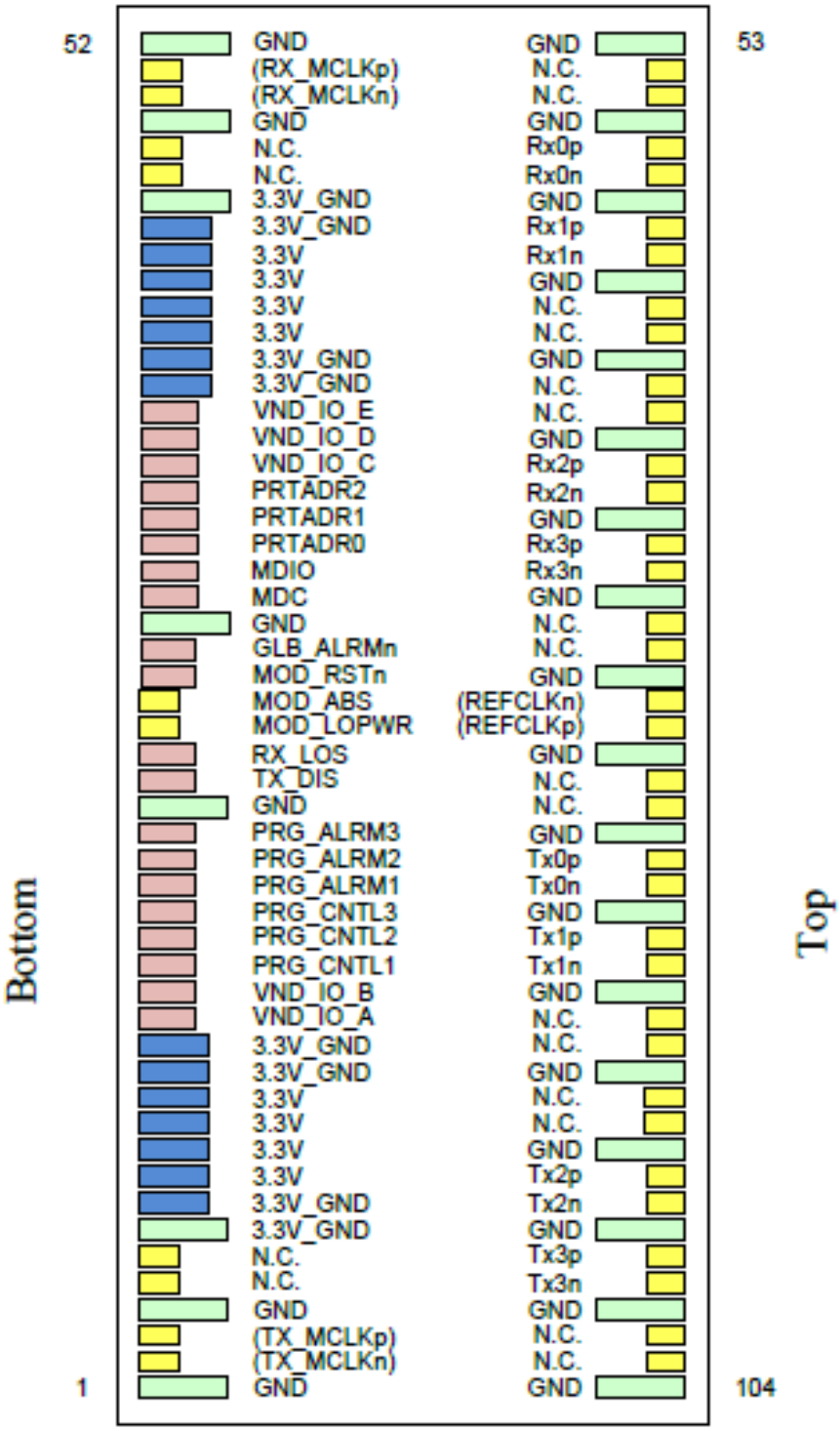
Pin no.	Name	Logic	Description
6		N.C.	No connect
7		3.3V_GND	3.3V ground; tied with module ground
8		3.3V_GND	3.3V ground; tied with module ground
9		3.3V	3.3V module supply voltage
10		3.3V	3.3V module supply voltage
11		3.3V	3.3V module supply voltage
12		3.3V	3.3V module supply voltage
13		3.3V_GND	3.3V ground; tied with module ground
14		3.3V_GND	3.3V ground; tied with module ground
15		VND_IO_A	Module vendor IO A; do not connect
16		VND_IO_B	Module vendor IO B; do not connect
17	LVCMOS1	PRG_CNTL1	Programmable control 1; MSA default: TRXIC_RSTn; “0”: reset; “1” or NC: not used
18	LVCMOS1	PRG_CNTL2	Programmable control 2; MSA default: Hardware interlock LSB; Default “0”: ≤ 9 W
19	LVCMOS1	PRG_CNTL3	Programmable control 3: MSA default: Hardware interlock MSB; Default “1”: ≤ 9 W
20	LVCMOS	PRG_ALRM1	Programmable alarm 1; MSA default: HIPWR_ON; “1”: module power up completed, “0”: module not high powered up
21	LVCMOS	PRG_ALRM2	Programmable alarm 2; MSA default: MOD_READY, “1”: Ready, “0”: not Ready
22	LVCMOS	PRG_ALRM3	Programmable alarm 3; MSA default:: MOD_FAULT, “1”: Fault, “0”: no Fault
23		GND	Module ground
24	LVCMOS1	TX_DIS	Transmitter disable for all lanes; “1” or NC: transmitter disabled; “0”: transmitter enabled
25	LVCMOS	RX_LOS	Receiver loss of optical signal; “1”: low optical signal, “0”: normal condition
26	LVCMOS1	MOD_LOPWR	Module low power mode; “1” or NC: module in low power mode, “0”: power on enabled
27	GND	MOD_ABS	Module absent; “1” or NC: module absent; “0”: module present. Pull up resistor on host.
28	LVCMOS2	MOD_RSTn	Module reset; “0”: reset the module; “1” or NC: module enabled

Pin no.	Name	Logic	Description
29	LVCMOS	GLB_ALRMn	Global alarm; “0”: alarm in any MDIO alarm register; “1”: no alarm condition. Pull up resistor on host.
30		GND	Module ground
31	1.2V CMOS	MDC	Management interface clock input
32	1.2V CMOS	MDIO	Management interface bi-directional data
33	1.2V CMOS	PRTADR0	MDIO physical port address bit 0
34	1.2V CMOS	PRTADR1	MDIO physical port address bit 1
35	1.2V CMOS	PRTADR2	MDIO physical port address bit 2
36		VND_IO_C	Module vendor IO C; do not connect
37		VND_IO_D	Module vendor IO D; do not connect
38		VND_IO_E	Module vendor IO E; do not connect
39		3.3V_GND	3.3V ground; tied with module ground
40		3.3V_GND	3.3V ground; tied with module ground
41		3.3V	3.3V module supply voltage
42		3.3V	3.3V module supply voltage
43		3.3V	3.3V module supply voltage
44		3.3V	3.3V module supply voltage
45		3.3V_GND	3.3V ground; tied with module ground
46		3.3V_GND	3.3V ground; tied with module ground
47		N.C.	No connect
48		N.C.	No connect
49		GND	Module ground
50	CML	(RX_MCLKn)	No connect
51	CML	(RX_MCLKp)	No connect
52		GND	Module ground
53		GND	Module ground
54		N.C.	No connect
55		N.C.	No connect
56		GND	Module ground
57		RX0P	25 Gbps receiver data; Lane 0
58		RX0n	25 Gbps receiver data bar; Lane 0
59		GND	Module ground
60		RX1p	25 Gbps receiver data; Lane 1
61		RX1n	25 Gbps receiver data bar; Lane 1

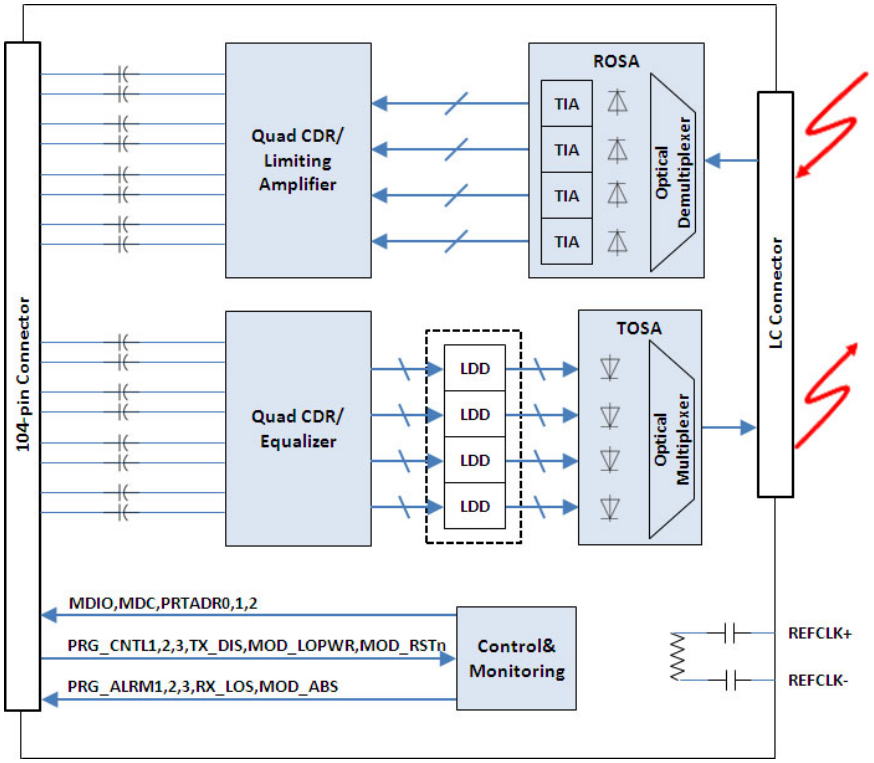
Pin no.	Name	Logic	Description
62		GND	Module ground
63		N.C.	No connect
64		N.C.	No connect
65		GND	Module ground
66		N.C.	No connect
67		N.C.	No connect
68		GND	Module ground
69		RX2p	25 Gbps receiver data; Lane 2
70		RX2n	25 Gbps receiver data bar; Lane 2
71		GND	Module ground
72		RX3p	25 Gbps receiver data; Lane 3
73		RX3n	25 Gbps receiver data bar; Lane 3
74		GND	Module ground
75		N.C.	No connect
76		N.C.	No connect
77		GND	Module ground
78	CML	(REFCLKp)	Module reference clock. No connect.
79	CML	(REFCLKn)	Module reference clock. No connect.
80		GND	Module ground
81		N.C.	No connect
82		N.C.	No connect
83		GND	Module ground
84		TX0p	25 Gbps transmitter data; Lane 0
85		TX0n	25 Gbps transmitter data bar; Lane 0
86		GND	Module ground
87		TX1p	25 Gbps transmitter data; Lane 1
88		TX1n	25 Gbps transmitter data bar; Lane 1
89		GND	Module ground
90		N.C.	No connect
91		N.C.	No connect
92		GND	Module ground
93		N.C.	No connect
94		N.C.	No connect
95		GND	Module ground
96		TX2p	25 Gbps transmitter data; Lane 2

Pin no.	Name	Logic	Description
97		TX2n	25 Gbps transmitter data bar; Lane 2
98		GND	Module ground
99		TX3p	25 Gbps transmitter data; Lane 3
100		TX3n	25 Gbps transmitter data bar; Lane 3
101		GND	Module ground
102		N.C.	No connect
103		N.C.	No connect
104		GND	Module ground

9. Technical Figure 1



10. Technical Figure 2



11. Revision History

Version	Date	Description	Prepared by
V6	2025	Unified WincoTek datasheet format	WincoTek
V6.1	2026-10-23	Engineering and format review	WincoTek