

### CFP2-WDM-D-1HL-C

Cisco® CFP2-WDM-D-1HL Compatible TAA Compliant 200GBase-DCO CFP2 Coherent Transceiver (SMF, 1528.77nm to 1568.36nm, 80km, LC)

#### Features:

- CFP MSA 1.0 Compliance
- Duplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



#### Applications:

- 200GBase Ethernet
- Access and Enterprise

#### Product Description

This Cisco® CFP2-WDM-D-1HL compatible CFP2 transceiver provides 200GBase-DWDM throughput up to 80km over single-mode fiber (SMF) using a wavelength of 1528.77nm to 1568.36nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Cisco® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. It is built to meet or exceed the specifications of Cisco®, as well as to comply with MSA (Multi-Source Agreement) standards to ensure seamless network integration. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	Vcc			3.6	V	
Input Voltage		-0.3		Vcc + 0.5	V	
RX Input Power	Prx			17	dBm	1
Operating Relative Humidity	RHop	5		85	%	2
Storage Temperature	Ttrs	-40		+85	°C	
Operating Case Temperature (long term)	Tcase	-5		70	°C	
Operating Case Temperature (short term)	Tcase	-5		75	°C	
Storage / Transportation RH	RHst	5		93	%	

### Note:

1. This should be considered an operating fault condition experienced for only short timeframe and should not result in damage; above it could risk damage.
2. Constant humidity ratio of 0.026 kg water/kg dry air not to be exceeded according to GR-63.

## Power Supplies

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
+3.3V Supply Voltage	Vcc	3.2	3.3	3.4	V	
+3.3 V Supply current (200G, 16QAM with SD-FEC)	Icc			6.1	A	
+3.3 V Supply current -5°C to 70°C	Icc			TBD	A	
Power dissipation -5°C to 70°C	Pdiss					
QPSK with HDFEC			15.5		W	
QPSK with SDFEC			17.5		W	
8QAM			21.5		W	
16QAM			20.5		W	

## Optical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
Baud rate	Per IQ modulator	27.95		43	GBaud	
Mean modulated output power	DP_QPSK	-5		2	dBm	
Mean modulated output power	DP-8QAM	-5		2	dBm	
Mean modulated output power	DP-16QAM	-5		2	dBm	
Shuttered output power				-35	dBm	
Wavelength range		1528.77		1568.36	nm	
Frequency range		191.150		196.100	THz	
Default channel grid spacing	Tunable across C-band		50		GHz	
Fine tune frequency resolution		0.1			GHz	
Wavelength deviation	± 20 pm	-1.5		+1.5	GHz	
On-grid tuning range	Unshuttered tuning	-6		+6	GHz	
Lorentzian linewidth	Tx and LO		300		kHz	
OSNR	Inband	35			dB	
OSNR	Outband	45			dB	
Optical transmitter turn on time 1	Warm start			1	s	
Optical transmitter turn on time 1	Cold start			60	s	
Optical transmitter turn off time	From TX_DIS activated			10	ms	
Transmitter channel tuning				60	s	
Optical return loss	Towards the module	27			dB	
<b>Receiver</b>						
Frequency range		191.150		196.100	THz	
Average optical input power		-20		+13	dBm	
Receiver dynamic range		-20		0	dBm	
VOA range	On input signal	10			dB	
VOA step size				0.4	dB	
VOA response time				100	ms	
Signal input monitor accuracy		-2.5		+2.5	dB	
Optical return loss				27	dB	
Required OSNR DP-QPSK (10-15 post FEC error rate)	SDFEC		11.4		dB/0.1 nm	
Required OSNR DP-8QAM (10-15 post FEC error rate)	SDFEC		18.1		dB/0.1nm	
Required OSNR DP-16QAM (10-15 post FEC error rate)	SDFEC		19.8		dB/0.1nm	
Chromatic dispersion tolerance	QPSK 8QAM 16QAM			40 20 16	ns/nm	

<b>DGD tolerance</b>	QPSK 8QAM 16QAM			90 45 45	ps ps ps	
<b>SOPMD tolerance</b>	QPSK 8QAM 16QAM		2500 2500 1000		ps^2 ps^2 ps^2	
<b>Acquisition time</b>				30	ms	

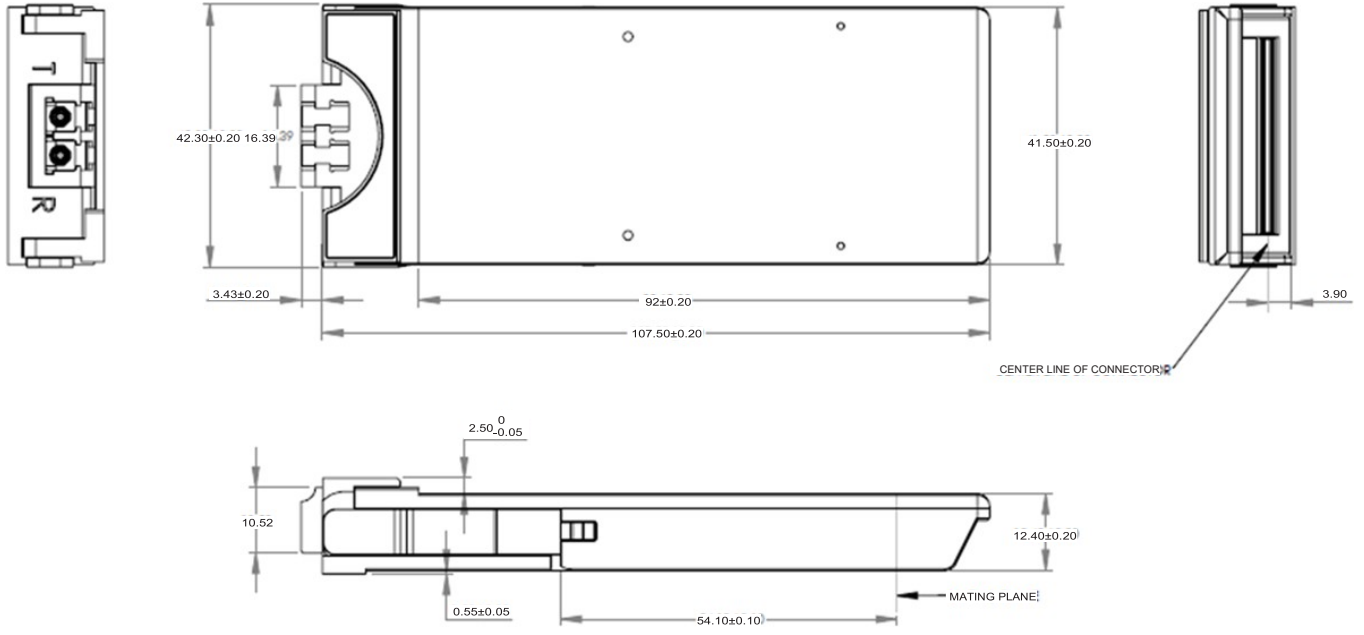
**Notes:**

1. Absolute tuning speed dependent on required power/wavelength mask requirements

**Pin Descriptions**

Bottom Row		Top Row		Bottom Row		Top Row	
Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	GND	104	GND	27	MOD_ABS	78	(REFCLKp)
2	TX_OHIO <sub>n</sub>	103	TX1_0 <sub>n</sub>	28	MOD_RST <sub>n</sub>	77	GND
3	TX_OHIO <sub>p</sub>	102	TX1_0 <sub>p</sub>	29	GLB_ALRM <sub>n</sub>	76	RX1_0 <sub>n</sub>
4	GND	101	GND	30	GND	75	RX1_0 <sub>p</sub>
5	RX_OHIO <sub>n</sub>	100	TX0_3 <sub>n</sub>	31	MDC	74	GND
6	RX_OHIO <sub>p</sub>	99	TX0_3 <sub>p</sub>	32	MDIO	73	RX0_3 <sub>n</sub>
7	3.3V_GND	98	GND	33	PRTADR0	72	RX0_3 <sub>p</sub>
8	3.3V_GND	97	TX0_2 <sub>n</sub>	34	PRTADR1	71	GND
9	3.3V	96	TX0_2 <sub>p</sub>	35	PRTADR2	70	RX0_2 <sub>n</sub>
10	3.3V	95	GND	36	SWDIO	69	RX0_2 <sub>p</sub>
11	3.3V	94	TX1_1 <sub>n</sub>	37	BER threshold alarm	68	GND
12	3.3V	93	TX1_1 <sub>p</sub>	38	DSP_UARTT0_TX	67	RX1_1 <sub>n</sub>
13	3.3V_GND	92	GND	39	3.3V_GND	66	RX1_1 <sub>p</sub>
14	3.3V_GND	91	TX1_2 <sub>n</sub>	40	3.3V_GND	65	GND
15	HOST_INT	90	TX1_2 <sub>p</sub>	41	3.3V	64	RX1_2 <sub>n</sub>
16	SWCLK	89	GND	42	3.3V	63	RX1_2 <sub>p</sub>
17	PRG_CNTL1	88	TX0_1 <sub>n</sub>	43	3.3V	62	GND
18	PRG_CNTL2	87	TX0_1 <sub>p</sub>	44	3.3V	61	RX0_1 <sub>n</sub>
19	PRG_CNTL3	86	GND	45	3.3V_GND	60	RX0_1 <sub>p</sub>
20	PRG_ALARM1	85	TX0_0 <sub>n</sub>	46	3.3V_GND	59	GND
21	PRG_ALARM2	84	TX0_0 <sub>p</sub>	47	OHIO_REFCLK <sub>n</sub>	58	RX0_0 <sub>n</sub>
22	PRG_ALARM3	83	GND	48	OHIO_REFCLK <sub>p</sub>	57	RX0_0 <sub>p</sub>
23	GND	82	TX1_3 <sub>n</sub>	49	GND	56	GND
24	TX_DIS	81	TX1_3 <sub>p</sub>	50	MUX_UART_RX	55	RX1_3 <sub>n</sub>
25	RX_LOS	80	GND	51	MUX_UART_TX	54	RX1_3 <sub>p</sub>
26	MOD_LOPWR	79	(REFCLK <sub>n</sub> )	52	GND	53	GND

# Mechanical Specifications



## **About ProLabs**

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

## **Complete Portfolio of Network Solutions**

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

## **Trusted Partner**

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

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