
400G OSFP DR4 Optical Transceiver

PN: VO-4CDR4CP-ANA / VO-2CDR2CP-ANA

Product Overview

Vitex VO-4CDR4CP-ANA & VO-2CDR2CP-ANA, are high-performance, hot-pluggable optical transceiver modules, adhering to the OSFP form factor with a Flat Top RHS mechanical design. They are engineered for 400 Gigabit Ethernet and high-bandwidth interconnect applications. It complies with the 400GBASE-DR4 standard, enabling 400 Gigabit Ethernet transmission over single-mode fiber up to 150 meters, utilizing a 1310nm wavelength. Employing an MPO12 connector for high-density fiber connections, this transceiver is designed for commercial temperature operation and supports hot-plugging. It also features InfiniBand NDR support and includes a two-wire serial interface with digital diagnostic monitoring (DDM) capabilities for real-time monitoring of critical transceiver parameters, ensuring reliable optical connectivity in demanding data center and high-performance computing environments.

Features

- Hot-pluggable OSFP 400G DR4 / 200G DR2 single mode transceiver
- Compliant with OSFP-RHS
- Compliant with CMIS 4.0
- Maximum power consumption 9W
- Compliant with IEEE 802.3-2022: 400GBASE-DR4 optical interface
- Compliant with IEEE 802.3ck-2022: 400GAUI-4/200GAUI-2/100GAUI-1 C2M electrical interface
- IB NDR support
- Case operating temperature: 0°C to 70°C
- Two wire serial Interface with digital diagnostic monitoring
- Complies with EU Directive 2011/65/EU (RoHS compliant)
- Class 1 Laser

Ordering Information

Part Number	Description
VO-4CDR4CP-ANA	OSFP 400G DR4 Flat Top RHS, 150m SMF, 1310nm, MPO12, C-temp
VO-2CDR2CP-ANA	OSFP 200G DR2 Flat Top RHS, 150m SMF, 1310nm, MPO12, C-temp

Note: This datasheet contains product information for both Vitex PN VO-4CDR4CP-ANA and VO-2CDR2CP-ANA

General Specifications

Parameter	Symbol	Min	Typical	Max	Unit	
Storage Temperature	TS	-40		85	°C	
Supply Voltage (Maximum)	VCC	-0.5		3.6	V	
Relative Humidity (non-condensing)	RH	5		95	%	
Control Input Voltage	VI	-0.3		VCC+0.5	V	
Operating Case Temperature	TOPR	0		70	°C	
Power Supply Voltage (Recommended)	VCC	3.135	3.3	3.465	V	
Instantaneous peak current at hot plug	ICC_IP			3600	mA	
Sustained peak current at hot plug	ICC_SP			2997	mA	
Maximum Power Dissipation	PD			9	W	
Maximum Power Dissipation, Low Power Mode	PDLP			2	W	
Signaling Rate per Lane	SRL		53.125		GBd	
Two Wire Serial Interface Clock Rate				400	kHz	
Power Supply Noise Tolerance 1 kHz – 1 MHz (p-p)				66	mVpp	
Operating Distance		2		500	m	

Optical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Wavelength	λ_C	1304.5	1311	1317.5	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power, each lane	AOPL	-2.9		4.0	dBm	1
Outer Optical Modulation Amplitude (OMA _{outer}), each lane	TOMA	-0.8		4.2	dBm	
Launch power in OMA _{outer} minus TDECQ, each lane	TOMA-TDECQ	-2.2			dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	TDECQ			3.4	dB	
Average Launch Power of OFF Transmitter, Each lane	TOFF			-15	dBm	
Extinction Ratio, each lane	ER	3.5			dB	
RIN OMA	RIN			-136	dB/Hz	
Optical Return Loss Tolerance	ORL			21.4	dB	
Transmitter Reflectance	TR			-26	dB	2

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength.
2. Transmitter reflectance is defined looking into the transmitter.

Optical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Wavelength	λ_C	1304.5	1311	1317.5	nm	
Damage Threshold, average optical power, each lane	AOPD	5			dBm	
Average Receive Power, each lane	AOPR	-5.9		4.0	dBm	
Receive Power (OMA _{outer}), each lane	OMAR			4.2	dBm	
Receiver Reflectance	RR			-26	dB	
Receiver Sensitivity (OMA _{outer}), each lane	SOMA			Max(-3.9, SECQ-5.3)	dBm	1
Stressed Receiver Sensitivity (OMA _{outer}), each lane	SRS			-1.9	dBm	2
Conditions of stressed receiver sensitivity test						
Stressed eye closure for PAM4	SECQ		3.4		dB	
OMA _{outer} of each aggressor lane			4.2		dBm	

1. Receiver sensitivity (OMA_{outer}), each lane (max) is informative and is defined for a transmitter with a value of SECQ up to 3.4 dB.
2. Measured with conformance test signal at TP3 for the BER = 2.4×10^{-4}

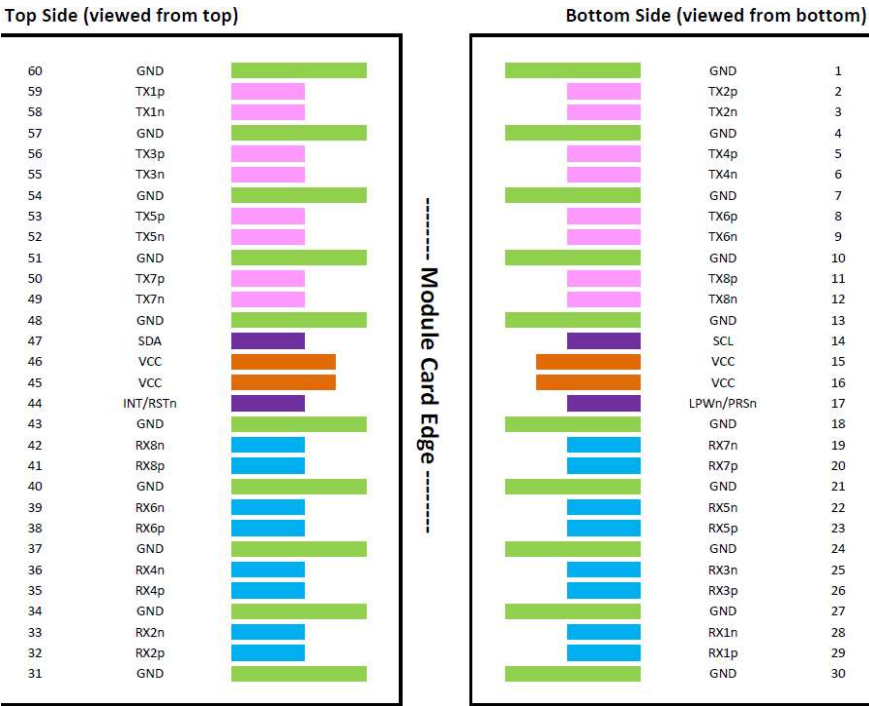
Electrical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Differential pk-pk input Voltage tolerance (TPI _a)		750			mV	
Differential-mode to common-mode return loss	RL _{cd}	802.3ck 120G-2			dB	
Effective return loss	ERL	8.5			dB	
Differential termination mismatch				10	%	
Single-ended voltage tolerance range		-0.4		3.3	V	
DC common-mode voltage tolerance		-0.35		2.85	V	

Electrical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Differential output Voltage (Long mode)				845	mV	
Differential output Voltage (Short mode)				600	mV	
Eye height	EH	15			mV	
Vertical eye closure	VEC			12	dB	
Common-mode to differential-mode return loss	RL _{Dc}	802.3ck 120G-1				
Effective return loss	ERL	8.5			dB	
Differential Termination Mismatch				10	%	
Transition Time (min, 20% to 80%)		8.5			ps	
DC common mode Voltage		-350		2850	mV	

Electrical Connector Layout



Electrical Pin Definition

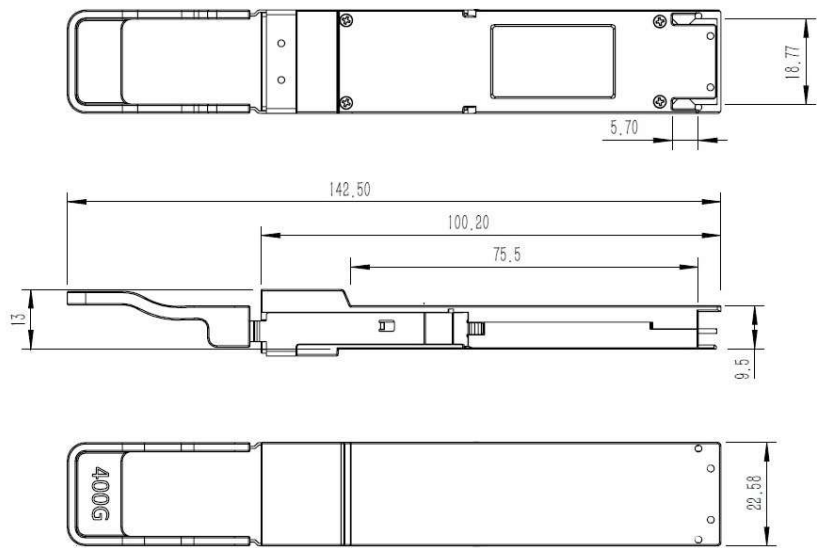
PIN #	Logic	Symbol	Description	Direction	Plug Seq.	Notes
1		GND	Ground		1	
2	CML-I	TX2p	Transmitter Data Non-Inverted	Input from Host	3	
3	CML-I	TX2n	Transmitter Data Inverted	Input from Host	3	
4		GND	Ground		1	
5	CML-I	TX4p	Transmitter Data Non-Inverted	Input from Host	3	
6	CML-I	TX4n	Transmitter Data Inverted	Input from Host	3	
7		GND	Ground		1	
8	CML-I	TX6p	Transmitter Data Non-Inverted	Input from Host	3	Not used
9	CML-I	TX6n	Transmitter Data Inverted	Input from Host	3	Not used
10		GND	Ground		1	
11	CML-I	TX8p	Transmitter Data Non-Inverted	Input from Host	3	Not used
12	CML-I	TX8n	Transmitter Data Inverted	Input from Host	3	Not used
13		GND	Ground		1	

14	LVC MOS-I/O	SCL	2-wire Serial interface clock	Bi-directional	3	
15		VCC	+3.3V Power	Power from Host	2	
16		VCC	+3.3V Power	Power from Host	2	
17	Multi-Level	LPWn/PRSn	Low-Power Mode / Module Present	Bi-directional	3	
18		GND	Ground		1	
19	CML-O	RX7n	Receiver Data Inverted	Output to Host	3	Not used
20	CML-O	RX7p	Receiver Data Non-Inverted	Output to Host	3	Not used
21		GND	Ground		1	
22	CML-O	RX5n	Receiver Data Inverted	Output to Host	3	Not used
23	CML-O	RX5p	Receiver Data Non-Inverted	Output to Host	3	Not used
24		GND	Ground		1	
25	CML-O	RX3n	Receiver Data Inverted	Output to Host	3	
26	CML-O	RX3p	Receiver Data Non-Inverted	Output to Host	3	
27		GND	Ground		1	
28	CML-O	RX1n	Receiver Data Inverted	Output to Host	3	
29	CML-O	RX1p	Receiver Data Non-Inverted	Output to Host	3	
30		GND	Ground		1	
31		GND	Ground		1	
32	CML-O	RX2p	Receiver Data Non-Inverted	Output to Host	3	
33	CML-O	RX2n	Receiver Data Inverted	Output to Host	3	
34		GND	Ground		1	
35	CML-O	RX4p	Receiver Data Non-Inverted	Output to Host	3	
36	CML-O	RX4n	Receiver Data Inverted	Output to Host	3	
37		GND	Ground		1	
38	CML-O	RX6p	Receiver Data Non-Inverted	Output to Host	3	Not used
39	CML-O	RX6n	Receiver Data Inverted	Output to Host	3	Not used
40		GND	Ground		1	
41	CML-O	RX8p	Receiver Data Non-Inverted	Output to Host	3	Not used
42	CML-O	RX8n	Receiver Data Inverted	Output to Host	3	Not used
43		GND	Ground		1	
44	Multi-Level	INT/RSTn	Module Interrupt / Module Reset	Bi-directional	3	
45		VCC	+3.3V Power	Power from Host	2	
46		VCC	+3.3V Power	Power from Host	2	
47	LVC MOS-I/O	SDA	2-wire Serial interface data	Bi-directional	3	
48		GND	Ground		1	
49	CML-I	TX7n	Transmitter Data Inverted	Input from Host	3	Not used
50	CML-I	TX7p	Transmitter Data Non-Inverted	Input from Host	3	Not used
51		GND	Ground		1	
52	CML-I	TX5n	Transmitter Data Inverted	Input from Host	3	Not used
53	CML-I	TX5p	Transmitter Data Non-Inverted	Input from Host	3	Not used



54		GND	Ground		1	
55	CML-I	TX3n	Transmitter Data Inverted	Input from Host	3	
56	CML-I	TX3p	Transmitter Data Non-Inverted	Input from Host	3	
57		GND	Ground		1	
58	CML-I	TX1n	Transmitter Data Inverted	Input from Host	3	
59	CML-I	TX1p	Transmitter Data Non-Inverted	Input from Host	3	
60		GND	Ground		1	

Mechanical Dimension



Revision History

Date	Rev	Description
08/26/2021	1.0	Release version
02/18/2025	2.0	New branding guidelines
2/25/2025	2.1	Added VO-2CDR2CP-ANA

For more information

Vitex LLC 32 Mercer St
Hackensack, NJ 07601

201-296-0145
info@vitextech.com
www.vitextech.com

