
100G QSFP28 DR1 Optical Transceiver

PN: VQ-1CDR1CS-AA

Product Overview

Vitex VQ-1CDR1CS-AA is designed for 500m optical communication applications over a duplex pair of fibers. The QSFP28 DR1 transceiver supports single 53.125GBd optical lane. The digital diagnostic management (DDM) interface and I2C interface are supported.

Features

- Compliant with IEEE 802.3cu
- Compliant with SFF-8679 MSA hardware specification
- Compliant with SFF-8636
- Compliant with SFF-8661
- 1310nm EML laser
- PIN receiver
- Up to 500m on 9/125um SMF
- 100ohm differential impedance system
- Operating temperature options
 - (Commercial) 0°C to +70 °C
- Trouble-free installation and network bring-up
- RoHS Compliant

Applications

- Data Center
- 100 Gigabit Ethernet

Ordering Information

Part Number	Description
VQ-1CDR1CS-AA	100G QSFP28, DR1 500m, 1310 nm, Duplex LC, C-temp

General Specifications

Parameter	Symbol	Min	Typical	Max	Unit	
Storage Temperature	T _s	-40		+85	°C	
Relative Humidity	RH	15		85	%	
Supply Voltage (Maximum)	V _{CC}	-0.5		3.6	V	
Supply Voltage (Recommended)	V _{CC}	3.13	3.3	3.47		
Operating Case Temperature	TC	0		70	°C	
Data Rate per Channel	-		53.125±100ppm		GBd	
Modulation Format			PAM4			
Data Rate	BR		53.125		GBd	
Bit Error Rate	BER	-	-	2.4E-4	-	1
Supported Link Length on 9/125um SMF, 53.125 GBd	L	-	500	-	m	2

1. Tested with a PRBS31Q test pattern for 53.125 GBd operation.
2. Distances are based on FC-PI-6 Rev. 3.1 and IEEE 802.3 standards, with FEC.

Optical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Launch Optical Power (Average)	P _o	-2.9		4	dBm	1
Launch Optical Power (OMA)	P _{oma}	-0.8		4.2	dBm	
OMA minus TDECQ	OMA-TDECQ	-1.9			dBm	
Extinction Ratio	ER	3.5			dB	
Center Wavelength Range	λ _c	1304.5	1311	1317.5	nm	
Transmitter and dispersion penalty eye closure for PAM4	TDECQ			3.4	dB	
RIN15.5OMA (max)	RIN			-136	dB/Hz	
Optical Return Loss Tolerance	ORLT			15.5	dB	
Pout@TX-Disable Asserted	P _{off}			-15	dBm	

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.

Optical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Center Wavelength	λ _c	1304.5		1317.5	nm	
Receiver Sensitivity (OMA)	RxSENS			-3.9	dBm	1
Average receive power		-5.9		4	dBm	
Receive power(OMAouter)				4.2	dBm	
Receiver reflectance				-26	dB	
LOS De-Assert	LOSD			-10	dBm	
LOS Assert	LOSA	-16			dBm	
LOS Hysteresis		0.5			dB	

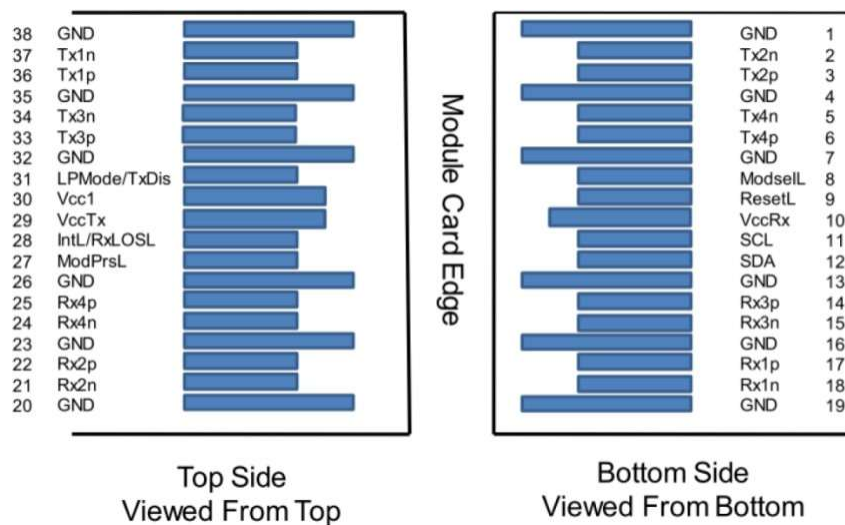
Electrical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit
Module Supply Current	I _{cc}			1276	mA
Power Dissipation	PD			4000	mW
Input Differential Impedance	Z _{IN}	90	100	110	Ω
Differential Data Input Swing	V _{IN} , P-P	180		900	mVP-P

Electrical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit
Output Differential Impedance	Z _o	90	100	110	Ω
Differential Data Output Swing	V _{OUT} , P-P	300		850	mVP-P

Electrical Connector Layout



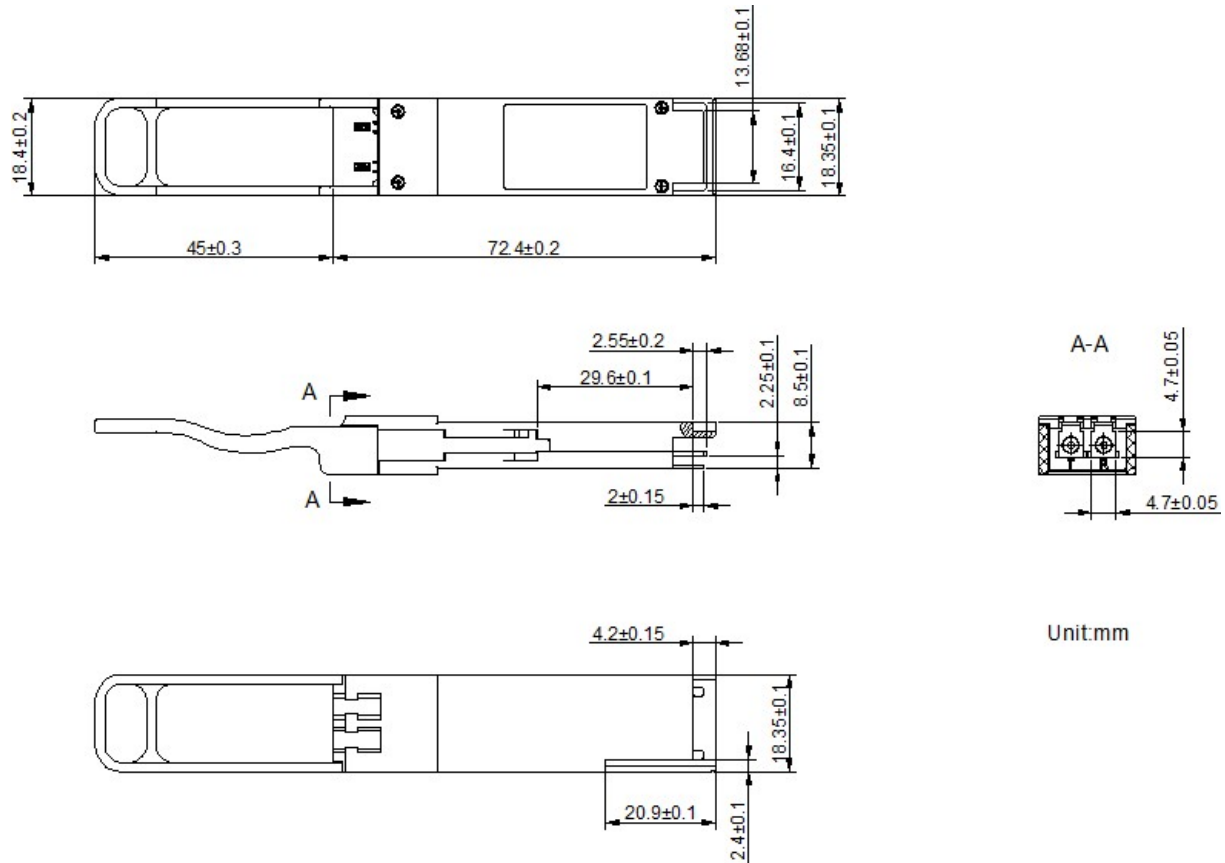
Electrical Pin Definition

PIN #	Logic	Symbol	Description	Plug Sequence	Remarks
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Output	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Output	3	
7		GND	Ground	1	1

8	LVTLL-I	ModSelL	Module Select	3	
9	LVTLL-I	ResetL	Module Reset	3	
10		VccRx	+3.3V Power Supply Receiver	2	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	3	
13		GND	Ground	1	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx2n	Receiver Inverted Data Output	3	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTLL-O	ModPrsL	Module Present	3	
28	LVTLL-O	IntL/Rx_LOS	Interrupt/Rx_LOS	3	
29		VccTx	+3.3V Power Supply Transmitter	2	2
30		VccI	+3.3V Power Supply	2	2
31	LVTLL-I	LPMode/TxDIS	Low Power Mode/Tx_Disable	3	
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Output	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Output	3	
38		GND	Ground	1	1

1. GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP28 module, and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. VccRx, VccI and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in MSA. The connector pins are each rated for a maximum current of 1A.

Mechanical Dimension



Unit:mm

Revision History

Date	Rev	Description
10/1/2021	1.0	Release version
02/11/2025	2.0	New branding guidelines

For more information

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