100G QSFP28 DR PSM4 Optical Transceiver

Part Number - VQ-1CDR4CP-AA

VQ-1CDR4CP-AA is a high performance QSFP28 transceiver module based on 100G Ethernet IEEE 802.3bm standard. QSFP28 DR PSM4 offers 4 independent transmit and receive channels, each capable of 25G for an aggregate bandwidth of 100G.

Features

- 4 Parallel lanes design
- Compliant with QSFP28 MSA
- 4 channels PIN photo detector
- Up to 25.78125Gb/s per channel data links
- Single +3.3V power supply
- Class 1 laser safety certified
- Up to 500m on SMF
- RoHS 6/6 Compliant
- Commercial operating temperature: -5°C to +70°C
- Compliant to IEEE 802.3bm 100GBASE DR PSM4

Applications

- 100GBASE Ethernet links
- InfiniBand QDR and DDR
- Data center

Ordering Information

Part Number	Description
VQ-1CDR4CP-AA	100G QSFP28 1310nm MPO/MTP connectors, up to 500m on SMF

Product Overview

Vitex **VQ-1CDR4CP-AA** transceivers are designed for use in 100 Gigabit Ethernet links on up to 500m of single mode fiber. They are compliant with the QSFP28 MSA and portions of IEEE 802.3bm. Digital diagnostics functions are available via the I2C interface, as specified by the QSFP28 MSA. The QSFP28 full-duplex optical module offers 4 independent transmit and receive channels, each capable of 25Gb/s operation for an aggregate data rate of 100Gb/s.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Storage Temperature	T_S	-40		85	°C
Relative Humidity	RH	5		95	%
Supply Voltage	V_{CC}	-0.5		4.0	V

Operating Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T_c	0	25	70	°C
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Data Rate PER Channel	-	-	25.78125	-	Gb/s
Module Supply Current	I_{cc}	-	-	1100	mA
Power Dissipation	P_D	-	-	3.5	W

Electrical – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit
Input Differential Impedance	Z_{IN}	90	100	110	Ω
Differential Data Input Swing	$V_{IN, P-P}$	190	-	700	mV_{P-P}

Electrical – Receiver

Parameter	Symbol	Min	Typ	Max	Unit
Output Differential Impedance	Z_O	90	100	110	Ω
Differential Data Output Swing[1]	$V_{OUT, P-P}$	300	-	850	mV_{P-P}
AC Common Mode Output Voltage	-	-	-	7.5	mV
Single-ended Output Voltage	-	-0.3	-	4	V

1. Internally AC coupled, but requires an external 100Ω differential load termination

Optical – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Note
Launch Optical Power	Po	-4	-	+2	dBm	1
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Center Wavelength Range	λc	1295	1310	1325	nm	
Extinction Ratio	EX	3.5	-	-	dB	2
Optical Return Loss Tolerance	ORLT	-	-	12	dB	
Pout @TX-Disable Asserted	Poff	-	-	-30	dBm	1
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}	{0.31,0.4,0.45,0.34,0.38,0.4}					

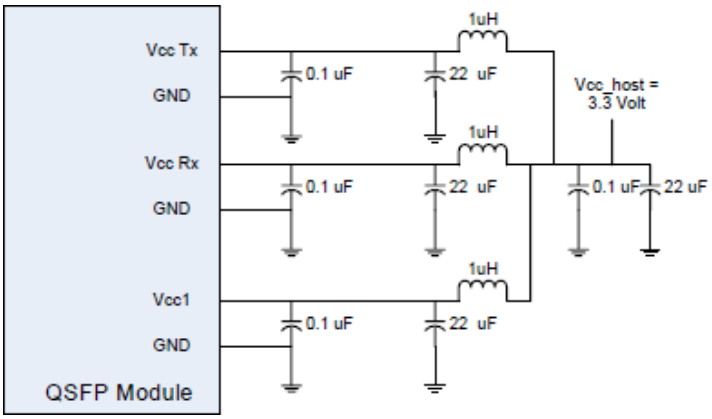
Notes:
1. The optical power is launched into SMF.
2. Measured with a PRBS 2^{31}-1 test pattern @25.78125Gbps.

Optical- Receiver

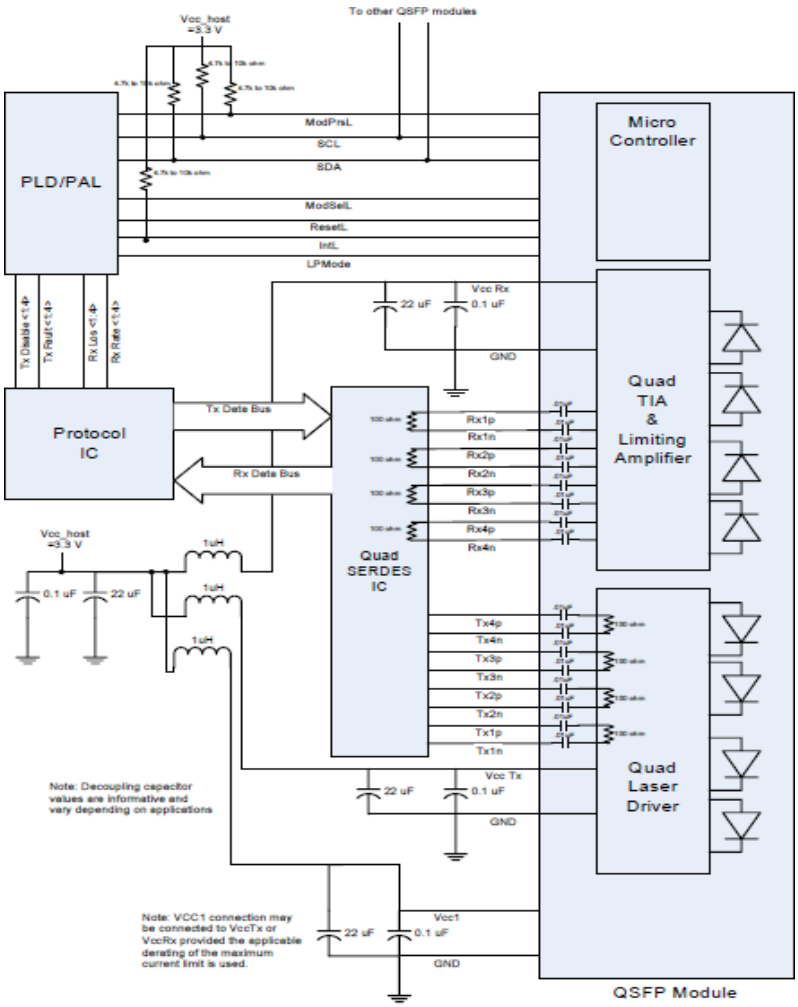
Parameter	Symbol	Min	Typ	Max	Unit	Note
Centre Wavelength	λ_C	1295		1325	nm	
Receiver Sensitivity	S	-	-	-12.0	dBm	1
Overload (each channel)	P_{OL}	2.0	-	-	dBm	1
Damage Threshold	P_{damage}	3.0	-	-	dBm	
LOS De-Assert	LOS_D	-	-	-11.6	dBm	
LOS Assert	LOS_A	-24	-	-	dBm	
LOS Hysteresis	-	0.5	-	-	dB	

Notes:
1. Measured with PRBS 2^{31}-1 test pattern, 25.78125Gb/s, BER<$5E^{-5}$.

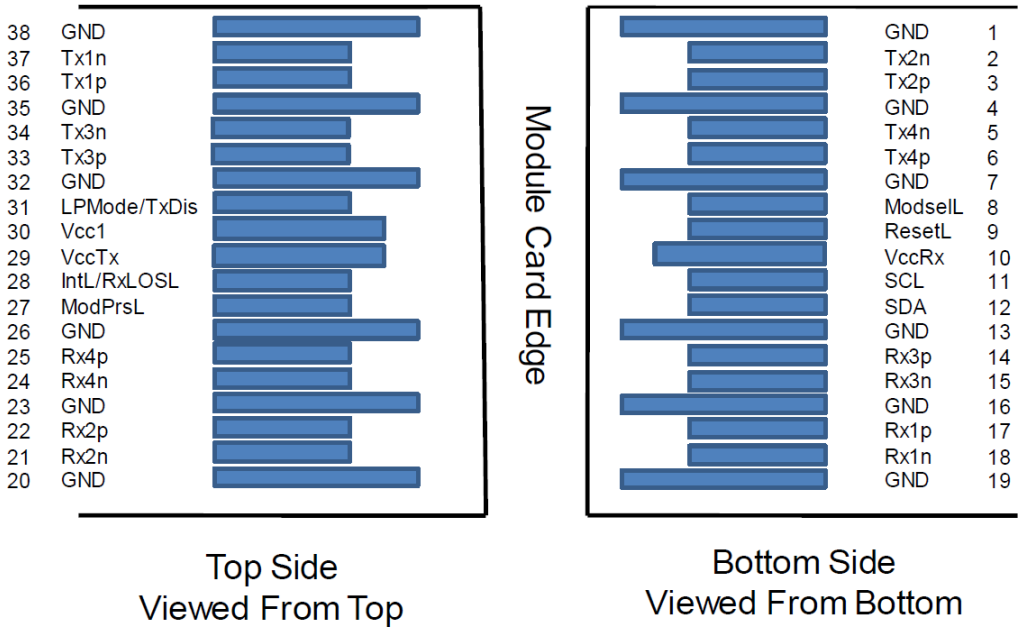
Recommended Host Board Power Supply Filter Network



Recommended Application Interface Block Diagram



Electrical Connector Layout



Electrical Pin Definition

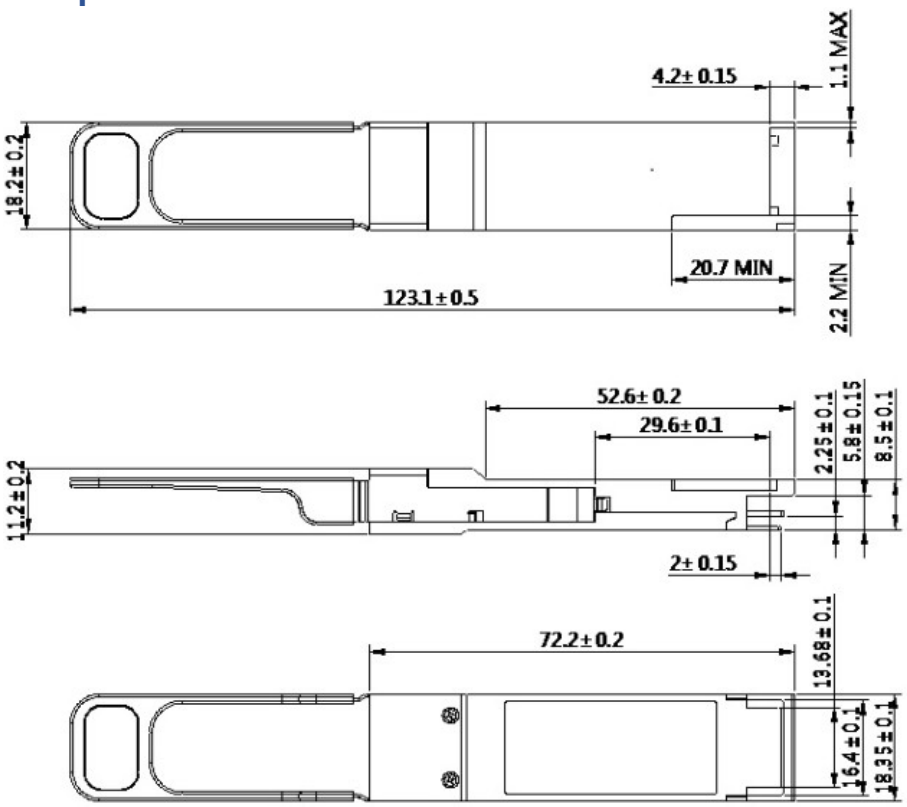
Pin	Symbol	Description	Unit
1	GND	Transmitter Ground (Common with Receiver Ground)	1
2	Tx2-	Transmitter Inverted Data Input	
3	Tx2+	Transmitter Non-Inverted Data Input	
4	GND	Transmitter Ground (Common with Receiver Ground)	1
5	Tx4-	Transmitter Inverted Data Input	
6	Tx4+	Transmitter Non-Inverted Data Input	
7	GND	Transmitter Ground (Common with Receiver Ground)	1
8	ModSelL	Module Select	2
9	ResetL	Module Reset	2
10	VccRx	3.3V Power Supply Receiver	
11	SCL	2-Wire serial Interface Clock	2
12	SDA	2-Wire serial Interface Data	2
13	GND	Transmitter Ground (Common with Receiver Ground)	1
14	Rx3+	Receiver Non-Inverted Data Output	
15	Rx3-	Receiver Inverted Data Output	
16	GND	Transmitter Ground (Common with Receiver Ground)	1
17	Rx1+	Receiver Non-Inverted Data Output	

18	Rx1-	Receiver Inverted Data Output	
19	GND	Transmitter Ground (Common with Receiver Ground)	1
20	GND	Transmitter Ground (Common with Receiver Ground)	1
21	Rx2-	Receiver Inverted Data Output	
22	Rx2+	Receiver Non-Inverted Data Output	
23	GND	Transmitter Ground (Common with Receiver Ground)	1
24	Rx4-	Receiver Inverted Data Output	1
25	Rx4+	Receiver Non-Inverted Data Output	
26	GND	Transmitter Ground (Common with Receiver Ground)	1
27	ModPrsl	Module Present	
28	IntL	Interrupt	2
29	VccTx	3.3V power supply transmitter	
30	Vcc1	3.3V power supply	
31	LPMode	Low Power Mode	2
32	GND	Transmitter Ground (Common with Receiver Ground)	1
33	Tx3+	Transmitter Non-Inverted Data Input	
34	Tx3-	Transmitter Inverted Data Input	
35	GND	Transmitter Ground (Common with Receiver Ground)	1
36	Tx1+	Transmitter Non-Inverted Data Input	
37	Tx1-	Transmitter Inverted Data Input	
38	GND	Transmitter Ground (Common with Receiver Ground)	1

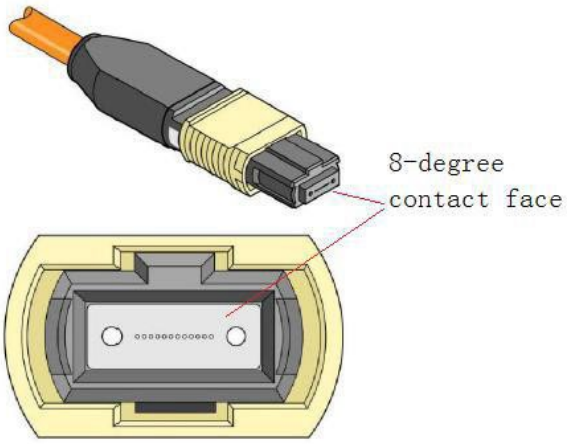
Notes:

1. The module signal grounds are isolated from the module case.
2. This is open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost

Mechanical specifications



Attention: To minimize MPO connection induced reflections, an MPO receptacle with 8-degree angled end-face is utilized for this product. A female MPO connector with 8-degree end-face should be used with this product as illustrated in below Figure.



Revision History

Date	Rev	Description
10/8/2019	1.0	Initial Release

Contact Information

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