

100G QSFP28 eSR4 Optical Transceiver

Part Number - VQ-1CSR4CP-EA

VQ-1CSR4CP-EA is a high performance QSFP28 transceiver module based on 100G Ethernet IEEE 802.3bm standard. QSFP28 eSR4 offers 4 independent transmit and receive channels, each capable of 25G for an aggregate bandwidth of 100G.

Features

- Up to 25.78 Gbps per channel
- 4-channel full-duplex
- Single 3.3V power supply
- Lower power consumption: 1.65W per cable end
- Up to 200m with OM3 fibers, up to 300m with OM4 fibers
- Single MPO12 receptacle
- I2C management interface
- Hot pluggable
- Commercial operating case temperature range 0°C to 70°C
- RoHS/REACH compliant

Applications

- IEEE 802.3bm 100G Base-eSR4
- InfiniBand EDR
- Datacenter: servers, switches, storages and NIC adapters

Ordering Information

Part Number	Description
VQ-1CSR4CP-EA	100G QSFP28 850nm MPO/MTP connectors, up to 200m/300m on OM3/OM4 MMF

Product Overview

Vitex **VQ-1CSR4CP-EA** transceivers are designed for use in 100Gb/s links up to 200m/300m on OM3/OM4 MMF.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V _{IN}	0		4.0	V
Storage Temperature	T _{STG}	-40		85	°C
Relative Humidity	RH	0		85	%

Operating Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _{OP}	0		70	°C
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V
Power Supply Current	I _{CC}		500		mA
Power Consumption			1.65	1.73	W

Electrical – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit
Data Rate, each lane	DR		25.78		Gbps
Input Differential Impedance	R _{IN}		100		Ω
Differential Data Input Swing	V _{INP-P}	200		900	mV

Electrical – Receiver

Parameter	Symbol	Min	Typ	Max	Unit
Data Rate, each lane	DR		25.78		Gbps
Output Differential Impedance	R _{OUT}		100		Ω
Differential Data Output Swing	V _{OUTP-P}			800	mV
Bit Error Ratio (at 25.78 Gbps) ¹				10 ⁻⁸	

1. Pre-FEC Bit Error Ratio with a PRBS 2³¹-1 test pattern

Optical – Transmitter

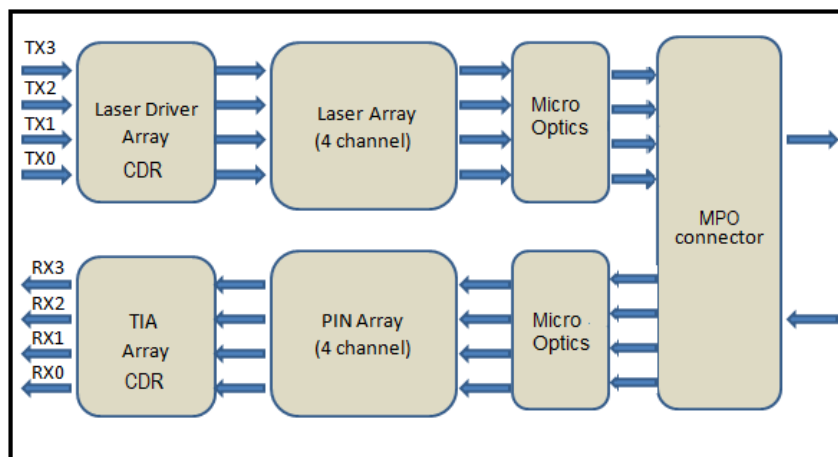
Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	840	850	860	nm
RMS Spectral Width	σ			0.6	nm
Average Launch Power per Lane	P_{AVG}	-8.4		2.4	dBm
Optical Modulation Amplitude (OMA) per lane	P_{OMA}	-6.4		3	dBm
Transmitter and Dispersion Eye Closure (TDEC), each lane	TDEC			4.3	dB
Average Launch Power of OFF Transmitter per lane				-30	dBm
Extinction Ratio	ER	2			dB
Eye Mask Coordinates (Hit ratio = 1.5×10^{-3})		{X1, X2, X3, Y1, Y2, Y3}			
		{0.3, 0.38, 0.45, 0.35, 0.41, 0.5}			

Optical- Receiver

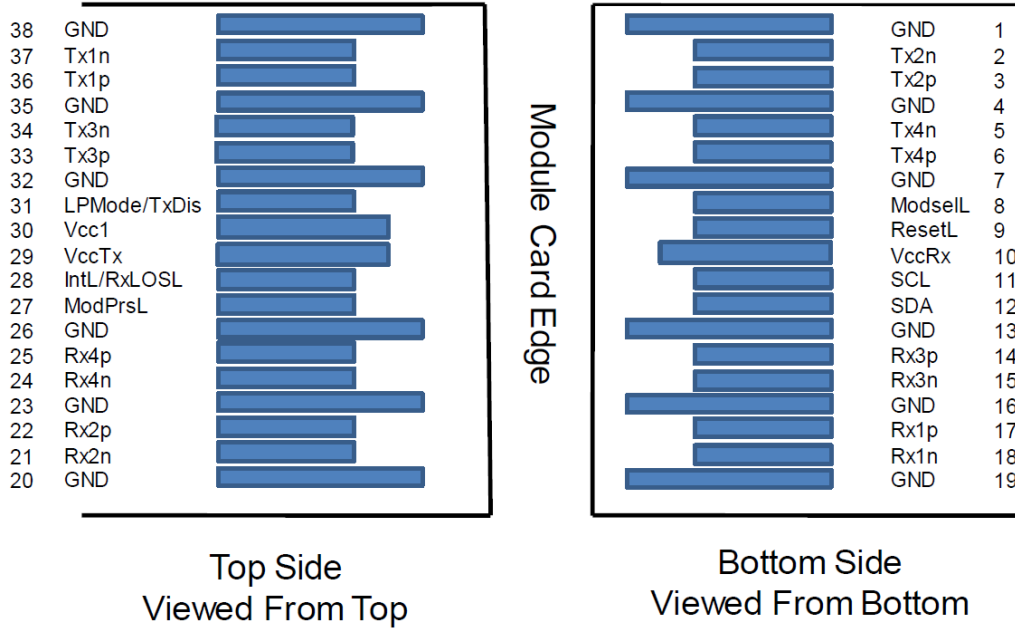
Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	840	850	860	nm
Average Receiver Power, each lane	RX_{AVG}	-10.3		2.4	dBm
Stressed Receiver Sensitivity (OMA), each lane ¹	SRS			-5.2	dBm
Receiver Reflectance				-12	dB
Stressed Receiver Eye Mask Definition ²		{X1, X2, X3, Y1, Y2, Y3}			
		{0.28, 0.5, 0.5, 0.33, 0.33, 0.4}			

1. Pre-FEC Bit Error Ratio with a PRBS $2^{31}-1$ test pattern with conformance test signal at TP3 for BER = 10^{-12}
2. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver. (Hit ratio = 5×10^{-5})

Transceiver Block Diagram



Electrical Connector Layout



Electrical Pin Definition

Pin	Symbol	Description	Unit
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input, LAN2	
3	Tx2p	Transmitter Non-Inverted Data Input, LAN2	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input, LAN4	
6	Tx4p	Transmitter Non-Inverted Data Input, LAN4	
7	GND	Ground	1
8	ModSelL	Module select pin, the module responds to two-wire serial communication when low level	
9	ResetL	Module Reset	
10	VccRx	+3.3V Power Supply Receiver	2
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output, LAN3	
15	Rx3n	Receiver Inverted Data Output, LAN3	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output, LAN1	

18	Rx1n	Receiver Inverted Data Output, LAN1	
19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output, LAN2	
22	Rx2p	Receiver Non-Inverted Data Output, LAN2	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output, LAN4	
25	Rx4p	Receiver Non-Inverted Data Output, LAN4	
26	GND	Ground	1
27	ModPrsL	The module is inserted into the indicate pin and grounded in the module.	
28	IntL	Interrupt	
29	VccTx	+3.3V Power Supply transmitter	2
30	Vcc1	+3.3V Power Supply	2
31	LPMODE	Low Power Mode	3
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input, LAN3	
34	Tx3n	Transmitter Inverted Data Input, LAN3	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input, LAN1	
37	Tx1n	Transmitter Inverted Data Input, LAN1	
38	GND	Ground	1

1. GND is the symbol for signal and supply (power) common for the QSFP module. All are common within the QSFP 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. Vcc RX, Vcc1 and Vcc TX are the receiver and transmitter power supplies and shall be applied concurrently. Vcc RX, Vcc1 and Vcc TX may be internally connected within the QSFP transceiver module in any combination. The connector pins are each rated for a maximum current of 500 mA
3. Not in use

Contact Information

Vitex LLC
 210 Sylvan Ave, Suite 25
 Englewood Cliffs, NJ 07632
 201-296-0145 | info@vitextech.com
www.vitextech.com