100G QSFP28 eCWDM4 Optical Transceiver

Part Number - VQ-1CCW4CS-EA

VQ-1CCW4CS-EA is a high performance QSFP28 transceiver module for use 100Gb/s links over single mode fiber.

Features

- Compliant with IEEE Std 802.3ba, 100G Ethernet
- Compliant with QSFP28 MSA
- 4 x 25Gb/s CWDM transmitter
- 4 channels PIN photo detector
- Single +3.3V power supply
- Class 1 laser safety certified
- Power consumption less than 3.5W
- Commercial operating temperature:0°C to 70°C
- Up to 10km on SMF
- RoHS-6 Compliant

Applications

- 100G CWDM4 Ethernet links
- Data center

Ordering Information

Part Number	Data Rate	Link Length	Laser	Detector	Fiber Type	Temperature
VQ-1CCW4CS-EA	100G	70m OM3 100m OM4	CWDM DFB	PIN	SMF	0 – 70°C

Product Overview

Vitex **VQ-1CCW4CS-EA** transceivers are designed for 100 Gigabit Ethernet over single mode fiber. They are compliant with the QSFP28 100G and IEEE 802.3ba. Digital diagnostics functions are available via the I2C interface, as specified by the QSFP28 MSA.**VQ-1CCW4CS-EA** are compliant with RoHS-6.

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Note
Operating Temperature	Tc	0	25	70	°C	1
Storage Temperature	Ts	-40		85	°C	2
Input Voltage	Vcc	3.135	3.3	3.465	V	
Maximum Voltage	Vmax	-0.5		4.0	V	3
Module total power	Pt			3.5	W	
Module Low Power Mode	Plp			1.5	W	

1.Case temperature
2.Ambient temperature
3.For electrical power interface

Optical – Transmitter

Parameter	Symbol	Min	Typl	Max	Unit	N
Launch Optical Power	Po	-6.5	-	+2.4	dBm	1
Total Launch Optical Power	Po	-	-	+8.5	dBm	1
Center Wavelength Range	L1	1264.5	1271	1277.5	nm	-
	L2	1284.5	1291	1297.5		
	L3	1304.5	1311	1317.5		
	L4	1324.5	1331	1337.5		
Extinction Ratio	EX	4	-	-	dB	2
Spectral width(-20dB)	Δλ	-	-	1.0	nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Optical Return Loss Tolerance	ORLT	-	-	20	dB	-
Pout @TX-Disable Asserted	Poff			-		1
Eye Mask {X1, X2, X3, Y1, Y2, Y3}	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}					

Note:

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	Notes
Center Wavelength	L1	1264.5	1271	1277.5	nm	-
	L2	1284.5	1291	1297.5	nm	
	L3	1304.5	1311	1317.5	nm	
	L4	1324.5	1331	1337.5	nm	
Sensitivity per Channel	S	-	-	-11.5	dBm	1
Overload (each channel)	POL	2.5	-	-	dBm	1
Damage Threshold(each channel)	Pdamag	3.5	-	-	dBm	-
Optical Return Loss	ORL	26	-	-	dB	-
LOS De-Assert	LOSD	-	-	-12.0	dBm	-
LOS Assert	LOSA	-24	-	-	dBm	-
LOS Hysteresis	-	0.5	-	-	dB	-

Note:

1. Measured with PRBS 231-1 test pattern, 25.78125Gb/s, BER 5.0E-5;

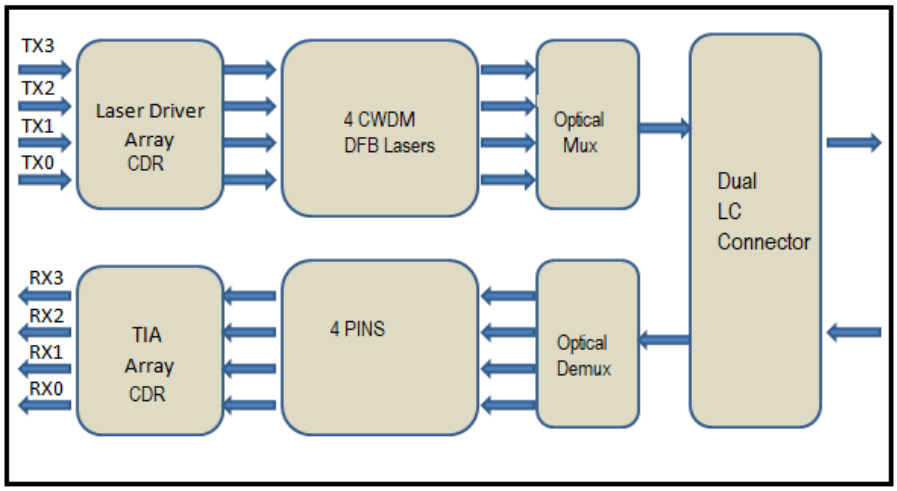
Electrical – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Note
Input Differential Impedance	ZIN	-	100	-	Ω	-
Differential Data Input Swing	VIN, P-P	190	-	700	mVP-P	-

Electrical – Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Note
Output Differential Impedance	ZO	90	100	110	Ω	-
Differential Data Output Swing	VOUT, P-P	300	-	850	mVP-P	-

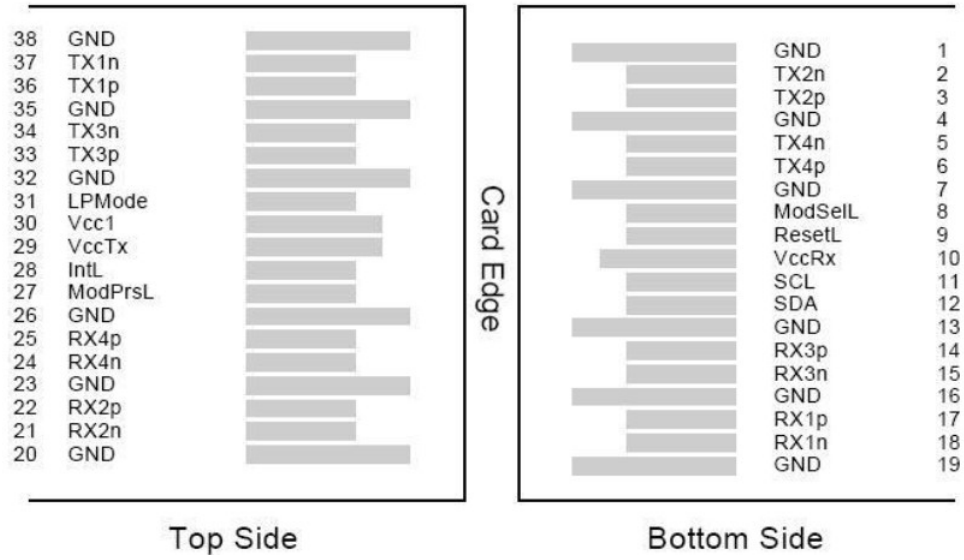
Transceiver Block Diagram



Functional Description

This product converts the 4-channel 25Gb/s electrical input data into a CDR at transmitter side and then driven those 4-channel 25Gb/s electrical signal into CWDM optical signals (light), by a driven 4-wavelength Distributed Feedback Laser (DFB) array. The light is combined by the MUX parts as a 100Gb/s data, propagating out of the transmitter module from the SMF. The receiver module accepts the 100Gb/s CWDM optical signals input, and de-multiplexes it into 4 individual 25Gb/s channels with different wavelength. Each wavelength light is collected by a discrete photo diode, and then outputted as electric data after amplified by a TIA and a post amplifier and a CDR at receiver side.

Electrical Connector Layout



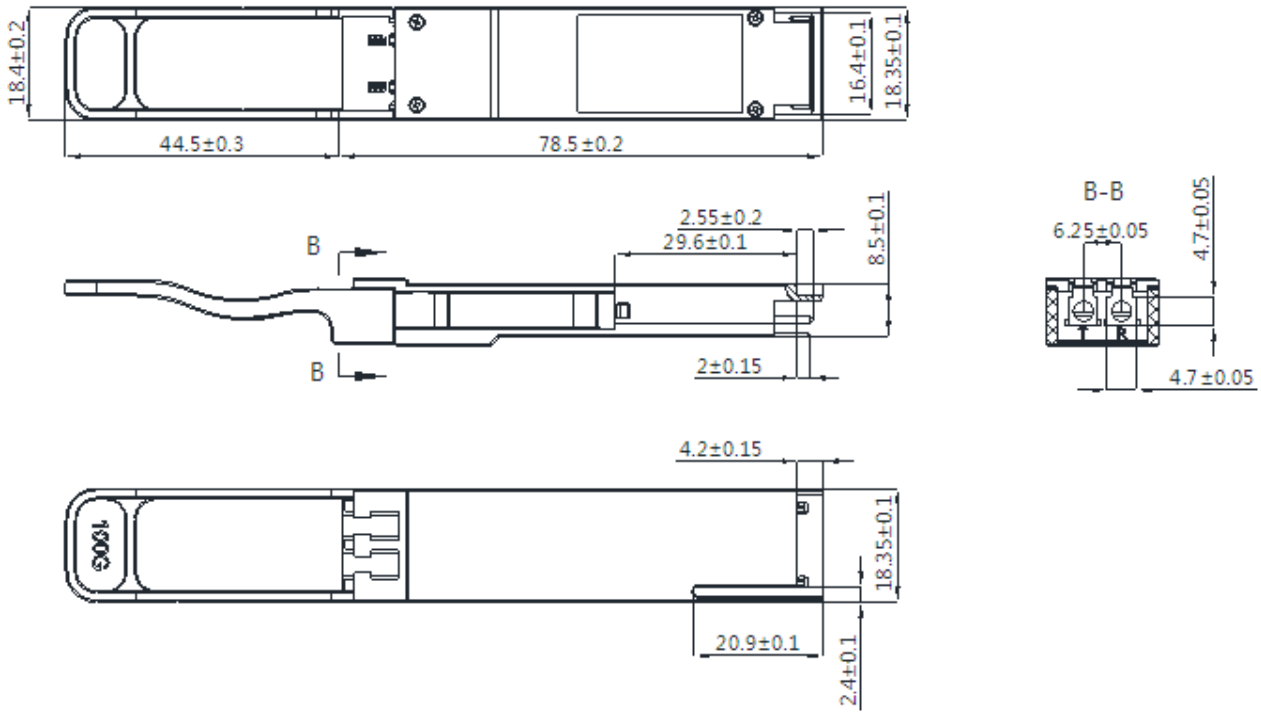
Electrical Pin Definition

Pin	Name	Function/Description	Notes
1	GND	Transmitter Ground (Common with Receiver Ground)	1
2	Tx2-	Transmitter Inverted Data Input	
3	Tx2+	Transmitter Non-Inverted Data output	
4	GND	Transmitter Ground (Common with Receiver Ground)	1
5	Tx4-	Transmitter Inverted Data Input	
6	Tx4+	Transmitter Non-Inverted Data output	
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 Output	
35	GND	Transmitter Ground (Common with Receiver Ground)	1
36	Tx1+	Transmitter Non-Inverted Data Input	
37	Tx1-	Transmitter Inverted Data Output	
38	GND	Transmitter Ground (Common with Receiver Ground)	1

Notes:

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

Mechanical Dimensions



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