40G QSFP+ LR4 4CWDM Optical Transceiver

PN: VQ-40LR4CS-AA

Product Overview

Vitex VQ-40LR4CS-AA are designed for use in 40G connections over single mode fiber. They integrate four channel CWDM DFB lasers and multiplex them into a single channel for 40Gbps optical transmission. The module can operate at 40 Gbps up to 10km using 9/125um SMF. They are compliant with the QSFP+ MSA and IEEE 802.3ba 40GBASE-LR4 standards.

Features

- Compliant with IEEE Std 802.3ba，40G Ethernet LR4
- Compliant with QSFP+MSA
- Management interface specifications per SFF-8436
- 4 CWDM Lane Mux/Demux design
- 4 channels CWDM DFB
- 4 channels PIN photo detector
- Up to 11.1Gb/s per channel data links
- Single +3.3V power supply
- Class 1 laser safety certified
- Commercial operating temperature: 0 °C to 70 °C
- Up to 10km on SMF
- RoHS Compliant

Applications

- 40GBASE-LR4 40G Ethernet
- Fiber channel
- Data center

Ordering Information

Part Number	Description
VQ-40LR4CS-AA	40G QSFP+ LR4, 10km SMF, 1310nm, 4CWDM, Duplex-LC, C-temp

General Specifications

Parameter	Symbol	Min	Typical	Max	Unit	
Storage Temperature	T_S	-40		85	°C	
Relative Humidity	RH	5		95	%	
Supply Voltage (Maximum)	V_{CC}	-0.5		4.0	V	
Supply Voltage (Recommended)	V_{CC}	3.135	3.3	3.465	V	
Operating Case Temperature	TC	0	25	70	°C	
Data Rate PER Channel			10.3125		Gbps	

Optical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Launch Optical Power per lane	Po	-7		+2.3	dBm	1
Total Launch Optical Power	Po			+8	dBm	1
Center Wavelength Range	λ0	1264.5	1271	1277.5	nm	
	λ1	1284.5	1291	1297.5	nm	
	λ2	1304.5	1311	1317.5	nm	
	λ3	1324.5	1331	1337.5	nm	
Extinction Ratio	Er	3.5			dB	2
Spectral width(-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Transmitter and Dispersion Penalty	TDP			2.3	dB	
Optical Return Loss Tolerance	ORLT			12	dB	
Eye Diagram	IEEE Std 802.3ba compatible					

1. The optical power is launched into SMF.
2. Measured with a PRBS 2^{31}-1 test pattern @ 10.3125Gbps.

Optical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Center Wavelength	λc	1260		1340	nm	
Receiver Sensitivity per lane	S			-11.5	dBm	1
Receiver Overload per lane	P_{OL}	2.3			dBm	1
Optical Return Loss	ORL	26			dB	
LOS De-Assert	LOS_D			-12	dBm	
LOS Assert	LOS_A	-30			dBm	
LOS Hysteresis		0.5			dB	

1. Measured with PRBS 2^{31}-1 test pattern, 10.3125Gbs, BER<10^{-12}.

Electrical – Transmitter

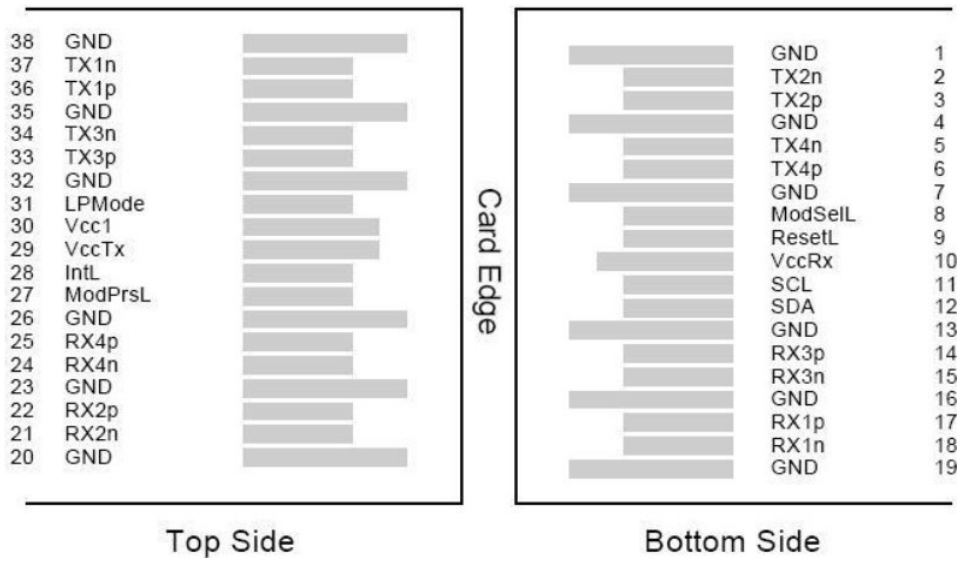
Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Module Supply Current	Icc			1100	mA	
Power Dissipation	P_D			3500	mW	
Input Differential Impedance	Z_{IN}		100		Ω	
Differential Data Input Swing	$V_{IN, P-P}$	180		900	mV_{P-P}	

Electrical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Output Differential Impedance	Z_O		100		Ω	
Differential Data Output Swing	$V_{OUT, P-P}$	300		850	mV_{P-P}	1

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

Electrical Connector Layout

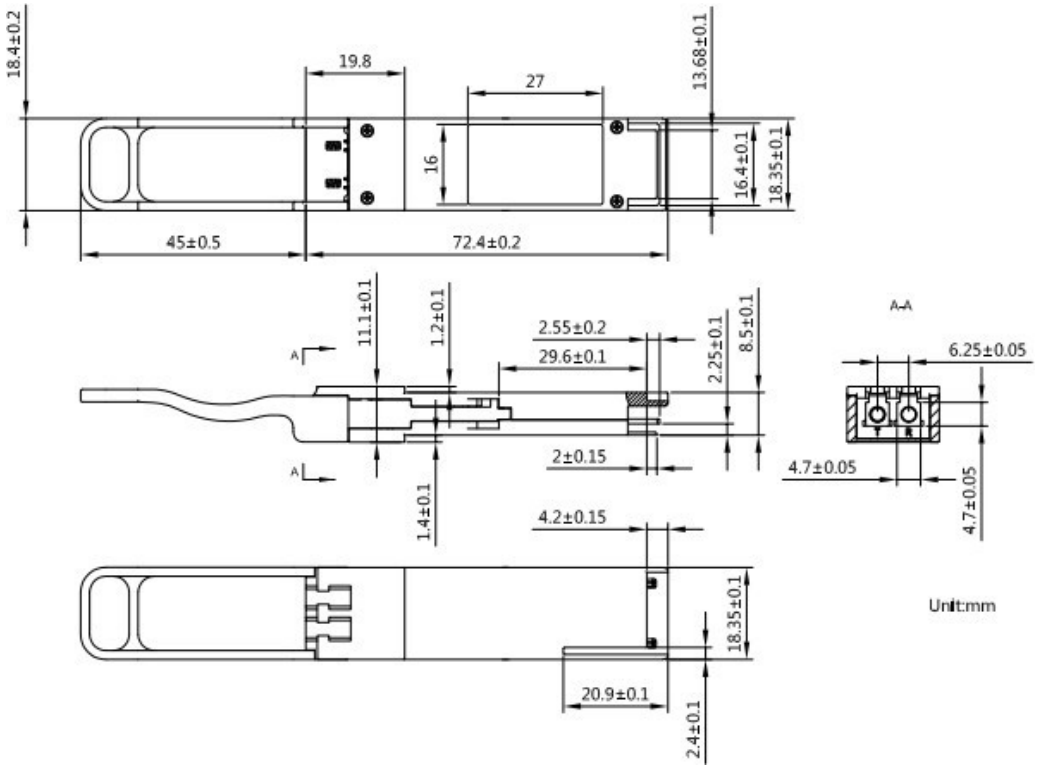


Electrical Pin Definition

PIN #	Symbol	Description	Remarks
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

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 Dimension



Revision History

Date	Rev	Description
11/09/2023	1.0	Release version
02/13/2025	2.0	New branding guidelines

For more information

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