100G QSFP28 ER4 Optical Transceiver

PN: VQ-1CER4CS-AA

Product Overview

Vitex VQ-1CER4CS-AA is designed for 100G Ethernet connections over single-mode fiber. They are compliant with QSFP28 MSA and IEEE 802.3ba 100GBASE-ER4 standards. Digital diagnostic functions are available via the I2C interface.

Features

- Compliant with IEEE Std 802.3ba, 100G Ethernet ER4
- Compliant with QSFP28 MSA
- 4 cooled 25Gb/s channels LAN WDM EML TOSA
- 4 channels SOA PIN photo detector
- Single +3.3V power supply
- Class 1 laser safety certified
- Power consumption less than 4.5W
- Commercial operating temperature: 0 °C to 70°C
- Up to 40km on SMF without FEC
- Duplex LC connector
- RoHS Compliant

Applications

- Data Center
- 100G BASE-ER4 Ethernet

Ordering Information

Part Number	Description
VQ-1CER4CS-AA	100G QSFP28 ER4, 40 km SMF, 1310nm, Duplex-LC, C-temp

General Specifications

Parameter	Symbol	Min	Typical	Max	Unit	
Storage Temperature	T_S	-40		+85	°C	
Relative Humidity	R_H	5		95	%	
Supply Voltage (Maximum)	V_{CC}	-0.5		4.0	V	
Supply Voltage (Operating)	V_{CC}	3.135	3.3	3.465	V	
Operating Case Temperature	TC	0	25	70	°C	
Data Rate PER Channel			25.78125		Gbps	

Optical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Launch Optical Power per lane	Po	-2.9		+2.9	dBm	1
Total Launch Optical Power	Po			+8.9	dBm	1
Center Wavelength Range	L1	1294.53	1295.56	1296.59	nm	
	L2	1299.02	1300.05	1301.09	nm	
	L3	1303.54	1304.58	1305.63	nm	
	L4	1308.09	1309.14	1310.19	nm	
Extinction Ratio	EX	8.0			dB	2
Spectral width(-20dB)	Δλ			1.0	nm	
Side Mode Suppression Ratio	SMSR	30.0			dB	
Optical Return Loss Tolerance	ORLT			20.0	dB	
Pout @TX-Disable Asserted	P_{off}			-30.0	dBm	1
Eye Mask {X1, X2, X3, Y1, Y2, Y3}	{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}					

1. The optical power is launched into SMF.
2. Measured with a PRBS 2^{31}-1 test pattern, 25.78125Gb/s.

Optical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Center Wavelength	L1	1294.53	1295.56	1296.59	nm	
	L2	1299.02	1300.05	1301.09	nm	
	L3	1303.54	1304.58	1305.63	nm	
	L4	1308.09	1309.14	1310.19	nm	
Sensitivity per Channel (OMA)	S			-21.4	dBm	1
Overload (each channel)	P_{OL}	2.0			dBm	1
Damage Threshold (each channel)	P_{damage}	5.5			dBm	
Receiver Reflectance	Rf			-26.0	dB	
LOS De-Assert	LOSD			-28.0	dB	
LOS Assert	LOSA	-35.0			dBm	
LOS Hysteresis		0.5		5.0	dB	

1. Measured with PRBS 2^{31}-1 test pattern, 25.78125Gb/s, BER 1.0E-12

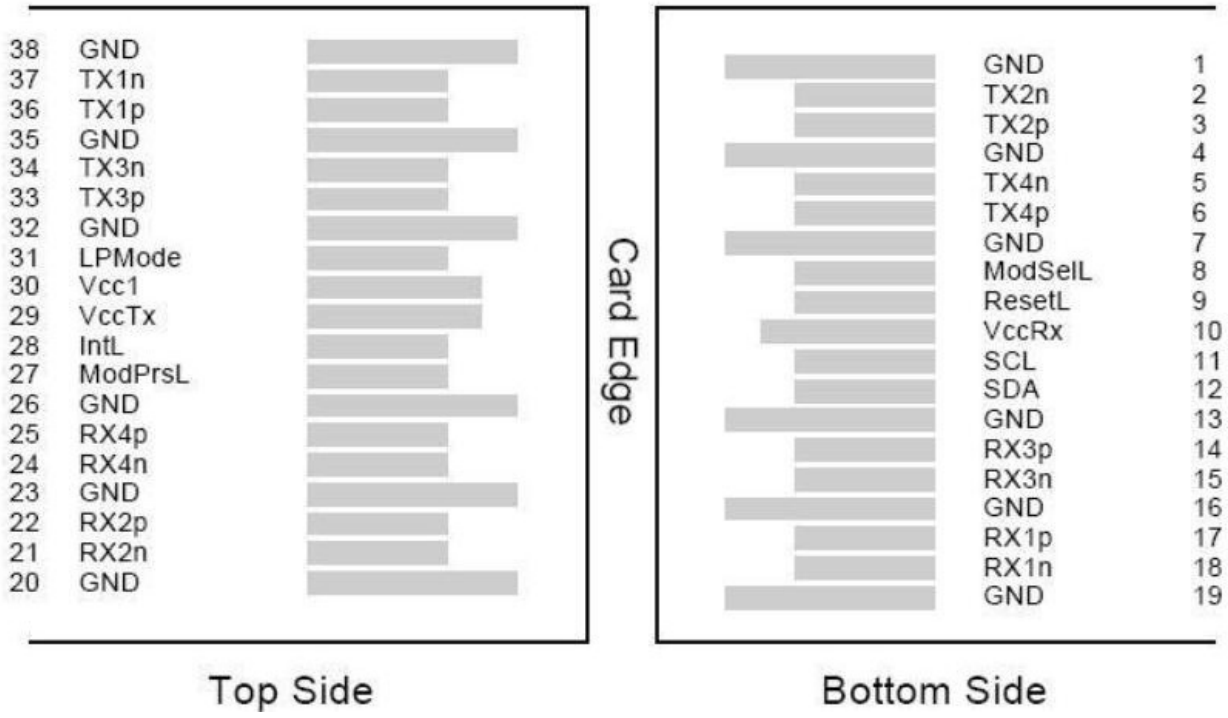
Electrical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit
Module Supply Current	Icc			1500	mA
Power Dissipation	P_D			5000	mW
Single-ended Input Voltage Tolerance		-0.3		4.0	V
Input Differential Impedance	Z_{IN}		100		Ω
Differential Data Input Swing	$V_{IN, P-P}$	190		700	mV_{P-P}
AC Common Mode Input Voltage Tolerance		15			mV
Differential Input Voltage Swing Threshold			50		mVpp

Electrical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit
Single-ended Output Voltage		-0.3		4.0	V
Output Differential Impedance	Z_O	90	100	110	Ω
Differential Data Output Swing	$V_{OUT, P-P}$	300		850	mV_{P-P}
AC Common Mode Output Voltage				7.5	mV

Electrical Connector Layout

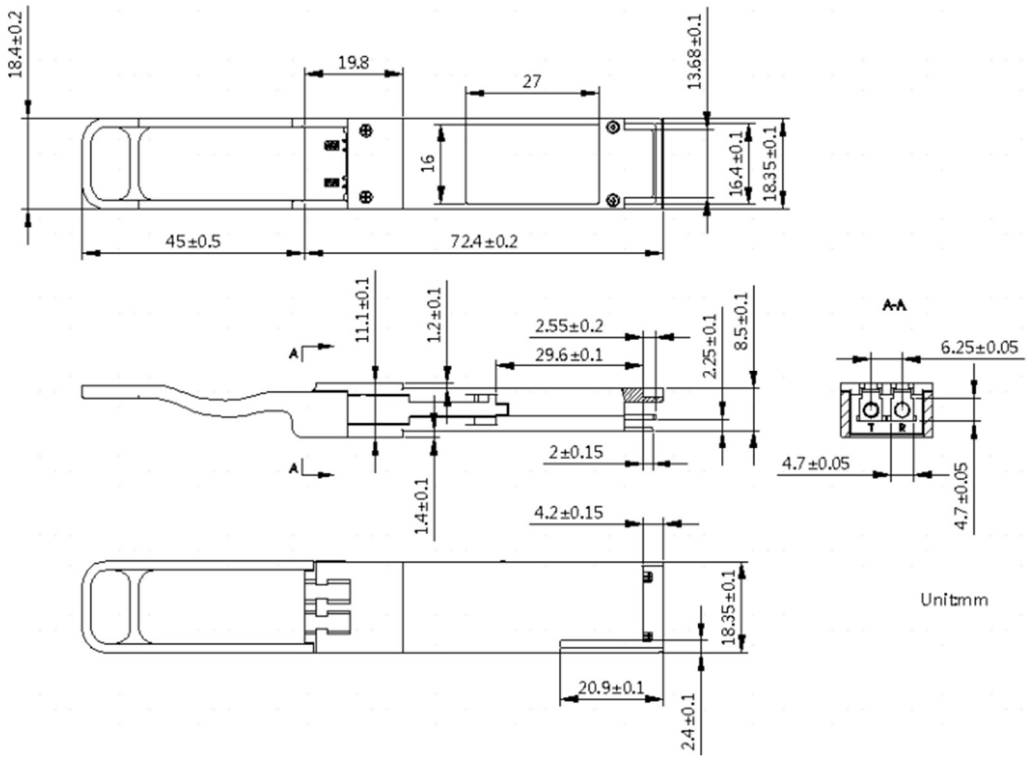


Electrical Pin Definition

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 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

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
01/07/2020	1.0	Release version
02/12/2025	2.0	New branding guidelines

For more information

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