100G QSFP28 LR4 Optical Transceiver

PN: VQ-1CLR4IS-AA

Product Overview

Vitex VQ-1CLR4IS-AA is designed for optical communication applications over single-mode fiber cables. The 100G QSFP28 LR4 transceiver supports 103.1 Gbps up to 10km. They are compliant with the QSFP28 MSA and IEEE 802.3ba 100GBASE-LR4 standards.

Features

- Compliant with IEEE Std 802.3ba, 100G Ethernet LR4
- Compliant with QSFP28 MSA
- 4 cooled 25Gb/s channels LAN WDM DFB TOSA
- 4 channels PIN photo detector
- Single +3.3V power supply
- Class 1 laser safety certified
- Power consumption less than 5.0W
- Industrial operating temperature: -40 °C to +85 °C
- Up to 10km on SMF
- RoHS Compliant

Applications

- Data Center
- 100G BASE-LR4 Ethernet

Ordering Information

Part Number	Description
VQ-1CLR4IS-AA	100G QSFP28 LR4, 10 km SMF, 1310nm, Duplex-LC, I-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 (Industrial)	TC	-40	25	85	°C	
Data Rate PER Channel			25.78125		Gb/s	

Optical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Launch Optical Power per lane	Po	-4.3		+4.5	dBm	1
Total Launch Optical Power	Po			+10.5	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	4.0			dB	2
Spectral width(-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Return Loss Tolerance	ORLT			20	dB	
Pout @TX-Disable Asserted	P_{off}			-30	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 @25.78125Gbps.

Optical - Receiver

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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			-8.6	dBm	1
Overload (each channel)	POL	4.5			dBm	1
Damage Threshold (each channel)	P_{damage}	5.5			dBm	
Optical Return Loss	ORL	26			dB	
LOS De-Assert	LOSD			-11.6	dBm	
LOS Assert	LOSA	-24			dBm	
LOS Hysteresis		0.5			dB	

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

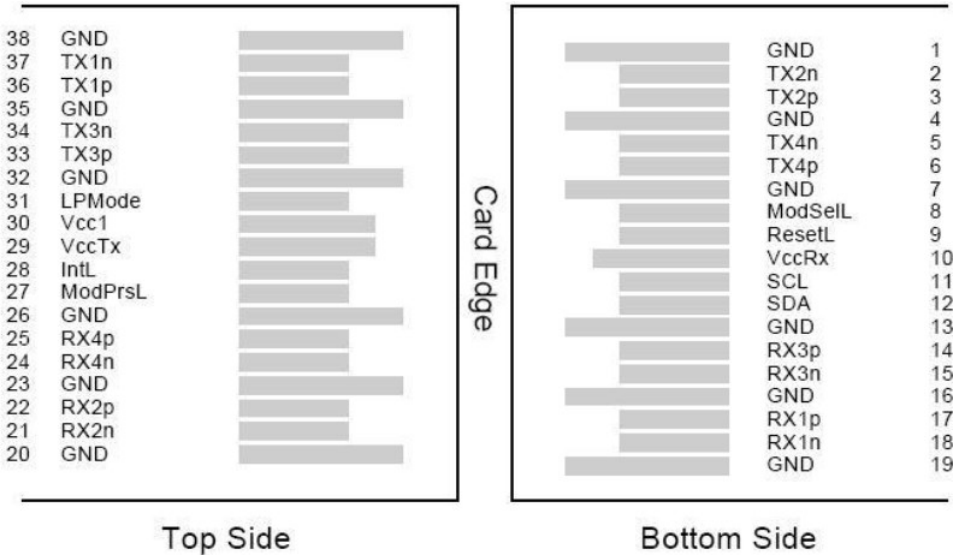
Electrical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
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			mV_{p-p}	

Electrical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
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 Mode Output Voltage				7.5	mV	

Electrical Connector Layout

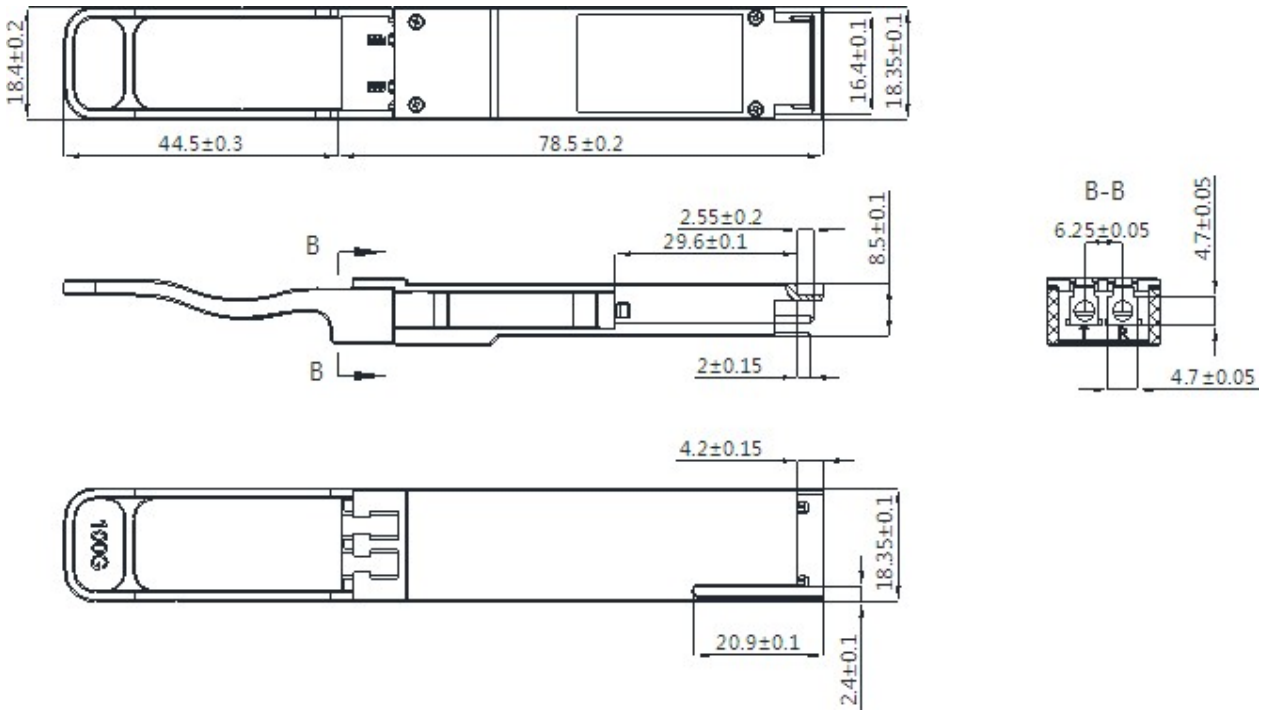


Electrical Pin Definition

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 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 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
06/10/2019	1.0	Release version
02/11/2025	2.0	New branding guidelines

For more information

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