

100G QSFP28 PSM4 Optical Transceiver

Part Number - VQ-1CIR4CP-AA

VQ-1CIR4CP-AA is a high performance QSFP28 transceiver module for 100 Gigabit Ethernet data links over single mode fiber.

Features

- Supports 103.1Gb/s bit rate
- Compliant with 100G PSM4 Specification 2.0
- Compliant with 100G Ethernet IEEE 802.3bm
- Compliant with SFF-8665 (QSFP28 Solution) Revision 1.8
- MPO optical connector
- Built-in digital diagnostic functions
- Up to 2km transmission on SMF
- RoHS Compliant
- Operating temperature range: 0°C to 70°C

Applications

- IEEE 802.3bm 100GBASE-PSM4
- InfiniBand QDR and DDR interconnects

Ordering Information

Part Number	Description
VQ-1CIR4CP-AA	100G QSFP28 PSM4 MPO Connectors, up to 2km on SMF, with DOM function

Product Overview

Vitex **VQ-1CIR4CP-AA** transceivers are designed for use in 100Gb/s links up to 2km of 9/125µm Single Mode Fiber. The QSFP48 module supports applications for Ethernet Switches and IP Routers optical interfaces. Digital Optical Monitoring interfaces are provided via the SFP+ standards compliant I2C interface.

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Signaling Rate(Each Lane)			25.78125		Gb/s	
Data speed tolerance		-100		100	ppm	
Operating Temperature	TC	0		70	°C	1
Storage Temperature	TSTO	-40		85	°C	2
Supply Current	I _{cc}			1200	mA	
Input Voltage	VCC	3.14	3.3	3.46	V	
Power Consumption	P			3.5	W	

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

Optical – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Average Launch Power(Each Lane)	P _{TX}	-9.4		2	dBm	
Optical Center Wavelength(Each Lane)	λ_C	1295	1310	1325	nm	
Optical Modulation Amplitude(Each Lane)	OMA	-5.15		2.2	dB	
Extinction Ratio	ER	3.5			dB	
Optical Return Loss Tolerance	TOL			20	dB	
Average Launch Power of OFF Transmitter(Each lane)	P _{OUT_OF}			-30	dBm	
Transmitter Eye Mask Margin	EMM	5			%	

1. Average

Optical- Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	λ_C	1295	1310	1325	nm	
Optical Input Power(each lane)	P _{RX}	-12.66		2	dBm	1
Damage Threshold	P	3			dBm	
Receiver Sensitivity (OMA)(Each Lane)	RX_SEN ₁			-11.35	dBm	2
LOS Assert	LOSA		TBD		dBm	
LOS De-Assert	LOSD		TBD		dBm	
LOS Hysteresis	LOSH		TBD		dB	

1. Average
2. Measured with PRBS2³¹-1 test pattern @ 25.78125Gbps, BER<1e-5

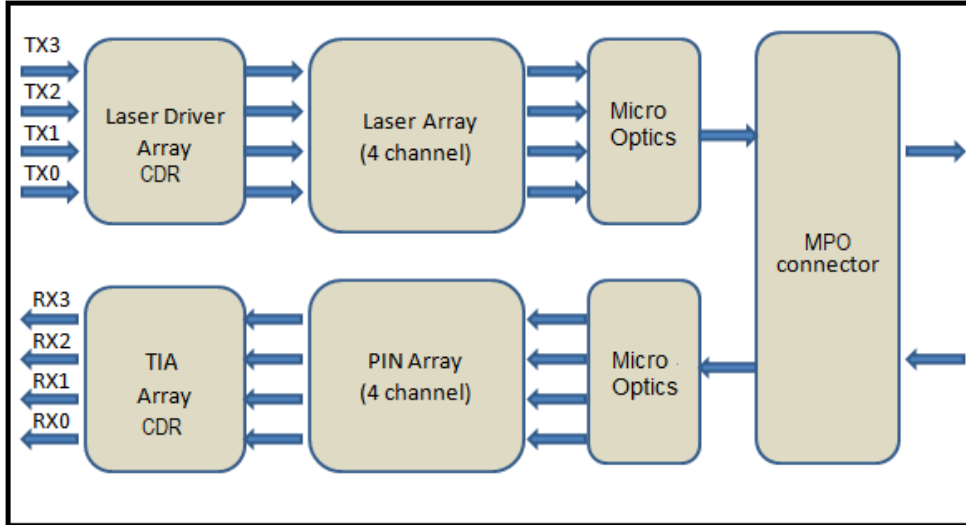
Electrical – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Input differential impedance	R _{IN}	90	100	110	Ω	
Differential data input swing	V _{IN_PP}	200		900	mV	
TP1/TP1a Interface	Compliant to IEEE802.3ba XLPP1					

Electrical – Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Differential Output Impedance	R _{OUT}	90	100	110	Ω	
Differential data output swing	V _{OUT_P}	200		900	mV	
TP4 Interface	Compliant to IEEE802.3ba XLPP1					

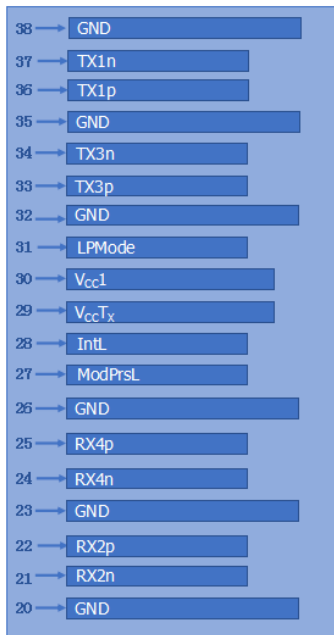
Transceiver Block Diagram



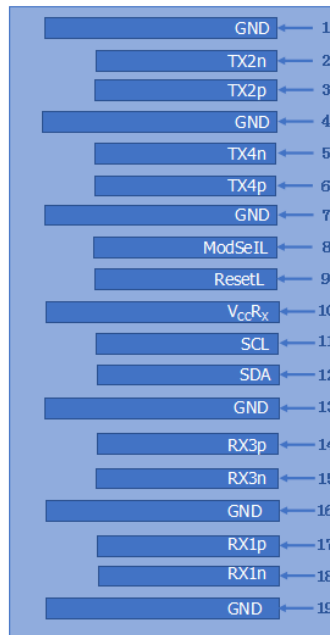
Functional Description

This product is a QSFP28 parallel single mode optical transceiver with an MTP/MPO fiber ribbon connector. The transmitter module accepts electrical input signals compatible with Common Mode Logic (CML) levels. All input data signals are differential and internally terminated. The receiver module converts parallel optical input signals via a photo detector array into parallel electrical output signals. The receiver module outputs electrical signals are also voltage compatible with Common Mode Logic (CML) levels. All data signals are differential and support a data rates up to 25Gb/s per channel. Figure 1 shows the functional block diagram of this product.

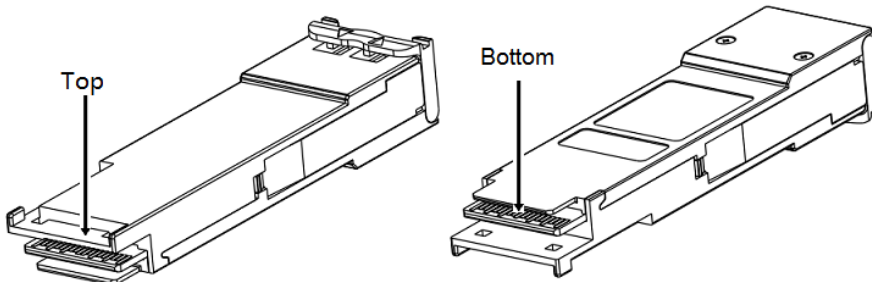
Electrical Connector Layout



Top of Board



Bottom of Board



Electrical Pin Definition

PIN #	Symbol	Description	Remarks
1	GND	Ground	5
2	Tx2n	Transmitter Inverted Data Input, LAN2	
3	Tx2p	Transmitter Non-Inverted Data Input, LAN2	
4	GND	Ground	5
5	Tx4n	Transmitter Inverted Data Input, LAN4	
6	Tx4p	Transmitter Non-Inverted Data Input, LAN4	
7	GND	Ground	5
8	ModSelL	Module select pin, the module responds to two-wire serial communication when low level	1
9	ResetL	Module Reset	2
10	V _{cc} ^R X	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	5
14	Rx3p	Receiver Non-Inverted Data Output, LAN3	
15	Rx3n	Receiver Inverted Data Output, LAN3	
16	GND	Ground	5
17	Rx1p	Receiver Non-Inverted Data Output, LAN1	
18	Rx1n	Receiver Inverted Data Output, LAN1	
19	GND	Ground	5
20	GND	Ground	5
21	Rx2n	Receiver Inverted Data Output, LAN2	
22	Rx2p	Receiver Non-Inverted Data Output, LAN2	
23	GND	Ground	5
24	Rx4n	Receiver Inverted Data Output, LAN4	
25	Rx4p	Receiver Non-Inverted Data Output, LAN4	
26	GND	Ground	5
27	ModPrsL	The module is inserted into the indicate pin and grounded in the module.	3
28	IntL	Interrupt	4
29	V _{cc} ^T X	+3.3V Power Supply transmitter	
30	V _{cc} 1	+3.3V Power Supply	
31	LPMoDe	Low Power Mode	5
32	GND	Ground	5
33	Tx3p	Transmitter Non-Inverted Data Input, LAN3	
34	Tx3n	Transmitter Inverted Data Input, LAN3	
35	GND	Ground	5
36	Tx1p	Transmitter Non-Inverted Data Input, LAN1	
37	Tx1n	Transmitter Inverted Data Input, LAN1	
38	GND	Ground	5

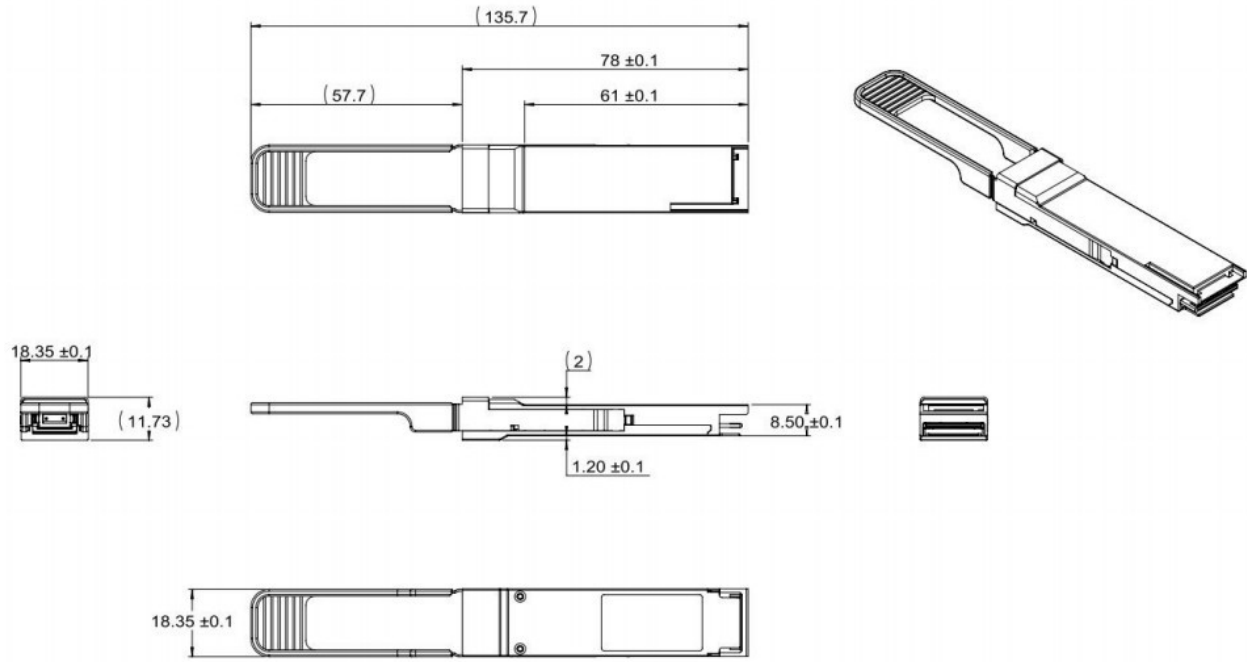
Notes:

1. ModSelL is the input pin. The module responds to 2-wire serial communication commands when it is held low by the host. ModSelL allows multiple QSFP modules to be used on a single 2-wire interface bus. If ModSelL is High, the module will not respond to any 2-wire interface communication from the host. ModSelL has internal pull-up resistors in the module
2. The module restart pin, when the low level on the ResetL pin lasts longer than the minimum pulse length, resets the module and restores all user modules to their default state. When performing reset device, the host should ignore all status bits. Until the module reset interrupt is completed, please note that during hot plugging, the module will issue this information to complete the reset interrupt without resetting
3. This pin is active high, indicating that the module is running under a low power module.
4. IntL is the output pin, which is the open collector output and must be pulled up to Vcc on the motherboard. When it is low, it indicates that the module may malfunction. The host uses a 2-wire serial interface to identify the interrupt source
5. Circuit ground is internally isolated from chassis ground.

References

1. 100G Ethernet IEEE 802.3bm
2. 100G PSM4 Specification 2.0

Mechanical Dimensions



ALL DIMENSIONS ARE ± 0.2 mm UNLESS OTHERWISE SPECIFIED
UNIT: mm

Contact Information

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