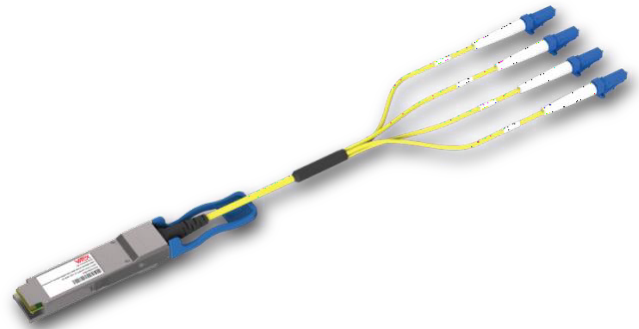# 100G QSFP28 4x25G Parallel BiDi

Part Number – V1C-QBD10A-yyyE-AA

V1C-QBD10A-yyyE-AA is a high performance QSFP28 transceiver module that is based on 100G Ethernet IEEE 802.3bm standard. QSFP28 parallel BiDi offers 4 independent optical paths, each capable of transmitting and receiving in a bi-directional manner over a single fiber. The QSFP28 module is a breakout cable attached transceiver with four single fiber pigtails with a simplex LC connector.

Features

- Hot-pluggable QSFP28 package
- 4x25Gbps BiDi optical engines
- Compatible with 25G BiDi SFP28
- Up to 103.1Gbps
- QSFP28 MSA compliant
- Up to 10km of reach
- 4 simplex LC pigtails
- RoHS-6 Compliant
- Operating temperature range:
  -20°C to 85°C (case temperature)

Applications

- 100G Ethernet connectivity
- 25G BiDi
- Cell Site Router

Ordering Information

Part Number	Description
V1C-QBD10A-yyyE-AA	100GQSFP28 4-lane parallel Bidi, yyym single ended breakout AOC simplex LC, 1270Tx/1330Rx, 10km, E-temp
V1C-QBD10A-003E-AA	100GQSFP28 4-lane parallel Bidi, 3m single ended breakout AOC simplex LC, 1270Tx/1330Rx, 10km, E-temp

Product Overview

Vitex V1C-QBD10A-yyyE-AA transceivers are designed for use in 100Gb/s links up to 10km over OS2 grade single mode fiber. The 100G parallel BiDi breakout devices consist of 4x 25G optical engines. Each 25G optical lane transmits and receives on a single fiber in a bi-directional manner (1330nm/1270nm). The breakout AOC has QSFP28 module with 4x 25G optical engines on one end, and 4x single fiber cables on the other end. Each fiber provides a 25G bi-directional signal that is compatible with a 25G-BX SFP28 module.

The use and replacement of breakout AOC is simple and straightforward as it adopts the standard QSFP28 form factor and complies to MSA specifications. The product provides an onboard MCU that allows the users to access full monitoring and configuration data via the 2-wire QSFP Management Interface.

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature[1]	T_C	−20		85	°C
Storage Temperature[2]	T_{STO}	−40		85	°C
Input Voltage	V_{CC}	3.14	3.3	3.46	V
Maximum Voltage[3]	V_{MAX}	−0.5		4	V
Transmission Distance	L			10	km

1. Case temperature

2. Ambient temperature

3. For electrical power interface
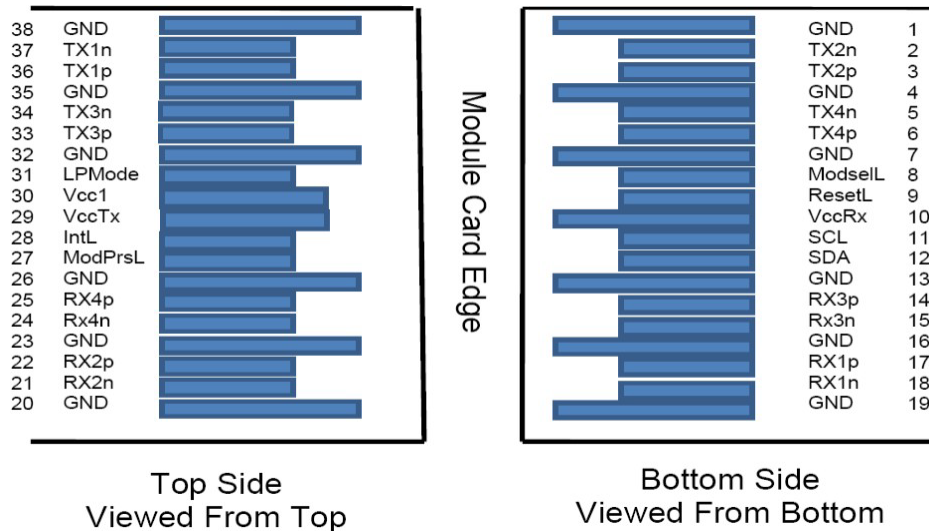
Optical – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit
Signal rate (per lane)	DR	25.78125±100ppm			Gb/s
Optical Center Wavelength	λ_C	1260	1270	1280	nm
Average Launch optical Power (per lane)	P_{TX}	−5		3.5	dBm
Extinction Ratio	ER	3.5			dB
Launch Power of OFF Transmitter	P_{OUT_OF}			−30	dBm
Transmitter Eye Mask {X1, X2, X3, Y1, Y2, Y3}	{0.3,0.38,0.45,0.35,0.41,0.5}				

Optical- Receiver

Parameter	Symbol	Min	Typ	Max	Unit
Signal rate (per lane)		25.78125±100ppm			Gb/s
Optical Center Wavelength	λC	1320	1330	1340	nm
Average received optical power (per lane)	P_{RX}	-10.3		2.4	dBm
Receive damage optical power input value	TH_D			2.0	dBm
Receiver Sensitivity @ 25.78125Gbps	R_{XSEN}	-13			dBm
Bit Error Ratio[1]	BER			5E-5	
Receiver Reflectance	TRRX			-12	dB
LOS Assert	LOSA	-30			dBm
LOS De-Assert	LOS_D			-13	dBm
LOS Hysteresis	LOS_H	0.5	2		dB

1. Tested using the pseudo-random code PBRS31.3. Need to use forward error correction in host.
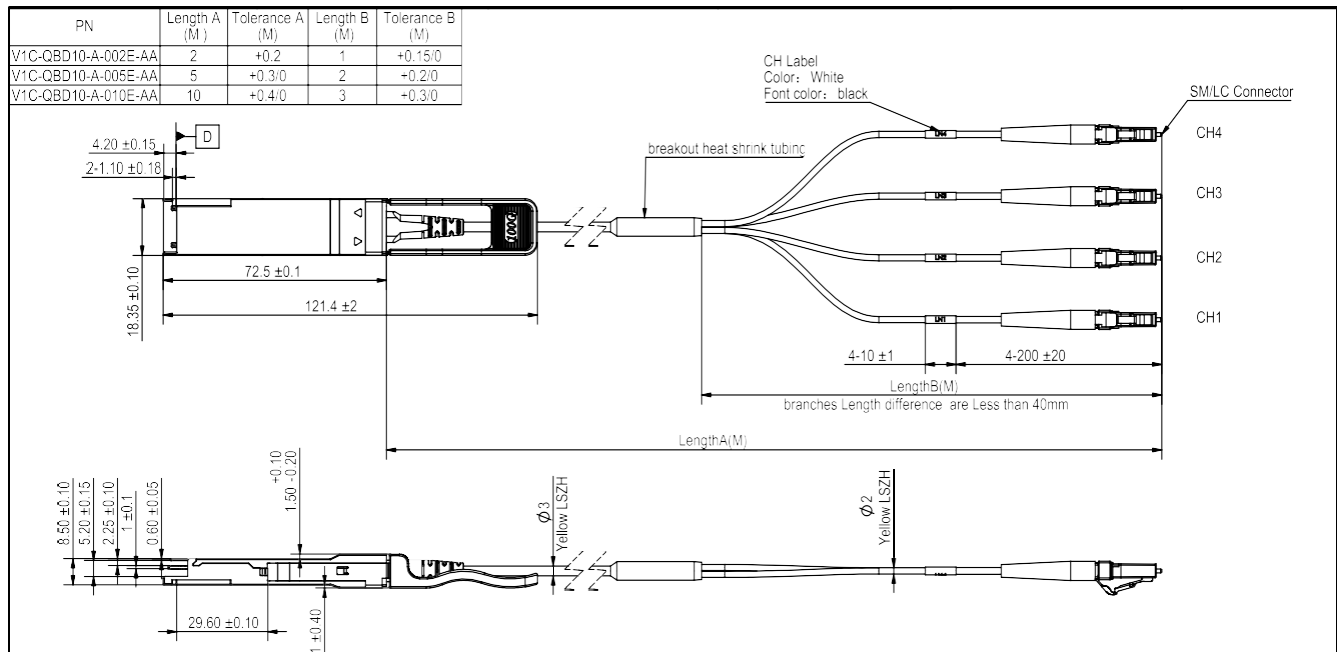
Electrical Connector Layout

	Top Side Viewed From Top	Module Card Edge	Bottom Side Viewed From Bottom	
38	GND		GND	1
37	TX1n		TX2n	2
36	TX1p		TX2p	3
35	GND		GND	4
34	TX3n		TX4n	5
33	TX3p		TX4p	6
32	GND		GND	7
31	LPMode		ModselL	8
30	Vcc1		ResetL	9
29	VccTx		VccRx	10
28	IntL		SCL	11
27	ModPrsL		SDA	12
26	GND		GND	13
25	RX4p		RX3p	14
24	Rx4n		Rx3n	15
23	GND		GND	16
22	RX2p		RX1p	17
21	RX2n		RX1n	18
20	GND		GND	19

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	$V_{cc}TX$	+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.

Mechanical Dimensions

PN	Length A (M)	Tolerance A (M)	Length B (M)	Tolerance B (M)
V1C-QBD10-A-002E-AA	2	+0.2	1	+0.15/0
V1C-QBD10-A-005E-AA	5	+0.3/0	2	+0.2/0
V1C-QBD10-A-010E-AA	10	+0.4/0	3	+0.3/0

References

1. IEEE standard 802.3bm. IEEE Standard Department.

2. QSFP28 4X PLUGGABLE TRANSCEIVER –SFF-8665.

3. SFF-8636 Specification for Management Interface for Cabled Environments

Revision History

Date	Rev	Description
09/27/2022	0.0	Prelim high level specs
11/8/2022	0.1	Updated optical specifications - Prelim
01/14/2023	0.2	Prelim specs with updated description and connector type
03/24/2023	1.0	Release version

About Vitex

Since 2003, we've been an essential and lead contributor to the fiber optic product sourcing and specialty product development process for OEMs, data centers, system integrators and telecom companies.

We aim to be the fiber optic expert extension of your product development, engineering and procurement departments.

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