Q28-100G-CWDM4-BX-AO

MSA and TAA 100GBase-BX CWDM4 QSFP28 Transceiver (SMF, 1270nm to 1330nm, 2km, LC, DOM, 0 to 70C)

Features:

- QSFP28 MSA compliant
- 4 CWDM lanes MUX/DEMUX design
- Supports 103.1Gbps aggregate bit rate
- Bidirectional optical data transmitting/receiving
- Maximum power consumption: 3.5W
- Commercial Temperature 0 to 70 Celsius
- SMF angled, polished LC simplex connector
- 4x25G electrical interface
- Hot Pluggable
- RoHS compliant and lead-free

Applications:

- Ethernet over CWDM
- Access, Metro and Enterprise

Product Description

This MSA compliant QSFP28 transceiver provides 100GBase-BX CWDM4 throughput up to 2km over single-mode fiber (SMF) using wavelengths between 1270nm to 1330nm via an LC connector. It can operate at temperatures between 0 and 70C. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

AddOn's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4.
- ESD to the LC Receptacle: compatible with IEC 61000-4-3.
- EMI/EMC: compatible with FCC Part 15 Subpart B Rules, EN55022:2010.
- Laser Eye Safety: compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1, 2.
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	
Relative Humidity (Non-Condensing)	RH	0		85	%	
Damage Threshold Per Lane	THd	3.5			dBm	
Data Rate Per Lane			25.78125		Gbps	
Data Rate Accuracy		-100		100	ppm	
Link Distance With G.652	D	0.002		2	km	

Electrical Characteristics

Parameter	Symbol/Test Point	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Control Input Voltage - High		2		Vcc	V	
Control Input Voltage - Low		0		0.8	V	
Power Consumption	P_{DISS}			3.5	W	
Supply Current	Icc			1.06	A	
Transmitter (Per Lane)						
Overload Differential Voltage (pk-pk)	TP1a	900			mV	
Common-Mode Voltage (Vcm)	TP1	-350		2850	mV	1
Differential Termination Resistance Mismatch	TP1			10	%	At 1MHz
Differential Return Loss (SDD11)	TP1			See CEI-28G-VSR Equation 13-19	dB	
Common-Mode to Differential Conversion and Differential to Common-Mode Conversion (SDC11, SCD11)	TP1			See CEI-28G-VSR Equation 13-20	dB	
Stressed Input Test	TP1a	See CEI-28G-VSR Section 13.3.11.2.1				

Receiver (Per Lane)						
Differential Voltage (pk-pk)	TP4			900	mV	
Common-Mode Voltage (Vcm)	TP4	-350		2850	mV	1
Common-Mode Noise (RMS)	TP4			17.5	mV	
Differential Termination Resistance Mismatch	TP4			10	%	At 1MHZ
Differential Return Loss (SDD22)	TP4			See CEI-28G-VSR Equation 13-19	dB	
Commo- Mode to Differential Conversion and Differential to Common-Mode Conversion (SDC22, SCD22)	TP4			See CEI-28G-VSR Equation 13-21	dB	
Common-Mode Return Loss (SCC22)	TP4			-2	dB	2
Transition Time (20-80%)	TP4	9.5			ps	
Vertical Eye Closure (VEC)	TP4			5.5	dB	
Eye Width at 10^{-15} Probability (EW15)	TP4	0.57			UI	
Eye Height at 10^{-15} Probability (EH15)	TP4	228			mV	

Notes:

1. Vcm is generated by the host. Specification includes effects of ground offset voltage.
2. From 250MHz to 30GHz.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Wavelength Assignment	L0	1264.5	1271	1277.5	nm	
	L1	1284.5	1291	1297.5	nm	
	L2	1304.5	1311	1317.5	nm	
	L3	1324.5	1331	1337.5	nm	
Transmitter						
Side-Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	Pavg			8.5	dBm	
Average Launch Power Per Lane	Pavg	-6.5		2.5	dBm	
Optical Modulation Amplitude (OMA) Per Lane	POMA	-4.0		2.5	dBm	1
Launch Power in OMA Minus Transmitter and Dispersion Penalty (TDP) Per Lane		-5.0			dBm	
TDP Per Lane	TDP			3.0	dB	
Extinction Ratio	ER	3.5			dB	
Optical Return Loss Tolerance	ORLT			20	dB	
Transmitter Reflectance				-12	dB	
Average Launch Power Off Transmitter Per Lane	Poff			-30	dBm	
Transmitter Eye Mask Definition: (X1, X2, X3, Y1, Y2, Y3)		(0.31, 0.4, 0.45, 0.34, 0.38, 0.4)				2
Receiver						
Damage Threshold Per Lane	THd	3.5			dBm	3
Average Receive Power Per Lane		-11.5		2.5	dBm	
Receive Power (OMA) Per Lane				2.5	dBm	
Receiver Sensitivity (OMA) Per Lane	SEN			-10	dBm	For BER=$5x10^{-5}$
Stressed Receiver Sensitivity (OMA) Per Lane				-7.3	dBm	4
Receiver Reflectance				-26	dB	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-15	dBm	
LOS Hysteresis	LOSH	0.5			dB	
Receiver Electrical 3dB Upper Cutoff Frequency Per Lane				31	GHz	
Conditions of Stress Receiver Sensitivity Test (Note 5)						
Vertical Eye Closure Penalty Per Lane		1.9			dB	
Stressed Eye J2 Jitter Per Lane		0.33			UI	
Stressed Eye J4 Jitter Per Lane		0.48			UI	
SRS Eye Mask Definition: (X1, X2, X3, Y1, Y2, Y3)		(0.39, 0.5, 0.5, 0.39, 0.39, 0.4)				

Notes:

1. Even if the TDP<1.0 dB, the OMA minimum must exceed the minimum value specified here.
2. Hit ratio $5x10^{-5}$.
3. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.
4. Measured with conformance test signal for BER=$5x10^{-5}$.
5. Vertical Eye Closure Penalty, Stressed Eye J2 Jitter, Stressed Eye J4 Jitter, and SRS Eye Mask Definition are test conditions for measuring Stressed Receiver Sensitivity. They are not characteristics of the receiver.

Pin Descriptions

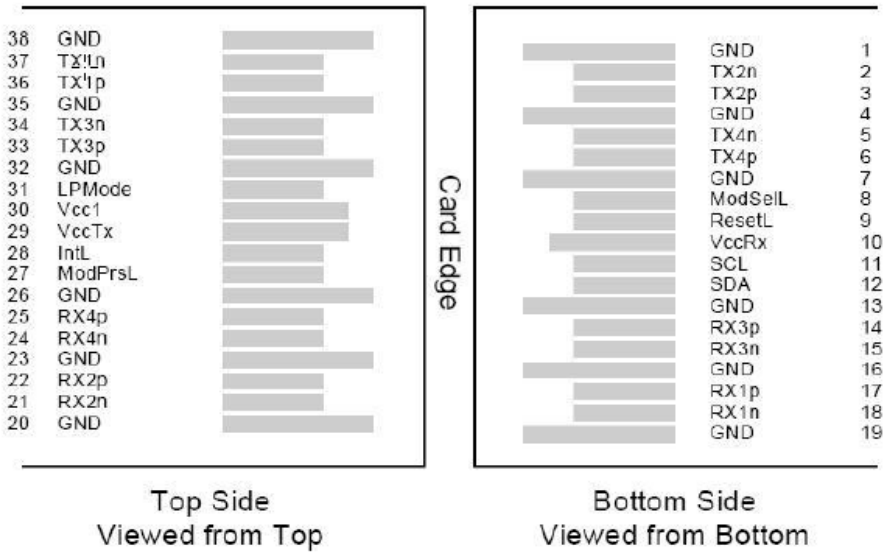
Pin	Logic	Symbol	Name/Descriptions	Notes
1		GND	Module Ground.	1
2	CML-I	Tx2-	Transmitter Inverted Data Input.	
3	CML-I	Tx2+	Transmitter Non-Inverted Data Output.	
4		GND	Module Ground.	1
5	CML-I	Tx4-	Transmitter Inverted Data Input.	
6	CML-I	Tx4+	Transmitter Non-Inverted Data Output.	
7		GND	Module Ground.	1
8	LVTTL-I	ModSelL	Module Select.	
9	LVTTL-I	ResetL	Module Reset.	
10		VccRx	+3.3V Receiver Power Supply.	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock.	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data.	
13		GND	Module Ground.	
14	CML-O	Rx3+	Receiver Non-Inverted Data Output.	
15	CML-O	Rx3-	Receiver Inverted Data Output.	
16		GND	Module Ground.	1
17	CML-O	Rx1+	Receiver Non-Inverted Data Output.	
18	CML-O	Rx1-	Receiver Inverted Data Output.	
19		GND	Module Ground.	1
20		GND	Module Ground.	1
21	CML-O	Rx2-	Receiver Inverted Data Output.	
22	CML-O	Rx2+	Receiver Non-Inverted Data Output.	
23		GND	Module Ground.	1
24	CML-O	Rx4-	Receiver Inverted Data Output.	1
25	CML-O	Rx4+	Receiver Non-Inverted Data Output.	

26		GND	Module Ground.	1
27	LVTTL-O	ModPrsL	Module Present.	
28	LVTTL-O	IntL	Interrupt.	
29		VccTx	+3.3V Transmitter Power Supply.	2
30		Vcc1	+3.3V Power Supply.	2
31	LVTTL-I	LPMode	Low-Power Mode.	
32		GND	Module Ground.	1
33	CML-I	Tx3+	Transmitter Non-Inverted Data Input.	
34	CML-I	Tx3-	Transmitter Inverted Data Output.	
35		GND	Module Ground.	1
36	CML-I	Tx1+	Transmitter Non-Inverted Data Input.	
37	CML-I	Tx1-	Transmitter Inverted Data Output.	
38		GND	Module Ground.	1

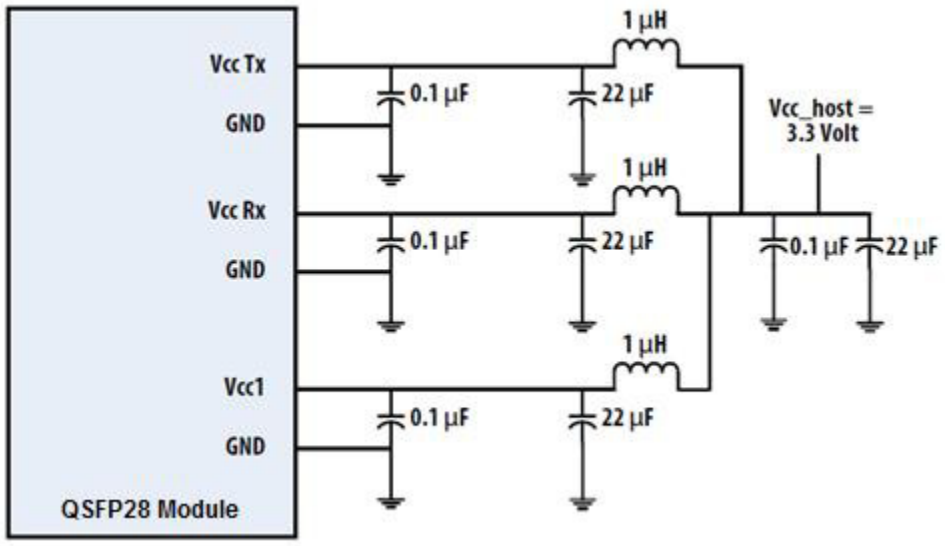
Notes:

1. GND is the symbol for signal and supply (power) common for QSFP28 modules. All are common within the QSFP28 module, and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal common ground plane.
2. VccRx, Vcc1, and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. VccRx, Vcc1, and VccTx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.

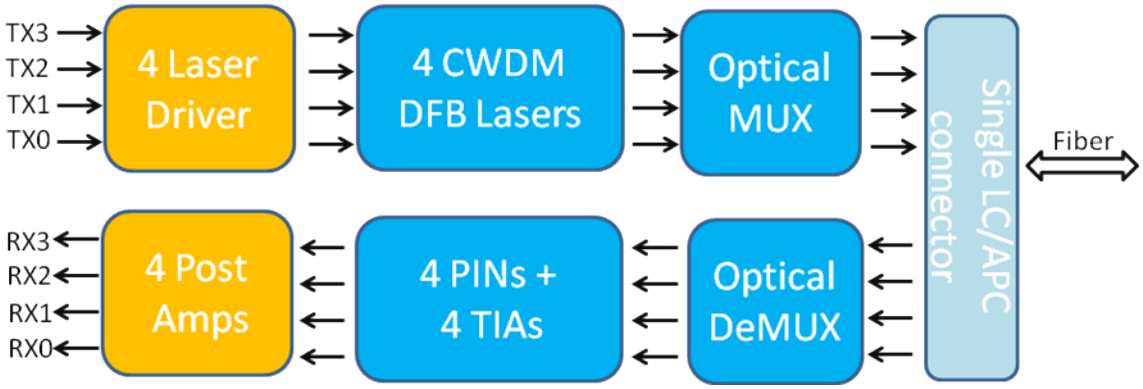
Electrical Pin-Out Details



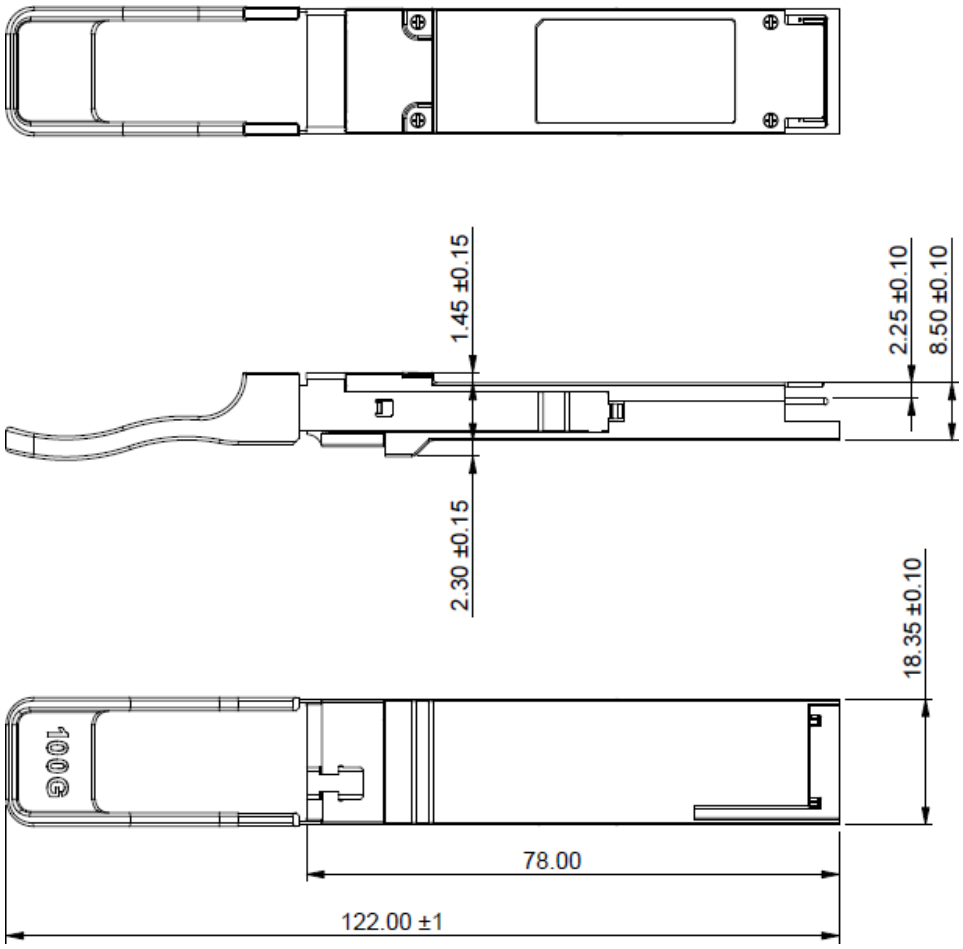
Recommended Power Supply Filter



Transceiver Block Diagram



Mechanical Specifications



About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is in engrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.

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