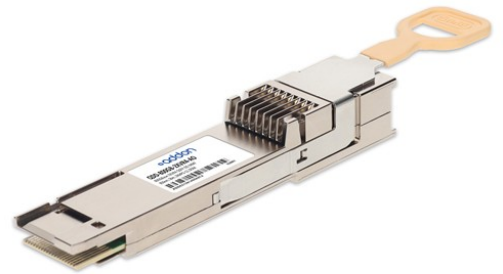


QDD-800GB-2XVR4-AO

MSA Compliant 800GBase-2xVR4 PAM4 QSFP-DD Transceiver (MMF, 850nm, 50m, 2xMPO-12, DOM, CMIS 5.2)

Features:

- Compliant with IEEE 802.db and IEEE 802.ck
- CMIS 5.0 or Updated Version
- Compliant with QSFP-DD MSA
- Electrical Interface: 106.25Gbps (PAM4) x 8
- Parallel 8 Optical Lanes
- Optical Interface: 106.25Gbps (PAM4) x 8
- Single 3.3V Power Supply
- Up to 50m Over OM4 MMF with FEC
- Dual MPO-12/APC Connector
- Maximum Power Consumption: 15W
- Case Operating Temperature: 15 to 70 Celsius
- RoHS Compliant and Lead-Free



Applications:

- 800GBase Ethernet

Product Description

This MSA compliant QSFP-DD transceiver provides 800GBase-2xVR4 throughput up to 50m over multi-mode fiber (MMF) PAM4 using a wavelength of 850nm via a 2xMPO-12 connector. It can operate at temperatures between 0 and 70C. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Supply Voltage	Vcc	-0.5	3.6	V	
Storage Temperature	Tstg	-40	85	°C	
Relative Humidity	RH	5	85	%	
Damage Threshold		5		dBm	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Electrical Signal Rate Per Lane		53.125 ± 100ppm			GBd	
Optical Signal Rate Per Lane		53.125 ± 100ppm			GBd	
Supply Voltage	Vcc	3.135	3.3	3.465	V	
Operating Case Temperature	Tc	15		70	°C	
Power Consumption	Pc			15	W	
Link Distance with OM4	D	0.5		50	m	

Electrical Characteristics (Under Recommended Operating Conditions)

Parameter		Test Point	Min.	Typ.	Max.	Unit	Notes
High-Speed Electrical Input Characteristics							
Signaling Rate Per Lane (PAM4 Encoded)		TP1	53.125 ± 100ppm			GBd	
Differential Pk-Pk Input Voltage Tolerance		TP1a	750			mV	
AC Common-Mode RMS Voltage Tolerance		TP1a	25			mV	
Single-Ended Voltage Tolerance		TP1a	-0.4		3.3	V	
DC Common-Mode Voltage Tolerance		TP1	-0.35		2.85	V	
High-Speed Electrical Output Characteristics							
Signaling Rate Per Lane (PAM4 Encoded)		TP4	53.125 ± 100ppm			GBd	
AC Common-Mode Output Voltage (RMS)		TP4			25	mV	
Differential Pk-Pk Output Voltage	Short-Mode	TP4			600	mV	
	Long-Mode				845	mV	
Eye Height		TP4	15			mV	
DC Common-Mode Voltage Tolerance		TP4	-0.35		2.85	V	

Optical Characteristics (Under Recommended Operating Conditions)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Signaling Rate Per Lane			53.125 ± 100ppm			GBd	
Modulation Format			PAM4				
Lane Wavelengths (Range)		λ	840		948	nm	
RMS Spectral Width					0.65	nm	1
Average Launch Power Per Lane		P	-4.6		4	dBm	2
OMA _{outer} Per Lane	For Max. (TECQ, TDECQ) ≤ 1.8dB	POMA	-2.6		3.5	dBm	2, 3
	For 1.8dB < Max. (TECQ, TDECQ) ≤ 4.4dB		-4.4 + Max. (TECQ, TDECQ)				
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane					4.4	dB	
Transmitter Eye Closure for PAM4 (TECQ) Per Lane		TECQ			4.4	dB	
Extinction Ratio Per Lane		ER	2.5			dB	
Average Launch Power of Off Transmitter Per Lane		P _{off}			-30	dBm	
RIN _{21OMA}		RIN			-132	dB/Hz	
Optical Return Loss Tolerance					14	dB	
Encircled Flux			≥86% at 19μm ≤30% at 4.5μm				4
Receiver							
Signaling Rate Per Lane			53.125 ± 100ppm			GBd	
Modulation Format			PAM4				
Lane Wavelengths (Range)		λ	840		948	nm	
Damage Threshold			5			dBm	5
Average Receive Power Per Lane			-6.3		4	dBm	6, 2
Receive Power (OMA _{outer}) Per Lane					3.5	dBm	
Receiver Reflectance					-15	dB	
Receiver Sensitivity (OMA _{outer}) Per Lane			Max. (-4.4, SECQ-6.2)			dBm	7
LOS Assert			-15			dBm	
LOS De-Assert					-6.6	dBm	
LOS Hysteresis			0.5			dB	

Notes:

1. RMS spectral width is the standard deviation of the spectrum.
2. Based on stressed receiver sensitivity of -2dBm and may increase by up to 0.4dB based on the choice of stressed receiver sensitivity.
3. Even if the TDECQ<1.4dB, the OMA (minimum) must exceed this value.
4. If measured into type A1a.2 or type A1a.3, or A1a.4, 50μm fiber, in accordance with IEC 61280-1-4.
5. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level on one lane. The receiver does not have to operate correctly at this input

power.

6. Average receive power, each lane (minimum), is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
7. Receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 4.4dB.

Digital Diagnostic Monitor Accuracy (Under Recommended Operating Conditions)

Parameter	Accuracy	Unit	Notes
Measured Transceiver Temperature	±3	°C	
Measured Transceiver Supply Voltage	±3	%	
Measured Tx Bias Current	±10	%	
Measured Tx Output Power	±3	dB	
Measured Rx Received Average Optical Power	±3	dB	

Pin Descriptions

Pin	Symbol	Logic	Name/Description	Plug Sequence	Notes
1	GND		Module Ground.	1B	1
2	TX2n	CML-I	Transmitter Inverted Data Input.	3B	
3	TX2p	CML-I	Transmitter Non-Inverted Data Input.	3B	
4	GND		Module Ground.	1B	1
5	TX4n	CML-I	Transmitter Inverted Data Input.	3B	
6	TX4p	CML-I	Transmitter Non-Inverted Data Input.	3B	
7	GND		Module Ground.	1B	1
8	ModSelL	LVTTL-I	Module Select.	3B	
9	ResetL	LVTTL-I	Module Reset.	3B	
10	VccRx		+3.3V Receiver Power Supply.	2B	2
11	SCL	LVC MOS-I/O	2-Wire Serial Interface Clock.	3B	
12	SDA	LVC MOS-I/O	2-Wire Serial Interface Data.	3B	
13	GND		Module Ground.	1B	1
14	RX3p	CML-O	Receiver Non-Inverted Data Output.	3B	
15	RX3n	CML-O	Receiver Inverted Data Output.	3B	
16	GND		Module Ground.	1B	1
17	RX1p	CML-O	Receiver Non-Inverted Data Output.	3B	
18	RX1n	CML-O	Receiver Inverted Data Output.	3B	
19	GND		Module Ground.	1B	1
20	GND		Module Ground.	1B	1
21	RX2n	CML-O	Receiver Inverted Data Output.	3B	
22	RX2p	CML-O	Receiver Non-Inverted Data Output.	3B	
23	GND		Module Ground.	1B	1
24	RX4n	CML-O	Receiver Inverted Data Output.	3B	
25	RX4p	CML-O	Receiver Non-Inverted Data Output.	3B	
26	GND		Module Ground.	1B	1
27	ModPrsL	LVTTL-O	Module Present.	3B	
28	IntL	LVTTL-O	Interrupt.	3B	
29	VccTx		+3.3V Transmitter Power Supply.	2B	2
30	Vcc1		+3.3V Power Supply.	2B	2
31	InitMode	LVTTL-I	Initialization Mode. In legacy QSFP applications, the InitMode pad is called LPMODE.	3B	
32	GND		Module Ground.	1B	1
33	TX3p	CML-I	Transmitter Non-Inverted Data Input.	3B	
34	TX3n	CML-I	Transmitter Inverted Data Input.	3B	
35	GND		Module Ground.	1B	1
36	TX1p	CML-I	Transmitter Non-Inverted Data Input.	3B	
37	TX1n	CML-I	Transmitter Inverted Data Input.	3B	
38	GND		Module Ground.	1B	1
39	GND		Module Ground.	1A	1
40	TX6n	CML-I	Transmitter Inverted Data Input.	3A	

41	TX6p	CML-I	Transmitter Non-Inverted Data Input.	3A	
42	GND		Module Ground.	1A	1
43	TX8n	CML-I	Transmitter Inverted Data Input.	3A	
44	TX8p	CML-I	Transmitter Non-Inverted Data Input.	3A	
45	GND		Module Ground.	1A	1
46	Reserved		For Future Use.	3A	3
47	VS1		Module Vendor-Specific 1.	3A	3
48	VccRx1		+3.3V Receiver Power Supply.	2A	2
49	VS2		Module Vendor-Specific 2.	3A	3
50	VS3		Module Vendor-Specific 3.	3A	3
51	GND		Module Ground.	1A	1
52	RX7p	CML-O	Receiver Non-Inverted Data Output.	3A	
53	RX7n	CML-O	Receiver Inverted Data Output.	3A	
54	GND		Module Ground.	1A	1
55	RX5p	CML-O	Receiver Non-Inverted Data Output.	3A	
56	RX5n	CML-O	Receiver Inverted Data Output.	3A	
57	GND		Module Ground.	1A	1
58	GND		Module Ground.	1A	1
59	RX6n	CML-O	Receiver Inverted Data Output.	3A	
60	RX6p	CML-O	Receiver Non-Inverted Data Output.	3A	
61	GND		Module Ground.	1A	1
62	RX8n	CML-O	Receiver Inverted Data Output.	3A	
63	RX8p	CML-O	Receiver Non-Inverted Data Output.	3A	
64	GND		Module Ground.	1A	1
65	NC		Not Connected.	3A	3
66	Reserved		For Future Use.	3A	3
67	VccTx1		+3.3V Transmitter Power Supply.	2A	2
68	Vcc2		+3.3V Power Supply.	2A	2
69	ePPS	LVTTL-I	Precision Time Protocol (PTP) Reference Clock Input (N/C Within Module).	3A	3
70	GND		Module Ground.	1A	1
71	TX7p	CML-I	Transmitter Non-Inverted Data Input.	3A	
72	TX7n	CML-I	Transmitter Inverted Data Input.	3A	
73	GND		Module Ground.	1A	1
74	TX5p	CML-I	Transmitter Non-Inverted Data Input.	3A	
75	TX5n	CML-I	Transmitter Inverted Data Input.	3A	
76	GND		Module Ground.	1A	1

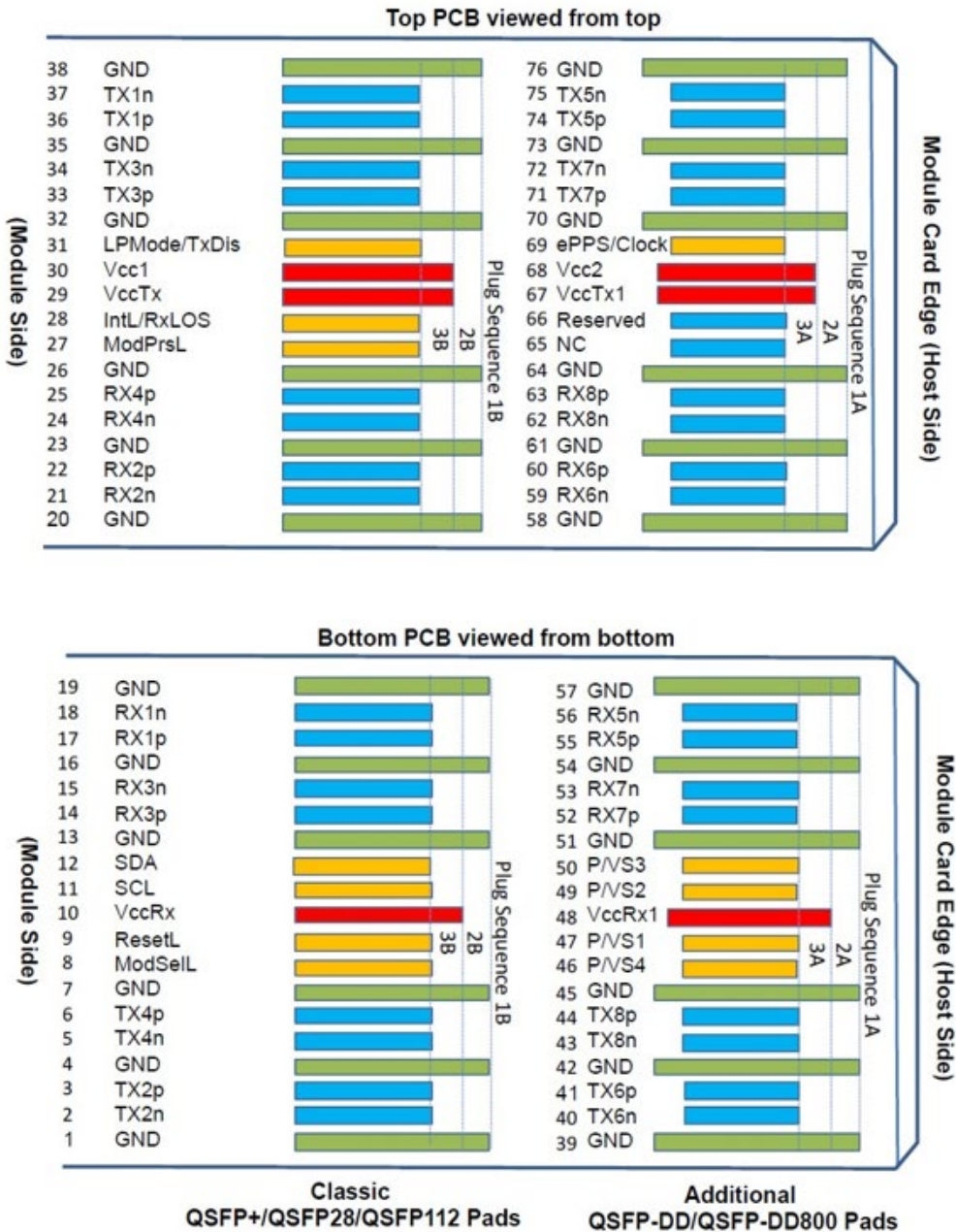
Notes:

1. QSFP-DD uses common ground (GND) for all signals and supply (power). All are common within the QSFP-DD 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, VccRx1, Vcc1, Vcc2, VccTx, and VccTx1 shall be applied concurrently. Supply requirements defined for the host side of the Host Card Edge Connector. VccRx, VccRx1, Vcc1, Vcc2, VccTx, and VccTx1 may be

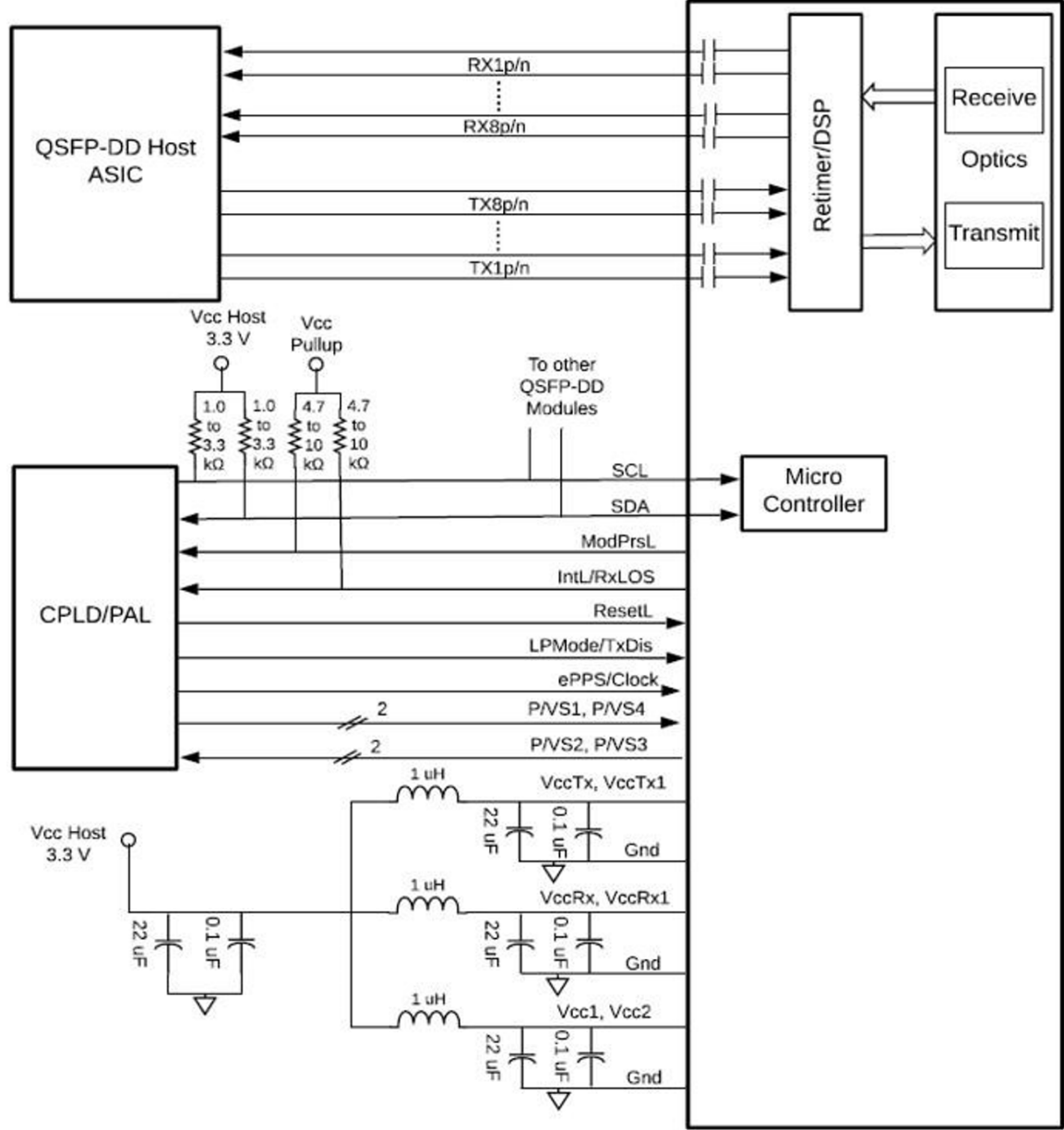
internally connected within the module in any combination. The connector Vcc pins are each rated for a maximum current of 1000mA.

3. All Vendor-Specific, Reserved, and Not Connected pins may be terminated with 50Ω to ground on the host. Pad 65 (Not Connected) shall be left unconnected within the module. Vendor-Specific and Reserved pads shall have an impedance to GND that is greater than 10kΩ and less than 100pF.

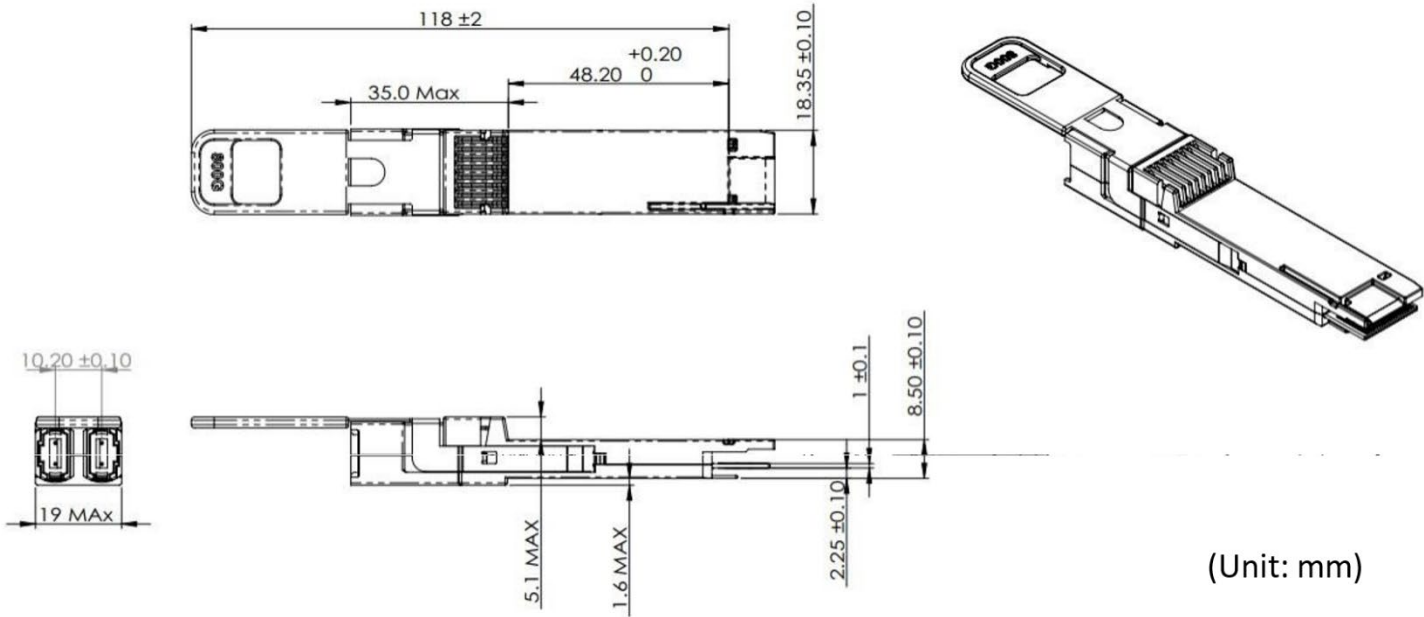
Electrical Pad Layout



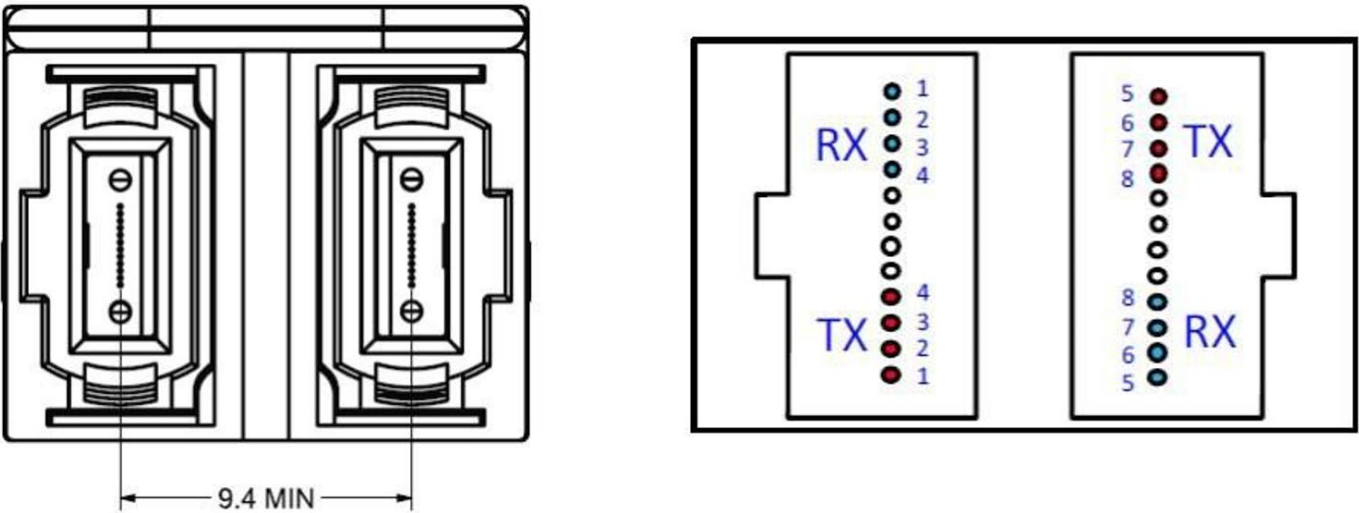
Recommended Host Board Schematic



Mechanical Specifications



Optical Interface Lanes and Assignments



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 ingrained 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 ranging from NEBS Level 3 to ISO 9001:2015 with every new development while maintaining the signature reliability of its products.



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