QDD-400GB-DR4-LP-2-AO

MSA and TAA 400GBase-DR4 QSFP-DD Transceiver Low Power (SMF, 1310nm, 2km, MPO, DOM)

Features

- Compliant with IEEE Std 802.3bs
- QSFP-DD MSA Compliant
- Compliant with 802.3cu 100G FR1 Optical Specifications
- MPO-12 Connector
- 1310nm EML Laser
- CMIS 4.0
- Single +3.3V Power Supply
- 8x26.5625GBd PAM4 Electrical Interface
- RoHS Compliant and Lead-Free
- Operating Temperature: 0 to 70 Celsius

Applications

- 400G Ethernet

Product Description

This MSA compliant QSFP-DD transceiver provides 400GBase-DR4 throughput up to 2km over single-mode fiber (SMF) using a wavelength of 1310nm via an MPO 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.")

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0	25	70	°C	
Relative Humidity	RH	0		85	%	
Data Rate	DR		53.125		Gbps	
Modulation Format			PAM4			

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Supply Current	Icc			2.55	A	
Power Dissipation	PD			8	W	
Transmitter						
Input Differential Impedance	ZIN		100		Ω	
Differential Data Input Swing	VIN,pp	180		900	mVp-p	
Receiver						
Output Differential Impedance	ZOUT		100		Ω	
Differential Data Output Swing	VOUT,pp	300		850	mVp-p	1
Transition Time (20-80%)	Tr/Tf	9.5			ps	

Notes:

1. Internally AC coupled but requires an external 100Ω differential load termination.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ	1304.5		1317.5	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power Per Lane	P	-3.1		4	dBm	
Outer Optical Modulation Amplitude Per Lane	OMAouter	-0.1		4.2		
OMA Minus TDECQ		-1.5			dBm	
Transmitter and Dispersion Penalty Eye Closure for PAM4 Per Lane	TDECQ			3.4	dB	
Extinction Ratio	ER	3.5			dB	
Average Launch Power of Off Transmitter	Poff			-15	dBm	
Optical Return Loss Tolerance	ORLT			21.4	dB	
Transmitter Reflectance				-26	dB	
Receiver						
Receiver Wavelength	λ	1304.5		1317.5	nm	
Receiver Sensitivity Per Lane (OMAouter)				-4.5	dBm	1
Damage Threshold	Pol	5			dBm	
Average Receiver Sensitivity	Pavg	-7.1		4	dBm	
Receive Power Per Lane (OMAouter)	OMA			4.2	dBm	
Optical Reflectance	OR			-26	dB	
LOS De-Assert	LOSD			-10	dBm	
LOS Assert	LOSA	-16			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Measured with a PRBS31Q test pattern @53.125GBd with PAM4 modulation and BER<2.4E^{-4}.

Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	GND	Module Ground.	1
2	Tx2-	Transmitter Inverted Data Input.	
3	Tx2+	Transmitter Non-Inverted Data output.	
4	GND	Module Ground.	1
5	Tx4-	Transmitter Inverted Data Input.	
6	Tx4+	Transmitter Non-Inverted Data output.	
7	GND	Module Ground.	1
8	ModSelL	Module Select.	
9	ResetL	Module Reset.	
10	VccRx	+3.3V Receiver Power Supply.	2
11	SCL	2-Wire Serial Interface Clock.	
12	SDA	2-Wire Serial Interface Data.	
13	GND	Module Ground.	1
14	Rx3+	Receiver Non-Inverted Data Output.	
15	Rx3-	Receiver Inverted Data Output.	
16	GND	Module Ground.	1
17	Rx1+	Receiver Non-Inverted Data Output.	
18	Rx1-	Receiver Inverted Data Output.	
19	GND	Module Ground.	1
20	GND	Module Ground.	1
21	Rx2-	Receiver Inverted Data Output.	
22	Rx2+	Receiver Non-Inverted Data Output.	
23	GND	Module Ground.	1
24	Rx4-	Receiver Inverted Data Output.	
25	Rx4+	Receiver Non-Inverted Data Output.	
26	GND	Module Ground.	1
27	ModPrsL	Module Present.	
28	IntL	Interrupt.	
29	VccTx	+3.3V Transmitter Power Supply.	2
30	Vcc1	+3.3V Power Supply.	2
31	Init Mode	Initialization Mode.	
32	GND	Module Ground.	1
33	Tx3+	Transmitter Non-Inverted Data Input.	
34	Tx3-	Transmitter Inverted Data Output.	
35	GND	Module Ground.	1
36	Tx1+	Transmitter Non-Inverted Data Input.	
37	Tx1-	Transmitter Inverted Data Output.	
38	GND	Module Ground.	1
39	GND	Module Ground.	1

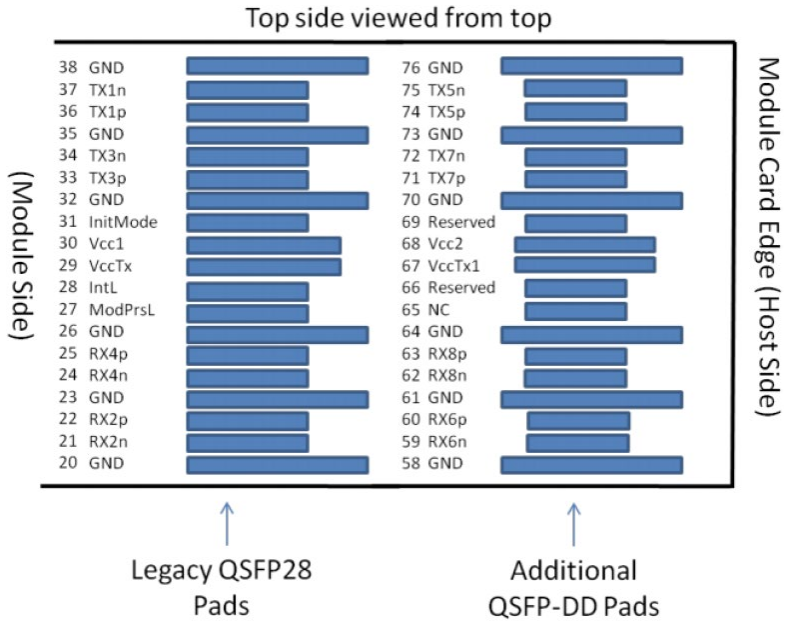
40	Tx6-	Transmitter Inverted Data Input.	
41	Tx6+	Transmitter Non-Inverted Data output.	
42	GND	Module Ground.	1
43	Tx8-	Transmitter Inverted Data Input.	
44	Tx8+	Transmitter Non-Inverted Data Output.	
45	GND	Module Ground.	1
46	Reserved	For Future Use.	3
47	VS1	Module Vendor-Specific 1.	3
48	VccRx1	+3.3V Receiver Power Supply.	2
49	VS2	Module Vendor-Specific 2.	3
50	VS3	Module Vendor-Specific 3.	3
51	GND	Module Ground.	1
52	Rx7+	Receiver Non-Inverted Data Output.	
53	Rx7-	Receiver Inverted Data Output.	
54	GND	Module Ground.	1
55	Rx5+	Receiver Non-Inverted Data Output.	
56	Rx5-	Receiver Inverted Data Output.	
57	GND	Module Ground.	1
58	GND	Module Ground.	1
59	Rx6-	Receiver Inverted Data Output.	
60	Rx6+	Receiver Non-Inverted Data Output	
61	GND	Module Ground.	1
62	Rx8-	Receiver Inverted Data Output.	
63	Rx8+	Receiver Non-Inverted Data Output.	
64	GND	Module Ground.	1
65	NC	Not Connected.	3
66	Reserved	For Future Use.	3
67	VccTx1	+3.3V Transmitter Power Supply.	2
68	Vcc2	+3.3V Power Supply.	2
69	Reserved	For Future Use.	3
70	GND	Module Ground.	1
71	Tx7+	Transmitter Non-Inverted Data Input.	
72	Tx7-	Transmitter Inverted Data Output.	
73	GND	Module Ground.	1
74	Tx5+	Transmitter Non-Inverted Data Input.	
75	Tx5-	Transmitter Inverted Data Output.	
76	GND	Module Ground.	1

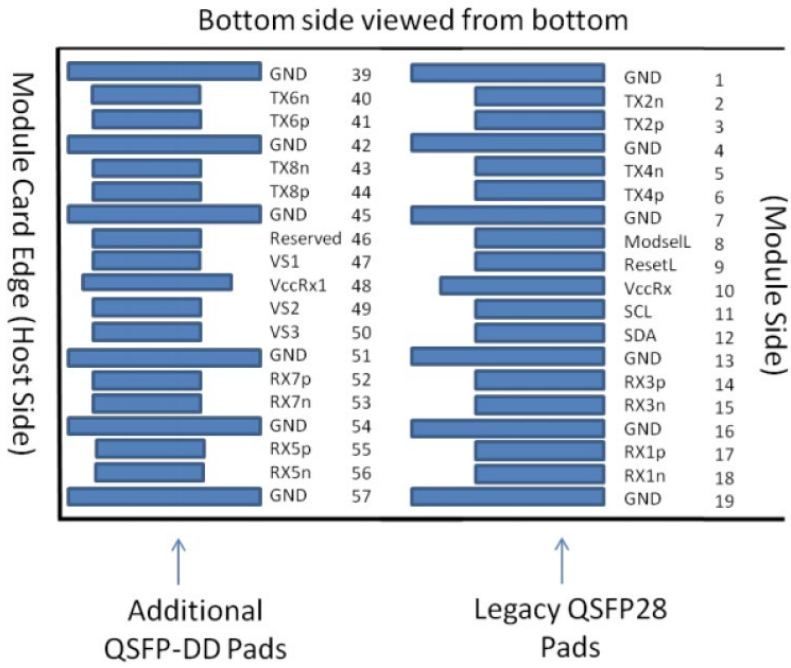
Notes:

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.

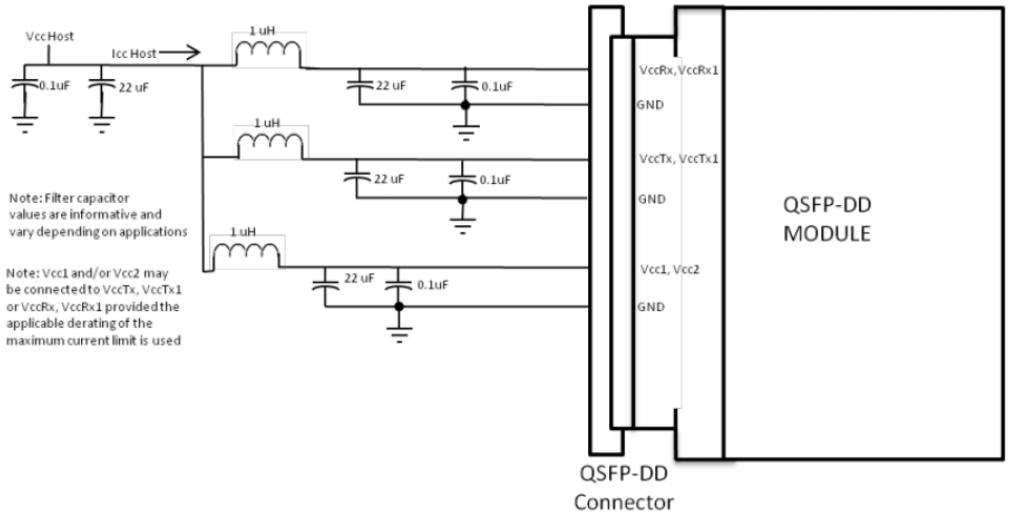
2. VccRx, VccRx1, Vcc1, Vcc2, VccTx, and VccTx1 shall be applied concurrently. VccRx, VccRx1, Vcc1, Vcc2, VccTx, and VccTx1 may be internally connected within the module in any combination. The connector Vcc pins are each rated for a maximum current of 1000mA.
3. All Vendor-Specific, Reserved, and Not 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 the GND that is greater than 10kΩ and less than 100pF.

Electrical Pin-Out Details

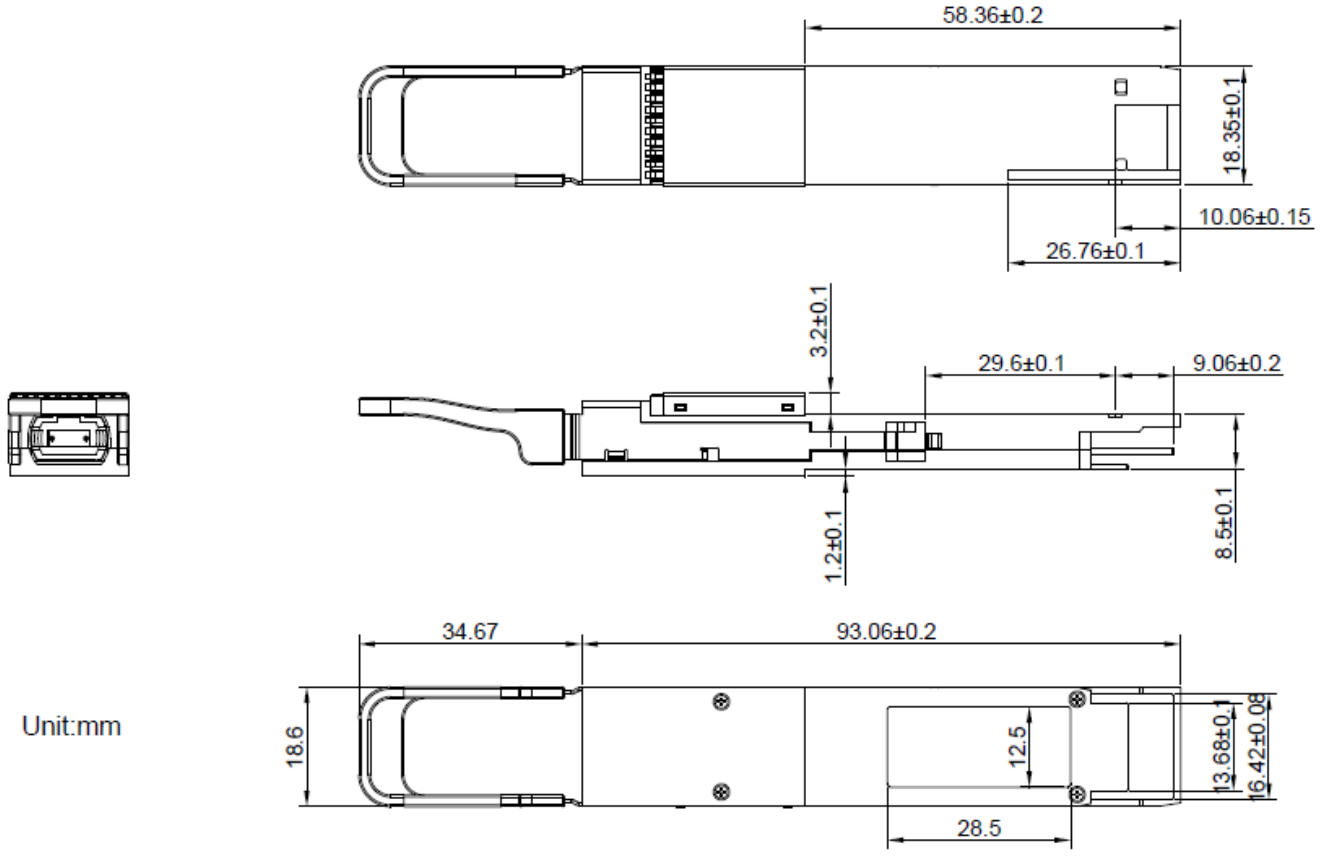




Recommended Host Board Power Supply Filter Network



Mechanical Specifications



Unit:mm

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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