QSFP112-400GB-FR4-IB-MX-AO

NVIDIA® Compatible TAA 400GBase-FR4 QSFP112 Transceiver (SMF, 1310nm, 2km, LC, DOM, CMIS 5.0, Infiniband NDR)

Features:

- Hot-Pluggable QSFP112 Form Factor
- Support 425Gbps Aggregate Bit Rate
- EML Transmitter and PIN PD Receiver
- Compliant with IEEE802.3ck Standard: 400GAUI-4 C2M Electrical Interface
- Compliant with QSFP112 MSA Rev. 2.0
- Compliant with 400GBASE-FR4 (IEEE802.3cu)
- Class 1 Laser
- CMIS 5.0
- Operating Temperature: 0 to 70 Celsius
- Type 2 Housing with LC Connector
- RoHS Compliant and Lead-Free



Applications:

- 400GBase Ethernet
- Access and Enterprise

Product Description

This NVIDIA® compatible QSFP112 transceiver provides 400GBase-FR4 throughput up to 2km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with NVIDIA®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide 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."

TAA COMPLIANT

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Tstg	-40		85	°C	
Supply Voltage	Vcc	-0.5		3.6	V	
Relative Humidity	RH	5		85	%	
Control Input Voltage	VI	-0.3		Vcc+0.5	V	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	Tc	0		70	°C	
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Instantaneous Peak Current at Hot Plug	Icc_IP			4000	mA	
Sustained Peak Current at Hot Plug	Icc_SP			3300	mA	
Maximum Power Dissipation	PD			10	W	
Maximum Power Dissipation (Low-Power Mode)	PD_{LP}			1.5	W	
Signaling Rate Per Lane	SRL		53.125		Gbd	PAM4
2-Wire Serial Interface Clock Rate				400	kHz	
Module Sinusoidal Power Supply Noise Tolerance 1kHz - 1MHz (Pk-Pk)				66	mVp-p	
Rx Differential Data Output Load			100		Ω	
Operating Distance		2		2000	m	

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter (Module Input, TP1)							
Signaling Rate Per Lane (Range)			53.125 ± 100ppm			GBd	
Differential Pk-Pk Input Voltage Tolerance (TP1a)			750			mV	
Pk-Pk AC Common-Mode Voltage Tolerance	**Low-Frequency (VCMLF)**		32			mV	
	Full-Band (VCMFB)		80				
Effective Return Loss		ERL	8.5			dB	
Differential Termination Mismatch					10	%	
Single-Ended Voltage Tolerance Range			-0.4		3.3	V	
DC Common-Mode Voltage Tolerance			-0.35		2.85	V	
Differential-Mode to Common-Mode Return Loss		RLcd	802.3ck 120G-2			dB	

Receiver (Module Output, TP4)							
Signaling Rate Per Lane (Range)			53.125 ± 100ppm			GBd	
Pk-Pk AC Common-Mode Voltage	**Low-Frequency (VCMLF)**				32	mV	
	Full-Band (VCMFB)				80		
Differential Pk-Pk Output Voltage	**Short-Mode**				600	mV	
	Long-Mode				845		
Eye Height		EH	15			mV	
Vertical Eye Closure		VEC			12	dB	
Effective Return Loss		ERL	8.5			dB	
Differential Termination Mismatch					10	%	
Transition Time			8.5			ps	
DC Common-Mode Voltage Tolerance			-0.35		2.85	V	
Common-Mode to Differential-Mode Return Loss		RLDc	802.3ck 120G-1			dB	
Low-Speed Signal							
Module Output SCL and SDA		VOL	0		0.4	V	
Module Input SCL and SDA		VIL	-0.3		Vcc*0.3	V	
		VIH	Vcc*0.7		Vcc+0.5	V	
LPMode/TxDis, ResetL, and ModSelL		VIL	-0.3		0.8	V	
		VIH	2		Vcc+0.3	V	
IntL/RxLOS		VOL	0		0.4	V	
		VOH	Vcc-0.5		Vcc+0.3	V	

Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Center Wavelength		λC	1264.5	1271	1277.5	nm	
			1284.5	1291	1297.5		
			1304.5	1311	1317.5		
			1324.5	1331	1337.5		
Side-Mode Suppression Ratio		SMSR	30			dB	
Average Launch Power Per Lane		AOP_L	-3.2		4.4	dBm	1
Outer Optical Modulation Amplitude (OMAouter) Per Lane		T_{OMA}			3.7	dBm	
Outer Optical Modulation Amplitude (OMAouter) Per Lane	**TDECQ<1.4dB**	T_{OMA}	-0.2				
	1.4≤TDECQ≤3.4dB		-1.6+TDECQ				

Difference in Launch Power Between Any Two Lanes (OMAouter)		DP			3.9	dB	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane		TDECQ			3.4	dB	
Transmitter Eye Closure for PAM4 (TECQ)		TECQ			3.4	dB	
| TDECQ - TECQ |					2.5	dB	
Over/Under-Shoot					22	%	
Transmitter Power Excursion					1.8	dBm	
Average Launch Power of Off Transmitter Per Lane		Toff			-16	dBm	
Extinction Ratio Per Lane		ER	3.5			dB	
Transmitter Transition Time					17	ps	
$RIN_{17.1}OMA$		RIN			-136	dB/Hz	
Optical Return Loss Tolerance		ORL			17.1	dB	
Transmitter Reflectance		TR			-26	dB	
Receiver							
Center Wavelength		λC	1264.5	1271	1277.5	nm	
			1284.5	1291	1297.5		
			1304.5	1311	1317.5		
			1324.5	1331	1337.5		
Damage Threshold Per Lane		AOP_D	5.4			dBm	
Average Receive Power Per Lane		AOP_R	-7.2		4.4	dBm	2
Receive Power (OMAouter) Per Lane		OMA_R			3.7	dBm	
Difference in Receive Power Between Any Two Lanes (OMAouter)		DR			4.1	dB	
Receiver Reflectance		RR			-26	dB	
Receiver Sensitivity (OMAouter) Per Lane	**TECQ<1.4dB**	SOMA			-4.6	dBm	
	1.4≤TECQ≤3.4dB				-6+TECQ		
Stressed Receiver Sensitivity (OMAouter) Per Lane		SRS			-2.6	dBm	3
Stressed Eye Closure for PAM4 (SECQ)				3.4		dB	
OMAouter of Each Aggressor Lane				1.4		dBm	

Notes:

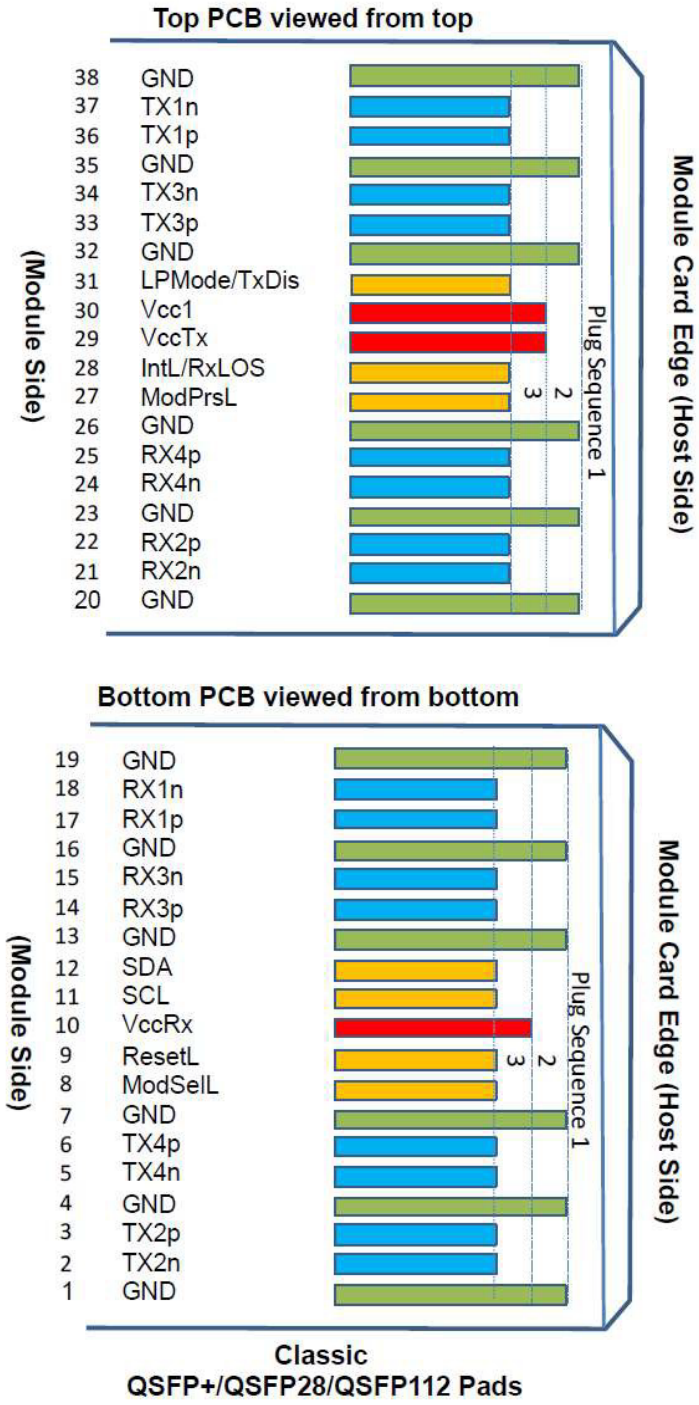
1. Average launch power, per lane (minimum), is informative and not the principal indicator of signal strength.
2. Average receive power, per lane (minimum), is informative and not the principal indicator of signal strength.
3. Measured with conformance test signal at TP3 for the BER=2.4×10^{-4}.

Pin Descriptions

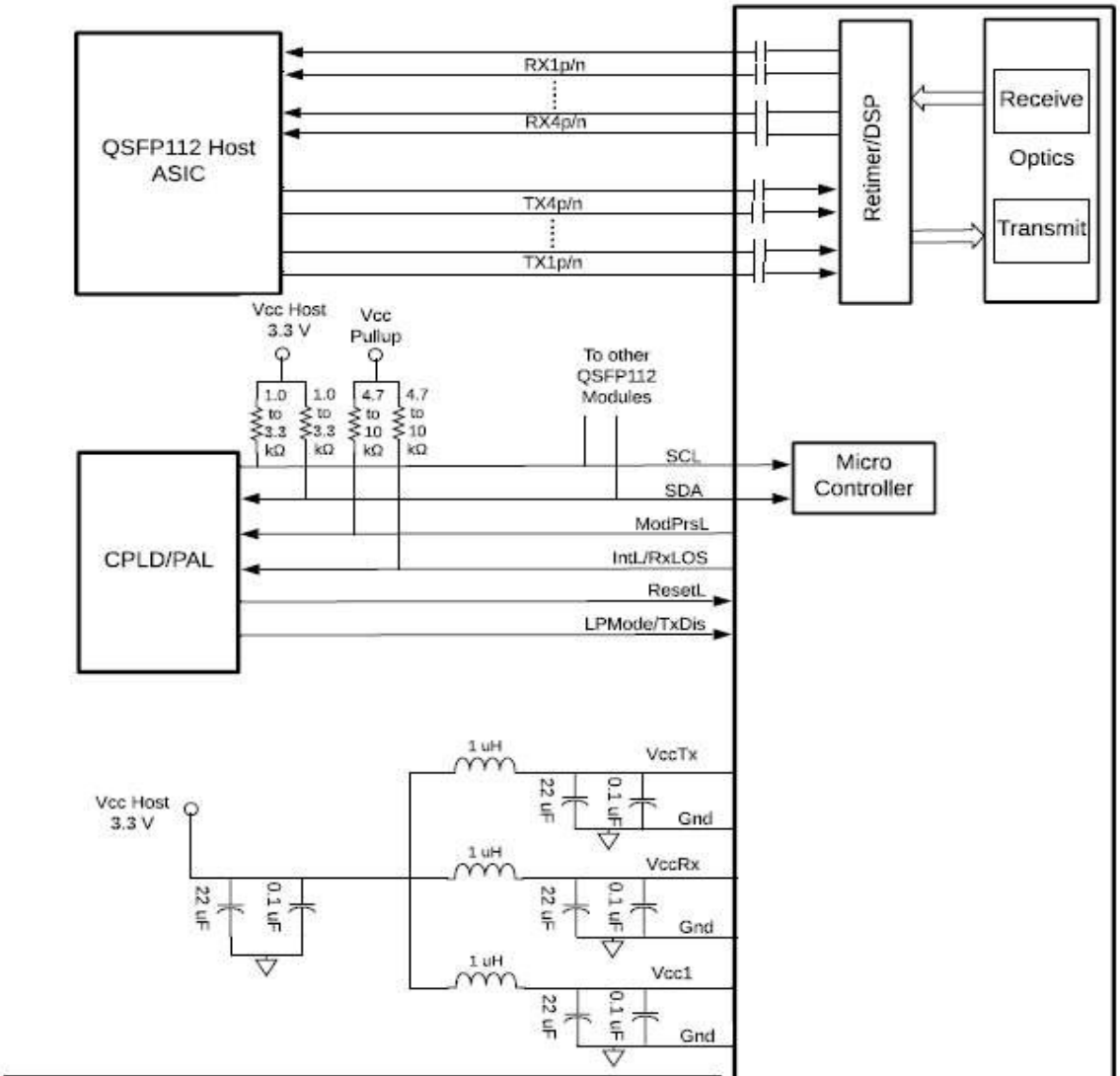
Pin	Symbol	Logic	Name/Description
1	GND		Module Ground.
2	Tx2n	CML-I	Transmitter Inverted Data Input.
3	Tx2p	CML-I	Transmitter Non-Inverted Data Input.
4	GND		Module Ground.
5	Tx4n	CML-I	Transmitter Inverted Data Input.
6	Tx4p	CML-I	Transmitter Non-Inverted Data Input.
7	GND		Module Ground.
8	ModSelL	LVTTL-I	Module Select.
9	ResetL	LVTTL-I	Module Reset.
10	VccRx		+3.3V Receiver Power Supply.
11	SCL	LVCMOS-I/O	2-Wire Serial Interface Clock.
12	SDA	LVCMOS-I/O	2-Wire Serial Interface Data.
13	GND		Module Ground.
14	Rx3p	CML-O	Receiver Non-Inverted Data Output.
15	Rx3n	CML-O	Receiver Inverted Data Output.
16	GND		Module Ground.
17	Rx1p	CML-O	Receiver Non-Inverted Data Output.
18	Rx1n	CML-O	Receiver Inverted Data Output.
19	GND		Module Ground.
20	GND		Module Ground.
21	Rx2n	CML-O	Receiver Inverted Data Output.
22	Rx2p	CML-O	Receiver Non-Inverted Data Output.
23	GND		Module Ground.
24	Rx4n	CML-O	Receiver Inverted Data Output.
25	Rx4p	CML-O	Receiver Non-Inverted Data Output.
26	GND		Module Ground.
27	ModPrsL	LVTTL- O	Module Present.
28	IntL/RxLOS	LVTTL- O	Interrupt/Optional RxLOS.
29	VccTx		+3.3V Transmitter Power Supply.
30	Vcc1		+3.3V Power Supply.
31	LPMode/TxDis	LVTTL- I	Low-Power Mode/Optional Tx_Disable.
32	GND		Module Ground.
33	Tx3p	CML-I	Transmitter Non-Inverted Data Input.
34	Tx3n	CML-I	Transmitter Inverted Data Input.
35	GND		Module Ground.

36	Tx1p	CML-I	Transmitter Non-Inverted Data Input.
37	Tx1n	CML-I	Transmitter Inverted Data Input.
38	GND		Module Ground.

Pin-Out Details



Recommended Host Board Schematic



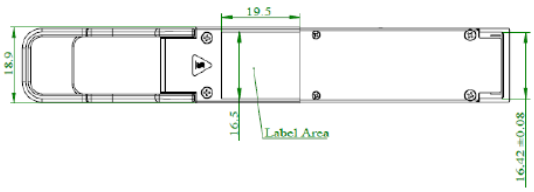
Note: Filter capacitors values are informative and application dependent, 0.1 µF capacitors should be placed in close proximity to power pads and may be duplicated for individual pads to provide additional high frequency filtering.

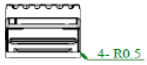
Note: Vcc1 may be connected to VccTx or VccRx within the module provided the applicable derating of the maximum current limit is used.

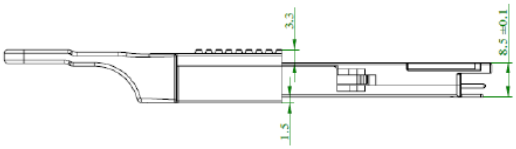
Digital Diagnostic Monitor

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	°C	Internal
Voltage	3.135 to 3.465	±3%	V	Internal
Tx Bias Current Per Lane	0 to 120	10%	mA	Internal
Tx Output Power Per Lane	-3.2 to +4.4	±3	dBm	Internal
Rx Receive Power Per Lane	-7.2 to +4.4	±3	dBm	Internal

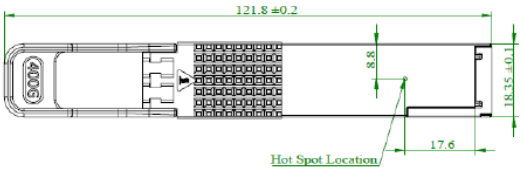
Mechanical Specifications

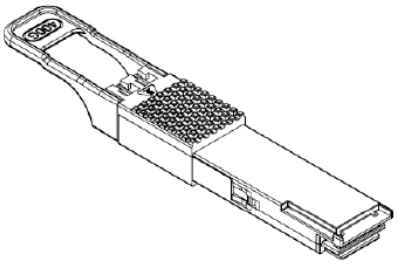












About AddOn Networks

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 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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