MMS4X00-NM16-AO

NVIDIA® MMS4X00-NM16 Compatible TAA 800GBase-DR8 PAM4 OSFP-IHS Transceiver (SMF, 1310nm, 500m, MPO-16, DOM, CMIS 5.0)

Features:

- Compliant with OSFP MSA Specifications
- Compliant with IEEE 802.3ck-2022: 8x100GAUI-1 C2M Electrical Interface
- Compliant with IEEE 802.3cu-2021: 8x100GBASE-DR Optical Interface
- MPO-16 Connector
- Operating Temperature: 0 to 70 Celsius
- Compliant with CMIS 5.0
- RoHS Compliant and Lead-Free
- Class 1 Laser



Applications:

- 800GBase Ethernet

Product Description

This NVIDIA® MMS4X00-NM16 compatible OSFP-IHS Transceiver provides 800GBase-DR8 throughput up to 500m over single-mode fiber (SMF) PAM4 using a wavelength of 1310nm via a MPO-16 connector. It can operate at temperatures between 0 and 70C. 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	
Operating Case Temperature	Tc	0		70	°C	
Power Supply Voltage	Vcc	-0.5		3.6	V	
Relative Humidity (Non-Condensing)	RH	5		95	%	
Data Input Voltage Differential	V_{DIP}-V_{DIN}			1	V	
Control Input Voltage	V_I	-0.3		Vcc+0.5	V	
Control Output Current	I_O	-20		20	mA	
Signaling Speed Per Lane	DRL		53.125		GBd	
Operating Distance		2		500	m	
Data Rate	DR		850		Gbps	

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.135	3.3	3.465	V	
Instantaneous Peak Current at Hot Plug		$Icc_{_IP}$			6600	mA	
Sustained Peak Current at Hot Plug		$Icc_{_SP}$			5494.5	mA	
Maximum Power Dissipation		PD			16.5	W	
Maximum Power Dissipation (Low-Power Mode)		PD_{LP}			2	W	
Control Input Voltage - High		VIH	Vcc*0.7		Vcc+0.3	V	
Control Input Voltage – Low		VIL	-0.3		Vcc*0.3	V	
2-Wire Serial Interface Clock Rate					400	kHz	
Power Supply Noise (1kHz to 1MHz, Pk-Pk)					66	mVp-p	
Transmitter (TP1)							
Differential Pk-Pk Input Voltage Tolerance			750			mV	
Pk-Pk AC Common-Mode Voltage Tolerance	**Low-Frequency (VCM_{LF})**		32			mV	
	Full-Band (VCM_{FB})		80			mV	
Differential-Mode to Common-Mode Return Loss		RLCd	802.3ck 120G-2			dB	
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	
Receiver (TP4)							
Pk-Pk AC Common-Mode Voltage	**Low-Frequency (VCM_{LF})**				32	mV	
	Full-Band (VCM_{FB})				80	mV	
Differential Pk-Pk Output	**Short-Mode**				600	mV	

Voltage	**Long-Mode**				845	mV	
Eye Height		EH	15			mV	
Vertical Eye Closure		VEC			12	dB	
Common-Mode to Differential-Mode Return Loss		RLDc	802.3ck 120G-1			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	

Electrical Low-Speed Control and Sense Signal Specifications

Parameter	Symbol	Min.	Max.	Unit	Notes
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	
INT/RSTn	Complaint with OSFP MSA 5.0				

Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Wavelength		λC	1304.5	1311	1317.5	nm	
Side-Mode Suppression Ratio		SMSR	30			dB	
Average Launch Power Per Lane		AOP_L	-2.9		4.0	dBm	1
Outer Optical Modulation Amplitude (OMAouter) Per Lane		TOMA	-0.8		4.2	dBm	
Launch Power in OMAouter Minus TDECQ Per Lane	**For ER ≥ 5dB**	TOMA - TDECQ	-2.2			dBm	
	For ER < 5dB	TOMA - TDECQ	-1.9			dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane		TDECQ			3.4	dB	
TDECQ – 10log10(Ceq) Per Lane		Ceq			3.4	dB	
Average Launch Power of Off Transmitter Per Lane		Toff			-15	dBm	
Extinction Ratio		ER	3.5			dB	
Transmitter Transition Time		Tr			17	ps	
$RIN_{15.5}OMA$		RIN			-136	dB/Hz	
Optical Return Loss Tolerance		ORLT			15.5	dB	
Transmitter Reflectance		TR			-26	dB	2
Receiver (TP4)							
Wavelength		λC	1304.5	1311	1317.5	nm	
Damage Threshold Per Lane		AOP_D	5			dBm	
Average Receive Power Per Lane		AOP_R	-5.9		4	dBm	
Receive Power (OMAouter) Per Lane		OMA_R			4.2	dBm	
Receiver Reflectance		RR			-26	dB	
Receiver Sensitivity (OMAouter) Per Lane		SOMA			Max. (–3.9, SECQ – 5.3)	dBm	3
Stressed Receiver Sensitivity (OMAouter) Per Lane		SRS			-1.9	dBm	4
Conditions of Stressed Receiver Sensitivity Test							
Stressed Eye Closure for PAM4 (SECQ) Per Lane Under Test		SECQ		3.4		dB	
SECQ – 10log10 (Ceq) Per Lane Under Test		Ceq			3.4	dB	

Notes:

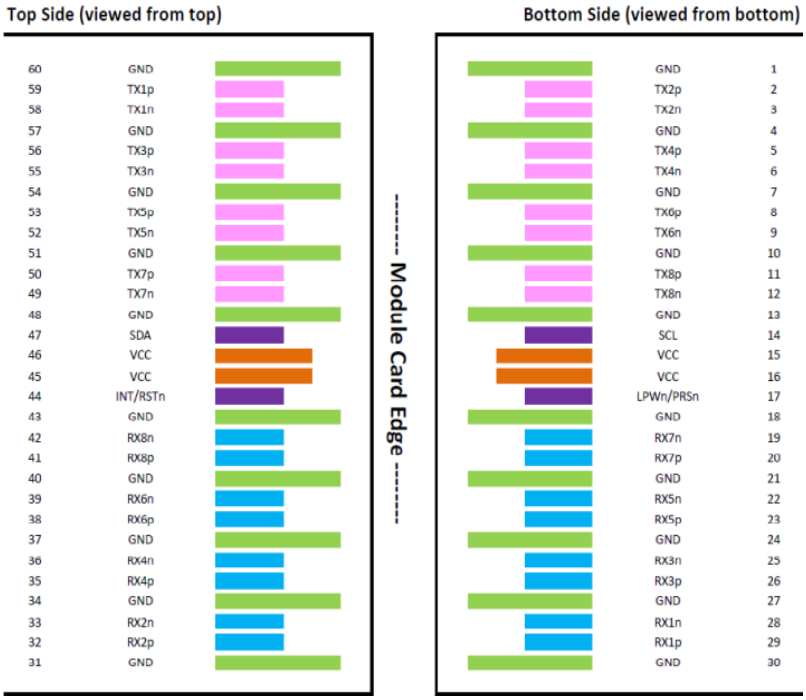
1. Average launch power, per lane (minimum), is informative and not the principal indicator of signal strength.
2. Transmitter reflectance is defined looking into the transmitter.
3. Receiver sensitivity (OMAouter), per lane (maximum), is informative and is defined for a transmitter with a value of SECQ up to 3.4dB.
4. Measured with conformance test signal at TP3 for the BER = $2.4x10^{-4}$.

Pin Descriptions

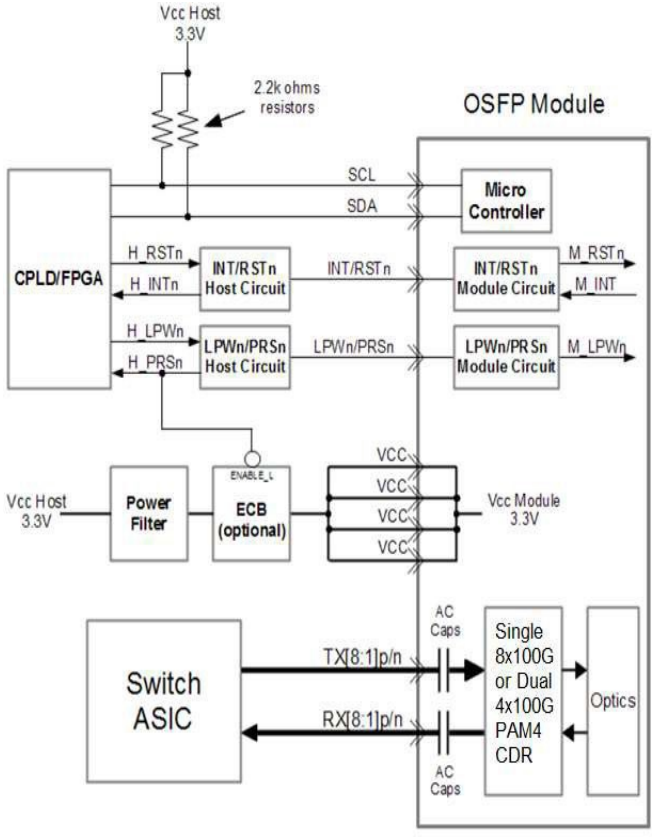
Pin	Logic	Symbol	Name/Description	Notes
1		GND	Module Ground.	
2	CML-I	Tx2+	Transmitter Non-Inverted Data.	
3	CML-I	Tx2-	Transmitter Inverted Data.	
4		GND	Module Ground.	
5	CML-I	Tx4+	Transmitter Non-Inverted Data.	
6	CML-I	Tx4-	Transmitter Inverted Data.	
7		GND	Module Ground.	
8	CML-I	Tx6+	Transmitter Non-Inverted Data.	
9	CML-I	Tx6-	Transmitter Inverted Data.	
10		GND	Module Ground.	
11	CML-I	Tx8+	Transmitter Non-Inverted Data.	
12	CML-I	Tx8-	Transmitter Inverted Data.	
13		GND	Module Ground.	
14	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock.	
15		Vcc	+3.3V Power Supply.	
16		Vcc	+3.3V Power Supply.	
17	Multi-Level	LPWn/PRSn	Low-Power Mode/Module Present.	
18		GND	Module Ground.	
19	CML-O	Rx7-	Receiver Inverted Data.	
20	CML-O	Rx7+	Receiver Non-Inverted Data.	
21		GND	Module Ground.	
22	CML-O	Rx5-	Receiver Inverted Data.	
23	CML-O	Rx5+	Receiver Non-Inverted Data.	
24		GND	Module Ground.	
25	CML-O	Rx3-	Receiver Inverted Data.	
26	CML-O	Rx3+	Receiver Non-Inverted Data.	
27		GND	Module Ground.	
28	CML-O	Rx1-	Receiver Inverted Data.	
29	CML-O	Rx1+	Receiver Non-Inverted Data.	
30		GND	Module Ground.	
31		GND	Module Ground.	
32	CML-O	Rx2+	Receiver Non-Inverted Data.	
33	CML-O	Rx2-	Receiver Inverted Data.	
34		GND	Module Ground.	
35	CML-O	Rx4+	Receiver Non-Inverted Data.	
36	CML-O	Rx4-	Receiver Inverted Data.	

37		GND	Module Ground.	
38	CML-O	Rx6+	Receiver Non-Inverted Data.	
39	CML-O	Rx6-	Receiver Inverted Data.	
40		GND	Module Ground.	
41	CML-O	Rx8+	Receiver Non-Inverted Data.	
42	CML-O	Rx8-	Receiver Inverted Data.	
43		GND	Module Ground.	
44	Multi-Level	INT/RSTn	Module Input/Module Reset.	
45		Vcc	+3.3V Power Supply.	
46		Vcc	+3.3V Power Supply.	
47	LVCMOS-I/O	SDA	2-Wire Serial Interface Data.	
48		GND	Module Ground.	
49	CML-I	Tx7-	Transmitter Inverted Data.	
50	CML-I	Tx7+	Transmitter Non-Inverted Data.	
51		GND	Module Ground.	
52	CML-I	Tx5-	Transmitter Inverted Data.	
53	CML-I	Tx5+	Transmitter Non-Inverted Data.	
54		GND	Module Ground.	
55	CML-I	Tx3-	Transmitter Inverted Data.	
56	CML-I	Tx3+	Transmitter Non-Inverted Data.	
57		GND	Module Ground.	
58	CML-I	Tx1-	Transmitter Inverted Data.	
59	CML-I	Tx1+	Transmitter Non-Inverted Data.	
60		GND	Module Ground.	

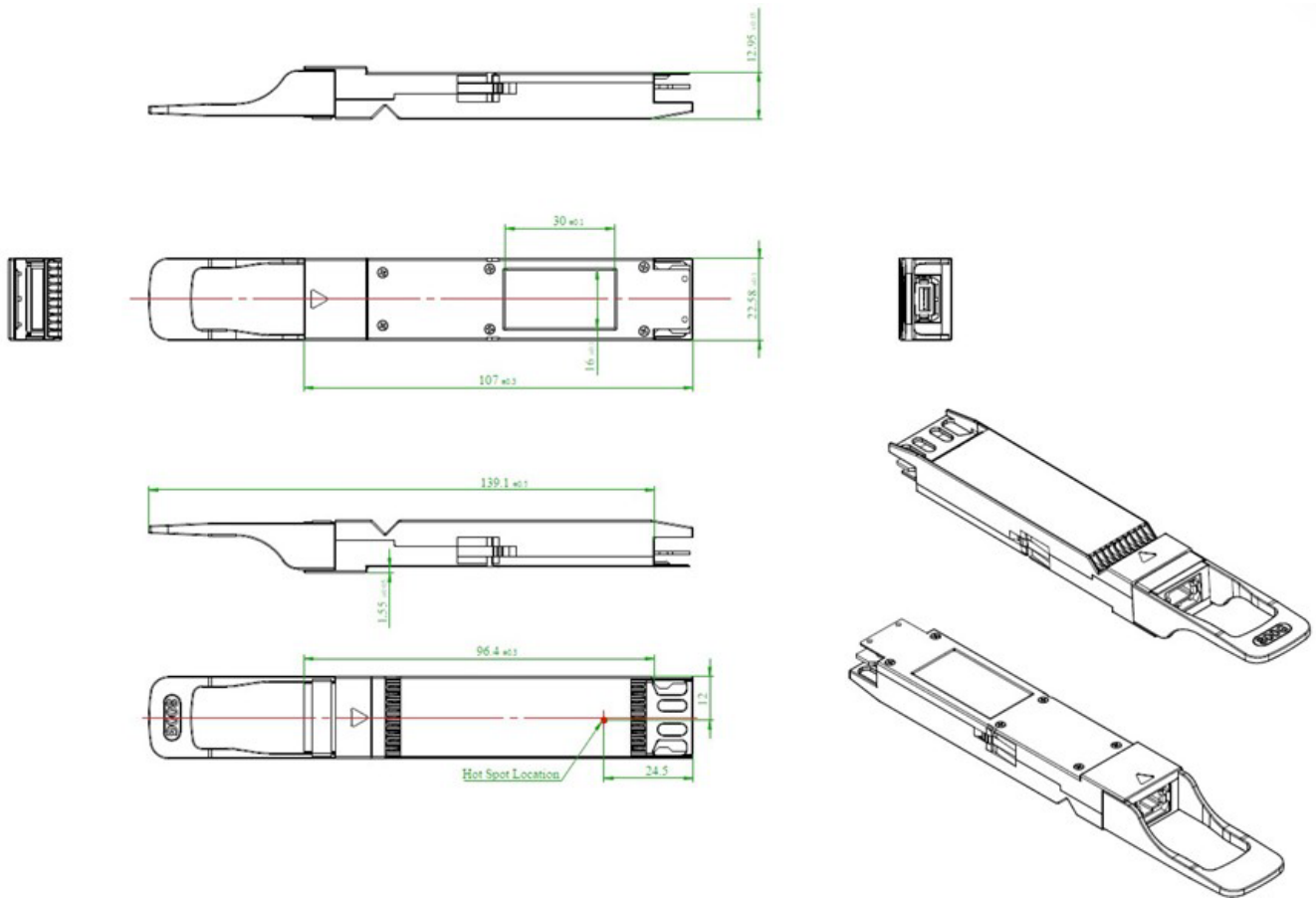
Electrical Pad Layout



Recommended OSFP Host Board Schematic



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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