



MMS4X00-NS-SKY

Mellanox® MMS4X00-NS Compatible 800GBase-DR8 PAM4 OSFP-IHS Transceiver (SMF, 1310nm, 100m, 2xMPO-12, DOM, CMIS 5.0)

Product Description

This Mellanox® MMS4X00-NS compatible OSFP-IHS Transceiver provides 800GBase-DR8 throughput up to 100m over single-mode fiber (SMF) PAM4 using a wavelength of 1310nm via a 2xMPO-12 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 Mellanox®. 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. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

Features:

- OSFP MSA Compliant
- Supports both Ethernet and InfiniBand NDR
- 8x100G PAM4/8x50G PAM4 data rates
- Compliant with IEEE 802.3ck-2022: 8x100GAUI-1 C2M electrical interface
- EML transmitter and PIN PD receiver
- Compliant with IEEE 802.3cu-2021: 8x100GBASE-DR optical interface
- Class 1 Laser
- Cooled 1310 EML Laser
- RoHS Compliant and Lead-Free
- Operating Temperature: 0 to 70 Celsius
- RoHS Compliant and Lead-Free



Applications:

- 2x400GBase Ethernet

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V _{CC}	-0.5		3.6	V	
Storage Temperature	T _{stg}	-40		85	°C	
Operating Case Temperature	T _c	0		70	°C	
Relative Humidity (Non-Condensing)	RH	15		85	%	
Data Rate			106.25		Gbps	
			53.125		Gbps	
Modulation Format			PAM4			

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V	
Module Supply Current	I _{CC}			5.1	A	
Power Dissipation	P _{DISS}			16	W	
Transmitter						
Input Differential Impedance	Z _{IN}	90	100	110	Ω	
Differential Data Input Swing	V _{IN,pp}			900	mVp-p	
DC Common-Mode Input Voltage		-350		2850	mV	
Receiver						
Differential Data Output Swing	V _{OUT}			900	mV	
Output Differential Impedance	Z _{OUT}	90	100	110	Ω	1
Dual Function Signals						
INT/RSTn	V _{INT/RSTn1}	0.000	0.000	1.000	V	2
	V _{INT/RSTn2}	0.000	0.000	1.000	V	3
	V _{INT/RSTn3}	1.500	1.900	2.250	V	4
	V _{INT/RSTn4}	2.750	3.000	3.465	V	5
LPWn/PRSn	V _{LPWn/PRSn_1}	0.000	0.950	1.100	V	6
	V _{LPWn/PRSn_2}	1.400	1.700	2.250	V	7
	V _{LPWn/PRSn_3}	2.750	3.300	3.465	V	8

Notes:

1. Internally AC coupled but requires an external 100Ω differential load termination.
2. INT/RSTn voltage for no module.
3. INT/RSTn voltage for module installed, H_RSTn=Low.
4. INT/RSTn voltage for module installed, H_RSTn=High, M_INT=Low.
5. INT/RSTn voltage for module installed, H_RSTn=High, M_INT=High.

6. LPWn/PRSn for module installed, H_LPWn=Low.
7. LPWn/PRSn for module installed, H_LPWn=High.
8. LPWn/PRSn for no module.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Average Launch Per Lane	Po(100G)	-2.9		4	dBm	1
	Po(50G)	-5.1		3	dBm	1
Outer Optical Modulation Amplitude Per Lane	Poma(100G)	-0.8		4.2	dBm	1
	Poma(50G)	-3		2.8	dBm	1
Extinction Ratio	ER	3.5			dB	2,3
Lane Wavelengths	λ	1304.5	1311	1317.5	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Transmitter and Dispersion Penalty Eye Closure for 100Gbps PAM4 Per Lane	TDECQ1			3.4	dB	2
Transmitter and Dispersion Penalty Eye Closure for 50Gbps PAM4 Per Lane	TDECQ2			3.2	dB	3
Launch Power in OMAouter Minus TDECQ for 100Gbps PAM4 Per Lane	OMA-TDECQ	-2.2			dBm	2
Launch Power in OMAouter Minus TDECQ for 50Gbps PAM4 Per Lane	OMA-TDECQ	-4.4			dBm	3
Average Launch Power of Off Transmitter	Poff			-15	dBm	
Optical Return Loss Tolerance	ORLT			21.4	dB	
Transmitter Reflectance				-26	dB	
Receiver (10G)						
Lane Wavelengths		1304.5	1311	1317.5	nm	
100G Receiver Sensitivity (OMA)				-3.9	dBm	4
50G Receiver Sensitivity (OMA)				-6.1	dBm	5
Receiver Overload Per Lane (Pavg)		4			dBm	
Damage Threshold Per Lane		5			dBm	
Receive Power Per Lane (OMAouter)				4.2	dBm	
Receiver Reflectance				-26	dB	
LOS De-Assert				-10	dBm	
LOS Assert		-16			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. Measured with SSPRQ test pattern, @106.25Gbps PAM4.
3. Measured with SSPRQ test pattern, @53.125Gbps PAM4.

4. Measured with PRBS31Q test pattern, @53.125GBd, PAM4, and BER<2.4E⁻⁴.
5. Measured with PRBS31Q test pattern, @26.5625GBd, PAM4, and BER<2.4E⁻⁴.

Pin Descriptions

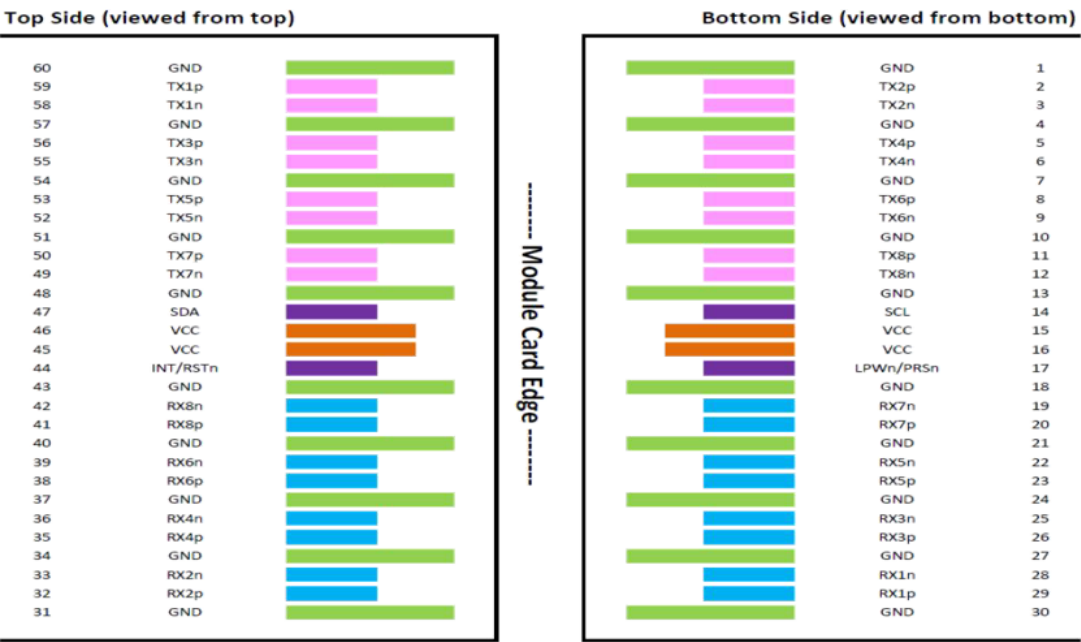
Pin	Symbol	Name/Description	Logic	Plug Sequence	Direction	Notes
1	GND	Module Ground.		1		
2	Tx2+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
3	Tx2-	Transmitter Data Inverted.	CML-I	3	Input from Host	
4	GND	Module Ground.		1		
5	Tx4+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	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

33	Rx2-	Receiver Data Inverted.	CML-O	3	Output to Host	
34	GND	Module Ground.		1		
35	Rx4+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
36	Rx4-	Receiver Data Inverted.	CML-O	3	Output to Host	
37	GND	Module Ground.		1		
38	Rx6+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
39	Rx6-	Receiver Data Inverted.	CML-O	3	Output to Host	
40	GND	Module Ground.		1		
41	Rx8+	Receiver Data Non-Inverted.	CML-O	3	Output to Host	
42	Rx8-	Receiver Data Inverted.	CML-O	3	Output to Host	
43	GND	Module Ground.		1		
44	INT/RSTn	Module Interrupt/Module Reset.	Multi-Level	3	Bi-Directional	2
45	Vcc	+3.3V Power.		2	Power from Host	
46	Vcc	+3.3V Power.		2	Power from Host	
47	SDA	2-Wire Serial Interface Data.	LVC MOS-I/O	3	Bi-Directional	1
48	GND	Module Ground.		1		
49	Tx7-	Transmitter Data Inverted.	CML-I	3	Input from Host	
50	Tx7+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
51	GND	Module Ground.		1		
52	Tx5-	Transmitter Data Inverted.	CML-I	3	Input from Host	
53	Tx5+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
54	GND	Module Ground.		1		
55	Tx3-	Transmitter Data Inverted.	CML-I	3	Input from Host	
56	Tx3+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
57	GND	Module Ground.		1		
58	Tx1-	Transmitter Data Inverted.	CML-I	3	Input from Host	
59	Tx1+	Transmitter Data Non-Inverted.	CML-I	3	Input from Host	
60	GND	Module Ground.		1		

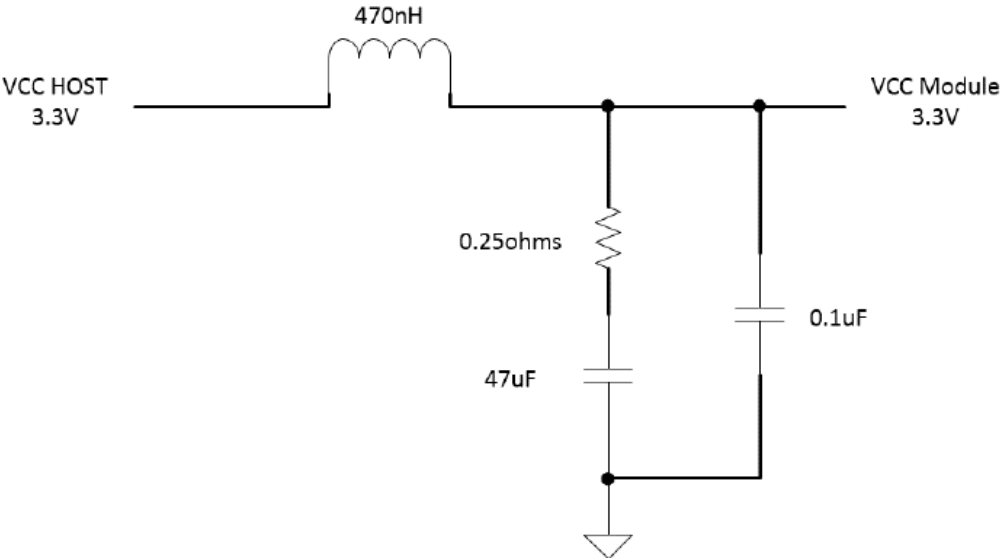
Notes:

1. Open-drain with pull-up resistor on the host.
2. See pin assignments below for the required circuit.

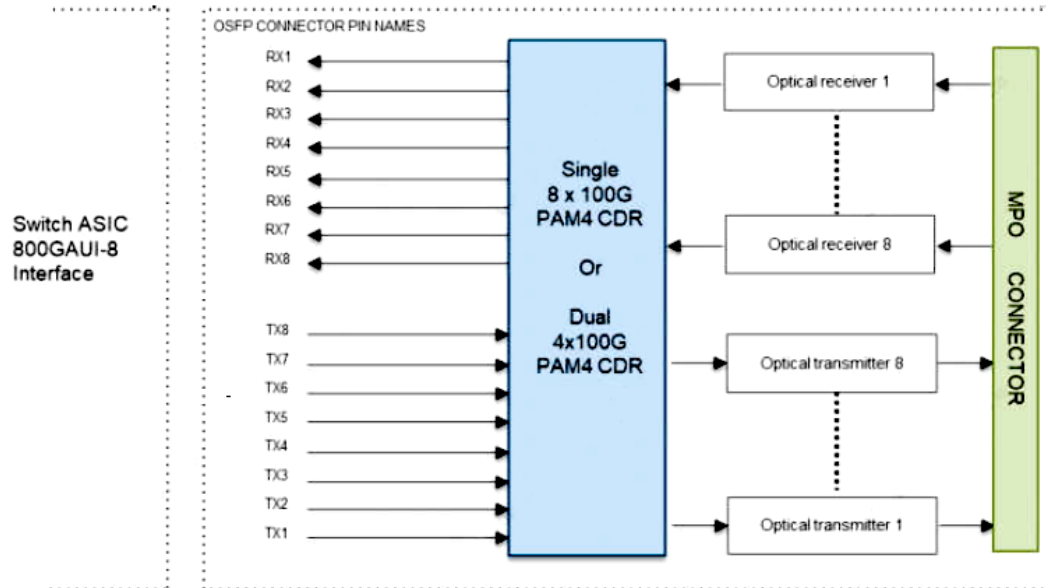
Electrical Pin-Out Details



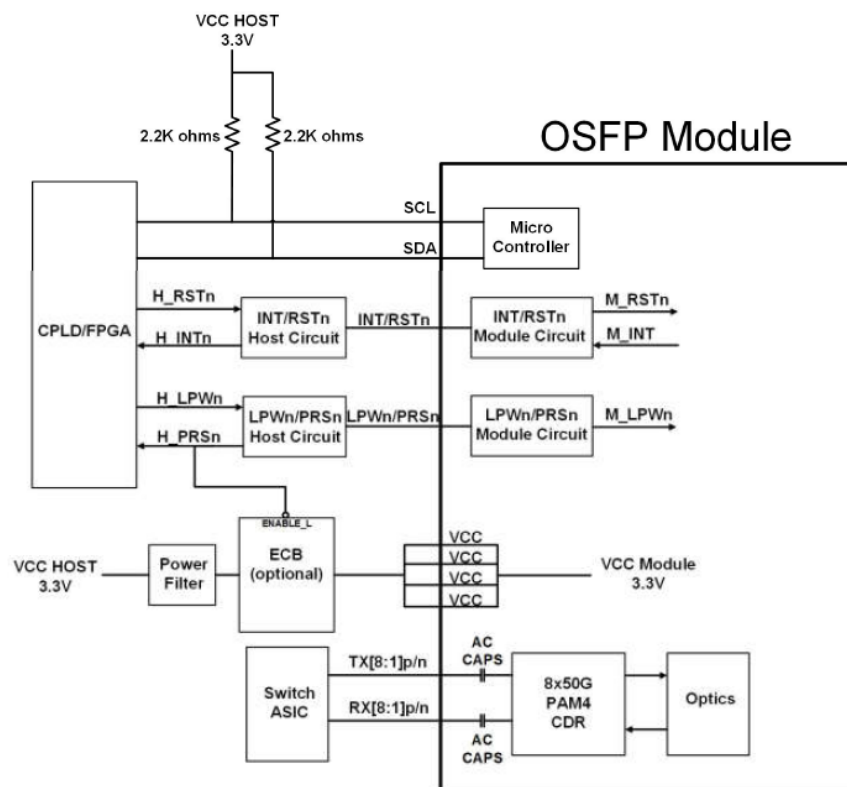
Recommended Host Board Power Supply Filter Network



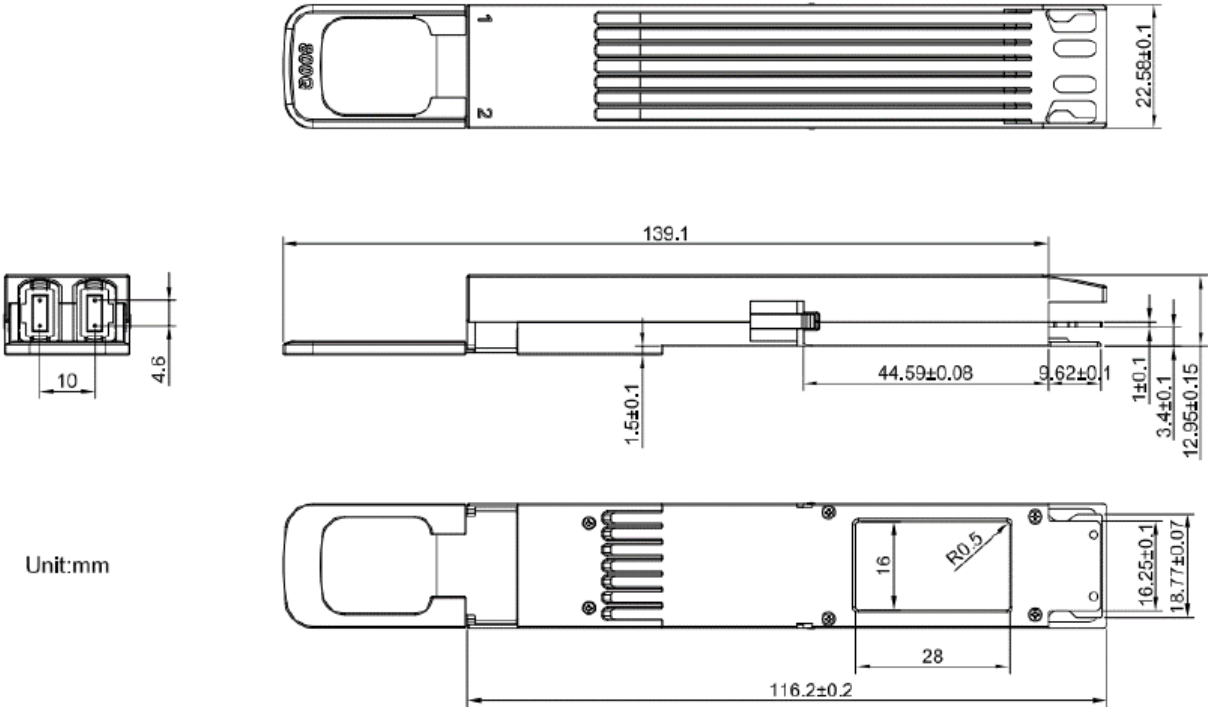
Block Diagram



Recommended Application Interface Block Diagram



Mechanical Specifications



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

