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Mellanox® MMA4Z00-NS Compatible 800GBase-2xSR4 PAM4 OSFP-IHS Transceiver (MMF, 850nm, 50m, 2xMPO-12, DOM, CMIS 5.0)

Product Description

This Mellanox® MMA4Z00-NS compatible OSFP-IHS Transceiver provides 800GBase-2xSR4 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. 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
- 8x53.125GBd (PAM4) Electrical Interface
- Supports 850Gbps
- Commercial Temperature: 0 to 70 Celsius
- VCSEL Transmitter
- Dual MPO-12 Connector APC
- RoHS Compliant and Lead-Free
- PIN and TIA Array on the Receiver Side



Applications:

- 2x400GBase Ethernet
- 8x100GBase 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
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	1
Power Supply Voltage	Vcc	-0.5		3.6	V	
Relative Humidity (Non-Condensing)	RH	5		85	%	
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		50	m	1
Data Rate	DR		850		Gbps	

Notes:

1. 0.5m to 30m for OM3, 0.5m to 50m for OM4 and OM5, with FEC.

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		I _{CC_IP}			6400	mA	
Sustained Peak Current at Hot Plug		I _{CC_SP}			5328	mA	
Maximum Power Dissipation		PD			16	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 (Module Input, 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 (Module Output, TP4)							

Pk-Pk AC Common-Mode Voltage	Low-Frequency ($V_{CM_{LF}}$)				32	mV	
	Full-Band ($V_{CM_{FB}}$)				80	mV	
Differential Pk-Pk Output Voltage	Short-Mode				600	mV	
	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	$V_{CC} \cdot 0.3$	V	
	VIH	$V_{CC} \cdot 0.7$	$V_{CC} + 0.5$	V	
InitMode, ResetL, and ModSelL	VIL	-0.3	0.8	V	
	VIH	2	$V_{CC} + 0.3$	V	
IntL	VOL	0	0.4	V	
	VOH	$V_{CC} - 0.5$	$V_{CC} + 0.3$	V	

Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Signaling Rate Per Lane (Range)			53.125 ± 100ppm			GBd	
Wavelength		λC	844		860	nm	
RMS Spectral Width		RMS			0.65	dB	1
Average Launch Power Per Lane		AOP _L	-4.6		4.0	dBm	
Outer Optical Modulation Amplitude (OMA _{outer}) Per Lane	(TECQ, TDECQ) <= 1.8dB	OMA _{outer}	-2.6		3.5	dBm	
	1.8 < (TECQ, TDECQ) <= 4.4dB		-4.4 + Max. (TECQ, TDECQ)				
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane		TDECQ			4.4	dB	
Transmitter Eye Closure for PAM4 (TECQ) Per Lane		TECQ			4.4	dB	
Over/Under-Shoot					29	%	
Transmitter Power Excursion Per Lane					2.3	dBm	
Average Launch Power of Off Transmitter Per Lane		Toff			-30	dBm	
Extinction Ratio		ER	2.5			dB	
Transmitter Transition Time		Tr			17	ps	
RIN ₁₄ OMA		RIN			-132	dB/Hz	
Optical Return Loss Tolerance		ORLT			14	dB	
Encircled Flux			>=86% at 19μm <=30% at 4.5μm				
Receiver							
Signaling Rate Per Lane (Range)			53.125 ± 100ppm			GBd	
Wavelength		λC	840		860	nm	
Damage Threshold Per Lane		AOP _D	5			dBm	
Average Receive Power Per Lane		AOP _R	-6.3		4	dBm	
Receive Power (OMA _{outer}) Per Lane		OMA _R			3.5	dBm	
Receiver Reflectance		RR			-15	dB	
Receiver Sensitivity (OMA _{outer})	TECQ < 1.4dB	SOMA			-4.4	dBm	
	1.4dB <= TECQ <= 3.4dB				-6.2+TECQ		
Stressed Receiver Sensitivity (OMA _{outer}) Per Lane		SRS			-1.8	dBm	2
Conditions of Stressed Receiver Sensitivity Test							
Stressed Eye Closure for PAM4 (SECQ) Per Lane Under Test		SECQ		4.4		dB	
OMA _{outer} of Each Aggressor Lane				3.5		dB	

Notes:

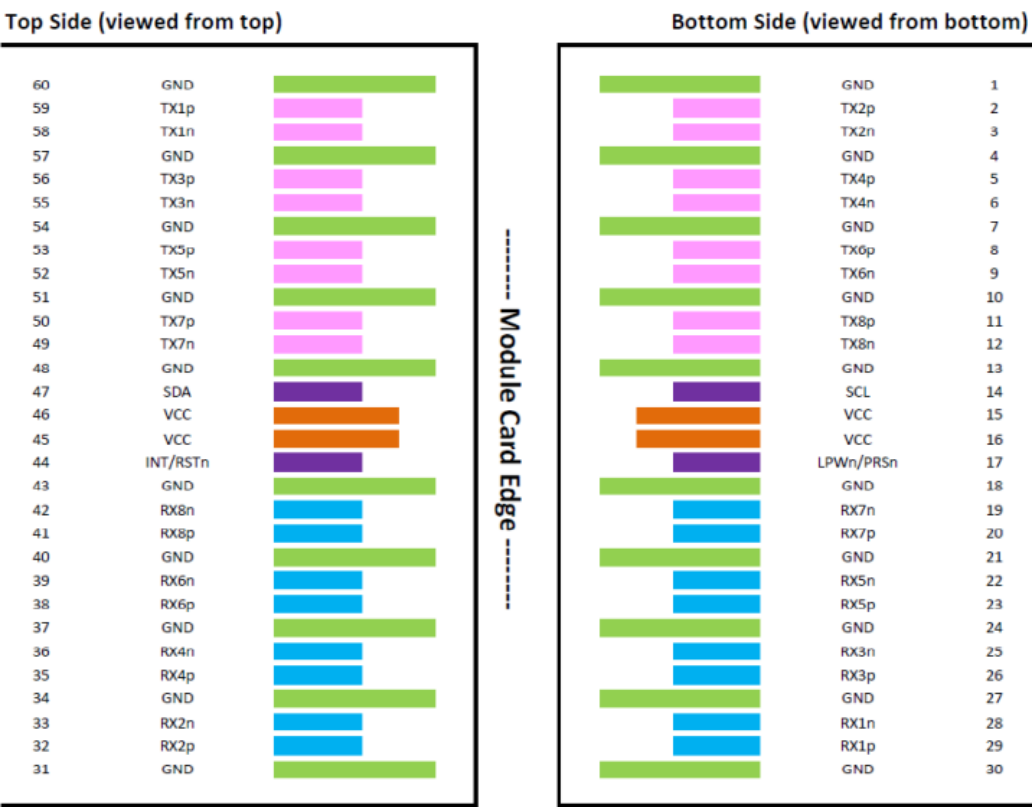
1. RMS spectral width is the standard deviation of the spectrum.
2. Measured with conformance test signal at TP3 for the BER = 2.4x10⁻⁴.

Pin Descriptions

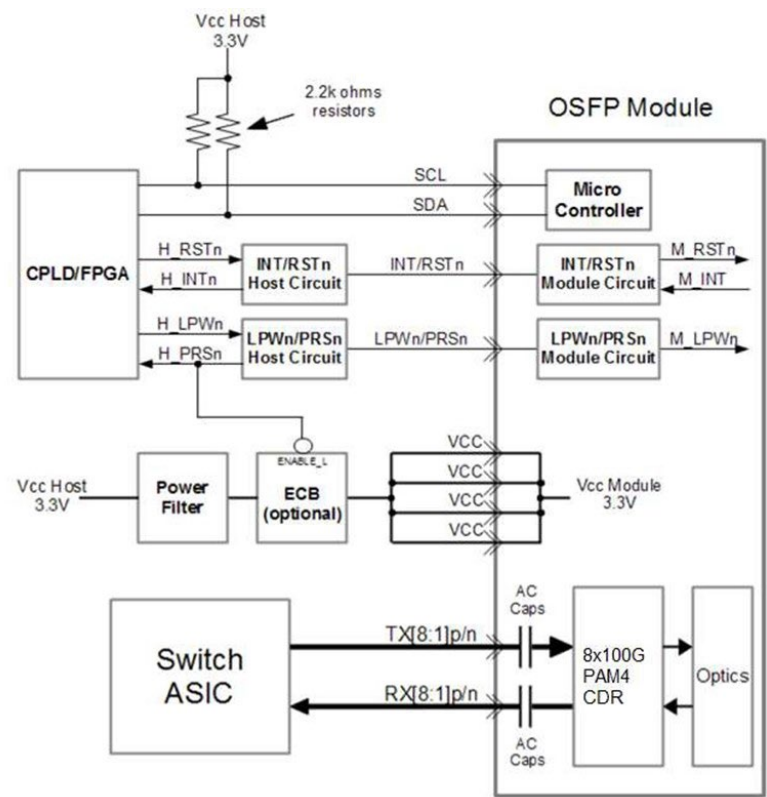
Pin	Logic	Symbol	Name/Description	Notes
1		GND	Module Ground.	
2	CML-I	Tx2+	Transmitter Non-Inverted Data.	
3	CML-I	Tx2-	Transmitter Inverted Data.	
4		GND	Module Ground.	
5	CML-I	Tx4+	Transmitter Non-Inverted Data.	
6	CML-I	Tx4-	Transmitter Inverted Data.	
7		GND	Module Ground.	
8	CML-I	Tx6+	Transmitter 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	LVC MOS-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	LVC MOS-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.	

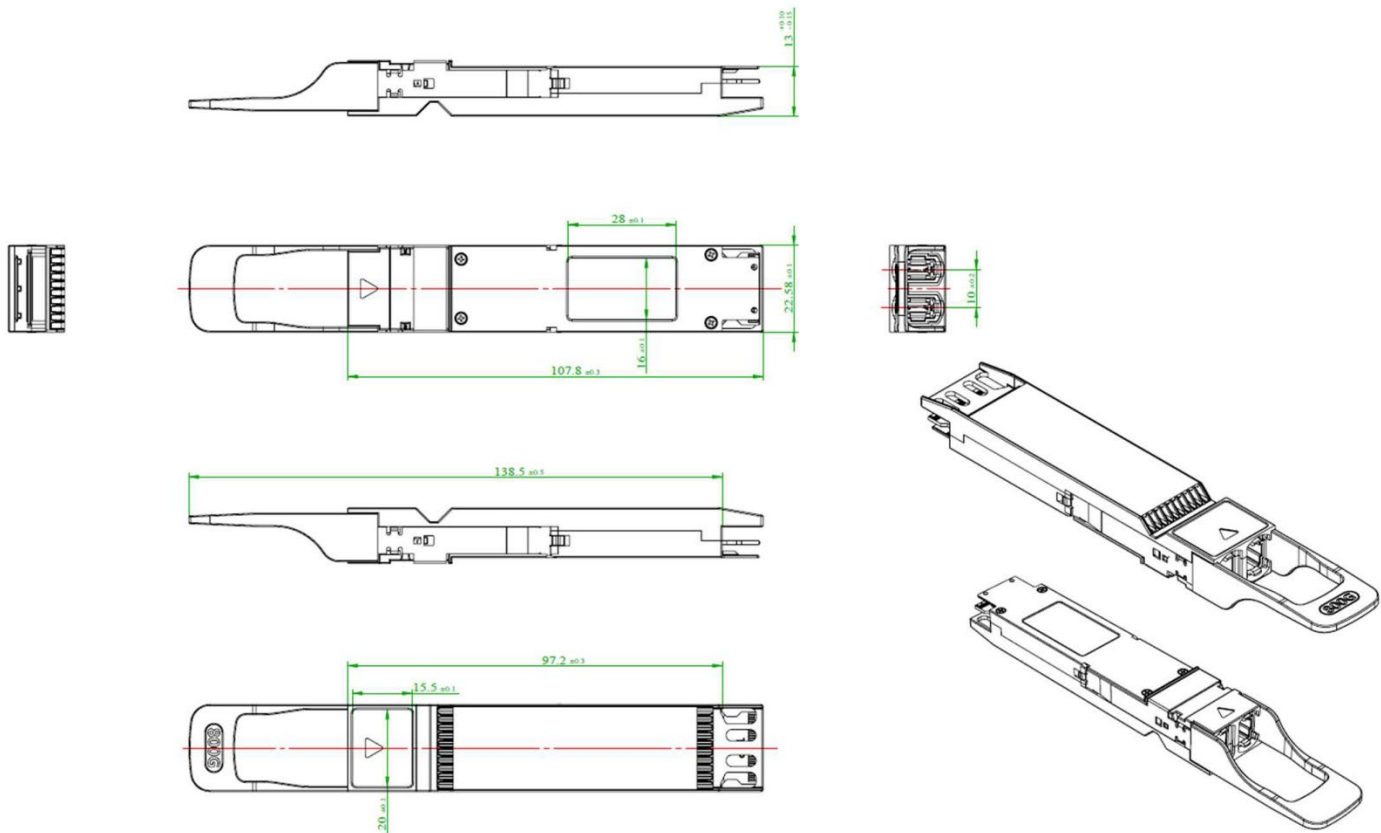
Electrical Pad Layout



Recommended OSFP Host Board Schematic



Mechanical Specifications



About 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.

