

O224-1600GB-2XDR4-LRO-MX-AO

Mellanox® Compatible 1.6T 2xDR4 PAM4 OSFP224-IHS Transceiver (SMF, 1310nm, 500m, 2xMPO-12-12, DOM, CMIS 5.3) LRO

Features

- OSFP Package
- 106GBaud Data Rate
- IHS (Close Top)
- Dual MPO-12 Optical Receptacle Connector
- Hot-Pluggable
- 3.3V Power Supply
- Up to 500m Transmission on Single-Mode Fiber
- CMIS 5.3 Compliant
- RoHS Compliant and Lead-Free
- Operating Temperature: 0 to 70 Celsius



Applications

- 2x800GBase Ethernet
- 16x100GBase Ethernet
- InfiniBand

Product Description

This Mellanox® compatible OSFP224-IHS transceiver provides 1600GBase-2xDR4 throughput up to 500m over single-mode fiber (SMF) PAM4 using a wavelength of 1310nm via a 2xMPO-12-12 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. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Ambient Temperature	Tstg	-40		85	°C	
Relative Humidity – Storage	RHs	0		95	%	1
Relative Humidity – Operating	RHo	0		85	%	1
Module Supply Voltage	Vcc	-0.5		3.6	V	

Notes:

1. Non-condensing.
2. Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Case Operating Temperature	Tc	0	25	70	°C	
Module Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Consumption	PC			18	W	
PAM4 Signaling Rate Per Lane	SR		106.25		GBaud	1

Notes:

1. Range: ± 100 ppm.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter (Host Rx)						
Tx_Data Differential Input Voltage	VIN			880	mV	
Tx_Data Differential Input Impedance	ZIN		93		Ω	
Signaling Rate Per Lane	SR		106.25		GBaud	1
Receiver						
Rx_Data Differential Output Voltage	VOUT			TBD	mV	
Rx_Data Differential Output Impedance	ZOUT		93		Ω	2
Signaling Rate Per Lane	SR		106.25		GBaud	1

Notes:

1. Range: ± 50 ppm.
2. $\pm 8\%$.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling Rate Per Lane		106.25 ± 50ppm			GBd	
Laser Type		DFB+SiPho PIC				
Lane Wavelength	λ	1304.5		1317.5	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power Per Lane	POUT	-3.3		4	dBm	
Outer Optical Modulation Amplitude	OMOuter	-0.1		4.2	dBm	1
		-1+TDECQ		4.2	dBm	2
Transmitter and Dispersion Penalty Eye Closure for PAM4	TDECQ			3.4	dB	3
Optical Output with Tx Off Per Lane	POFF			-15	dBm	
Extinction Ratio	ER	3.5			dB	3
Transmitter Reflectance	RFL			-26	dB	
Receiver						
Signaling Rate Per Lane	SR	106.25 ± 50ppm			GBd	
Lane Wavelength	λ	1304.5		1317.5	nm	
Receiver Sensitivity (OMOuter) Per Lane	SEN	-3.4		4.2	dBm	4, 6
		-4.3+TECQ		4.2	dBm	5, 6
Average Receiver Power Per Lane	PIN	-6.3		4	dBm	6
Damage Threshold Per Lane		5			dBm	
Receiver Reflectance	RFL			-26	dB	

Notes:

1. For TDECQ<0.9dB
2. For 0.9dB≤TDECQ≤3.4dB.
3. Test with SSPRQ pattern, the reference equalizer is 15-tap FFE.
4. For TECQ<0.9dB
5. For 0.9dB≤TECQ≤3.4dB.
6. PAM4 Signaling rate per lane 106.25GBaud, $6.4E^{-5}$ and PRBS $2^{31}-1$.

Pin Descriptions

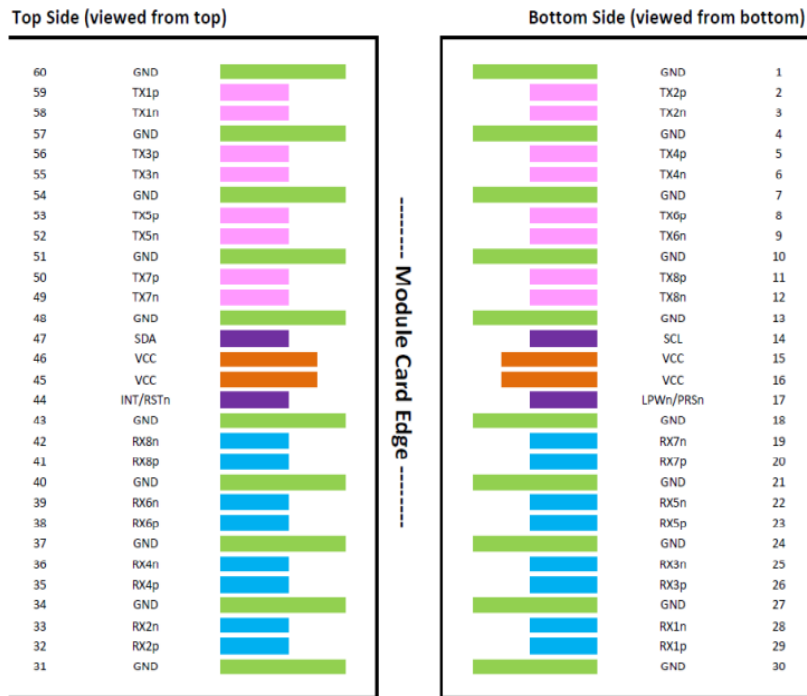
Pin	Logic	Symbol	Name/Description	Direction	Plug Sequence	Notes
1		GND	Module Ground.		1	
2	CML-I	TX2P	CH2 Transmitter Data Non-Inverted.	Input from Host	3	
3	CML-I	TX2N	CH2 Transmitter Data Inverted.	Input from Host	3	
4		GND	Module Ground.		1	
5	CML-I	TX4P	CH4 Transmitter Data Non-Inverted.	Input from Host	3	
6	CML-I	TX4N	CH4 Transmitter Data Inverted.	Input from Host	3	
7		GND	Module Ground.		1	
8	CML-I	TX6P	CH6 Transmitter Data Non-Inverted.	Input from Host	3	
9	CML-I	TX6N	CH6 Transmitter Data Inverted.	Input from Host	3	
10		GND	Module Ground.		1	
11	CML-I	TX8P	CH8 Transmitter Data Non-Inverted.	Input from Host	3	
12	CML-I	TX8N	CH8 Transmitter Data Inverted.	Input from Host	3	
13		GND	Module Ground.		1	
14	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock.	Bi-Directional	3	1
15		Vcc	+3.3V Power Supply.	Power from Host	2	
16		Vcc	+3.3V Power Supply.	Power from Host	2	
17	Multi-Level	LPWN/PRSN	Low-Power Mode/Module Present.	Bi-Directional	3	2
18		GND	Module Ground.		1	
19	CML-O	RX7N	CH7 Receiver Data Inverted.	Output to Host	3	
20	CML-O	RX7P	CH7 Receiver Data Non-Inverted.	Output to Host	3	
21		GND	Module Ground.		1	
22	CML-O	RX5N	CH5 Receiver Data Inverted.	Output to Host	3	
23	CML-O	RX5P	CH5 Receiver Data Non-Inverted.	Output to Host	3	
24		GND	Module Ground.		1	
25	CML-O	RX3N	CH3 Receiver Data Inverted.	Output to Host	3	
26	CML-O	RX3P	CH3 Receiver Data Non-Inverted.	Output to Host	3	
27		GND	Module Ground.		1	
28	CML-O	RX1N	CH1 Receiver Data Inverted.	Output to Host	3	
29	CML-O	RX1P	CH1 Receiver Data Non-Inverted.	Output to Host	3	
30		GND	Module Ground.		1	
31		GND	Module Ground.		1	
32	CML-O	RX2P	CH2 Receiver Data Non-Inverted.	Output to Host	3	
33	CML-O	RX2N	CH2 Receiver Data Inverted.	Output to Host	3	
34		GND	Module Ground.		1	
35	CML-O	RX4P	CH4 Receiver Data Non-Inverted.	Output to Host	3	
36	CML-O	RX4N	CH4 Receiver Data Inverted.	Output to Host	3	

37		GND	Module Ground.		1	
38	CML-O	RX6P	CH6 Receiver Data Non-Inverted.	Output to Host	3	
39	CML-O	RX6N	CH6 Receiver Data Inverted.	Output to Host	3	
40		GND	Module Ground.		1	
41	CML-O	RX8P	CH8 Receiver Data Non-Inverted.	Output to Host	3	
42	CML-O	RX8N	CH8 Receiver Data Inverted.	Output to Host	3	
43		GND	Module Ground.		1	
44	Multi-Level	INT/RSTN	Module Interrupt/Module Reset.	Bi-Directional	3	3
45		Vcc	+3.3V Power Supply.	Power from Host	2	
46		Vcc	+3.3V Power Supply.	Power from Host	2	
47	LVCMOS-I/O	SDA	2-Wire Serial Interface Data.	Bi-Directional	3	1
48		GND	Module Ground.		1	
49	CML-I	TX7N	CH7 Transmitter Data Inverted.	Input from Host	3	
50	CML-I	TX7P	CH7 Transmitter Data Non-Inverted.	Input from Host	3	
51		GND	Module Ground.		1	
52	CML-I	TX5N	CH5 Transmitter Data Inverted.	Input from Host	3	
53	CML-I	TX5P	CH5 Transmitter Data Non-Inverted.	Input from Host	3	
54		GND	Module Ground.		1	
55	CML-I	TX3N	CH3 Transmitter Data Inverted.	Input from Host	3	
56	CML-I	TX3P	CH3 Transmitter Data Non-Inverted.	Input from Host	3	
57		GND	Module Ground.		1	
58	CML-I	TX1N	CH1 Transmitter Data Inverted.	Input from Host	3	
59	CML-I	TX1P	CH1 Transmitter Data Non-Inverted.	Input from Host	3	
60		GND	Module Ground.		1	

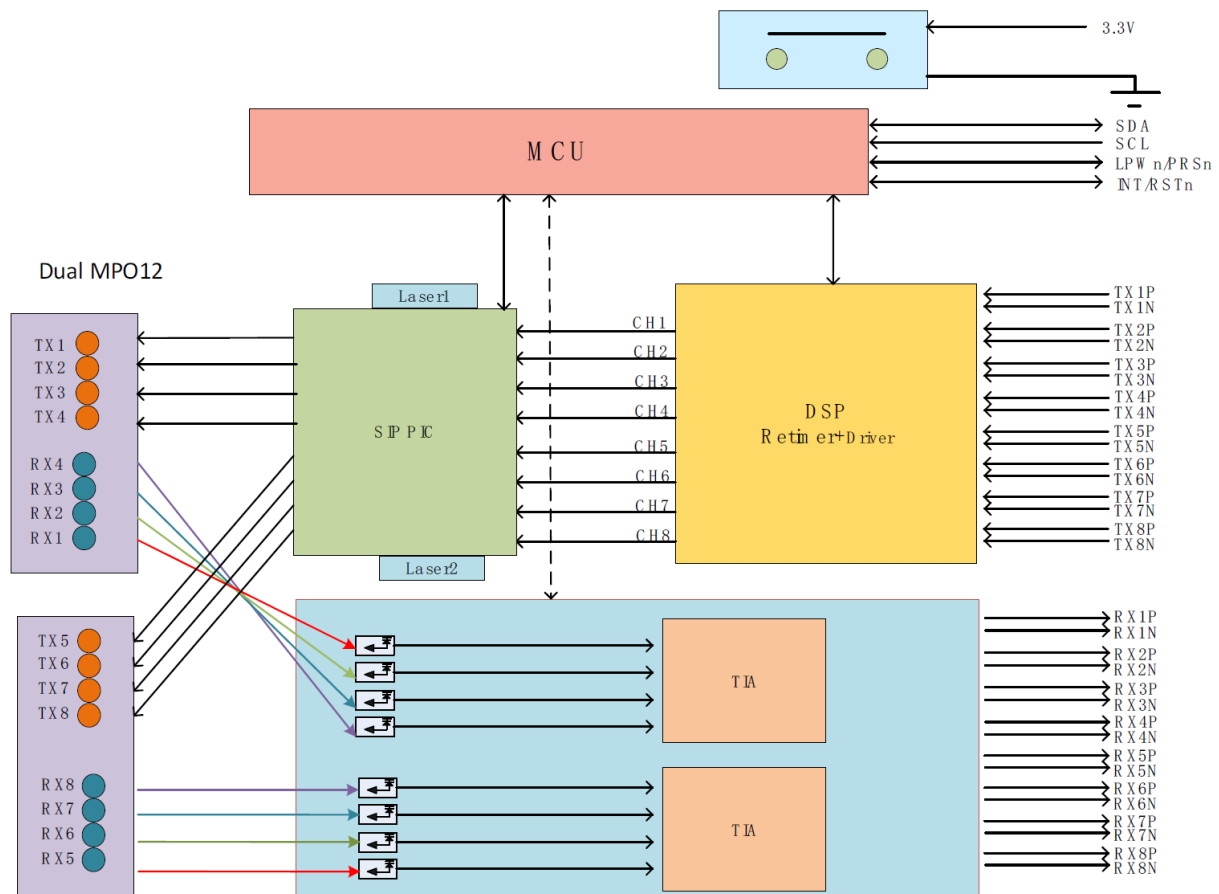
Notes:

1. Open-drain with pull-up resistor on host.
2. LPWn/PRSn is a dual function signal that allows the host to signal Low-Power Mode and for the module to indicate that the module is present.
3. INT/RSTn is a dual function signal that allows the module to raise an interrupt to the host and allows the host to reset the module.

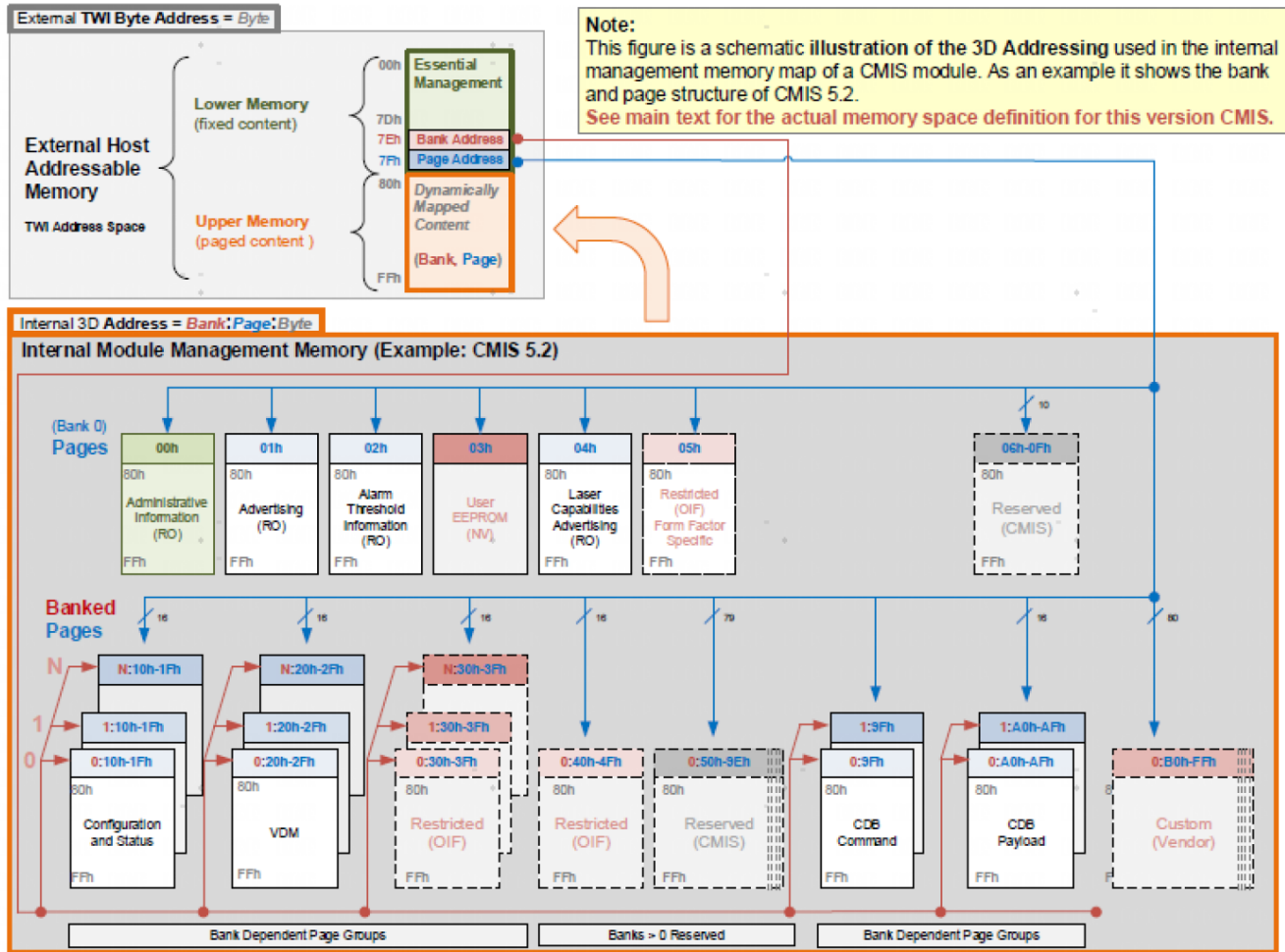
Electrical Pad Layout



Block Diagram



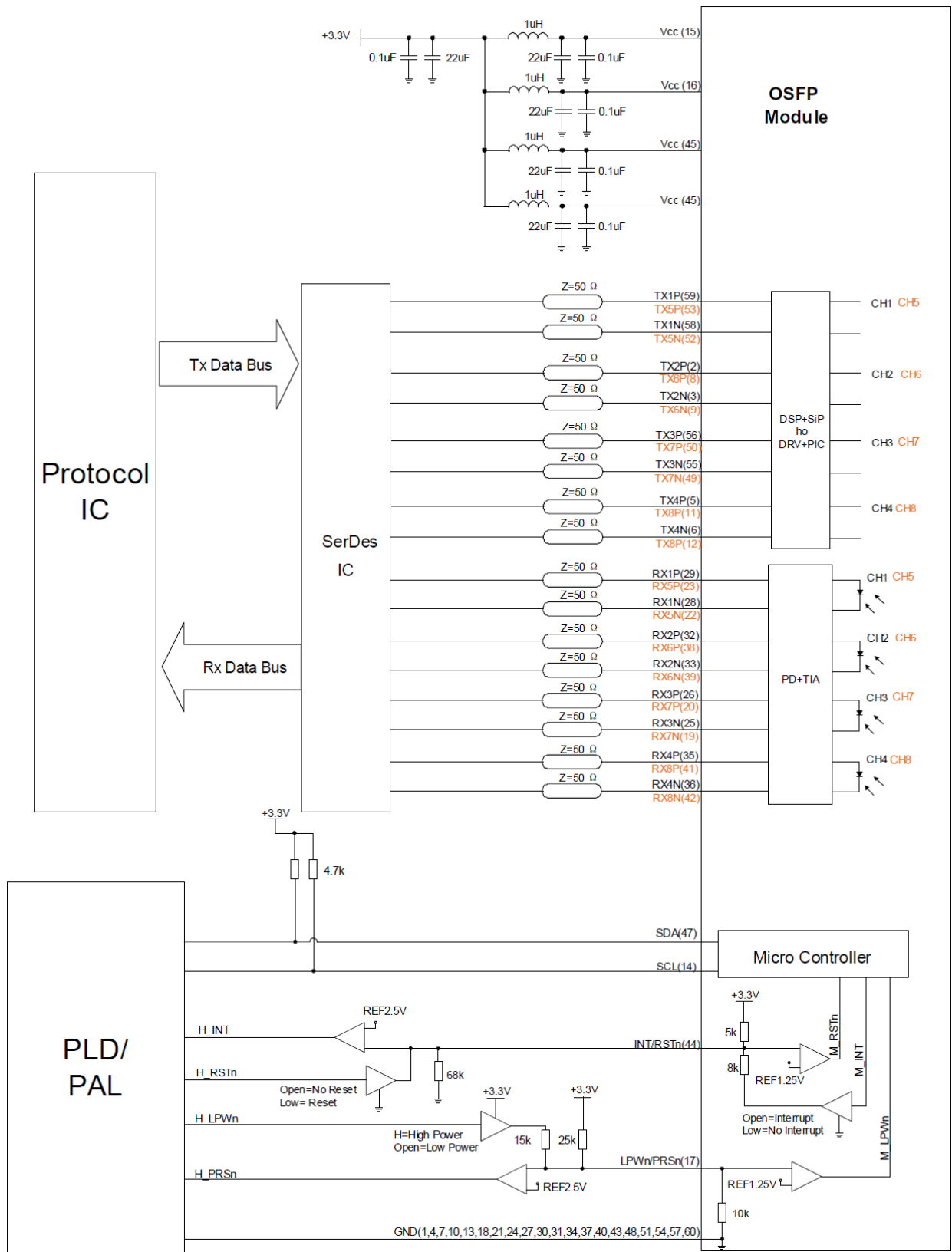
2-Wire Serial Memory Map



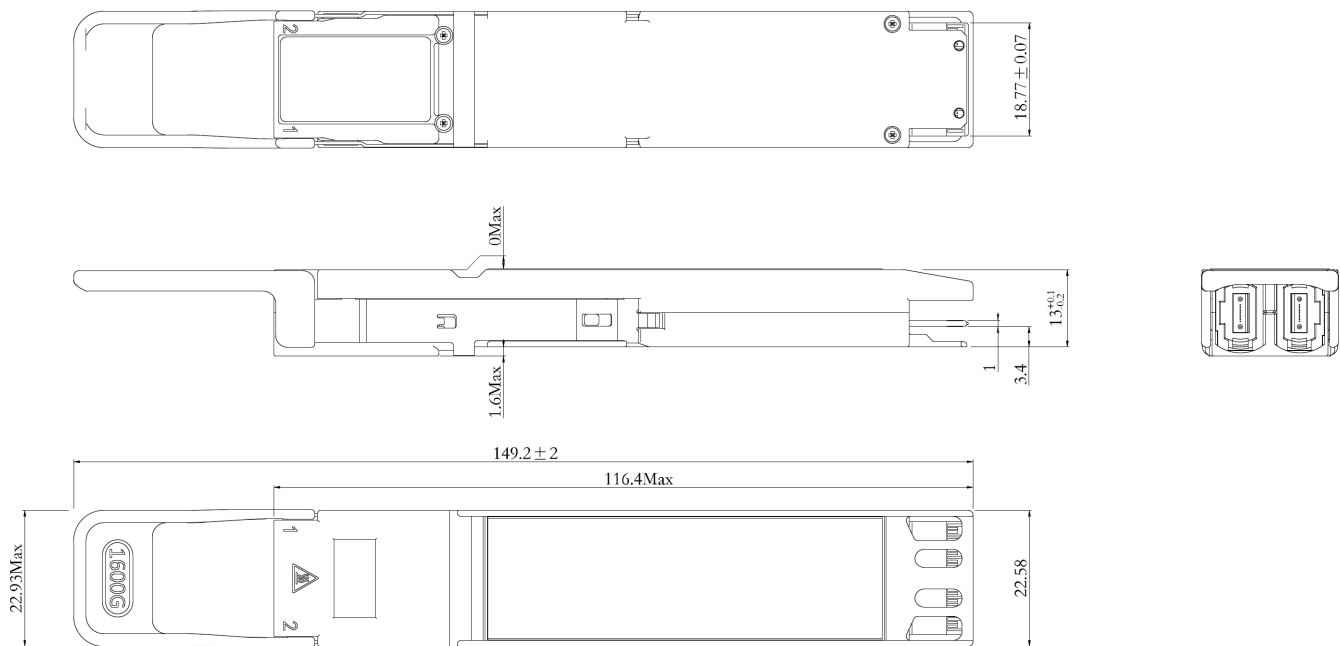
Notes:

1. For detailed definitions of the registers, please refer to Common Management Interface Specifications for 8/16x Pluggable Transceivers R5.3.

Host Board



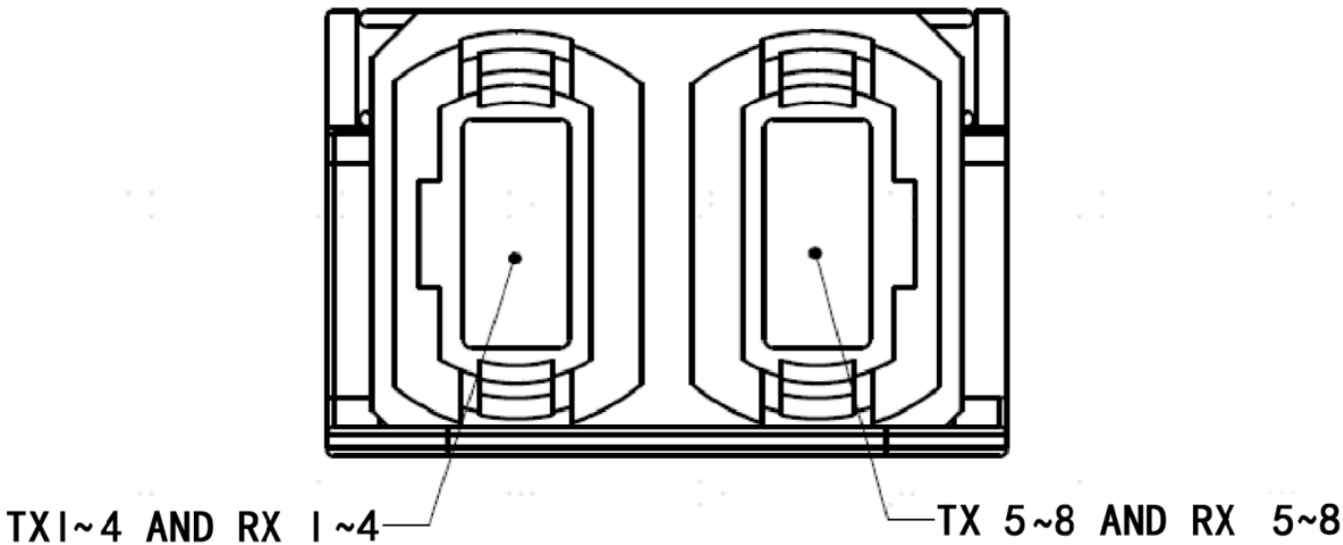
Mechanical Specifications



Notes:

- 1. Tolerance: ± 0.1 mm.
- 2. Others according with OSFP MSA.
- 3. Optical port according with Fiber Connector Specifications.

Optical Lane Assignment



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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