

## OSFPRHS-800GB-2XSR4-C

MSA and TAA 800GBase-2xSR4 PAM4 OSFP112 RHS Transceiver (MMF, 850nm, 50m, 2xMPO, DOM, CMIS 5.0)

### Features:

- Compliant with IEEE 802.3-2022: 8x100GBASE-VR1 Optical Interface
- Compliant with IEEE 802.3ck-2022: 8x100GAUI-1 C2M Electrical Interface
- VCSEL Transmitter and PIN PD Receiver
- Supports 850Gbps
- Supports Both Ethernet and InfiniBand NDR
- OSFP MSA Compliant
- Dual MPO-12 Connector APC
- Compliant with CMIS 5.0
- Operating Temperature: 0 to 70 Celsius
- Class 1 Laser
- RoHS Compliant and Lead-Free



### Applications:

- 800GBase Ethernet

### Product Description

This MSA compliant OSFP transceiver provides 800GBase-2xSR4 throughput up to 50m over multi-mode fiber (MMF) PAM4 using a wavelength of 850nm via a 2xMPO 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. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' 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.")



### 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 <sub>DIP</sub> -V <sub>DIN</sub>			1	V	
Control Input Voltage	V <sub>I</sub>	-0.3		Vcc+0.5	V	
Control Output Current	I <sub>O</sub>	-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		V <sub>CC</sub>	3.135	3.3	3.465	V	
Instantaneous Peak Current at Hot Plug		I <sub>CC_IP</sub>			6400	mA	
Sustained Peak Current at Hot Plug		I <sub>CC_SP</sub>			5328	mA	
Maximum Power Dissipation		PD			16	W	
Maximum Power Dissipation (Low-Power Mode)		PD <sub>LP</sub>			2	W	
Control Input Voltage - High		V <sub>IH</sub>	V <sub>CC</sub> *0.7		V <sub>CC</sub> +0.3	V	
Control Input Voltage - Low		V <sub>IL</sub>	-0.3		V <sub>CC</sub> *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 (V <sub>CM<sub>LF</sub></sub> )		32			mV	
	Full-Band (V <sub>CM<sub>FB</sub></sub> )		80			mV	
Differential-Mode to Common-Mode Return Loss		RL <sub>cd</sub>	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 <sub>L</sub>	-4.6		4.0	dBm	
Outer Optical Modulation Amplitude (OMA <sub>outer</sub> ) Per Lane	(TECQ, TDECQ) <= 1.8 dB	OMA <sub>outer</sub>	-2.6		3.5	dBm	
	1.8< (TECQ, TDECQ) <= 4.4 dB		-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 <sub>14</sub> 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 <sub>D</sub>	5			dBm	
Average Receive Power Per Lane		AOP <sub>R</sub>	-6.3		4	dBm	
Receive Power (OMA <sub>outer</sub> ) Per Lane		OMA <sub>R</sub>			3.5	dBm	
Receiver Reflectance		RR			-15	dB	
Receiver Sensitivity (OMA <sub>outer</sub> )	TECQ < 1.4 dB	SOMA			-4.4	dBm	
	1.4 dB <=TECQ<=3.4 dB				-6.2+TECQ		
Stressed Receiver Sensitivity (OMA <sub>outer</sub> ) 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 <sub>outer</sub> of Each Aggressor Lane				3.5		dB	

### Notes:

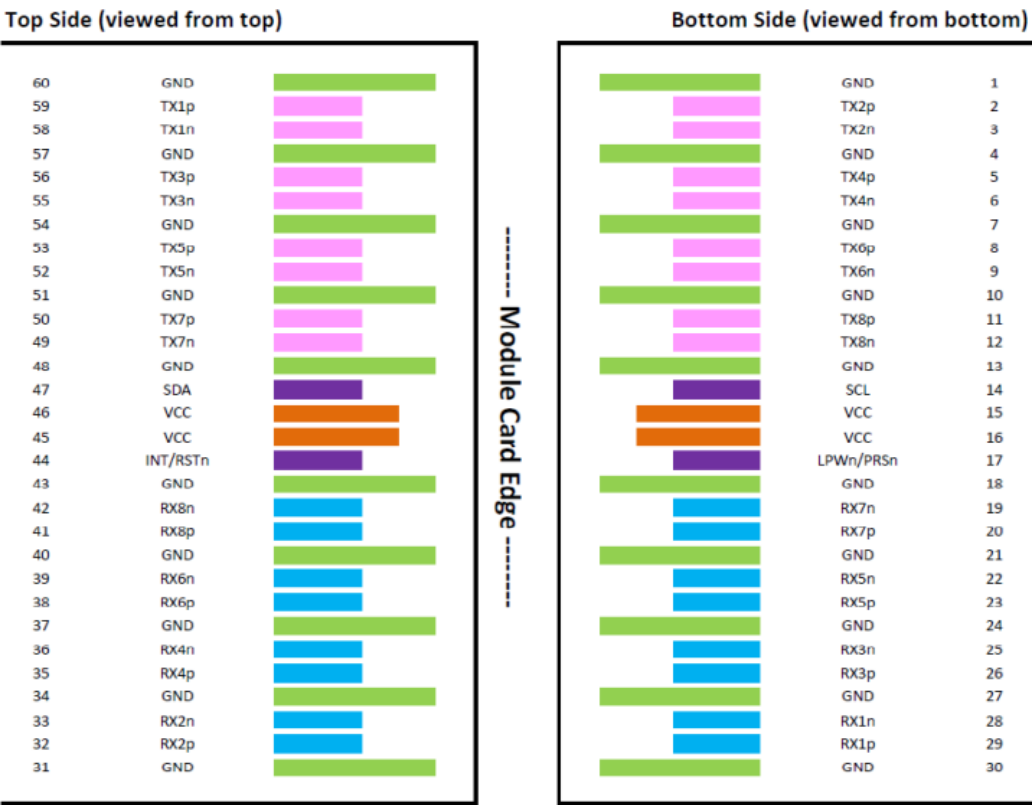
1. RMS spectral width is the standard deviation of the spectrum.
2. Measured with conformance test signal at TP3 for the BER = 2.4x10<sup>-4</sup>.

## Pin Descriptions

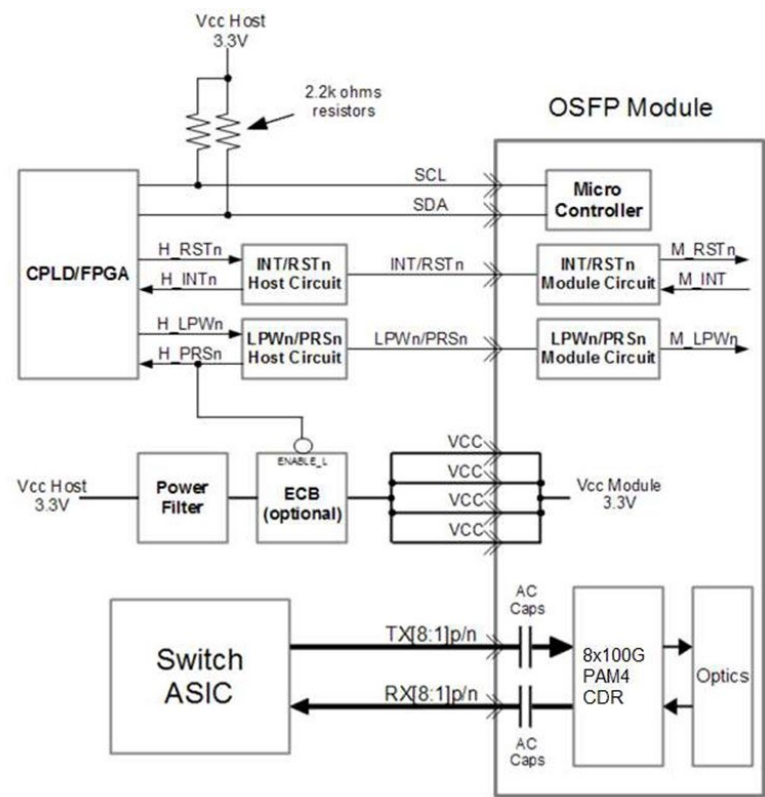
Pin	Logic	Symbol	Name/Description	Notes
1		GND	Module Ground.	
2	CML-I	Tx2+	Transmitter Non-Inverted Data.	
3	CML-I	Tx2-	Transmitter Inverted Data.	
4		GND	Module Ground.	
5	CML-I	Tx4+	Transmitter Non-Inverted Data.	
6	CML-I	Tx4-	Transmitter Inverted Data.	
7		GND	Module Ground.	
8	CML-I	Tx6+	Transmitter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

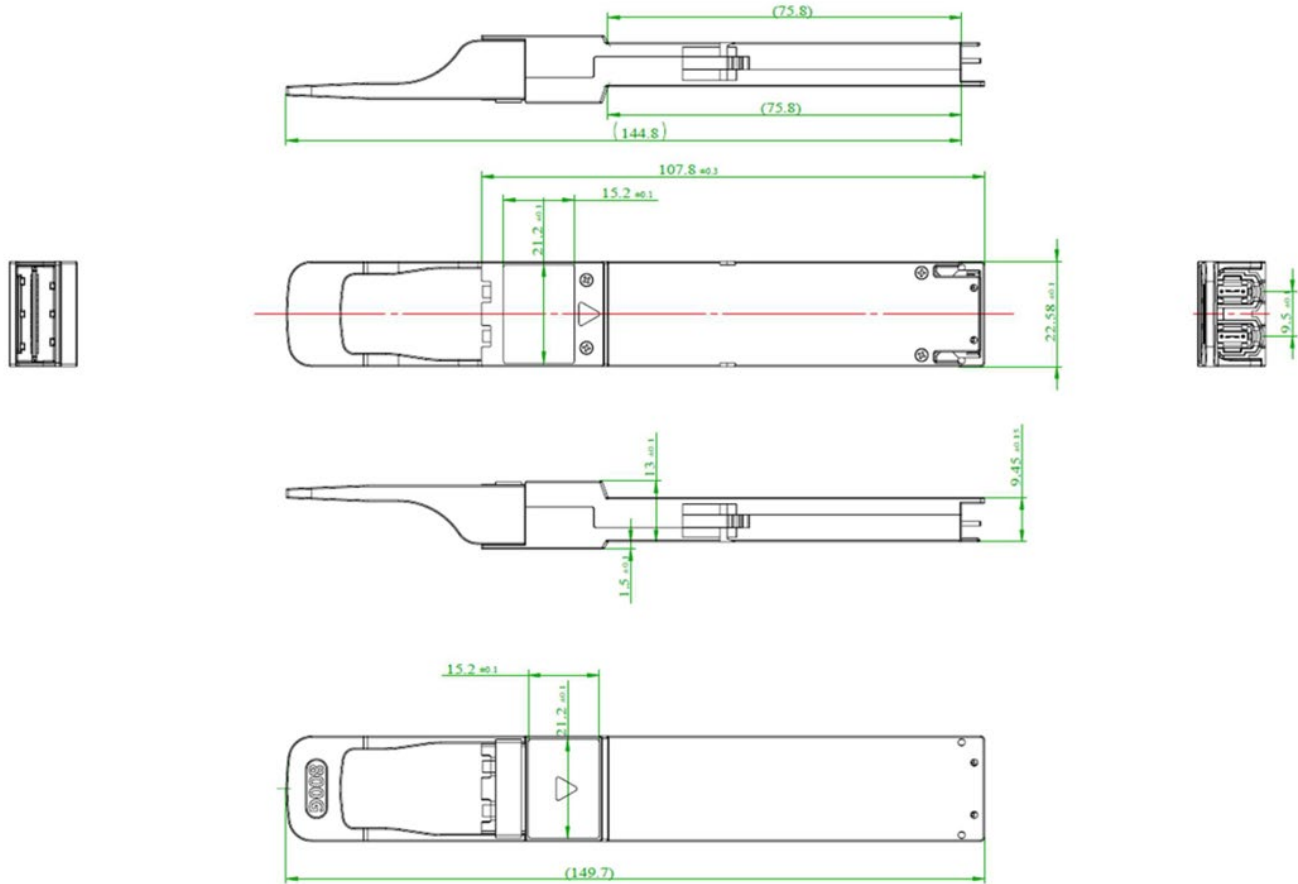
Electrical Pad Layout



Recommended OSFP Host Board Schematic



Mechanical Specifications





## About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

## Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

## Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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