

OSFPRHS-800GB-2XDR4-C

MSA and TAA 800GBase-2xDR4 PAM4 OSFP112 RHS Transceiver (SMF, 1310nm, 500m, 2xMPO, DOM, CMIS 5.0)

Features:

- OSFP MSA Compliant
- Supports Both Ethernet and InfiniBand NDR
- Compliant with IEEE 802.3cu-2021: 8x100GBASE-DR Optical Interface
- Compliant with IEEE 802.3ck-2022: 8x100GAUI-1 C2M Electrical Interface
- Supports 850Gbps
- EML Transmitter and PIN PD Receiver
- Compliant with CMIS 5.0
- Operating Temperature: 0 to 70 Celsius
- Dual MPO-12 Connector APC
- Class 1 Laser
- RoHS Compliant and Lead-Free



Applications:

- 800GBase Ethernet

Product Description

This MSA compliant OSFP112 RHS transceiver provides 800GBase-2xDR4 throughput up to 500m over single-mode fiber (SMF) PAM4 using a wavelength of 1310nm 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 | |
| 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 | I _{CC_IP} | | | 6600 | mA | |
| Sustained Peak Current at Hot Plug | I _{CC_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 | V _{IH} | Vcc*0.7 | | Vcc+0.3 | V | |
| Control Input Voltage – Low | V _{IL} | -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 | | 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 | Short-Mode | | | 600 | mV | |

| | | | | | | | |
|--|-----------|------|----------------|--|------|----|--|
| Output 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 | |

Notes:

1. Compliant with IEEE802.3ck C2M.

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 | |
| InitMode, ResetL, and ModSelL | VIL | -0.3 | 0.8 | V | |
| | VIH | 2 | Vcc+0.3 | V | |
| IntL | VOL | 0 | 0.4 | V | |
| | VOH | Vcc-0.5 | Vcc+0.3 | V | |

Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|------------------|--------------|------|-------------------------|-------|-------|
| Transmitter | | | | | | |
| Wavelength | λ_C | 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 (OMA _{outer}) Per Lane | TOMA | -0.8 | | 4.2 | dBm | |
| Launch Power in OMA _{outer} 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 _{15.5OMA} | RIN | | | -136 | dB/Hz | |
| Optical Return Loss Tolerance | ORLT | | | 15.5 | dB | |
| Transmitter Reflectance | TR | | | -26 | dB | 2 |
| Receiver (TP4) | | | | | | |
| Wavelength | λ_C | 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 (OMA _{outer}) Per Lane | OMA _R | | | 4.2 | dBm | |
| Receiver Reflectance | RR | | | -26 | dB | |
| Receiver Sensitivity (OMA _{outer}) Per Lane | SOMA | | | Max. (-3.9, SECQ – 5.3) | dBm | 3 |
| Stressed Receiver Sensitivity (OMA _{outer}) 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 (OMA_{outer}), 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 = 2.4×10^{-4} .

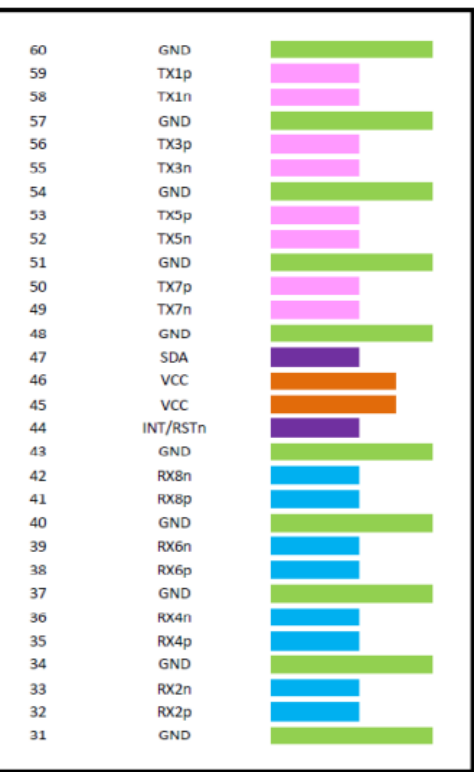
Pin Descriptions

| 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. | |

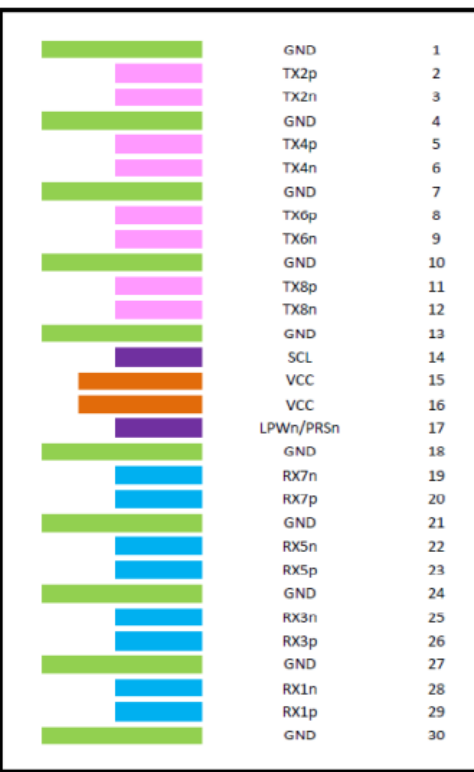
| | | | | |
|----|-------------|----------|--------------------------------|--|
| 37 | | GND | Module Ground. | |
| 38 | CML-O | Rx6+ | Receiver Non-Inverted Data. | |
| 39 | CML-O | Rx6- | Receiver Inverted Data. | |
| 40 | | GND | Module Ground. | |
| 41 | CML-O | Rx8+ | Receiver Non-Inverted Data. | |
| 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

Top Side (viewed from top)

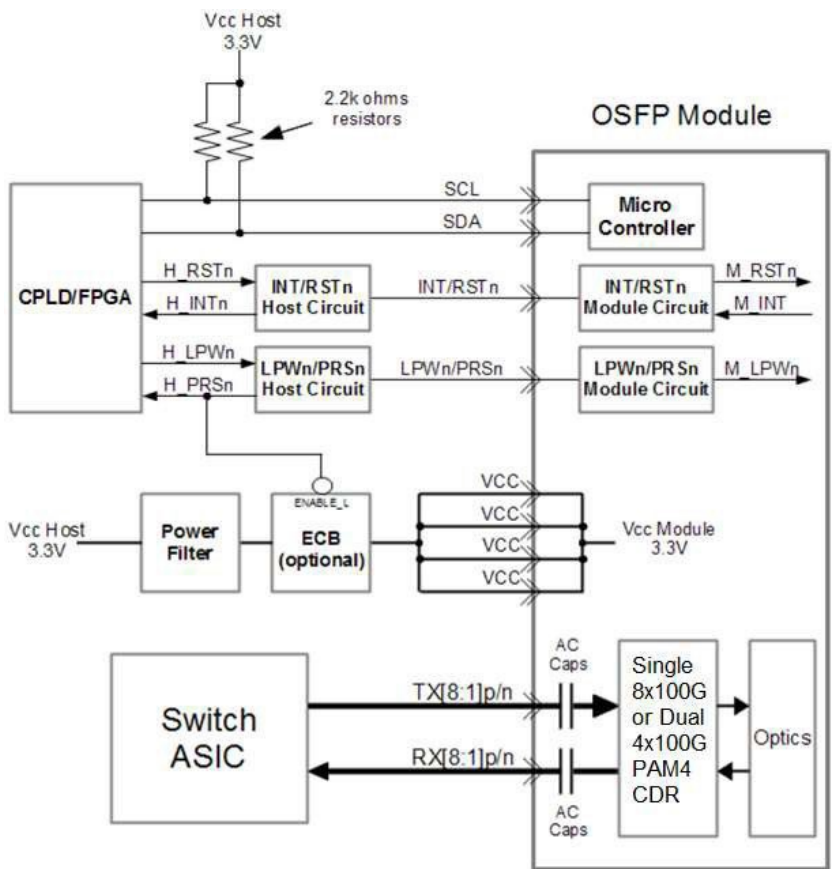


Bottom Side (viewed from bottom)

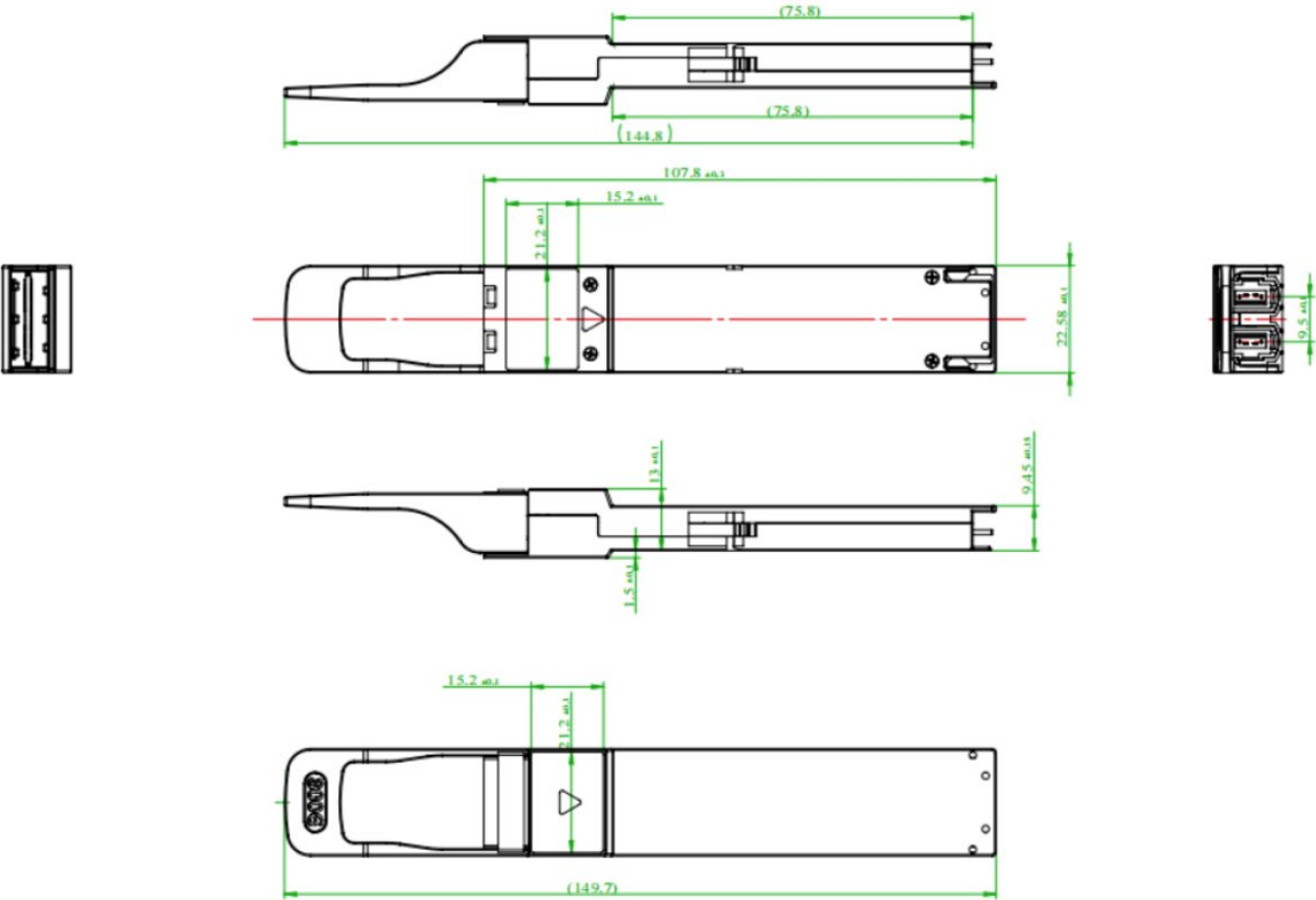


----- Module Card Edge -----

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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