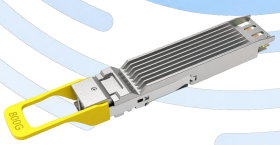
WESTERN OPTRONICS



# CP-OSFP-800G-2FR4

## 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver

The Western Optronics CP-OSFP-800G-2FR4 is an 800Gb/s OSFP silicon photonics optical module designed for 2 km optical communication applications. On the transmitter side, the module converts 8 channels of 100G (PAM4) electrical input data into 8 optical channels, each capable of 100G operation, for an aggregate data rate of 800G. On the receiver side, the module converts 8 optical channels of 100G each into 8 channels of 100G (PAM4) electrical output data.

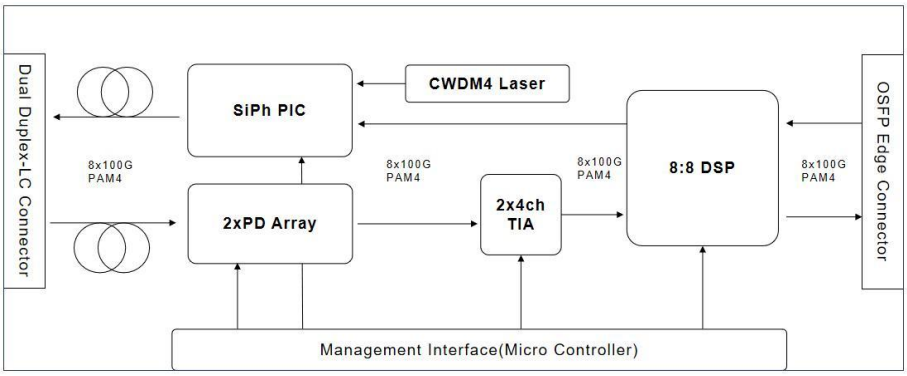
### Product Selection

| Part Number | Operating case temperature | DDMI | Package |
|---|---|---|---|
| CP-OSFP-800G-2FR4 | Commercial (0 to 70°C) | Yes | OSFP Finned Top |

### Regulatory Compliance

- ESD compatible with MIL-STD-883, Method 3015.4 / JESD22-A114-A (HBM)
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and EN (IEC) 60825-1
- RoHS compliance

### Transceiver Block Diagram




### FEATURES

Compliant with OSFP MSA

CMIS 5.0 compliance

53.125 GBd PAM4 × 8-channel 800GAUI-8 C2M electrical interface

53.125 GBd PAM4 × 8-channel 800G-2×FR4 optical interface

Up to 2 km reach on SMF

Dual Duplex-LC connector

Single 3.3 V power supply

Power dissipation <15 W

Case temperature: 0 to 70°C

### APPLICATION

2×400GBASE-FR4

InfiniBand

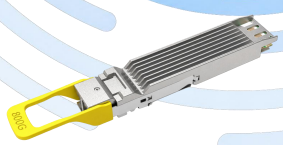


# CP-OSFP-800G-2FR4

## 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver

### Pin Descriptions

| Pin | Symbol | Description | Logic | Plug Sequence |
|---|---|---|---|---|
| 1 | GND | Ground | | 1 |
| 2 | TX2p | Transmitter Data Non-Inverted | CML-I | 3 |
| 3 | TX2n | Transmitter Data Inverted | CML-I | 3 |
| 4 | GND | Ground | | 1 |
| 5 | TX4p | Transmitter Data Non-Inverted | CML-I | 3 |
| 6 | TX4n | Transmitter Data Inverted | CML-I | 3 |
| 7 | GND | Ground | | 1 |
| 8 | TX6p | Transmitter Data Non-Inverted | CML-I | 3 |
| 9 | TX6n | Transmitter Data Inverted | CML-I | 3 |
| 10 | GND | Ground | | 1 |
| 11 | TX8p | Transmitter Data Non-Inverted | CML-I | 3 |
| 12 | TX8n | Transmitter Data Inverted | CML-I | 3 |
| 13 | GND | Ground | | 1 |
| 14 | SCL | 2-wire Serial interface clock | LVCMOS-I/O | 3 |
| 15 | VCC | +3.3V Power | | 2 |
| 16 | VCC | +3.3V Power | | 2 |
| 17 | LPWn/PRSn | Low-Power Mode / Module Present | Multi-Level | 3 |
| 18 | GND | Ground | | 1 |
| 19 | RX7n | Receiver Data Inverted | CML-O | 3 |
| 20 | RX7p | Receiver Data Non-Inverted | CML-O | 3 |
| 21 | GND | Ground | | 1 |
| 22 | RX5n | Receiver Data Inverted | CML-O | 3 |
| 23 | RX5p | Receiver Data Non-Inverted | CML-O | 3 |
| 24 | GND | Ground | | 1 |
| 25 | RX3n | Receiver Data Inverted | CML-O | 3 |
| 26 | RX3p | Receiver Data Non-Inverted | CML-O | 3 |
| 27 | GND | Ground | | 1 |
| 28 | RX1n | Receiver Data Inverted | CML-O | 3 |
| 29 | RX1p | Receiver Data Non-Inverted | CML-O | 3 |
| 30 | GND | Ground | | 1 |

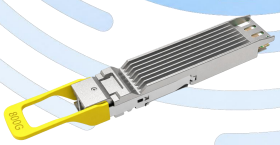


# CP-OSFP-800G-2FR4

## 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver

### Pin Descriptions (continued)

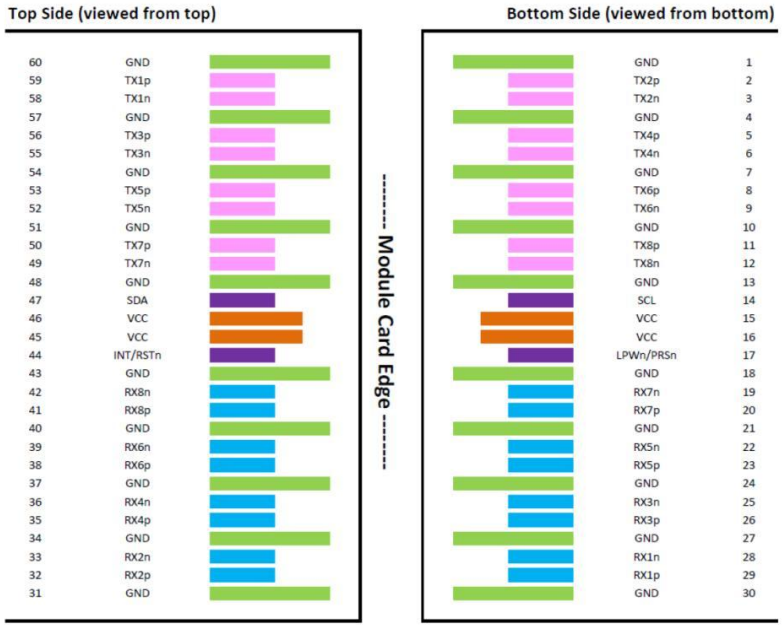
| Pin | Symbol | Description | Logic | Plug Sequence |
|---|---|---|---|---|
| 31 | GND | Ground | | 1 |
| 32 | RX2p | Receiver Data Non-Inverted | CML-O | 3 |
| 33 | RX2n | Receiver Data Inverted | CML-O | 3 |
| 34 | GND | Ground | | 1 |
| 35 | RX4p | Receiver Data Non-Inverted | CML-O | 3 |
| 36 | RX4n | Receiver Data Inverted | CML-O | 3 |
| 37 | GND | Ground | | 1 |
| 38 | RX6p | Receiver Data Non-Inverted | CML-O | 3 |
| 39 | RX6n | Receiver Data Inverted | CML-O | 3 |
| 40 | GND | Ground | | 1 |
| 41 | RX8p | Receiver Data Non-Inverted | CML-O | 3 |
| 42 | RX8n | Receiver Data Inverted | CML-O | 3 |
| 43 | GND | Ground | | 1 |
| 44 | INT/RSTn | Module Interrupt / Module Reset | Multi-Level | 3 |
| 45 | VCC | +3.3V Power | | 2 |
| 46 | VCC | +3.3V Power | | 2 |
| 47 | SDA | 2-wire Serial interface data | LVCMOS-I/O | 3 |
| 48 | GND | Ground | | 1 |
| 49 | TX7n | Transmitter Data Inverted | CML-I | 3 |
| 50 | TX7p | Transmitter Data Non-Inverted | CML-I | 3 |
| 51 | GND | Ground | | 1 |
| 52 | TX5n | Transmitter Data Inverted | CML-I | 3 |
| 53 | TX5p | Transmitter Data Non-Inverted | CML-I | 3 |
| 54 | GND | Ground | | 1 |
| 55 | TX3n | Transmitter Data Inverted | CML-I | 3 |
| 56 | TX3p | Transmitter Data Non-Inverted | CML-I | 3 |
| 57 | GND | Ground | | 1 |
| 58 | TX1n | Transmitter Data Inverted | CML-I | 3 |
| 59 | TX1p | Transmitter Data Non-Inverted | CML-I | 3 |
| 60 | GND | Ground | | 1 |



# CP-OSFP-800G-2FR4

## 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver

### Pin-out of Connector Block on Host Board




### OSFP Control Pins

| Parameter | Function | Description |
|---|---|---|
| SCL | BiDir | 2-wire serial clock signal. Requires pull-up resistor to 3.3V on host. |
| SDA | BiDir | 2-wire serial data signal. Requires pull-up resistor to 3.3V on host. |
| LPWn/PRSn | Input/output | Dual Function Signal<br>• Low Power mode is an active-low input signal.<br>• Module Present is controlled by a pull-down resistor on the module which gets converted to an active-low output logic signal. |
| INT/RSTn | Input/output | Dual Function Signal<br>• Reset is an active-low input signal.<br>• Interrupt is an active-high output signal. |

### Absolute Maximum Ratings

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Storage Temperature | Tstg | -40 | | +85 | °C | |
| Maximum Supply Voltage | VCC | -0.5 | | 3.5 | V | |
| Operating Relative Humidity | RH | 0 | | 85 | % | Non-condensing |



# CP-OSFP-800G-2FR4

## 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver

### Recommended Operating Conditions

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Case Operating Temperature | Tc | 0 | | +70 | °C | |
| Power Supply Voltage | Vcc | 3.135 | 3.3 | +3.465 | V | |
| Power Consumption | | | | 15 | W | |
| Data Rate, each Lane | | | 53.125 | | GBd | PAM4 |
| Two Wire Serial Interface Clock Rate | | 100 | | 1000 | kHz | |
| Power Supply Noise Tolerance (10Hz - 10MHz) | | 66 | | | mV | |
| Rx Differential Data Output Load | | | 100 | | ohm | |
| Link Distance (SMF) | | | | 2 | km | |

### Electrical Characteristics

| Parameter | Test Point | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Module input (each Lane) | | | | | | |
| Signaling Rate, each lane | TP1 | 53.125 ± 100 ppm | | | GBd | |
| DC common-mode voltage tolerance | TP1 | -350 | | 2850 | mV | |
| Single-ended voltage tolerance range | TP1a | -0.4 | | 3.3 | V | |
| AC Common-Mode Voltage Tolerance<br>Low-Frequency, VCMLF<br>Full-Band, VCMLF | TP1a | <br>32<br>80 | | | mV | |
| Module stressed input tolerance | TP1a | IEEE 802.3ck D3.3 120G.3.4.3 | | | | |
| Differential Voltage pk-pk Tolerance | TP1a | 750 | | | mV | |
| Differential-mode to common-mode return loss, RLcd | TP1 | IEEE 802.3ck D3.3 Equation 120G-2 | | | dB | |
| Effective return loss, ERL | TP1 | 8.5 | | | dB | |
| Differential termination mismatch | TP1 | | | 10 | % | |
| Module output (each Lane) | | | | | | |
| Signaling Rate, each lane | TP4 | 53.125 ± 100 ppm | | | GBd | |
| Peak-to-peak AC common-mode voltage<br>Low-frequency, VCMLF<br>Full-band, VCMFB | TP4 | | | <br>32<br>80 | mV | |
| Differential peak-to-peak output voltage<br>Short mode<br>Long mode | TP4 | | | <br>600<br>845 | mV | |
| Eye Height | TP4 | 15 | | | mV | |
| Vertical Eye Closure, VEC | TP4 | | | 12 | dB | |
| Common-Mode to Differential Return Loss, Rldc | TP4 | IEEE 802.3ck Equation 120G-1 | | | dB | |
| Effective return loss, ERL | TP4 | 8.5 | | | dB | |
| Differential termination mismatch | TP4 | | | 10 | % | |
| Transition time (20% to 80%) | TP4 | 8.5 | | | ps | |
| DC common-mode output voltage | TP4 | -350 | | 2850 | mV | |

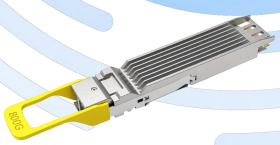



# CP-OSFP-800G-2FR4

## 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver

### Optical Characteristics - Transmitter

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Transmitter | | | | | | |
| Data Rate, each Lane | | 53.125 ± 100 ppm | | | GBd | |
| Modulation Format | | | PAM4 | | | |
| Optical Wavelength | L0<br>L1<br>L2<br>L3 | 1264.5<br>1284.5<br>1304.5<br>1324.5 | 1271<br>1291<br>1311<br>1331 | 1277.5<br>1297.5<br>1317.5<br>1337.5 | nm<br>nm<br>nm<br>nm | |
| Side-mode Suppression Ratio | SMSR | 30 | | | dB | |
| Total Average Launch Power | | | | 10.4 | dBm | |
| Average Launch Power, each lane | | -3.2 | | 4.4 | dBm | |
| Outer Optical Modulation Amplitude (OMAouter), each Lane<br>For TDECQ < 1.4 dB | | -0.2 | | 3.7 | dBm | |
| Outer Optical Modulation Amplitude (OMAouter), each Lane<br>For 1.4 ≤ TDECQ ≤ 3.4 dB | | -1.6 + TDECQ | | 3.7 | dBm | |
| Difference in Launch Power between any Two Lanes (OMAouter) | | | | 3.9 | dB | |
| Transmitter and Dispersion Eye Closure for PAM4, each Lane | TDECQ | | | 3.4 | dB | |
| Transmitter Eye Closure for PAM4, each Lane | TECQ | | | 3.4 | dB | |
| \|TDECQ-TECQ\| | | | | 2.5 | dB | |
| Over/under-shoot | | | | 22 | % | |
| Transmitter power excursion | | | | 1.8 | dBm | |
| Extinction Ratio, each Lane | ER | 3.5 | | | dB | |
| Transmitter transition time | | | | 17 | ps | |
| Average launch power of OFF transmitter, each lane | | | | -16 | dBm | |
| RIN17.1OMA | | | | -136 | dB/Hz | |
| Optical return loss tolerance | | | | 17.1 | dB | |
| Transmitter reflectance | | | | -26 | dB | |



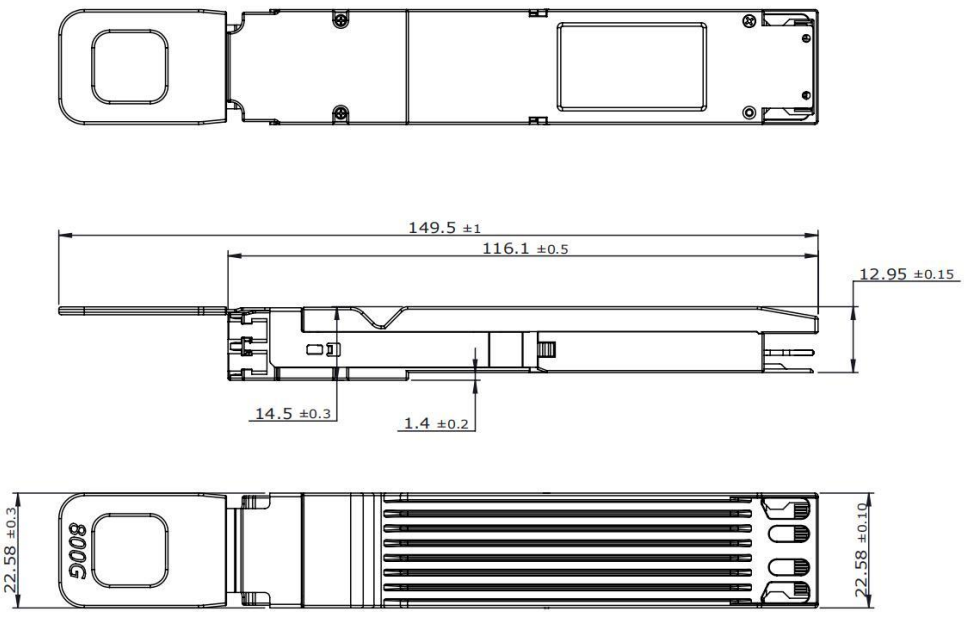
# CP-OSFP-800G-2FR4

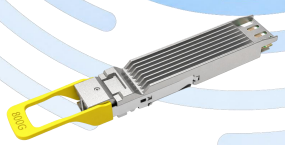
## 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver

### Optical Characteristics - Receiver

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Receiver | | | | | | |
| Data Rate, each Lane | | 53.125 ± 100 ppm | | | GBd | |
| Modulation Format | | | PAM4 | | | |
| Optical Wavelength | L0<br>L1<br>L2<br>L3 | 1264.5<br>1284.5<br>1304.5<br>1324.5 | 1271<br>1291<br>1311<br>1331 | 1277.5<br>1297.5<br>1317.5<br>1337.5 | nm<br>nm<br>nm<br>nm | |
| Damage threshold, each lane | | 5.4 | | | dBm | |
| Average power at receiver, each lane | | -7.2 | | 4.4 | dBm | |
| Receive power (OMAouter), each lane | | | | 3.7 | dBm | |
| Difference in Receiver Power between any Two Lanes (OMAouter) | | | | 4.1 | dBm | |
| Receiver reflectance | | | | -26 | dB | |
| Receiver Sensitivity (OMAouter), each Lane<br>For TECQ < 1.4 dB | | | | -4.6 | dBm | |
| Receiver Sensitivity (OMAouter), each Lane<br>For 1.4 ≤ TECQ ≤ 3.4 dB | | | | -6 + TECQ | dBm | |
| Stressed receiver Sensitivity (OMAouter), each lane | | | | -2.6 | dBm | |
| Conditions of Stress Receiver Sensitivity Test | | | | | | |
| Stressed Eye Closure for PAM4 (SECQ), Lane under Test | | | 3.4 | | dB | |
| OMAouter of each aggressor lane | | | 1.4 | | dBm | |

### Mechanical Specifications





# CP-OSFP-800G-2FR4

## 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver

### Digital Diagnostic Monitoring Interface

Five transceiver parameter values are monitored. The following table defines the monitoring accuracy.

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Temperature monitor absolute error | DMI_Temp | -3 | | 3 | °C | |
| Supply voltage monitor absolute error | DMI_VCC | -3 | | 3 | % | |
| Bias current monitor absolute error | DMI_I Bias | -10 | | 10 | % | |
| Tx power monitor absolute error | DMI_TX | -3 | | 3 | dB | |
| Rx power monitor absolute error | DMI_RX | -3 | | 3 | dB | |

### SAFETY AND OPERATING INSTRUCTIONS

1. This product emits laser radiation. Do not look directly into an optical port or exposed fiber end.

2. This product is electrostatic-discharge sensitive. Operate in an ESD-protected area and ensure that personnel and tools making direct contact with the device are properly grounded.

3. Fit the dust cap immediately after testing or inspection to protect the optical connector from contamination.

4. Absolute maximum ratings are stress limits. Prolonged exposure to these limits, or exposure to multiple maximum ratings simultaneously, may damage the device or reduce reliability. Use the recommended operating conditions for normal operation.

5. Provide adequate airflow and thermal management for the OSFP Finned Top package. Keep the module case temperature within the specified operating range.

6. Do not overstretch or sharply bend the optical fiber.



# CP-OSFP-800G-2FR4

## 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver

## DOCUMENT CONTROL

| CONTROL FIELD | VALUE |
|---|---|
| Document Title | CP-OSFP-800G-2FR4 - 800G OSFP 2×FR4 Silicon Photonics Optical Transceiver |
| Document ID | WO-800G-2FR4 |
| Revision | V1.00 |
| Effective Date | 2026-09-17 |
| Status | Controlled Document |

| REVISION | DATE | CHANGE DESCRIPTION |
|---|---|---|
| V1.00 | 2026-09-17 | Initial Western Optronics controlled release |

## SUPPORT

Western Optronics provides product-selection, setup, and application support. Specifications and availability are subject to change without notice.