



### **CWDM-XFP-1610-40-OPC**

Cisco® CWDM-XFP-1610-40 Compatible TAA 10GBase-CWDM XFP Transceiver (SMF, 1610nm, 40km, LC, DOM)

#### **Features**

- INF-8077i Compliance
- Duplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



#### **Applications:**

- 10x Gigabit Ethernet over CWDM
- 8x/10x Fibre Channel
- Access, Metro and Enterprise
- Mobile Fronthaul CPRI/OBSAI

#### **Product Description**

This Cisco® CWDM-XFP-1610-40 compatible XFP transceiver provides 10GBase-CWDM throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1610nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Cisco® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow 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.

OptioConnect's 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."



## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

## CWDM Available Wavelengths

| Wavelengths | Min.   | Typ. | Max.   |
|-------------|--------|------|--------|
| 47          | 1463.5 | 1471 | 1476.5 |
| 49          | 1483.5 | 1491 | 1496.5 |
| 51          | 1503.5 | 1511 | 1516.5 |
| 53          | 1523.5 | 1531 | 1536.5 |
| 55          | 1543.5 | 1551 | 1556.5 |
| 57          | 1563.5 | 1571 | 1576.5 |
| 59          | 1583.5 | 1591 | 1596.5 |
| 61          | 1603.5 | 1611 | 1616.5 |

## Absolute Maximum Ratings

| Parameter                  | Symbol | Min. | Typ. | Max. | Unit |
|----------------------------|--------|------|------|------|------|
| Maximum Supply Voltage     | Vcc3   | -0.5 |      | 4.0  | V    |
|                            | Vcc5   | -0.5 |      | 6.0  | V    |
| Storage Temperature        | Ts     | -40  |      | 85   | °C   |
| Operating Case Temperature | Tc     | 0    |      | 70   | °C   |
| Relative Humidity          | RH     | 5    |      | 95   | %    |
| Data Rate                  |        | 9.95 |      | 11.3 | Gbps |

## Electrical Characteristics

| Parameter                        | Symbol                          | Min.                     | Typ. | Max.                     | Unit  | Notes |
|----------------------------------|---------------------------------|--------------------------|------|--------------------------|-------|-------|
| Power Supply Voltage             | Vcc3                            | 3.135                    | 3.3  | 3.465                    | V     |       |
|                                  | Vcc5                            | 4.75                     | 5.00 | 5.25                     | V     |       |
| Power Supply Current             | Icc3                            |                          |      | 750                      | mA    |       |
|                                  | Icc5                            |                          |      | 500                      | mA    |       |
| Power Dissipation                | PD                              |                          |      | 3500                     | mW    |       |
| Transmitter                      |                                 |                          |      |                          |       |       |
| Differential data input swing    | V <sub>in,p-p</sub>             | 120                      |      | 1000                     | mVp-p |       |
| Input differential impedance     | Z <sub>in</sub>                 |                          | 100  |                          | Ω     |       |
| Tx_Disable, P_Down/RST           | V <sub>IH</sub>                 | 2.0                      |      | Vcc3+0.3                 | V     |       |
|                                  | V <sub>IL</sub>                 | -0.3                     |      | 0.8                      | V     |       |
| Transmit Disable Assert Time     |                                 |                          |      | 10                       | us    |       |
| Receiver                         |                                 |                          |      |                          |       |       |
| Differential data output swing   | V <sub>out, p-p</sub>           | 340                      |      | 850                      | mVp-p | 1     |
| Output differential impedance    | Z <sub>o</sub>                  |                          | 100  |                          | Ω     |       |
| Data Output Rise Time, Fall Time | t <sub>r</sub> , t <sub>f</sub> | 24                       |      |                          | ps    | 2     |
| Rx_LOS, Mod_NR, Interrupt        | V <sub>OH</sub>                 | V <sub>CCHOST</sub> -0.5 |      | V <sub>CCHOST</sub> +0.3 | V     | 3     |
|                                  | V <sub>OL</sub>                 | 0                        |      | 0.4                      | V     | 3     |

### Notes:

1. Internally AC coupled, but requires an external 100Ω differential termination.
2. 20–80%.
3. Loss of Signal is an open collector output. Should be pulled up with a 4.7kΩ-10kΩ resistor on the host board.

## Optical Characteristics

| Parameter                                | Symbol                                 | Min.   | Typ. | Max.   | Unit | Notes |
|------------------------------------------|----------------------------------------|--------|------|--------|------|-------|
| Transmitter                              |                                        |        |      |        |      |       |
| Launch Average Optical Power             | P <sub>O</sub>                         | -1     |      | 4      | dBm  | 1     |
| Center Wavelength Range                  | λ <sub>c</sub>                         | 1464.5 |      | 1617.5 | nm   |       |
| Center Wavelength Tolerance              | Δλ <sub>c</sub>                        | -6.5   |      | 6.5    | nm   |       |
| Extinction Ratio                         | EX                                     | 8.2    |      |        | dB   | 2     |
| Spectral Width (-20dB)                   | Δλ                                     |        |      | 0.3    | nm   |       |
| Side Mode Suppression Ratio              | SMSR                                   | 30     |      |        | dB   |       |
| Dispersion Penalty @ 800ps/nm            | DP                                     |        |      | 2      | dB   | 2     |
| Average Optical Power (Laser Off)        | P <sub>OFF</sub>                       |        |      | -30    | dBm  | 1     |
| Eye Diagram                              | ITU-T G.691 SDH STM S-64.2b compatible |        |      |        |      | 2     |
| Receiver                                 |                                        |        |      |        |      |       |
| Center Wavelength                        | λ <sub>c</sub>                         | 1460   |      | 1620   | nm   |       |
| Receiver Sensitivity (P <sub>avg</sub> ) | S                                      |        |      | -16    | dBm  | 3     |
| Receiver Overload (P <sub>avg</sub> )    | P <sub>OL</sub>                        | -1.0   |      |        | dBm  | 3     |
| Optical Return Loss                      | ORL                                    | 27     |      |        | dB   |       |
| LOS De-Assert                            | LOS <sub>D</sub>                       |        |      | -20    | dBm  |       |
| LOS Assert                               | LOS <sub>A</sub>                       | -27    |      |        | dBm  |       |
| LOS Hysteresis                           |                                        | 0.5    |      |        | dB   |       |

### Notes:

1. The optical power is launched into 9/125 $\mu$ m SMF.
2. Measured with a PRBS 2<sup>31</sup>-1 test pattern @ 9.953Gbps.
3. Average received power; BER less than 1E-12 and PRBS 231-1 test pattern.

## Pin Descriptions

| Pin | Logic     | Symbol     | Name/Descriptions                                                                                                                                                                                                                                                                                 | Notes |
|-----|-----------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1   |           | GND        | Module Ground                                                                                                                                                                                                                                                                                     | 1     |
| 2   |           | VEE5       | Optional -5.2V Power Supply - Not Required                                                                                                                                                                                                                                                        |       |
| 3   | LVTTL-I   | MOD_DESEL  | Module De-select; When held low allows module to respond to 2-wire serial interface                                                                                                                                                                                                               |       |
| 4   | LVTTL-O   | Interrupt  | Interrupt; Indicates presence of an important condition which can be read via the 2-wire serial interface.                                                                                                                                                                                        | 2     |
| 5   | LVTTL-I   | TX_DIS     | Transmitter Disable; Turns off transmitter laser output                                                                                                                                                                                                                                           |       |
| 6   |           | VCC5       | +5V Power Supply                                                                                                                                                                                                                                                                                  |       |
| 7   |           | GND        | Module Ground                                                                                                                                                                                                                                                                                     | 1     |
| 8   |           | VCC3       | +3.3V Power Supply                                                                                                                                                                                                                                                                                |       |
| 9   |           | VCC3       | +3.3V Power Supply                                                                                                                                                                                                                                                                                |       |
| 10  | LVTTL-I/O | SCL        | 2-Wire Serial Interface Clock.                                                                                                                                                                                                                                                                    | 2     |
| 11  | LVTTL-I/O | SDA        | 2-Wire Serial Interface Data Line                                                                                                                                                                                                                                                                 | 2     |
| 12  | LVTTL-O   | MOD_Abs    | Indicates Module is not present. Grounded in the Module.                                                                                                                                                                                                                                          | 2     |
| 13  | LVTTL-O   | MOD_NR     | Module Not Ready; Indicating Module Operational Fault                                                                                                                                                                                                                                             | 2     |
| 14  | LVTTL-O   | RX_LOS     | Receiver Loss of Signal Indicator                                                                                                                                                                                                                                                                 | 2     |
| 15  |           | GND        | Module Ground                                                                                                                                                                                                                                                                                     | 1     |
| 16  |           | GND        | Module Ground                                                                                                                                                                                                                                                                                     | 1     |
| 17  | CML-O     | RD-        | Receiver Inverted Data Output                                                                                                                                                                                                                                                                     |       |
| 18  | CML-O     | RD+        | Receiver Non-Inverted Data Output                                                                                                                                                                                                                                                                 |       |
| 19  |           | GND        | Module Ground                                                                                                                                                                                                                                                                                     | 1     |
| 20  |           | VCC2       | +1.8V Power Supply (Not required).                                                                                                                                                                                                                                                                |       |
| 21  | LVTTL-I   | P_DOWN/RST | Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode.<br>Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle. |       |
| 22  |           | VCC2       | +1.8V Power Supply (Not required)                                                                                                                                                                                                                                                                 |       |
| 23  |           | GND        | Module Ground                                                                                                                                                                                                                                                                                     | 1     |
| 24  | PECL-I    | REFCLK+    | Reference Clock Non-Inverted Input, AC coupled on the host board - Not Required                                                                                                                                                                                                                   | 3     |
| 25  | PECL-I    | REFCLK-    | Reference Clock Inverted Input, AC coupled on the host board – Not Required                                                                                                                                                                                                                       | 3     |
| 26  |           | GND        | Module Ground                                                                                                                                                                                                                                                                                     | 1     |
| 27  |           | GND        | Module Ground                                                                                                                                                                                                                                                                                     | 1     |
| 28  | CML-I     | TD-        | Transmitter Inverted Data Input                                                                                                                                                                                                                                                                   |       |
| 29  | CML-I     | TD+        | Transmitter Non-Inverted Data Input                                                                                                                                                                                                                                                               |       |
| 30  |           | GND        | Module Ground                                                                                                                                                                                                                                                                                     | 1     |

**Notes:**

1. Module ground pins Gnd are isolated from the module case.
2. Shall be pulled up with 4.7KΩ to 10KΩ to a voltage between 3.15V and 3.45V on the host board.
3. Reference Clock is not required. If present, it will be ignored.



Pin-out of connector Block on Host board

**Recommended Host Board Power Supply Filter Network**

Recommended Application Interface Block Diagram



Mechanical Specifications



## **OptioConnect**

### **Innovation for the Future of High-Speed Networking**

#### **Who We Are**

OptioConnect is reshaping the landscape of communication and high-speed networking through intelligent technology. With a core focus on cutting edge technology, we deliver smarter fiber optic solutions for enterprise networks, data centers, and next-gen telecom infrastructures.

#### **What We Do**

At OptioConnect, we fuse advanced engineering with intelligent automation to drive the future of networking. Our AI-integrated solutions are designed to optimize performance and streamline operations with:

- Superior Performance
- Network and traffic optimization
- Intelligent energy management
- Seamless OEM compatibility
- Scalable cost-efficiency

#### **Smarter Networks by Design**

Innovation isn't just a goal—it's our process. We embed AI and machine learning across our R&D and product lines, enabling adaptive performance, automated tuning, and faster deployment cycles. The result? Networks that don't just work—they learn, evolve, and outperform.

#### **Our Team**

Our engineers, data scientists, and network architects bring decades of experience and a future-focused mindset. We provide hands-on support with intelligent insights that turn complex challenges into simple solutions.

#### **Our Mission**

To deliver AI-enhanced connectivity that reduces cost, increases speed, and maximizes efficiency—empowering our partners to operate at the forefront of a rapidly evolving digital world.

#### **Let's Connect**

Discover how OptioConnect's intelligent infrastructure solutions can power your network's next leap forward.

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