

### **XFP-10GB-CW37-40-C**

MSA and TAA 10GBase-CWDM XFP Transceiver (SMF, 1370nm, 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 MSA compliant XFP transceiver provides 10GBase-CWDM throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1370nm via an LC connector. It can operate at temperatures between 0 and 70C. The listed reach has been determined using a link budget calculation and tested in a standard environment. Actual link distances achieved will be dependent upon the deployed environment. 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.")



## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883G Method 3015.7
- 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 Wavelength

| Band            | Channels | Wavelength |      |        |
|-----------------|----------|------------|------|--------|
|                 |          | Min.       | Typ. | Max.   |
| O-Band          | 27       | 1264       | 1270 | 1277.5 |
|                 | 29       | 1284       | 1290 | 1297.5 |
|                 | 31       | 1304       | 1310 | 1317.5 |
|                 | 33       | 1324       | 1330 | 1337.5 |
|                 | 35       | 1344       | 1350 | 1357.5 |
| E-Band Extended | 37       | 1364       | 1370 | 1377.5 |
|                 | 39       | 1384       | 1390 | 1397.5 |
|                 | 41       | 1404       | 1410 | 1417.5 |
|                 | 43       | 1424       | 1430 | 1437.5 |
|                 | 45       | 1444       | 1450 | 1457.5 |

## Absolute Maximum Ratings

| Parameter                   | Symbol | Min  | Max | Unit |
|-----------------------------|--------|------|-----|------|
| Storage Temperature         | TS     | -40  | +85 | °C   |
| Maximum Supply Voltage      | VCC    | -0.5 | 3.6 | V    |
| Operating Relative Humidity |        |      | 95  | %    |
| Operating Case Temperature  | Tc     | 0    | +70 | °C   |

\*Exceeding any one of these values may destroy the device immediately.

## Electrical Characteristics

| Parameter                      | Symbol     | Min.      | Typ. | Max.     | Unit | Notes |
|--------------------------------|------------|-----------|------|----------|------|-------|
| Power Supply Voltage           | Vcc        | 3.15      | 3.3  | 3.45     | V    |       |
| Power Supply Current           | Icc        |           |      | 750      | mA   |       |
| <b>Transmitter</b>             |            |           |      |          |      |       |
| Input differential Impedance   | Rin        |           | 100  |          |      |       |
| Differential data input        | Vin,pp     | 120       |      | 820      | mV   | 1     |
| Transmit Disable Voltage       | VD         | 2.0       |      | Vcc      | V    |       |
| Transmit Enable Voltage        | VEN        | GND       |      | GND +0.8 | V    |       |
| Transmit Disable Assert Time   |            |           |      | 10       | us   |       |
| <b>Receiver</b>                |            |           |      |          |      |       |
| Differential data output swing | Vout,pp    | 340       | 650  | 850      | mV   | 1     |
| RX Rise time (20-80%)          | tr         |           |      | 38       | ps   |       |
| RX Fall time (20-80%)          | tf         |           |      | 38       | ps   |       |
| LOS Fault                      | VLOS fault | Vcc – 0.5 |      | VccHOST  | V    | 2     |
| LOS Normal                     | VLOS norm  | GND       |      | GND+0.5  |      | 2     |

### Notes:

1. After internal AC coupling
2. Loss of signal is open collector to be pulled up to with a 4.7k-10kohm resister to 3.15-3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

## Optical Characteristics

| Parameter                   | Symbol          | Min.          | Typ.        | Max.            | Unit | Notes |
|-----------------------------|-----------------|---------------|-------------|-----------------|------|-------|
| Power Budget                | PB              |               | 14          |                 | dB   |       |
| Data Rate                   |                 |               | 10.3125     |                 | Gbps |       |
| Transmitter                 |                 |               |             |                 |      |       |
| Center Wavelength           | $\lambda_C$     | $\lambda_C-6$ | $\lambda_C$ | $\lambda_C-7.5$ | nm   |       |
| Spectral Width (-20dB)      | $\Delta\lambda$ |               |             | 1               | nm   |       |
| Side Mode Suppression Ratio | SMSR            | 30            |             |                 | dB   |       |
| Average Output Power        | Pout            | -1            |             | 4               | dBm  | 3     |
| Extinction Ratio            | ER              | 3.5           |             |                 | dB   |       |
| Pout@TX Disable Asserted    | Pout            |               |             | -30             | dBm  |       |
| Receiver                    |                 |               |             |                 |      |       |
| Center Wavelength           | $\lambda_C$     | 1260          |             | 1600            | nm   |       |
| Receiver Sensitivity        | Pmin            |               |             | -15             | dBm  | 4     |
| Receiver Overload           | Pmax            | 0.5           |             |                 | dBm  |       |
| LOS De-Assert               | LOSD            |               |             | -17.8           | dBm  |       |
| LOS Assert                  | LOSA            | -29.8         |             |                 | dBm  |       |
| LOS Hysteresis              |                 | 1             |             |                 | dB   |       |

### Notes:

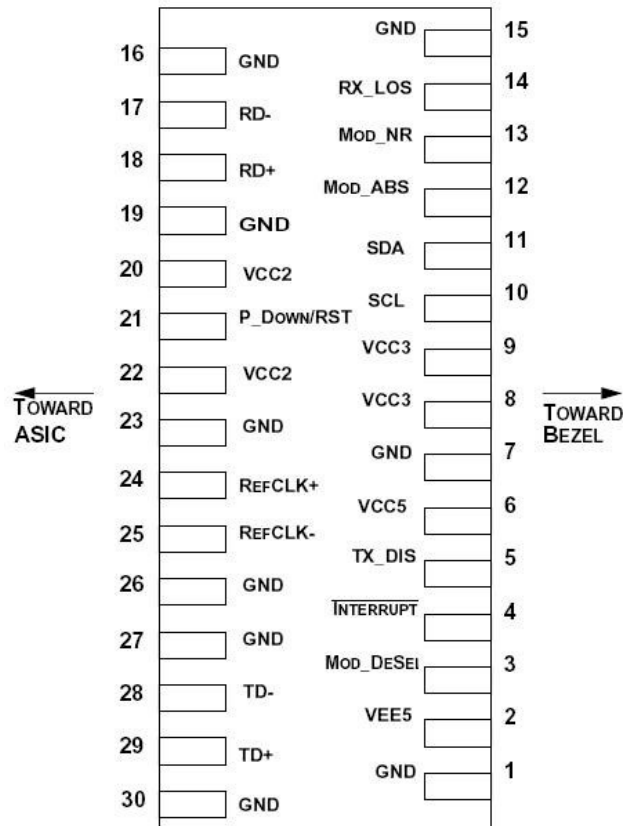
1. Output power is coupled into a 9/125 $\mu$ m SMF.
2. Average received power; BER less than 1E-12 and PRBS 231-1 test pattern.

## Pin Descriptions

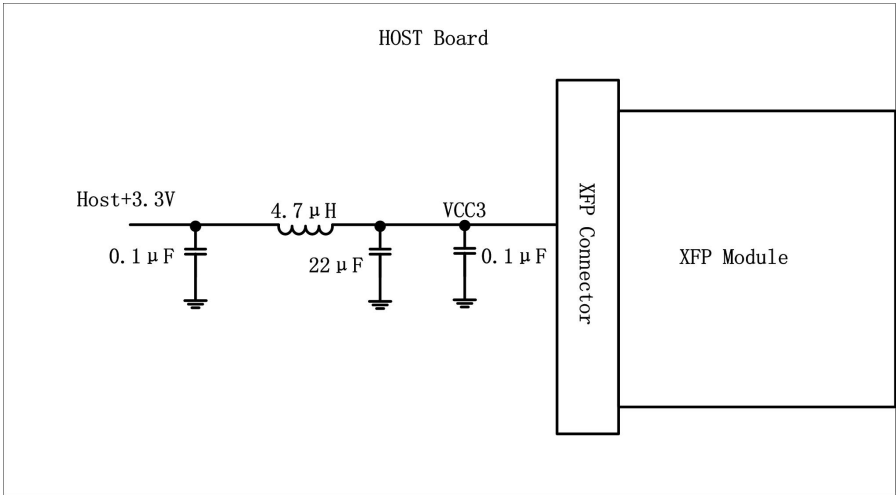
| Pin | Symbol           | Function                                                                                                                                                                                                                                                                   | Notes |
|-----|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1   | GND              | Module Ground                                                                                                                                                                                                                                                              | 1     |
| 2   | V <sub>EE5</sub> | Optional -5.2 Power Supply - Not Required                                                                                                                                                                                                                                  |       |
| 3   | Mod_Desel        | Module De-select; When held low allows module to respond to 2-wire serial interface commands                                                                                                                                                                               |       |
| 4   | Interrupt        | Interrupt; Indicates presence of an important condition which can be read over the 2-wire serial interface.                                                                                                                                                                | 2     |
| 5   | TX_DIS           | Transmitter Disable; Transmitter laser source turned off                                                                                                                                                                                                                   |       |
| 6   | VCC5             | +5V Power Supply – Not required                                                                                                                                                                                                                                            |       |
| 7   | GND              | Module Ground                                                                                                                                                                                                                                                              | 1     |
| 8   | VCC3             | +3.3V Power Supply                                                                                                                                                                                                                                                         |       |
| 9   | VCC3             | +3.3V Power Supply                                                                                                                                                                                                                                                         |       |
| 10  | SCL              | Serial 2-wire Interface clock.                                                                                                                                                                                                                                             | 2     |
| 11  | SDA              | Serial 2-wire Interface Data Line                                                                                                                                                                                                                                          | 2     |
| 12  | Mod_Abs          | Module Absent: Indicated module is not present. Grounded in the module.                                                                                                                                                                                                    | 2     |
| 13  | Mod_NR           | Module Not Ready                                                                                                                                                                                                                                                           | 2     |
| 14  | RX_LOS           | Receiver Loss of Signal Indicator                                                                                                                                                                                                                                          | 2     |
| 15  | GND              | Module Ground                                                                                                                                                                                                                                                              | 1     |
| 16  | GND              | Module Ground                                                                                                                                                                                                                                                              | 1     |
| 17  | RD-              | Receiver Inverted Data Output                                                                                                                                                                                                                                              |       |
| 18  | RD+              | Receiver Non-Inverted Data Output                                                                                                                                                                                                                                          |       |
| 19  | GND              | Module Ground                                                                                                                                                                                                                                                              | 1     |
| 20  | VCC2             | +1.8V Power Supply (Not required).                                                                                                                                                                                                                                         |       |
| 21  | P_DOWN/RST       | Power down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset<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  | REFCLK+          | Reference Clock Non-Inverted Input, AC coupled on the host board - Not Required                                                                                                                                                                                            | 3     |
| 25  | 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  | TD-              | Transmitter Inverted Data Input                                                                                                                                                                                                                                            |       |
| 29  | TD+              | Transmitter Non-Inverted Data Input                                                                                                                                                                                                                                        |       |
| 30  | GND              | Module Ground                                                                                                                                                                                                                                                              | 1     |

**Notes:**

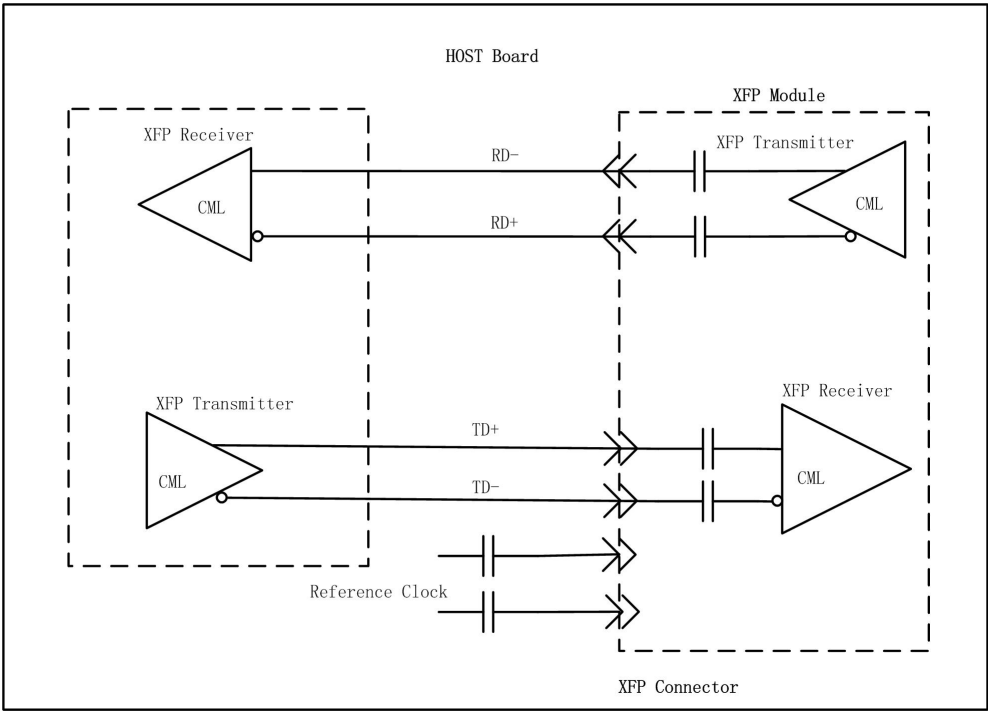
1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector; should be pulled up with 4.7k-10k ohms on host board to a voltage between 3.15V and 3.6V.
3. Reference Clock input is not required.

**Electrical Pin-out Details**

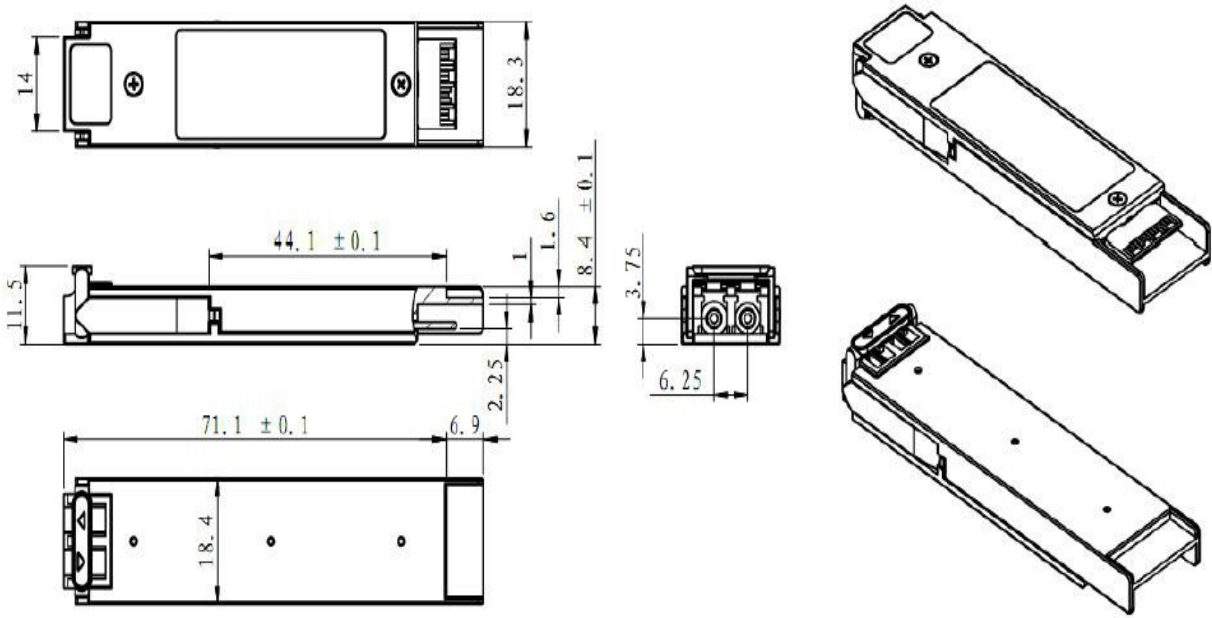
Recommended Host Board Power Supply Circuit



Recommend High-speed Interface Circuit



Mechanical Specifications



## About ProLabs

Our extensive experience comes as standard. For over 20 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 more than 100 optical switching and transport platforms.

## A 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 1.6T 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.

## The Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure compatible products, and immediate answers to your questions. 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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