

## 1061701698-C

ADVA® 1061701698 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 ADVA® 1061701698 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 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. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with ADVA®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. 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-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:

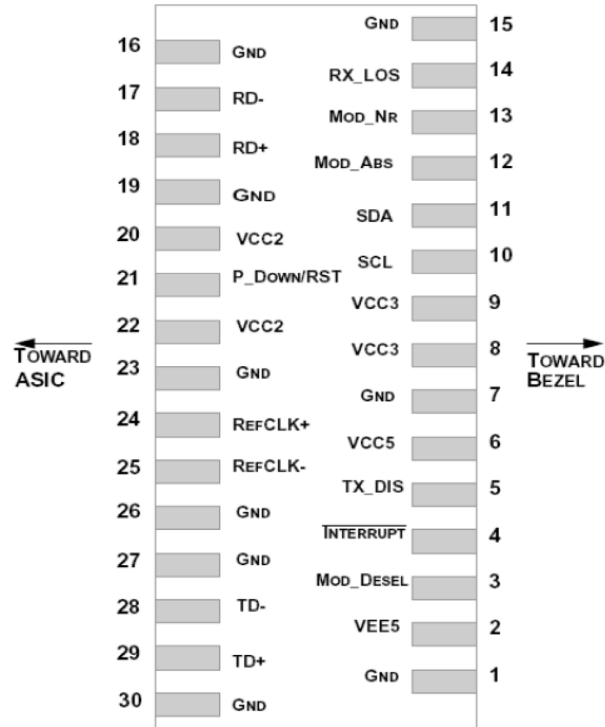
1. The optical power is launched into 9/125 $\mu$ m SMF.
2. Measured with a PRBS 2<sup>31</sup>-1 test pattern @ 9.953Gbps.
3. Average received power; BER less than 1E-12 and PRBS 231-1 test pattern.

## 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     |

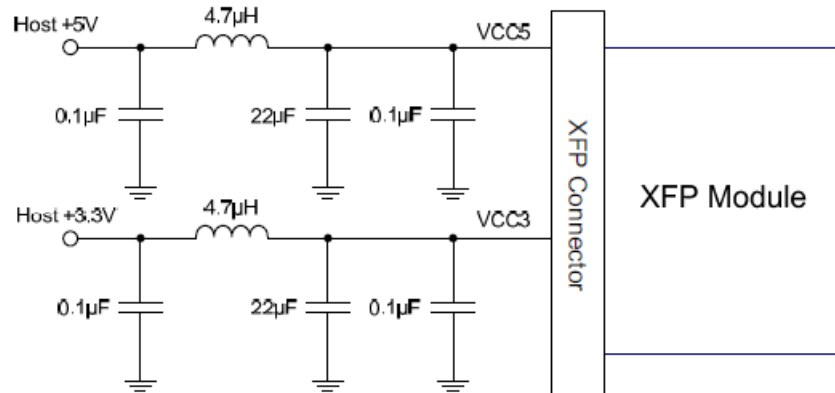
### Notes:

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.

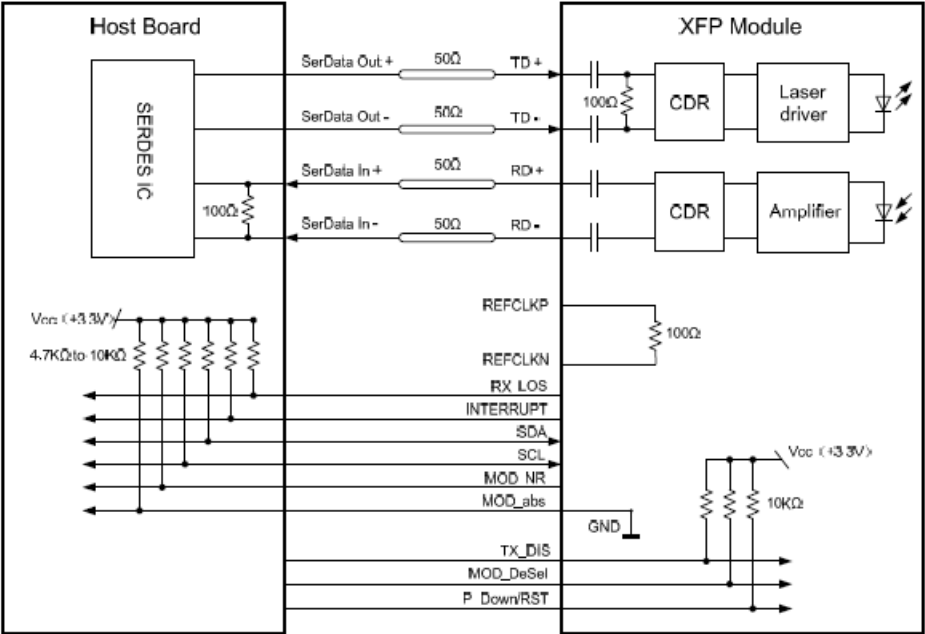


Pin-out of connector Block on Host board

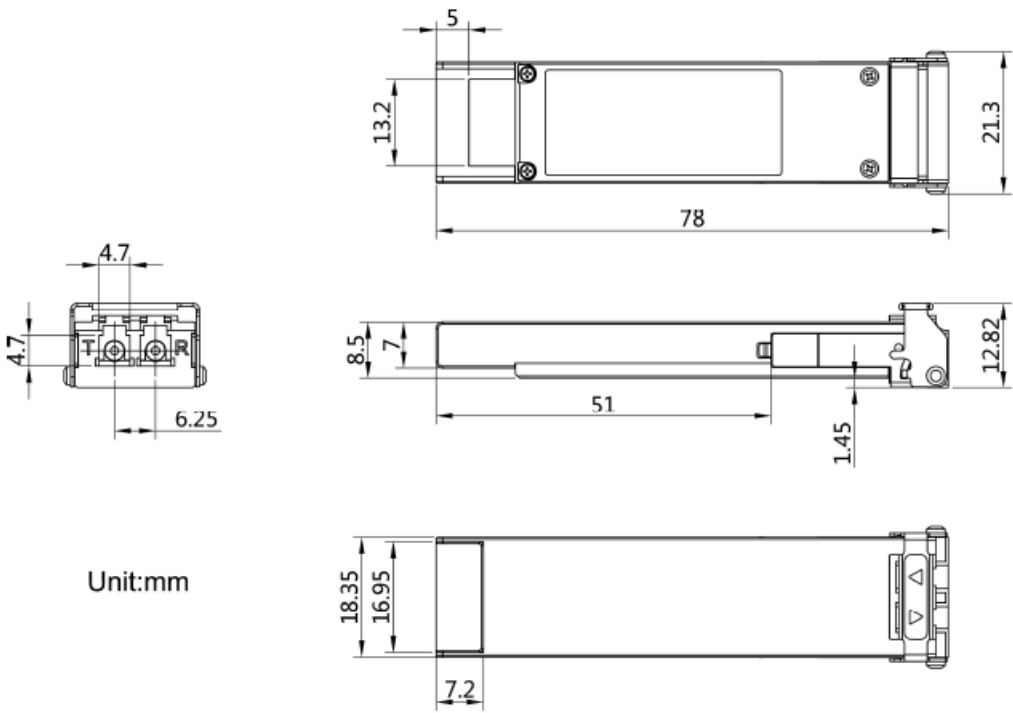
### Recommended Host Board Power Supply Filter Network



Recommended Application Interface Block Diagram



Mechanical Specifications



## 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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