

### **XCVR-S80W48-100-I-PRO**

Ciena® XCVR-S80W48-100-I Compatible TAA Compliant 10GBase-DWDM 100GHz SFP+ Transceiver (SMF, 1538.98nm, 100km, DOM, -40 to 85C, LC)

#### **Features**

- SFF-8432 and SFF-8472 Compliance
- Duplex LC Connector
- Industrial Temperature -40 to 85 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



#### **Applications:**

- 10x Gigabit Ethernet over DWDM
- 8x/10x Fibre Channel
- Access, Metro and Enterprise

#### **Product Description**

This Ciena® XCVR-S80W48-100-I compatible SFP+ transceiver provides 10GBase-DWDM throughput up to 100km over single-mode fiber (SMF) using a wavelength of 1538.98nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Ciena® 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.

Proline'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

## Wavelength Guide (100GHz ITU-T Channel)

| Channel # | Frequency (THz) | Center Wavelength (nm) |
|-----------|-----------------|------------------------|
| 34        | 193.4           | 1550.12                |
| 35        | 193.5           | 1549.32                |
| 36        | 193.6           | 1548.51                |
| 37        | 193.7           | 1547.72                |
| 38        | 193.8           | 1546.92                |
| 39        | 193.9           | 1546.12                |
| 40        | 194.0           | 1545.32                |
| 41        | 194.1           | 1544.53                |
| 42        | 194.2           | 1543.73                |
| 43        | 194.3           | 1542.94                |
| 44        | 194.4           | 1542.14                |
| 45        | 194.5           | 1541.35                |
| 46        | 194.6           | 1540.56                |
| 47        | 194.7           | 1539.77                |
| 48        | 194.8           | 1538.98                |
| 49        | 194.9           | 1538.19                |
| 50        | 195.0           | 1537.40                |
| 51        | 195.1           | 1536.61                |
| 52        | 195.2           | 1535.82                |
| 53        | 195.3           | 1535.04                |
| 54        | 195.4           | 1534.25                |
| 55        | 195.5           | 1533.47                |
| 56        | 195.6           | 1532.68                |
| 57        | 195.7           | 1531.90                |
| 58        | 195.8           | 1531.12                |
| 59        | 195.9           | 1530.33                |
| 60        | 196.0           | 1529.55                |
| 61        | 196.1           | 1528.77                |

## Absolute Maximum Ratings

| Parameter                  | Symbol | Min. | Typ.    | Max. | Unit |
|----------------------------|--------|------|---------|------|------|
| Storage Temperature        | TS     | -40  |         | 85   | °C   |
| Operating Case Temperature | Tc     | -40  | 25      | 85   | °C   |
| Supply Voltage             | Vcc    | -0.5 |         | 4.0  | V    |
| Relative Humidity          | RH     | 5    |         | 95   | %    |
| Data Rate                  |        |      | 10.3125 |      | Gb/s |

## Electrical Characteristics

| Parameter                        | Symbol                          | Min.            | Typ. | Max.  | Unit                | Notes |   |
|----------------------------------|---------------------------------|-----------------|------|-------|---------------------|-------|---|
| Supply Voltage                   | Vcc                             | 3.135           | 3.3  | 3.465 | V                   |       |   |
| Module Supply Current            | Icc                             |                 |      | 550   | mA                  |       |   |
| Power Dissipation                | P <sub>D</sub>                  |                 |      | 1.8   | W                   |       |   |
| <b>Transmitter</b>               |                                 |                 |      |       |                     |       |   |
| Input Differential Impedance     | Z <sub>IN</sub>                 |                 | 100  |       | Ω                   |       |   |
| Differential Data Input Swing    | V <sub>IN, P-P</sub>            | 180             |      | 700   | mV <sub>P-P</sub>   |       |   |
| TX_FAULT                         | Transmitter Fault               | V <sub>OH</sub> | 2.0  |       | V <sub>CCHOST</sub> | V     |   |
|                                  | Normal Operation                | V <sub>OL</sub> | 0    |       | 0.8                 | V     |   |
| TX_DISABLE                       | Transmitter Disable             | V <sub>IH</sub> | 2.0  |       | V <sub>CCHOST</sub> | V     |   |
|                                  | Transmitter Enable              | V <sub>IL</sub> | 0    |       | 0.8                 | V     |   |
| <b>Receiver</b>                  |                                 |                 |      |       |                     |       |   |
| Output Differential Impedance    | Z <sub>O</sub>                  |                 | 100  |       | Ω                   |       |   |
| Differential Data Output Swing   | V <sub>OUT, P-P</sub>           | 300             |      | 850   | mV <sub>P-P</sub>   | 1     |   |
| Data Output Rise Time, Fall Time | t <sub>r</sub> , t <sub>f</sub> | 28              |      |       | ps                  | 2     |   |
| RX_LOS                           | Loss of signal (LOS)            | V <sub>OH</sub> | 2.0  |       | V <sub>CCHOST</sub> | V     | 3 |
|                                  | Normal Operation                | V <sub>OL</sub> | 0    |       | 0.8                 | V     | 3 |

### Notes:

1. Internally AC coupled, but requires a external 100Ω differential load termination.
2. 20–80%.
3. LOS is an open collector output. Should be pulled up with 4.7KΩ on the host board.

## Optical Characteristics

| Parameter                          | Symbol  | Minimum | Typical | Maximum | Unit  | Notes |
|------------------------------------|---|---------|---------|---------|-------|-------|
| <b>Transmitter</b>                 |   |         |         |         |       |       |
| Launch Optical Power               | $P_o$   | +1.0    |         | +4.0    | dBm   | 1     |
| Center Wavelength Range            | $\lambda_c$   | 1528.77 |         | 1550.22 | nm    |       |
| Center Wavelength Spacing          |   |         | 100     |         | GHz   |       |
| Center Wavelength Tolerance        | $\Delta\lambda_c$                                       | -100    |         | 100     | pm    |       |
| Extinction Ratio                   | EX  | 9.0     |         |         | dB    | 2     |
| Side Mode Suppression Ratio        | SMSR  | 30      |         |         | dB    |       |
| Spectral Width (-20dB)             |   |         |         | 1       | nm    |       |
| Transmitter and Dispersion Penalty | TDP   |         |         | 4.0     | dB    |       |
| Relative Intensity Noise           | RIN   |         |         | -128    | dB/Hz |       |
| Optical Return Loss Tolerance      | ORLT  |         |         | 21      | dB    |       |
| Pout @TX-Disable Asserted          | $P_{off}$   |         |         | -30     | dBm   | 1     |
| Eye Diagram                        | IEEE Std 802.3-2005 10Gb Ethernet 10GBASE-ZR compatible |         |         |         |       |       |
| <b>Receiver</b>                    |   |         |         |         |       |       |
| Center Wavelength                  | $\lambda_c$   | 1528    |         | 1565    | nm    |       |
| Receiver Sensitivity ( $P_{avg}$ ) | S   |         |         | -26     | dBm   | 3     |
| Receiver Overload ( $P_{avg}$ )    | $P_{OL}$  | -7.0    |         |         | dBm   | 3     |
| Optical Return Loss                | ORL   |         |         | -27     | dB    |       |
| OSNR                               |   | 27      |         |         | dB    | 4     |
| Max OSNR Path Penalty              |   |         |         | 4       | dB    | 4     |
| Dispersion Limited Distance        |   |         |         | 100     | Km    |       |
| LOS De-Assert                      | $LOS_D$   |         |         | -26     | dBm   |       |
| LOS Assert                         | $LOS_A$   | -35     |         |         | 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 @10.3125Gbps.
3. Measured with PRBS 2<sup>31</sup>-1 test pattern, 10.3125Gb/s, BER<10<sup>-12</sup>.
4. Receiver power@ -7~-18dBm, 10.3125Gb/s, BER<10<sup>-12</sup>.

## Pin Descriptions

| Pin | Symbol     | Name/Descriptions  | Ref. |
|-----|------------|--|------|
| 1   | VeeT       | Transmitter Ground (Common with Receiver Ground).                              | 1    |
| 2   | TX Fault   | Transmitter Fault. LVTTTL-O  | 2    |
| 3   | TX Disable | Transmitter Disable. Laser output disabled on high or open. LVTT-I.            | 3    |
| 4   | SDA        | 2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I/O. |      |
| 5   | SCL        | 2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I.   |      |
| 6   | MOD_ABS    | Module Absent, Connect to VeeT or VeeR in Module.                              | 4    |
| 7   | RS0        | Rate Select 0. Not used  | 5    |
| 8   | LOS        | Loss of Signal indication. Logic 0 indicates normal operation. LVTTTL-O.       | 2    |
| 9   | RS1        | Rate Select 1. Not used  | 5    |
| 10  | VeeR       | Receiver Ground (Common with Transmitter Ground).                              | 1    |
| 11  | VeeR       | Receiver Ground (Common with Transmitter Ground).                              | 1    |
| 12  | RD-        | Receiver Inverted DATA out. AC Coupled. CML-O.                                 |      |
| 13  | RD+        | Receiver Non-inverted DATA out. AC Coupled. CML-O.                             |      |
| 14  | VeeR       | Receiver Ground (Common with Transmitter Ground).                              | 1    |
| 15  | VccR       | Receiver Power Supply.   |      |
| 16  | VccT       | Transmitter Power Supply.  |      |
| 17  | VeeT       | Transmitter Ground (Common with Receiver Ground).                              | 1    |
| 18  | TD+        | Transmitter Non-Inverted DATA in. AC Coupled. CML-I.                           |      |
| 19  | TD-        | Transmitter Inverted DATA in. AC Coupled. CML-O.                               |      |
| 20  | VeeT       | Transmitter Ground (Common with Receiver Ground).                              | 1    |

### Notes:

1. The module signal ground contacts, VeeR and VeeT, should be isolated from the module case.
2. This contact is an open collector/drain output and should be pulled up to the Vcc\_Host with resistor in the range 4.7K $\Omega$  to 10K $\Omega$ . Pull ups can be connected to one or several power supplies, however the host board design shall ensure that no module contract has voltage exceeding module VccT/R +0.5.V.
3. Tx\_Disable is an input contact with a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccT inside module.
4. Mod\_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull the contract up to Vcc\_Host with a resistor in the range from 4.7K $\Omega$  to 10K $\Omega$ . Mod\_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.
5. Internally pulled down per SFF-8431



Pin-out of connector Block on Host board

### Recommended Application Interface Block Diagram



### Mechanical Specifications

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



### EEPROM Information

EEPROM memory map specific data field description is as below:



**About Us:**

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.



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