

### SFPP-10GE-ZR-1550-100-C

Juniper Networks® SFPP-10GE-ZR Compatible TAA 10GBase-CWDM SFP+ Transceiver (SMF, 1550nm, 100km, LC)

#### Features:

- SFF-8432 and SFF-8472 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

#### Product Description

This Juniper Networks® SFP+ transceiver provides 10GBase-CWDM throughput up to 100km over single-mode fiber (SMF) using a wavelength of 1550nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Juniper Networks® 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.

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

## Absolute Maximum Ratings

| Parameter              | Symbol           | Min. | Typical | Max.              | Unit | Notes |
|------------------------|------------------|------|---------|-------------------|------|-------|
| Maximum Supply Voltage | V <sub>MAX</sub> | -0.5 |         | 4                 | V    |       |
| Storage Temperature    | T <sub>STO</sub> | -40  |         | 85                | °C   | 3     |
| Operating Temperature  | T <sub>C</sub>   | 0    |         | 70                | °C   | 2     |
| Data Rate              | DR               | 1.2  |         | 11.3              | Gb/s | 1     |
| Bit Error Rate         | BER              |      |         | 10 <sup>-12</sup> |      |       |

### Notes:

1. IEEE 802.3ae
2. Case temperature
3. Ambient temperature

## Electrical Characteristics (TOP=25°C, V<sub>CC</sub>=3.3 Volts)

| Parameter                                 | Symbol                         | Min.            | Typ. | Max.                 | Unit | Notes |
|---|--------------------------------|-----------------|------|----------------------|------|-------|
| Power Supply Voltage                      | V <sub>CC</sub>                | 3.14            | 3.3  | 3.46                 | V    |       |
| Power Supply Current                      | I <sub>CC</sub>                |                 | 450  | 500                  | mA   |       |
| <b>Transmitter</b>                        |                                |                 |      |                      |      |       |
| Input Differential Impedance              | R <sub>IN</sub>                | 100             |      | 2200                 | Ω    |       |
| Differential data input swing             | V <sub>IN PP</sub>             | 120             |      | 850                  | mV   |       |
| Transmit Disable Voltage                  | V <sub>D</sub>                 | 2               |      | V <sub>CC</sub>      | V    |       |
| Transmit Enable Voltage                   | V <sub>EN</sub>                | V <sub>EE</sub> |      | V <sub>EE</sub> +0.8 | V    |       |
| <b>Receiver</b>                           |                                |                 |      |                      |      |       |
| Differential data output swing            | V <sub>OUT PP</sub>            | 300             |      | 850                  | mV   |       |
| Data output rise time/fall time (20%-80%) | t <sub>r</sub> /t <sub>f</sub> | 28              |      |                      | ps   |       |
| LOS Fault                                 | V <sub>LOS A</sub>             | 2               |      | V <sub>CC HOST</sub> | V    |       |
| LOS Normal                                | V <sub>LOS D</sub>             | V <sub>EE</sub> |      | V <sub>EE</sub> +0.5 | V    |       |

## Optical Characteristics

| Parameter                          | Symbol          | Min. | Typ. | Max. | Unit  | Notes |
|------------------------------------|-----------------|------|------|------|-------|-------|
| <b>Transmitter</b>                 |                 |      |      |      |       |       |
| Output Optical Power               | $P_{TX}$        | 0    |      | 4    | dBm   | 1     |
| Optical Center Wavelength – 1550nm | $\lambda_C$     | 1545 | 1551 | 1557 | Nm    |       |
| Extinction Ratio                   | EX              | 9    |      |      | dB    |       |
| Spectral Width (-20dB)             | $\Delta\lambda$ |      |      | .06  | nm    |       |
| Side Mode Suppression Ratio        | SMSR            | 30   |      |      | dB    |       |
| Relative Intensity Noise           | RIN             |      |      | -128 | dB/Hz |       |
| Transmitter Dispersion Penalty     | TDP             |      |      | 4    | dB    |       |
| Total Jitter                       |                 |      |      |      |       | 2     |
| Launch Power of OFF Transmitter    | $P_{OUT\_OFF}$  |      |      | -30  | dBm   | 1     |
| <b>Receiver</b>                    |                 |      |      |      |       |       |
| Optical Center Wavelength          | $\lambda_C$     | 1260 |      | 1620 | nm    |       |
| Average Receiver Power             | $P_{RX}$        | -23  |      | -8   | dBm   |       |
| Receiver Sensitivity @10.3Gb/s     | $RX\_SEN$       |      |      | -2   | dBm   | 3     |
| Receiver Reflectance               | $TR_{RX}$       |      |      | -27  | dB    |       |
| LOS Assert                         | $LOS_A$         | -35  |      |      | dBm   |       |
| LOS De- Assert                     | $LOS_D$         |      |      | -27  | dBm   |       |
| LOS Hysteresis                     | $LOS_H$         | 0.5  |      |      | dB    |       |

### Notes:

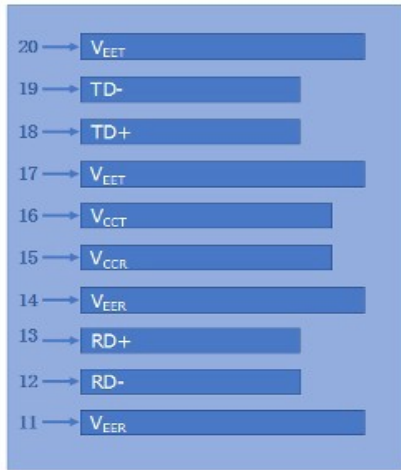
1. Average
2. According to IEEE 802.3ae requirement
3. Measured with the PRBS  $2^{31}-1$  test mode.  $BER < 10^{-12}$

## Pin Descriptions

| Pin | Symbol     | Name/Descriptions   | Ref. |
|-----|------------|---|------|
| 1   | VEET       | Transmitter ground (common with receiver ground)              | 1    |
| 2   | TX_FAULT   | Transmitter Fault   |      |
| 3   | TX_DISABLE | Transmitter Disable. Laser output disabled on high or open    | 2    |
| 4   | SDA        | 2-wire Serial Interface Data Line                             | 3    |
| 5   | SCL        | 2-wire Serial Interface Clock Line                            | 3    |
| 6   | MOD_ABS    | Module Absent. Grounded within the module                     | 3    |
| 7   | RS0        | No connection required  |      |
| 8   | LOS        | Loss of Signal indication. Logic 0 indicates normal operation | 4    |
| 9   | RS1        | No connection required  | 1    |
| 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                        |      |
| 13  | RD+        | Receiver Non-inverted DATA out. AC coupled                    |      |
| 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                  |      |
| 19  | TD-        | Transmitter Inverted DATA in. AC coupled                      |      |
| 20  | VEET       | Transmitter ground (common with receiver ground)              | 1    |

### Notes:

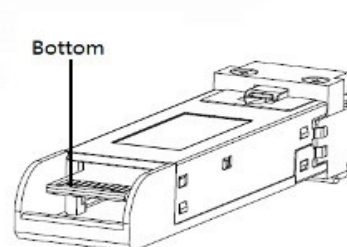
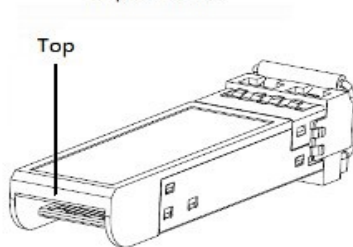
1. Circuit ground is isolated from Chassis ground.
2. Disabled:  $T_{DIS} > 2V$  or open Enabled:  $T_{DIS} < 0.8V$
3. Should be pulled up with 4.7 – 10k ohm on host board to a voltage between 2V and 3.6V
4. LOS is open collector output.



Top of Board

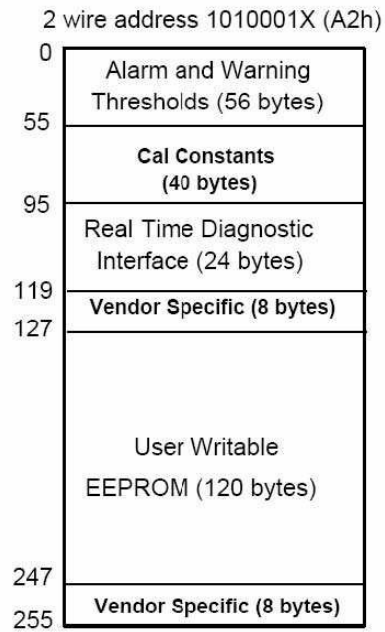
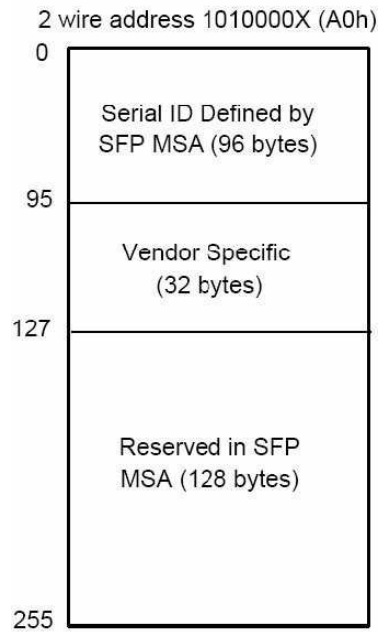


Bottom of Board

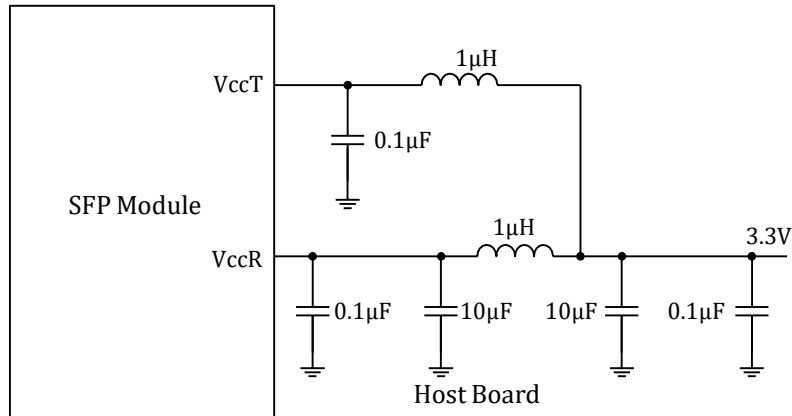


Pin-out of connector Block on Host board

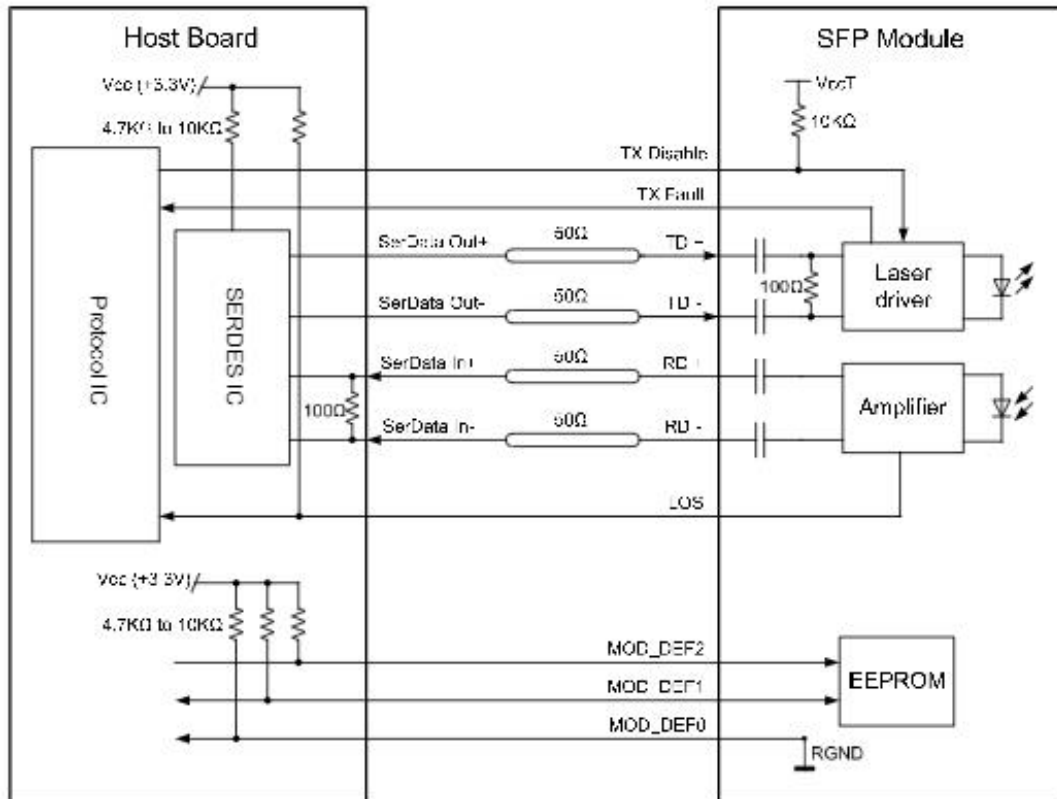
### Digital Diagnostic Memory Map



### Required Host Board Components

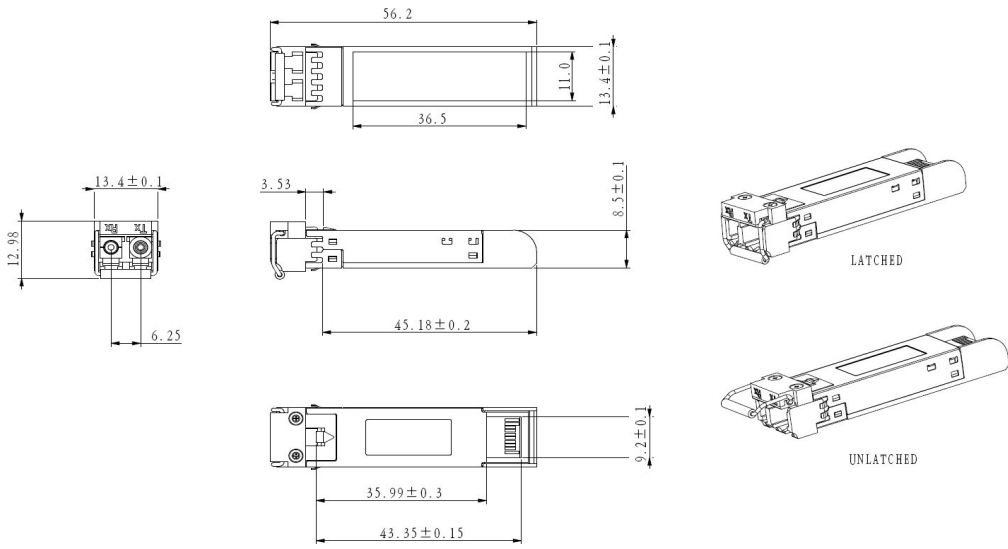


### Recommended Application Interface Circuit



## Mechanical Specifications

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



## **About ProLabs**

Our experience comes as standard; for over 15 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 over 90 optical switching and transport platforms.

## **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 400G 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.

## **Trusted Partner**

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. 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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