

## XG-PON ONU N1 SFP+

### Optical Transceiver

#### Product Features

- Support ITU-T G.987.2 XG-PON OLT N1 class application
- Single fiber bi-directional data links with asymmetric 2.488Gbps Tx and 9.953Gbps Rx
- 1270nm burst mode transmitter with DFB Laser
- 1577nm continuous mode receiver with APD-TIA
- +3.3V power supplies and Sleep Mode for Power Consumption
- Digital diagnostic SFF-8472 Compliant
- Operation case temperature -40~85°C for industrial
- SFP+ (Small Form-factor Pluggable Plus) package with SC receptacle optical interface.
- RoHS compliance, and Class 1 laser safety

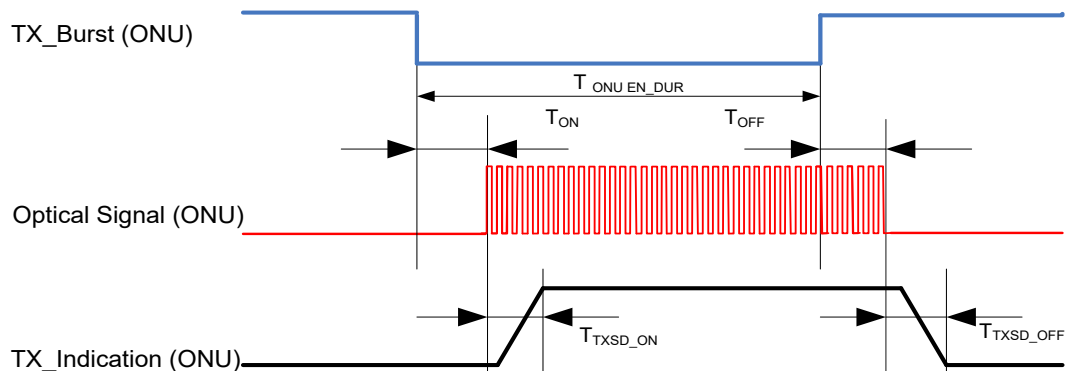
#### Operating Conditions

| Parameter            | Unit | Min.  | Typical | Max.  |
|----------------------|------|-------|---------|-------|
| Storage Temperature  | °C   | -40   |         | 85    |
| Operating Case Temp  | °C   | -40   |         | 85    |
| Power Supply Voltage | V    | 3.135 | 3.3     | 3.465 |
| Supply Current       | mA   |       |         | 450   |
| Bit Rate for Tx      | Gbps |       | 2.488   |       |
| Bit Rate for Rx      | Gbps |       | 9.953   |       |

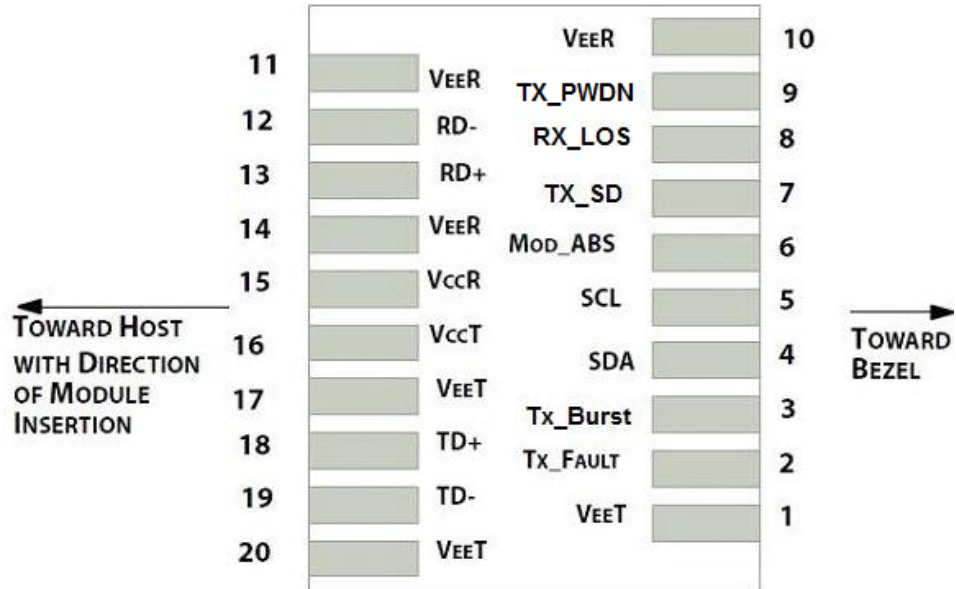
**Characteristics**

All performance is specified at whole working temperature and conditions

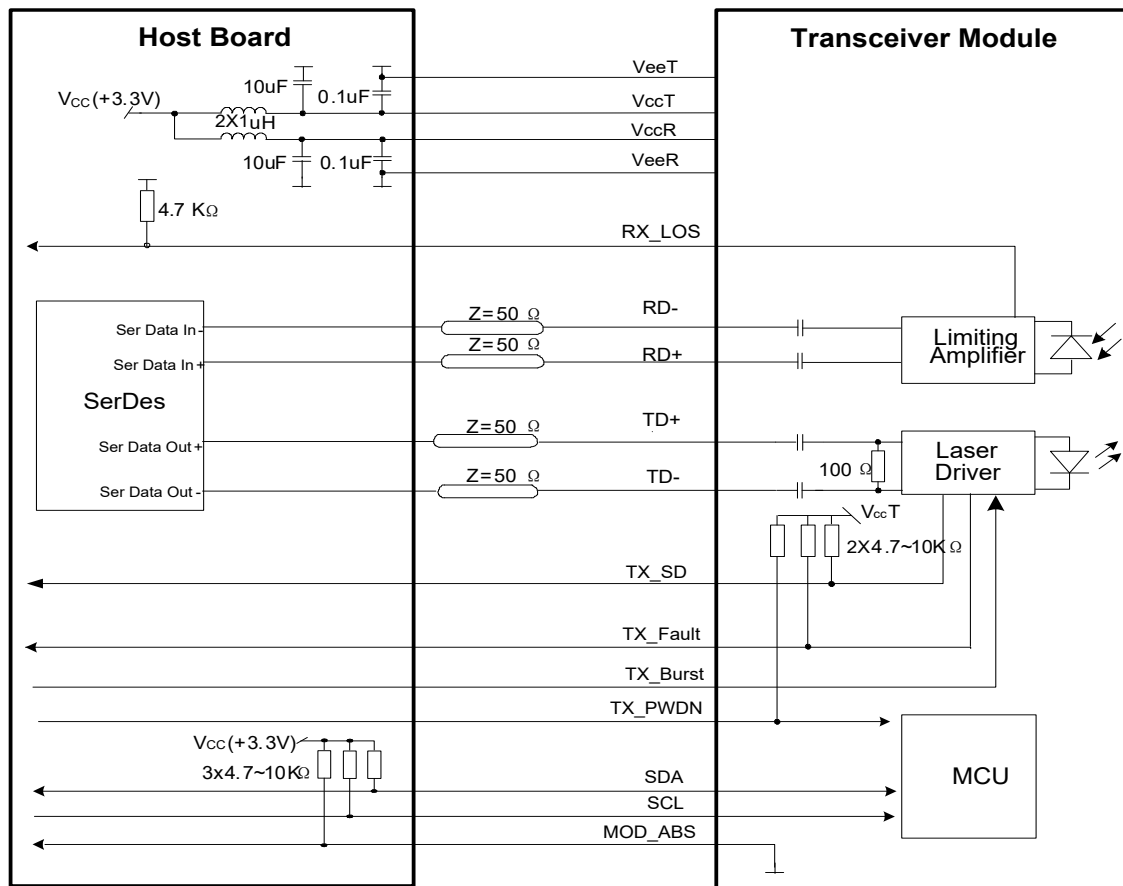
| Parameter   | Unit                         | Min. | Typical | Max.                 |
|---|------------------------------|------|---------|----------------------|
| <b>Transmitter</b>  |                              |      |         |                      |
| TX Central Wavelength   | nm                           | 1260 |         | 1280                 |
| Spectral Width (-20dB)  | nm                           |      |         | 1                    |
| Mean Launched Power   | dBm                          | 2    |         | 7                    |
| Mean Launched Power (TX Off)  | dBm                          |      |         | -39                  |
| Extinction Ratio  | dB                           | 8.2  |         |                      |
| Optical Return Loss Tolerance   | dB                           | -15  |         |                      |
| Transmitter and dispersion Penalty  | dB                           |      |         | 1                    |
| Transmitter Mask<br>(PRBS2 <sup>23</sup> -1@2.488Gbit/s)                      | Compliant With ITU-T G.987.2 |      |         |                      |
| <b>Receiver</b>   |                              |      |         |                      |
| Receive Wavelength  | nm                           | 1575 |         | 1580                 |
| Sensitivity (PRBS2 <sup>31</sup> -1@9.953Gbit/s,<br>BER ≤1×10 <sup>-3</sup> ) | dBm                          |      |         | -28                  |
| Overload  | dBm                          | -8   |         |                      |
| LOS De-assert Level   | dBm                          |      |         | -29                  |
| LOS Assert Level  | dBm                          | -45  |         |                      |
| LOS Hysteresis  | dB                           | 0.5  |         | 6                    |
| <b>Electrical Interface Characteristics</b>                                   |                              |      |         |                      |
| Data Input Swing Differential/TX  | mV                           | 200  | -       | 1200                 |
| Data Output Swing Differential/RX   | mV                           | 700  |         | 950                  |
| Input Differential Impedance  | Ω                            | 90   | 100     | 110                  |
| LVTTTL Output High  | V                            | 2.4  |         | V <sub>cc</sub>      |
| LVTTTL Output Low   | V                            | 0    |         | 0.4                  |
| LVTTTL Input High   | V                            | 2.0  |         | V <sub>cc</sub> +0.3 |
| LVTTTL Input Low  | V                            | 0    |         | 0.8                  |
| <b>Timing Characteristics</b>   |                              |      |         |                      |
| Burst Turn On Time (T <sub>on</sub> )   | ns                           |      |         | 12.8                 |
| Burst Turn Off Time (T <sub>off</sub> )                                       | ns                           |      |         | 12.8                 |
| Tx-SD Assert (T <sub>TXSD_ON</sub> )  | ns                           |      |         | 100                  |
| Tx-SD De-Assert (T <sub>TXSD_OFF</sub> )                                      | ns                           |      |         | 100                  |
| LOS Assert Time (T <sub>LOSA</sub> )  | us                           |      |         | 100                  |
| LOS De-assert Time (T <sub>LOSD</sub> )                                       | us                           |      |         | 100                  |

**Timing Sequence for Burst Tx**

**PIN Definition**

| Pin No. | Symbol   | Level / Logic | Description  |
|---------|----------|---------------|--|
| 1       | VeeT     |               |  |
| 2       | Tx_Fault | LVTTTL-O      | Module Transmitter Fault   |
| 3       | Tx_Burst | LVTTTL-I      | Transmitter Burst Control, low active for transmitter on   |
| 4       | SDA      | LVTTTL-I/O    | 2-Wire Serial Interface Data Line (MOD-DEF2) (note3)   |
| 5       | SCL      | LVTTTL-I      | 2-Wire Serial Interface Clock (MOD-DEF1)   |
| 6       | MOD_ABS  | LVTTTL-O      | Module Absent, connected to ground in the module   |
| 7       | TX_SD    | LVTTTL-O      | Tx Signal Detect, active high when transmitter on  |
| 8       | Rx_LOS   | LVTTTL-O      | Loss of Receiver Signal Indication   |
| 9       | TX_PWDN  | LVTTTL-I      | Power saving of Tx side, On/off time less than 1ms, active low to active Tx power saving. if this feature will not be used, main board connection should be NC |
| 10      | VeeR     |               | Module Receiver Ground   |
| 11      | VeeR     |               | Module Receiver Ground   |
| 12      | RD-      | CML-O         | Receiver Inverted Data Output  |
| 13      | RD+      | CML-O         | Receiver Non-Inverted Data Output  |
| 14      | VeeR     |               | Module Receiver Ground   |
| 15      | VccR     |               | Module Receiver 3.3V Supply  |
| 16      | VccT     |               | Module Transmitter 3.3V Supply   |
| 17      | VeeT     |               | Module Transmitter Ground  |
| 18      | TD+      | CML-I         | Transmitter Non-Inverted Data Input  |
| 19      | TD-      | CML-I         | Transmitter Inverted Data Input  |
| 20      | VeeT     |               | Module Transmitter Ground  |

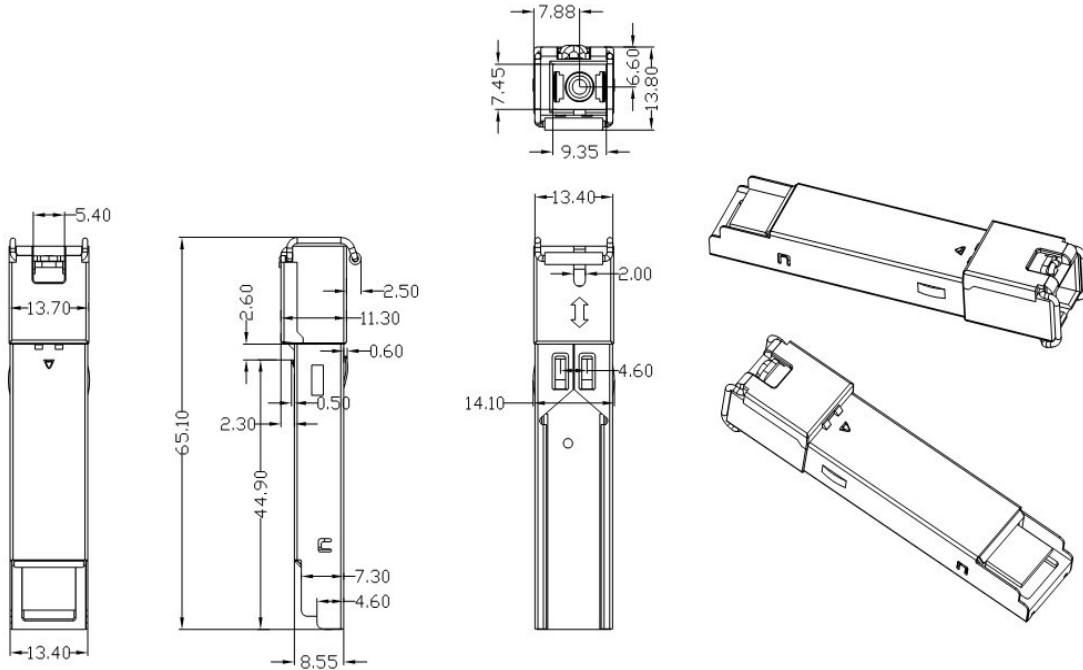


**Typical Interface Circuit**



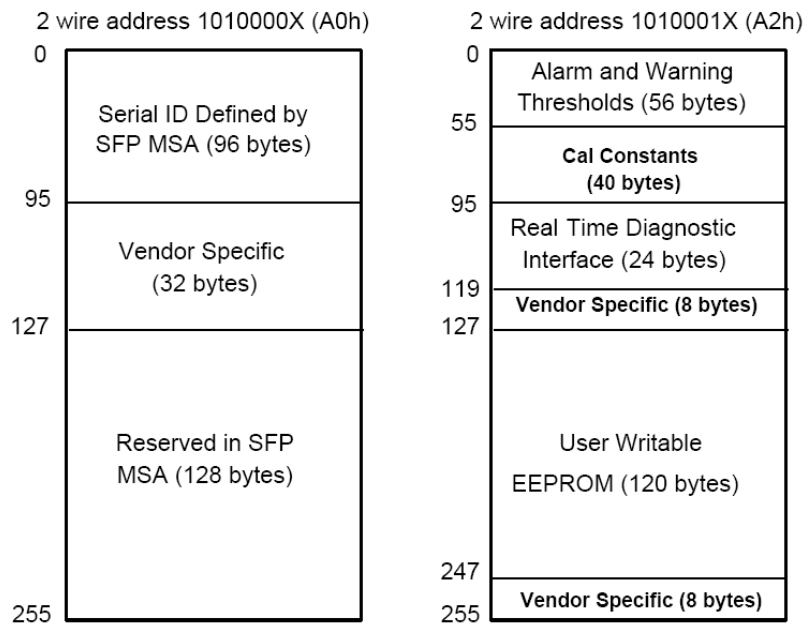
**Mechanical Diagram**

For detail mechanical information, please refer to the related document of SFF-8432



**EEPROM Memory Map**

The digital diagnostic memory map specific data field define as following. For detail EEPROM information, please refer to the related document of SFF 8472 Rev 12.0.



## ESD

The SFP+ module and host SFI contacts (High Speed Contacts) shall withstand 1kV electrostatic discharge based on Human Body Model and all host contacts with exception of the SFI contacts (High Speed Contacts) shall withstand 2kV electrostatic discharge based on Human Body Model. The SFP+ module shall meet ESD requirements given in EN61000-4-2, criterion B test specification such that units are subjected to 15kV air discharges during operation and 8kV direct contact discharges to the case per section 2.9 in SFF-8431 REV4.1. However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

## Laser Safety

This is a Class 1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

## Ordering Information

| Ordering P/Ns | Description  |
|---------------|--|
| D2276R-SSHA   | XG-PON N1 ONU, Tx 1270nm 2.488G, Rx 1577nm 9.953G, TX_Burst signal low active transmitter on, Tx_LOS signal get to be high when the receiver signal power is below the threshold,, SFP form-factor, SC/UPC receptacle connector, -40~85°C Industrial temperature |

## Contact Us



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