

## XGPON ONU N1 SFP+ Optical Transceiver

### Product Features

- Support ITU-T G.987.2 XGPON 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

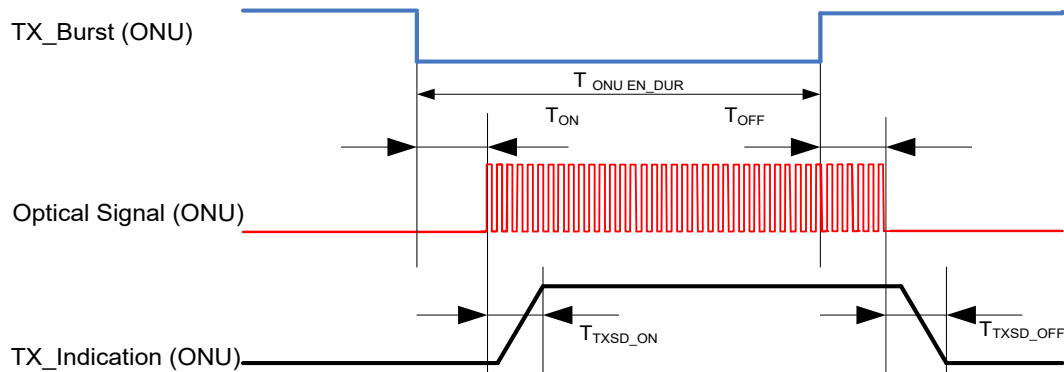
### Operating Condition

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	

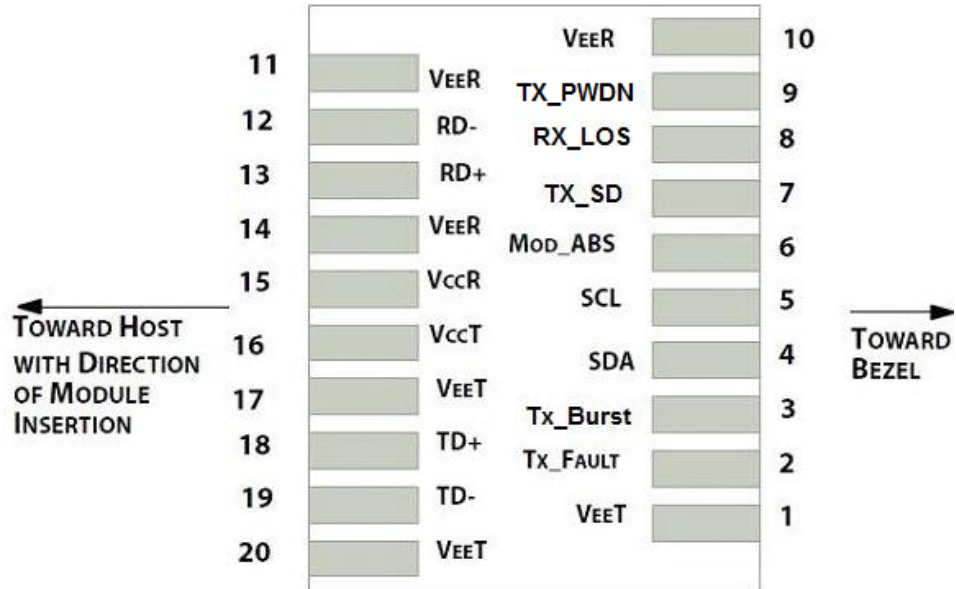
**Characteristics**

All performance is specified at whole working temperature and conditions

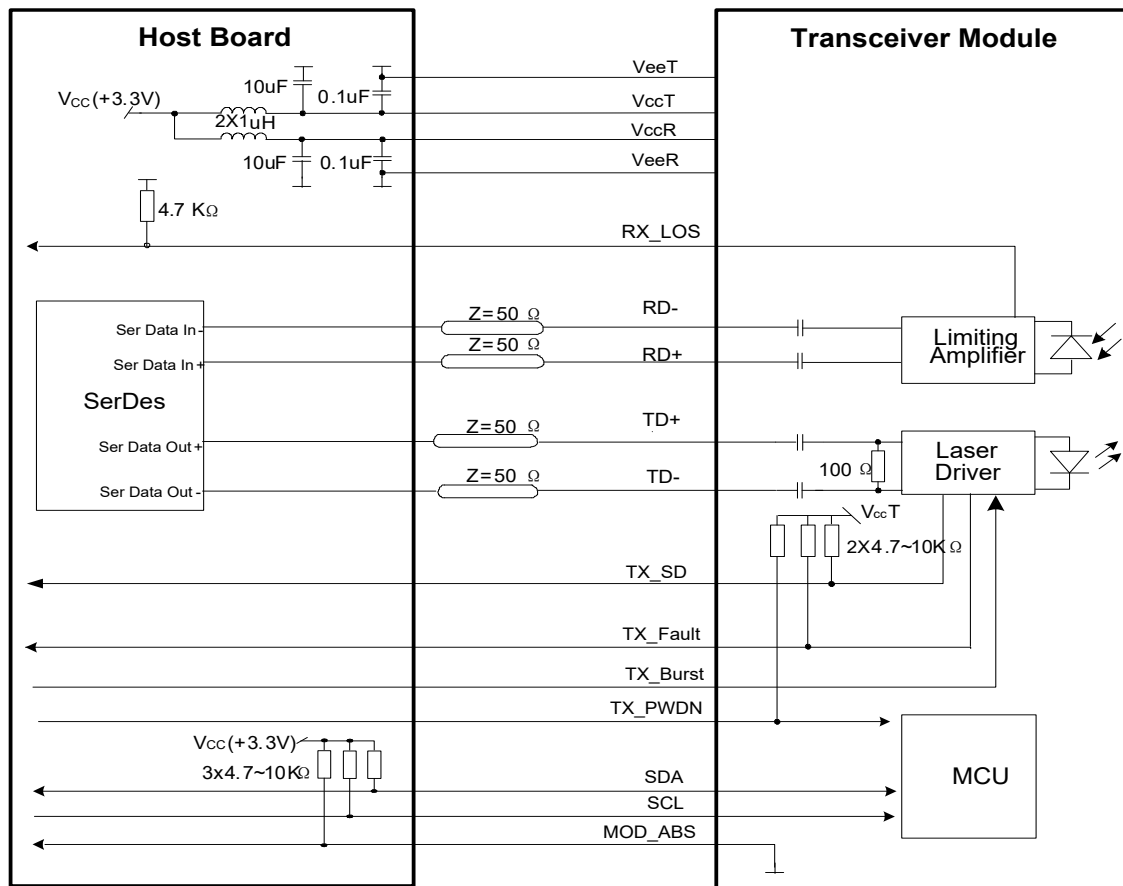
Parameter	Unit	Min.	Typical	Max.
<b>Transmitter</b>				
TX Central Wavelength	nm	1260		1280
Spectral Width (-20dB)	nm			1
Mean Launched Power	dBm	2		7
Mean Launched Power (TX Off)	dBm			-39
Extinction Ratio	dB	8.2		
Optical Return Loss Tolerance	dB	-15		
Transmitter and dispersion Penalty	dB			1
Transmitter Mask (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, 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
WDM Filter Isolation (ISO 1550)	dB	38		
WDM Filter Isolation (1260~1560)	dB	21.5		
WDM Filter Isolation (ISO 1650)	dB	35		
WDM Filter Isolation (1600~1675)	dB	21.5		
<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
LVTTL Output High	V	2.4		V <sub>cc</sub>
LVTTL Output Low	V	0		0.4
LVTTL Input High	V	2.0		V <sub>cc</sub> +0.3
LVTTL 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	LVTTL-O	Module Transmitter Fault
3	Tx_Burst	LVTTL-I	Transmitter Burst Control, low active for transmitter on
4	SDA	LVTTL-I/O	2-Wire Serial Interface Data Line (MOD-DEF2) (note3)
5	SCL	LVTTL-I	2-Wire Serial Interface Clock (MOD-DEF1)
6	MOD_ABS	LVTTL-O	Module Absent, connected to ground in the module
7	TX_SD	LVTTL-O	Tx Signal Detect, active high when transmitter on
8	Rx_LOS	LVTTL-O	Loss of Receiver Signal Indication
9	TX_PWDN	LVTTL-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

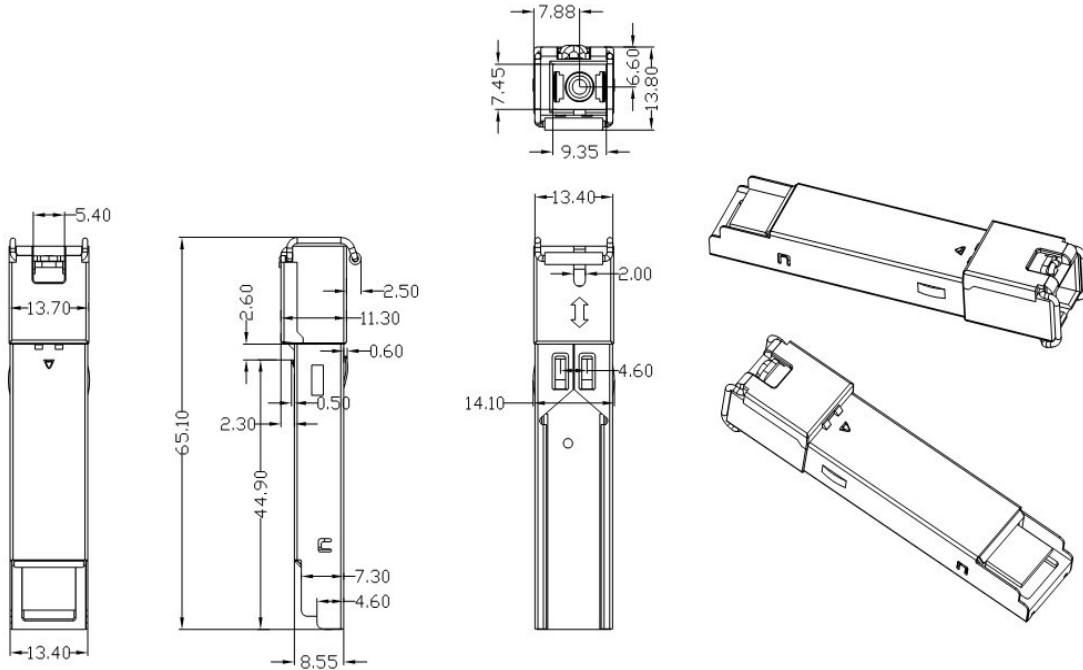


**Typical Interface Circuit**



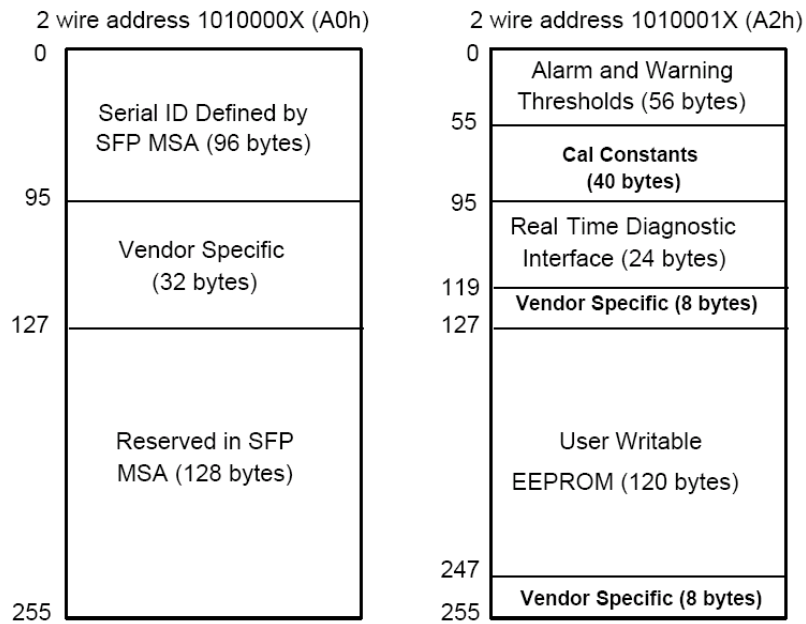
**Mechanical Diagram**

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	XGPON 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

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