

## 10PU-P1TXR-X3I

Asymmetric 10GEPON ONU SFP+ Transceiver

### Features

- Single fiber bi-directional data links Asymmetric TX 1.25Gbps/RX10.3125Gbps application
- -40°C to 85°C operating case temperature
- Single 3.3V power supply
- SFP+ package with SC Receptacle connector
- Hot-pluggable capability
- High power 1310nm DML DFB LD and high sensitivity 1577nm APD
- Support 20km transmission distance with SMF
- CML compatible data input/output interface
- Low power dissipation
- Low EMI and excellent ESD protection
- Digital diagnostic monitor interface
- RoHS compliance for 10PU-P1TXR-X3I



### Applications

- Asymmetric 10GEPON PRX30 ONU with 15~29dB attenuation range

### Standards

- Complies with SFP+ MSA (SFF-8431)
- Complies with IEEE 802.3av
- Complies with SFF-8472 Rev 10.2
- Complies with FCC 47 CFR Part 15, Class B
- Complies with FDA 21 CFR 1040.10 and 1040.11, Class I
- Complies with FDA 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

## Absolute Maximum Ratings

**Table 1 - Absolute Maximum Ratings**

Parameter	Symbol	Min	Max	Unit	Notes
Storage Ambient Temperature	T <sub>STG</sub>	-40	85	°C	
Operating Case Temperature	T <sub>C</sub>	-40	85	°C	
Operating Humidity	OH	5	95	%	
Power Supply Voltage	V <sub>CC</sub>	-0.5	3.6	V	

## Recommended Operating Environment

**Table 2 - Recommended Operating Environment**

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	T <sub>C</sub>	-40		+85	°C	
Power Supply Voltage	V <sub>CC</sub>	3.13	3.3	3.47	V	
Power Supply Current	I <sub>CC</sub>		290	450	mA	
Nominal upstream line rate			1.25		Gbps	
Nominal downstream line rate			10.3125		Gbps	

## Transmitter Optical Characteristics

**Table 3- Transmitter Optical Characteristics**

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Average Launch Optical Power	P <sub>OUT</sub>	0.62	-	5.62	dBm	EOL, Launched into 9/125µm single mode fiber
Extinction Ratio	ER	9	-	-	dB	
Centre Wavelength	λ	1260	1310	1360	nm	

Spectral Width (-20dB)	$\Delta\lambda$	-	-	1	nm	
Side Mode Suppression Mode	SMSR	30			dB	
Burst on time	Ton			30	ns	
Burst off time	Toff			30	ns	
Transmitter and dispersion penalty	TDP			1.4	dB	
Eye Diagram	Compliant With IEEE Std 802.3ah™-2004					PRBS 2 <sup>7</sup> -1 test pattern @1.25Gbit/s

## Transmitter Electrical Characteristics

Table 4- Transmitter Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Input Differential Impedance	ZIN	90	100	110	$\Omega$	
Data Input Swing Differential	VIN	200	-	1600	mV	
Burst_ENABLE	Burst Disable	2.0	-	Vcc	V	
	Burst Enable	0	-	0.8	V	

## Receiver Optical Characteristics

Table 5- Receiver Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Center Wavelength	$\lambda_c$	1575	-	1580	nm	
Receiver Sensitivity				-28.5	dBm	Measured with PRBS 2 <sup>31</sup> -1 test pattern @10.31 25Gbit/s, BER $\leq 1 \times 10^{-3}$ .
Receiver Overload		-10			dBm	

Receiver reflectance					-12	dB	
LOS De-Assert			-45			dBm	
LOS Assert					-29.5	dBm	
LOS Hysteresis			0.5		6	dB	
Data Output Swing Differential		$V_{OUT}$	340	-	850	mV	
LOS	High		2.4		$V_{CC}$	V	
	Low		0	-	0.4	V	

## Pin Descriptions

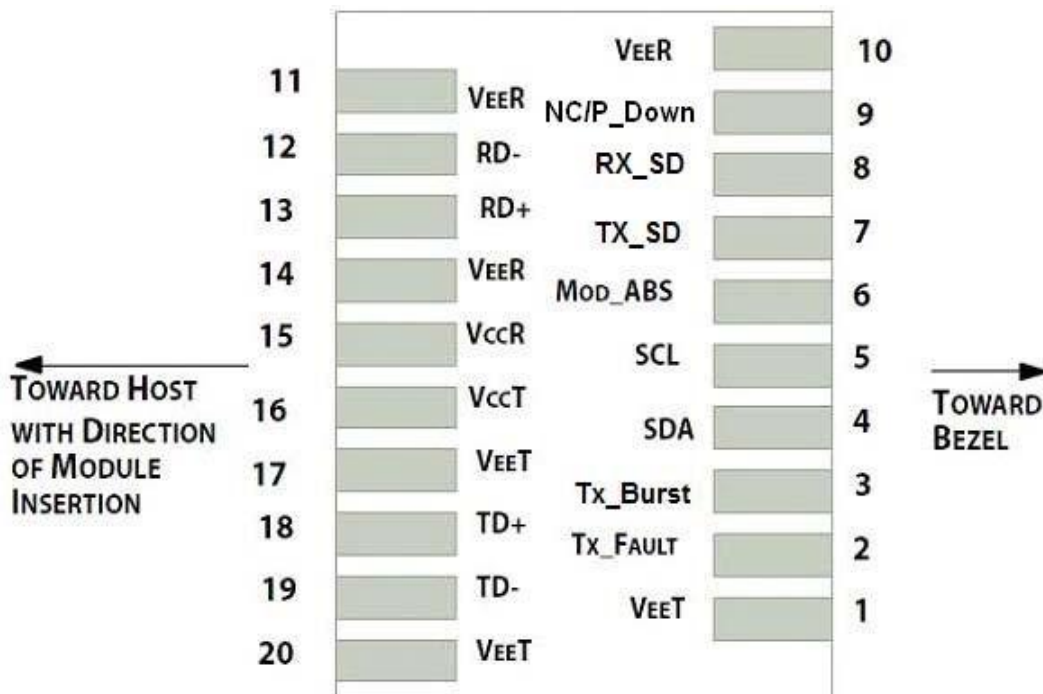
**Table 6-Pin Descriptions**

Pin	Name	Description	Notes
1	VeeT	Module Transmitter Ground	
2	TX Fault	Module Transmitter Fault	Low: normal; High: abnormal
3	TX BURST	Transmitter Burst Enable	TTL Input, Low: transmitter on
4	MOD-DEF2	Module Definition 2	2 wire serial ID interface, SDA
5	MOD-DEF1	Module Definition 1	2 wire serial ID interface, SCL
6	Mod_ABS	Module Absent	Connected to VeeT or VeeR in the module
7	TX_SD	Tx Transmitter State Indication	TX_Indication Assert When Transmitter ON
8	Rx_SD	Receiver Signal Indication	High: signal detected; Low: loss of signal
9	NC/P_Down	NC/ Module power down, Putting the module in the power saving mode	Active Low
10	VeeR	Module Receiver Ground	
11	VeeR	Module Receiver Ground	
12	RD-	Inverted Received Data Out	AC-coupled
13	RD+	Non-inverted Received Data Out	AC-coupled

14	VeeR	Module Receiver Ground	
15	VCCR	Module Receiver 3.3 V Supply	
16	VCCT	Module Transmitter 3.3 V Supply	
17	VeeT	Module Transmitter Ground	
18	TD+	Non-Inverted Transmit Data in	AC-coupled
19	TD-	Inverted Transmit Data in	AC-coupled
20	VeeT	Module Transmitter Ground	

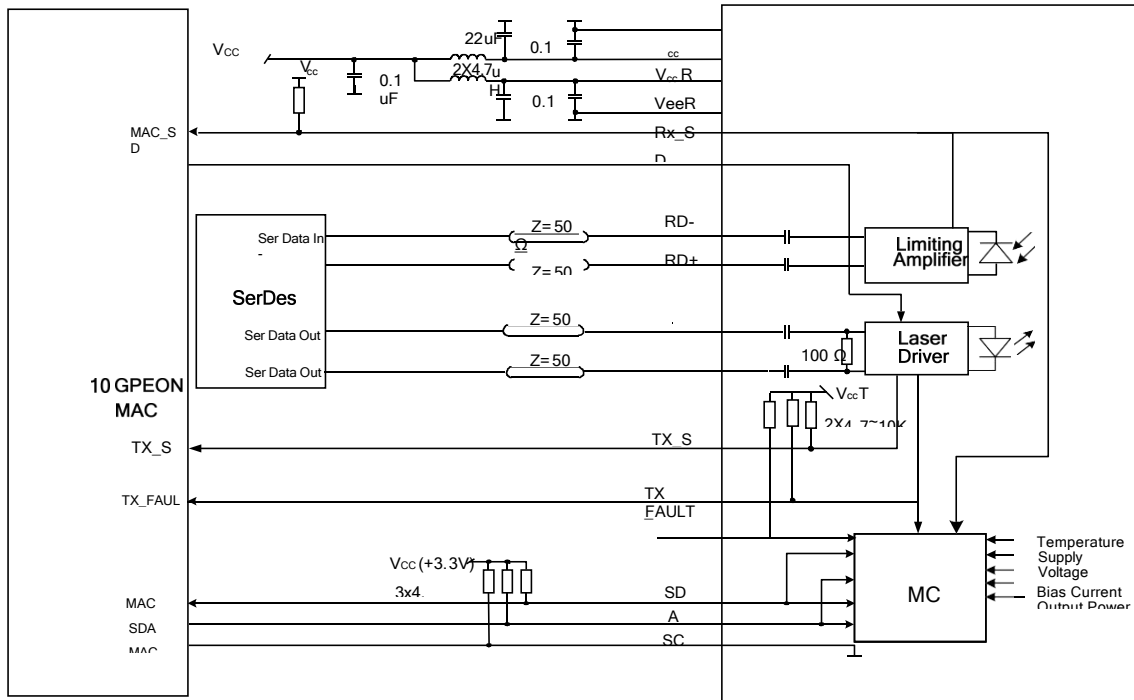
## Pin Assignment

Pin Out Drawing



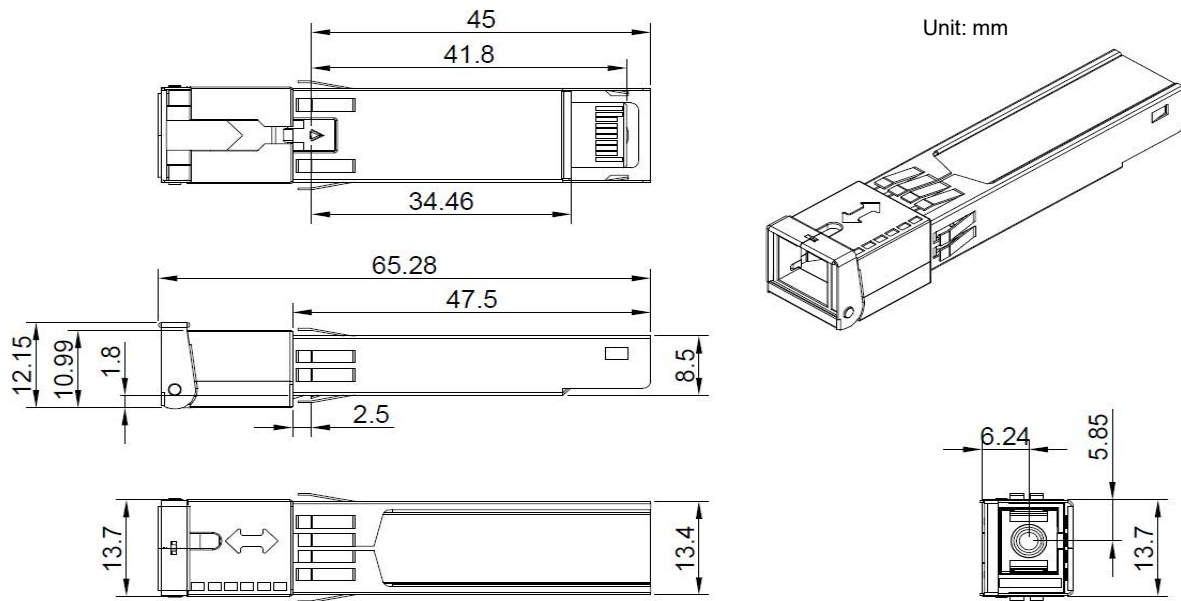
Pin Out Drawing

## Typical Interface Circuit



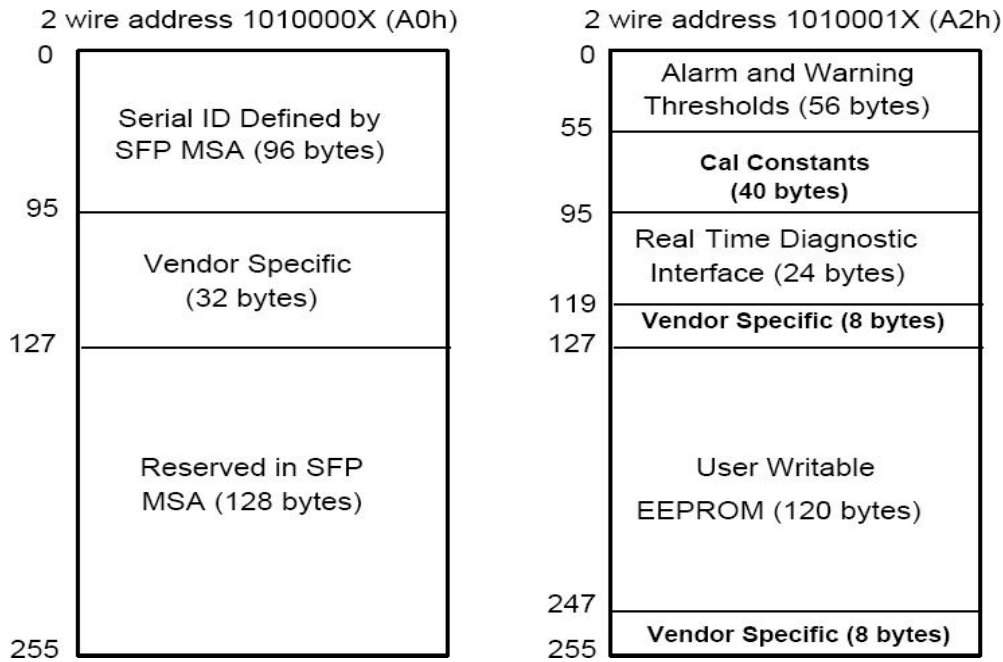
Typical Interface Circuit

## Package Outline



Package Outline

## EEPROM Information



EEPROM Memory Map Specific Data Field Descriptions

## Digital Diagnostic Monitoring

Table 7- Digital Diagnostic Monitoring

Five transceiver parameter values are monitored. The following table defines the monitored parameter's accuracy.

Parameter	Range	Accuracy	Calibration	Note
Temperature	-40 to +85 °C	±3°C	Internal	
Voltage	3 to 3.6 V	±3%	Internal	
Bias Current	0 to 100 mA	±10%	Internal	
TX Power	0.62 to 5.62dBm	±3dB	Internal	
RX Power Monitor	-28.5 to -10dBm	±3dB	Internal	

**Ordering information****Table 8- Ordering information**

Part Number	Product Description
10PU-P1TXR-X3I	Asymmetric 10GE PON ONU SFP+, I temp, SC, PRX30, 1310T/1577R, -40~ +85°C, with DDM

AscentOptics reserves the right to make changes to the product(s) or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information. Edition: Apr. 2019 Published by Ascent Optics Co.,Ltd. Copyright © Ascent Optics All Rights Reserved.

E-mail: [sales@ascentoptics.com](mailto:sales@ascentoptics.com)

Web : <http://www.ascentoptics.com>