

## 10PU-P1TXR-X3C

10GEPON ONU PRX30 SFP+ Transceiver

### Features

- Single fiber bi-directional data links Asymmetric TX 1.25Gbps/RX10.3125Gbps application
- 0°C to 70°C operating case temperature
- Single 3.3V power supply
- SFP+ package with SC Receptacle connector
- Hot-pluggable capability
- High power 1310nm DFB LD and high sensitivity 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-6 compliance



### Applications

- Asymmetric 10GEPON PRX30 ONU

### Standards

- Complies with SFP+ MSA (SFF-8431)
- Complies with IEEE 802.3av
- Complies with SFF-8472
- Complies with FCC 47 CFR Part 15, Class B
- Complies with FDA 21 CFR 1040.10 and 1040.11, Class I

## Absolute Maximum Ratings

**Table 1 - Absolute Maximum Ratings**

Parameter	Symbol	Min	Max	Unit	Notes
Storage Ambient Temperature	TSTG	-40	85	°C	
Operating Case Temperature	T <sub>c</sub>	0	70	°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>	0		70	°C	
Power Supply Voltage	V <sub>CC</sub>	3.13	3.3	3.47	V	
Power Supply Current	I <sub>CC</sub>			400	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	$P_{OUT}$	0.62	-	5.62	dBm	
Extinction Ratio	ER	6	-	-	dB	
Centre Wavelength	$\lambda$	1260	1310	1360	nm	
Spectral Width (-20dB)	$\Delta\lambda$	-	-	1	nm	
Side Mode Suppression Mode	SMSR	30			dB	
Burst on time	$T_{on}$			30	ns	
Burst off time	$T_{off}$			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	$Z_{IN}$	90	100	110	$\Omega$	
Data Input Swing Differential	$V_{IN}$	200	-	1600	mV	
Burst_ENABLE	Burst Disable	2.0	-	V <sub>cc</sub>	V	
	Burst Enable	0	-	0.8	V	

## Receiver Optical Characteristics

**Table 5- Receiver Optical 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 @10.3125 Gbit/s, BER $\leq 1 \times 10^{-3}$ .
Receiver Overload		-8			dBm	
Receiver reflectance				-12	dB	
RX_LOS De-Assert		-38			dBm	
RX_LOS Assert				-30	dBm	
RX_LOS Hysteresis		0.5		6	dB	

## Receiver Electrical Characteristics

**Table 6- Receiver Electrical Characteristics**

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Data Output Swing Differential	V <sub>OUT</sub>	300	-	850	mV	
LOS	High	2.4	-	V <sub>CC</sub>	V	
	Low	0	-	0.4	V	

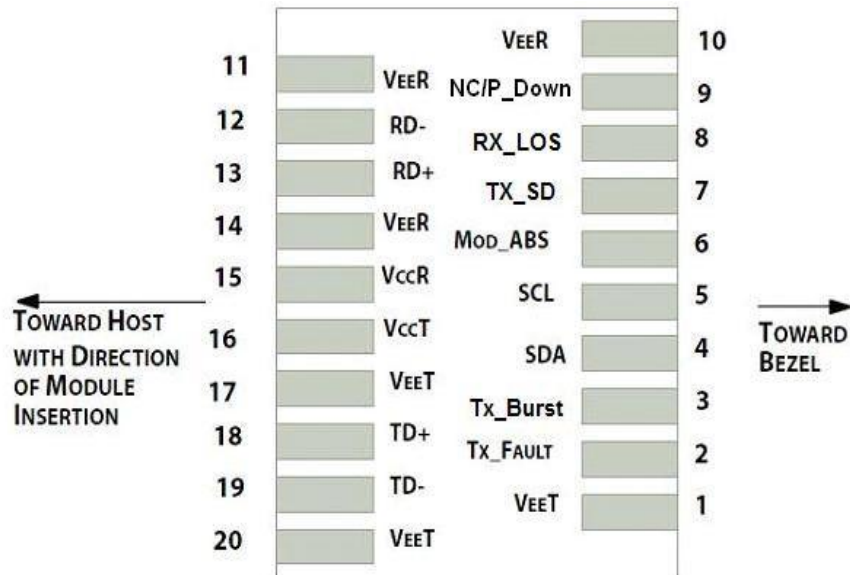
## Pin Descriptions

**Table 7-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	LVTTTL Input, Low: transmitter on, Internal pull up
4	SDA	2-wire Serial Interface Data Line	Same as MOD-DEF2 in INF-8074i
5	SCL	2-wire Serial Interface Clock	Same as MOD-DEF1 in INF-8074i
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_LOS	Loss of Signal	Low: signal detected; High: loss of signal
9	NC/P_Dow n	NC/ Module pow er 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	
19	TD-	Inverted Transmit Data in	
20	VeeT	Module Transmitter Ground	

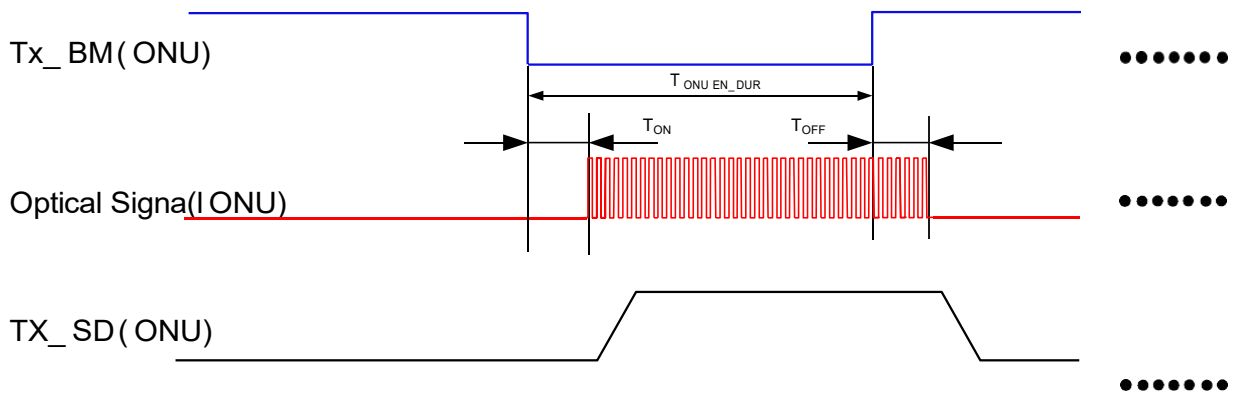
## Pin Assignment

Pin Out Drawing



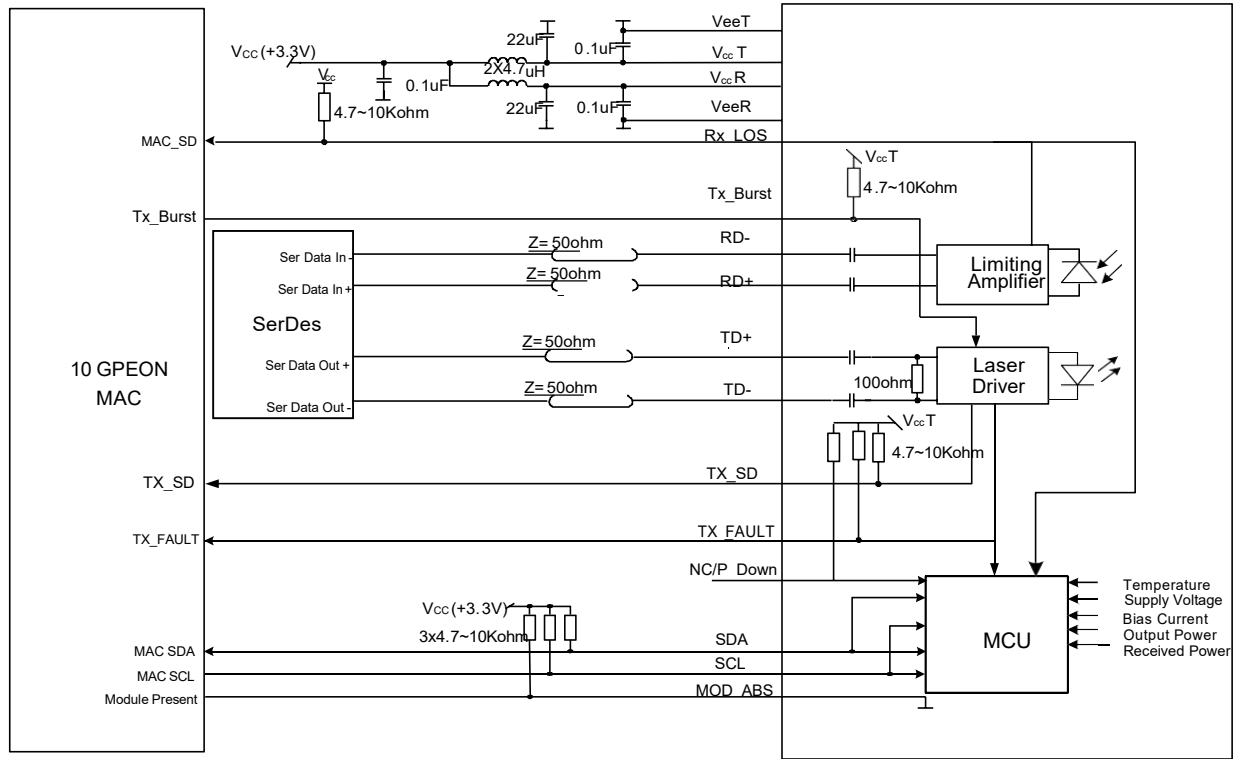
Pin Out Drawing

## Typical ONU Timing Sequence



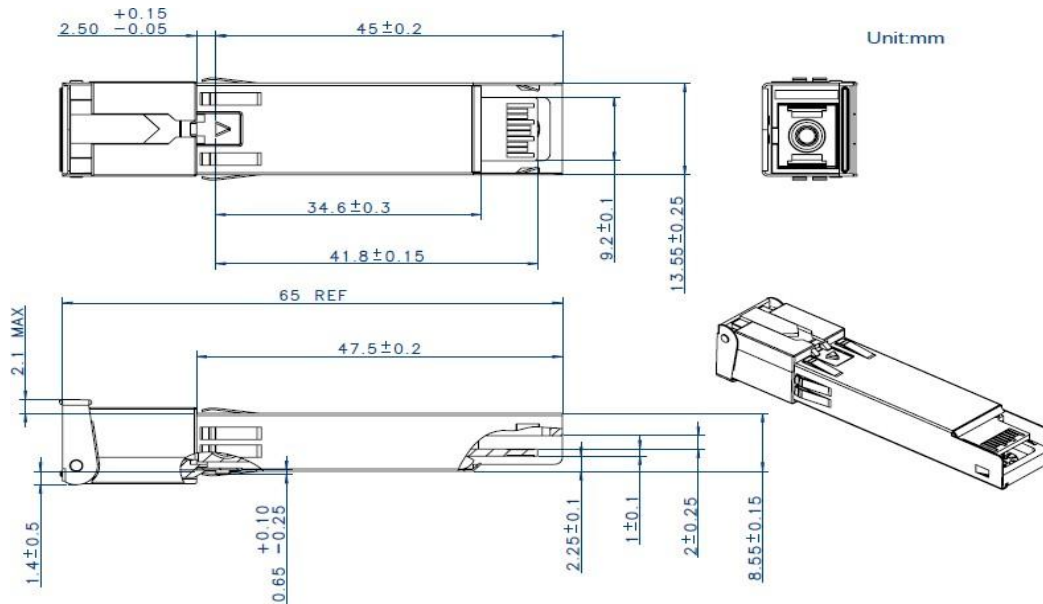
Typical ONU Timing Sequence

## Typical Interface Circuit



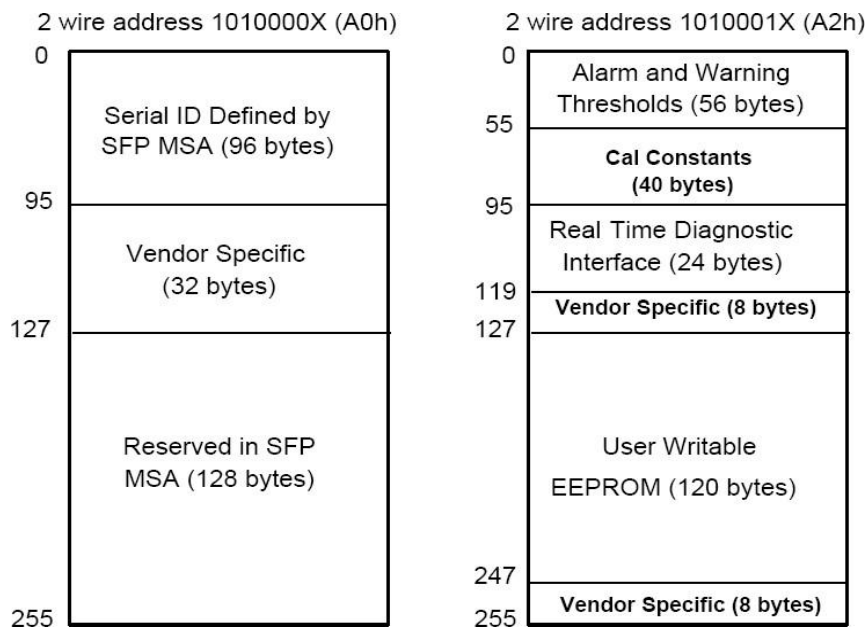
Typical Interface Circuit

## Package Outline



Package Outline

## EEPROM Information



EEPROM Memory Map Specific Data Field Descriptions

## Digital Diagnostic Monitoring

Table 8- Digital Diagnostic Monitoring

Parameter	Range	Accuracy	Calibration	Notes
Temperature	0 to 70°C	±3°C	Internal	
Voltage	3 to 3.6V	±3%	Internal	
Bias Current	0 to 130mA	±10%	Internal	
TX Power	0.62 to 5.62dBm	±3dB	Internal	
RX Power Monitor	-28.5 to -8 dBm	±3dB	Internal	



## Ordering information

**Table 9- Ordering information**

Part Number	Product Description
10PU-P1TXR-X3C	Asymmetric 10GE PON ONU SFP+, C temp, SC, PRX30,0 ~ +70°C, with DDM

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