DATA SHEET

MODULETEK: EPON-OLT-PX20PLUS-C10

SFP EPON OLT Transceiver with DOM

EPON-OLT-PX20PLUS-C10 Overview

ModuleTek's EPON-OLT-PX20PLUS-C10 is a point-to-multipoint (P2MP) high quality EPON transceiver module,mainly used in home, Business or Curb(FTTX). It is designed for symmetric 1.25G data links that employ high-speed burst mode TDM receivers/transmitters.The product is based on the IEEE 802.3ah standard,two-way communication over a single fiber,and integrates a high-performance 1310nm burst mode APD/TIA receiver and 1490nm continuous mode DFB transmitter with internal optical isolator.

Product Features

- Single fiber bi-directional data links symmetric 1.25Gbps
- 1310nm APD/TIA burst-mode Receiver
- 1490nm continuous-mode DFB Laser with Isolator
- Support more than 24dB dynamic range
- IEEE802.3ah Compliant
- SFF-8472 Compliant
- Low Power Consumption
- Hot-pluggable SFP footprint
- Simplex SC connector
- Single power supply 3.3V
- RoHS Compliant
- Class 1 laser product complies with EN 60825-1
- Operating temperature range: 0°C to70°C

Applications

- Access Networks
- Fiber to the Home, Curb, Office (FTTX)
- Point to Multi Point Service (P2MP)

Ordering Information

Part Number	Description
EPON-OLT-PX20PLUS-C10	SFP EPON OLT Transceiver with DOM

For More Information:
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General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate	DR		1.25		Gb/s	
Bit Error Rate	BER			10^{-12}		
Operating Temperature	T_C	0		70	°C	1
Storage Temperature	T_{STO}	-40		85	°C	2
Supply Current	I_{CC}		300	400	mA	3
Input Voltage	V_{CC}	3.14	3.3	3.46	V	
Maximum Voltage	V_{MAX}	-0.5		4	V	3

Notes:
1. Case temperature
2. Ambient temperature
3. For electrical power interface

Optical – Characteristics – Transmitter

V_{CC}=3.14V to 3.46V, T_C=0°C to 70°C

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Transmitter Type	1490nm DFB Laser with Isolator					1
Downstream Signaling Speed	S_{TX}		1.25		Gb/s	
Output Optical Power	P_{TX}	2.5		7	dBm	2
Optical Center Wavelength	λ_C	1480	1490	1500	nm	
Extinction Ratio	ER	9	10		dB	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Optical Rise/Fall Time (20%-80%)	t_r /t_f			200	ps	
Side Mode Suppression Ratio	SMSR	30			dB	
Launch Power of OFF Transmitter	P_{OUT_OFF}			-30	dBm	
Output Eye	Compliant with IEEE802.3ah					

Notes:
1. Continuous-mode
2. Class 1 Product

Optical – Characteristics – Receiver

V_{CC}=3.14V to 3.46V, T_C=0°C to 70°C

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Receiver Type	1310nm APD/TIA burst-mode Receiver					
Signaling Speed	S_{rx}		1.25		Gb/s	
Optical Center Wavelength	λ_C	1260	1310	1360	nm	
Receiver Sensitivity @ 1.25Gb/s	R_{X_SEN}			-30	dBm	1
Maximum Input Power	P_{MAX}	-6			dBm	
Receiver Threshold Settling Time	$T_{SETTLING}$			250	ns	
Dynamic Range		-30		-6	dBm	
LOS Assert	LOS_A	-45			dBm	
LOS De-Assert	LOS_D			-31	dBm	
LOS Hysteresis	LOS_H	0.5			dB	
Receiver Reflectance				-12	dB	

Notes:
1.PRBS 2^7-1

Electrical Characteristics

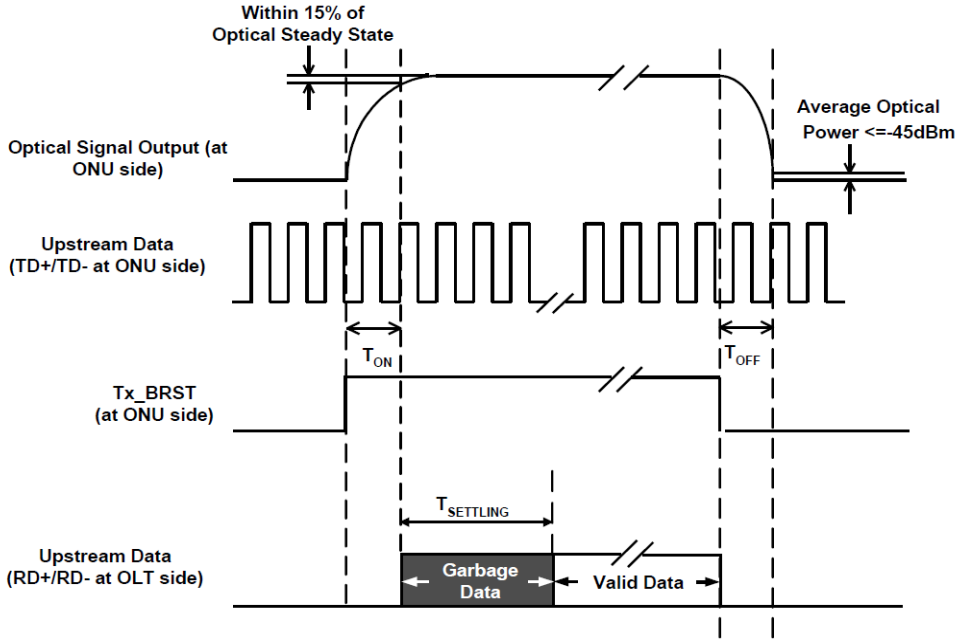
V_{CC}=3.14V to 3.46V, T_C=0°C to 70°C

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Input differential impedance	R_{IN}		100		Ω	
Differential data input swing	V_{IN_PP}	200		1600	mV	
Differential data output swing	V_{OUT_PP}	400		1600	mV	
Input Signal Level (LVTTL H)	V	2.0		V_{CC}	V	
Input Signal Level (LVTTL L)	V	0		0.8	V	
Output Signal Level (LVTTL H)	V	2.4		V_{CC}	V	
Output Signal Level (LVTTL L)	V	0		0.4	V	

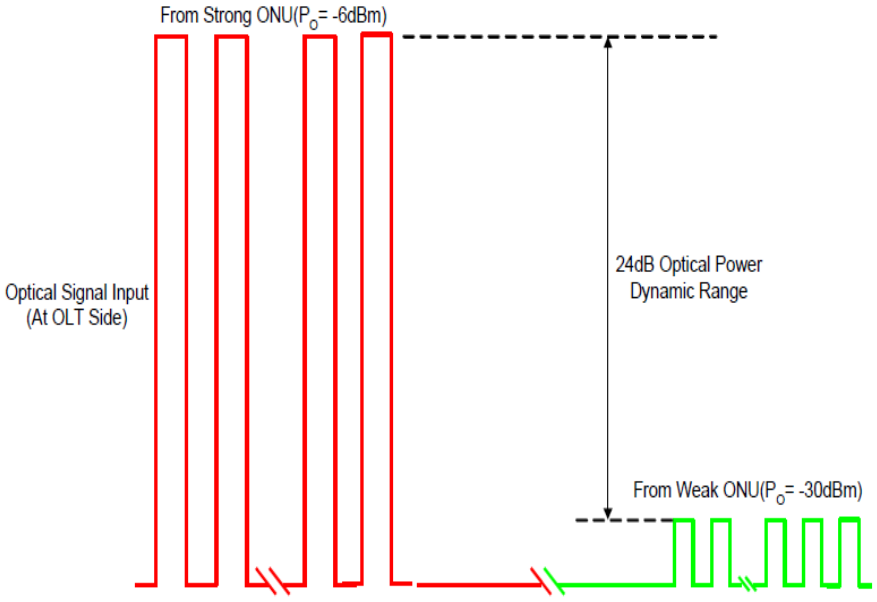
Digital Diagnostic Functions

EPON-OLT-PX20PLUS-C10 supports the 2-wire serial communication protocol as defined in SFP MSA. Digital diagnostic information is accessible over the 2-wire interface at the address 0xA2. Digital diagnostics for EPON-OLT-PX20PLUS-C10 are internally calibrated by default. The internal micro control unit accesses the device operating parameters in real time,Such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.The module implements the alarm function of the SFP MSA,alerts the user when a particular operating parameter exceeds the factory-set normal range.

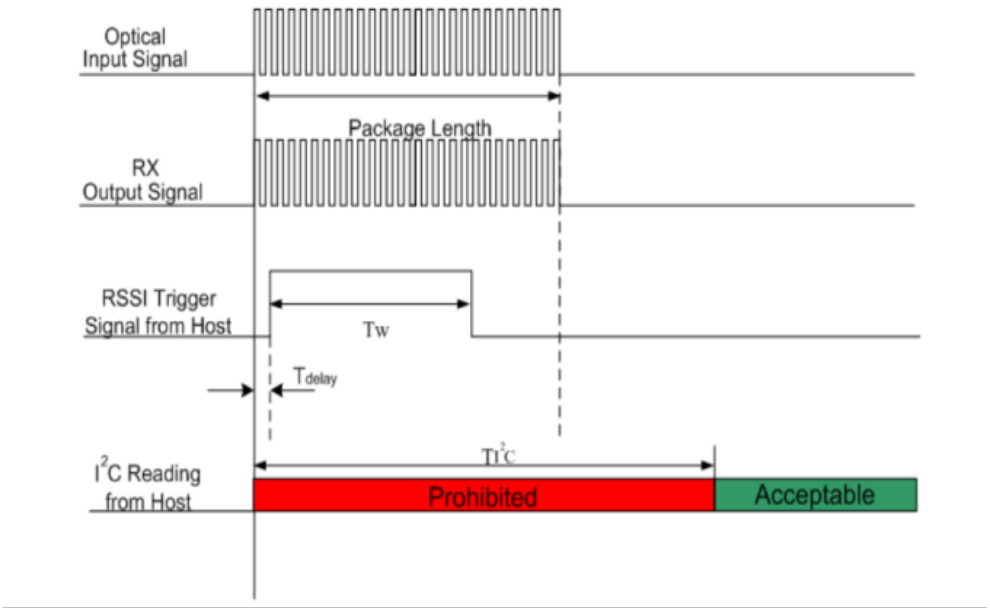
Timing Diagram



Timing Parameter Definition in Burst Mode Sequence



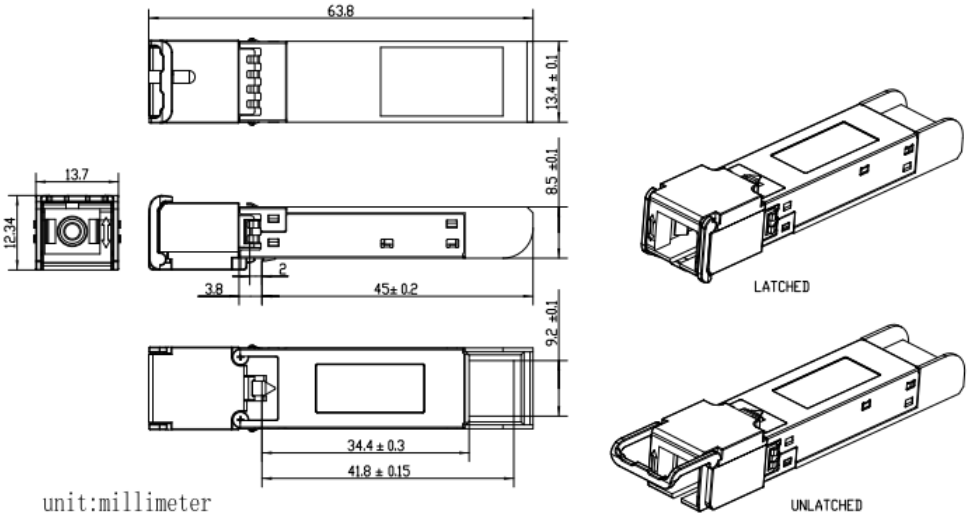
Burst Mode Receiver Dynamic Range



RSSI Timing Diagram

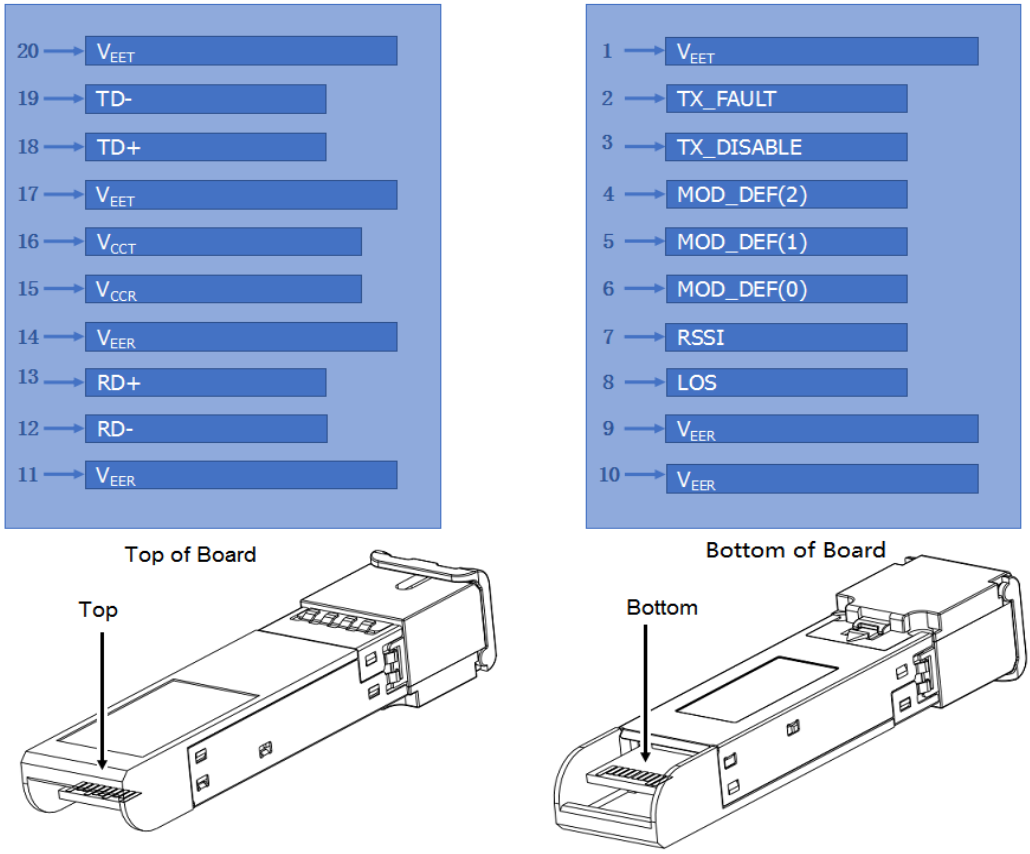
Parameter	Symbol	Min	Type	Max	Unit	Remarks
Trigger width	T_W		600		ns	
Package Length	T_{PK}	1100			ns	
RSSI Trigger Delay	T_{DELAY}		600		ns	
I2C response time	T_{I2C}			500	us	

Dimensions



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED
UNIT: mm

Electrical Pad Layout



Pin Assignment

PIN #	Symbol	Description	Remarks
1	V_{EET}	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter Fault.	
3	TX_DIS	Transmitter Disable. Laser output disabled on high or open	2
4	MOD_DEF(2)	Module Definition 2. Data line for serial ID	3
5	MOD_DEF(1)	Module Definition 1. Clock line for serial ID	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module	3
7	RSSI	LVTTL Active high, controlled by MAC	
8	LOS	open collector/drain output	4
9	V_{EER}	Receiver ground (common with transmitter ground)	1
10	V_{EER}	Receiver ground (common with transmitter ground)	1
11	V_{EER}	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	V_{EER}	Receiver ground (common with transmitter ground)	1
15	V_{CCR}	Receiver power supply	
16	V_{CCT}	Transmitter power supply	
17	V_{EET}	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	V_{EET}	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 4.7kΩ-10kΩ on host board to a voltage between 2V and 3.6V

References

1. IEEE 802.3ah
2. Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA)
3. SFF-8472