

XG-PON&GPON Combo OLT SFP+ 1577nm-Tx/1270nm-Rx and 1490nm- Tx/1310nm-Rx ClassB+ 20km DOM SC SMF Optical Transceiver Module (Industrial)

XGG-SFP-B+L-I



Application

- FTTx
- XG-PON&GPON Access network

Features

- Combination of XG-PON OLT and GPON OLT optical transceiver in a SFP+ package
- Comply ITU-T G.984.5 (2014)/Amd.2 (10/2020) GPON & XG-PON OPL Class B +
- Single fiber bi-directional data links with:
Tx1: 9.953Gbps, Rx1: 2.488Gbps
Tx2: 2.488Gbps, Rx2: 1.244Gbps
- 1577nm continuous-mode transmitter with EML laser
- 1490nm continuous-mode transmitter with DFB laser
- 1270nm burst-mode receiver with APD-TIA
- 1310nm burst-mode receiver with APD-TIA
- +3.3V power supply
- 20km Reach
- 2-wire interface for integrated digital diagnostic Monitoring
- RoHS With Exemptions 7C(I)
- Operating temp: - 4 0 ~ 8 5 ° C
- Support Pin-out :
22 Pins : Combo XGPON OLT-C(I)DFA

Description

The Combo XGPON OLT optical module is inserted on the single board of the Generic Combo XGPON OLT device. It integrates bidirectional data transmission over one single-mode optical fiber. The XG-PON&GPON Combo OLT Small Form-Factor Pluggable Plus (SFP+) transceiver can provide a asymmetrical bandwidth with a maximum uplink 10G and downlink rate of 2.5G via SC connector, reaching a link up to 20km. The Combo XGPON OLT optical module integrates the functions of XGPON OLT and GPON OLT optical modules, and can deploy different network rates in an ODN network according to the requirements of the ONU side, realizing a smooth upgrade from GPON to XGPON. It avoids external WDM equipment in the network, and reduces the cost of network construction and maintenance. It can operate at temperatures between -40~85 and is fully compliant with ITU-T G.984.5, ITU-T G.987.2, ITU-T G.984.2 and SFP+ MSA.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Temperature Range	Ts	-40	85	°C	
Operating Case Temperature	Tc	-40	85	°C	I-Temp
Supply Voltage	VCC3	0	3.6	V	
Relative Humidity	RH	5	85	%	

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	Tc	-40		85	°C	I-Temp
Power Supply Voltage	VCC3	3.14	3.3	3.47	V	
Power Consumption(I-Temp)			3.5		W	
XG Rx Optical Isolation (From external 1290- 1650nm)	ISO	-30			dB	
GPON Rx Optical Isolation (From external 1260- 1280nm)	ISO	-30			dB	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
GPON Rx Optical Isolation (From external 1342- 1650nm)	ISO	-30			dB	
Differential Power Range				20	dB	1

Notes:

- Power differential between sequential ONU bursts

III. Optical Characteristics

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Transmitter (9.953G)						
Centre Wavelength	λ_C	nm	1575	1577	1580	
Side Mode Suppression Ratio	SMSR	dB	30			
Average Launch Power	Aop	dBm	1		5	
Average Launch Power-OFF	POFF	dBm			-39	
Extinction Ratio	ER	dB	8.2			
Transmitter tolerance to Reflected Power		dB	- 15			
Eye Diagram			ITU-T G.987.2 Compliant			

Transmitter (2.488G)						
Centre Wavelength	λ_C	nm	1480	1490	1500	
Side Mode Suppression Ratio	SMSR	dB	30			

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Average Launch Power	Aop	dBm	1.5		5	
Average Launch Power-OFF	POFF	dBm			-40	
Extinction Ratio	ER	dB	8.2			
Transmitter tolerance to Reflected Power		dB	-15			
Eye Diagram	ITU-T G.984.2 Compliant					
Receiver (2.488G)						
Operating Wavelength	λC	nm	1260	1270	1280	
Sensitivity	PSEN	dBm			-26.5	1
Saturation	PSAT	dBm	- 6			1
Signal Detected De-assert Level	Psdd	dBm	-45			
Signal Detected Assert Level	Psda	dBm			-28	
Max Optical input	Pdamage	dBm			0	
Receiver (1.244G)						
Operating Wavelength	λC	nm	1290	1310	1330	
Sensitivity	PSEN	dBm			-28	2
Saturation	PSAT	dBm	- 8			2
Signal Detected De-assert Level	Psdd	dBm	-45			
Signal Detected Assert Level	Psda	dBm			-29	



Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Max Optical input	Pdamage	dBm			0	

- Notes:
- 1. Measured with PRBS 2^23- 1 test pattern @2.488Gbps and ER=8.2dB, BER =10^-4
 - 2. Measured with PRBS 2^23- 1 test pattern @1.244Gbps and ER=8.2dB, BER =10^-10

IV. Electrical Characteristics

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
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Transmitter (9.953G)

Data Input Differential Swing	VIN	mVp-p	100		850	
Input Differential Impedance	ZIN	Q		100		
Tx_Disable Voltage	VIL	V	0		0.8	
	VIH	V	2.4		3.3	
Transmitter Fault Voltage - Low	VTFI, L	V	0		0.4	
Transmitter Fault Voltage - High	VTFI, H	V	2.4		3.3	

Transmitter (2.488G)

Data Input Differential Swing	VIN	mVp-p	100		850	
Input Differential Impedance	ZIN	Q		100		
Tx_Disable Voltage	VIL	V	0		0.8	
	VIH	V	2.4		3.3	
Transmitter Fault Voltage - Low	VTFI, L	V	0		0.4	
Transmitter Fault Voltage - High	VTFI, H	V	2.4		3.3	

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
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Receiver (2.488G)

Data Output Differential Swing	VOUT	mVP-P	300		800	
Signal Detected Voltage_low	VSD, L	V	0		0.8	
Signal Detected Voltage_high	VSD, H	V	2.4		3.3	

Receiver (1.244G)

Data Output Differential Swing	VOUT	mVP-P	300		800	
Signal Detected Voltage_low	VSD, L	V	0		0.8	
Signal Detected Voltage_high	VSD, H	V	2.4		3.3	

V. RSSI Timing

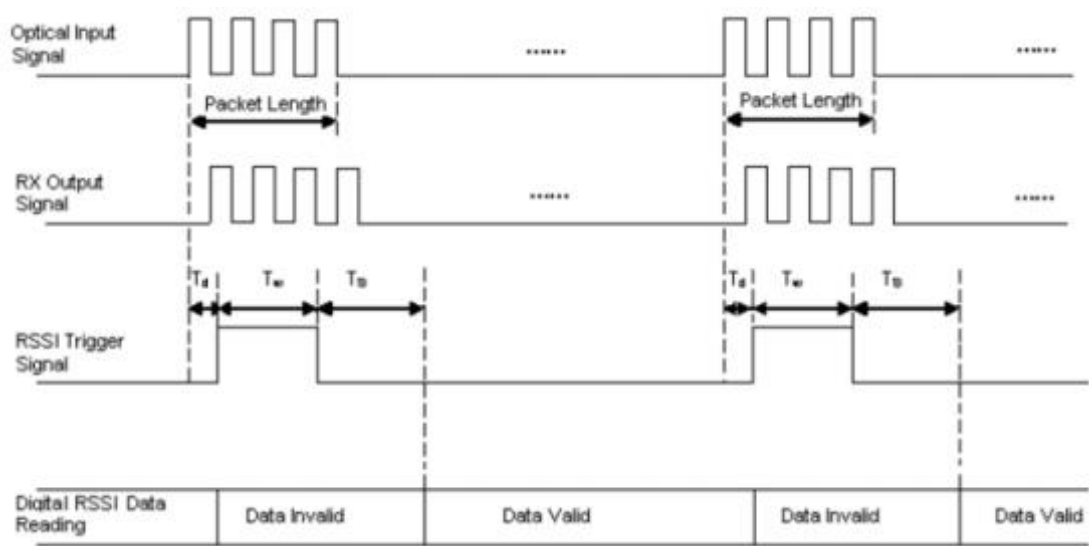


Figure 1, RSSI Timing Specification

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Packet Length		ns	575			
RSSI Trigger Delay	Td	ns	100			
RSSI Trigger Width	Tw	ns	500			
RSSI Sampling Time	TSAMPLE	ns	500			
Delay Before Read	Ts	ns	500			

VI. Recommended Host Board Power Supply Circuit

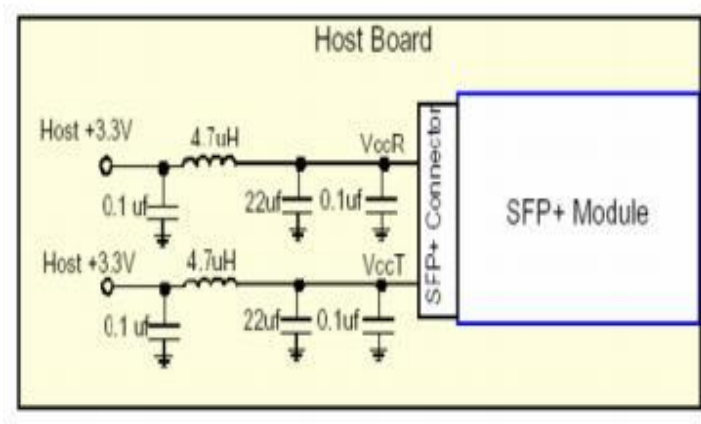


Figure 2, Recommended Host Board Power Supply Filtering

VII. XGPON Rx Burst Timing (22pins)

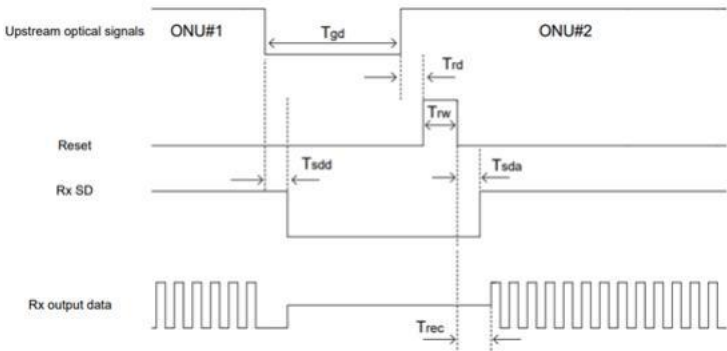


Figure 3, XGPON Rx Burst Timing(22pins)

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Guard Time	Tgd	ns	25.6			
Reset Delay	Trd	ns	0			1
Reset Width	Trw	ns	12.8			
SD Assert Time	Tsda	ns	0	25.6	51.2	
SD De-assert Time	Tsdd	ns		100		2
Data Recovery Time	Trec	ns	0	25.6	100	

- Notes:
- 1. Reset pulse is suggested to be fully inside the preamble.
 - 2. Signal detect auto reset function is applied. The signal detect de-assert time forced by auto reset is typically 100ns, and could short to about 12.8ns with additional reset pulse.

VIII. GPON Rx Burst Timing (22pin)

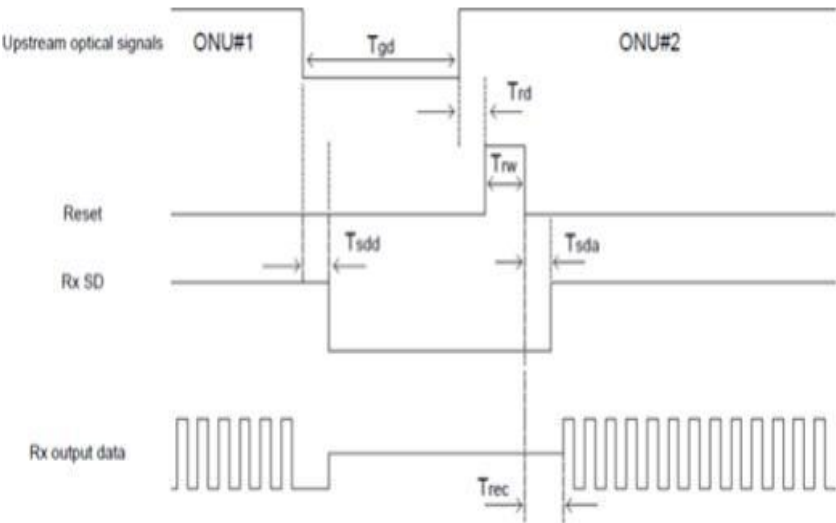


Figure 4, GPON Rx Burst Timing (22pins)

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Guard Time	Tgd	ns	25.6			
Reset Delay	Trd	ns	0			1
Reset Width	Trw	ns	12.8			
SD Assert Time	Tsda	ns	0	25.6	51.2	
SD De-assert Time	Tsdd	ns		100		2
Data Recovery Time	Trec	ns	0	25.6	100	

- Notes:
- 1. Reset pulse is suggested to be fully inside the preamble.
 - 2. Signal detect auto reset function is applied. The signal detect de-assert time forced by auto reset is typically 100ns, and could short to about 12.8ns with additional reset pulse.

IX. Recommended Interface Circuit

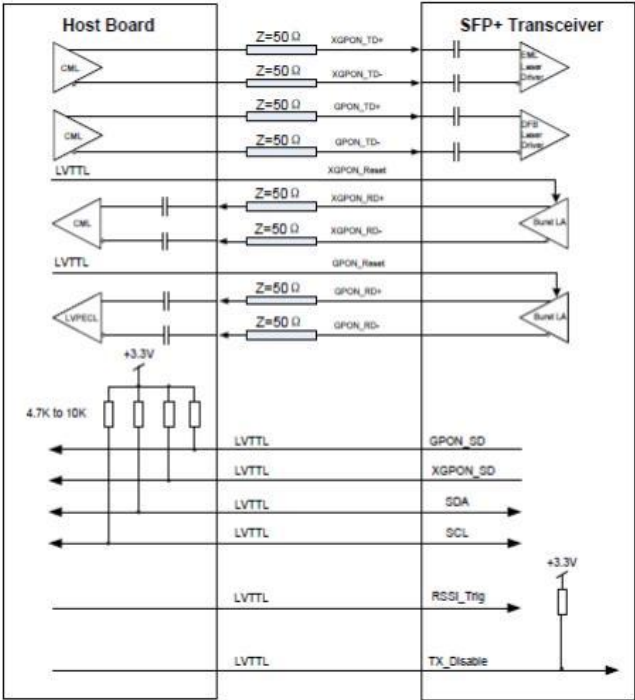


Figure 5, Recommended Interface Circuit

X. Diagnostics

Parameter	Range	Accuracy	Unit	Notes	Calibration
Temperature	0 to70	±3	°C	LSB equal to1/256c	Internal
Voltage	3.15 to 3.45	±3%	V	LSB equal to100uV	Internal
Bias Current	0 to 130	±10%	mA	LSB equal to 4uA	Internal
Tx Power (9.953G)	1to 5	±2dB	dBm	LSB equal to 0.2uW	Internal
Tx Power (2.488G)	1.5to 5	±2dB	dBm	LSB equal to 0.2uW	Internal
Rx Power (2.488G)	-27to -6	±3dB	dBm	LSB equal to 0.1uW	Internal
Rx Power (1.244G)	-28to -8	±3dB	dBm	LSB equal to 0.1uW	Internal

XI. Pin Function Definitions (22Pins)

Pin	Logic	Name	Description
1	CML	GPON_TD+	AC-coupled,
2	CML	GPON_TD-	AC-coupled,
3		GND	Ground
4	LVTTL-I	TX Disable	Active High, TX Disable Control Both XG-PON and GPON transmitter, and can be Separately Disable GPON or XG-PON by IIC Programming.
5	LVTTL	SDA	2-Wire Serial Interface SDA
6	LVTTL	SCL	2-Wire Serial Interface SCL
7	LVPECL	GPON_RD-	DC-coupling

Pin	Logic	Name	Description
8	CML	XG-PON Rest	Reset Input, Active High,
9	CML	XG-PON SD	RX SD Output. Logic1: Normal Operation
10	LVTTTL-I	RSSI_Trigger	RSSI Trigger Input, Active High. RSSI Trigger Control Both XG-PON and GPON Receiver, and Select GPON or XG-PON Channel by IIC Programming
11	LVPECL	GPON_RD+	DC-coupling
12		NC	Not Connection
13		GND	Ground
14	CML	XG-PON RD-	DC-coupling
15	CML	XG-PON RD+	DC-coupling
16	LVTTTL	GPON SD	RX SD Output. Logic1: Normal Operation
17		VCC	+3.3V Power supply
18		VCC	+3.3V Power supply
19	LVTTTL	GPON Reset	Reset for GPON Receiver, Reset Input, Active High
20	CML	XG-PON TD+	AC-coupled
21	CML	XG-PON TD-	AC-coupled
22		GND	Module Ground

XII. Outline Drawing

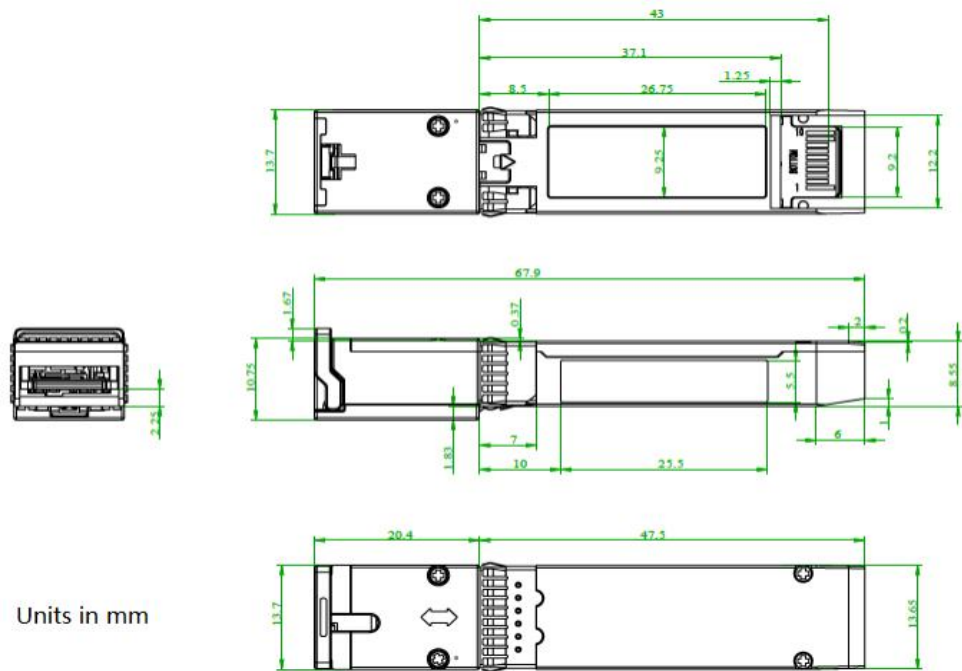


Figure 6, Outline Drawing

Order Information

Part Number	Description
XGG-SFP-B+L-I	XG-PON&GPON Combo OLT SFP+ 1577nm-Tx/1270nm-Rx and 1490nm-Tx/1310nm-Rx Class B+ 20km DOM SC SMF Optical Transceiver Module (Industrial,22PIN)
XGG-SFP-D-L	XGS-PON&GPON Combo OLT SFP+ 1577nm-Tx/1270nm-Rx and 1490nm-Tx/1310nm-Rx Class D 20km DOM SC SMF Optical Transceiver Module (22PIN)
XGG-SFP-C+L-I	XG-PON&GPON Combo OLT SFP+1577nm-Tx/1270nm-Rx and 1490nm-Tx/1310nm-RX Class C+ 20km DOM SC SMF Optical Transceiver Module (Industrial,22PIN)