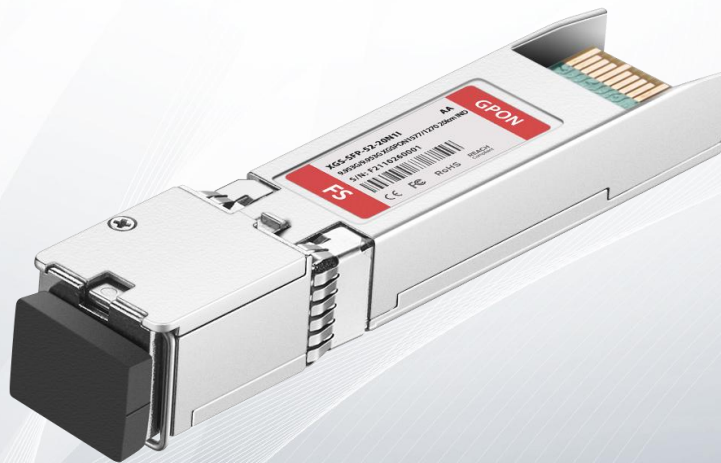


XGSPON OLT SFP+ 1577nm-TX/1270nm-RX 9.953G-TX/9.953G-RX Class N1 20km DOM SC SMF Optical Transceiver Module(Industrial)

XGS-SFP-52-20N1I



Application

- Access Network

Features

- Support ITU-T G.9807.1 XGS-PON OLT N1 Application
- Single fiber bi-directional data links with 9.953Gbps downstream and 9.953Gbps/2.488Gbps (compatible) upstream
- 1577nm continuous-mode transmitter with EML laser
- 1270nm burst-mode receiver with APD-TIA
- 2-wire interface for integrated digital diagnostic Monitoring
- SFP+ package with SC/UPC receptacle optical interface
- +3.3V power supplies
- RoHS With Exemptions
- 20Km Reach
- Operating case temperature:
Industry temp: -40~+85°C Commercial temp: 0~70°C

Description

XGSPON OLT SFP+ transceiver provides a symmetric 9.953Gbps upstream and 9.953G & 2.488G downstream, reaching a link up to 20km over SMF via SC/UPC connector. It is fully compliant with SFP+ MSA and RoHS standards and is ideal for symmetric 10Gigabit capable passive optical network (XGS-PON) system.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Temperature Range	Ts	-40	85	°C	
Operating Temperature	Tc	0	70	° C	C-Temp
Operating Temperature	Tc	-40	85	°C	I-Temp
Relative Humidity	RH	5	85	%	
Supply Voltage	Vcc	0	3.6	V	

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	Tc	0	-	70	° C	C-Temp
Operating Case Temperature	Tc	-40	-	85	° C	I-Temp
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Power Consumption			2.5		W	
Supply current	Icc			796	mA	1
Power Consumption				2.5	W	
Transmission Distance				20	km	

Rx Optical Isolation (From external below 1260nm)	ISO	-32			dB	
Rx Optical Isolation (From external above 1280nm)	ISO	-32			dB	

Notes:

- Base on 3.14V

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	POUT	dBm	2		5	1
Average Launch Power-OFF	POFF	dBm			-39	
Optical Path Penalty		dB			1	2
Extinction Ratio	EX	dB	8.2			
Transmitter Eye Diagram	Comply with ITU-T G.9807. 1					
Receiver (9.953G)						
Operating Wavelength	λ_C	nm	1260	1270	1280	
Sensitivity	PSEN	dBm			-26	3
Saturation	PSAT	dBm	-5			
Signal Detected De-assert Level	Psdd	dBm	-42			
Signal Detected Assert Level	Psda	dBm			-30	
Receiver (2.488G)						
Operating Wavelength	λ_C	nm	1260	1270	1280	
Sensitivity	PSEN	dBm			-27.5	4

Saturation	PSAT	-7	4
Signal Detected De-assert Level	Psdd	-42	
Signal Detected Assert Level	Psda	-28	

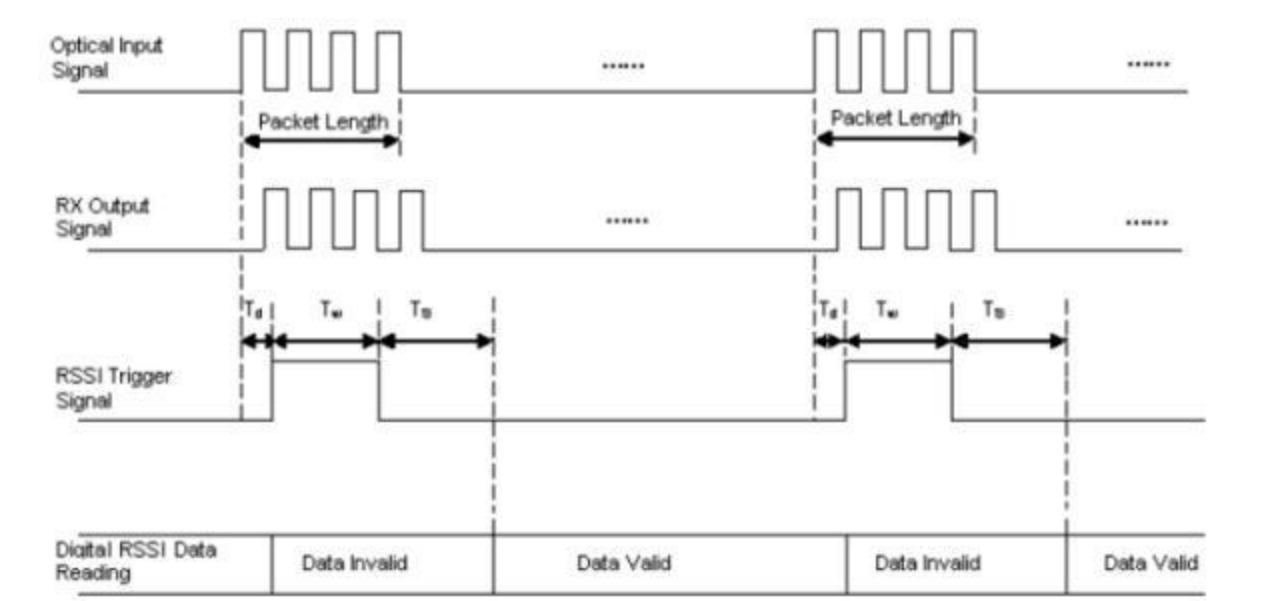
- Notes:
- 1. The optical power is launched into 9/125um SMF
 - 2. 20km transmission (DD20)
 - 3. Measured with PRBS 2^31- 1 test pattern @9.953Gbps and ER=6dB BER =10^-3
 - 4. Measured with PRBS 2^23- 1 test pattern @2.488Gbps and ER=8.2dB, BER =10^-4.

IV. Electrical Characteristics

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Transmitter (9.953G)						
Data Input Differential Swing	VIN	mVp-p	200	-	850	
Input Differential Impedance	ZIN	Q		100		
Tx_Disable Voltage	VIL	V	0	-	0.8	
	VIH	V	2.4		3.3	
Receiver (9.953G)						
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		VCC3	
Signal Detected Assert Time	TSDA	ns			100	
Signal Detected Deassert Time	TSDD	ns			50	
Data Recovery Time	Trec	ns			200	
Receiver (2.488G)						
Data Output Differential Swing	VOUT	mVP-P	300		800	

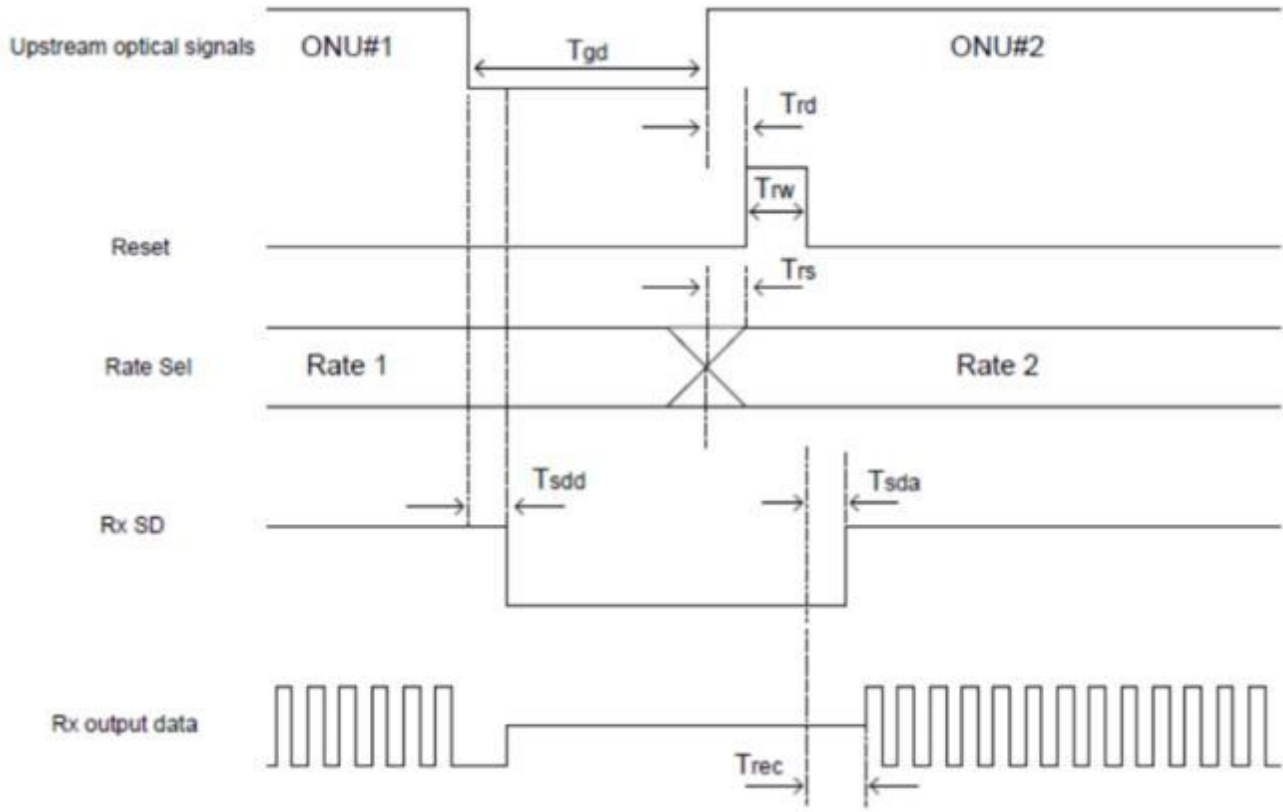
Signal Detected Voltage_low	VSD, L	V	0	0.8
Signal Detected Assert Time	TSDA	ns		100
Signal Detected Deassert Time	TSDD	ns		50
Data Recovery Time	Trec	ns		200
Signal Detected Voltage_high	VSD,H	V	2	VCC3

V. RSSI Timing



Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Packet Length		575			ns	
RSSI Trigger Delay	Td	25			ns	
RSSI Trigger Width	Tw	500			ns	
RSSI Sampling Time	TSAMPLE	500			ns	
Delay before Read	Ts	500			us	

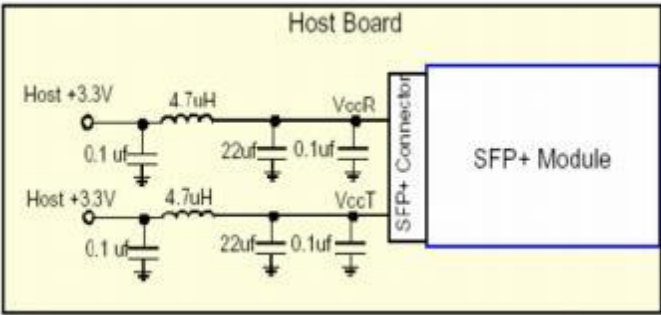
VI. XGSPON Rx Burst Timing



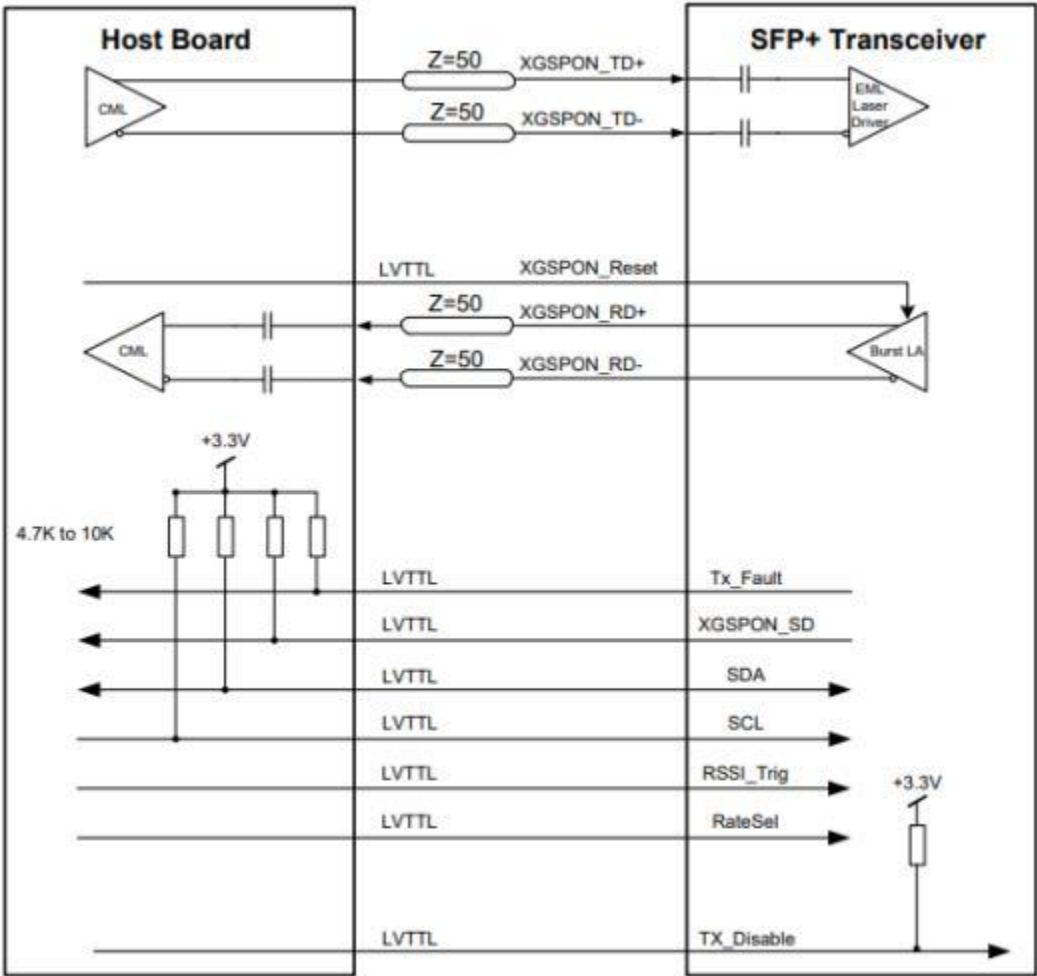
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Guard Time	T_{gd}	51.2	-	-	ns	
Reset Delay	T_{rd}	0	-	-	ns	1
Reset Width	T_{rw}	25.6	-	-	ns	
RateSel Setup Time	T_{rs}	5	-	-	ns	2
SD Assert Time	T_{sda}	0	-	51.2	ns	
SD De-assert Time	T_{sdd}	-	100	-	ns	3
Data Recovery Time	T_{rec}	0	51.2	100	ns	

- Notes:
- Reset pulse is suggested to be fully inside the preamble.
 - The polarity of RateSel signal could be customized, high = 10G rate, low = 2.5G rate by default.
 - 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.

VII. Recommended Host Board Power Supply Circuit



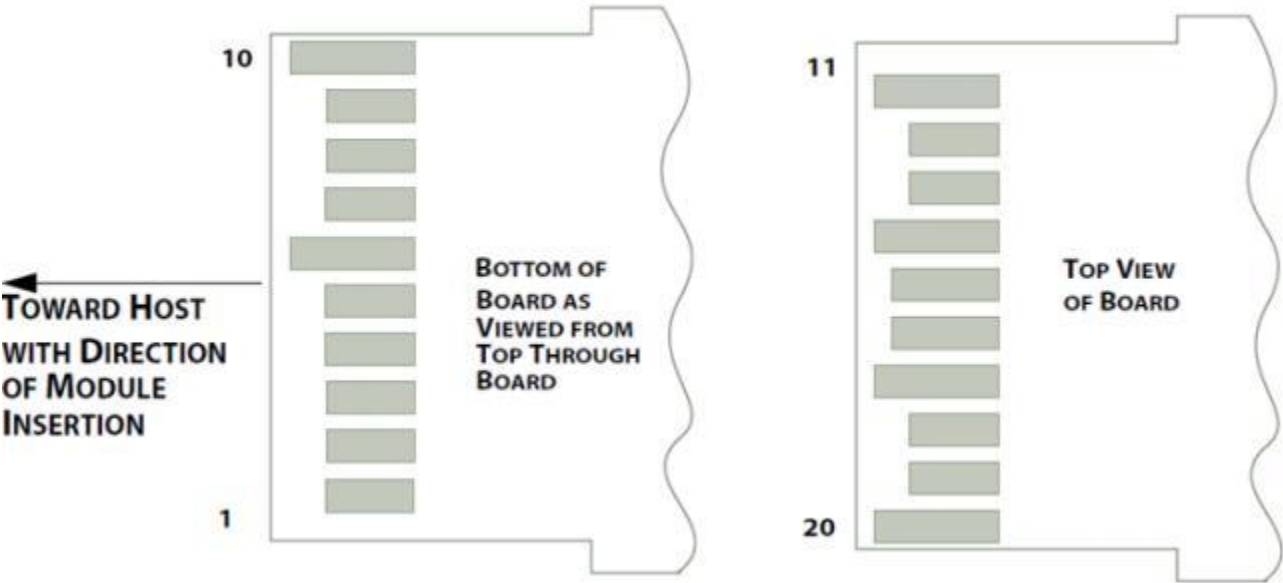
VIII. Recommended Interface Circuit



IX. Diagnostics

Address	Parameter	Range	Accuracy	Unit	Notes	Calibration
96	Temperature	0 to70 -40 to 85	±3	°C	LSB equal to 1/256c	Internal
98	Voltage	3.15 to3.45	±3%	V	LSB equal to 100uV	Internal
100	BiasCurrent	0to130	±10%	mA	LSB equal to 4uA	Internal
102	TxPower	2to5	±2dB	dBm	LSB equal to 0.2uW	Internal
104	RxPower	-27.5 to-7	±2dB	dBm	LSB equal to 0.1uW	Internal

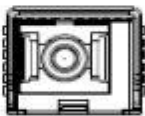
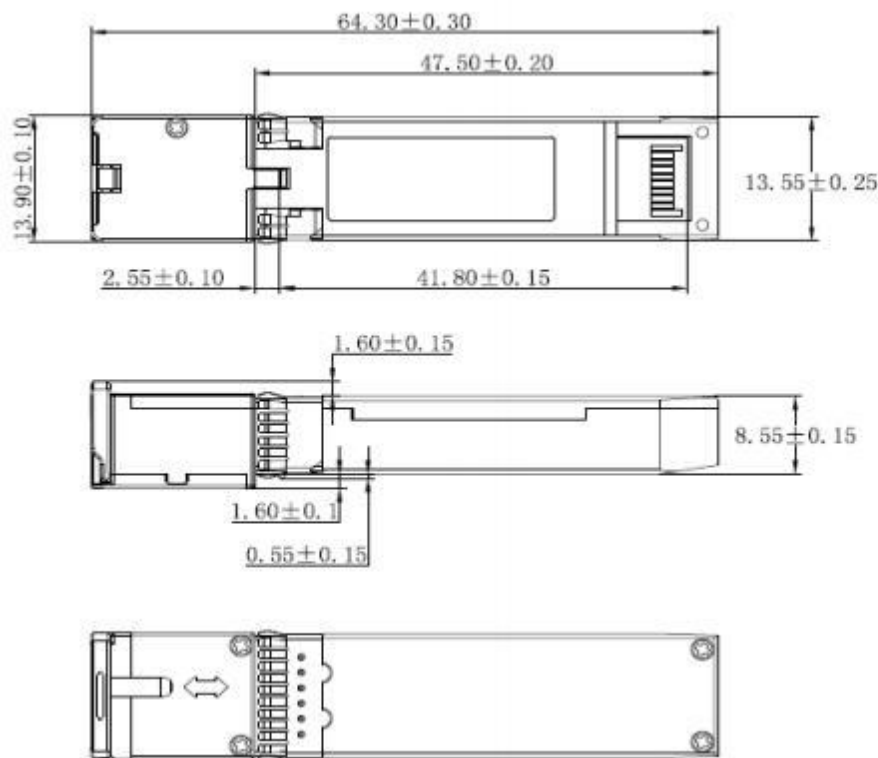
X. Pin Function Definitions



Pin	Logic	Name	Description	Notes
1	LVTTTL	Rate_Sel	2.5G=Low, 10G=High	
2	LVTTTL-O	TX_Fault	High voltage: TX Laser fault or safety, low voltage: Normal operation	

3	LVTTTL-I	Tx_Disable	Active high to disable laser	
4		SDA	2-Wire serial interface SDA	
5		SCL	2-Wire serial interface SCL	
6		MOB_ABS	Module Ground	
7		RESET	Reset for TIA/LIA, Active High	
8	LVTTTL	Rx_SD	Receiver signal detect, logic 1 indicates normal operation	
9	LVTTTL	RSSI_Trigger	RSSI trigger input, active high	
10		GND	Module Ground	
11		GND	Module Ground	
12	CML	RD-	2.5/10G CML output with DC coupling	
13	CML	RD+	2.5/10G CML output with DC coupling	
14		GND	Module Ground	
15		VCC	+3.3V Power supply	
16		VCC	+3.3V Power supply	
17		GND	Module Ground	
18	CML	TD+	10G CML input with AC coupling	
19	CML	TD-	10G CML input with AC coupling	
20		GND	Module Ground	

Mechanical Diagram



Units in mm

Order Information

Part Number	Description
XGS-SFP-52-20N1I	XGSPON OLT SFP+ 1577nm-TX/1270nm-RX 9.953G-TX/9.953G-RX Class N1 20km DOM SC SMF Optical Transceiver Module(Industrial, 20PIN)