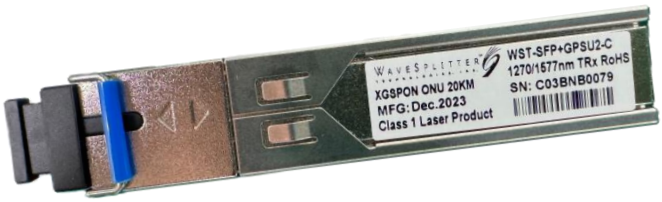
Data Sheet

XGS-PON ONU SFP+ Transceiver

P/N: WST-SFP+GPSU2-x



Features:

- Single fiber symmetric TX 9.953Gbps/ RX9.953Gbps application
- Single 3.3V power supply
- SFP+ package with SC/APC Receptacle connector
- Hot-pluggable capability
- High power 1270nm DFB LD and high sensitivity 1577nm APD
- Support 20km transmission distance with SMF
- CML compatible data input/output interface
- Low power dissipation
- Digital diagnostic monitor interface
- RoHS compliance
- Operating case temperature:

  0 to 70 °C: WST-SFP+GPSU2-C

  -40 to 85 °C: WST-SFP+GPSU2-I

Applications:

- XGSPON ONU

Standard:

- Complies with ITU-T G.9807.1
- Complies with SFF-8472
- Complies with Telcodia GR-468-CORE and MIL-STD-883
- Complies with IEC60825-1
- Complies with GR326 in SC/APC Receptacle

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Ambient Temperature	T_{STG}	-40	85	°C	
Operating Humidity	OH	5	95	%	
Power Supply Voltage	V_{CC}	3.0	3.6	V	
Damage Threshold for Receiver			-7	dBm	In average Power

Recommended Operating Environment

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T_C	0		70	°C	WST-SFP+GPSU2-C
		-40		85		WST-SFP+GPSU2-I
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Nominal upstream line rate			9.95328		Gbps	
Nominal downstream line rate			9.95328		Gbps	

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Input differential impedance	R_{in}	90	100	110	Ω	
Single ended data input swing	$V_{in\ PP}$	200		1600	mV	1
Receiver Section:						
Single ended data output swing	Vout,pp	300		850	mv	1
LOS High	VOH	2.4		V_{CC}	V	2
LOS Low	VOL	0		0.8	V	

Notes:

1. AC-Coupled CML
2. LVTTL

Optical Characteristics (T_{OP} = Operation Case Temperature Range, V_{CC} = 3.135 to 3.465 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Center Wavelength	λt	1260	1270	1280	nm	
Average Optical Power	Pavg	4		9	dBm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	6			dB	
Spectrum Bandwidth(-20dB)	Δλ			1	nm	
Tx Enable Time	Ton			25.6	ns	
Tx Disable Time	Toff			25.6	ns	
Tx-SD Assert	SD-on			350	ns	
Tx-SD De-Assert	SD-off			350	ns	
Transmitter and dispersion penalty				3	dB	@ 20km SMF
Transmitter OFF Output Power				-45	dB	
Output Optical Eye	Compliant With ITU-T G.9807.1					

Receiver Section:						
Optical Center Wavelength	λr	1575	1577	1580	nm	
Receiver Sensitivity				-28.5	dBm	1
Receiver Overload		-8			dBm	
LOS Assert	LOS_A	-45			dBm	
LOS Dessert	LOS_D			-29	dBm	2
LOS Hysteresis	LOS_H	0.5	2	5	dB	
LOS Assert/De-assert Time				100	s	
Optical Isolation of Receiver		40			dB	

Notes:

1. Measured with PRBS 2^{31}-1 NRZ (9.953Gbps) and ER=6dB, BER ≤1×10^{-3}.
2. When LOS Deasserted, the data output is signal output.

Pin Assignment

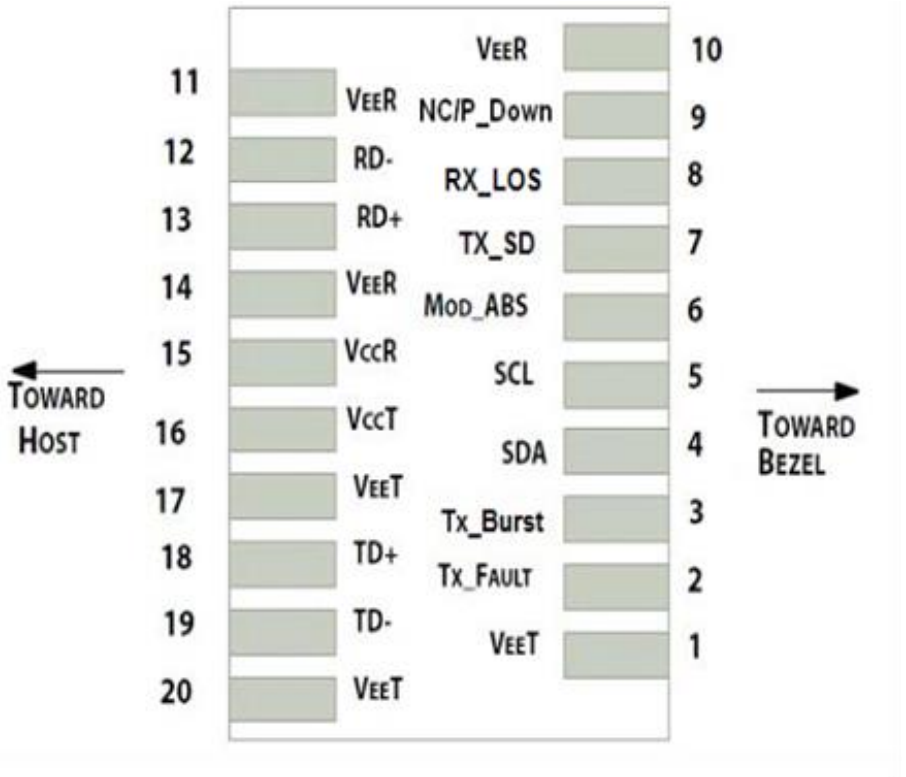


Figure 1: Diagram of Host Board Connector Block Pin Numbers and Names

Pin Description

PIN #	Name	Function
1	VeeT	Tx Ground
2	Tx Fault	Indicate the TX fail.
3	Burst Control	LVTTL input. The default setting is that laser output is disabled when this pin is asserted HIGH and laser output is enabled when this pin is LOW.
4	MOD_DEF(2)	2-Wire Serial Data I/O Pin.(SDA)
5	MOD_DEF(1)	2-Wire Serial Clock Input.(SCL)
6	MOD_DEF(0)	Internally Grounded
7	TX_SD	Tx Transmitter State Indication, Assert high when Transmitter ON. Or to the ground directly if not use.
8	LOS/SD	Set LOS is that active Low when signal is detected(LVTTL)
9	NC	Not Connect
10	VeeR	Rx Ground
11	VeeR	Rx Ground
12	RXD-	Inverted Receiver Data Output (AC-Coupled internally)
13	RXD+	Non-Inverted Receiver Data Output (AC-Coupled internally)
14	VeeR	Rx Ground
15	Vcc_RX	Rx Vcc
16	Vcc_TX	Tx Vcc
17	Veet	Tx Ground
18	TXD+	Non-Inverted Transmitter Data Input (AC-Coupled)
19	TXD-	Inverted Transmitter Data Input (AC-Coupled)
20	Veet	Tx Ground

SFP Module EEPROM Information and Management

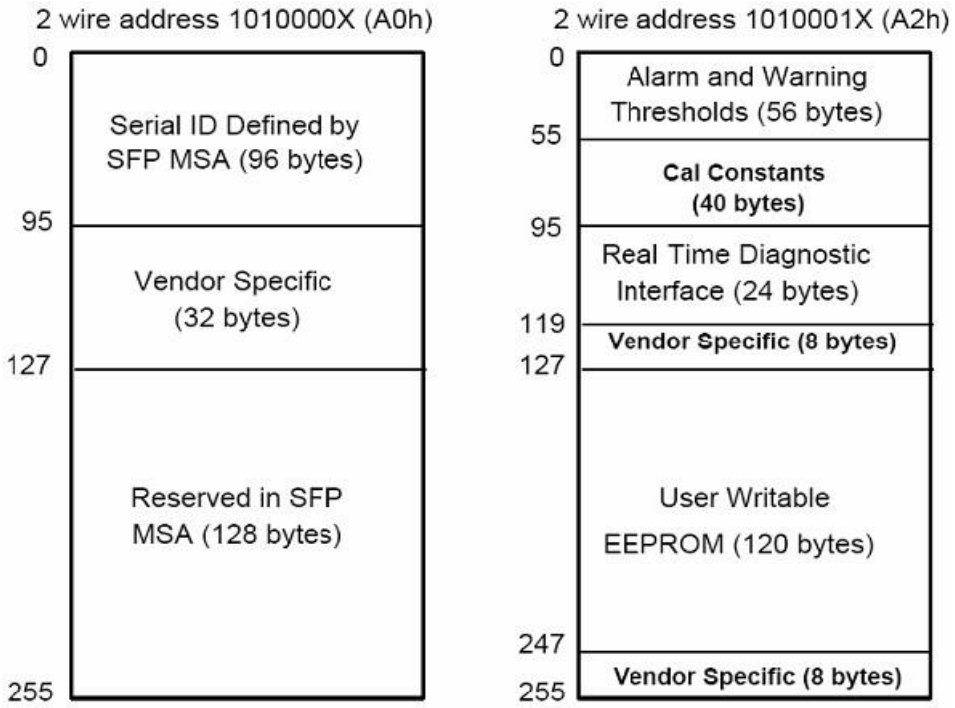


Table 2. EEPROM Memory Map (Specific Data Field Descriptions)

Digital Diagnostic Monitor Characteristics

Parameter	Symbol	Units	Min.	Max.	Accuracy	Calibration
Transceiver temperature	D_{Temp-E}	ºC	-40	+85	±3ºC	Internal
			0	+70	±3ºC	Internal
Transceiver supply voltage	$D_{Voltage}$	V	3	3.6	±3%	Internal
Transmitter bias current	D_{Bias}	mA	0	90	±10%	Internal
Transmitter output power	$D_{Tx-Power}$	dBm	4	+9	±3dB	Internal
Receiver average input power	$D_{Rx-Power}$	dBm	-28	-8	±3dB	Internal

Typical Interface Circuit

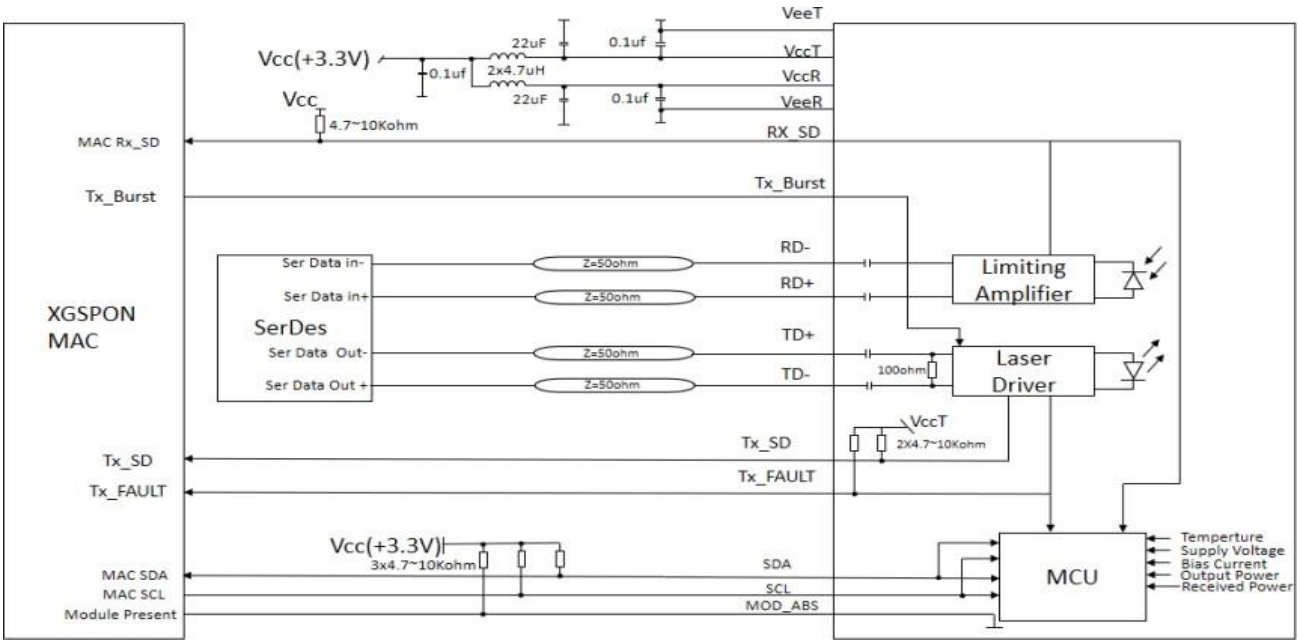
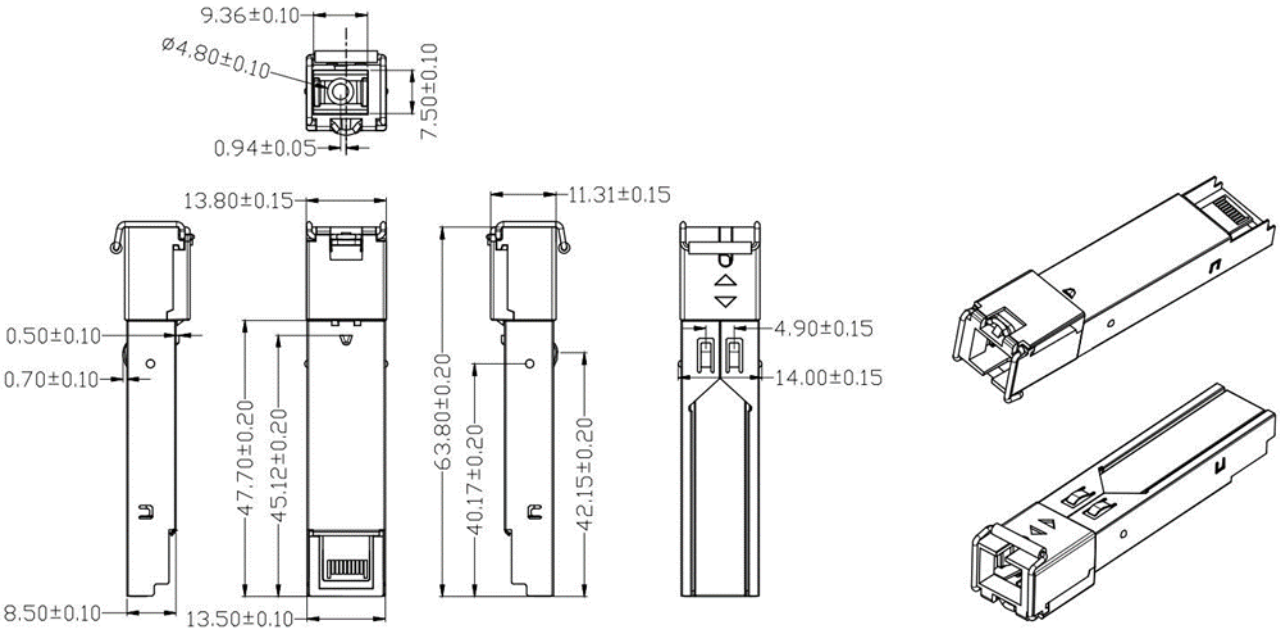


Figure 4. Typical Interface Circuit

Mechanical Design Diagram



Unit: mm

Ordering Information

Part No	Specification									
	Package	Data rate	Laser	Optical Power	Detector	Receiver Sensitivity	Temp.	Reach	Other	Application code
WST-SFP+GPSU2-C	SFP+ SC/APC Receptacle	9.95328 Gbps	1270nm DFB laser	4 ~ 9 dBm	1577nm APD	-28.5dBm	0~70 °C	20km	DDM RoHS	XGS-PON ONU
WST-SFP+GPSU2-I	SFP+ SC/APC Receptacle	9.95328 Gbps	1270nm DFB laser	4 ~ 9 dBm	1577nm APD	-28.5dBm	-40~85°C	20km	DDM RoHS	XGS-PON ONU

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	25-Dec-2022	New Issue	Joanne Ni	Ken Cheng	Wayne Liao

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