

10G SFP+ XGSPON OLT SFP+TX-1577nm/RX-1270nm 20km Optical Transceiver

Features

- SFP+ package with SC receptacle optical interface compliant
- Hot-Pluggable
- 9.953Gbps downstream and 9.953Gbps/2.488Gbps upstream
- +3.3V single power supply
- ROHS Compliant
- Excellent EMI and EMC

Applications

- symmetric 10Gigabit capable passive optical network (XGS-PON) system.

Standards

- SFP MSA
- SFF 8472
- ITU-T G.9807.1

Description

The SFP-XGSP52-20N1 OLT product is designed for OLT module based on XGSPON N1 technology. The product is an integrated module containing a micro-optic component and semiconductor material. The module could implement DDM function. It could be used at key locations in optical networks.

Specifications

Parameter	Symbols	Unit.	Value		
			Min	typical	Max
Electrical Characteristics					
Power Consumption		W	-	-	2.5
CML Signal Differential Data Input Swing		mV	100	-	800
CML Single Differential Data Output Swing		mV	600		1000
Differential Data input impedance		Ω	-	100	-
Signal Level(LVTTL)	VOH	V	2.4	-	Vcc
	VOL	V	0	-	0.8
Optical Transmitter Characteristics					
Data Rate		Mbps	--	9953.28	-
Center Wavelength Range	lc	nm	1575	-	1580
Spectral Width(@-20dB)	DL	nm	-	-	1
Launch Optical Power	Po	dBm	+2	-	+5
Pout@TX-Disable Asserted	Poff	dBm			-39
Extinction Ratio1	EX	dB	8.2	-	-
Eye Diagram	Compliant with ITU-T G.987.2				
Transmitter dispersion penalty 2	TDP	dB	-	-	1
Optical Receiver Characteristics (10G)					
Data Rate		Mbps	-	9953.28	-
Center Wavelength Range	lc	nm	1260	1270	1280
Receiver Sensitivity 3	S	dBm	-	-	-26
Over load Input Optical Power	Pin	dBm	-5		
LOS	Optical Dessert		dB	-	-
	Optical Assert			-45	-
LOS Hysteresis		dB	0.5	-	6
Optical Receiver Characteristics (2.5G)					
Data Rate		Mbps	-	2488.32	-
Center Wavelength Range	lc	nm	1260	1270	1280
Receiver Sensitivity4	S	dBm	-	-	-27.5

Overload Input Optical Power	Pin	dBm	-7		
LOS	Optical Dessert		dB	-	-
	Optical Assert			-45	-
LOSH hysteresis		dB	0.5	-	6

Notes:

1. Measured with PRBS 231- 1 test pattern @9.95328Gbps .
2. Transmit on 20km SMF.
3. Measured with PRBS 231- 1 test pattern @9.953Gbps , BER= 10-3
4. Measured with PRBS 223- 1 test pattern @2.48832Gbps , BER= 10-4

Ordering Information

Table1-Ordering Information

Parameter	Specifications								
	Package	Datarate	Laser	OpticalPower	Detector	Sensitivity	Top	Reach	Others
SFP-XGSP52-20N1	SFP+	9.95328G/2.48 832GUS9.95328GDS	1577nm EML	+2~+5dBm	APD1270nm	10G:-26dBm2.5G:-27.5dBm	0~70oC	20km	DDM,RoHS

Absolute Maximum Ratings

Table2-Absolute Maximum Ratings

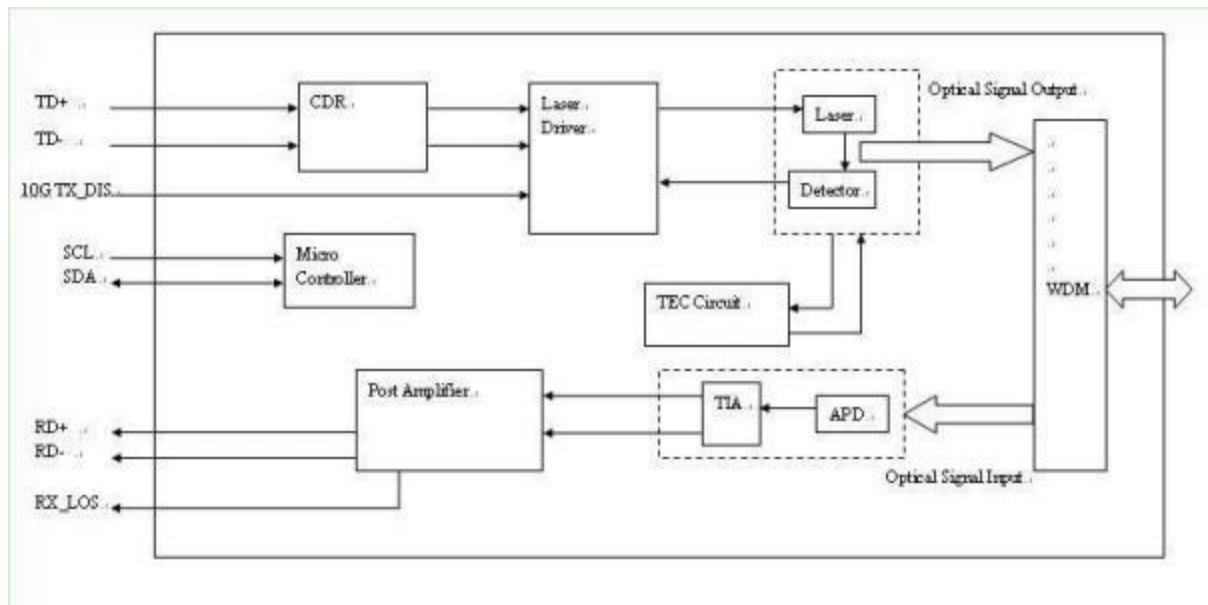
Parameter	Symbols	Unit.	Min	Max
Storage Temperature Range	Ts	oC	-40	+85
Relative Humidity	RH	%	5	95
Power Supply Voltage	Vcc	V	0	+3.6
Receiver Damage Threshold		dBm	0	-

Recommended Operating Conditions

Table3-Recommended Operating Conditions

Parameter	Symbols	Unit.	Min	Typ	Max
Operating Case Temperature Range	Tc	°C	-5	-	75
Power Supply Voltage	Vcc	V	3.135	3.3	3.465

Principle diagram



Optic Ports Definition

Single SC receptacle optical interface

Electric Ports Definition

Pin	Name	Description
1	GND_T	Transmitter ground
2	TX_FAULT	LVTTTL Signal detect output
3	Transmitter Disable	(Note1)
4	SDA	I2C Serial Data (LVTTTL)
5	SCL	I2C Serial Clock (LVTTTL)
6	MOS_ABS	Internally connected GND
7	RESET	RX Reset (LVTTTL)
8	RX_SD	LVTTTL Signal detect output, internally pull up(Note2)
9	RSSI TRIG	Receiver RSSI trigger input
10	GND_R	Receiver ground
11	GND_R	Receiver ground
12	RD-	CML data output-(DC coupled and

		internal terminated)
13	RD+	CML data output+(DC coupled
14	GND_R	Receiver ground
15	VCC_R	Receiver power supply
16	VCC_T	Transmitter power supply
17	GND_T	Transmitter ground
18	TD+	(AC coupled and internal terminated)
19	TD -	LVPECL Data input- (AC coupled and internal terminated)
20	GND_T	Transmitter ground

Notes:

1. TX Disable input is used to shut down both the 10G laser and 1G laser (if module has 1G transmitter) output per the state table below. It is pulled up within the module with a 4.7 – 10K resistor.

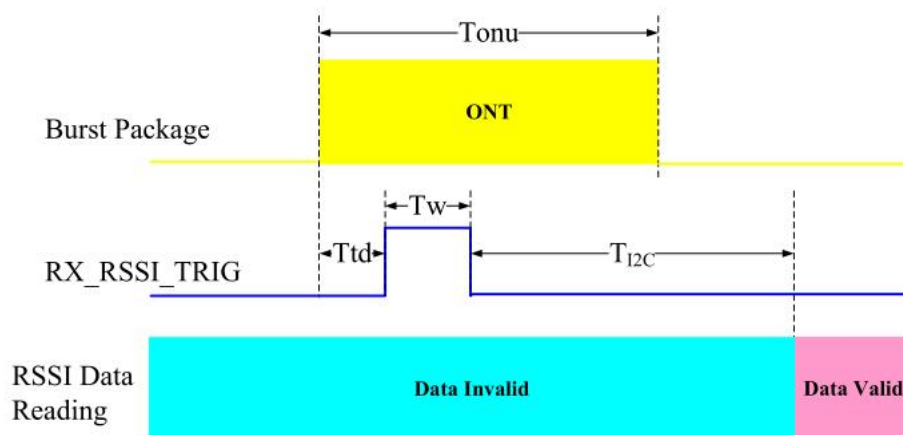
Low (<0.8V): Transmitter on

High (>2.0 V): Transmitter Disabled

Open : Transmitter Disabled

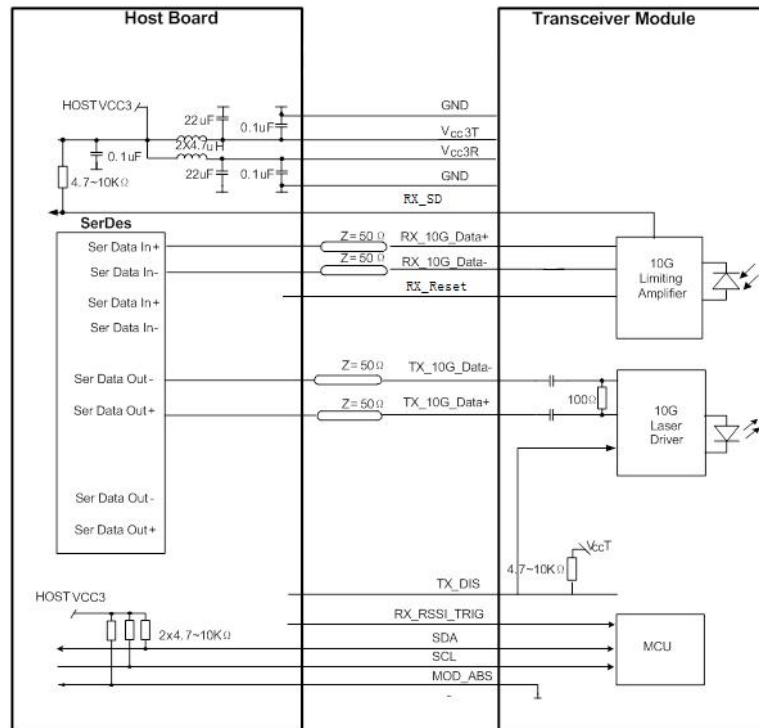
2. SD (signal Detect) is an open collector/drain output which should be pulled up externally with a 4.7 – 10K resistor on the host board to supply <VccT+0.3V or VccR+0.3V. When low, this output indicates the received optical power is below the worst case receiver sensitivity. High indicates normal operation. In the low state, the output will be pulled to <0.8V.

3. RX_RSSI_TRIG is used to start a RX Power Monitoring. It is pulled high to trigger a A/D sample start. The timing is shown as below:

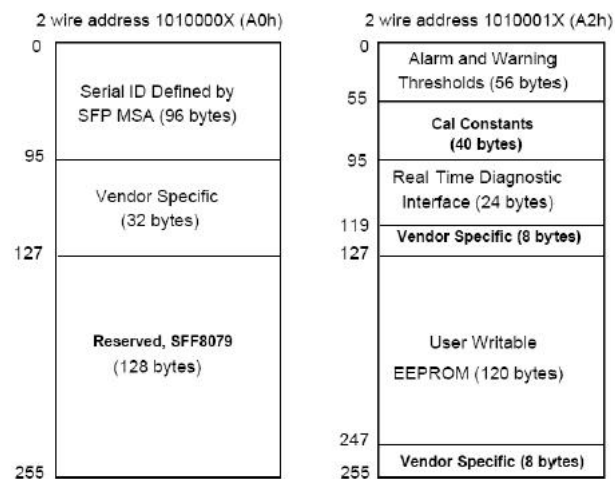


Parameter	Symbols	Min.	Typ	Max	Units
Packet Length	-	550	-	-	ns
Trigger delay	Td	25	-	-	ns
RSSI Trigger and Sample Time	Tw	500	-	-	ns
Internal delay	Ts	500	-	-	us
Packet Length	-	550	-	-	ns

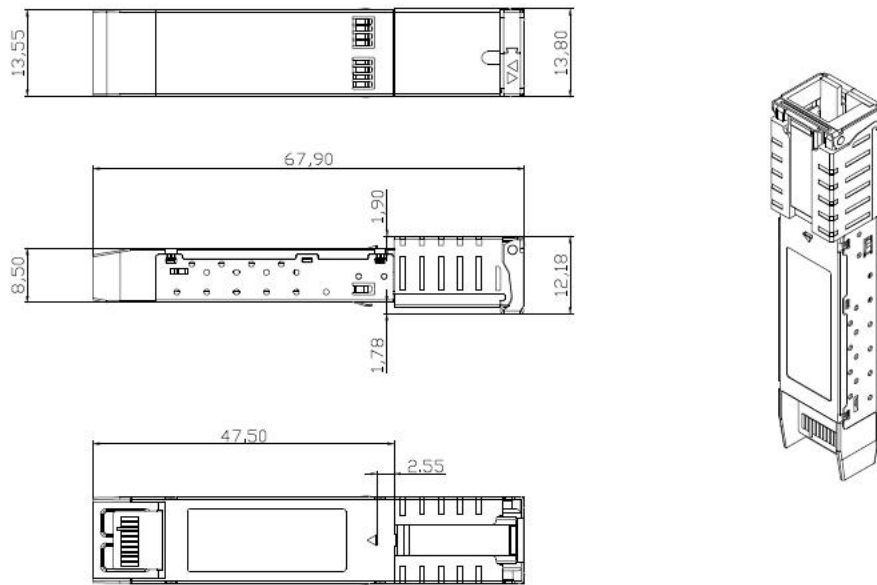
Typical Application Circuit



Digital Diagnostic Memory Map



Mechanical Dimensions



Regulatory Compliance

Parameter	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1 ($> 1.5\text{kV}$) – Human Body Model
Electrostatic Discharge (ESD) Immunity	IEC61000-4-2	LV4(Air discharge 15kV, Contact discharge 8kV) Performance criterion B
Electromagnetic Interference (EMI)	CISPR22 ITE Class B EN55022 Class B	Compliant with standards
Immunity	IEC61000-4-3 Class 2 EN55024	Typically show no measurable effect from a 3V/m field swept from 80 to 1000MHz applied to the transceiver without a chassis enclosure.
Eye Safety	FDA 21 CFR 1040. 10 and 1040. 1 1	
Compliant with Class 1 laser product UL TUV EN 60825- 1		

Further Information:

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