XGSPON ONU SFP+ Transceiver
PXS96-B2520

Features

Single fiber bi-directional data links with Symmetric9.95328Gbps upstream and downstream
Operating Case Temperature Commercial: 0 to 70°C Industrial: -40 to 85°C
SFP+ Package with SC/APC Receptacle
Hot-pluggable capability
Single +3.3V Power Supply
9.95328Gbps / 1270nm Burst-Mode Transmitter with DFB laser
9.95328Gbps / 1577nm High Sensitivity Continuous-Mode APD-TIA Receiver
LVTTL burst enable control, active low
LVTTL TX_SD, TX_Fault, RX_LOS
LVTTL Sleep Mode for Power Consumption
Digital diagnostic monitor interface compatible with SFF-8472
Class 1 Laser eye safety standard IEC-60825 compliant
Low EMI and excellent ESD protection
RoHS-6 compliance

Applications

XGSPON

Standards

Complies with SFP+ MSA (SFF-8431)
Compliant with SFF-8472 MSA
Complies with ITU-T G.987.2
Complies with ITU G.9807.1
Complies with FCC 47 CFR Part 15, Class B
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

ABSOLUTE MAXIMUM RATINGS					
Parameter	**Symbol**	**Min**	**Max**	**Units**	**Notes**
Storage Temperature	T_{stg}	-40	+85	℃	Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.
Operating Case Temperature(Industrial)	T_{case}	-40	+85	℃	
Operating Case Temperature(Commercial)	T_{case}	0	+70	℃	
DC Supply Voltage	V_{CC}	0	4	V	
Relative Humidity - Operating	RH_o	5	90	%	

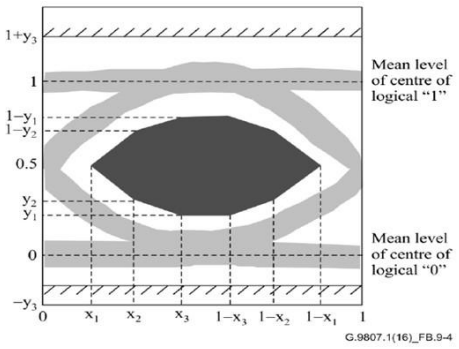
RECOMMENDED OPERATING CONDITION						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Units**	**Notes**
Operating Case Temperature(Industrial)	T_{case}	-40		+85	℃	
Operating Case Temperature(Commercial)	T_{case}	0		+70	℃	
Power Supply Voltage	Vcc	3.14	3.3	3.46	V	
Power Supply Current	Icc			450	mA	
Date Rate	@Tx		9.95328		Gbps	
	@Rx		9.95328			

TRANSMITTER ELECTRICAL CHARACTERISTICS						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Units**	**Notes**
Tx_Data Differential Input Voltage	V_{IH}-V_{IL}	100		1000	mV	AC coupled
InputDifferential Impedance	R_{in}	90	100	110	Ω	
Transmitter burst control Voltage - Low	V_{IL}	0		0.8	V	LVTTL
Transmitter burst control Voltage - High	V_{IH}	2.0		Vcc	V	
TX_SD indicate voltage - Low	V_{OL}	0		0.4	V	
TX_SD indicate voltage - High	V_{OH}	2.4		Vcc	V	
TX_Fault indicate voltage - Low	V_{OL}	0		0.4	V	
TX_Fault indicate voltage - High	V_{OH}	2.4		Vcc	V	
P_Downcontrol Voltage - Low	V_{IL}	0		0.8	V	
P_Downcontrol Voltage - High	V_{IH}	2.0		Vcc	V	

RECEIVER ELECTRICAL CHARACTERISTICS						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Units**	**Notes**
Rx_Data Differential Output Voltage	V_{OH}-V_{OL}	350		850	mV	CML, AC coupled
Output Differential Impedance	R_{out}		100		Ω	
RX_LOS indicate voltage - Low	V_{OL}	0		0.4	V	LVTTL
RX_LOS indicate voltage - High	V_{OH}	2.4		Vcc	V	

UPSTREAM BURST MODE TRANSMITTER OPTICAL SPECIFICATION						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Transmitter Type			1270		nm	DFB Laser
Upstream Signaling Speed	Stx		9.95328		Gbps	
Centre Wavelength	λ_C	1260	-	1280	nm	
Side Mode Suppression Ration	SMSR	30			dB	
-20dB Spectral Width				1	nm	
Average Output Power	Pout_e	4.5		9	dBm	@Operating Case Temperature
Average Output Power	Pout_e	5		9	dBm	@Room temperature
Insertion consistency (AOP)	Pout	-1		+1	dB	
Optical Output with TX OFF	Pout			-45	dBm	
Extinction Ratio	ER	6			dB	
Transmitter Turn ON / Turn OFF Time	Ton /Toff		256	512	bits	
Optical Rise and Fall Time	t_r/t_f			38	ps	20% to 80%
Total Jitter	TJ			0.35	UI	
Transmitter and Dispersion Penalty	TDP			1.5	dB	.
Transmitter tolerance to reflected optical power		-15			dB	
Eye Diagram(PRBS 2^{31} –1 @9.95328Gbps)			ITU-T G.9807 Compliant			Note1

Note1: Eye pattern mask



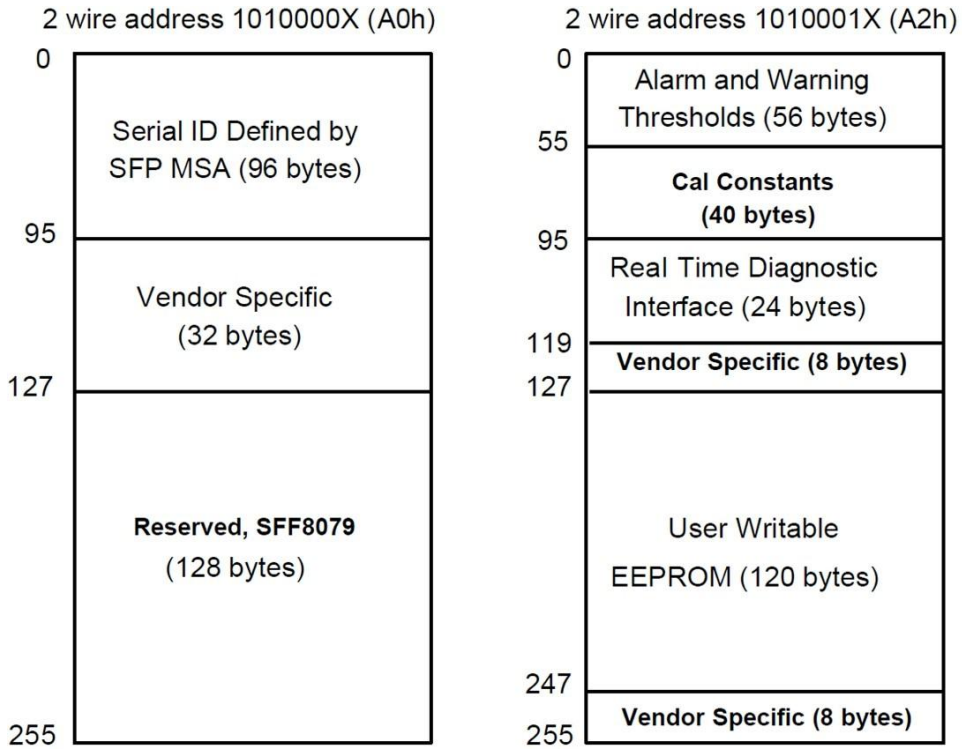
	9.95328 Gbit/s
x1	0.25
x2	0.4
x3	0.45
y1	0.25
y2	0.28
y3	0.4
Max hit ratio	5×10^{-5}

NOTE – The values are taken from clause 7.2.2.14 of [ITU-T G.959.1], "NRZ 10G Ratio small.". The "Hit ratio" is the acceptable ratio of samples inside to outside the hatched area.

DOWNSTREAM CW MODE RECEIVER OPTICAL SPECIFICATIONS						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Receiver Type			1577		nm	APD CW Mode
Downstream Signaling Speed	Stx		9.95328		Gbps	
Wavelength	λ_C	1575		1580	nm	
Sensitivity	SEN			-28.5	dBm	
Saturation Optical Power	SAT	-9			dBm	
LOSDe-assert Level	LOS_D			-29	dBm	
LOS Assert Level	LOS_A	-39			dBm	

LOS Hysteresis		0.5		5	dB	
WDM filter isolation		35			dB	1560nm

EEPROM INFORMATION



DIGITAL DIAGNOSTIC MONITORING INTERFACE			
Parameter	**Range**	**Accuracy**	**Calibration**
Temperature	Commercial:0 to70°C	±3°C	Internal
	Industrial:-45 to 90°C		
Voltage	3.0 to 3.6V	±5%	Internal
Bias Current	1 to 100mA	±10%	Internal
TX Power	3 to 8.2dBm	±2dB	Internal
RX Power monitor	-30to -7dBm	±3dB	Internal

PIN FUNCTION DEFINITIONS			
Pin	**Symbol**	**Description**	**Note**
1	VeeT	Transmitter Ground	Note1
2	TX_Fault	Transmitter FaultIndication	Note2
3	TX_Burst	Burst Enable, active low	Note3
4	SDA	Module Definition 2	Note4
5	SCL	Module Definition 1	Note4
6	MOD_ABS	Module Definition 0	Note4
7	TX_SD	TX signal detector	Note5
8	RX_LOS	RX Loss of Signal	Note6
9	NC	NC	
10	VeeR	Receiver Ground	Note1
11	VeeR	Receiver Ground	Note1
12	RD-	Inverting Receiver data output	Note7
13	RD+	Non-inverting Receiver data output	Note7
14	VeeR	Receiver Ground	Note1
15	VccR	Receiver Power	Note8
16	VccT	Transmitter Power	Note8
17	VeeT	Transmitter Ground	Note1
18	TD+	Non-inverting Transmitter data input	Note9
19	TD-	Inverting Transmitter data input	Note9
20	VeeT	Transmitter Ground	Note1

Note1: VeeR and VeeT may be internally connected within the SFP+ module.

Note2: TX Fault is an open collector/drain output, which should be pulled up with a 4.7K~10KΩ resistor on the host board. Pull up voltage between 2.0V and VccT, R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.

Note3:TX_Burst is an input that is used to open the transmitter burst optical output. It is pulled up with in the module with a 4.7~10 KΩ resistor.

It's states are:

Low (0~0.8V): Default Transmitter burst on (>0.8, < 2.0V): Undefined

High (2.0~3.3V): Default Transmitter burst off

Note4:SDA/SCL is the 2 wire serial interface, which should be pulled up with a 4.7K~10KΩ resistor on the host board. MOD_ABS is GND internal, which should be pulled up with a 4.7K~10KΩ resistor on the host board, high indicates module is absence.

Note5:TX_SD is the indicator of TX signal. High indicates laser on, low indicates laser off.

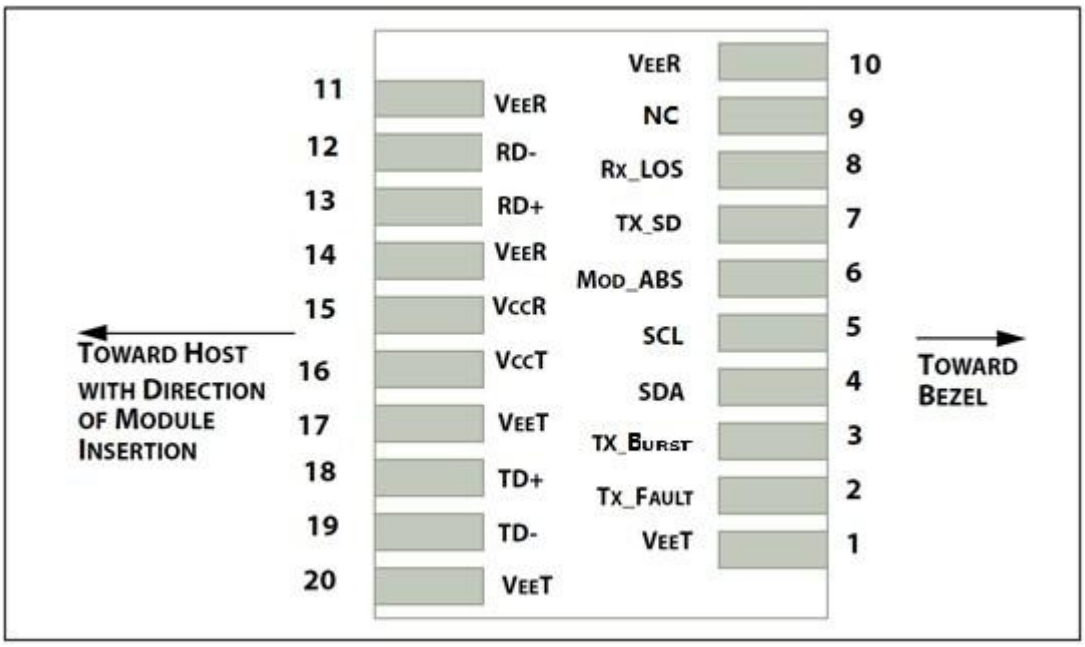
Note6:RX_LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a4.7K~10KΩ resistor. Assert high when the input optical power below the threshold.

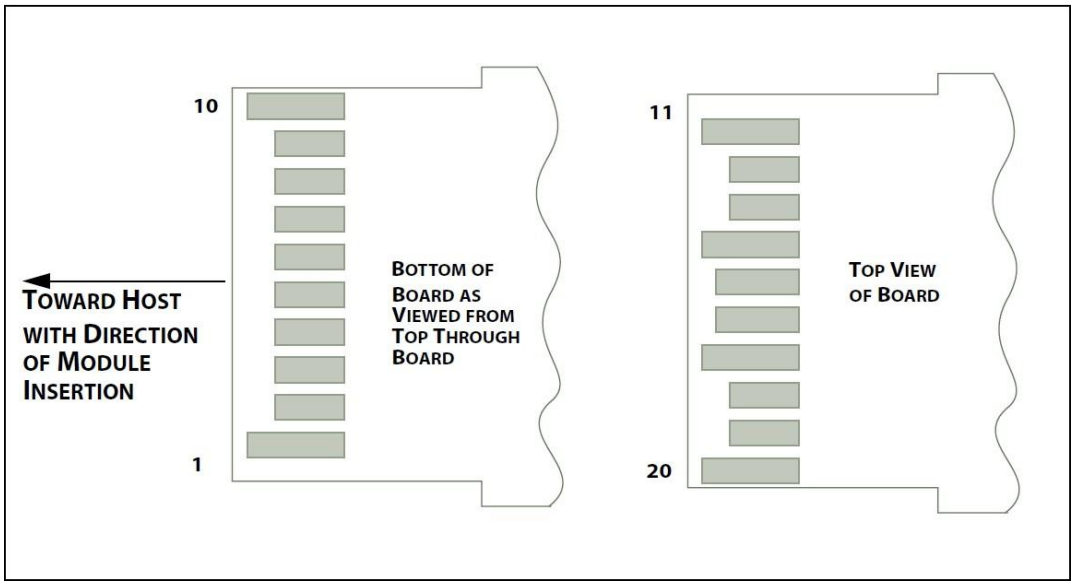
Note7:AC coupled internal.

Note8:VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V ±5% at the SFP+ connector pin. Maximum supply current is 600mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1 ohm should be used in order to maintain the required voltage at the SFP+ input pin with 3.3V supply voltage. When the recommended supply-filtering network is used, hot plugging of the SFP+ transceiver module will result in an inrush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP+ transceiver module.

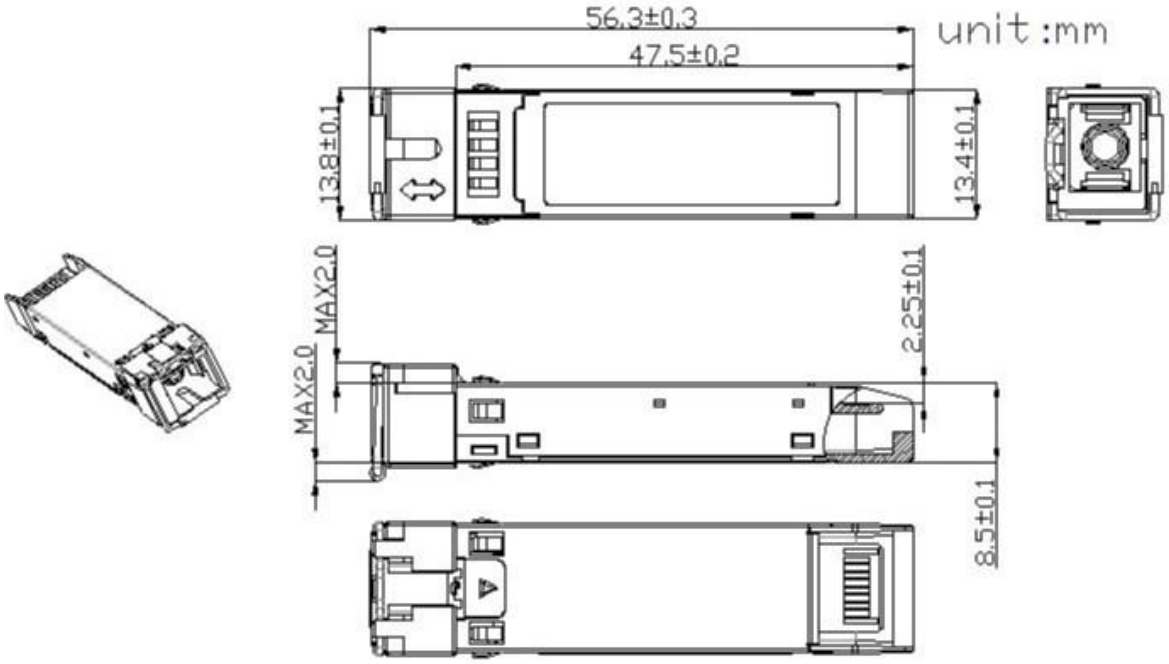
Note9: AC coupled internal.

PIN OUT DRAWING

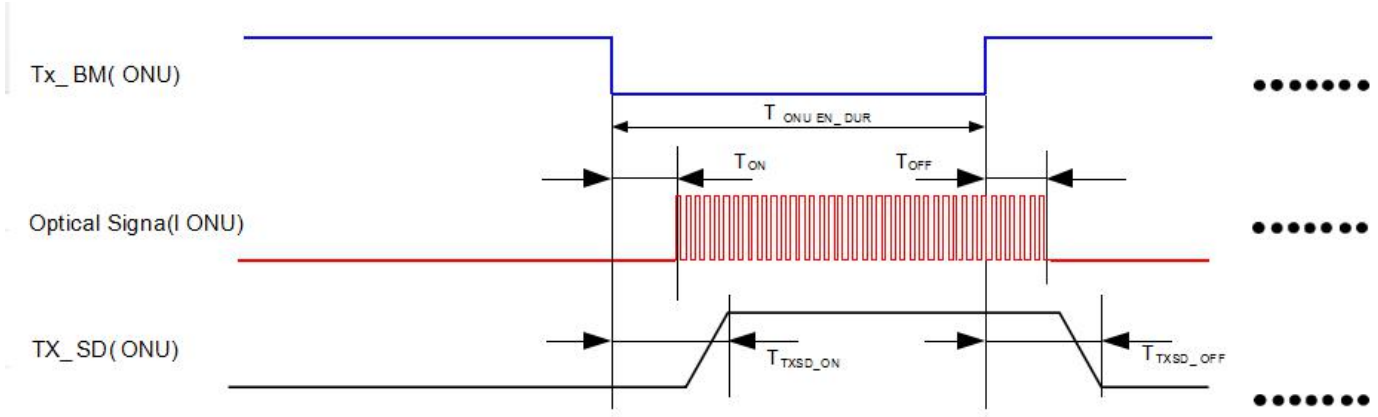




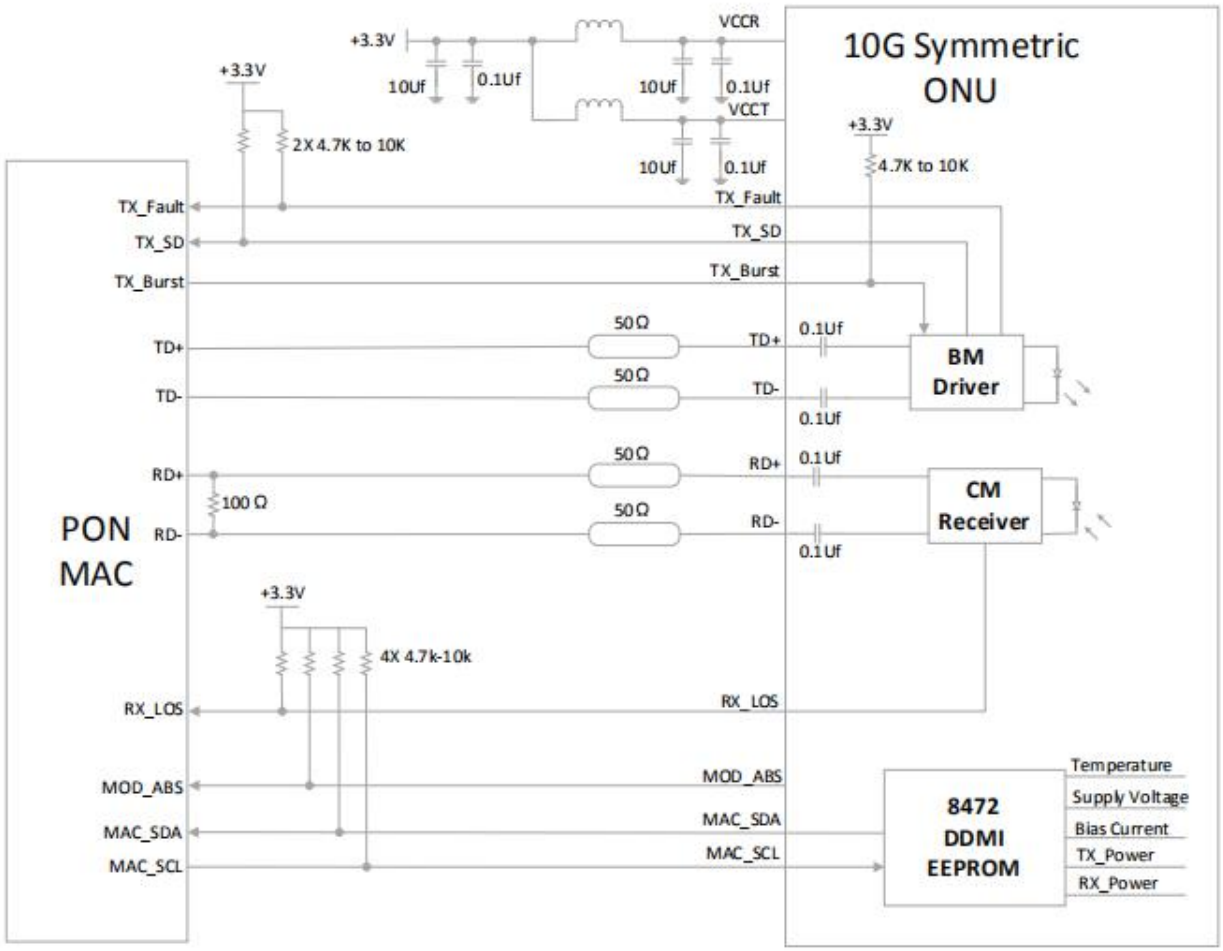
SPECIFICATIONS MECHANICAL (Unit:mm)



TYPICALONU TIMING SEQUENCE



RECOMMEND CIRCUIT SCHEMATIC



ORDER INFORMATION	
Part Number	**Product Description**
PXS96-B2520I	1270nm 9.95328Gb/s(TX)/1577nm 9.95328Gb/s(RX), XGS-PON ONU, active low, SFP+ SC/APC receptacle connector,-40~85℃
PXS96-B2520	1270nm 9.95328Gb/s(TX)/1577nm 9.95328Gb/s(RX), XGS-PON ONU, active low, SFP+ SC/APC receptacle connector,0~70℃

Contact Information

PRIMUS IT LIMITED

1、HongKong：RM M4/F Continental Mansion 300 King's RD HK

2、Tel:+86 0755-25924025

3、Fax:+86 0755-25924051

4、Website：http://www.primus-it.com

5、Email：sales@primus-it.com