



SSND000AJ203000

MSA Compliant 1G/10GBase-N1/B+ SFP+ OLT Transceiver (SMF, 1577nmTx/1270nmRx and 1490nmTx/1310nmRx, 20km, SC, DOM)

Product Description

This MSA compliant SFP+ transceiver provides 10GBase-N1/B+ throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1577nmTx/1270nmRx and 1490nmTx/1310nmRx via a SC connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

- Hot Pluggable SFP+
- 4 Lambda
- 3.3V DC Power Supply
- 2x10 SFP+ Electrical Interface
- ITU-T G.9807.1 Class N1/N2 compliant
- SC receptacle optical connector
- ITU-T G.984.2 Class B+/C+ compliant
- ITU-T G.987.2 Class N1/N2a compliant
- RoHS compliant and Lead Free
- Operating Temperature: 0C to 70C



Applications:

- PON
- Broadband Access

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage	VCC3	0	3.6	V
Storage Ambient Temperature	T _{stg}	-40	+85	°C
Operating Case Temperature	T _c	0	70	°C
Relative Humidity Storage	RH _s	5	90	%
Relative Humidity Operating	RH _o	5	85	%

Note:

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.

Absolute Maximum Ratings: Control Function Logic Levels

Parameter	Symbol	Min.	Max.	Unit	Notes
Tx_DISABLE	Tx_Dis	0	V _{CC3} +0.5	V	LVTTL
Burst Mode SIGNAL Detect	Rx_SD	0	V _{CC3} +0.5	V	LVTTL
Rx_Reset	Rx_Reset	0	V _{CC3} +0.5	V	1
Digital Rx_RSSI_Trigger Input	TRI	0	V _{CC3} +0.5	V	1
I ² C Serial Data	SDA	0	V _{CC3} +0.5	V	2
I ² C Serial Clock	SCL	0	V _{CC3} +0.5	V	1

Notes:

1. Signal Ended LVTTL input
2. Single Ended LVTTL I/O

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V _{CC3}	3.135	3.30	3.465	V	
Power Supply Current	I _{CC3}		750		mA	
Power Consumption	P			3.5	W	
Transmitter						
Tx Differential Input Impedence	Z _{IN}	90	100	110	Ω	
10Gb/s Tx Differential Input Amplitude	V _{IN10}	120		800	mV	
2.5Gb/s Tx Differential Input Amplitude	V _{IN1}	120		800	mV	
Tx_Dis = HIGH (Transmitter OFF / DISABLED)	V _{TDH}	0.7*V _{CC3}		V _{CC3}	V	1
Tx_Dis = LOW (Transmitter ON / ENABLED)	V _{TDL}	0		0.8	V	1
Receiver						
Rx Differential Output Impedence	Z _{OUT}	90	100	110	Ω	
10Gb/s Rx_Data Differential Output Voltage Amplitude	V _{OUT10}	300		850	mV	LVCML
10Gb/s Output HIGH Voltage	V _{OH10}	V _{CC3} -20	V _{CC3} -5	V _{CC3}	mV	LVCML
10Gb/s Output LOW Voltage	V _{OL10}	V _{CC3} -400	V _{CC3} -350	V _{CC3} -300	mV	LVCML
1.25Gb/s Rx_Data Differential Output Voltage Amplitude	V _{OUT1}	600		1600	mV	LVPECL
1.25Gb/s Output HIGH Voltage	V _{OH1}	V _{CC3} -1085	V _{CC3} -955	V _{CC3} -880	mV	LVPECL
1.25Gb/s Output LOW Voltage	V _{OL1}	V _{CC3} -1850	V _{CC3} -1705	V _{CC3} -1555	mV	LVPECL
Rx_SD = HIGH (Receiver ON)	V _{OH}	2.0		V _{CC3}	V	2
Rx_SD = LOW (Receiver OFF)	V _{OL}	0		0.8	V	2
Ratesel/Reset=HIGH	V _{IH}	1.9		V _{CC3}	V	3
Ratesel/Reset=Middle	V _{IM}	1.2		1.6	V	3
Ratesel/Reset=LOW	V _{IL}	0		0.9	V	3
TRI=HIGH	V _{IH}	0.7*V _{CC3}		V _{CC3}	V	1
TRI=LOW	V _{IL}	0		0.8	V	1

Notes:

1. LVTTL (Control INPUT)
2. LVTTL (Monitor OUTPUT)
3. Tri-level (Control INPUT)

9.95328Gb/s Transmitter Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Laser Type		1577nm CW EML				
Downstream Signal Rate		9.95328			Gb/s	
Average Launch Power	P_{OUT10}	2		5	dBm	
Optical Center Wavelength	λ_{10}	1575		1580	nm	
Spectral Width	$\Delta\lambda_{10}$			1.0	nm	
Side Mode Suppression Ratio	$SMSR_{10}$	30			dB	
Extinction Ratio	ER_{10}	8.2			dB	
Output Eye Diagram	Compliant with ITU-T G.987.2 & ITU-T G.9807.1					

2.48832Gb/s Transmitter Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Laser Type		1490nm CW DFB Laser				
Downstream Signal Rate		2.48832			Gb/s	
Average Launch Power	P_{OUT2}	1.5	2.5	5	dBm	
Optical Rise and Fall Time	T_r / T_f			200	ps	20% to 80%
Optical Center Wavelength	λ_1	1480	1490	1500	nm	
Spectral Width	$\Delta\lambda_1$			1.0	nm	
Side Mode Suppression Ratio	$SMSR_1$	30			dB	
Extinction Ratio	ER_1	8.2			dB	
Output Eye Diagram	Compliant with ITU-T G.984.2					

9.95328/2.48832Gb/s Receiver Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver Type		1270nm APD/TIA Receiver				
Upstream Signal Rate		9.95328/2.48832			Gb/s	
Optical Center Wavelength	λ	1260	1270	1280	nm	
XGS-PON Receiver Sensitivity	P_{IN}			-26	dBm	1
XG-PON Receiver Sensitivity	P_{IN}			-27.5	dBm	2
XGS-PON Receiver Optical Overload*	$P_{IN}(SAT)$	-5			dBm	3
XG-PON Receiver Optical Overload*	$P_{IN}(SAT)$	-7			dBm	3
Damaged Input Optical Power	P_d			-5	dBm	
Rx_SD Assert	P_A	-45		-29.5	dBm	
Rx_SD De Assert	P_D	-45		-29.5	dBm	
Rx_SD Hysteresis	PHy	0		7	dBm	

Notes:

1. BER@ 10^{-3} *: Test Condition: PRBS: $2^{31}-1$, ER=8.2 dB
2. BER@ 10^{-4} *: Test Condition: PRBS: $2^{23}-1$, ER=8.2 dB
3. Test Condition: BER@ 10^{-10} , PRBS $2^{23}-1$, ER=10dB

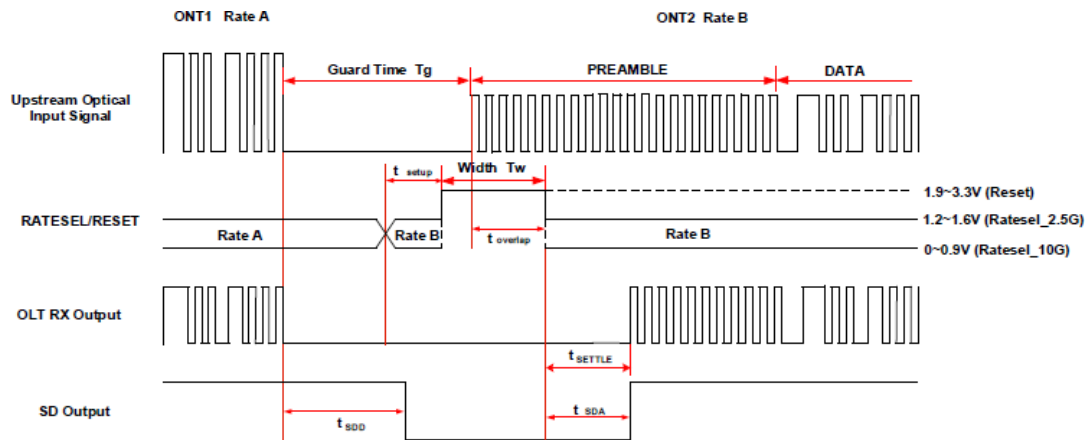
1.24416Gb/s Receiver Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver Type		1310nm Burst APD/TIA Receiver				
Upstream Signal Rate		1.24416			Gb/s	
Optical Center Wavelength	λ	1290	1310	1330	nm	
Receiver Sensitivity	P_{IN}			-28	dBm	1
Receiver Optical Overload	$P_{IN}(SAT)$	-7			dBm	
Damaged Input Optical Power	P_d			-5	dBm	
Receiver Settling Time	Trx			51.2	ns	
Rx_SD Assert	P_A	-45		-30	dBm	
Rx_SD De Assert	P_D	-45		-30	dBm	
Rx_SD Hysteresis	PHy	0		7	dB	

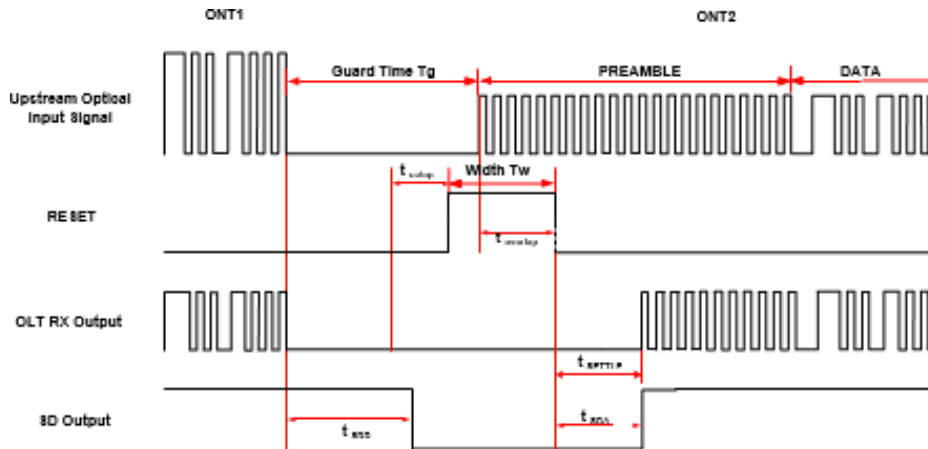
Notes:

1. Test Condition: BER@ 10^{-10} , PRBS $2^{23}-1$, ER=10dB

XGS Time Diagram



G Time Diagram



Receiver Timing Diagram

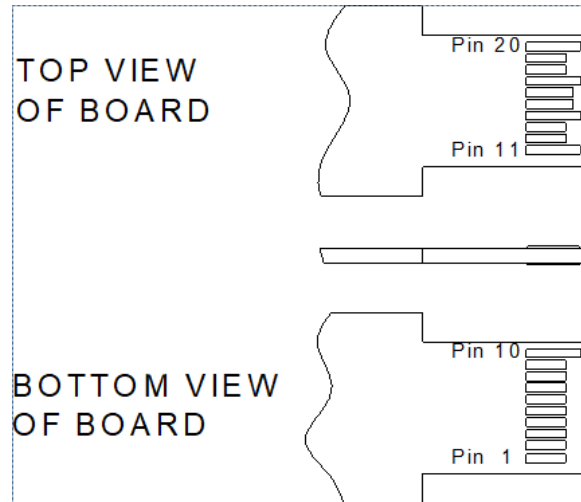
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Guard Time (GPON)	T_g	25.6			ns	
Guard Time (XGS-PON)	T_g	51.2			ns	
Reset Pulse Width (GPON)	T_w	12.8			ns	1
Reset Pulse Width (XGS-PON)	T_w	25.6			ns	1
Reset time overlapping preamble	t_{overlap}	0			ns	
Setup time of rate level for following burst	t_{setup}	5			ns	
Burst Signal Detect Assert (GPON)	T_{SDA}			25.6	ns	
Burst Signal Detect Assert (XGS-PON)	T_{SDA}		25	100	ns	
Burst Signal Detect De-assert (GPON)	T_{SDD}			100	ns	2

Pin Descriptions

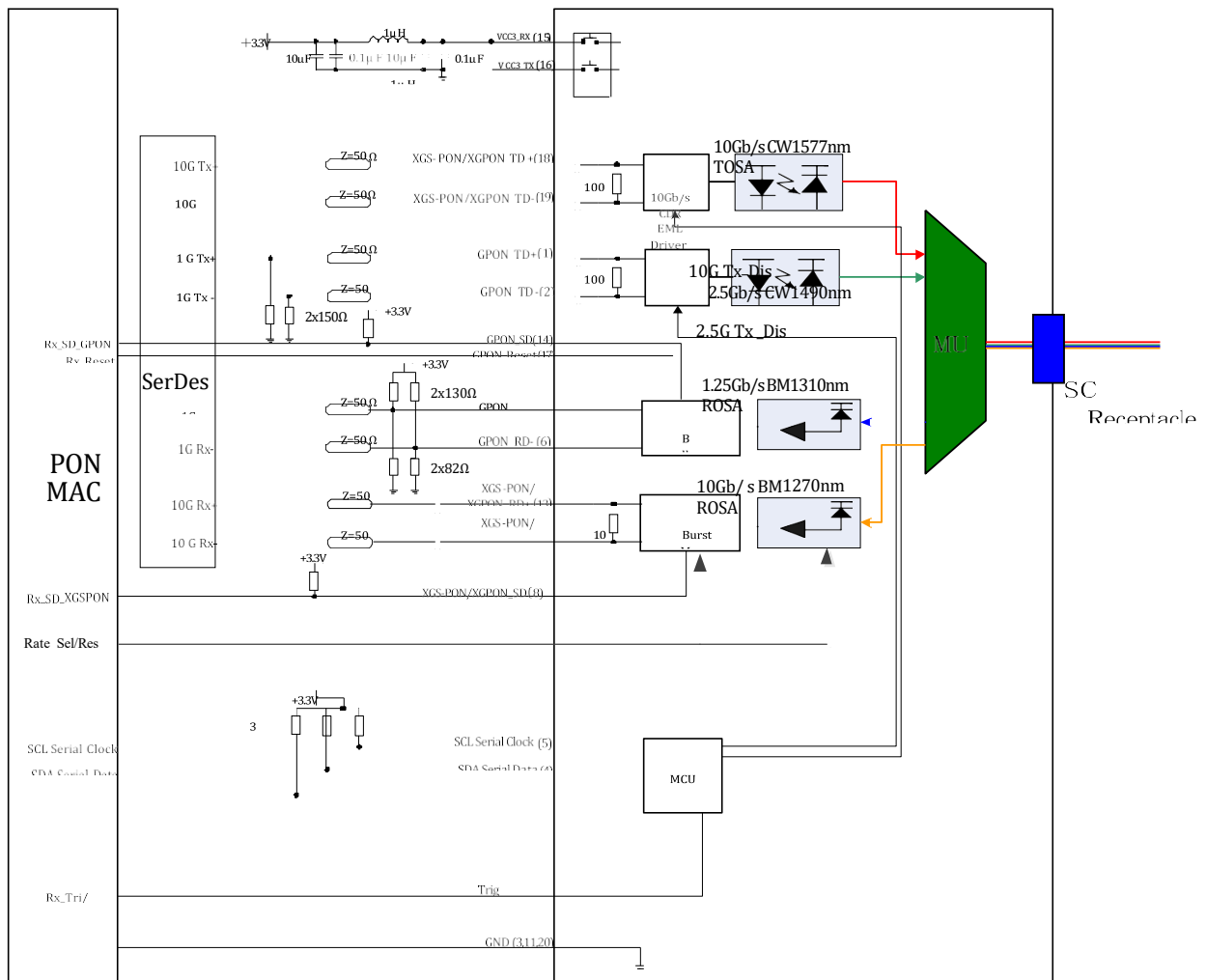
Pin	Symbol	Name/Descriptions	Ref.
1	GPON_TD+	Transmit Non-Inverted 2.48832Gb/s Data Input; AC coupled inside the module.	
2	GPON_TD-	Transmit Inverted 2.48832Gb/s Data Input; AC coupled inside the module.	
3	GND	Module Ground.	
4	SDA	2-Wire Serial Interface Data Line, with the pull-up resistance: 4.7k Ω ~10k Ω .	
5	SCL	2-Wire Serial Interface Clock, with the pull-up resistance: 4.7k Ω ~10k Ω .	
6	GPON_RD-	Receive Burst Mode Inverted 1.2488Gb/s Data Output; DC coupled inside the module.	1
7	Ratesel/Reset	Three-level input combining "Rate Select" and "Reset" information. Set high level to reset TIA/LA. Middle level indicates 2.5G data rate. Low level indicates 10G data rate.	
8	XGS-PON_SD	Receiver Signal Detect Indicator for XGS-PON/XGPON Receiver, when Low, indicates insufficient optical input power to the module; when High, means in normal.	
9	Trig/Txdis	Two signals multiplex, which selected by the register. Receiver signal strength indication trigger for Digital RSSI. As TXdisable, when Low level, the transceiver port work in normal; when High level, both 10Gb/s and 2.5Gb/s are disabled.	
10	GPON_RD+	Receive Burst Mode Non-Inverted 1.2488Gb/s Data Output; DC coupled inside the module.	1
11	GND	Module Ground.	
12	XGS-PON_RD-	Receive Burst Mode Inverted 9.953 or 2.48832Gb/s Data Output. DC coupled inside the module.	
13	XGS-PON_RD+	Receive Burst Mode Non-Inverted 9.953 or 2.48832Gb/s Data Output. DC coupled inside the module.	
14	GPON_SD	Receiver Signal Detect Indicator for G-PON Receiver. When Low, indicates insufficient optical input power to the module. When High, means in normal.	
15	VCC3_RX	+3.3V power supply for RX. Tolerance: 3.3V $\pm$ 5%.	
16	VCC3_TX	+3.3V power supply for TX. Tolerance: 3.3V $\pm$ 5%.	
17	GPON_Reset	Burst Mode Receiver Reset for GPON Receiver. When HIGH, indicates the receiver is OFF/being reset.	
18	XGS-PON_TD+	Transmit Non-Inverted 9.95328Gb/s Data Input; AC coupled inside the module.	
19	XGS-PON/_TD-	Transmit Inverted 9.95328Gb/s Data Input; AC coupled inside the module.	
20	GND	Module Ground.	

Notes:

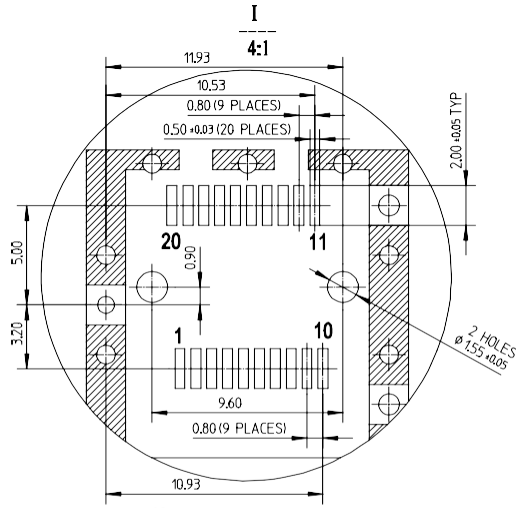
1. When GPON_RD+/- set as LVPECL, and the module without the pull-down resistances. The differential signal amplitude must be satisfied with the Electrical Characteristics.



Electrical Interface

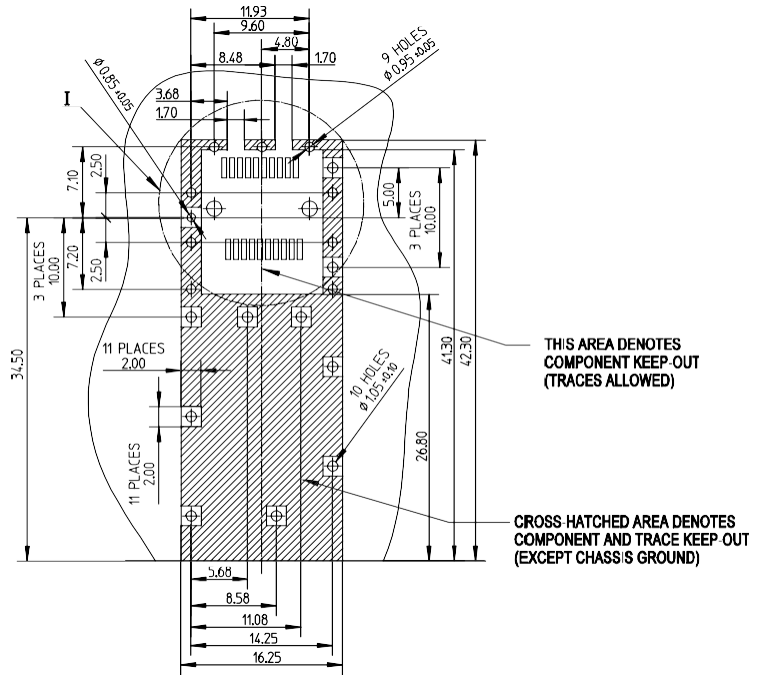


SFP+ Connector Dimensions

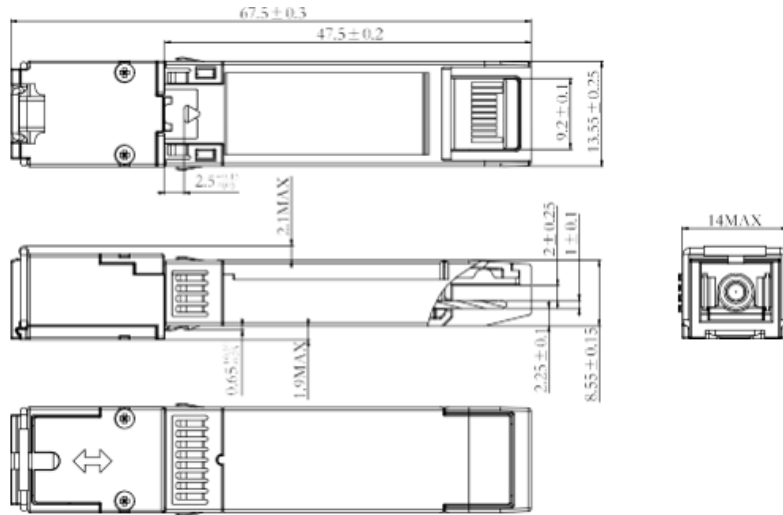


Notes:

1. Datum and basic dimensions established by customer
2. Pads and vias are chassis ground, 11 places
3. Thru holes, plating optional



Mechanical Specifications

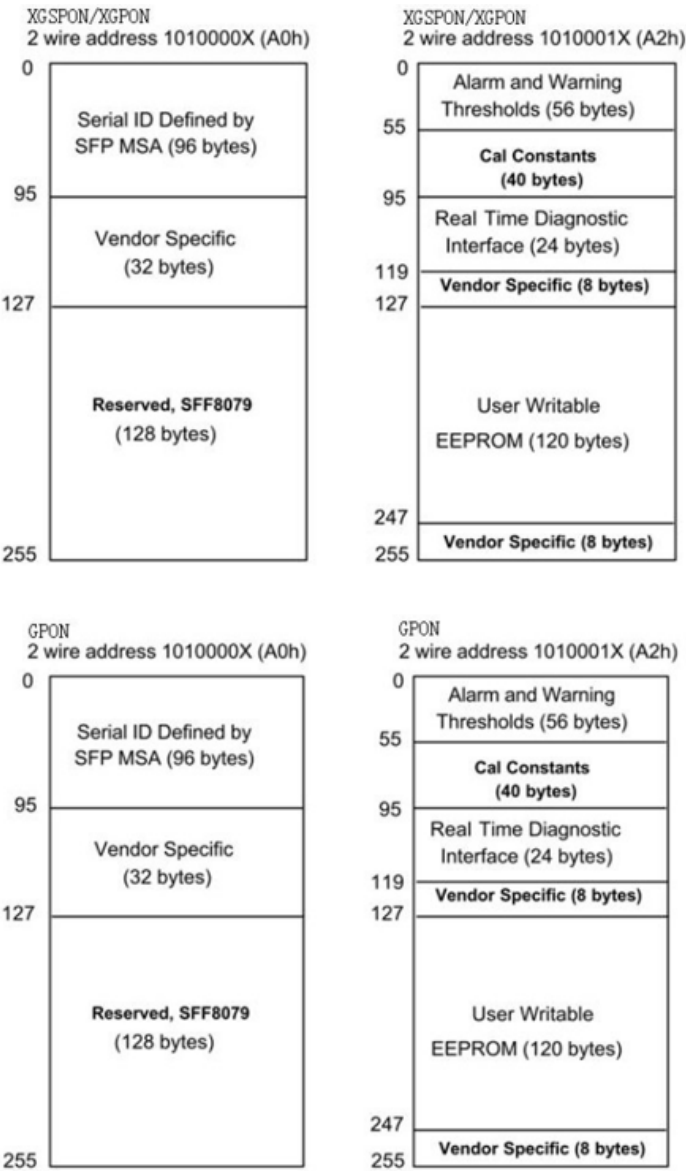


NOTES:

- 1.TOLERANCE:±0.1MM;
2.OTHERS ACCORDING WITH SFF-8074/SFF-8432 OR CUSTOMER SPEC;
3.LIGHT PORT ACCORDING WITH FIBER CONNECTOR SPEC.

EEPROM Information

EEPROM memory map specific data field description is as below:



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

