

XPON STICK ONU



Product specification

Specifications	Package	Model	Data Rate	Wavelength	Laser	Interface	model	Receiving Sensitivity
XPON STICK ONU	SFP	DFP-34X-2C2	GPON:1.25Gbps/2.5Gbps EPON:1.25Gbps/1.25Gbps	Tx1310/RX1490	DFB	SC	Adaptive EPON/GPON	<= -28dBm
GPON STICK ONU	SFP	DFP-34G-2C2	1.25Gbps/2.5Gbps	Tx1310/RX1490	DFB	SC	GPON	<= -28dBm
EPON STICK ONU	SFP	DFP-34E-2C2	1.25Gbps/1.25Gbps	Tx1310/RX1490	DFB	SC	EPON	<= -28dBm

Features

- Single fiber bi-directional data links GPON ONU and application with GPON MAC function.
- 1310nm DFB burst mode transmitter, 1490nm TIA continuous mode receiver
- Single 3.3V power supply
- Digital diagnostic monitor interface compatible with SFF-8472
- SFP MSA compliance
- Low EMI and excellent ESD protection
- Class I laser safety standard IEC-60825 compliant
- RoHS compliance
- Complies with SFP Multi-Source Agreement (MSA) SFF-8074i
- Complies with ITU-T G.984.2, G.984.2 Amendment 1
- Complies with ITU G.988 ONU management and control interface (OMCI) specification

RECOMMENDED OPERATING CONDITION

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Power Dissipation	PD	-	2.10	2.5	W	Max value under High temp environment
Operating Case Temperature	Tc	0		+70	°C	
	Tc	-40		+85	°C	
Operating Humidity Range	OH	5		95	%	
Data Rate			TX:1.244 / RX:2.488		Gbit/s	GPON MODE
Data Rate Drift	t	-100		+100	PPM	

TRANSMITTER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Center Wavelength	λ_c	1290	1310	1330	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Optical Power	AOP	0.5		4	dBm	Launched into SMF Fiber
Burst off Average Output Power				-45	dBm	
Extinction Ratio	ER	10			dB	
Rise/Fall Time (20%-80%)	Tr/Tf			0.26	ns	Unfiltered PRBS 223 - 1@1244.16 Mbps
RINsOMA				-115	dB/Hz	
Optical Return Loss Tolerance					dB	
Transmitter Reflectance		-15		-10	dB	
Transmitter and Dispersion Penalty	TDP			1	dB	Transmit on 20km SMF.
Optical Waveform Diagram		Compliant With ITU-T G.984.2				PRBS 223 - 1@1244.16Mbps

TRANSMITTER ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Input Differential Swing		300		1800	mV	CML input, AC coupled
Input Differential Impedance		90	100	110	Ω	
Transmitter TxDisable Control Voltage -		0		0.8	V	
Transmitter TxDisable Voltage - High		2.0		Vcc	V	
Transmitter Fault Alarm Voltage - Low		0		0.4	V	
Transmitter Fault Alarm Voltage - High		2.4		Vcc	V	

RECOMMENDED HOST BOARD SUPPLY FILTERING NETWORK

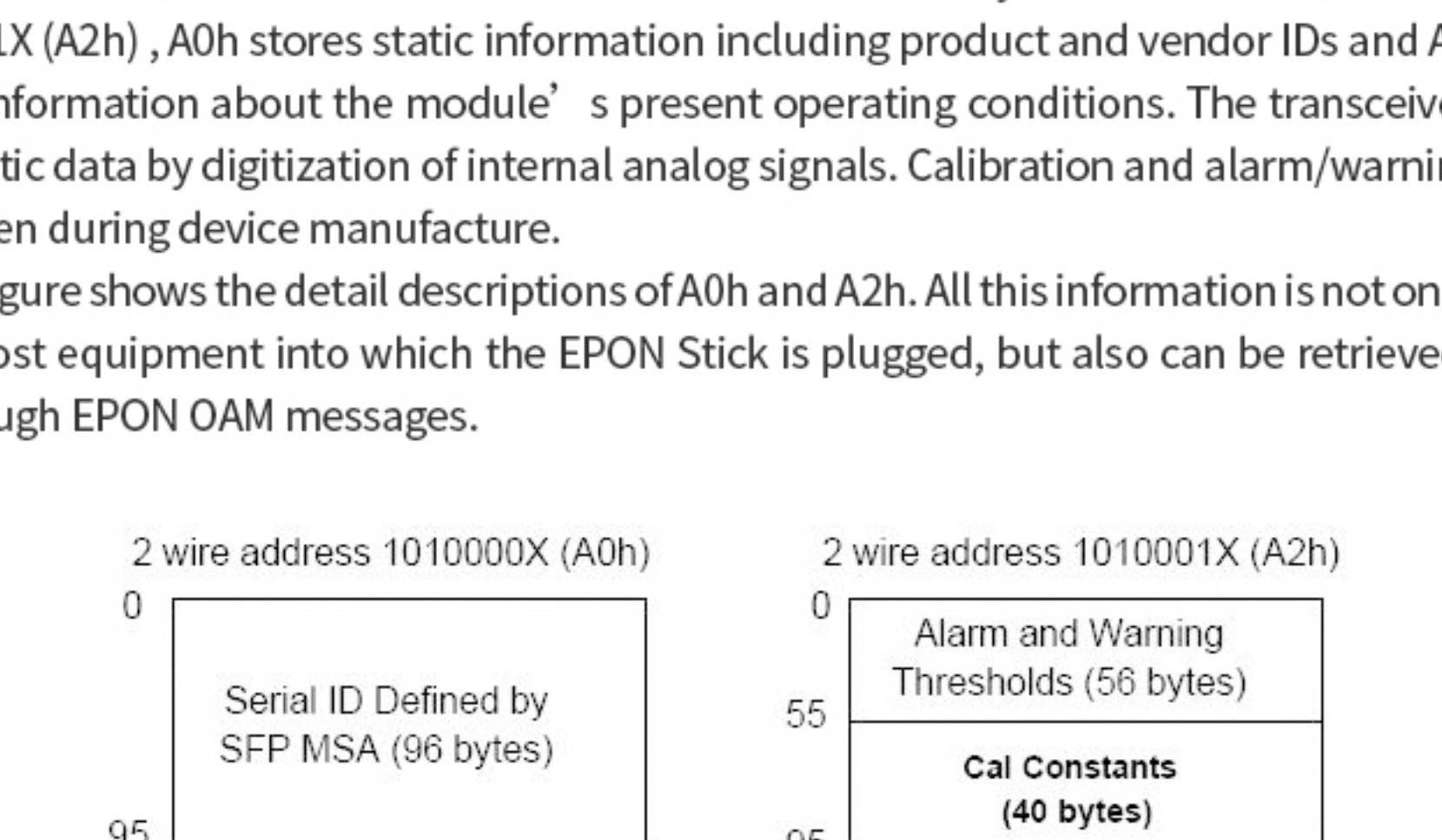


Figure 2 Recommended Host Board Supply Filtering Network

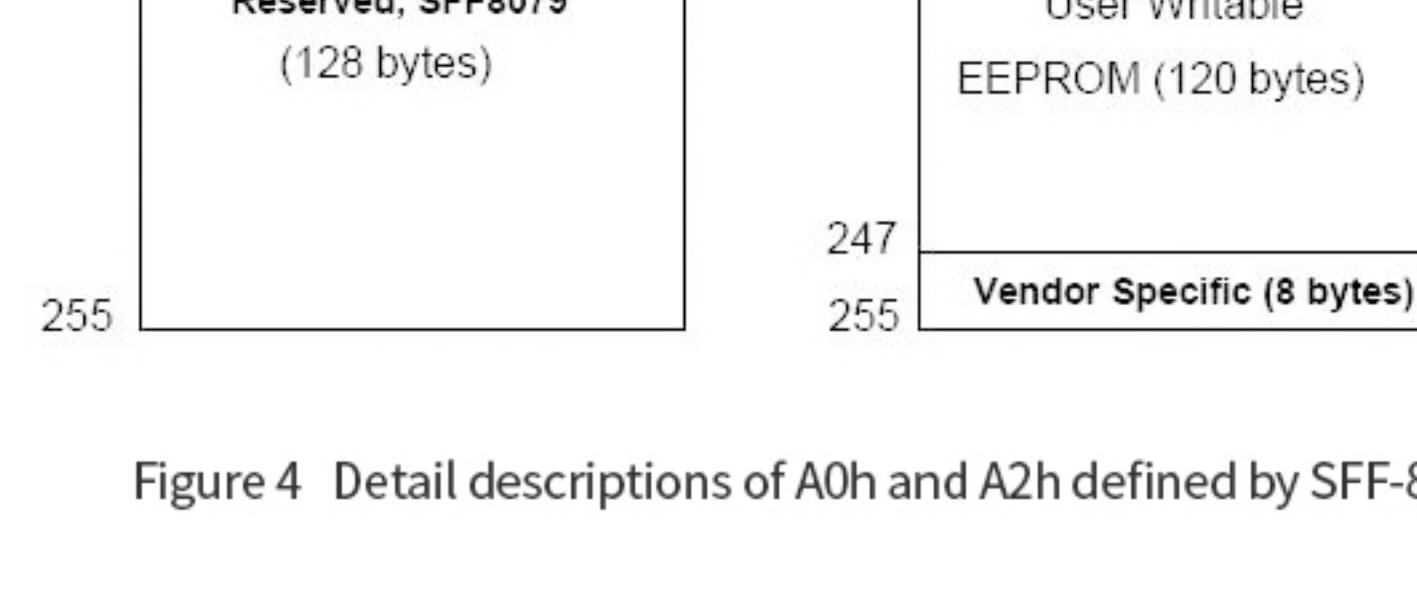


Figure 3 Mechanical Specifications

DESCRIPTION OF EEPROM ADDRESS A0H AND A2H

SFP ONU uses the two wire serial bus to access two blocks of 256-byte EEPROM address 101000X (A0h) and 1010001X (A2h), A0h stores static information including product and vendor IDs and A2h provides diagnostic information about the module's present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Calibration and alarm/warning threshold data is written during device manufacture.

The below figure shows the detail descriptions of A0h and A2h. All this information is not only accessible by a local host equipment into which the EPON Stick is plugged, but also can be retrieved by OLT remotely through EPON OAM messages.

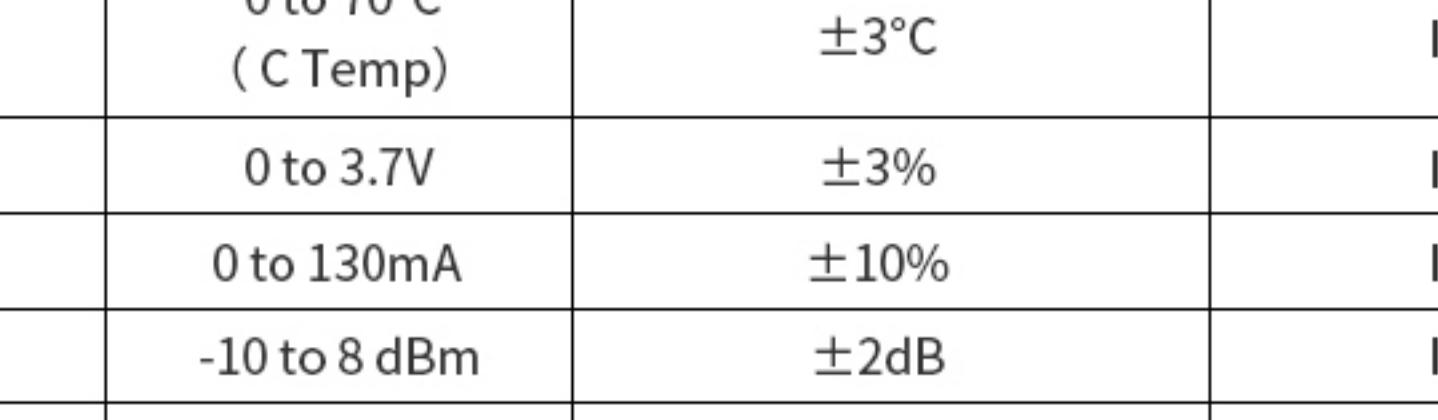


Figure 4 Detail descriptions of A0h and A2h defined by SFF-8472

DIGITAL DIAGNOSTIC MONITORING INTERFACE

Parameter	Range	Accuracy	Calibration
Temperature	-40 to 85°C (1 Temp)	$\pm 3^\circ\text{C}$	Internal
	0 to 70°C (C Temp)	$\pm 3^\circ\text{C}$	Internal
Voltage	0 to 3.7V	$\pm 3\%$	Internal
Bias Current	0 to 1.30mA	$\pm 10\%$	Internal
TX Power	-10 to 8 dBm	$\pm 2\text{dB}$	Internal
RX Power monitor	-28 to -8 dBm	$\pm 2\text{dB}$	Internal

PIN DESCRIPTION

PIN	Name	Description	Notes
1	VeeT	Transmitter Ground	Note 5
2	TxFault	Transmitter Fault Indication	Note 1
3	Tx Disable	Transmitter Disable	Note 2, Module disables on high or open
4	MOD-DEF2	Module Definition 2	Note 3,2 wire serial ID Interface
5	MOD-DEF1	Module Definition 1	Note 3,2 wire serial ID Interface
6	MOD-DEF0	Module Definition 0	Note 3 Grounded in Module
7	Rate	NC	-
8	LOS	Loss of Signal	Note 4
9	VeeR	Receiver Ground	Note 5
10	VeeR	Receiver Ground	Note 5
11	VeeR	Receiver Ground	Note 5
12	RD+	Inv. Received DataOut	Note 6
13	RD-	Received Data Out	Note 6
14	VeeR	Receiver Ground	Note 5
15	VccR	Receiver Power	$3.3 \pm 5\%$, Note 7
16	VccT	Transmitter Power	$3.3 \pm 5\%$, Note 7
17	VeeT	Transmitter Ground	Note 5
18	TD+	Transmit Data In	Note 8
19	TD-	Inv. Transmit Data In	Note 5
20	VeeT	Transmitter Ground	Note 8

Top of Board

Bottom of Board (as viewed thru top of board)

Figure 1 SFP Transceiver Electrical Pad Layout

1) TX Fault is an open collector/drain output, which should be pulled up with a $4.7\text{k} - 10\text{k}\Omega$ 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 $< 0.8\text{V}$.

2) TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the SFP module with a $4.7 - 10\text{k}\Omega$ resistor. Its states are:

- Low ($0 - 0.8\text{V}$): Transmitter on ($> 0.8, < 2.0\text{V}$): Undefined
- High ($2.0 - 3.465\text{V}$): Transmitter Disabled
- Open: Transmitter Disabled

3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a $4.7\text{k} - 10\text{k}\Omega$ resistor on the host board.

The pull-up voltage shall be VccT or VccR.

Mod-Def 0 is grounded by the module to indicate that the module is present.

Mod-Def 1 is the clock line of two wire serial interface for serial ID

Mod-Def 2 is the data line of two wire serial interface for serial ID

4) LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a $4.7\text{k} - 10\text{k}\Omega$ resistor. Pull up voltage between 2.0V and VccT, R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to $< 0.8\text{V}$.

5) VeeR and VeeT may be internally connected within the SFP module.

6) RD-/+: These are the differential receiver outputs. They are AC coupled 100 Ω differential lines which should be terminated with 100 Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.

The voltage swing on these lines will be between 370 and 2000 mV differential (185 – 1000 mV single ended) when properly terminated.

7) VccR and VccT are the receiver and transmitter power supplies. They are defined as $3.3V \pm 5\%$ at the SFP connector pin.

Maximum supply current is 300 mA. Recommended host board power supply filtering is shown below. Inductor with DC resistance of less than 1 Ω =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 30 mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.

8) TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

The voltage swing on these lines will be between 500 and 2400 mV (250 – 1200 mV single-ended), though it is recommended that values between 500 and 1200 mV differential (250 – 600 mV single-ended) be used for best EMI performance.