XGSPON ONU Stick

Product Specification

Version: 1.0

This document details the specifications required for optical transceiver modules designed for use in XGSPON applications. With 1270nm DML laser and single channel XGSPON ONU MAC, this ONU Stick module brings extra benefits and value to our customers, such as high optical power, low cost, no system management required, zero-touch provisioning and lexible deployment solutions.

STICKOPTICS

Shenzhen Stick Optics Co., Ltd.

Contact

Production information

STK10XGSONU

10G XSGPON STICK SFP+ ONU; 20KM;XGSPON SFP+ ONU;Including a 9.953G 1270nm Burst mode Tx and a 9.953 1577nm APD-Rx ; I-Temp;

Features

- Support XGSPON application with a regular switch to replace traditional ONU equipment.
- Integrates an XGS-PON ONU MAC.
- Hot-pluggable SFP+ footprint
- 10G 1270nm DML laser transmitter
- RoHS compliant and Lead Free
- Single 3.3V power supply
- Typical power consumption is 1.6W, with a maximum of 2W.
- Operating temperature range: -40°C to 85°C

Applications

- XGSPON Access Networks
- FTTX

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Note
Maximum Voltage Supply	V_{CC3}	-	-	3.46	V	-
Storage Temperature	T_{stg}	-40	-	+85	°C	-
Relative Humidity	RH	5	-	85	%	-
Receiver Optical Power	OP_RX	-	-	-3	dBm	-

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Note
Power Supply Voltage	V_{CC3}	3.14	3.3	3.46	V	-
Power Supply Current	I_{CC}	-	-	-	-	-
Operating Temperature (case)	T_{op}	-40	-	85	°C	-
Power Consumption	-	-	2	2.5	W	-
Transmission Distance	L	-	-	20	Km	-

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage	V_{CC}	-	3.3	-	V	-
Supply Current	I_{CC}	-	-	TBD	mA	-
Input differential impedance	R_{in}	-	100		Ω	-
differential data input swing	V_{in-pp}	?	-	?	mV	TBD
Transmitter Disable Voltage	V_{dis}	2	-	-	V	-
Transmitter Enable Voltage	V_{dis}	-	-	0.8	V	-
differential data output swing	V_{out-pp}	?	-	?	mV	-
LOS HIGH	V_{sd}	2	-	-	V	-
LOS LOW	V_{sd}	-	-	0.8	V	-

Note: T_{op} = -40 ~ 85°C, V_{CC} = 3.15~3.45 V

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Optical Transmitter 10G						
Optical Wavelength	λ	1260	-	1280	-	-
Spectrum Width	σ	-	-	1	nm	-
Side mode suppression ratio	SMSR	30	-	-	dB	-
Optical output power (EOL)	P_O	4	5.5	9	-	
Laser off power	P_{off}	-	-	-39	dBm	-
Extinction ratio	ER	6.5	-		dB	-
Tx_Burst Enable Time	T_{on}	-	-	25	ns	-
Tx_Burst Disable Time	T_{off}	-	-	25	ns	-
Optical Receiver 10G						
Upstream data rate	DR	9.952			Gbps	-
Optical Wavelength	λ	1575	-	1580	nm	-
Receiver Sensitivity (EOL)	P_{sens}	-	-	-28	dBm	-
Receiver Saturation	$P_{overload}$	-8	-	-	dBm	-
LOS Assert	LOS_A	-	-	-39	dBm	-
LOS D-Assert	LOS_D	-29	-		dBm	-
LOS Hysteresis	LOS_H	1	-	5	dB	-

Note: T_{op} = -40 ~ 85°C, V_{CC} = 3.15~3.45 V

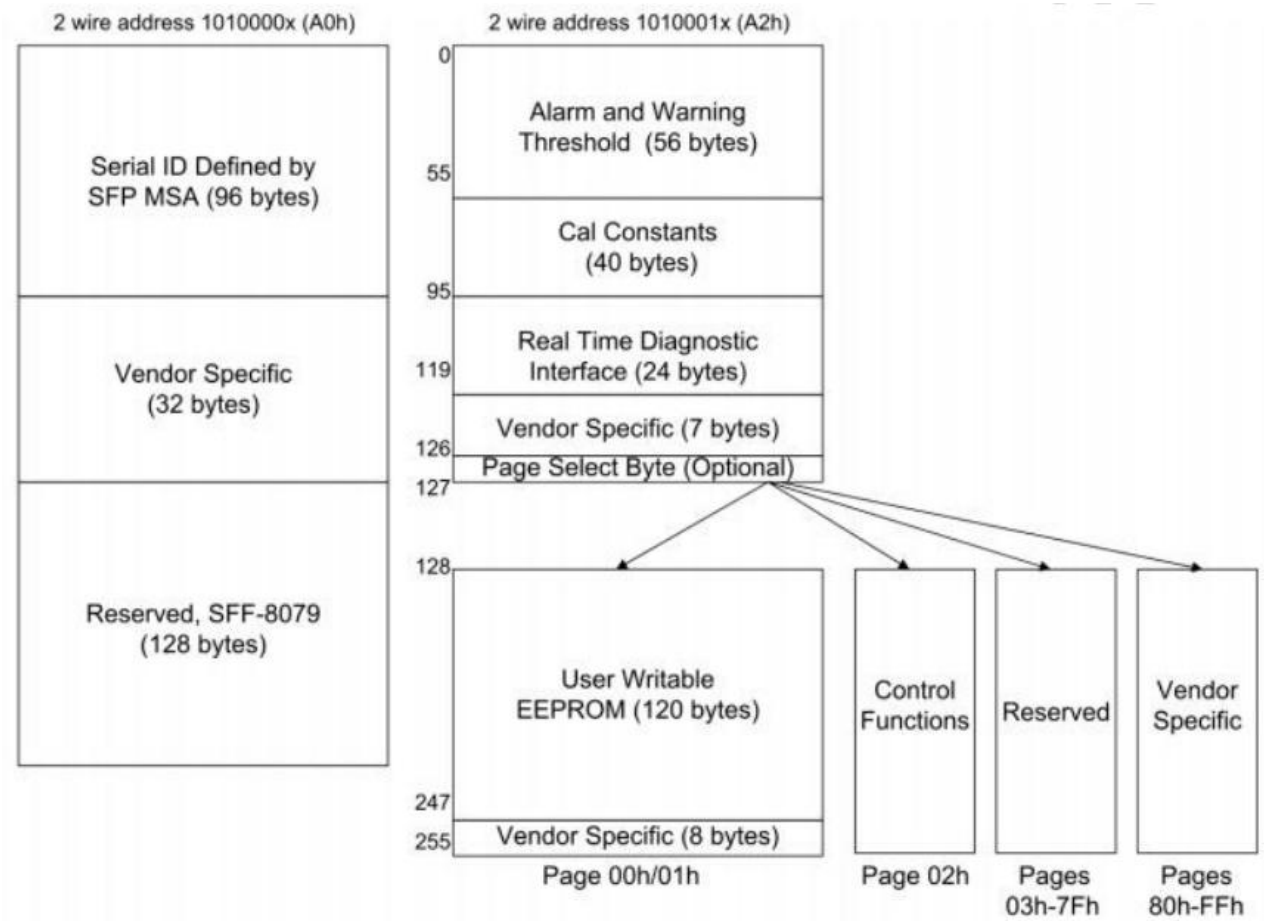
PIN Definition

PIN	Symbol	Logic	Power up sequence	Description
1	NC	-	-	-
2	TX_Fail1	LVTTL	OUT	Transmit Laser Fail ;TX_FAULT1 is alternate name, Open-Drain, active High, Pull-up on Host.
3	TX_DIS1	LVTTL	IN	Transmit Disable ; Active High
4	SDA	LVTTL	InOut	2-Wire Serial Interface data line
5	SCL	LVTTL	In	2-Wire Serial Interface Clock
6	MOD_ABS	Ground	-	Module absent indication; Pull-up on host PCB, internally,pulled to GND
7	NC	-	-	-
8	LOS	LVTTL	Out	Low level indicates normal transmission operation
9	NC	LVTTL	IN	-
10	GND	-	-	Module Ground
11	GND	-	-	Module Ground
12	RD-	CML	Out	10G/2.5G differential data output; DC coupled
13	RD+	CML	Out	
14	GND	-	-	Module Ground
15	Vcc3_Rx	-	2nd	+3.3V Power Supply for Rx
16	Vcc3_Tx	-	2nd	+3.3V Power Supply for Tx
17	GND	-	-	Module Ground
18	TD+	CML	In	Tx differential input; AC coupled;
19	TD-	CML	In	
20	GND	-	1st	Module Ground

Digital Diagnostic Interface

STK10XGSONU is fully compliant with XGSPON ONU module specifications, including 2-wire serial diagnostic memory contents.

SFP+ 2-wire serial diagnostic interface and address map shown as below:



Digital diagnostic range and accuracy defined as below:

Data Addr	Parameter	Range	Accuracy	Notes
96-97	Temperature	-40 to 125°C	±3°C	Case Temp
98-99	Vcc Voltage	0 to 6.55 V	±3%	
100-101	10G Tx Bias Current	0 to 262 mA	±3%	Unit value 4uA
102-103	10G Tx Power	-37 to 11.2 dBm	±2dB	Unit value 0.2uW
104-105	10G/1G Rx Power	-40 to 8.2 dBm	±2dB	Unit value 0.1uW

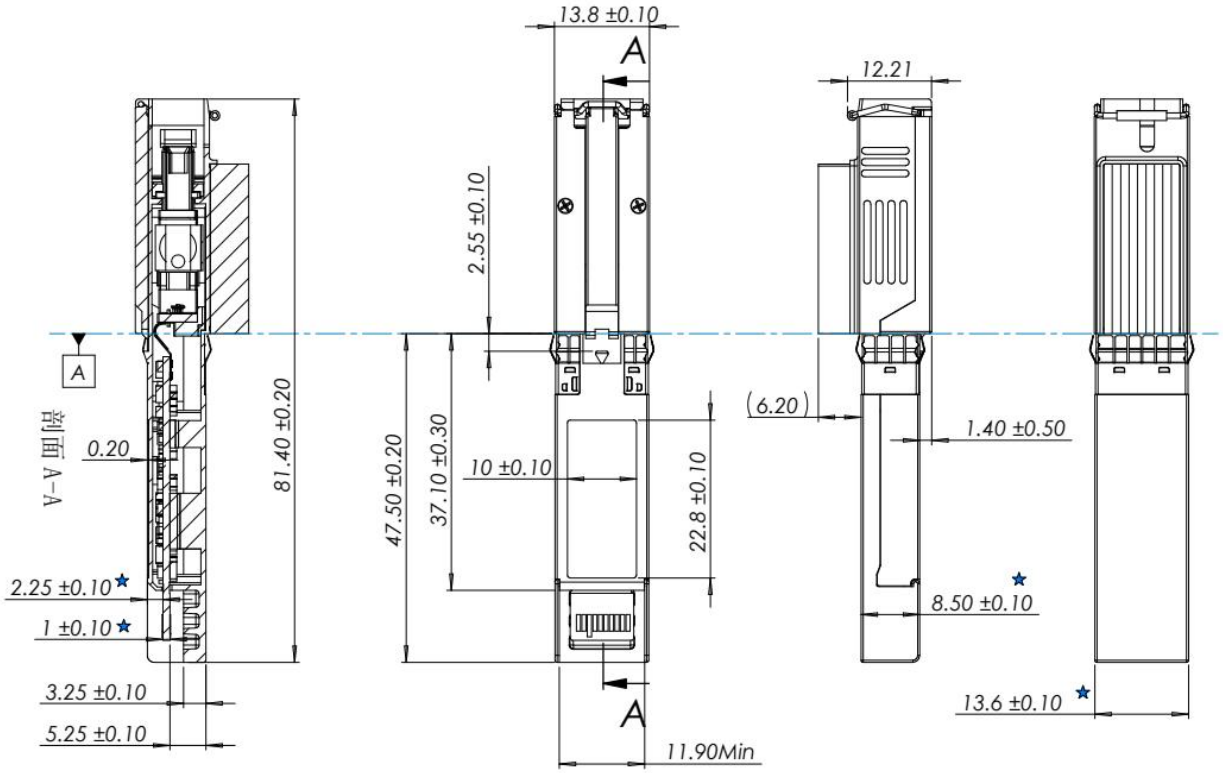
Reliability indicators

The reliability requirements of XGSPON SFP+ symmetric ONU optical transceiver module are shown in the following table.

Parameter	Description
MTBF	2 million hours, confidence 60%, operating temperature 40°C (Reference GR-468 and SR-332)
Module ESD level requirements	HBM High-speed pins ±1000V，Other pins ±2000V
ESD level requirements for modules mounted on a single board	Installed on the single board to be discharged through ± 8KV contact, ± 15KV air discharge.
Module reliability requirements	Accord with Telcordia GR-468-CORE Compatible with Telcordia GR-468-CORE
RE	Meet the Class B limit requirements of GB9254 (or CISPR 22).
CE	Meet the Class B limit requirements of GB9254 (or CISPR 22).
Electrostatic discharge immunity	The test is carried out according to GB/T 17626.2 (or IEC 61000-4-2); Contact discharge ± 8kV, air discharge ± 4kV, ± 15kV, performance criterion B
RF electromagnetic field radiation immunity	The test is carried out according to GB/T 17626.3 (or IEC 61000-4-3); The frequency is 80MHz-6GHz (CE certification EN55032 requires 80MHz-6GHz), the amplitude is 10 V/m, and the performance criterion is A

Mechanical Specification

STK10XGSONU XGSPON Stick ONU module is hot pluggable, and fully complies with SFP MAS and SFF-8432 specifications.



About Stick Optics

Shenzhen Stick Optics specializes in high-speed PON Stick communication technology, offering professional PON Stick solutions. Built on a strong foundation in optical components and backed by robust R&D capabilities, the company delivers a full range of PON Stick products. As an emerging high-tech enterprise, Stick integrates chip-level R&D, manufacturing, and sales under one roof. Its products are defined by high speed, high reliability, and low power consumption.

The company's latest flagship offerings-XGS/XGPON OLT Stick, XGSPON ONU Stick, and XGS Combo Stick-have already captured the attention of multiple industry leaders with their exceptional performance.

STICKOPTICS

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