

### GPON-SFP-ONUS-SC-I-C

MSA and TAA GPON ONU Stick SFP Transceiver (SMF, 1310nmTX/1490nmRX, 1.25G/2.5G, 20km, SC, Stick, -40 to 85C)

#### Features:

- 2x10 electrical SFP connector
- Single fiber bi-directional with 2488Mbps downstream
- Single fiber bi-directional with 1244Mbps upstream
- SC/UPC optical connector
- Supporting 1000BASE-X/2500BASE-X/SGMII/HSGMII interface
- Single-mode fiber
- Downstream AES decryption
- Highly flexible 802.1Q VLAN support
- Industrial temperature: -40 to 85 Celsius
- RoHS compliant and Lead-Free



#### Applications:

- Network switch, router and MDU

#### Product Description

This Industry Standard SFP transceiver provides 2.5Gbps/1.25Gbps-PON throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1310nmTx/1490nmRx via a SC connector. It is guaranteed to be 100% compatible with the equivalent Industry Standard transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. It is built to meet or exceed the specifications of Industry Standard, as well as to comply with MSA (Multi-Source Agreement) standards to ensure seamless network integration. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	V <sub>CC</sub>	GND		3.6	V	1
Storage Ambient Temperature	T <sub>stg</sub>	-40		85	°C	1
Operating Case Temperature	T <sub>c</sub>	-40	25	85	°C	1
Relative Humidity - Storage	RH <sub>stg</sub>	0		95	%	1
Relative Humidity - Operating	RH <sub>op</sub>	5		80	%	1
Optical Upstream Data Rate	BR		1244		Mbps	
Optical Downstream Data Rate	BR		2488		Mbps	
Tx_DIS Logic - High State	Tx_DIS <sub>H</sub>	2.0		V <sub>CC</sub>	V	LVTTTL
Tx_DIS Logic - Low State	Tx_DIS <sub>L</sub>	0		0.8	V	LVTTTL
Tx_Fault Logic - High State	Tx_Fault <sub>H</sub>	2.4			V	2
Tx_Fault Logic - Low State	Tx_Fault <sub>L</sub>			0.4	V	2
Rx_LOS Logic - High State	Rx_LOS <sub>H</sub>	2.4			V	2
Rx_LOS Logic - Low State	Rx_LOS <sub>L</sub>			0.4	V	2

### Notes:

1. 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.
2. LVTTTL (open collector/drain).

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Module Supply Voltage	V <sub>CC</sub>	3.135	3.30	3.465	V	
Module Supply Current (Tx and Rx)	I <sub>IN</sub>		550		mA	
Module Power Consumption	PD			2	W	
<b>Transmitter</b>						
Tx_Data Differential Input Voltage	V <sub>ID</sub>	300		1200	mV	SGMII Mode
Bit Rate (Tx)	BR <sub>Tx</sub>		1250		Mbps	SGMII Mode
Tx_DIS - High (Transmitter Off)	VO <sub>H</sub>	2.0		V <sub>CC</sub>	V	
Tx_DIS - Low (Transmitter On)	VO <sub>L</sub>	0		0.8	V	
<b>Receiver</b>						
Rx_Data Differential Output Voltage	V <sub>OD</sub>	300		800	mV	1250Mbps
Rx_Data Differential Output Voltage	V <sub>OD</sub>	500		1000	mV	2500Mbps
Rx_LOS Logic – High State	V <sub>LOS<sub>H</sub></sub>	2.4			V	1
Rx_LOS Logic – Low State	V <sub>LOS<sub>L</sub></sub>			0.8	V	1

### Notes:

1. LVTTTL (open collector/drain).

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
Transmitter Type		1310nm DFB Burst Mode				
Upstream Signaling Speed	Sup		1244		Mbps	
Average Output Power (9/125μm SMF)	POUT	0		5.0	dBm	1
Optical Output with Tx Off	POUT			-40	dBm	
Tx Wavelength	$\lambda$	1290	1310	1330	nm	
Spectral Line Width @-20dB	$\Delta\lambda$			1.0	nm	
Extinction Ratio	ER	10			dB	2
Side-Mode Suppression Ratio	SMSR	30			dB	
<b>Receiver</b>						
Receiver Type		1490nm CW Mode				
Downstream Signaling Speed	Sdown		2488		Mbps	
Optical Center Wavelength	$\lambda$	1480	1490	1500	nm	
Receiver Sensitivity	PIN			-28.0	dBm	3
Receiver Optical Overload	PIN(SAT)	-8			dBm	3
Rx_LOS of Signal Asserted	P <sub>A</sub>	-45			dBm	
Rx_LOS of Signal De-Asserted	P <sub>D</sub>			-28.5	dBm	
Rx_LOS of Signal Hysteresis	P <sub>H</sub>	0.5		6.0	dB	

### Notes:

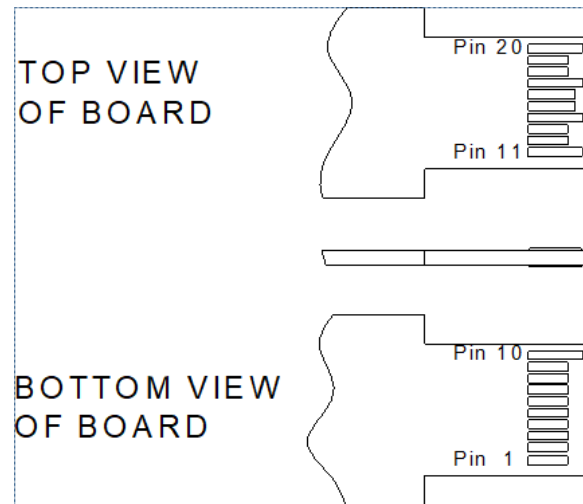
1. Measured with 9/125μm G.652 SMF.
2. Measured by Ethernet package with random payload.
3. BER<10<sup>-10</sup>, @2488Mbps, PRBS 2<sup>23</sup>- 1, and ER=11dB.

## Pin Descriptions

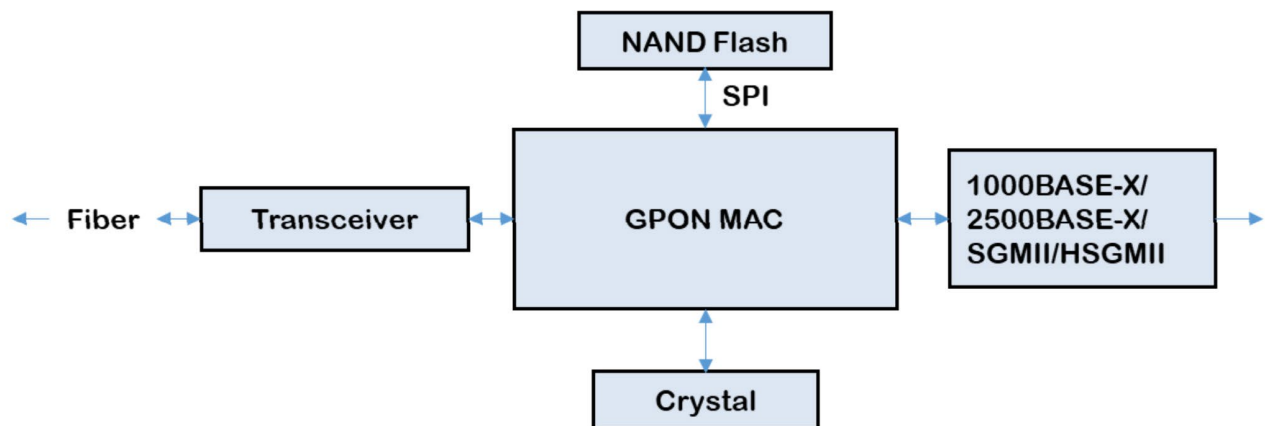
Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground.	
2	Tx_Fault	Transmitter Fault. Low = Normal Operation. High = Fault Indication.	1
3	Tx_Disable	Transmitter Disable. Low = Normal Operation. High = Disables Module.	1
4	MOD_DEF2	Module Definition 2. 2-Wire Serial Interface Data.	1
5	MOD_DEF1	Module Definition 1. 2-Wire Serial Interface Clock.	1
6	MOD_DEF0	Module Definition 0. Presence Pin. The MOD_DEF0 signal is set to low level after initialization of $\mu$ C and power up the I <sup>2</sup> C interface.	
7	Dying Gasp	Dying Gasp Indication. When “high,” indicates normal operation. “Low” indicates power failure.	4
8	LOS	Loss of Signal. When “high” indicates no optical power. “Low” indicates normal operation.	1
9	PIN9	Reserved. Keep floating when not used.	
10	VeeR	Receiver Ground.	
11	VeeR	Receiver Ground.	
12	RD-	Rx_Data Output Inverted.	2
13	RD+	Rx_Data Output Non-Inverted.	2
14	VeeR	Receiver Ground.	
15	VccR	Receiver DC Power.	3.3V $\pm$ 5%
16	VccT	Transmitter DC Power.	3.3V $\pm$ 5%
17	VeeT	Transmitter Ground.	
18	TD+	Tx_Data Input Non-Inverted.	3
19	TD-	Tx_Data Input Inverted.	3
20	VeeT	Transmitter Ground.	

### Notes:

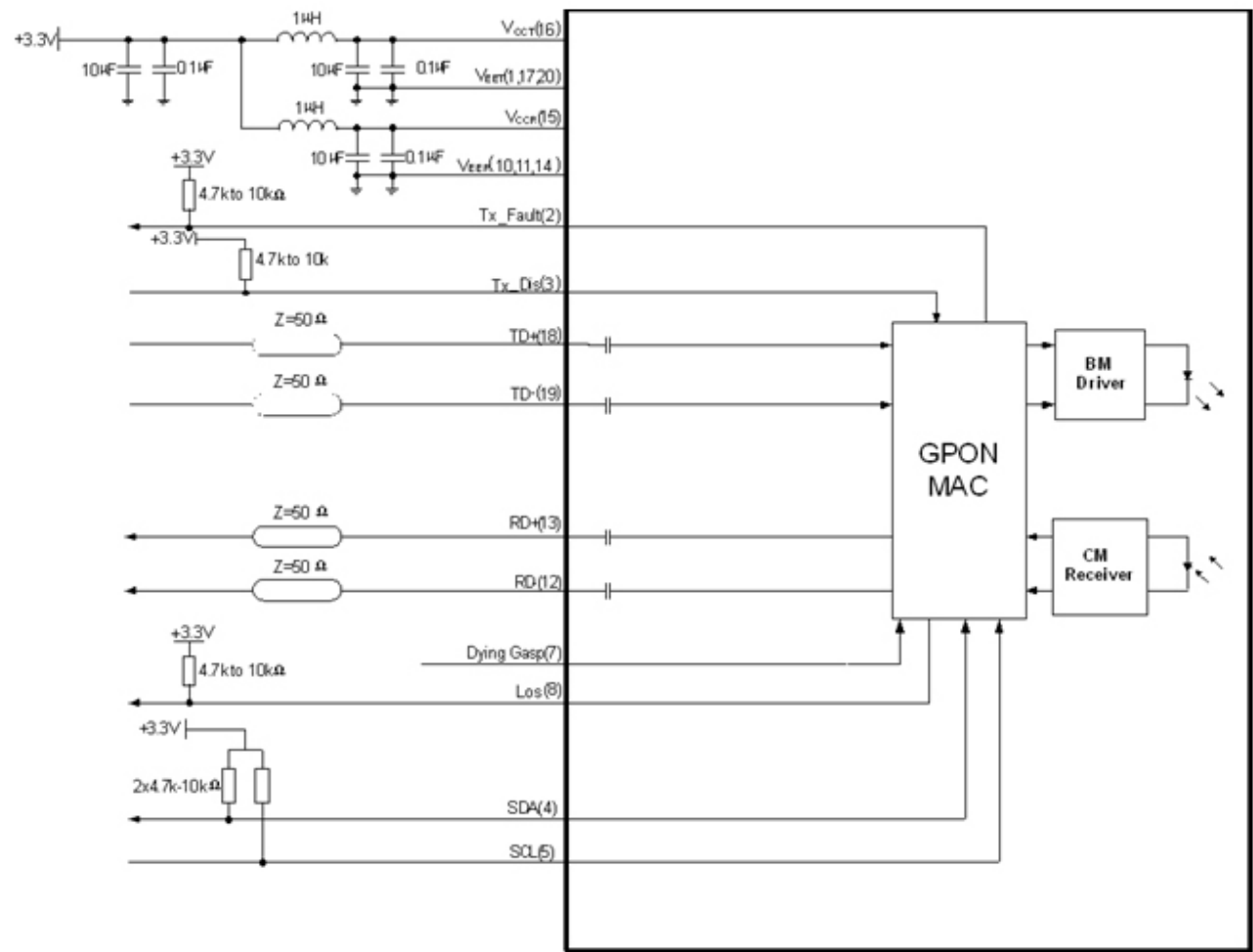
1. The uncommitted Tx\_Fault, Tx\_Disable, MOD\_DEF2, MOD\_DEF1, and LOS monitor and control pins each require a pull up resistor of 4.7k $\Omega$  to 10k $\Omega$ . The pull-up voltage must be 3.3V.
2. The 100 $\Omega$  differential Rx Data Output is internally AC coupled. Supporting 1000BASE-X/2500BASE-X/SGMII/HSGMII interface.
3. The 100 $\Omega$  differential Tx Data Input is internally AC coupled. Supporting 1000BASE-X/2500BASE-X/SGMII/HSGMII interface.
4. Voltage Detect Input for Dying Gasp. When the voltage on this pin is lower than 1.29V $\pm$ 5%, a dying gasp event is triggered. A 4.7k $\Omega$  resistor is used to pull up to DC power in the module.



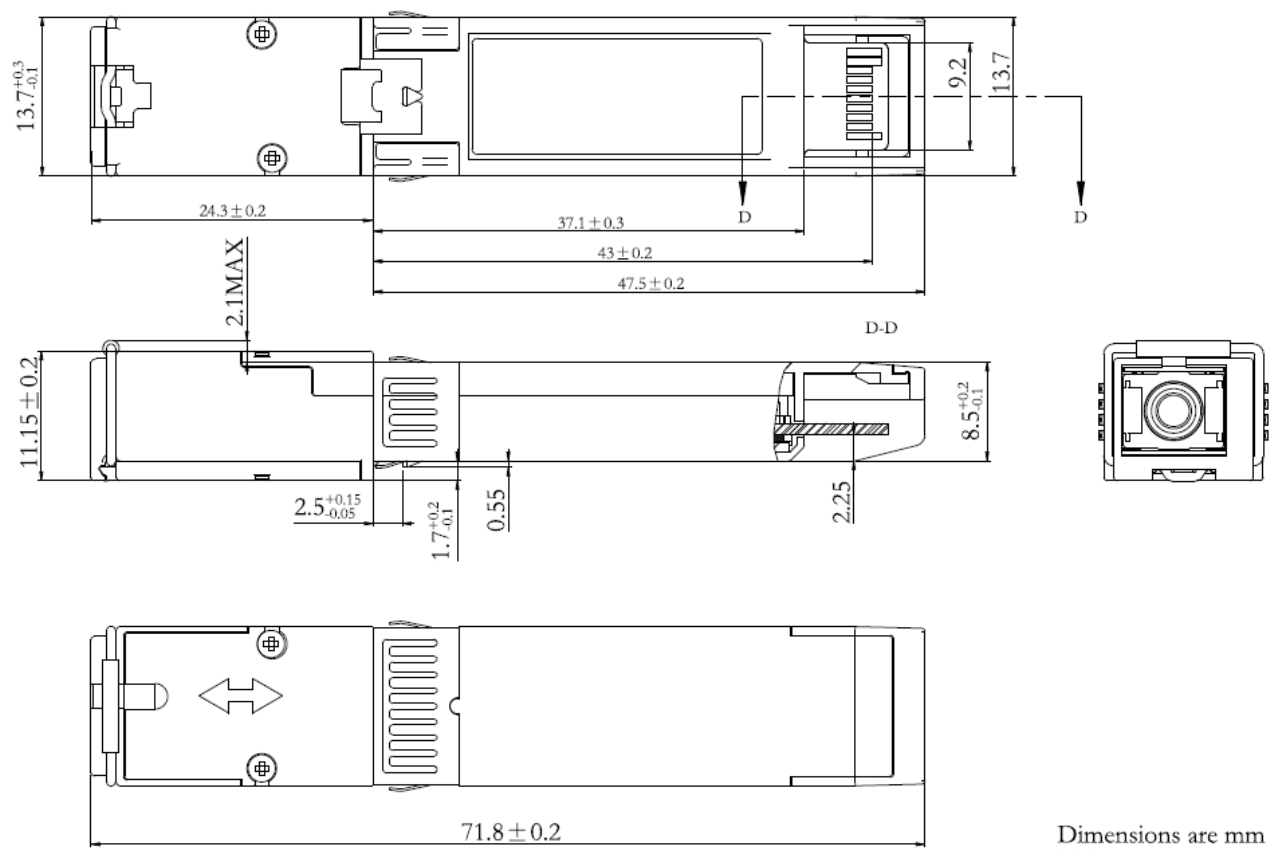
### Block Diagram



Electrical Interface



Mechanical Specifications



## About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

## Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

## Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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