

Rev	Date	Modified by	Description
A0	2023		

## Product Specifications

### SFP+ COMBO PON OLT D2/C+ TX 9.95Gbps, RX 2.488Gbp 20KM

#### PN: EGP25X-3SCDTC2

#### Features

- Compatible with GPON & XGPON system. Work in GPON & XGPON system simultaneously.
- XGPON: Single fiber bi-directional data links TX 9.95Gbps, RX 2.488Gbps application.  
GPON: Single fiber bi-directional data
- links asymmetric TX 2488Mbps/RX1244Mbps application
- 0 to 70°C operating case temperature
- 3.3V power supply
- SFP+ package with SC Receptacle connector
- Hot-pluggable capability
- XGPON: High power 1577nm EML LD & High sensitivity 1270nm APD. GPON: 1490nm DFB LD & High sensitivity 1310nm APD
- Support 20km transmission distance with SMF
- SD indication for GPON&XGPON
- Low EMI and excellent ESD protection
- Digital diagnostic monitor interface
- RoHS6 compliance

#### Applications

- GPON OLT CLASS C+ & XGPON D2 SFP+ OLT

#### Standards

- Complies with SFF-8472
- Complies with ITU G.987.2
- Complies with ITU-T G.984.2
- Complies with FCC 47 CFR Part 15, Class B
- Complies with FDA 21 CFR 1040.10 and 1040.11

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Ambient Temperature	TSTG	-40	85	°C	
Operating Case Temperature	Tc	0	70	°C	
Operating Humidity	OH	5	85	%	
VCC3 Power Supply Voltage	VCC3	0	3.6	V	

## RECOMMENDED OPERATING CONDITION

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	Tc	0		+70	°C	
VCC3 Power Supply Voltage	VCC3	3.13	3.3	3.47	V	
Data Rate	XGPON		9.953/2.488		Gbps	
	GPON		2.488/1.244		Gbps	
Power Consumption	P		-	3.3	W	

## XGPON TRANSMITTER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Center Wavelength	$\lambda_c$	1575		1580	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Waveform Diagram	Compliant with ITU G.987.2					Figure 1
Average Launch Optical Power	AOP	+5.5		+8	dBm	Launched into SMF @ 25°C
Average Launch Optical Power	AOP	+5		+8	dBm	Launched into SMF @ 0~70°C
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF@0~70°C
Extinction Ratio	ER	8.2			dB	PRBS2 <sup>31</sup> -1 @9.95Gbps

## GPON TRANSMITTER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Center Wavelength	$\lambda_c$	1480		1500	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Waveform Diagram	ITU-T G.984.2					Figure 2
Average Launch Optical Power	AOP	+4		+7	dBm	Launched into SMF @ 25°C
Average Launch Optical Power	AOP	+3		+7	dBm	Launched into SMF @ 0~70°C
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF @ 0~70°C
Extinction Ratio	ER	8.2			dB	PRBS 2 <sup>23</sup> -1+72CID @2.488Gbps

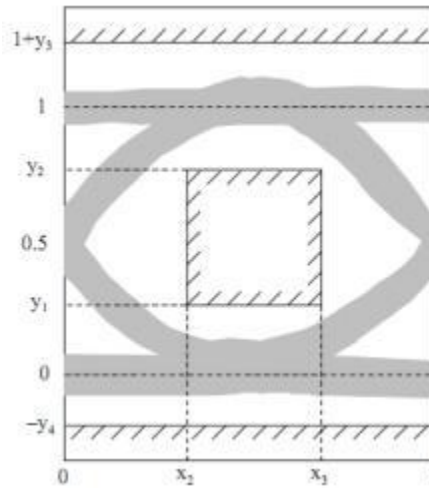
## XGPON TRANSMITTER ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Input Differential Swing		120		850	mV	CML input, AC coupled
Input Differential Impedance		90	100	110	$\Omega$	
Transmitter Enable Voltage - Low		0		0.8	V	
Transmitter Disable Voltage - High		2.0		VCC	V	

## GPON TRANSMITTER ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Input Differential Swing		200		1600	mV	LVPECL input, AC coupled
Input Differential Impedance		90	100	110	$\Omega$	
Transmitter Disable Voltage - Low		0		0.8	V	
Transmitter Disable Voltage - High		2.0		VCC	V	
Transmitter Fault Alarm Voltage - Low		0		0.4	V	
Transmitter Fault Alarm Voltage - High		2.4		Vcc	V	

# XGPON TRANSMITTER EYE MASK DEFINITIONS AND TEST PROCEDURE



X3-X2	Y1	Y2	Y3	Y4	Unit
0.2	0.25	0.75	0.25	0.25	UI

# GPON TRANSMITTER EYE MASK DEFINITIONS AND TEST PROCEDURE

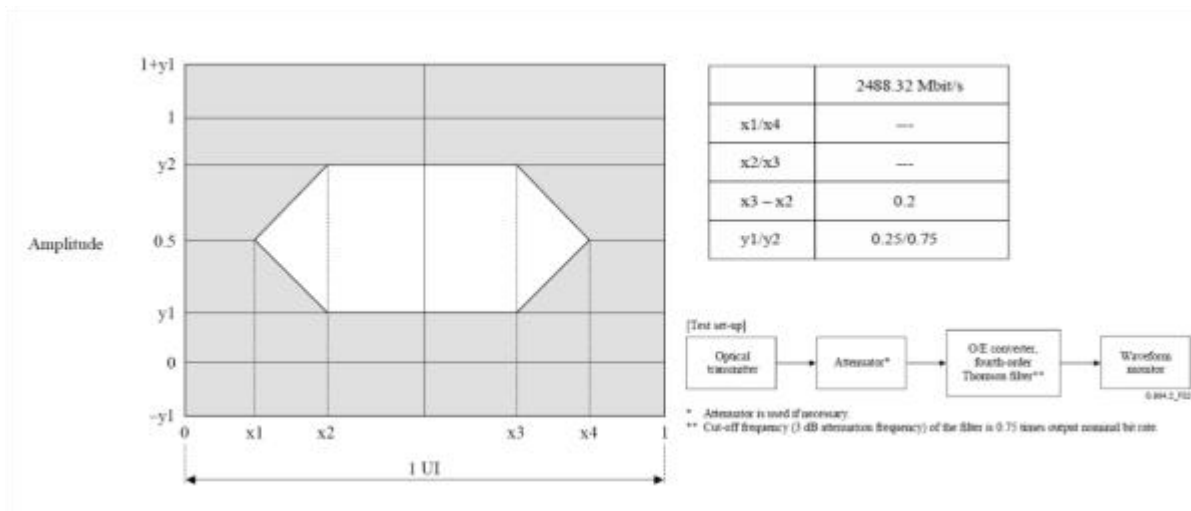


Figure 2 GPON Transmitter Eye Mask Definitions

## XGPON RECEIVER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Wavelength		1260		1280	nm	
Max Optical input				-3	dBm	input without incurring damage
Sensitivity(BOL)	SEN			-30.5	dBm	PRBS 223-1@2.488Gbps BER $\leq 1 \times 10^{-4}$
Sensitivity(EOL)	SEN			-29.5	dBm	PRBS 223-1@2.488Gbps BER $\leq 1 \times 10^{-4}$
Saturation Optical Power	SAT	-9			dBm	PRBS 223-1@2.488Gbps BER $\leq 1 \times 10^{-4}$
SD Assert Level(BOL)				-31	dBm	=SEM-0.5dB
SD Assert Level(EOL)				-30	dBm	=SEN-0.5dB
SD De-assert Level		-43			dBm	
Hysteresis		0.5		6	dB	
Receiver Reflectance				-20	dB	

## GPON RECEIVER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Wavelength		1290		1330	nm	
Max Optical input				-3	dBm	input without incurring damage
Sensitivity (BOL)	SEN			-31	dBm	PRBS 2 <sup>23</sup> -1@1.244Gbps BER $\leq 1 \times 10^{-10}$
Sensitivity (EOL)	SEN			-30	dBm	PRBS 2 <sup>23</sup> -1@1.244Gbps BER $\leq 1 \times 10^{-10}$
Saturation Optical Power	SAT	-12			dBm	PRBS 2 <sup>23</sup> -1@1.244Gbps BER $\leq 1 \times 10^{-10}$
SD Assert Level(BOL)				-31.5	dBm	=SEN-0.5dB
SD Assert Level(EOL)				-30.5		=SEN-0.5dB
SD De-assert Level		-43			dBm	
Hysteresis		0.5		8	dB	
Receiver Reflectance				-20	dB	

## RECEIVER ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Notes
Data Output Differential Swing(XGPON)		340		850	mV	CML output, DC coupled
Data Output Differential Swing(GPON)		400		1600	mV	LVPECL output, DC coupled
Reset width(XGPON)	Trw	25.6			ns	Figure 3
Reset width(GPON)	Trw	12.8			ns	Figure 3
Signal Detect Assert Time	Tsda1			50	ns	Figure 3
Signal Detect Assert Time	Tsda2			50	ns	Figure 3
Signal Detect De-assert Time	Tsdd			12.8	ns	Figure 3
Data recovery time	Trec			50	ns	Figure 3
Reset To ONU Optical Time	Trto	0	-	250	us	Figure 3
Reset Guard Time	Trg	0	-	250	us	Figure 3
Reset-Low		0		0.8	V	
Reset-High		2.0		VCC	V	
Signal Detect Voltage-Low		0		0.4	V	
Signal Detect Voltage-High		2.4		VCC	V	
RSSI Trigger-Low		0		0.8	V	
RSSI Trigger-High		2.0		VCC	V	
Upstream Signal Width	T <sub>ONT</sub>	300			ns	Figure 5
RSSI Trigger Delay	T <sub>D</sub>	0		3000	ns	Figure 5
RSSI Trigger Width	T <sub>W</sub>	300			ns	Figure 5
I <sup>2</sup> C Access Prohibited Time	T <sub>P</sub>	500			us	

## TIMING PARAMETER DEFINITIONS IN BURST MODE SEQUENCE

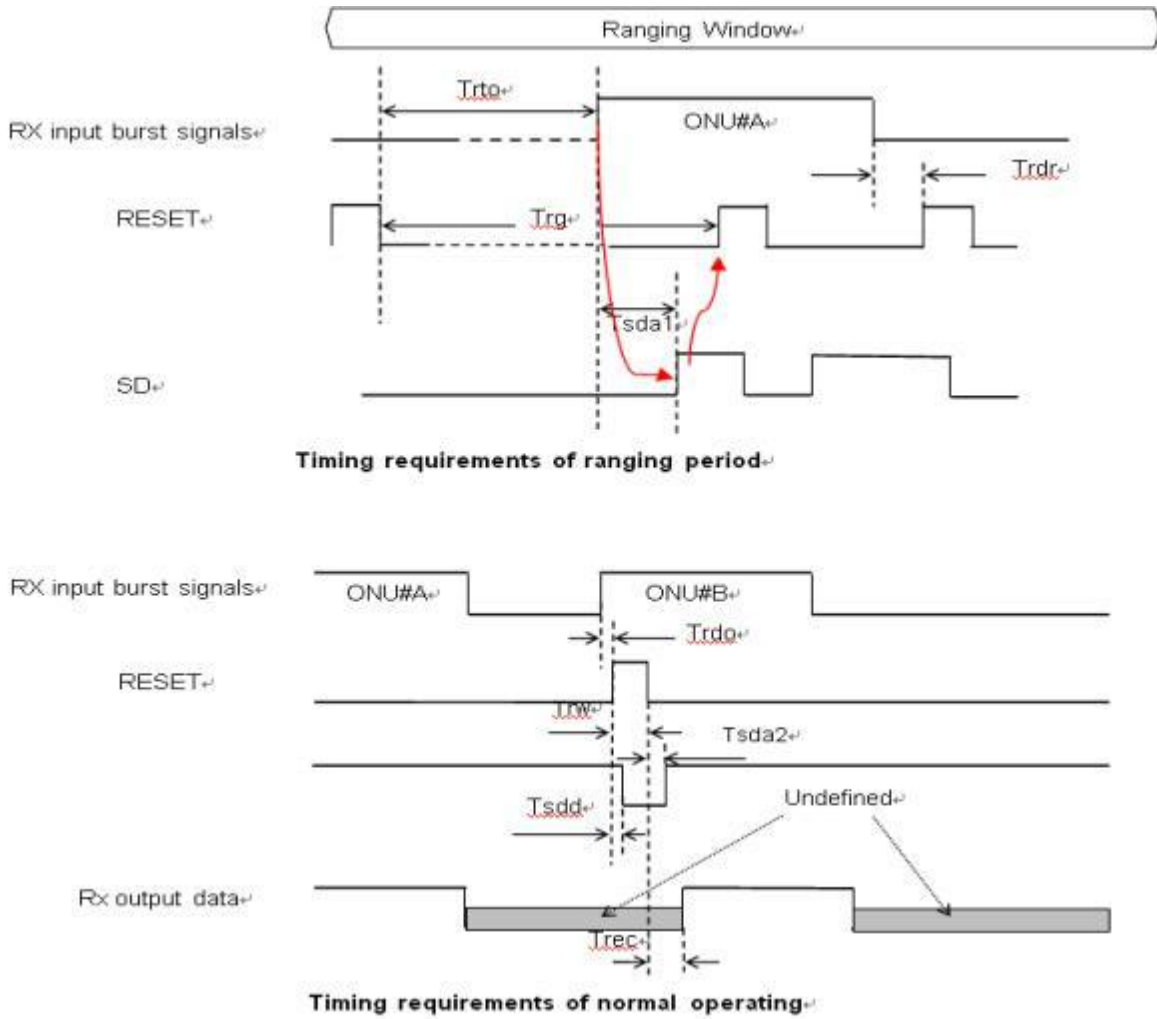


Figure 3 Timing Parameter Definitions in Burst Mode Sequence

## BURST MODE RECEIVER DYNAMIC RANGE

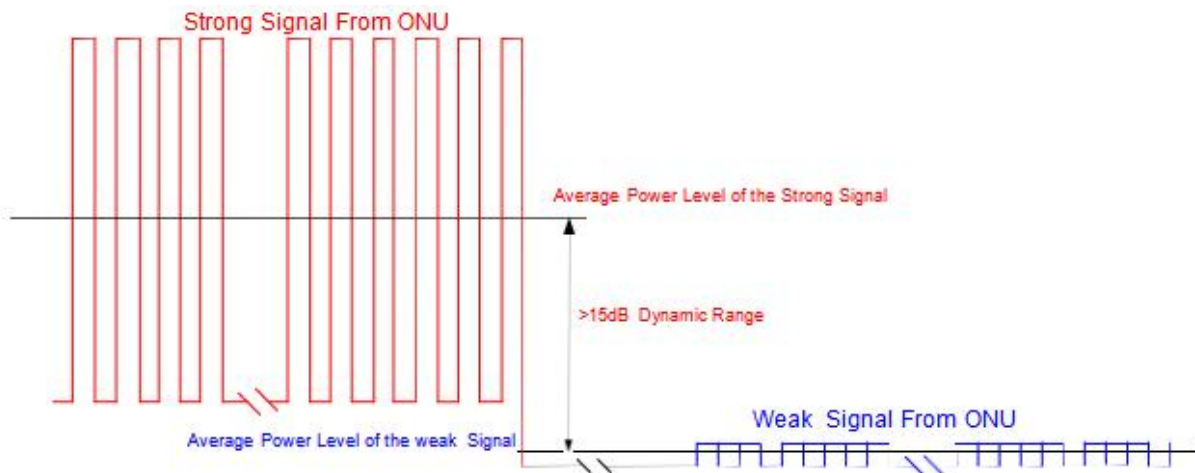


Figure 4 Burst Mode Receiver Dynamic Range

## TIMING PARAMETER DEFINITIONS IN RSSI TRIGGER

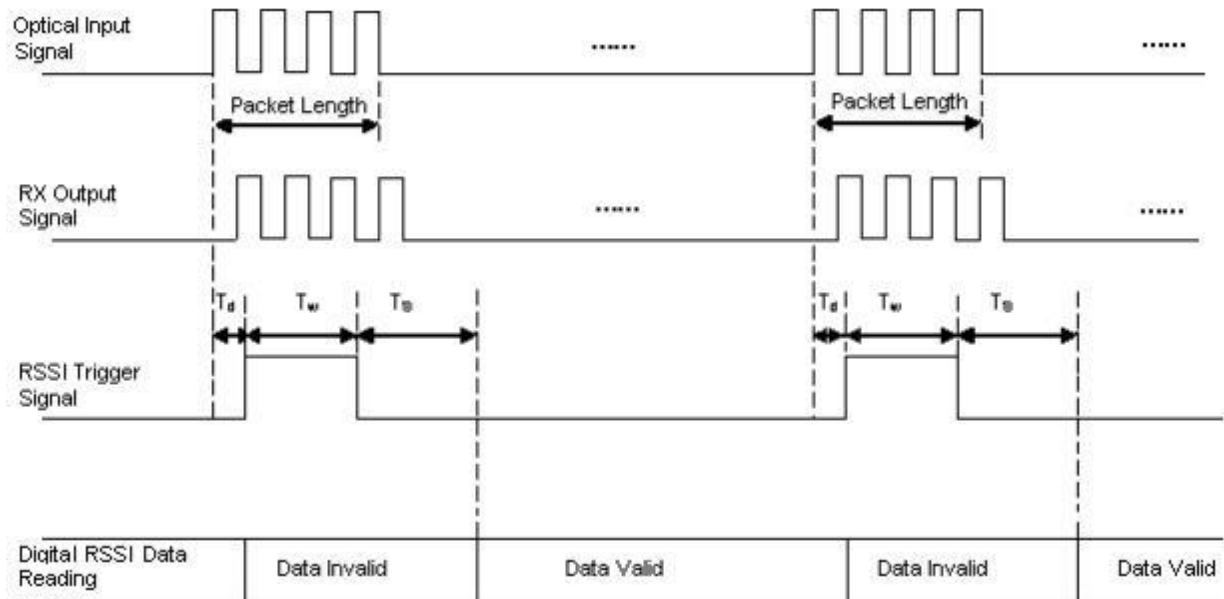


Figure 5 Timing Parameter Definitions in RSSI Trigger

## PIN OUT DRAWING

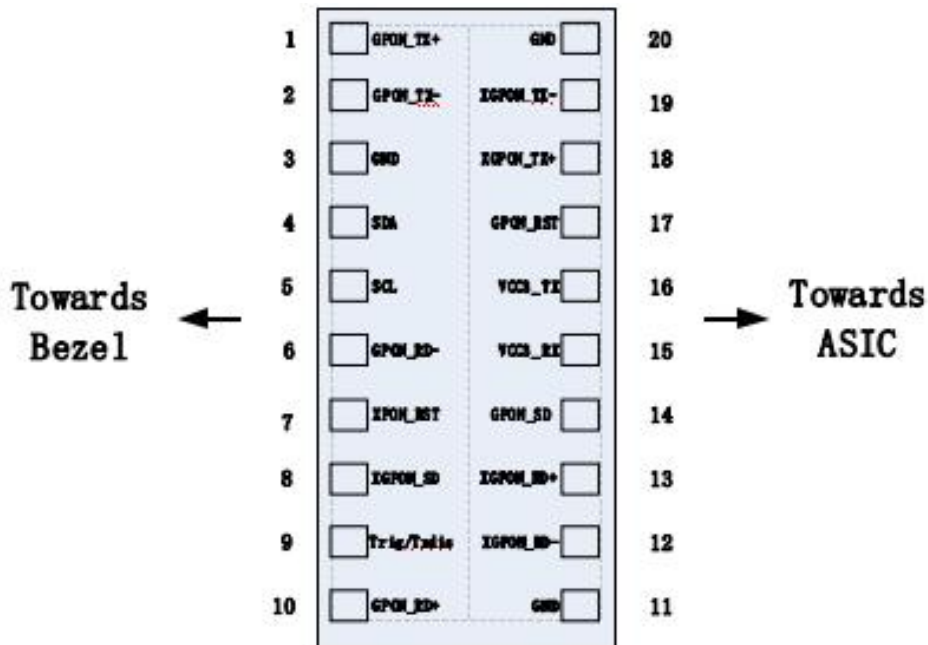


Figure 6 Pin Out Drawing

## PIN DESCRIPTION

PIN	Name	Description	Notes
1	GPON_TX+	GPON Non-Inverted Transmit Data in	LVPECL input, AC coupled



2	GPON_TX-	GPON Inverted Transmit Data in	LVPECL input, AC coupled
3	GND	Module Ground	
4	SDA	The data line	The data line of two wire serial interface
5	SCL	The clock line	The clock line of two wire serial interface
6	GPON_RD-	GPON Non-inverted Received Data Out	LVPECL output, DC coupled; No squelch function
7	XGPON_RST	XGPON Burst Receiver Reset	LVTTTL, High level Reset
8	XGPON_SD	XGPON SD Indication	LVTTTL output, active LOW when the receiver lost signal
9	TX_DIS/Trig	Transmitter Disable	LVTTTL Input by 10k pull up resistor, Low: transmitter on
10	GPON_RD+	GPON Non-inverted Received Data Out	LVPECL output, DC coupled; No squelch function
11	GND	Module Ground	
12	XGPON_RD-	XGPON Inverted Received Data Out	CML output, DC coupled; No squelch function
13	XGPON_RD+	XGPON Non-inverted Received Data Out	CML output, DC coupled; No squelch function
14	GPON_SD	GPON SD Indication	LVTTTL output, active LOW when the receiver lost signal
15	VCC3_RX	Receiver 3.3V Power Supply	
16	VCC3_TX	Transmitter 3.3V Power Supply	
17	GPON_RST	GPON Burst Receiver Reset	LVTTTL, High level Reset
18	XGPON_TX+	XGPON Non-Inverted Transmit Data in	CML input, AC coupled
19	XGPON_TX-	XGPON Inverted Transmit Data in	CML input, AC coupled
20	GND	Module Ground	

### TYPICAL INTERFACE CIRCUIT

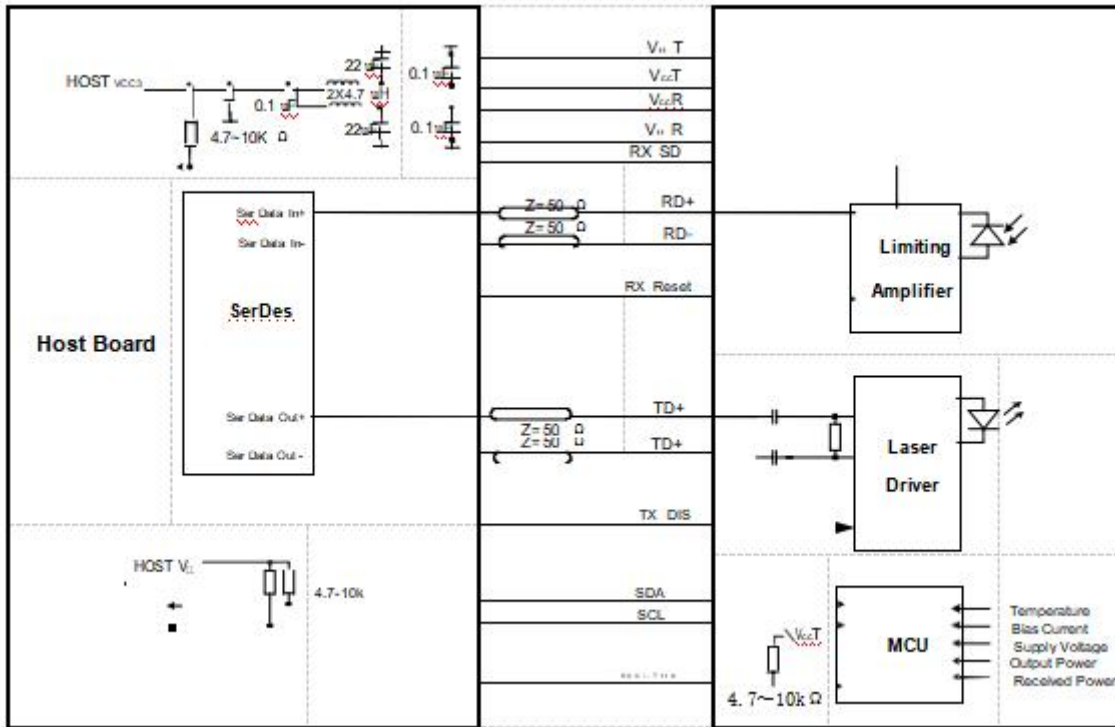


Figure 7 Typical Interface Circuit

### PACKAGE OUTLINE

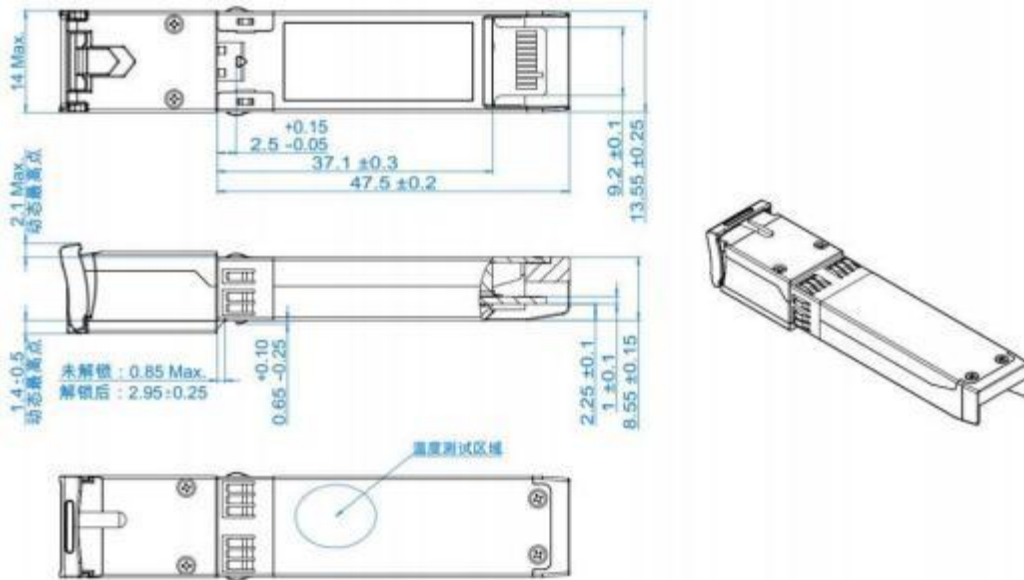


Figure 8 Package Outline

## EEPROM INFORMATION

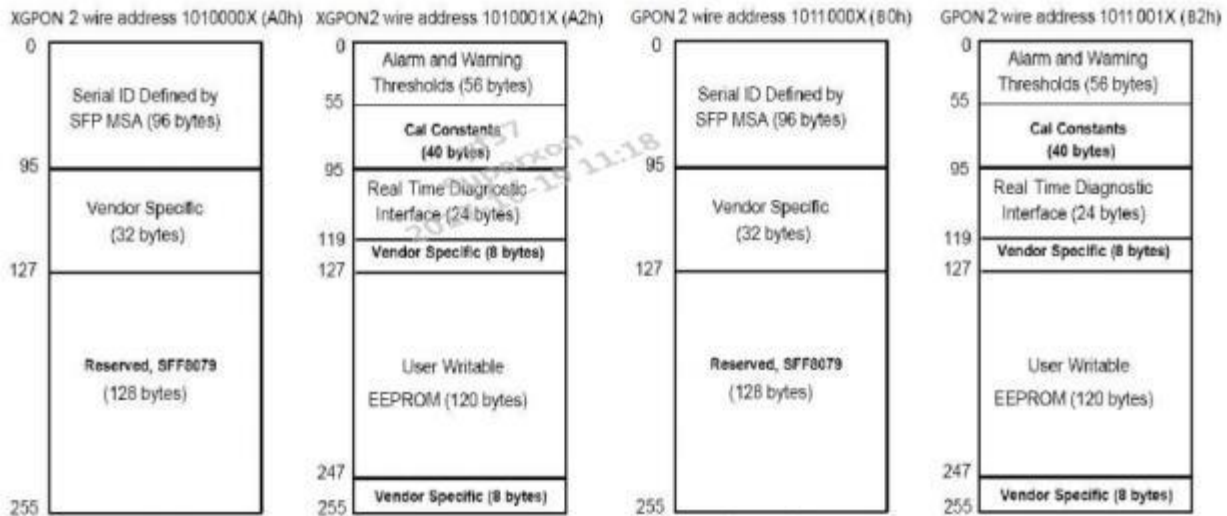


Figure 9 EEPROM Memory Map Specific Data Field Descriptions

## DIGITAL DIAGNOSTIC MONITORING INTERFACE

Parameter	Range	Accuracy	Calibration	NOTES
Temperature	-5 to 75°C	±3°C	Internal	LSB: 1/256C
Voltage	3.0 to 3.6V	±5%	Internal	LSB: 0.1mV
Bias Current	0 to 262m	±10%	Internal	LSB: 4uA
TX Power	XGPON:2 to 10dBm	±3dB	Internal	LSB: 0.2uW
	GPON:1 to 9dBm			
RX Power	XGPON:-30 to -9dBm	±3dB	Internal	LSB: 0.1uW
	GPON:-31 to -12dBm			

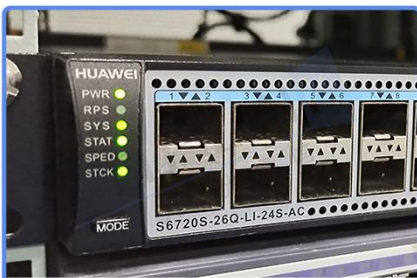
## WARNINGS

- Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.
- Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

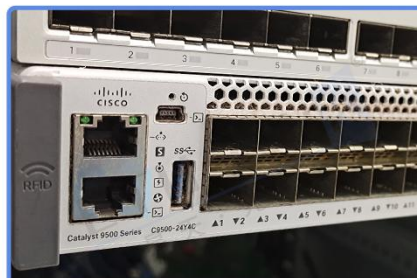
## Compatibility Test

In order to ensure the product compatibility, our products will be tested on the switch before shipment. Our modules can compatible with many mainstream brand switches, such as Cisco, Juniper, Extreme, Brocade, IBM, H3C, HP, Huawei, D-Link, Mikrotik, ZTE, TP-Link...

Our test equipment: VOLKTEK MEN-4110, HP 2530-8G, CRS226-24G-25+RM, Catalyst 2960G Series, Catalyst 3850 XS 10G SFP+, Catalyst 3750-E Series, HUAWEI S5700Series, H3C S3100V2 Series, Juniper-EX4200, etc.



HUAWEI S6720S



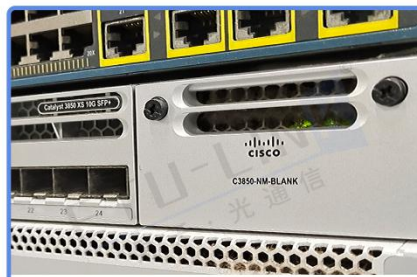
CISCO Catalyst 9500



DELL S5048F



H3C S3100V2



CISCO C3850



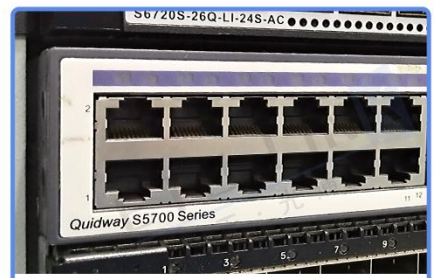
Aruba 2930F



Juniper EX 4200



HP J9264A



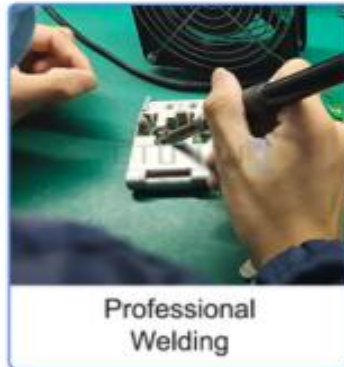
Quidway S5700



## Product Production Process

# Quality Assurance

Continuous introduction of new equipment,  
produced by strict standards, strict quality inspection,  
to guarantee the high quality, standard of each product.



## Packaging

ETU-Link provides two kinds of packaging, 10pcs/Tray and individual package.



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