
XGSPON OLT E2 I-temp VP-STE252IS-AA

Product Overview

The VP-XTB143CS-AA is a Small Form Factor Pluggable transceiver designed for GPON OLT equipment operating under the B+ power class. It supports single-fiber bi-directional data links with an asymmetric application, providing a 2488Mbps continuous-mode downstream transmission at 1490nm using a DFB laser and a 1244Mbps burst-mode upstream reception at 1310nm using an APD-TIA receiver. Featuring an SC/UPC connector.

Features

- Single fiber bi-directional data links asymmetric TX 2488Mbps/RX1244Mbps application
- 1490nm continuous-mode DFB laser transmitter and 1310nm burst-mode APD-TIA receiver
- Small Form Factor Pluggable package with SC/UPC Connector
- Reset burst-mode receiver design support more than 15dB dynamic range
- 0 to 70°C operating case temperature
- Single 3.3V power supply
- Digital diagnostic monitoring interface
- Digital burst RSSI function to monitor the input optical power level
- LVPECL compatible data input/output interface
- LVTTTL transmitter disable control
- LVTTTL transmitter laser fault alarm
- LVTTTL receiver Signal Detect (SD) indication
- Low EMI and excellent ESD protection
- Class I laser safety standard IEC-60825 compliant
- RoHS-6 compliance

Applications

- Gigabit-capable Passive Optical Networks (GPON) 20Km

Standards

- Complies with SFP Multi-Source Agreement (MSA) SFF-8074i
- Complies with ITU-T G.984.2 Amendment 1
- Complies with SFF-8472 Rev 9.5
- Complies with FCC 47 CFR Part 15, Class B
- Complies with FDA 21 CFR 1040.10 and 1040.11

Ordering Information

Part Number	Description
VP-STE252IS-AA	XGSPON OLT E2 I-temp

Absolute Maximum Ratings

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Storage Ambient Temperature	TSTG	-40		85	°C	
Operating Case Temperature	T _c	0		70	°C	
Operating Humidity	OH	5		95	%	
Power Supply Voltage	V _{CC}	3.13		3.47	V	

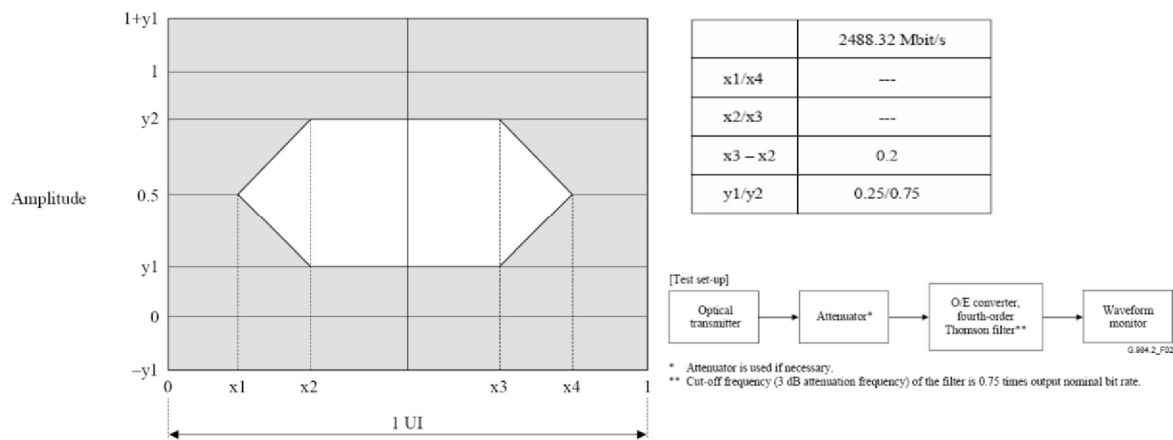
Recommended Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V	
Operating Case Temperature	T _c	0		70	°C	
Operating Humidity Range	OH	5		95	%	
Data Rate			Tx 2488.32 Rx 1244.16		Mbit/s	

Optical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Center Wavelength	λ_c	1480		1500	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
	AOP	+2.5		+5	dBm	BOL, 25°C
		+1.5		+5	dBm	EOL, 0~70°C
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF
Extinction Ratio	ER	8.2			dB	PRBS 2 ²³ -1+72CID @2.488Gbit/s
Tolerance to Transmitter Incident Light		-15			dB	
Transmitter Reflectance				-10	dB	
Transmitter and Dispersion Penalty	TDP			1	dB	Transmit on 20km SMF
Optical Waveform Diagram	ITU-T G.984.2					Figure 1, margin>5%

TRANSMITTER EYE MASK DEFINITIONS AND TEST PROCEDURE (Fig 1)



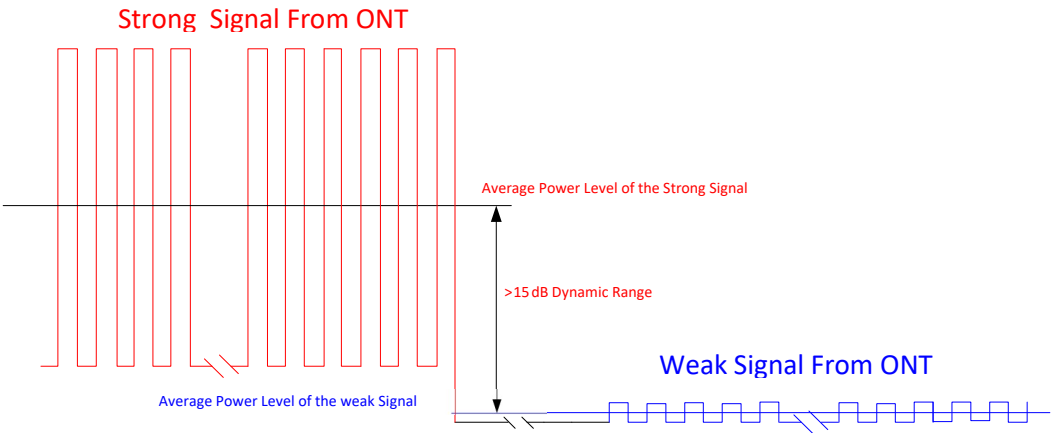
Electrical - Transmitter

Parameter		Symbol	Min	Typical	Max	Unit	Notes
Data Input Differential Swing			600		1600	mV	LVPECL input, AC coupled
Input Differential Impedance			90	100	110	Ω	
TX Disable Voltage	Low		0		0.8	V	
	High		2.0		V _{CC}	V	
TX Fault Alarm Voltage	Low		0		0.4	V	
	High		2.4		V _{CC}	V	

Receiver Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Wavelength		1260		1360	nm	
Sensitivity	SEN			-28	dBm	PRBS 223-1+72CID@1244Mbps BER ≤1×10 ⁻¹⁰ Figure 2
Saturation Optical Power	SAT				dBm	
Dynamic Range		-8 15			dB	
Signal Detect Assert Level				-30	dBm	
Signal Detect De-Assert Level		-45			dBm	
Signal Detect Hysteresis		0.5		6	dB	
Receiver Reflectance				-12	dB	

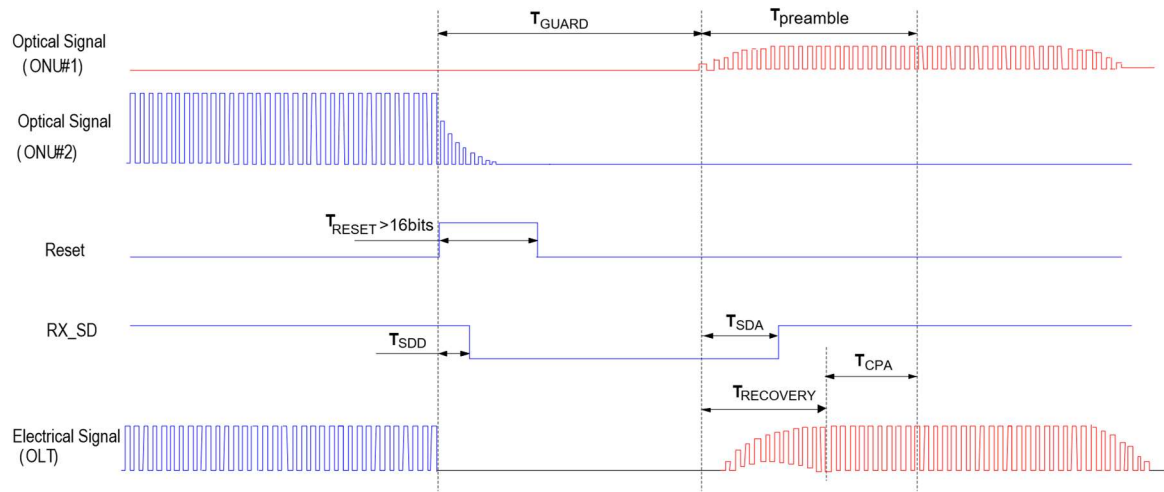
Burst Mode Receiver Dynamic Range in GPON System (Fig 2)



Electrical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Data Output Voltage – Low		Vcc -1.81		Vcc -1.62	V	
Data Output Voltage – High		Vcc -1.02		Vcc -0.88	V	
Data Output Differential Swing		400		1600	mV	LVPECL output, DC coupled
Reset width	TRESET	16			bits	
Reset-Low		0		0.4	V	
Reset-High		2.4		Vcc	V	
Receiver Amplitude Recovery Time	TRECOVERY			32	bits	Refer to the Reset signal falling
Signal Detect Assert Time				50	ns	
Signal Detect De-assert Time				12.8	ns	Refer to the Reset signal rising
Signal Detect Voltage-Low		0		0.4	V	
Signal Detect Voltage-High		2.4		Vcc	V	
RSSI Trigger-Low		0		0.8	V	

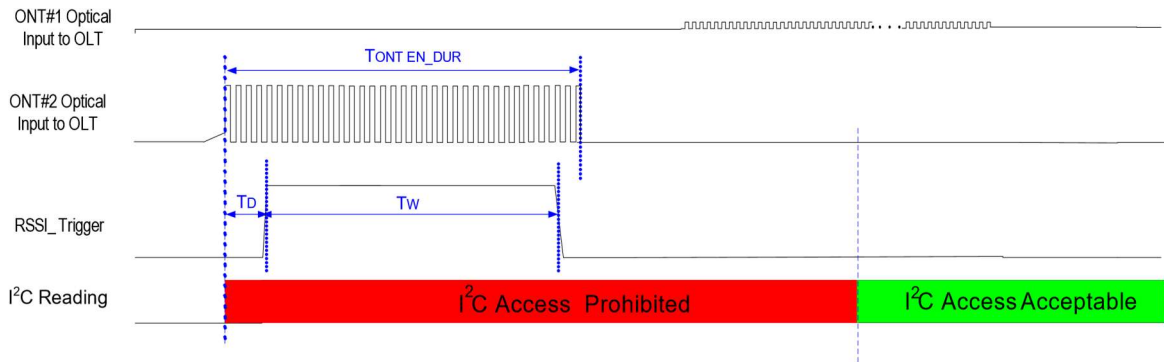
Timing Parameter Definitions In Burst Mode Sequence



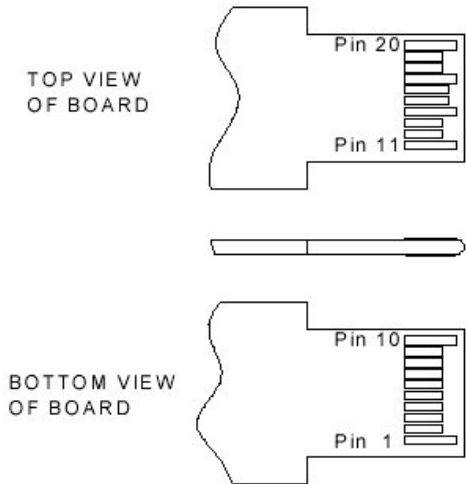
RSSI Timing Sequence (Fig 4)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Signal Duration time	T _{opt}	1200			ns	
RSSI Trigger width	T _w	500		T _{ont} -T _d	ns	
RSSI Trigger Delay	T _d	150			ns	
I ² C Access Prohibited Time	T _s	500			μs	
I ² C Bus Frequency			100		KHz	
I ² C - High		2.4		3.6	V	
I ² C - Low		-0.3		0.8	V	

- RSSI result is provided by access to EEPROM A2H 104~105Byte the unit is 0.1uW. Please refer to the SFF-8472 V9.5 for the detail information.



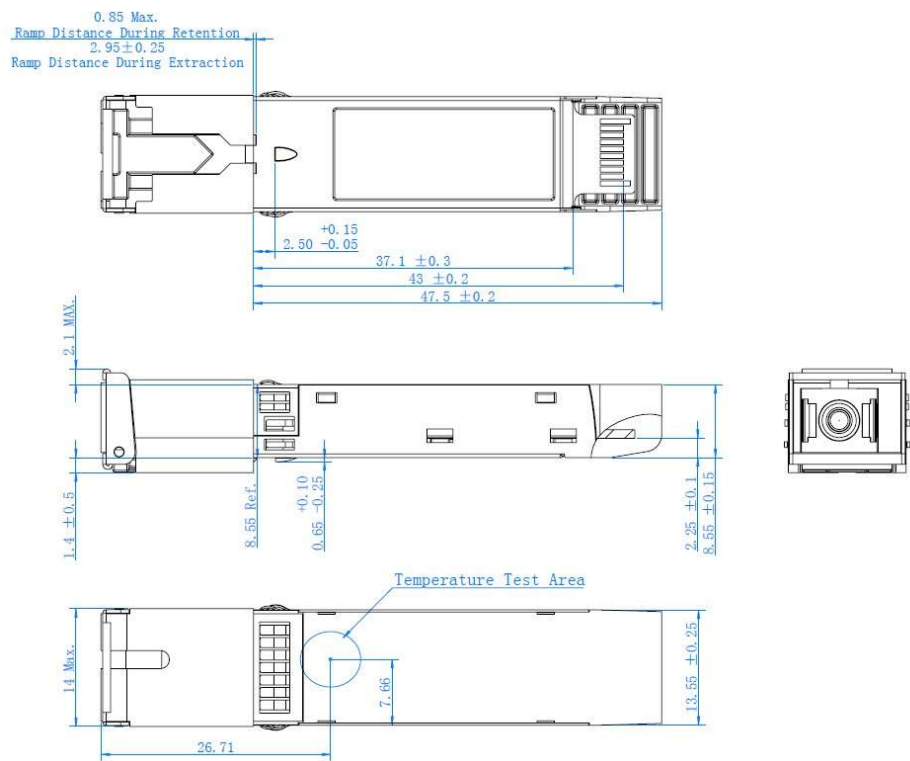
in Out Definition



Electrical Pin Definition

PIN #	Symbol	Description	Remarks
1	V _{EE} T	Transmitter Ground	
2	TX Fault	Transmitter Fault Indication	High: abnormal; Low: normal
3	TX Disable	Transmitter Disable	High: transmitter disable; Low: transmitter enable
4	MOD-DEF2	Module Definition 2	The data line of two wire serial interface
5	MOD-DEF1	Module Definition 1	The clock line of two wire serial interface
6	MOD-DEF0	Module Definition 0	Connected to Ground in the transceiver
7	Reset	Receiver Reset	High: reset the receiver
8	SD	Signal Detect	High: signal detected; Low: loss of signal;
9	RSSI_Trigger	RSSI Trigger for Transceiver A/D	High: enable RSSI A/D conversion
10	V _{EE} R	Receiver Ground	
11	V _{EE} R	Receiver Ground	
12	RD-	Inv. Receiver Data Out	LVPECL logic output, DC coupled
13	RD+	Receiver Data Out	LVPECL logic output, DC coupled
14	V _{EE} R	Received Ground	
15	V _{CC} R	Receiver Power	
16	V _{CC} T	Transmitter Power	
17	V _{EE} T	Transmitter Ground	
18	TD+	Transmit Data In	LVPECL logic input, AC coupled
19	TD-	Inv. Transmit Data In	LVPECL logic input, AC coupled
20	V _{EE} T	Transmitter Ground	

Mechanical Diagram



Revision History

Date	Rev	Description
07/15/2024	1.0	Release version
01/24/2025	1.1	New branding guidelines

For more information

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