
XGSPON OLT E2 C-temp VP-STE252CS-AA

Product Overview

The VP-STE252CS-AA is a high-performance, hot-pluggable SFP+ transceiver module designed for XGSPON OLT equipment operating under the E2 power class. This module facilitates single-fiber bi-directional data links with a 9.953Gbps downstream transmission rate and a burst-mode upstream reception capability of 9.953Gbps or 2.488Gbps. Featuring an SC receptacle connector, the transceiver utilizes a high-power 1577nm EML laser diode for transmission and a high-sensitivity 1270nm APD for reception, enabling a transmission distance of up to 20km over single-mode fiber.

Features

- Single fiber bi-directional data links TX 9.953Gbps, Burst Mode RX 9.953Gbps/2.488Gbps application
- 0 to 70°C operating case temperature
- 3.3V power supply
- SFP+ package with SC Receptacle connector
- Hot-pluggable capability
- High power 1577nm EML LD and high sensitivity 1270nm APD
- Support 20km transmission distance with SMF
- SD indication
- Low EMI and excellent ESD protection
- Digital diagnostic monitor interface
- RoHS10 compliance

Applications

- SFP+ XGS-PON OLT E2

Standards

- Complies with SFP+ MSA
- Complies with SFF-8472
- Complies with ITU-T G.9807.1
- 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-STE252CS-AA	XGSPON OLT E2 C-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		85	%	
VCC3 Power Supply Voltage	VCC3	-0.5		3.6	V	

Recommended Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	T _c	0		70	°C	
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Power Supply Consumption	P			3.0	W	
TX Data Rate			9.953		Gbps	
RX Data Rate			9.953/2.488		Gbps	

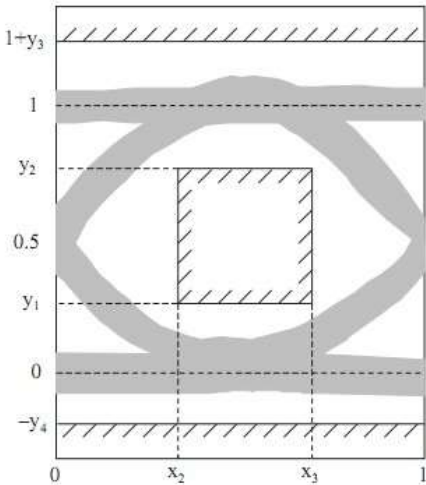
Optical - Transmitter

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Center Wavelength	λ_c	1575		1580	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Optical Power	AOP	+8		+11	dBm	Launched into SMF
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF
Extinction Ratio	ER	8.2			dB	PRBS2 ³¹ -1 @9.953Gbps
Optical Waveform Diagram	Compliant with ITU G.9807.1					Figure 1, Mask Margin>5%
Transmitter and Dispersion Penalty	TDP			1	dB	Transmit on 20km SMF

Electrical – Transmitter

Parameter		Symbol	Min	Typical	Max	Unit	Notes
Data Input Differential Swing			100		850	mV	AC coupled, CML input
Input Differential Impedance		Zin	90	100	110	Ω	
TX Disable	Disable		2		VCC	V	
	Enable		0		0.8	V	
TX Fault	Fault		2.4		VCC+0.3	V	
	Disable		0		0.4	V	

Transmitter Eyemask Definitions (Fig 1)



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

XGS PON Optical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Wavelength		1260		1280	nm	
Sensitivity	SEN			-32.0	dBm	ER≥6dB PRBS2 ³¹ -1@9.953Gbps BER ≤1×10 ⁻³
Saturation Optical Power	SAT	-11			dBm	
SD Assert Level				-32.5	dBm	
SD De-Assert Level		-43			dBm	
Signal Detected Hysteresis		0.5		6	dB	
CID		72			Bit	

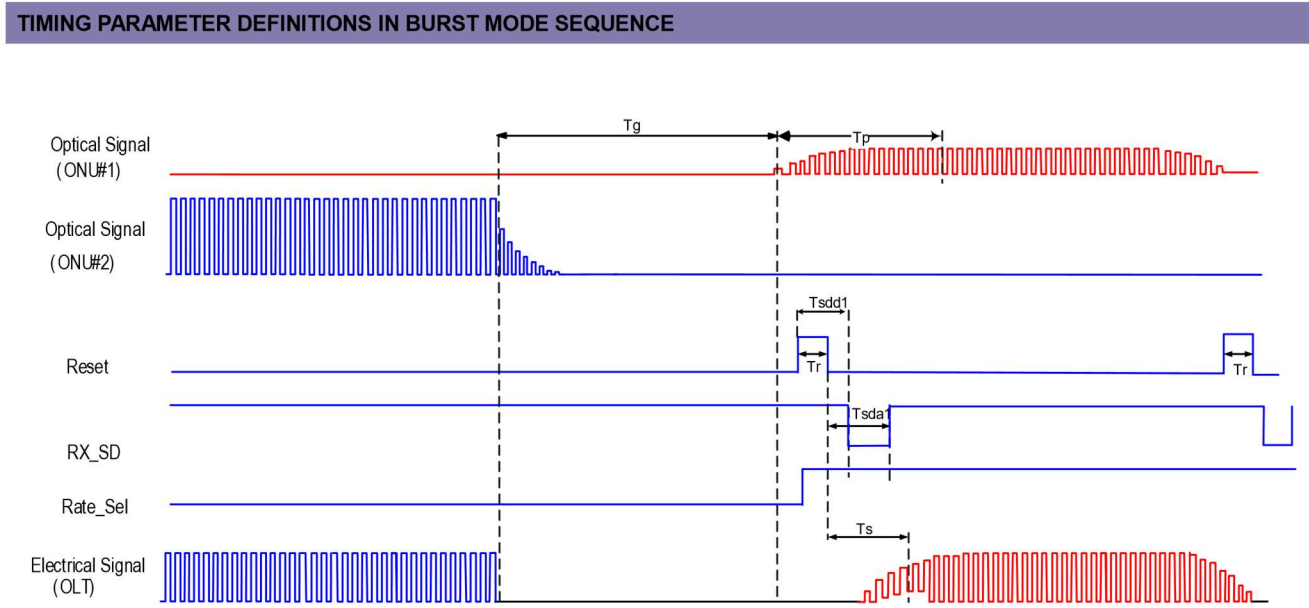
XG PON Optical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Wavelength		1260		1280	nm	
Sensitivity	SEN			-33.5	dBm	ER≥8.2dB PRBS2 ²³ -1@2.488Gbps BER ≤1×10 ⁻⁴
Saturation Optical Power	SAT	-13			dBm	
SD Assert Level				-34.0	dBm	
SD De-Assert Level		-43			dBm	
Signal Detected Hysteresis		0.5		6	dB	
CID		72			Bit	

RECOMMENDED XGS/XGPON Receiver Timing Characteristics

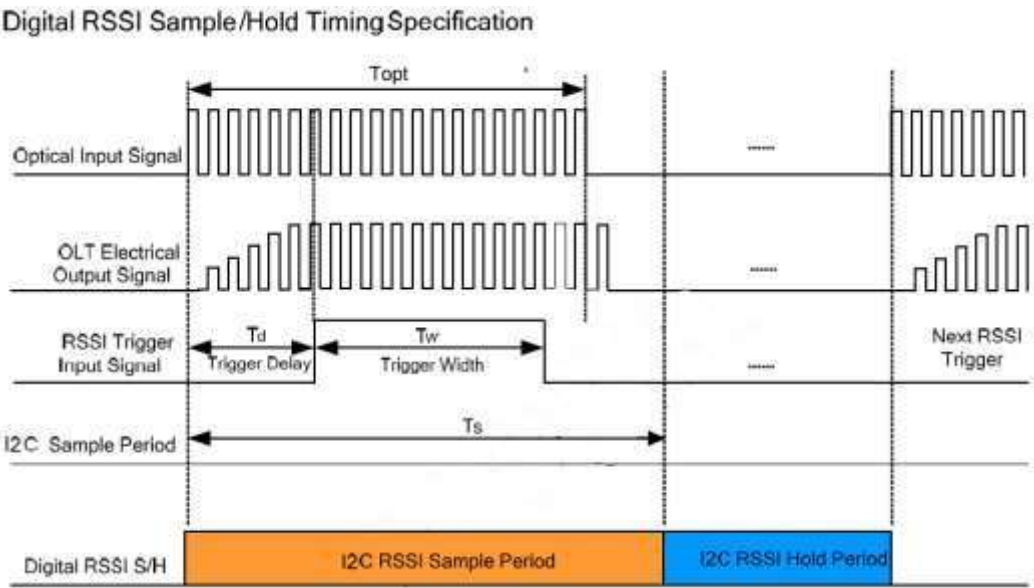
Parameter	Symbol	Min	Typical	Max	Unit	Notes
RSSI Trigger-Low		0		0.8	V	
RSSI Trigger-High		2.0		Vcc	V	
Data Output Differential Swing		400		850	mV	CML output, DC coupled
Output Differential Impedance	Zout	90	100	110	Ω	
Reset-Low		0		0.8	V	
Reset-High		2.0		Vcc	V	
SD Voltage-Low		0		0.4	V	
SD Voltage-High		2.4		Vcc	V	
Reset Width	Tr		25.6		ns	Suggest the first Reset location is partial in preamble of the optical packet.
Data Recovery Time	Ts		50	100	ns	
SD De-Assert Time	TSDD			50	ns	
SD Assert Time	TSDA			50	ns	
Guard time	Tg		50		ns	

Timing Parameter Definitions in Burst Mode Sequence (Fig 2)

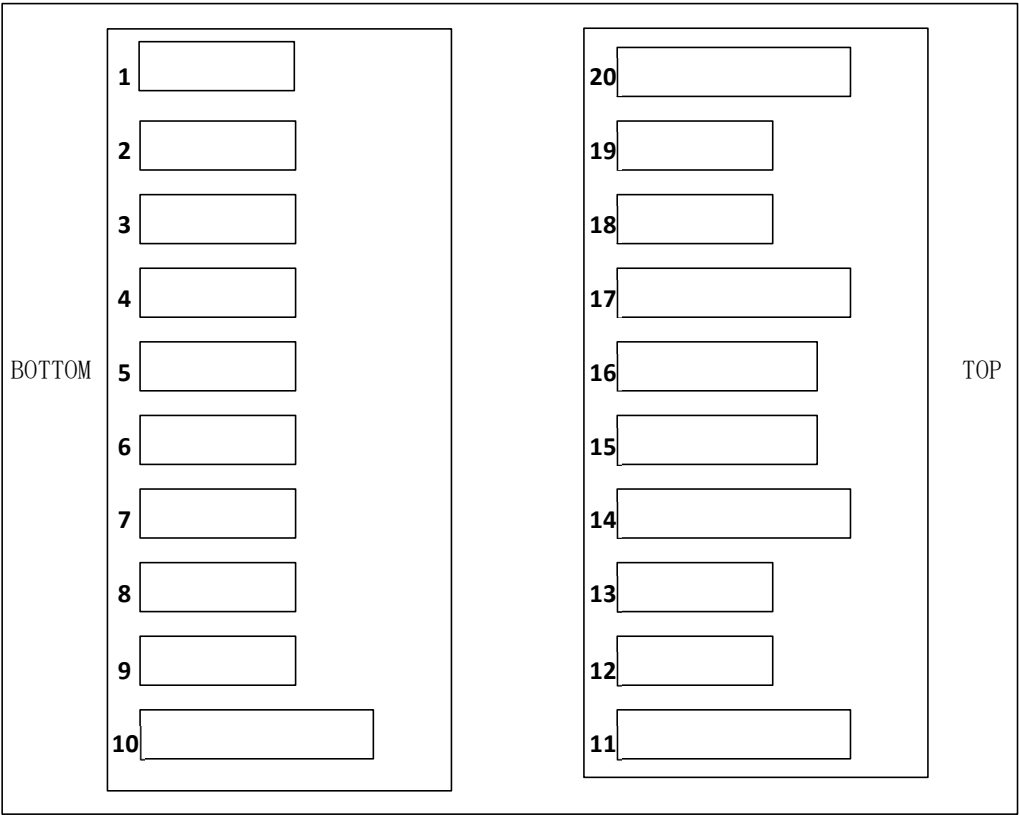


Timing Parameter Definitions in RSSI Trigger (Fig 3)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Signal Duration	T_{opt}	1200			ns	
RSSI Trigger width	T_w	500			ns	
RSSI Trigger Delay	T_D	150			ns	
RSSI Trigger-High		2.0		Vcc	V	
RSSI Trigger-High		2.0		Vcc	V	
I ² C Access Prohibited Time	T_s	500			μs	
I ² C BUS Frequency			100	200	KHz	
I ² C - High		2.4		3.6	V	
I ² C - Low		0		1	V	



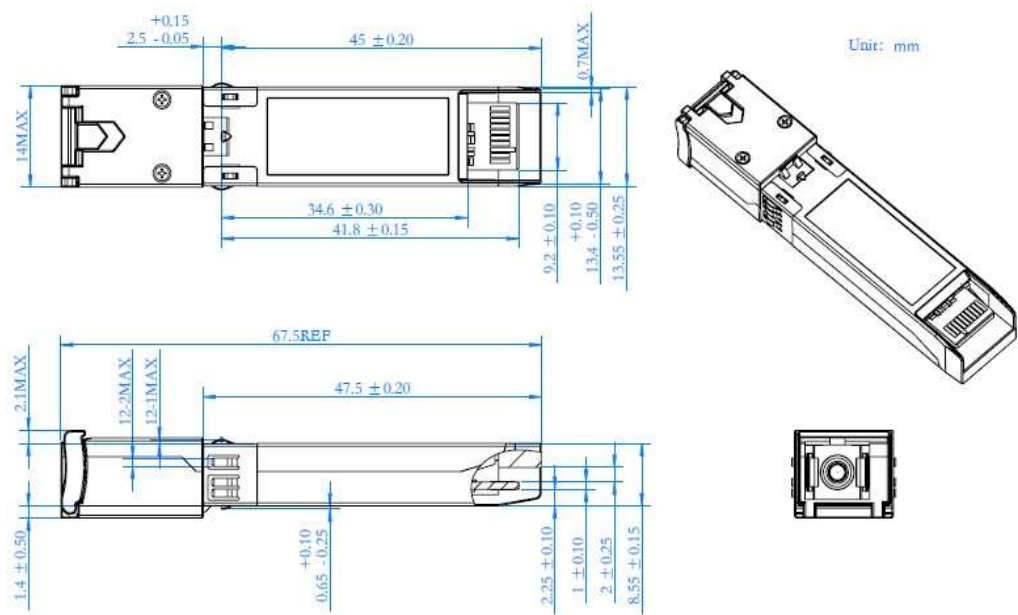
Pin Out Definition



Electrical Pin Definition

PIN #	Symbol	Description	Remarks
1	Rate_Select	Rate select	High = 9.953Gbps, Low = 2.488Gbps
2	TX_Fault	TX fault out	Low = Normal, High = Fault
3	TX_Disable	TX disable in	Low = Normal, High = Disable
4	SDA	I2C Data in/out	
5	SCL	I2C Clock in	
6	MOD_ABS	Module absent	
7	RX_Reset	Reset	Active High
8	RX_SD	Signal detect out	
9	RSSI_Trigger	RSSI trigger in	
10	GND	GND.	
11	GND	GND.	
12	XGS_RD-	XGSPON data out, CML	CML output, DC coupled; squelch function
13	XGS_RD+	XGSPON data out, CML	CML output, DC coupled; squelch function
14	GND	GND.	
15	VCCR	Module power	
16	VCCT	Module power	
17	GND	GND.	
18	XGS_TD+	XGSPON data in, CML	AC coupled, CML input
19	XGS_TD-	XGSPON data in, CML	AC coupled, CML input
20	GND	GND.	

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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