

10GEPON-OLT-SGCE

10G EPON OLT Symmetric SFP+ BIDI PR30 Transceiver



Product Features

- ❖ Single fiber bi-directional data links TX 10.3125Gbps, Burst Mode RX 10.3125Gbps application
- ❖ Single fiber bi-directional data links TX 1.25Gbps, Burst Mode RX 1.25Gbps application
- ❖ 3.3V power supply
- ❖ SFP+ package with SC Receptacle connector
- ❖ Hot-pluggable capability
- ❖ High power 1577nm EML LD and 1490nm DFB LD

- ❖ High sensitivity 1270nm/1310nm APD
- ❖ Support 20km transmission distance with SMF
- ❖ RX_LOS indication
- ❖ Low EMI and excellent ESD protection
- ❖ Digital diagnostic monitor interface
- ❖ 0 to 70°C operating case temperature
- ❖ RoHS6 compliance

Applications

- ❖ Symmetric 10GE PON OLT
- ❖ GE PON PX20 OLT

Standards

- ❖ Complies with SFF-8472
- ❖ Complies with IEEE-802.3av
- ❖ Complies with IEEE-802.3ah
- ❖ Complies with FCC 47 CFR Part 15, Class B
- ❖ Complies with FDA 21 CFR 1040.10 and 1040.11

Absolute Maximum Rating

Parameter	Symbol	Min	Max	Unit	Notes
Storage Ambient Temperature	T _{STG}	-40	85	°C	
Operating Case Temperature	T _A	0	70	°C	
Relative Storage Humidity	RH _S	0	95	%	
Relative Operating Humidity	RH _O	0	85	%	
VCC3 Power Supply Voltage	VCC3	0	3.6	V	

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
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	W
TX Data Rate			10.3125 1.25		Gbps Gbps
RX Data Rate			10.3125 1.25		Gbps Gbps

10G EPON Transmitter Optical Characteristics

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	+2		+5	dBm	Launched into SMF
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF
Extinction Ratio	ER	6			dB	PRBS2 ³¹ -1 @10.3125Gbps
Transmitter and Dispersion Penalty	TDP			1.5	dB	Transmit on 20km SMF
Optical Waveform Diagram	Compliant with IEEE Std 802.3av					Figure 1, Mask Margin>5%

10G EPON Transmitter Electrical Characteristics

Parameter		Symbol	Min	Typical	Max	Unit	Notes
Data Input Differential Swing			120		800	mV	CML input, AC coupled
Input Differential Impedance			90	100	110	Ω	
TX Disable	Disable		2		VCC+0.3	V	
	Enable		-0.3		0.8	V	
TX Fault	Fault		2.4		VCC+0.3	V	
	Normal		-0.3		0.4	V	

Transmitter Eye Mask Definitions and Test Procedure

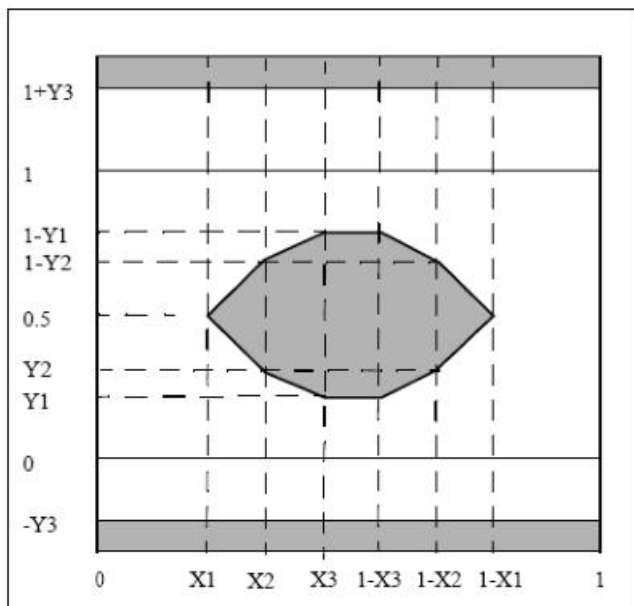


Figure 1: 10G EPON Transmitter Eye Mask Definitions

X1	X2	X3	Y1	Y2	Y3	Unit
0.25	0.40	0.45	0.25	0.28	0.40	UI

GEPON Transmitter Optical Characteristics

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	
Average Launch Optical Power	AOP	+2		+7	dBm	Launched into SMF
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF
Extinction Ratio	ER	9			dB	PRBS 2 ⁷ -1 test pattern
Transmitter and Dispersion Penalty	TDP			2.3	dB	Transmit on 20km SMF
Optical Waveform Diagram	Compliant with IEEE Std 802.3ah™-2004					Figure 2, Mask Margin>5%

GEPON Transmitter Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Data Input Differential Swing		120		800	mV	LVPECL input, AC coupled
Input Differential Impedance		90	100	110	Ω	
TX Disable	Disable	2		VCC+0.3	V	
	Enable	-0.3		0.8	V	
TX Fault	Fault	2.4		VCC+0.3	V	
	Normal	-0.3		0.4	V	

Transmitter Eye Mask Definitions and Test Procedure

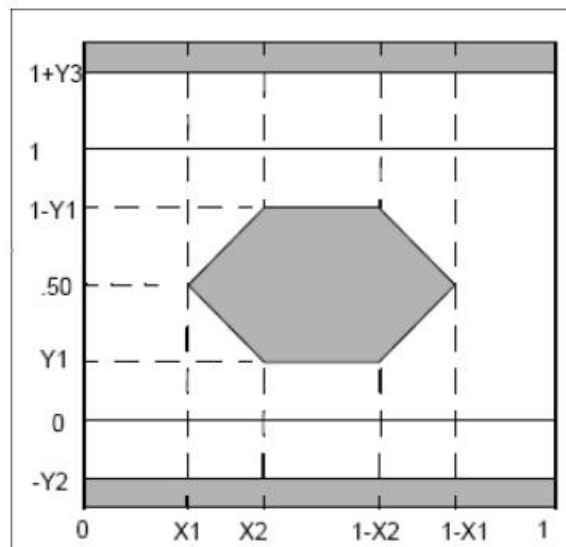


Figure 2: GEAPON Transmitter Eye Mask Definitions

X1	X2	Y1	Y2	Y3	Unit
0.22	0.375	0.20	0.20	0.30	UI

10G EPON Receiver Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Wavelength		1260		1280	nm	
Sensitivity	SEN			-28	dBm	PRBS2 ³¹ -1 @10.3125Gbps BER ≤ 1×10 ⁻³
Saturation Optical Power	SAT	-6			dBm	
Loss of Signal De-assert Level				-30.5	dBm	
Loss of Signal Assert Level		-45			dBm	
Hysteresis		0.5		6	dB	

10G EPON Receiver Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Threshold Settling Time	T _{SETTLING}		300	800	ns	Figure 3
Data Output Differential Swing		400		850	mV	DC coupled, CML output
Input Differential Impedance	Z _{in}	90	100	110	Ω	
Loss of Signal Assert Time				1024	ns	
Loss of Signal De-assert Time				512	ns	
Loss of Signal Voltage - Low		-0.3		0.4	V	
Loss of Signal Voltage - High		2.4		VCC+0.3	V	
RSSI Trigger-Low		-0.3		0.8	V	
RSSI Trigger-High		2.0		VCC+0.3	V	

GEPON Receiver Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Wavelength		1260		1360	nm	
Sensitivity	SEN			-29.78	dBm	PRBS 2 ⁷ -1 @1.25Gbps BER ≤ 1 × 10 ⁻¹²
Saturation Optical Power	SAT	-6			dBm	
Loss of Signal De-assert Level				-31.5	dBm	
Loss of Signal Assert Level		-45			dBm	
Hysteresis		0.5		6	dB	

GEAPON Receiver Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Threshold Settling Time	$T_{SETTLING}$			300	ns	Figure 3
Data Output Differential Swing		600		1600	mV	
Input Differential Impedance	Z_{in}	90	100	110	Ω	
Loss of Signal Assert Time				1024	ns	
Loss of Signal De-assert Time				512	ns	
Loss of Signal Voltage - Low		-0.3		0.4	V	
Loss of Signal Voltage - High		2.4		VCC+0.3	V	
RSSI Trigger-Low		-0.3		0.8	V	
RSSI Trigger-High		2.0		VCC+0.3	V	

Timing Parameter Definitions in Burst Mode Sequence

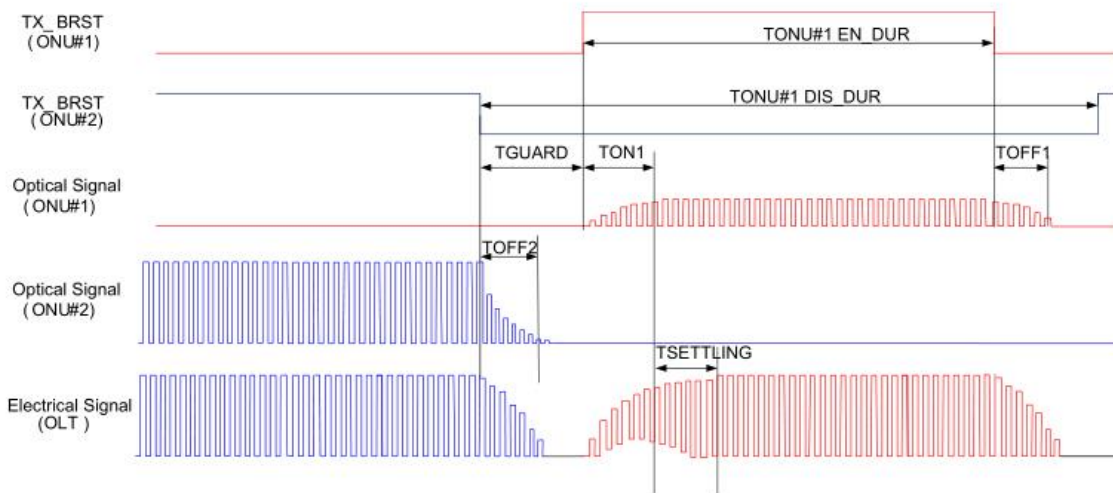


Figure 3: Timing Parameter Definitions in Burst Mode Sequence

RSSI Timing Sequence

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Signal During Time	T_{opt}		1500		ns	
RSSI Trigger Width	T_w		500		ns	
RSSI Trigger Delay	T_D		300		ns	
I ² C Access Prohibited Time	T_s			500	μ s	
I ² C Bus Frequency		0	100	200	KHz	

Digital RSSI Sample/Hold Timing Specification

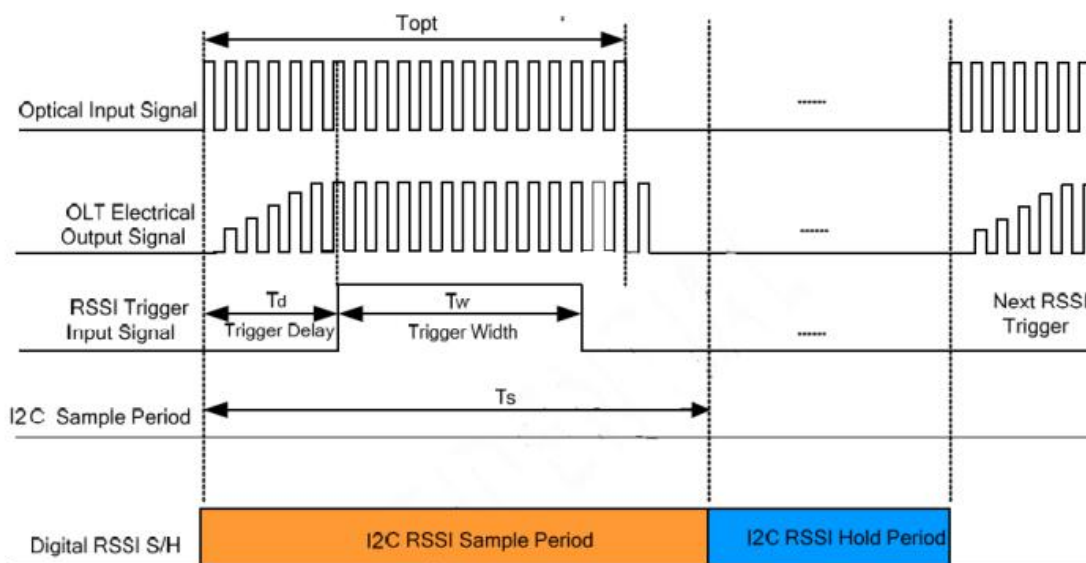


Figure 4 Timing Parameter Definitions in RSSI Trigger

Pin Out Drawing

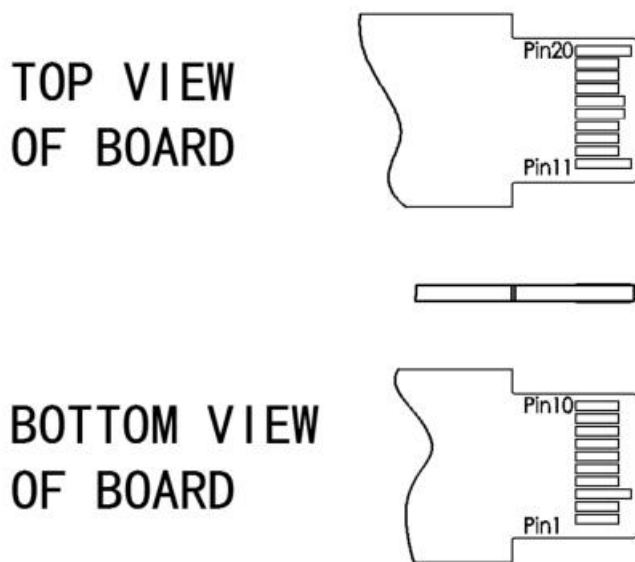


Figure 5: Pin Out Drawing

Pin Description

PIN	Name	Description	Notes
1	EPON_TD+	1G Transmit Data In	AC coupled, CML input
2	EPON_TD-	Inv. 1G Transmit Data In	AC coupled, CML input
3	GND	Module Ground	DC coupled, LVPECL output, See note 1
4	SDA	2-Wire Serial Interface Data	The data line of two wire serial interface
5	SCL	2-Wire Serial Interface Clock	The clock line of two wire serial interface
6	EPON_RD-	Inv. Received 1G Data Out	DC coupled, LVPECL output, See note 1
7	N/C		
8	RX_LOS	RX_LOS Indicator	High: lost signal
9	Trig/Tx_Dis	Receiver RSSI trigger input /Transmitter Disable	The Mode can be switched, See note 2
10	EPON_RD+	Received 1G Data Out	
11	GND	Module Ground	

12	10GEAPON_ RD-	Inv. Received 10G Data Out	DC coupled, CML output
13	10GEAPON_ RD+	Received 10G Data Out	DC coupled, CML output
14	TX_Fault	Indication of Transmitter Fault	
15	VCCR	3.3V DC Power Input	
16	VCCT	3.3V DC Power Input	
17	N/C		
18	10GEAPON_ TD+	Differential 10G Transmit Data In	AC coupled, CML input
19	10GEAPON_ TD-	Inv. differential 10G Transmit Data In	AC coupled, CML input
20	GND	Module Ground	

Note 1: This contact shall be pulled down with LVPECL output in the host;

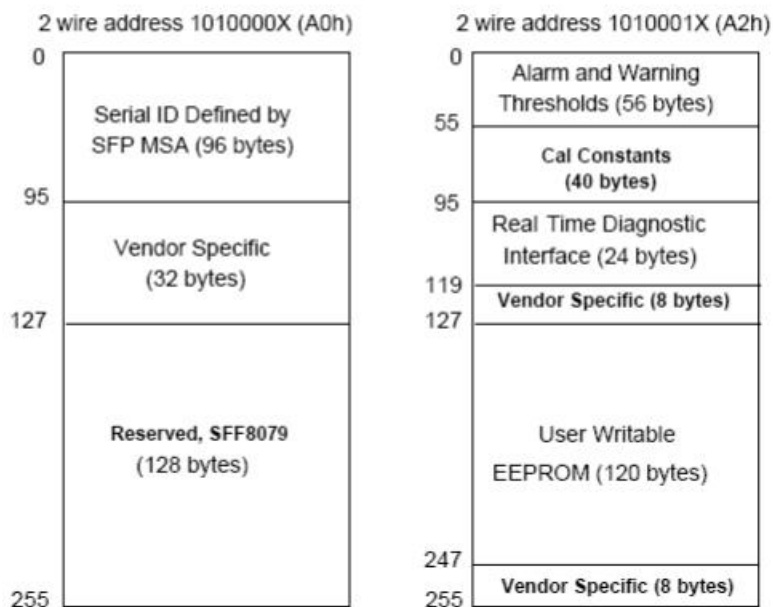
Note 2: A2 RSSI/TXDIS SELECTION

Address	Bit	Name	Description
A2 BYTE118	7	RSSI Select	Writing "0" for 10GEAPON RSSI Monitor; Writing "1" for EPON RSSI Monitor. Default power up value is "0".
	6	RSSI/ TXDIS Select	When set "0" ,PIN9 input as TXDIS input; When set "1", PIN9 as RSSI input. Default power up value is "0".
	5	10GPON TXDIS Selection	When set "0", PIN9 as the 10GEAPON TXDIS input. Default power-up value: "0".
	4	EPON TXDIS Selection	When set "0", PIN9 as the EPON TXDIS input. Default power-up value: "0".

EEPROM Information

A0h(1010000X) and B0h(1011000X) are the Serial ID addresses for 10G EPON and EPON OLT, respectively.

A2h(1010001X) and B2h(1011001X) are the Digital Diagnostic addresses for 10G EPON and EPON OLT, respectively



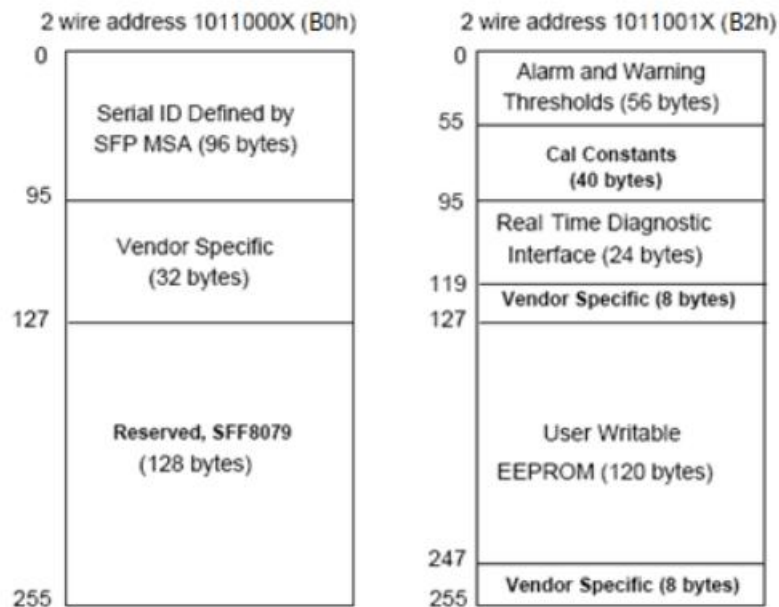
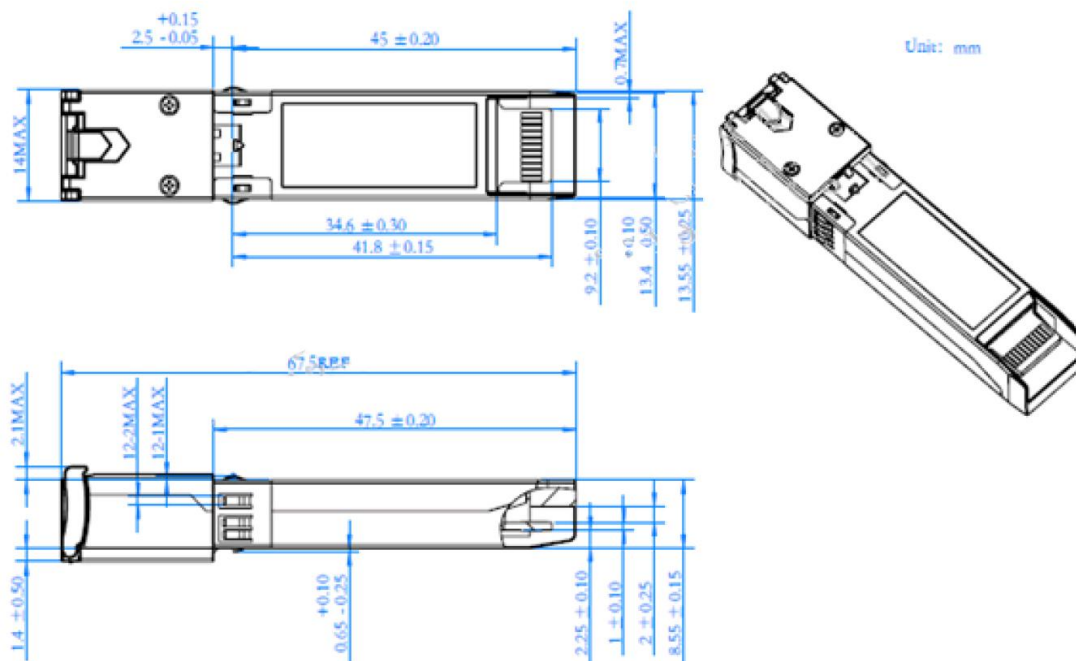


Figure 6: EEPROM Memory Map Specific Data Field Description

Digital Diagnostic Monitoring Interface

Parameter	Range	Accuracy	Calibration	Notes
Temperature	0 to 70° C	±3°C	Internal	LSB: 1/256°C
Voltage	3 to 3.6V	±3%	Internal	LSB: 0.1mV
Bias Current_1G	0 to 262mA	±10%	Internal	LSB: 4uA
TX Power_1G	2 to 7dBm	±3dB	Internal	LSB: 0.2uW
Bias Current_10G	0 to 262mA	±10%	Internal	LSB: 4uA
TX Power_10G	2 to 5dBm	±3dB	Internal	LSB: 0.2uW
RX Power Monitor	-30 to -6dBm	±3dB	External	LSB: 0.1uW

Package Outline



Note: The SFP+ 10GEPON Symmetric OLT package is preliminary version.

Ordering Information

Part Number	10GEPON-OLT-SGCE
Application	Symmetric 10GEPON OLT,with 1.25G TX/RX,0°C~+70°C
Wavelength (nm)	1577T/1270R 1490T/1310R
Data Rate (Gb/s)	10.3T/10.3R 1.25T/1.25R
ODN Class	PR30
Package	SFP+
Connector	SC