

10PT-PXTXR-P3C-W

10GEPON Symmetric OLT PR30 SFP+ Transceiver

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
- 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 power 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
- RoHS6 compliance



APPLICATIONS

- Symmetric 10GEPON OLT
- GEAPON 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 Ratings

Table 1 - Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Ambient Temperature	TSTG	-40	85	°C	
Operating Case Temperature	TA	0	70	°C	
Relative Storage Humidity	RHs	0	95	%	
Relative Operating Humidity	RHo	0	85	%	
VCC3 Power Supply Voltage	VCC3	0	3.6	V	

Recommended Operating Environment

Table 2 - Recommended Operating Environment

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	Tc	0		70	°C	
Power Supply Voltage	Vcc	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	

Transmitter Optical Characteristics

Table 3-10GEPON Transmitter Optical Characteristics

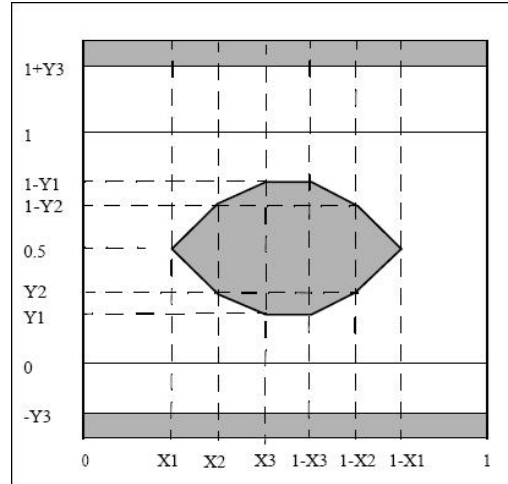
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Center Wavelength	λ_C	1575		1580	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$	-	-	1	nm	

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 @10.31 25Gbps
Transmitter and Dispersion Penalty	TDP			1.5	dB	Transmit on 20km SMF
Optical Waveform Diagram	Compliant with IEEE Std 802.3av					Figure1, Mask Margin>5%

Transmitter Electrical Characteristics

Table 4-10GEPON 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

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

Transmitter Optical Characteristics

Table 5-GEPON Transmitter Optical Characteristics

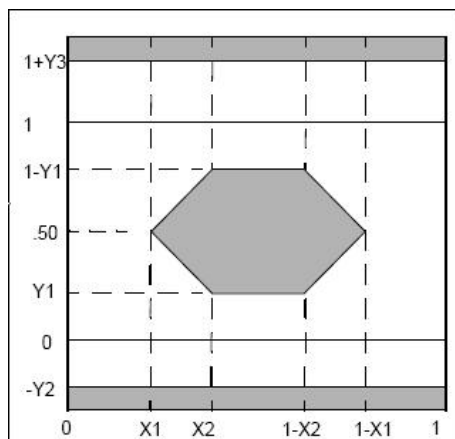
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Center Wavelength	λ_C	1480		1500	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Optical Power	AOP	+2		+7	dBm	Launched into SMF
Power-OFF Transmitter Optical Power				-39	dBm	Launched 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 %

Transmitter Electrical Characteristics

Table 6-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 Procedure



GEPON Transmitter Eye Mask Definitions

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

Receiver Optical Characteristics

Table 7-10GEPON 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 $\leq 1 \times 10^{-3}$
Saturation Optical Power	SAT	-6			dBm	PRBS2 ³¹ -1@10.3125Gbps BER $\leq 1 \times 10^{-3}$
Loss of Signal De-assert Level				-30.5	dBm	
Loss of Signal Assert Level		-45			dBm	
Hysteresis		0.5		6	dB	

Receiver Electrical Characteristics

Table 8-10GEPON Receiver Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Threshold Settling Time	TSETTLING		300	800	ns	Figure 3
Data Output Differential Swing		400		850	mV	CML output, DC coupled
Input Differential Impedance	Zin	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	

Receiver Electrical Characteristics

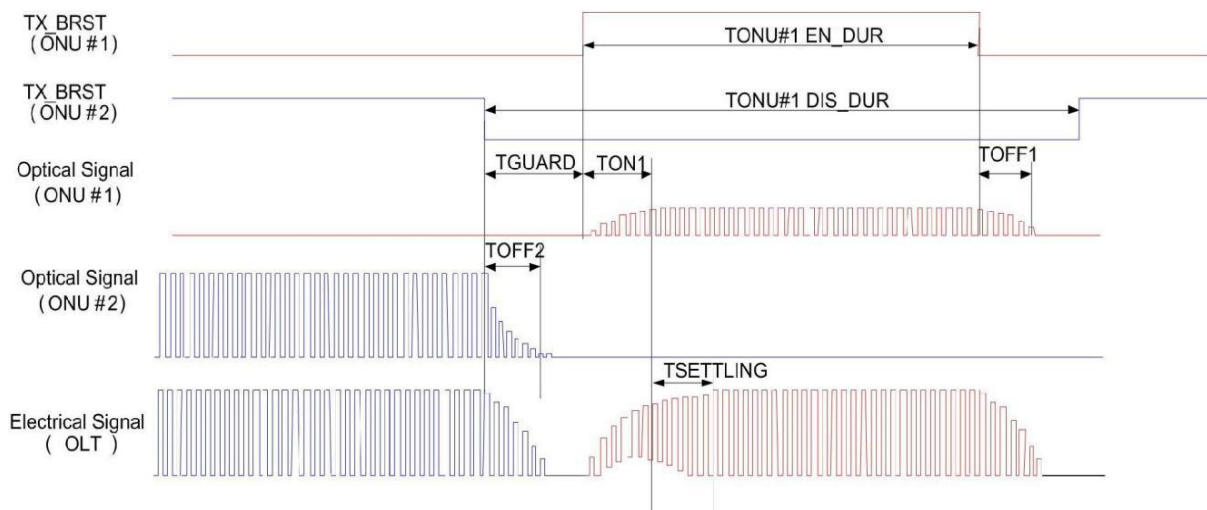
Table 9- Receiver Electrical Characteristics

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	PRBS 2 ⁷ -1@1.25Gbps BER ≤1×10 ⁻¹²
Loss of Signal De-assert Level				-31.5	dBm	
Loss of Signal Assert Level		-45			dBm	
Hysteresis		0.5		6	dB	

Receiver Electrical Characteristics

Table 10-GEAPON Receiver Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Threshold Settling Time	TSETTLING			300	ns	Figure 3
Data Output Differential Swing		600		1600	mV	
Input Differential Impedance	Zin	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 More Sequence

RSSI Timing Sequence

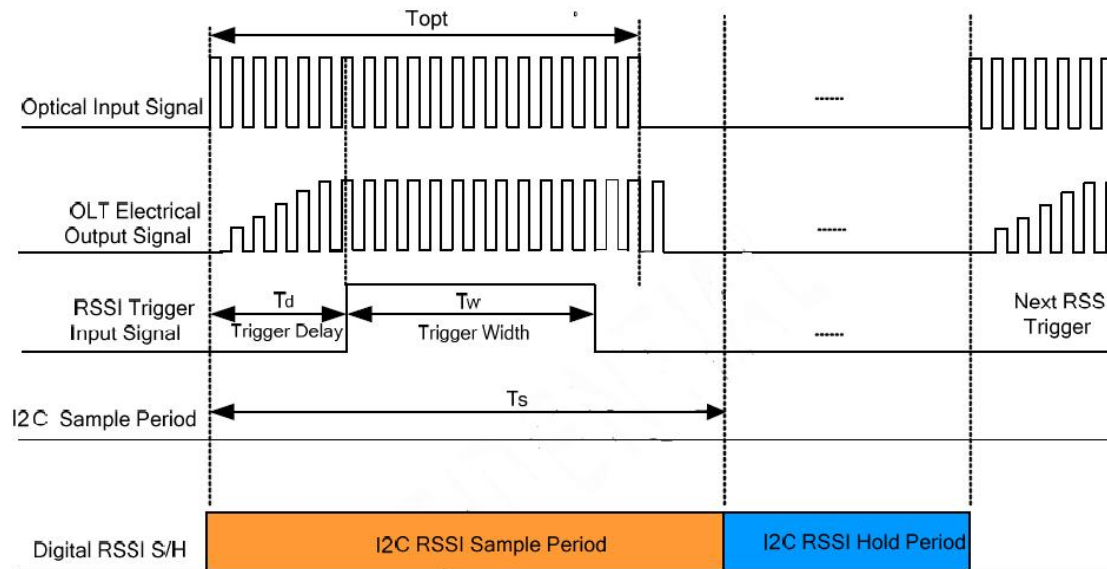
Table 11-RSSI Timing Sequence

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	μs	
I ² C Bus Frequency		0	100	200	KHz	

Pin Assignment

Pin Diagram

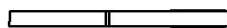
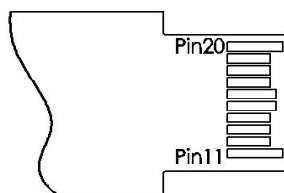
Digital RSSI Sample/Hold Timing Specification



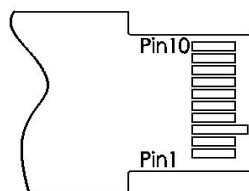
Timing Parameter Definitions in RSSI Trigger

Pin Out Drawing

TOP VIEW
OF BOARD



BOTTOM VIEW
OF BOARD



Pin Descriptions

Table 12-Pin Descriptions

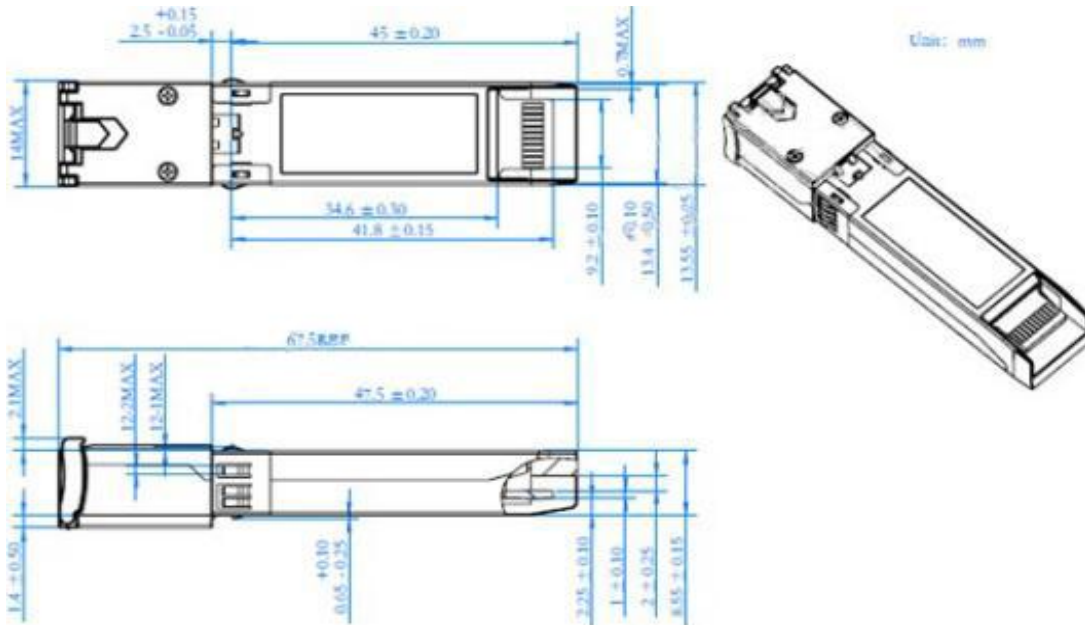
Pin	Name	Description	Notes
1	EPON_TD+	1G Transmit Data In	AC coupled, CML input
2	EPON_TD-	Inv. 1G Transmit Data In	AC coupled, CML input
3	GND	Module Ground	DC coupled, LVPECL output, See note 1
4	EPON_TD+	1G Transmit Data In	AC coupled, CML input
5	EPON_TD-	Inv. 1G Transmit Data In	AC coupled, CML input
6	GND	Module Ground	DC coupled, LVPECL output, See note 1
7	EPON_TD+	1G Transmit Data In	AC coupled, CML input
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	10GEPON_ RD-	Inv. Received 10G Data Out	DC coupled, CML output
13	10GEPON_ 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	10GEPON_ TD+	differential 10G Transmit Data In	AC coupled, CML input
19	10GEPON_ 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 BYTE1 18	7	RSSI Select	Writing "0" for 10GEPON 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 10GEPON 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".

Package Outline

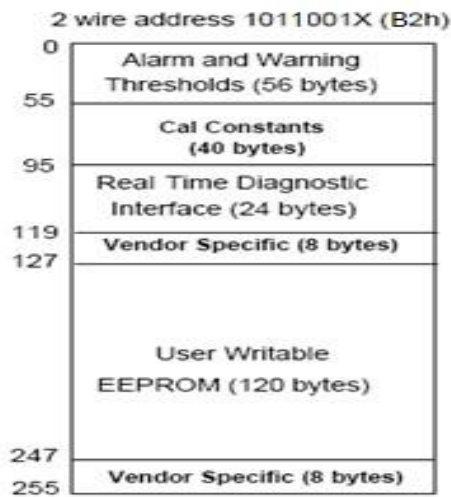
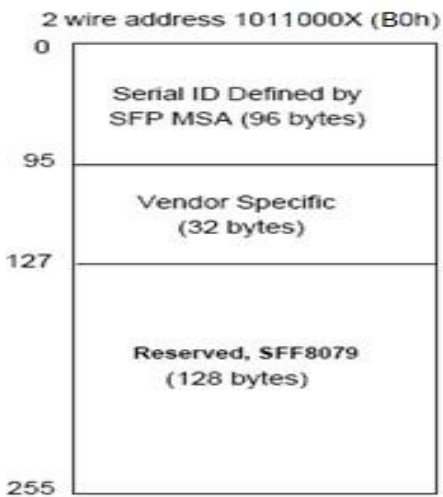
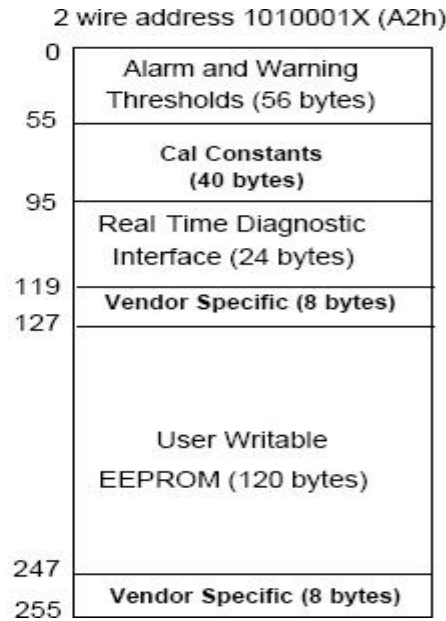
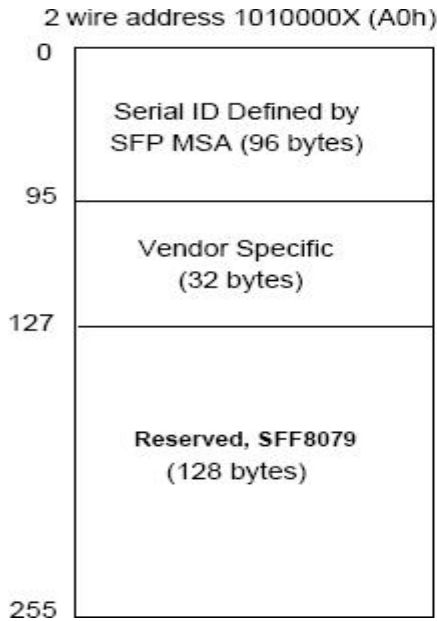


Package Outline

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

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.



EEPROM Memory Map Specific Data Field Descriptions

Digital Diagnostic Monitoring Interface

Table 13-Digital Diagnostic Monitoring Interface

Parameter	Range	Accuracy	Calibration	Notes
Temperature	0 to 70°C	±3°C	Internal	LSB: 1/256C
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

Ordering information

Table 14- Ordering information

Part Number	Product Description
10PT-PXTXR-P3C-W	Symmetric 10GEPON OLT SFP+, with 1G RX, with 1G TX SC PR30, 0 ~ +70°C, with DDM

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