

## 10GEPON OLT PR40 XFP Transceiver PEX96-BC5423-30

### Features

- Single fiber bi-directional data links TX 10.3125Gbps/ Burst Mode RX10.3125Gbps application
- Single fiber bi-directional data links TX 10.3125Gbps/ Burst Mode RX1.25Gbps application
- Single fiber bi-directional data links TX 1.25Gbps/ Burst Mode RX1.25Gbps application
- 0 to 70°C operating case temperature
- 3.3V,5V power supply
- XFP package with SC Receptacle connector
- Hot-pluggable capability
- High power 1577nm EML transmitter
- High power 1490nm DFB LD
- High sensitivity 1270nm and 1310nm APD
- Support 30km transmission distance with SMF
- Low EMI and excellent ESD protection
- Digital diagnostic monitor interface
- RoHS compliance

### Applications

- Symmetric 10GEPON OLT
- Asymmetric 10GEPON OLT
- GEPON PX20+ OLT

### Standards

- Complies with INF-8077i
- 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

Parameter	Symbol	Min	Max	Units	Notes
Storage Ambient Temperature	T <sub>STG</sub>	-40	85	°C	
Operating Case Temperature	T <sub>C</sub>	0	70	°C	
Operating Humidity	OH	5	95	%	
VCC3 Power Supply Voltage	VCC3	0	3.6	V	
VCC5 Power Supply Voltage	VCC5	0	5.5	V	
Receiver Damaged Threshold			-3	dBm	

### RECOMMENDED OPERATING CONDITION

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Operating Case Temperature	T <sub>C</sub>	0		+70	°C	
VCC3 Power Supply Voltage	V <sub>CC</sub>	3.13	3.3	3.47	V	
VCC5 Power Supply Voltage	V <sub>CC</sub>	4.75	5	5.25	V	
VCC3 Power Supply Current	ICC3		-	750	mA	
VCC5 Power Supply Current	ICC5		-	300	mA	
Line Rate			10.3125/1.25		Gbps	
Date Rate Drift		-100		+100	ppm	

### 10GEPON TRANSMITTER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Center Wavelength	λ <sub>C</sub>	1575	1577	1580	nm	
Optical Spectrum Width (-20dB)	Δλ	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Optical Power	AOP	5		9	dBm	Launched into SMF
Power-OFF Transmitter Optical Power				-39	dBm	
Extinction Ratio	ER	6			dB	PRBS2 <sup>31</sup> -1@10.3125Gbps
Transmitter Reflectance				-10	dB	
Transmitter and Dispersion Penalty	TDP			2	dB	Transmit on 30km SMF
Optical Waveform Diagram		Compliant with IEEE Std 802.3av				Figure 1, Margin>5%

### 10GEPON 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	Ω	
Transmitter Disable Voltage - Low		0		0.8	V	
Transmitter Disable Voltage - High		2.0		V <sub>CC</sub>	V	

**GEPON TRANSMITTER OPTICAL CHARACTERISTICS**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Center Wavelength	$\lambda_c$	1480	1490	1500	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Optical Power (BOL)	AOP	5.5		10	dBm	Room temperature
Average Launch Optical Power (EOL)		5		10		0~70°C
Power-OFF Transmitter Optical Power				-39	dBm	
Extinction Ratio	ER	9			dB	PRBS 2 <sup>7</sup> -1 test pattern @1.25Gbit/s
Optical Return Loss Tolerance				15	dB	
Transmitter Reflectance				-10	dB	
Transmitter and Dispersion Penalty	TDP			1	dB	Transmit on 30km SMF
Optical Waveform Diagram	Compliant with IEEE Std 802.3ah™-2004					Figure 2, Margin>5%

**GEPON 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		V <sub>cc</sub>	V	

**TRANSMITTER EYE MASK DEFINITIONS AND TEST PROCEDURE**

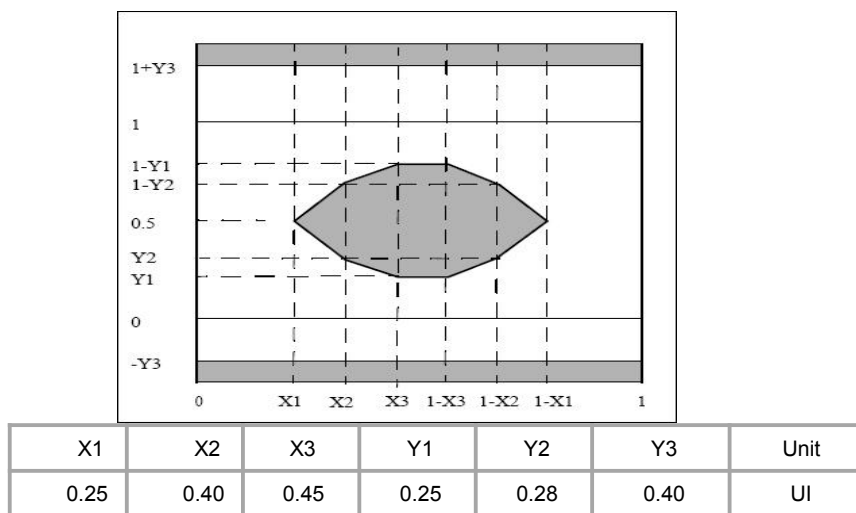
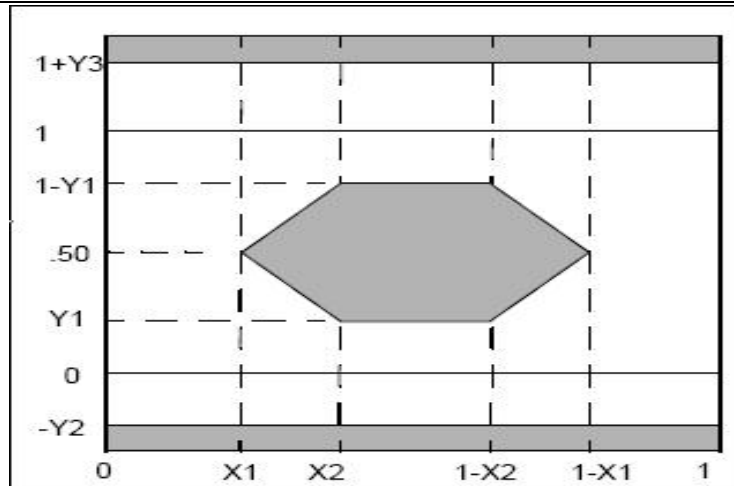


Figure 1 10GEPON Transmitter Eye Mask Definitions



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

Figure 2 GEPON Transmitter Eye Mask Definitions

10GEPON RECEIVER OPTICAL CHARACTERISTICS						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Wavelength		1260	1270	1280	nm	
Sensitivity	SEN			-29	dBm	PRBS2 <sup>31</sup> -1@10.3125Gbps BER ≤ 1×10 <sup>-3</sup>
Saturation Optical Power	SAT	-9			dBm	
Loss Of Signal De-assert Level				-30	dBm	
Loss Of Signal Assert Level		-45			dBm	
Loss Of Signal Hysteresis		0.5		6	dB	
Receiver Reflectance				-12	dB	

10GEPON RECEIVER ELECTRICAL CHARACTERISTICS						
Parameter	Symbol	Min.	Typ.	Max.	Unit.	Notes
Receiver Threshold Settling Time	T <sub>SETTLING</sub>			800	ns	
Data Output Differential Swing		400		1600	mV	CML output, AC coupled
Loss Of Signal Assert Time				512	ns	
Loss Of Signal De-assert Time				512	ns	
Loss Of Signal Voltage - Low		0		0.4	V	
Loss Of Signal Voltage - High		2.4		VCC	V	

GEPON RECEIVER OPTICAL CHARACTERISTICS						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Wavelength		1260		1360	nm	
Sensitivity	SEN			-32	dBm	PRBS 2 <sup>7</sup> -1@1.25Gbps BER ≤1×10 <sup>-12</sup>
Saturation Optical Power	SAT	-12			dBm	
Loss Of Signal De-assert Level				-32	dBm	
Loss Of Signal Assert Level		-45			dBm	
Loss Of Signal Hysteresis		0.5		6	dB	
Receiver Reflectance				-12	dB	

GEPON RECEIVER ELECTRICAL CHARACTERISTICS						
Parameter	Symbol	Min.	Typ.	Max.	Unit.	Notes
Receiver Threshold Settling Time	T <sub>SETTLING</sub>			400	ns	
Data Output Differential Swing		400		1600	mV	LVPECL output, DC coupled
Loss Of Signal Assert Time				512	ns	
Loss Of Signal Deassert Time				512	ns	
Loss Of Signal Voltage - Low		0		0.4	V	
Loss Of Signal Voltage - High		2.4		VCC	V	

RSSI CHARACTERISTICS						
Parameter	Symbol	Min.	Typ.	Max.	Unit.	Notes
RSSI Trigger-Low		0		0.8	V	
RSSI Trigger-High		2.0		V <sub>cc</sub>	V	
RSSI Trigger Delay	T <sub>D</sub>	496	512	528	ns	
RSSI Trigger Width	T <sub>W</sub>	584	600	616	ns	Figure 3
I <sup>2</sup> C Access Prohibited Time				500	μs	



Figure 3 RSSI Timing Diagram

EEPROM INFORMATION

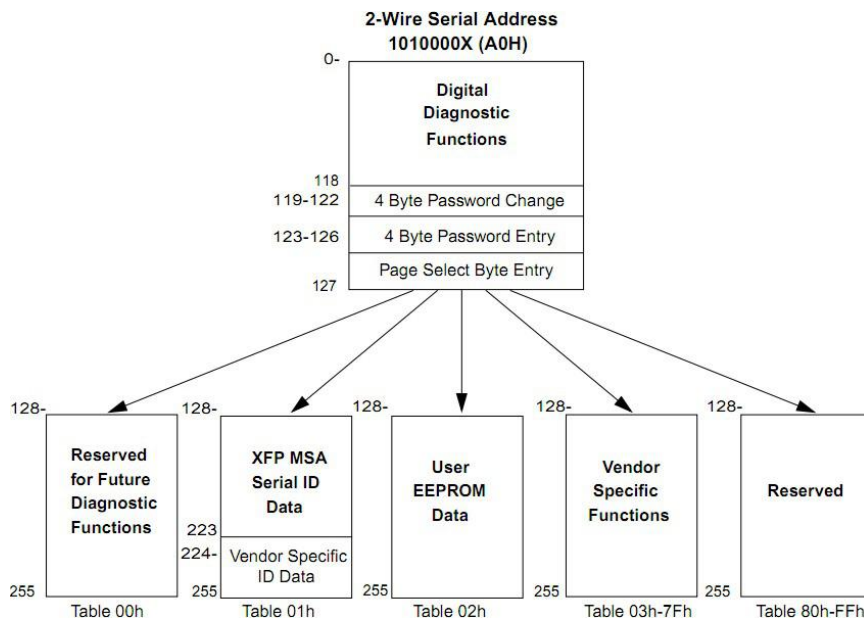


Figure 4 EEPROM Memory Map Specific Data Field Descriptions

DIGITAL DIAGNOSTIC MONITORING INTERFACE

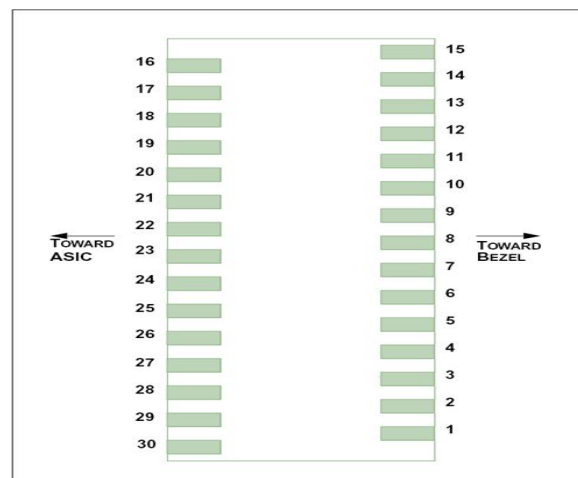
Parameter	Range	Accuracy	Calibration	Notes
Temperature	0 to 70°C	±3%	Internal	
Voltage	2.97 to 3.63V	±3%	Internal	
Bias Current_1G	0 to 100mA	±10%	Internal	LSB:4uA
TX Power_1G	5 to 10dBm	±3dB	Internal	LSB:0.2uW
Bias Current_10G	0 to 150mA	±10%	Internal	LSB:4uA
TX Power_10G	5 to 9dBm	±3dB	Internal	LSB:0.2uW
RX Power monitor	-32 to -9 dBm	±3dB	Internal	LSB:0.1uW

PIN ASSIGNMENT

PIN	Name	Description	Notes
1	GND	Module Ground	
2	TX-1G-Pa	Non-Inverted Transmit Data in	LVPECL input, AC coupled
3	TX-1G-Na	Inverted Transmit Data in	LVPECL input, AC coupled
4	GND	Module Ground	
5	TX_DIS	Transmitter Disable	LVTTTL Input, Low: transmitter on
6	VCC5	+5V Power Supply	
7	GND	Module Ground	
8	VCC3_TX	Transmitter 3.3V Power Supply	

9	VCC3_RX	Receiver 3.3V Power Supply	
10	SCL	The clock line	The clock line of two wire serial interface
11	SDA	The data line	The data line of two wire serial interface
12	MOD_ABS	Indicates Module is not present.	Grounded in the Module
13	N.C.	Not be Connected in the transceiver	
14	RX_LOS	Loss of signal	LVTTTL output, RX LOS pin indication 10G receiver or 1.25G receiver LOS status.
15	GND	Module Ground	
16	GND	Module Ground	
17	RD_10G_N	Inverted 10G Received Data Out	CML
18	RD_10G_P	Non-inverted 10G Received Data Out	CML
19	GND	Module Ground	
20	RD_1G_N	Inverted 1G Received Data Out	LVPECL Output, DC coupled
21	RD_1G_P	Non-inverted 1G Received Data Out	LVPECL Output, DC coupled
22	N.C.	Not be Connected in the transceiver	
23	RSSI_TRIG	RSSI Trigger for Transceiver	High: enable RSSI A/D conversion
24	N.C.	Not be Connected in the transceiver	
25	N.C.	Not be Connected in the transceiver	
26	N.C.	Not be Connected in the transceiver	
27	GND	Module Ground	
28	TX_10G_N	Inverted Transmit Data in	CML input, AC coupled
29	TX_10G_P	Non-Inverted Transmit Data in	CML input, AC coupled
30	GND	Module Ground	

**PIN OUT DRAWING**



**Figure 5 Pin Out Drawing**

PACKAGE OUTLINE (Unit: mm)

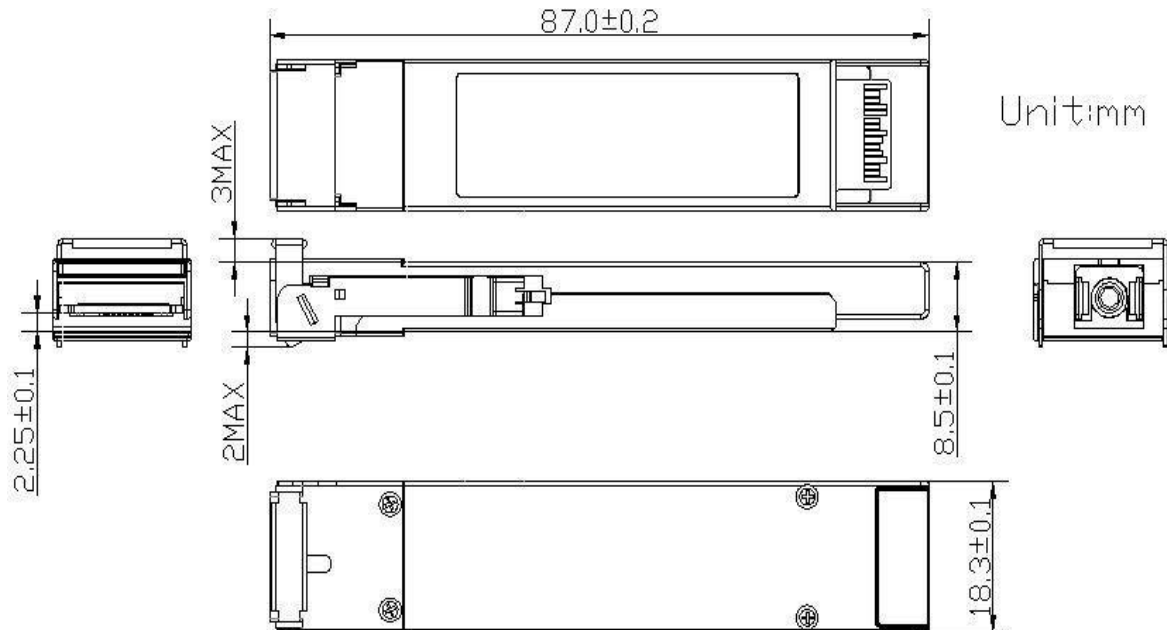


Figure 6 Package Outline

Order Information	
Part Number	Product Description
PEX96-BC5423-30	10GE PON OLT PR40, Tx 1577nm/1490nm&10.3125G/1.25G, Rx 1270nm/1310nm&10.3125G/1.25G, XFP form-factor, SC/UPC receptacle connector, 0~70°C

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