

GPON OLT Class B+ SFP Transceiver
PGS24-B4320**Features**

Single fiber bi-directional data links symmetric TX 2488Mbps/RX 1244Mbps application
Small Form Factor Pluggable package with SC/UPC connector
Single 3.3V power supply
1490nm continuous-mode DFB laser transmitter and 1310nm Burst-mode APD/TIA receiver
Class B+ Optical Line Terminal (OLT) for ITU-T G.984.2 Gigabit-capable Passive Optical Networks (GPON)
Reset burst-mode receiver design support more than 15dB dynamic range.
Burst Digital Receiving Signal Strength Indication (RSSI)
0 to 70°C for commercial Case Operating Temperature Range
-40 to 85°C for industrial Case Operating Temperature Range
Digital diagnostic monitor interface compatible with SFF-8472
Digital burst RSSI function to monitor the input optical power level
LVPECL compatible data input/output interface
LVTTTL transmitter disable control and transmitter laser fault alarm
LVTTTL fast receiver Signal Detect (SD) indication response
Low EMI and excellent ESD protection
Class 1 Laser eye safety standard
RoHS-6 compliance

Applications

Gigabit-Capable Passive Optical Networks

Standards

Complies with SFP Multi-Source Agreement (MSA) SFF-8074i
Complies with ITU-T G.984.2 Amendment 2
Complies with SFF 8472 V9.5
Complies with FCC 47 CFR Part 15, Class B
Complies with FDA 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	T _{stg}	-40	+85	°C	Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.
Commercial Case Operating Temperature Range	T _{case}	0	+70	°C	
Industrial Case Operating Temperature Range		-40	85		
DC Supply Voltage	V _{cc}	0	4.2	V	
Relative Humidity - Operating	RH _o	5	95	%	
Receiver Damaged Threshold		0		dBm	

RECOMMENDED OPERATING CONDITION

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Operating Case Temperature	T _{case}	0		70	°C	Commercial
		-40		85		Industrial
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Power Supply Current				450	mA	
Operating Relative Humidity		5		95	%	
Data Rate(TX/RX)	TX		2488.32		Mbit/s	
	RX		1244.16			
Data Rate Drift		-100		+100	PPM	

Transmitter Optical Specification

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter Type		1490nm DFB Continuous Mode				
Data Rate	Stx		2488.32		Mbit/s	
Centre Wavelength	λ _c	1480	1490	1500	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launched Power	P _{out}	1.5		5	dBm	
Mean Launched Power (TX Off)	P _{out}			-39	dBm	
Extinction Ratio	ER	8.2			dB	Note 1
Transmitter dispersion Penalty	TDP			1	dB	Transmit on 20km SMF
Eye Diagram		Compliant With ITU-T G.984.2				Note 2

Note 1: Measured with PRBS 2²³-1 test pattern @2488.32Mbit/s, Low Pass Filter is on.

Note 2: Transmitter eye mask definition

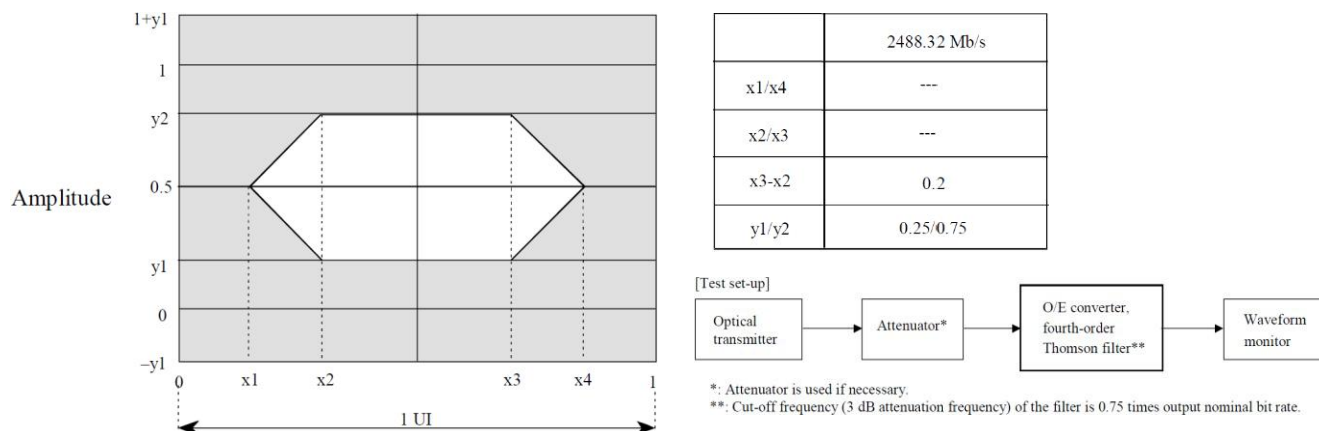


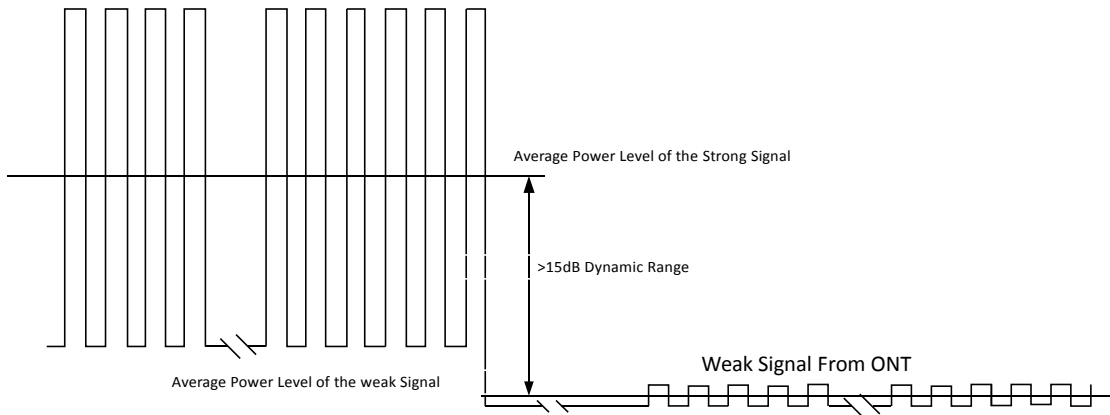
Figure 1 Transmitter Eye Mask Definitions and Test Procedure

TRANSMITTER ELECTRICAL CHARACTERISTICS						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Tx_Data Differential Input Voltage	$V_{IH}-V_{IL}$	200		1600	mV	LVPECL, AC coupled
Input Differential Impedance	R_{in}	90	100	110	Ω	
Transmitter Disable control Voltage - Low	V_{IL}	0		0.8	V	LVTTTL
Transmitter Disable control Voltage - High	V_{IH}	2.0		Vcc	V	
TX_Fault indicate voltage - Low	V_{OL}	0		0.4	V	
TX_Fault indicate voltage - High	V_{OH}	2.4		Vcc	V	

Receiver Optical Specifications						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Receiver Type		1310nm Burst-mode APD/TIA				
Data Rate	Stx		1244.16		Mbit/s	
Receive Wavelength	λ_c	1260	1310	1360	nm	
Sensitivity	SEN			-28	dBm	Note 1
Overload	SAT	-8			dBm	
RX Dynamic Range		-28		-8	dBm	Note 2
Signal Detect Assert level				-29	dBm	
Signal Detect De-assert level		-45			dBm	
SD Hysteresis		0.5		6	dB	

Note 1: Measured with a PRBS 2²³-1 test pattern @1244.16Mbit/s and ER=10dB, BER <=10⁻¹²

Note 2: RX Dynamic Range Definition



RECEIVER ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Rx_Data Differential Output Voltage	$V_{IH}-V_{IL}$	400		1600	mV	
Reset width	T_{RESET}	12.8			ns	
Receiver Amplitude Recovery Time	$T_{RECOVERY}$			25.6	ns	Refer to the reset signal falling edge
Signal Detect Assert Time	T_{SDA}			50	ns	
Signal Detect De-assert Time	T_{SDD}			12.8	ns	
Signal Detect indicate voltage - Low	V_{OL}	0		0.4	V	LVTTTL
Signal Detect indicate voltage - High	V_{OH}	2.4		V_{CC}	V	

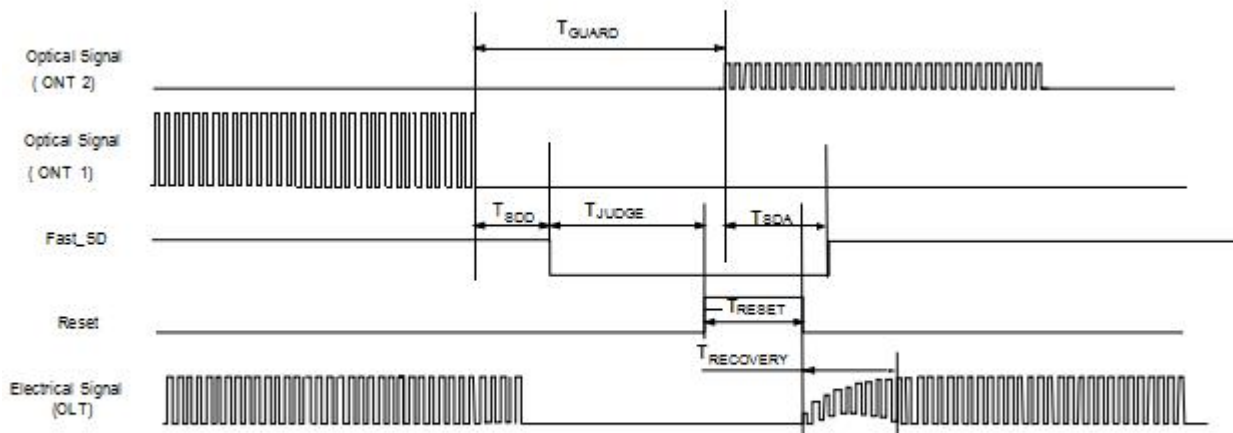


Figure 3 Burst Receiver Timing Sequence

Digital RSSI Timing Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
RSSI Trigger-Low		0		0.8	V	
RSSI Trigger-High		12		VCC	V	
RSSI Trigger Delay	T_D	25			ns	Refer to first bit of the preamble
RSSI Trigger width	T_W	500			ns	
Optical Signal During Time	$T_{ONT_EN_DUR}$	525			ns	For RSSI Measurement
I2C Access Prohibited Time	V_{OL}	500			μ s	

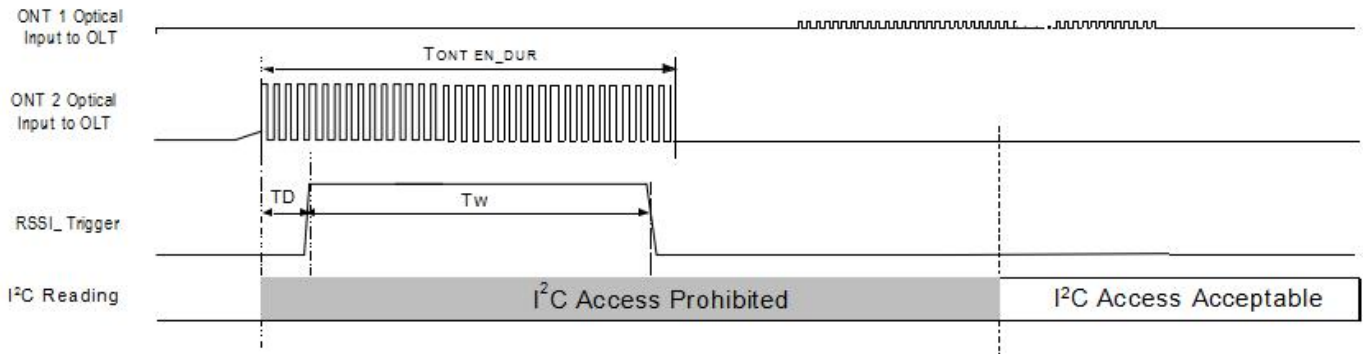


Figure 4 RSSI Timing Sequence

I2C SERIAL LOGIC

Parameter	Symbol	State	Min	Typ	Max	Unit
I2C Serial Data	SDA_H	HIGH	2.0		Vcc	V
	SDA_L	LOW	0		0.8	V
I2C Serial Clock	SCL_H	HIGH	2.0		Vcc	V
	SCL_L	LOW	0		0.8	V

EEPROM INFORMATION

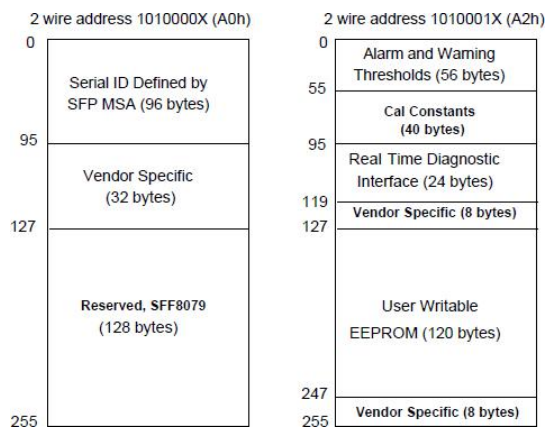


Figure 5 EEPROM Information

PGS24-B4320(I) I2C Memory Map (Page A0 HEX, Unlisted Fields are Blank / Empty)

Address		Memory Contents		Description	Name of Field
Decimal	HEX	HEX			
0	00	03		SFP transceiver	Identifier
1	01	04		MOD4	Extended Identifier
2	02	01		SC	Connector Values
3-10	03 to 0A	00 14 00 00 00 00 00 00		Compatibility	Transceiver Codes
11	0B	03		NRZ	Encoding Codes
12	0C	19		2.488Gbps	Nominal Bit Rate
14	0E	14		20(km)	9 micron fiber length
15	0F	C8		200(100m)	9 micron fiber length
20 to 35	14 to 23	XX		Vendor Name	"PRIMUS IT."
40 to 48	28 to 30	XX		Vendor Part Number	"PGS24-B4320(I)"
56 to 59	37 to 3B	01		Vendor Revision Number	Revision 1.0
60 to 61	3C to 3E	05 D2		Wavelength = 1490 nm	Laser Wavelength
65	41	1C		SD,TX_FAULT and TX_DISABLE	Option Values
68 to 83	44 to 53	XX		Vendor Serial Number	Serial Number
84 to 91	54 to 5B	XX		Vendor Date Code	Date Code
92	5C	58		Type of Diagnostics	Average Power, External Calibration, 8472 DDMI
93	5D	F0		Enhanced Options	Optional Alarm/warning Flags Implemented; RX_LOS;TX_FAULT;TX_DISABLE Implemented
94	5E	02		8472 Compatibility	Rev 9.5 of SFF-8472.

SFF-8472 Rev 9.4 A2 (HEX) Address Table for Alarm and Warning Data

8472 Parameter	Alarm Threshold Data				Warning Threshold Data				Measured Values		Alarm Bit Address + Position		Warning Bit Address + Position	
	High Value		Low Value		High Value		Low Value				HIGH	Low	HIGH	Low
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	HIGH	Low	HIGH	Low
Temperature	00	01	02	03	04	05	06	07	96	97	112 (7)	112 (6)	116 (7)	116 (6)
Vcc	08	09	10	11	12	13	14	15	98	99	112 (5)	112 (4)	116 (5)	116 (4)
TX Bias	16	17	18	19	20	21	22	23	100	101	112 (3)	112 (2)	116 (3)	116 (2)
TX Power	24	25	26	27	28	29	30	31	102	103	112 (1)	112 (0)	116 (1)	116 (0)
RX Power	32	33	34	35	36	37	38	39	104	105	113 (7)	113 (6)	117 (7)	117 (6)

DIGITAL DIAGNOSTIC MONITORING INTERFACE

Parameter	Range	Accuracy	Calibration
Temperature	-40 to 85°C	±3°C	Internal
Voltage	2.9 to 3.6V	±3%	Internal
Bias Current	0 to 100mA	±10%	Internal
TX Power	1.5 to 5dBm	±3dB	Internal
RX Power monitor	-28 to -8dBm	±3dB	Internal

PGS24-B4320 PIN ASSIGNMENT

Pin	Name	Level/Logic	Function	Description
1	NC	NA	NA	Not connect inside the transceiver
2	TX_Fault	LVTTTL	TX Fault	TX Fault Alarm, TX Fault State: High; TX Normal State: Low
3	TX_Dis	LVTTTL	Transmitter Enable/Disable	Active High
4	MOD-DEF2	LVTTTL	SDA	I2C data
5	MOD-DEF1	LVTTTL	SCL	I2C clock
6	MOD-DEF0	MOD-DEF0		Module Definition 0, Grounding in SFP
7	Reset	LVTTTL	Receiver Reset	Active High
8	SD	LVTTTL	Signal Detect	High: signal detected; Low: loss of signal;
9	RSSI Trigger	LVTTTL	RSSI Trigger for Transceiver A/D Conversion	High: enable RSSI A/D conversion
10	GNDR	NA	Ground	Receiver Ground
11	GNDR	NA	Ground	Receiver Ground
12	RD-	LVPECL	Rx Data-	Inv. RX data output, DC coupled output
13	RD+	LVPECL	Rx Data+	RX data output, DC coupled output
14	GNDR	NA	Ground	Receiver Ground
15	V _{cc} R	NA	Receiver Power Supply	Rx Power
16	V _{cc} T	NA	Transmitter Power Supply	Tx Power
17	GNDT	GNDT	Ground	Transmitter Ground
18	TD+	LVPECL	Tx Data+	TX data input, internally AC coupled with 100ohm terminated
19	TD-	LVPECL	Tx Data-	Inv. TX data input, internally AC coupled with 100ohm terminated
20	GNDT	NA	Ground	Transmitter Ground

PIN OUT DRAWING

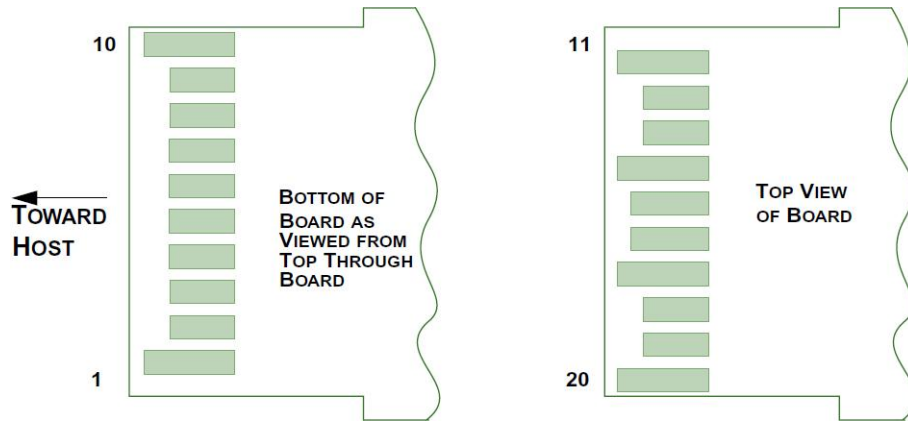


Figure 6 Pin Out Drawing (Top view)

Mechanical Specifications (Unit: mm)

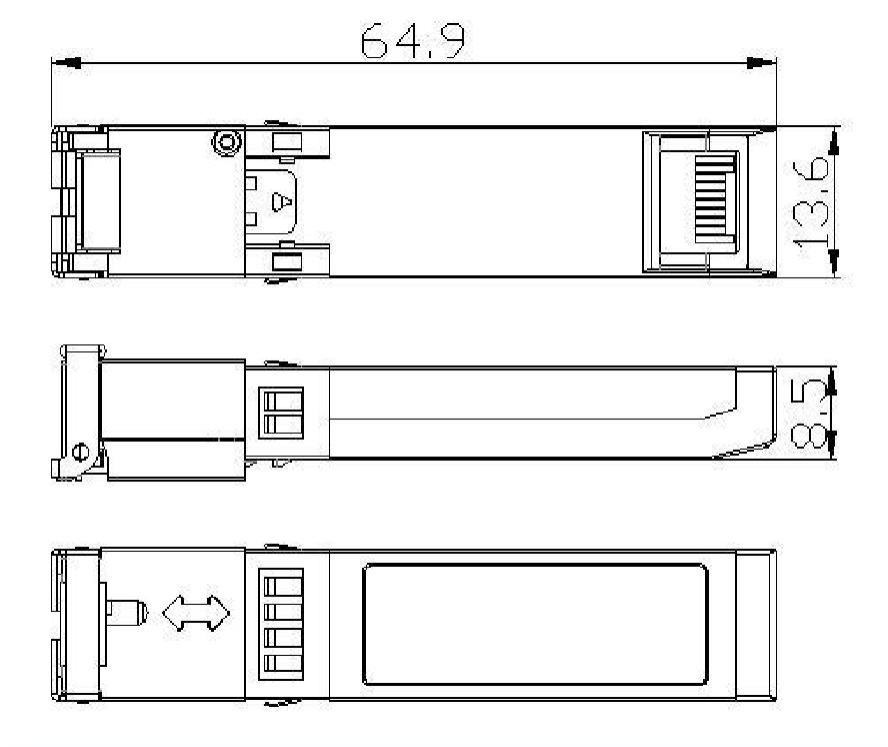
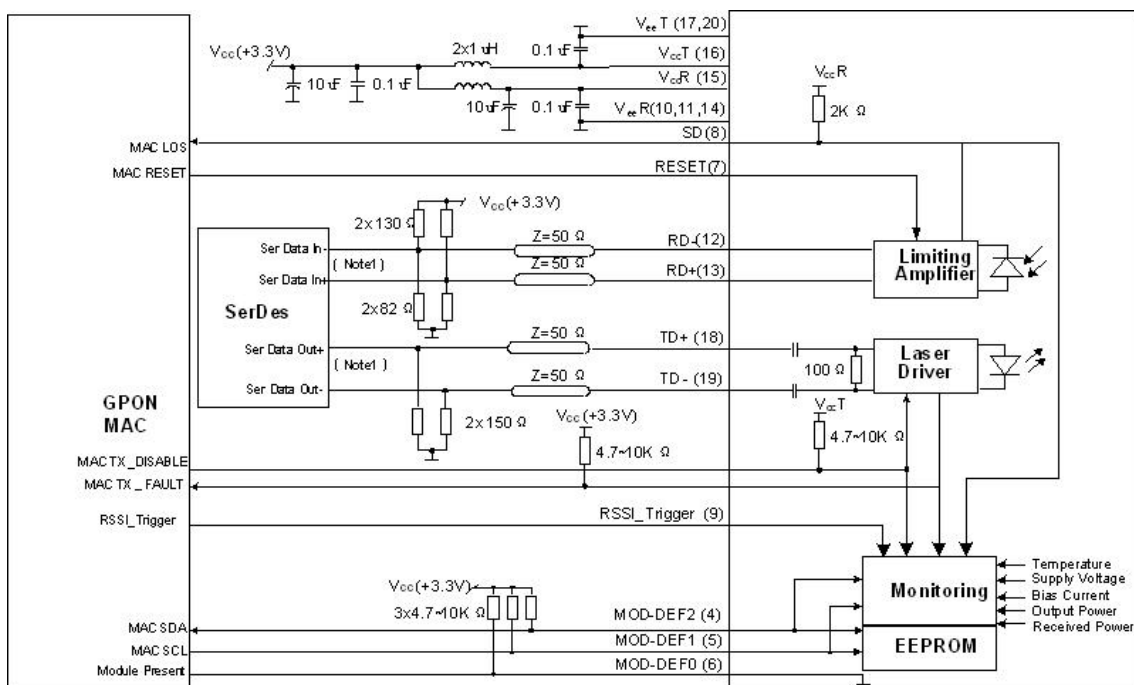


Figure 7 Mechanical Outline Drawing

Recommended Interface Circuit



Order Information

Part Number	Product Description
PGS24-B4320	GPON OLT Class B+, 20km, Tx 1490nm 2.488Gbit/s, Rx 1310nm 1.244Gbit/s, SFP form-factor, SC/UPC receptacle connector, 0~70°C
PGS24-B4320I	GPON OLT Class B+, 20km, Tx 1490nm 2.488Gbit/s, Rx 1310nm 1.244Gbit/s, SFP form-factor, SC/UPC receptacle connector, -40~85°C

Contact Information

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