

GPON ONU SFP Transceiver
PGS12-B3420**Features**

Single fiber bi-directional data links with asymmetric 1244Mbps upstream and 2488Mbps downstream
SFP package with SC/APC Receptacle connector
Single 3.3V power supply
1310nm DFB burst mode laser, active low
1490nm continuous mode APD-TIA Receiver
CML compatible data input/output interface
LVTTTL burst enable control and low level enable
0°C to 70°C operating temperature
Digital diagnostic monitor interface compatible with SFF-8472
Low EMI and excellent ESD protection
Compliant with IEC60825 Class 1
Compliant with ITU-T G.984.5
RoHS-6 compliance

Applications

Gigabit-capable Passive Optical Networks(GPON) ONU for P2MP application

Standards

Complies with SFP MSA
Complies with SFF 8432
Complies with ITU-T G984.5 Class B+
Complies with ITU-T G984.5 Class C+
Complies with SFF 8472 V9.4
Complies with FCC 47 CFR Part 15, Class B
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

Descriptions

The PGS12-B3420 transceivers provide high-speed Bi-directional serial optical links with asymmetric 1244Mbps upstream and 2488Mbps downstream for GPON applications up to 20km. The optical interface is SC/APC Receptacle. It adopts SFP Package. Power supply is single +3.3 Voltage.

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.	
Operating Case Temperature Range	T _{case}	0	+70	°C		
Relative Humidity - Storage	RH _s	0	95	%		
Relative Humidity - Operating	RH _o	0	85	%		
DC Supply Voltage	V _{cc}	0	3.6	V		

RECOMMENDED OPERATING CONDITION						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Operating Case Temperature Range	T _c	0		70	°C	
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Power Supply Current	I _{cc}			400	mA	
Downstream Data Rate			2.488		Gbps	
Upstream Data Rate			1.244		Gbps	
Data Rate Drift		-100		+100	PPM	

TRANSMITTER ELECTRICAL CHARACTERISTICS						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Tx DC Supply Current	I _{cc}			200	mA	
Tx_Data Differential Input Voltage	V _{IH-VIL}	200		1600	mV	CML Tx_DATA Electrical Signal
Input Differential Impedance	R _{in}	90	100	110	Ω	
Transmitter burst control Voltage - Low	V _{IL}	0		0.8	V	LVTTTL
Transmitter burst control Voltage - High	V _{IH}	2.0		V _{cc}	V	
TX_SD indicate voltage - Low	V _{oL}	0		0.4	V	
TX_SD indicate voltage - High	V _{oH}	2.4		V _{cc}	V	
TX_Fault indicate voltage - Low	V _{oL}	0		0.4	V	
TX_Fault indicate voltage - High	V _{oH}	2.4		V _{cc}	V	

RECEIVER ELECTRICAL CHARACTERISTICS						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Rx DC Supply Current	I _{cc}			200	mA	
Rx_Data Differential Output Voltage	V _{IH-VIL}	400		1600	mV	CML Rx_DATA Electrical Signal
Signal-Detected indicate voltage - Low	V _{oL}	0		0.4	V	LVTTTL
Signal-Detected indicate voltage - High	V _{oH}	2.4		V _{cc}	V	

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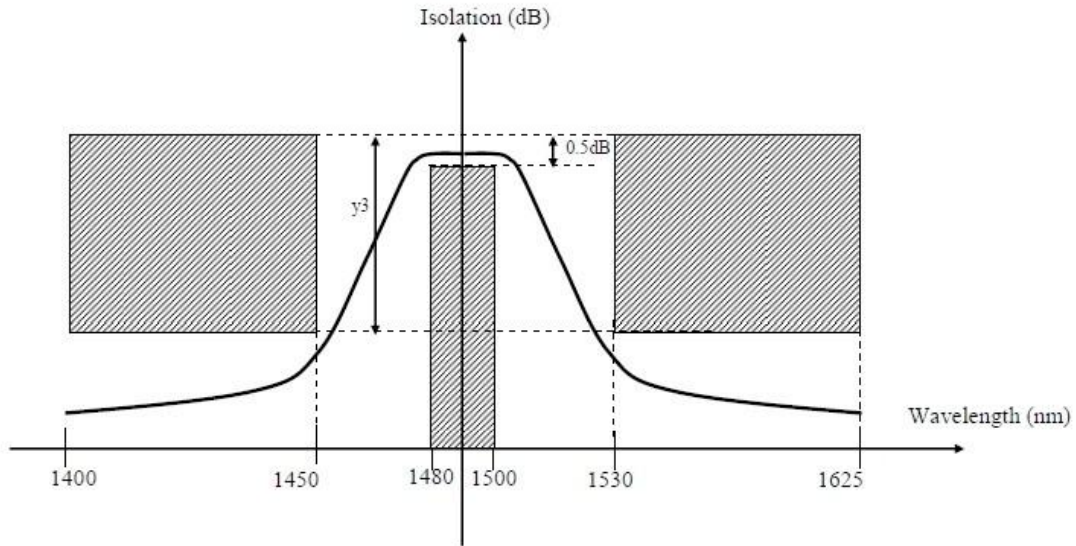
TRANSMITTER ELECTRICAL CHARACTERISTICS						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Tx DC Supply Current	I _{cc}			200	mA	
Tx_Data Differential Input Voltage	V _{IH-VIL}	200		1600	mV	CML Tx_DATA Electrical Signal
Input Differential Impedance	R _{in}	90	100	110	Ω	
Transmitter burst control Voltage - Low	V _{IL}	0		0.8	V	LVTTTL
Transmitter burst control Voltage - High	V _{IH}	2.0		V _{cc}	V	
TX_SD indicate voltage - Low	V _{oL}	0		0.4	V	
TX_SD indicate voltage - High	V _{oH}	2.4		V _{cc}	V	
TX_Fault indicate voltage - Low	V _{oL}	0		0.4	V	
TX_Fault indicate voltage - High	V _{oH}	2.4		V _{cc}	V	

RECEIVER ELECTRICAL CHARACTERISTICS						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Rx DC Supply Current	I _{cc}			200	mA	
Rx_Data Differential Output Voltage	V _{IH-VIL}	400		1600	mV	CML Rx_DATA Electrical Signal
Signal-Detected indicate voltage - Low	V _{oL}	0		0.4	V	LVTTTL
Signal-Detected indicate voltage - High	V _{oH}	2.4		V _{cc}	V	

I2C SERIAL LOGIC							
Parameter	Symbol	State	Min	Typ	Max	Unit	
I ² C Serial Data	SDA _H	HIGH	2.0		V _{cc}	V	
	SDA _L	LOW	0		0.8	V	
I ² C Serial Clock	SCL _H	HIGH	2.0		V _{cc}	V	
	SCL _L	LOW	0		0.8	V	
UPSTREAM BURST MODE TRANSMITTER OPTICAL SPECIFICATION							
Parameter	Symbol	Min	Typ	Max	Unit	Notes	
Transmitter Type		1310 nm DFB Burst Mode					
Upstream Signaling Speed	Stx		1.244		Gbps		
Centre Wavelength	λ_c	1290	1310	1330	nm		
Spectral Width (-20dB)	$\Delta\lambda$			1	nm		
Side Mode Suppression Ratio	SMSR	30			dB		
Average Output Power (BOL)	P _{out}	2		5	dBm		
Average Output Power (EOL)	P _{out}	0.5		5	dBm		
Optical Output with Tx OFF	P _{out}			-45	dBm		
Insertion consistency (AOP)	P _{out}	-1		+1	dB		
Extinction Ratio	ER	10			dB		
Optical Rise and Fall Time	t _r /t _f			0.26	ns	20% to 80%	
Turn On Time at Burst mode	T _{on}			12.8	ns		
Turn Off Time at Burst mode	T _{off}			12.8	ns		
Tx_SD Assert Time	t _A			200	ns		
Tx_SD Deassert Time	t _D			200	ns		
Relative Intensity Noise				-115	dB/Hz		
Transmitter and Dispersion Penalty	TDP			1	dB	Transmit on 20km SMF.	
Jitter Peak to Peak	J _{p-p}			0.2	UI	Compliant With ITU-T G.984.2	
Eye Diagram		Compliant With ITU-T G984.2				PRBS 2 ²³ -1 @1.244Gbps	
DOWNSTREAM CW MODE RECEIVER OPTICAL SPECIFICATIONS							
Parameter	Symbol	Min	Typ	Max	Unit	Notes	
Receiver Type		1490nm CW Mode					
Downstream Signaling Speed	Stx		2.488		Gbps		
Wavelength	λ_c	1480	1490	1500	nm		
Sensitivity (BOL)	SEN			-28.5	dBm	BER<10 ⁻¹⁰ , PRBS 2 ²³ -1 @2.488G	
Saturation Optical Power	SAT	-8			dBm	BER<10 ⁻¹⁰ , PRBS 2 ²³ -1 @2.488G	
LOS Assert Level		-45			dBm		
LOS De-assert Level				-30	dBm		
Loss of signal Hysteresis		0.5		6	dB		
Receiver Reflectance				-12	dB	$\lambda=1490\text{nm}$	
WDM filter isolation		35			dB	1400nm~1441nm	

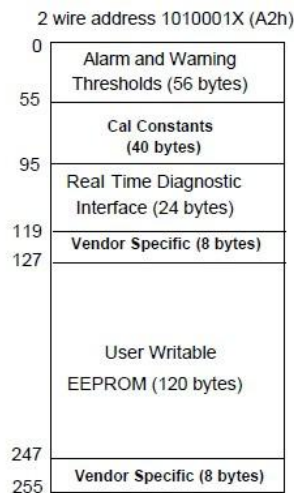
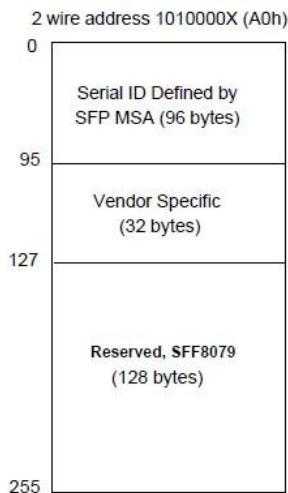
	25				dB	1450nm
	25				dB	1530nm
	35				dB	1539nm~1625nm

WBF Isolation characteristics (ITU-T G.984.5)



WBF Isolation characteristics				
Wavelength (nm)	1400 ~ 1441	1450	1530	1539 ~ 1625
Isolation (dB)	y3	y3	y3	y3
	>35	>25	>25	>35

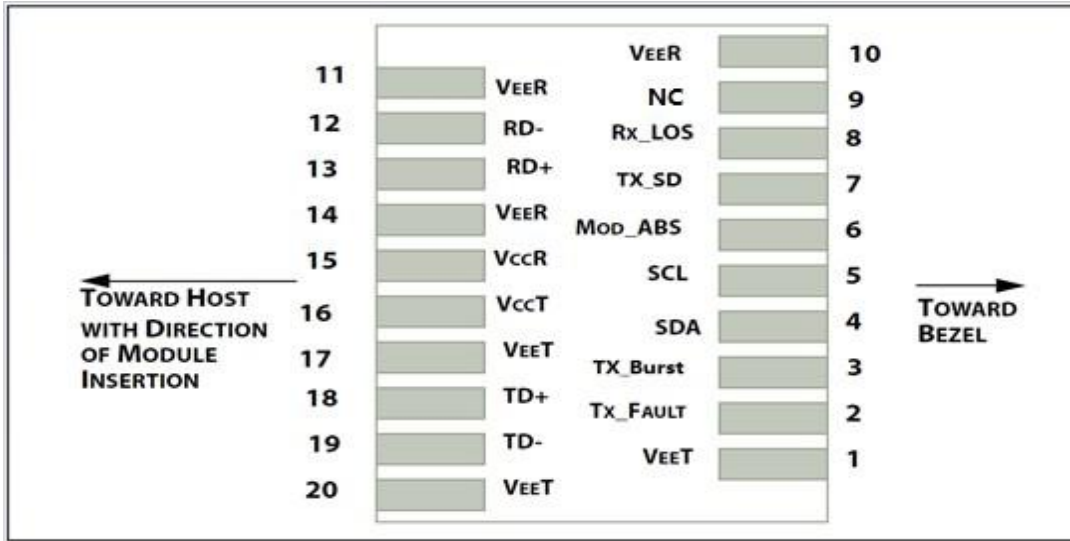
EEPROM INFORMATION



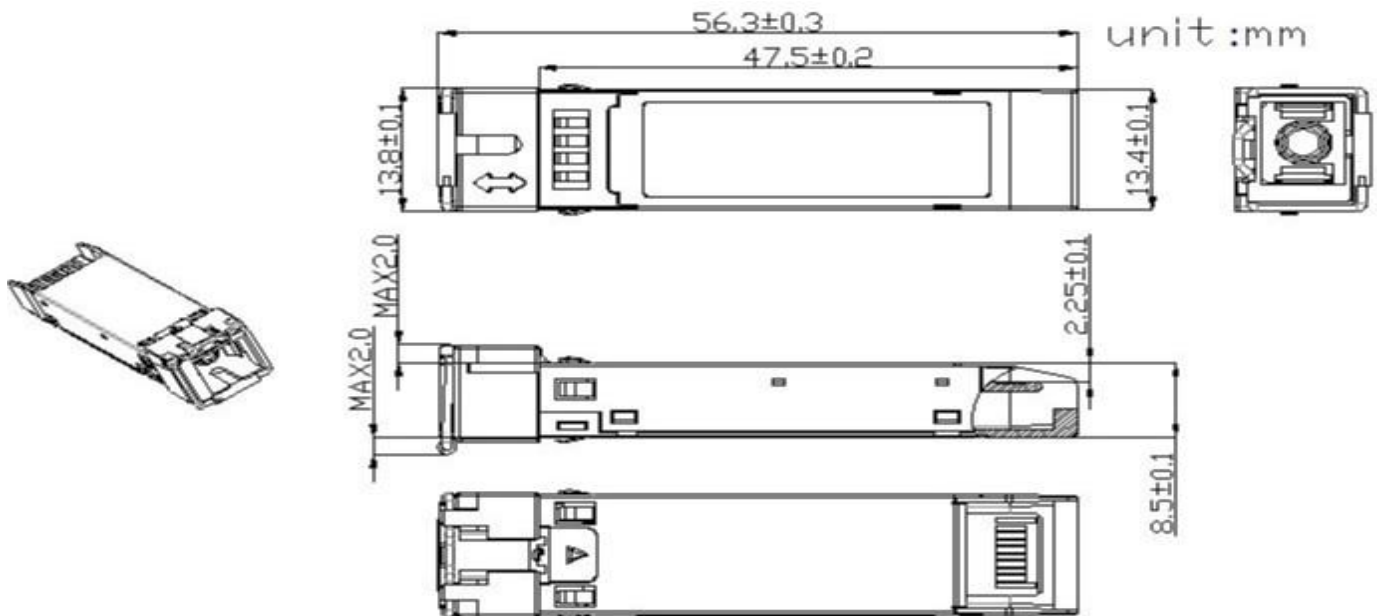
DIGITAL DIAGNOSTIC MONITORING INTERFACE			
Parameter	Range	Accuracy	Calibration
Temperature	0 to 70°C	±3°C	Internal
Voltage	3.0 to 3.7V	±3%	Internal
Bias Current	0 to 100mA	±10%	Internal
Burst TX Power	-0.5 to 6dBm	±2dB	Internal
RX Power monitor	-29 to -8dBm	±2dB	Internal

PGS12-B3420 2x10 SFP PIN ASSIGNMENT			
Pin	Symbol	Function	Description
1	VEET	Ground	Transmitter Ground
2	Tx_Fault	TX Fault	TX Fault Alarm, TX Fault State: High; TX Normal State: Low
3	Tx Burst	Transmitter Enable/Disable	Transmit Burst Control (LVTTTL), Low enable
4	MOD-DEF2	SDA	I2C Serial Data
5	MOD-DEF1	SCL	I2C Serial Clock
6	MOD_ABS		Module Definition 0, Grounding in SFP
7	TX_SD	Transmitter State Indication	TX_Indication Assert When Transmitter ON
8	RX_LOS	RX Los of signal	Receiver Los of signal Indication , Low indicates normal operation
9	NC	NC	NC
10	VeeR	Ground	Receiver Ground
11	VeeR	Ground	Receiver Ground
12	RD-	Rx Data-	Rx_DATA Inverted Differential Output - Internally AC Coupled and Terminated
13	RD+	Rx Data+	Rx_DATA Non Inverted Differential Output - Internally AC Coupled and Terminated
14	VeeR	Ground	Receiver Ground
15	VccR	Receiver Power Supply	Receiver Power
16	VccT	Transmitter Power Supply	Transmitter Power
17	VeeT	Ground	Transmitter Ground
18	TD+	Tx Data+	Tx_DATA Non Inverted Differential Input - Internally AC Coupled
19	TD-	Tx Data-	Tx_DATA Inverted Differential Input - Internally AC Coupled
20	VeeT	Ground	Transmitter Ground

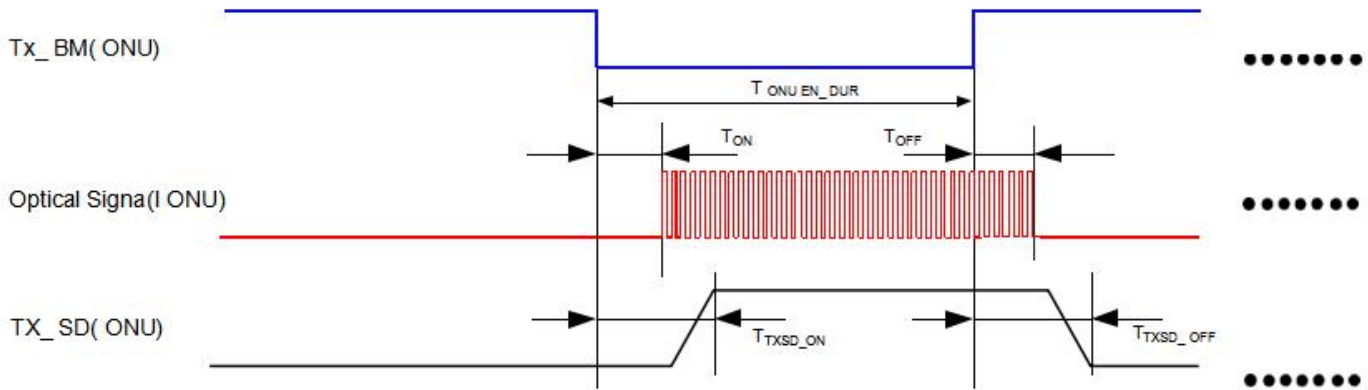
PIN DESCRIPTIONS



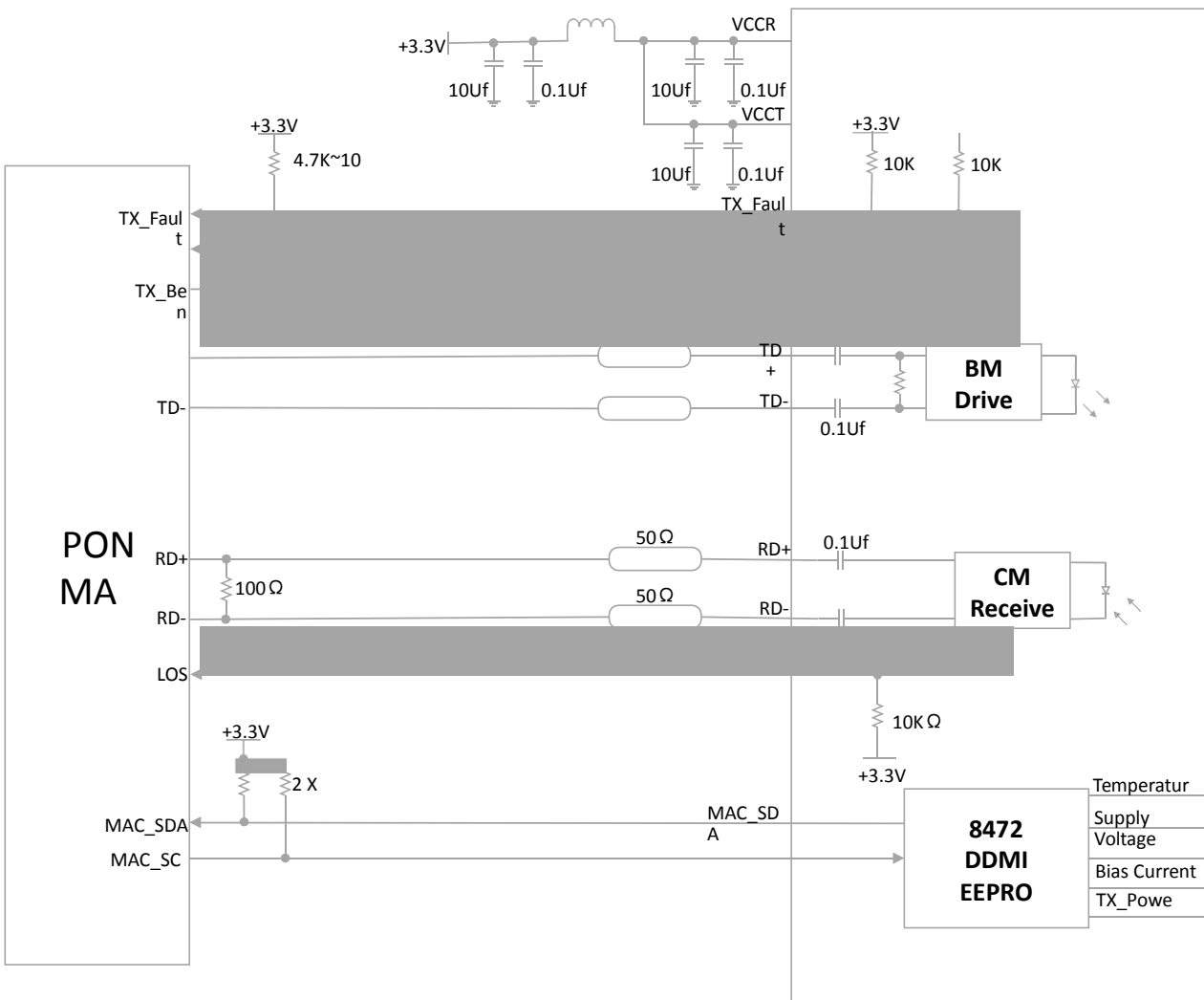
MECHANICAL SPECIFICATIONS (Unit:mm)



TYPICAL ONU TIMING SEQUENCE



PGS12-B3420 ELECTRICAL INTERFACE



ORDER INFORMATION				
Part Number	Product Description	Input(TD±)	Output(RD±)	Tx_burst
PGS12-B3420I	1310nm(TX)/1490nm(RX), SC/APC Receptacle SFP for GPON ONU, active low, 0~70°C。	AC Couple	AC Couple	Low

Contact Information

PRIMUS IT LIMITED

- 1、HongKong: RM M4/F Continental Mansion 300 King's RD HK
- 2、Tel:+86 0755-25924025
- 3、Fax:+86 0755-25924051
- 4、Website: <http://www.primus-it.com>
- 5、Email: sales@primus-it.com