

GPON SFP ONU Transceiver

Product Features

- SFP with single mode SC/UPC receptacle Transceiver
- 1490nm continuous-mode 2.488Gb/s APD receiver
- 1310nm burst-mode 1.244Gb/s DFB transmitter
- Complies with ITU-T G.984.2 Class B+
- Digital Diagnostic Monitoring (DDM) with external calibrations
- Operation case temperature: 0~70° C
- Complies with RoHS directive (2002/95/EC)

This is a high performance transceiver module for single fiber communications. It is designed to meet ITU G.984.2 Class B+ requirements for ONU applications.

The 1310nm DFB LD transmitter has automatic power control (APC) function and temperature compensation circuitry to ensure stable optical power and extinction ratio over all operating temperature range. The transmitter meets Class 1 eye safety per IEC60825 and CDRH standards.

The receiver has a hermetically packaged APD-TIA (trans-impedance amplifier) pre-amplifier and a limiting amplifier with differential outputs.

The module provides digital diagnostic information of its operating conditions and status, including transmitting power, laser bias current, module temperature, and supply voltage.

Ordering Information

Part Number	Description
AC-B-SFPGPUU-B-xx	GPON SFP ONU Transceiver

Applications

- Gigabit Passive Optical Network (GPON) ONU

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	Tst	-40	+85	°C	
Operating relative humidity (Non- condensing)	RH	5	90	%	
Case Temperature (Operating)	TC	0	70	°C	
Input Voltage	-	GND	Vcc	V	
Power Supply Voltage	Vcc	0	3.6	V	

Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Power Supply Voltage	Vcc	+3.14	+3.3	+3.46	V	
Power Supply Current	Icc	-	200	300	mA	
Operating relative humidity (Non- condensing)	RH	5		85	%	
Case Temperature (Operating)	TC	0	-	70	°C	
I2C clock frequency		-	100	400	KHz	
Power consumption Max	-	-	-	1	W	

Optical Characteristics

All parameters are specified under the recommended operating conditions unless otherwise specified..

Parameter	Symbol	Min	Typical	Max	Unit	Notes
1310nm Digital Burst-Mode Transmitter E-O Characteristics						
Support data rate	-		1.244		Gb/s	
Center Wavelength	λ	1290	1310	1330	nm	1
Spectral Width (-20dB)	$\Delta\lambda$	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Output Power	Po	0.5	-	5	dBm	
Extinction Ratio	Er	10	-	-	dB	
Output Power with Transmitter Disabled	Poff			-45	dBm	
Output Eye Diagram	Compliant with ITU-T G.984.2 Mask					
1490 Receiver Characteristics O-E Characteristics						
Support data rate			2.488		Gb/s	
Wavelength of Operation	-	1480	1490	1500	nm	
Receiver Sensitivity(BOL)	Sen.	-	-	-28	dBm	2
Saturation Optical Power	Sat	-8	-	-	dBm	2
LOS Assert	LOSA	-	-	-42	dBm	
LOS Deassert	LOSD	-29	-	-	dBm	
LOS Hysteresis	HYS	0.5		6	dB	

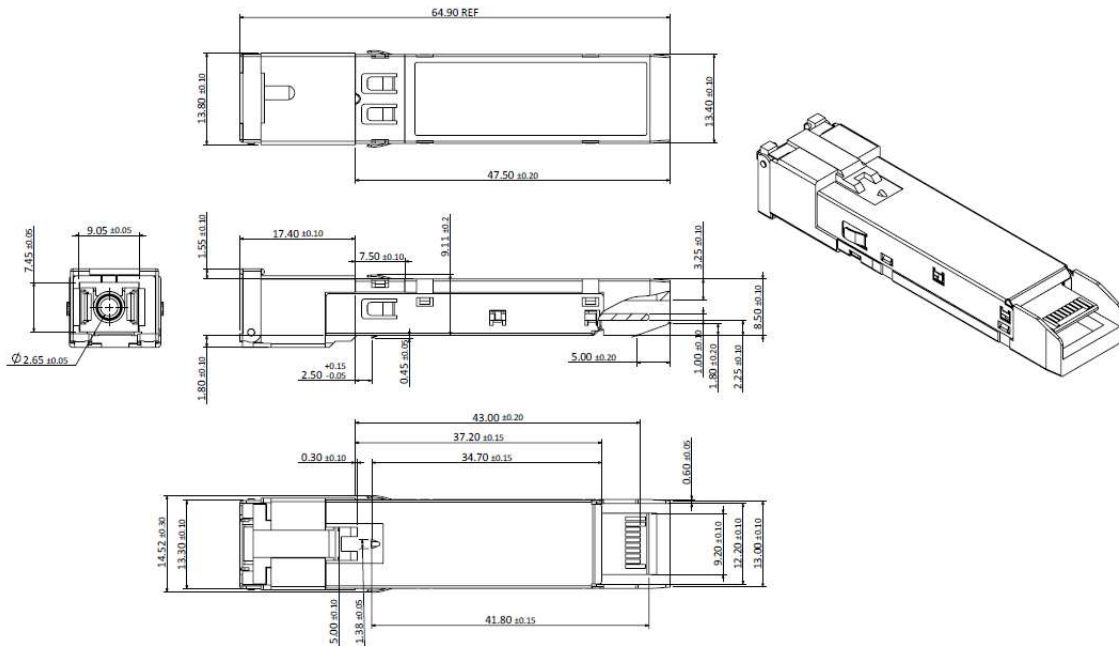
Note:

1. 1.244Gbps continuous-mode , PRBS2²³-1
2. Measured with 1490nm, 2.488Gbps PRBS2²³-1, ER=10dB.

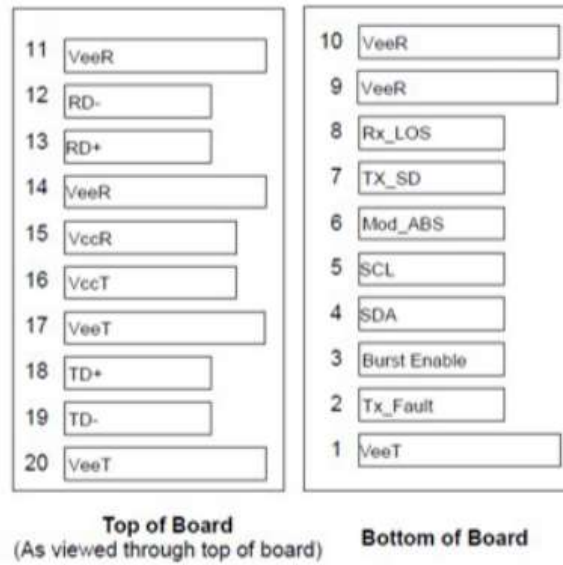
Digital Diagnostic Functions

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	+3	°C	
Supply voltage monitor absolute error	DMI_VCC	-3%	+3%	V	
TX power monitor absolute error	DMI_RX	-3	+3	dB	
RX power monitor absolute error	DMI_RX	-3	+3	dB	
Bias current monitor	DMI_Ibias	-10%	+10%	mA	

Mechanical Dimensions



Pin Assignment and Description



Pin Assignment

PIN #	Symbol	Description	Notes
1	VeeT	Transmitter Ground	Note 4
2	TX_Fault	Transmitter Fault Indication	Note 1
3	Burst Enable	Transmitter Burst Enable	Note 2
4	SDA	I ² C Data	Note 3
5	SCL	I ² C Clock	Note 3
6	MOD-ABS	Internally grounded	
7	TX-SD	Assert when transmitter is transmitting optical power	

8	RX-LOS	Receiver loss of signal indication, low indicates normal operation	
9	VeeR	Receiver Ground	Note4
10	VeeR	Receiver Ground	Note4
11	VeeR	Receiver Ground	Note 4
12	RD-	Inv. Received Data Out	Note 5
13	RD+	Received Data Out	Note 5
14	VeeR	Receiver Ground	Note 4
15	VccR	Receiver Power	Note 6
16	VccT	Transmitter Power	Note 6
17	VeeT	Transmitter Ground	Note 4
18	TD+	Transmit Data In	Note 7
19	TD-	Inv. Transmit Data In	Note 7
20	VeeT	Transmitter Ground	Note 4

Notes:

1. TX Fault is an open collector output, which should be pulled up with a 4.7k~10k Ω resistor on the hostboard to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.

2. This pin is an input that is used to shut down the transmitter optical output. Low shuts down the transmitter optical output .It is pulled up within the module with a 4.7k~10k Ω resistor. It's states are:

Low (0 – 0.8V): Transmitter on

(>0.8, < 2.0V): Undefined

High (2.0 – 3.465V): Transmitter Disabled

Open: Transmitter Disabled.

3. SDA and SCL is communication interface for I2C . They should be pulled up with a 4.7K – 10K Ω resistor on the host board. The pull-up voltage should be Vcc.

4. Vee is connected inside the SFP transceiver.

5. RD- and RD+ are externally DC-coupled to 100 Ω differential lines at the user host board.

6. Vcc is the receiver and transmitter power supply, respectively. They are defined as 3.3V 5% at the SFP connector pin. Maximum supply current is 500mA. Inductors with DC resistance of less than 1 Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage.

7. TD- and TD+ are the differential transmitter inputs. They are AC or DC coupled differential lines with 100 Ω differential termination inside the module. The AC or DC coupling is done inside the module and is thus not required on the host board.