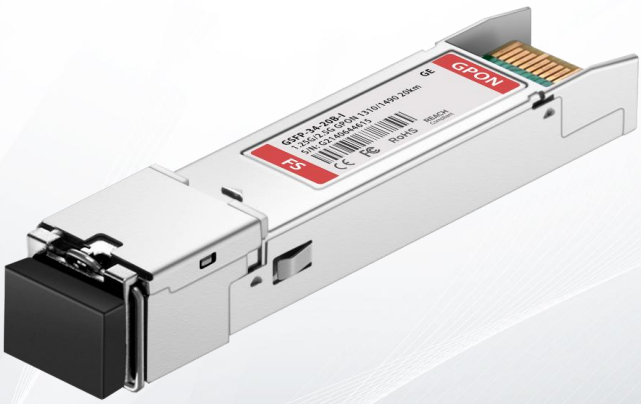
GPON ONU SFP 1310nm-TX/1490nm-RX 1.25G-TX/2.5G-RX Class B+ 20km DDM SC SMF Optical Transceiver Module

GSFP-34-20B-I



Application

- FTTx
- GPON Access network

Features

- Compliant to ITU-T G.984.2 GPON ONU Specifications
- SFP MSA, digital diagnostics SFF-8472 Compliant
- Simplex SC/APC Connector, Integrated Diplexer Transceiver
- Voice/Data FTTx ONT/ONU Applications
- 1244 Mbps Tx, 2488 Mbps Rx Asymmetric Data Rate
- Burst Mode Transmission
- TX Burst Mode Detection, TX_SD
- 28 dB link budget; Class B+, 20 km reach
- Compliant to IEC-60825 Class 1 laser diode
- RoHS compliant
- Internal Calibration
- Operating case temperature: Industry Temp: -40~85C

Description

The GPON ONU SFP transceiver provides an asymmetric 1.244Gbps upstream and 2.488Gbps downstream, reaching a link up to 20km over SMF via SC connector. It is fully compliant with SFP MSA, ITU-T G.984.2, IEC-60825 and is ideal for asymmetric passive optical network (GPON) system.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40	-	85	℃	I -temp
	Ts	0	-	70	℃	C-Temp
Supply Voltage	V_{CC}_Rx	-0.4	-	+4.2	V	
	V_{CC}_Tx	-0.4	-	V_{CC}_ Rx+1	V	
Operating Relative Humidity	RH	5	-	95	%	

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	Tc	-40	-	85	℃	I-Temp
	Tc	0	-	70	℃	C-Temp
Operating Voltage	V_{CC}	3.14	3.30	3.46	V	
Total TX and RX Supply Current	I_{CC}	-	-	350	dB	
Power Consumption	P_D	-	-	1	W	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Bit Rate(Tx)	BR	-	1244.16	-	Mbps	
Bit Rate(Rx)	BR	-	2488.32	-	Mbps	
Transmission Distance	TD	-	-	20,000	m	

III. Optical Characteristics

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Transmitter						
Centre Wavelength Range	λC	nm	1290	1310	1330	
Average Output Power	Pout	dBm	0.5	5	-	
Average Output Power (Laser Off)	Poff	dBm	-	-45	-	
Side Mode Suppression Ratio	SMSR	dB	30	-	-	
Spectral Width (-20dB)	λ20	nm			1	
Extinction Ratio	ER	dB	10	-	-	
Optical Rise and Fall Time	tr/ tf	ps			260	
Tx reflectance		dB			-6	
ORL of ODN at Oru and Ord		dB	32			
Tolerance to Transmitter Incident Light Power		dB	-15			

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Optical Eye Mask		Compliant with G.984.2				
Receiver						
Operating Wavelength	λC	nm	1480	1490	1500	
Sensitivity	PSEN	dBm			-27	1
Saturation	PSAT	dBm	-8			1
BER				1 x 10^- 10		
Damage Threshold		dBm			0	
Loss of Signal Assert	PLOSA	dBm	-45	-	-	
Loss of Signal Deassert	PLOSD	dBm			-28	
LOS Hysteresis		dB	0.5		6	
Rx Reflectance		dB			-20	
Tolerance to the Reflected Optical Power		dB			10	
1310nm Tx to1490nm Rx Crosstalk		dB	-	-	-45	
1490nm Rx to1555nm Isolation			30			
G.984.5 Wavelength Blocking Filter Isolation		dB	7	-	-	2
		dB	7	-	-	3
		dB	22	-	-	4
		dB	22	-	-	5

Notes:
1. Measured with a PRBS 2^23- 1 test pattern @2.488Gbps, ER=8.2, BER 1X10^- 10, pre-FEC,
2. 1490 Rx isolation for 1441 nm to 1450 nm
3. 1490 Rx isolation for 1530 nm to 1539 nm
4. 1490 Rx isolation for 1400 nm to 1441 nm
5. 1490 Rx isolation for 1539 nm to 1625 nm

IV. Electrical Specifications and Timing

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Transmitter						
Differential Data Input Voltage	VIN,P-P	mVpp	300	-	1800	1
Input Differential Impedance	ZIN	Q	-	100	-	2
Tx Burst EnableTime	TBURST_EN	ns	-	-	12.86	3
Tx Burst DisableTime	TBURST_DIS	ns	-	-	12.86	3
Transmitter						
Differential Output Voltage		mV	300	-	1200	4
Los Output HIGH Voltage	VLOS_High	V	2.4	-	-	5
Los Output LOW Voltage	VLOS_Low	V	0	-	0.4	6
Data Output Rise and Fall Time	TR/TF	ps	-	160	-	

Notes:
1. TXD+/-. DC-coupled.
2. TXD+/-.
3. 16 bits data @1244Mbps
4. CML output, AC coupled(0.1 F)
5. LVTTL with internal 10k pull up resistor. Asserts HIGH when input data amplitude is below threshold.
6. LVTTL. De-asserts LOW when input data amplitude is above threshold.

V. Recommended Host Board Power Supply Circuit

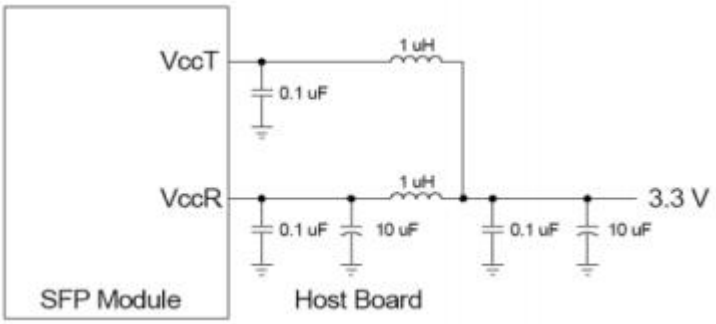


Figure 1, Recommended Host Board Power Supply Filtering Network

VI. Recommended Interface Circuit

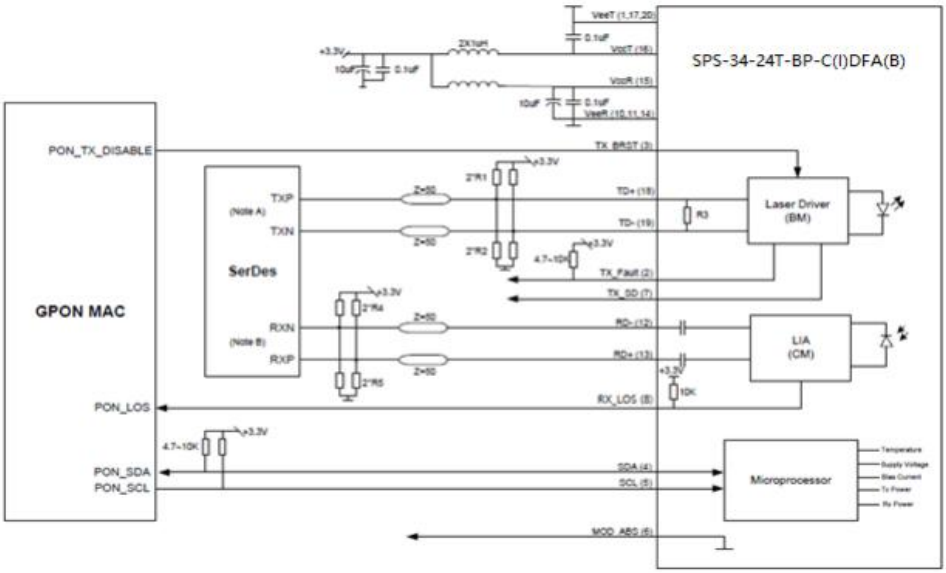


Figure 2, Recommended Interface Circuit

VII. Pin Function Definitions

Pin	Logic	Symbol	Name/Description	Note
1	NA	VeeT	Module Transmitter Ground	
2	LVTTL-O	TX_FAULT	Module Transmitter Fault	
3	LVTTL-I	TX_BRST	Transmitter Burst Control, Active Low	Low=TxEnable High=TxDisable
4	LVTTL-I/LVTTL-O	SDA	2-Wire Serial Interface Data Line (MOD-DEF2)	
5	LVTTL-I	SCL	2-Wire Serial Interface Clock (MOD-DEF1)	
6	NA	MOD_ABS	Module Absent, Connected to VeeT or VeeR in the Module	
7	LVTTL-O	TX_SD	TX Signal Detect	
8	LVTTL-O	LOS	Loss of Signal	
9	NA	NC	Not connected	
10	NA	VeeR	Module Receiver Ground	
11	NA	VeeR	Module Receiver Ground	
12	CML-O	RXD-	Receiver Inverted Data Output	
13	CML-O	RXD+	Receiver Non-Inverted Data Output	
14	NA	VeeR	Module Receiver Ground	
15	NA	VCCR	Module Receiver 3.3V Supply	
16	NA	VCCT	Module Transmitter 3.3V Supply	
17	NA	VeeT	Module Transmitter Ground	

Pin	Logic	Symbol	Name/Description	Note
18	CML-I	TXD+	Transmitter Non-Inverted Data Input, CML with 100 ohm differential Impedance	
19	CML-I	TXD-	Transmitter Inverted Data Input, CML with 100 ohm differential Impedance	
20	NA	VeeT	Module Transmitter Ground	

VIII. Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Notes
Temperature	-40 to 85	±5	ºC	Internal	LSB equal to 1/256C
Voltage	3 to Vcc	±3%	V	Internal	LSB equal to 100uV
Bias Current	0 to 100	10%	mA	Internal	LSB equal to 2uA
Tx Power	-0.5 to 5	±3	dBm	Internal	LSB equal to 0.1uW
Rx Power	-28 to -8	±3	dBm	Internal	LSB equal to 0.1uW

IX. Mechanical Diagram

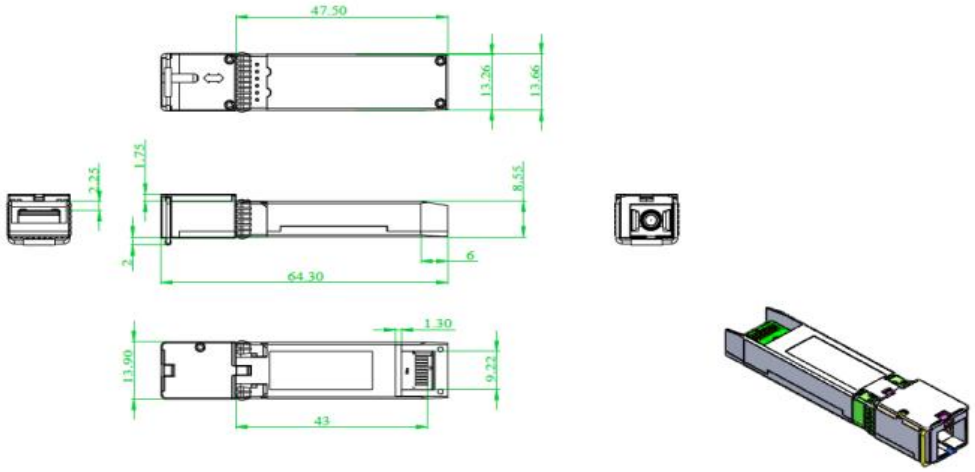


Figure3, outline drawing

Order Information

Part Number	Description
GSFP-34-20B-I	GPON ONU SFP 1310nm-TX/1490nm-RX 1.25G-TX/2.5G-RX Class B+ 20km DDM SC SMF Optical Transceiver Modules (Industrial)
GSFP-34-20C-I	GPON ONU SFP 1310nm-TX/1490nm-RX 1.25G-TX/2.5G-RX Class C+ 20km DDM SC SMF Optical Transceiver Module (Industrial)
GSFP-43-20B	GPON OLT SFP 1490nm-TX/1310nm-RX 2.5G-TX/1.25G-RX Class B+ 20km DDM SC SMF Module
GSFP-43-20C	GPON OLT SFP 1490nm-TX/1310nm-RX 2.5G-TX/1.25G-RX Class C+ 20km DDM SC SMF Transceiver Modules
GSFP-43-20B+L-I	GPON OLT SFP 1490nm-TX/1310nm-RX 2.5G-TX/1.25G-RX Class B+ 20km DDM SC SMF Optical Transceiver Module
GSFP-43-20C++L-I	GPON OLT SFP 1490nm-TX/1310nm-RX 2.5G-TX/1.25G-RX Class C++ 20km DDM SC SMF Optical Transceiver Module
GPON-ONU-34-20BI	GPON SFP ONU Stick with Mac