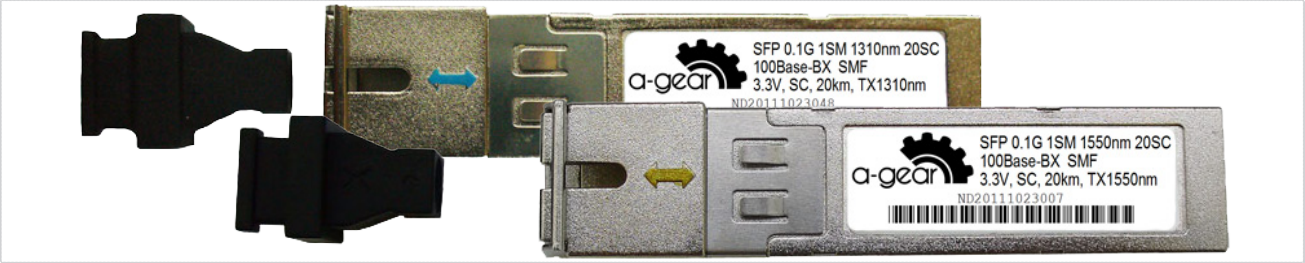
Product Specification
SFP WDM 100M 20km SC Transceiver



1. Product features

- Up to 155Mb/s data links
- 1310nm FP laser transmitter for XGSF-BS3503-20
- 1550nm DFB laser transmitter for XGSF-BS5303-20
- Up to 20km on 9/125μm SMF
- Hot-pluggable SFP footprint
- BIDI SC/UPC type pluggable optical interface
- Low power dissipation
- Metal enclosure, for lower EMI
- RoHS compliant and lead-free
- Single +3.3V power supply
- Compliant with SFF-8472
- Operating case temperature
  Commercial: 0°C to +70°C
  Extended: -10°C to +80°C
  Industrial: -40°C to +85°C

2. Applications

- Switch to Switch Interface
- Fast Ethernet
- Switched Backplane Applications
- Router/Server Interface
- Other Optical Links

3. Product description

SFP WDM 100M 20km SC Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA), The tansceiver consists of four sections: the LD driver, the limiting amplifier, the 1310nm FP laser (the 1550nm DFB laser) and the PIN photo-detector.The module data link up to 20KM in 9/125um single mode fiber.

The optical output can be disabled by a TTL logic high-level input of Tx Disable, and the system also can disable the module via I2C. Tx Fault is provided to indicate that degradation of the laser. Loss of signal (LOS) output is provided to indicate the loss of an input optical signal of receiver or the link status with partner. The system can also get the LOS(or Link)/ Disable/Fault information via I2C register access.

4. Absolute Maximum Ratings

Rating	Symbol	Min.	Max.	Units
Storage Temperature	Ts	-40	85	ºC
Storage Ambient Humidity	HA	5	95	%
Power Supply Voltage	VCC	-0.5	4	V
Signal Input Voltage		-0.3	Vcc+0.3	V
Receiver Damage Threshold		0		dBm
Lead Soldering Temperature/Time	TSOLD		260/10	ºC/sec [1]
Lead Soldering Temperature/Time	TSOLD		380/10	ºC/sec [2]

Notes:
[1] Suitable for wave solderin
[2] Only for soldering by iron

5. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Ambient Operating Temperature	TA	0		70	ºC
		-10		80	
		-40		85	
Ambient Humidity	HA	5		70	% [1]
Power Supply Voltage	VCC	3.13	3.3	3.47	V
Power Supply Current	ICC			280	mA
Power Supply Noise Rejection				100	mVp-p [2]
Data Rate			155/155		Mbps [3]
Transmission Distance				20	KM
Coupled Fiber		Single mode fiber (9/125um G.652)			

Notes:
[1] 4 Non-condensing
[2] 100Hz to 1MHz
[3] TX Rate/RX Rate

6. Specification of Transmitter

Parameter	Symbol	Min.	Typical	Max.	Unit
Average Output Power	POUT	-15		-8	dBm
Extinction Ratio	ER	8.2			dB
Center Wavelength	λC	1270	1310	1360	nm
		1530	1550	1570	
Spectrum Width (RMS)	σ			7	Nm [4]
Side Mode Suppression Ratio	SMSR	30			dB [5]
Spectrum Bandwidth(-20dB)	σ			1	nm [5]
Transmitter OFF Output Power	POff			-32	dBm
Differential Line Input Impedance	RIN	90	100	110	Ohm
Optical Rise/Fall Time	tr/tf			3	ns [1]
Total Jitter	tJ			1	ns [2]
Output Eye Mask	Compliant with G957(class 1 laser safety) [3]				

Notes:
[1] These are unfiltered 20-80% values.
[2] Measure at 2^{23}-1 NRZ PRBS pattern
[3] Transmitter eye mask definition
[4] FP Laser (TX:1310nm)
[5] DFB Laser (TX:1550nm)

7. Specification of Receiver

Parameter	Symbol	Min.	Typical	Max.	Unit
Input Optical Wavelength	λIN	1530	1550	1570	nm
		1270	1310	1360	
Receiver Sensitivity	PIN			-29	dBm [1]
Input Saturation Power (Overload)	PSAT	-8			dBm
Signal Detect -Assert Power	PA			-30	dBm
Signal Detect -Deassert Power	PD	-38			dBm [2]
Signal Detect Hysteresis	PA-PD	0.5	2	6	dB
Data Output Rise/Fall time	tr/tf			0.25	ns [3]

Notes:
[1] Measured with Light source 1550nm(1310nm), ER=9dB; BER =<10^{-10} @PRBS=2^{23}-1 NRZ
[2] When SD deasserted, the RX-LOS output is High-level (fixed)
[3] These are 20%~80% values.

8. Electrical Interface Characteristics

Parameter	Symbol	Min.	Max.	Unit
Transmitter				
Total Supply Current	ICC		A	mA [1]
Transmitter Disable Input-High	VDISH	2	Vcc+0.3	V
Transmitter Disable Input-Low	VDISL	0	0.8	V
Transmitter Fault Input-High	VDISL	2	Vcc+0.3	V
Transmitter Fault Input-Low	VTxFH	0	0.8	V
Receiver				
Total Supply Current	ICC		B	mA [1]
LOSS Output Voltage-High	VLOSH	2	Vcc+0.3	V [2]
LOSS Output Voltage-Low	VLOSL	0	0.8	V [2]

Notes:
[1] A (TX)+ B (RX) = 280 mA (Not include termination circuit)
[2] LVTTL

9. Pin Descriptions

Pin	Symbol	Name/Description
1	VEET	Transmitter Ground (Common with Receiver Ground) [1]
2	TFAULT	Transmitter Fault. Not supported.
3	TDIS	Transmitter Disable. Laser output disabled on high or open. [2]
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID. [3]
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID. [3]
6	MOD_DEF(0)	Module Definition 0. Grounded within the module. [3]
7	Rate Select	No connection required [4]
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation. [5]
9	VEER	Receiver Ground (Common with Transmitter Ground) [1]
10	VEER	Receiver Ground (Common with Transmitter Ground) [1]
11	VEER	Receiver Ground (Common with Transmitter Ground) [1]
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver Non-inverted DATA out. AC Coupled
14	VEER	Receiver Ground (Common with Transmitter Ground) [1]
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET	Transmitter Ground (Common with Receiver Ground) [1]
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.
19	TD-	Transmitter Inverted DATA in. AC Coupled.
20	VEET	Transmitter Ground (Common with Receiver Ground) [1]

Notes:

[1] Circuit ground is internally isolated from chassis ground.

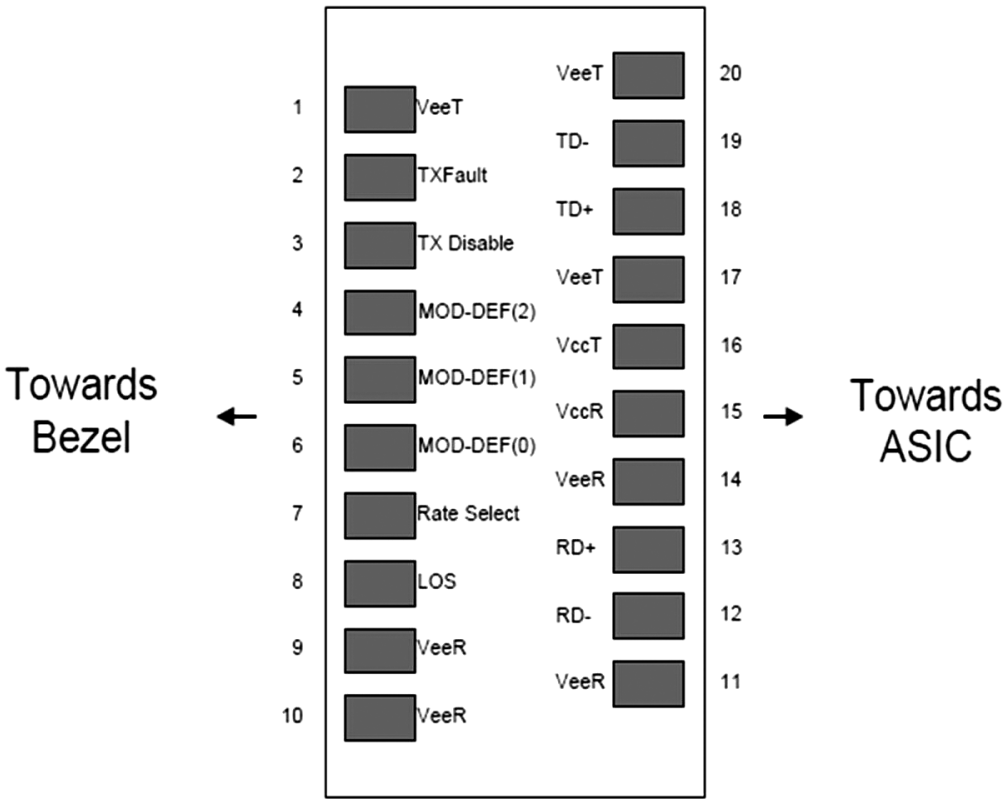
[2] Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

[3] Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.

[4] This is an optional input used to control the receiver bandwidth for compatibility with multiple data rates (most likely Fibre Channel 1x and 2x Rates). If implemented, the input will be internally pulled down with > 30kΩ resistor. The input states are:

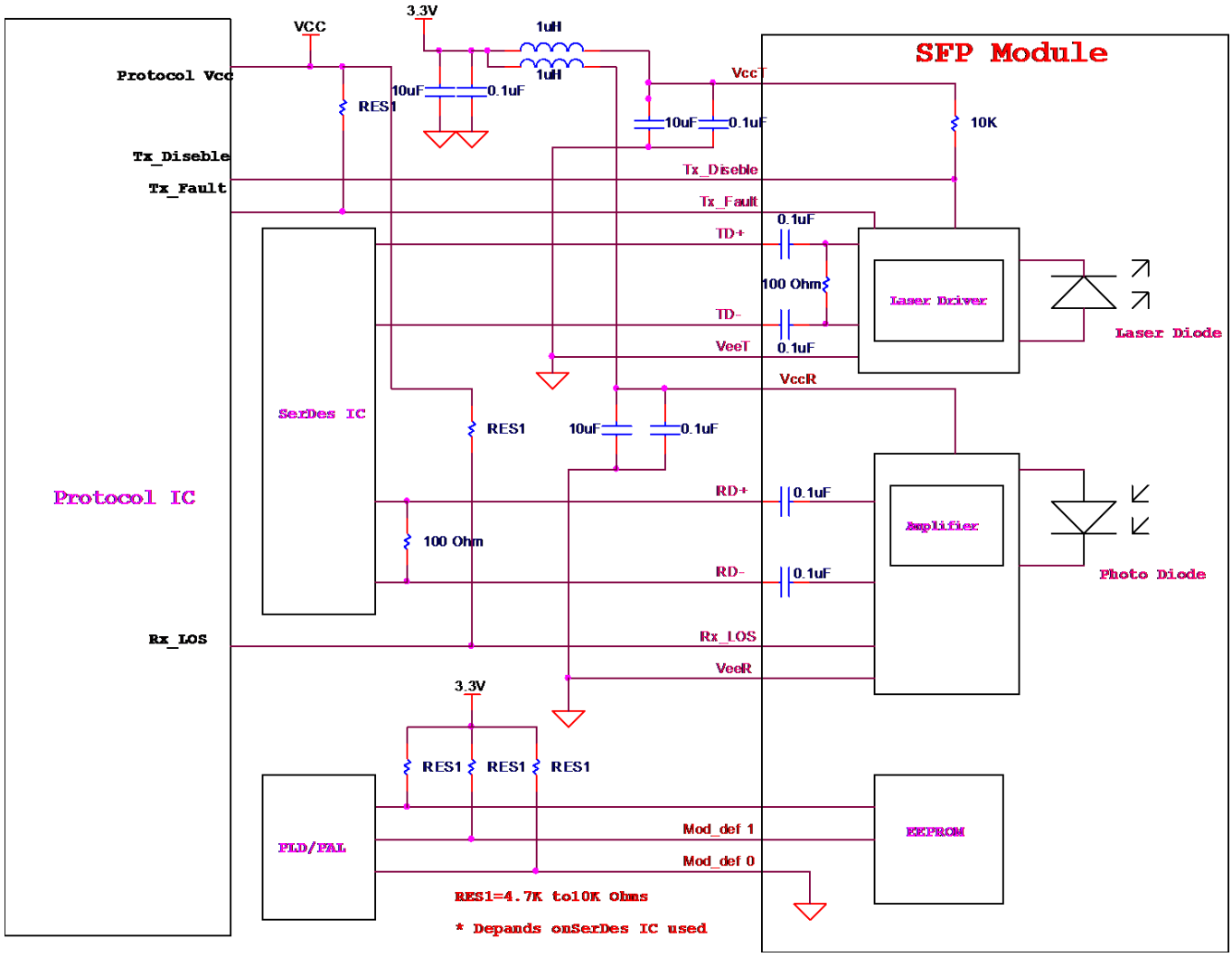
Low (0 – 0.8V):	Reduced Bandwidth
(>0.8 , < 2.0V):	Undefined
High (2.0 – 3.465V):	Full Bandwidth
Open:	Reduced Bandwidth

[5] LOS is open collector output. Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.



Pinout of Connector Block on Host Board

10. Recommend Circuit Schematic



11. Mechanical Specifications

(Unit:mm)