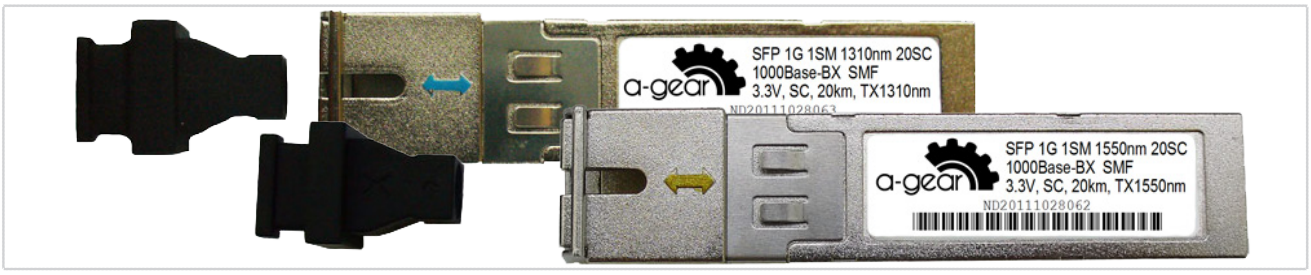
A-GEAR World Wide Manufacturing

Product Specification
SFP WDM 1G 20 km SC Transceiver



Product features

- Up to 1.25 Gb/s bi-directional data links
- Hot-pluggable SFP footprint
- 1310nm FP Transmitter and 1550 PIN Receiver for SFP-1SM-1310nm-20SC
- 1550 DFB Transmitter and 1310 PIN Receiver for for SFP-1SM-1550nm-20SC
- Single SC connector
- Low power dissipation
- Metal enclosure, for lower EMI
- Up to 20km point to point transmission
- Digital Diagnostical Management support
- Single 3.3 V power supply
- Compatible with SFP MSA
- Operating temperature range: -40°C to 85°C

Applications

- Ethernet
- Point-to-point FTTX Application

Absolute Maximum Ratings

Rating	Symbol	Min.	Max.	Units
Maximum Supply Voltage	Vcc	-0.5	4.7	V
Storage Temperature	TS	-40	85	°C
Case Operating Temperature	TOP	-40	85	°C

Electrical Characteristics

(TOP = -40 to 85°C, VCC = 3.15 to 3.60Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	Vcc	3.15	3.3	3.6	V
Supply Current	Icc		185	250	mA
Transmitter					
Input differential impedance	Rin		100		Ω [1]
Single ended data input swing	Vin,pp	250		1200	mV
Transmit Disable Voltage	VD	Vcc-1.3		Vcc	V
Transmit Enable Voltage	VEN	Vee		Vee+ 0.8	V [2]
Transmit Disable Assert Time				10	us
Receiver					
Single ended data output swing	Vout,pp	250		800	mV [3]
Data output rise time	tr		100	175	ps [4]
Data output fall time	tf		100	175	ps [4]
LOS Fault	VLOS fault	Vcc-0.5		VccHOST	V [5]
LOS Normal	VLOS norm	Vee		Vee+0.5	V [5]
Power Supply Rejection	PSR	100			mVpp [6]

Notes:

[1] Connected directly to TX data input pins. AC coupled thereafter.
[2] Or open circuit.
[3] Into 100 ohms differential termination.
[4] 20 - 80 %
[5] Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
[6] Receiver sensitivity is compliant with power supply sinusoidal modulation of 20 Hz to 1.5 MHz up to specified value applied through the recommended power supply filtering network.

Optical Characteristics

(TOP = -40 to 85°C, VCC = 3.15 to 3.60 Volts)

SFP-1SM-1310nm-20SC

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Output Opt. Power (End of Life)	POUT	-8.0		-3.0	dBm [1]
Optical Wavelength	λ	1270	1310	1360	nm
Wavelength Temperature Dependence			0.08	0.125	nm/°C
Spectral Width (-20dB)	σ			3.0	nm
Optical Extinction Ratio	ER	8			dB
Sidemode Suppression ratio	SSRmin	30			dB

Parameter	Symbol	Min.	Typical	Max.	Unit
Optical Rise/Fall Time	tr/ tf		100	160	ps
RIN	RIN			-120	dB/Hz
Transmitter Jitter (peak to peak)				100	ps
Receiver					
Average Rx Sensitivity @ 1.25G	RSENS3			-23.0	dBm [2]
Maximum Input Power	PMAX	-3.0			dBm
Optical Center Wavelength	iC	1530	1550	1570	nm
LOS De -Assert	LOSD			-30	dBm
LOS Assert	LOSA	-35			dBm
LOS Hysteresis		0.5		4	dB
Receiver Jitter Generation @1.25Gbps				160	ps [3]

SFP-1SM-1550nm-20SC

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Output Opt. Pwr (End of Life)	POUT	-8.0		-3.0	dBm [1]
Optical Wavelength	λ	1540	1550	1560	nm
Wavelength Temperature Dependence			0.08	0.125	nm/°C
Spectral Width (-20dB)	σ			3.0	nm
Optical Extinction Ratio	ER	8			dB
Sidemode Suppression ratio	SSRmin	30			dB
Optical Rise/Fall Time	tr/ tf		100	160	ps
RIN	RIN			-120	dB/Hz
Transmitter Jitter (peak to peak)				100	ps
Receiver					
Average Rx Sensitivity @1.25G	RSENS3			-23.0	dBm [2]
Maximum Input Power	PMAX	-3.0			dBm
Optical Center Wavelength	XC	1260	1310	1360	nm
LOS De -Assert	LOSD			-30	dBm
LOS Assert	LOSA	-35			dBm
LOS Hysteresis		0.5		4	dB
Receiver Jitter Generation @1.25Gbps				160	ps [3]

Notes:

[1] Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.

[2] With worst-case extinction ratio. Measured with a PRBS 2^7-1 test pattern, @1.25Gb/s, BER<10^{-12}.

[3] Jitter added by receiver (peak to peak). Measured at -18.0dBm average Rx sensitivity, PRBS 2^7 -1 test pattern.

Pin Descriptions

Pin	Symbol	Name/Description
1	V_{EET}	Transmitter Ground (Common with Receiver Ground) [1]
2	T_{FAULT}	Transmitter Fault. [2]
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open. [3]
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID. [4]
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID. [4]
6	MOD_DEF(0)	Module Definition 0. Grounded within the module. [4]
7	Rate Select	No connection required
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation. [5]
9	V_{EER}	Receiver Ground (Common with Transmitter Ground) [1]
10	V_{EER}	Receiver Ground (Common with Transmitter Ground) [1]
11	V_{EER}	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	V_{EER}	Receiver Ground (Common with Transmitter Ground) [1]
15	V_{CCR}	Receiver Power Supply
16	V_{CCT}	Transmitter Power Supply
17	V_{EET}	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	V_{EET}	Transmitter Ground (Common with Receiver Ground) [1]

Notes:

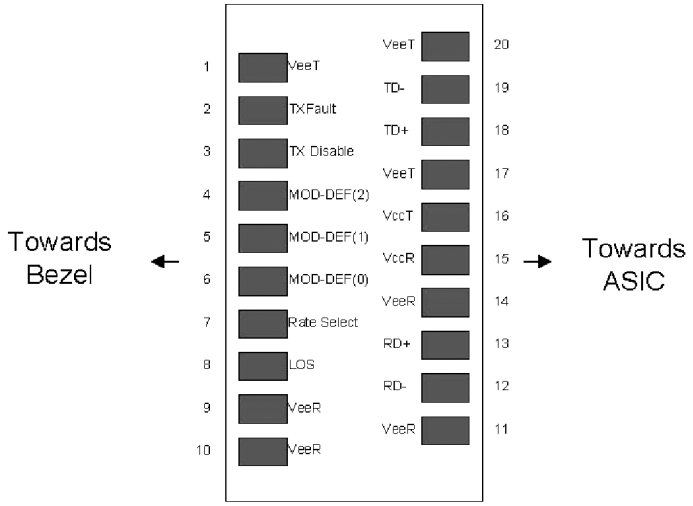
[1] Circuit ground is internally isolated from chassis ground.

[2] T_{FAULT} is an open collector/drain output, which should be pulled up with a 4.7k - 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3 V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.

[3] Laser output disabled on T_{DIS} >2.0V or open, enabled on T_{DIS} <0.8V.

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

[5] LOS is open collector output. Should be pulled up with 4.7k - 10 kohms 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

Mechanical Dimensions