

A-GEAR Product Specification

Single Fiber Bi-directional SFP Tranceiver SFP-1SM-20SC

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 10km point to point transmission
Digital Diagnostical Management support
Single 3.3V power supply
Compatible with SFP MSA
Operating temperature range: -40°C to 85°C

APPLICATIONS

Ethernet
Point-to-point FTTX Application

PRODUCT SELECTION

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
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	Typ	Max	Unit	Ref.
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



Notes:

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

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Pwr (End of Life)	POUT	-8.0		-3.0	dBm	1
Optical Wavelength	λ	1270	1310	1360	nm	
Wavelength Temperature Dependance			0.08	0.125	nm/°C	
Spectral Width (-20dB)	σ			3.0	nm	
Optical Extinction Ratio	ER	8			dB	
Sidemode Supression 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	RSNS3			-23.0	dBm	2
Maximum Input Power	PMAX	-3.0			dBm	
Optical Center Wavelength	λ C	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

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						



SFP-1SM-20SC DATASHEET

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Wavelength Temperature Dependence			0.08	0.125	nm/°C	
Spectral Width (-20dB)	σ			3.0	nm	
Optical Extinction Ratio	ER	8			dB	
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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	RSSENS3			-23.0	dBm	2
Maximum Input Power	PMAX	-3.0			dBm	
Optical Center Wavelength	λC	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.

PRODUCT SELECTION

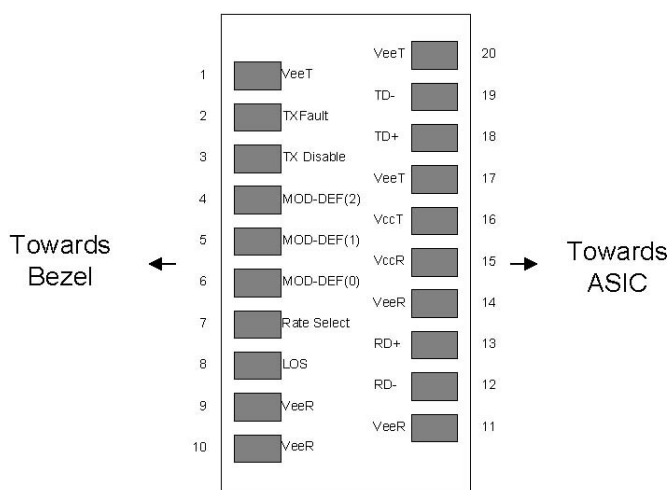
Pin Descriptions

Pin	Symbol	Name/Description	Ref.
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

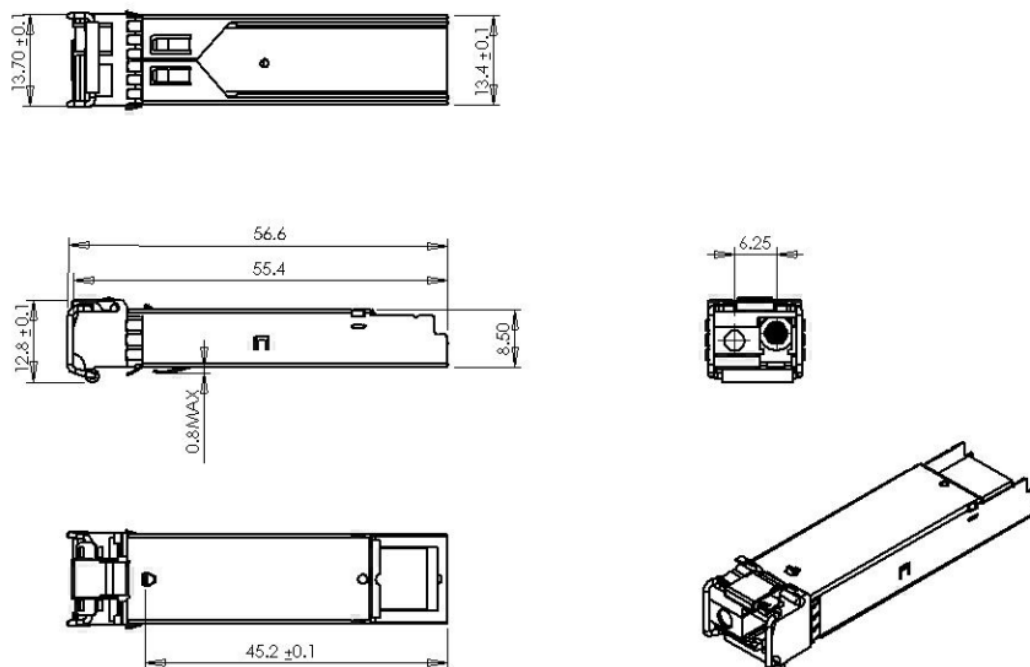
Notes:

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 + 0.3V. 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 Specifications



Visual look

