PRODUCT SPECIFICATION

Part No.:	AC-SF-Q2G1-120	
Description:	1.25G SFP Transceiver, DWDM 120km	
Release Date	**Rev.**	**Revision Change Description**
2015/07/16	**A0**	New Release
2020/12/28	**A1**	Template Update

Features

- Up to 1.25Gbps Data Links
- Transceiver unit with independent DWDM DFB Laser
- diode transmitter APD photodiode receiver
- Metal enclosure, for lower EMI
- Single +3.3V power supply
- 100GHz ITU Grid, C Band
- Duplex LC/UPC type pluggable optical interface
- Operating temperature range:
- Commercial: 0℃~+70℃
- Industrial: -40~+85℃
- RoHS Compliant
- Wavelength controlled within ± 0.1nm over life and temperature
- Digital diagnostic monitoring
- 120 km with 9/125 μm single mode fiber (SMF) of maximum interconnect distances
- Low power dissipation

Application

- C Band DWDM networks
- SONET/SDH networks
- Fiber channel
- Gigabit Ethernet

Standard

- Compliant with SFF-8472
- Compliant with DWDM SFP MSA

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Wavelength Selection

Channel	Wavelength (nm)	Frequency(THZ)	Channel	Wavelength (nm)	Frequency(THZ)
C17	1563.86	191.70	C39	1546.12	193.90
C18	1563.05	191.80	C40	1545.32	194.00
C19	1562.23	191.90	C41	1544.53	194.10
C20	1561.42	192.00	C42	1543.73	194.20
C21	1560.61	192.10	C43	1542.94	194.30
C22	1559.79	192.20	C44	1542.14	194.40
C23	1558.98	192.30	C45	1541.35	194.50
C24	1558.17	192.40	C46	1540.56	194.60
C25	1557.36	192.50	C47	1539.77	194.70
C26	1556.55	192.60	C48	1538.98	194.80
C27	1555.75	192.70	C49	1538.19	194.90
C28	1554.94	192.80	C50	1537.40	195.00
C29	1554.13	192.90	C51	1536.61	195.10
C30	1553.33	193.00	C52	1535.82	195.20
C31	1552.52	193.10	C53	1535.04	195.30
C32	1551.72	193.20	C54	1534.25	195.40
C33	1550.92	193.30	C55	1533.47	195.50
C34	1550.12	193.40	C56	1532.68	195.60
C35	1549.32	193.50	C57	1531.90	195.70
C36	1548.51	193.60	C58	1531.12	195.80
C37	1547.72	193.70	C59	1530.33	195.90
C38	1546.92	193.80	C60	1529.55	196.00
Non-ITU	Peak wavelength between 1528.77nm-1563.86		C61	1528.77	196.10

Specification

Absolute Maximum Ratings				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Storage temperature	TS	-40	85	℃
Power Supply Voltage	Vcc3	-0.5	+4	V
Relative Humidity	RH	5	95	%
Signal Input Voltage		-0.3	Vcc+0.3	V
Receiver Damage Threshold			+5	dBm

Recommended Operating Conditions					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Operating Case Temperature (Commercial)	Tc	0		70	℃
Operating Case Temperature (Industrial)	Tc	-40		85	
Power Supply Voltage	Vcc3	3.13	3.3	3.47	V
Supply Current	Icc3			360	mA
Power Supply Noise Rejection				100	100 mVp-p
Data Rate			1.25		Gbps
Fiber Length 9/125μm core SMF		-	120	-	km

Electrical Characteristics						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Transmit Total Supply Current	Icc			A	mA	1
Transmit disable voltage	VIH	2		Vcc+0.3	V	
Transmit enable voltage	VIL	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
LOS output high level	VLOS-H	2		Vcc+0.3	V	2
LOS output low level	VLOS-L	0		0.8	V	2

Notes:

1) A (TX) + B (RX) =360mA (Not include termination circuit).

2) Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

Optical transmitter Characteristics						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Launched Power (avg.)	Pout	0		5	dBm	3
Center Wavelength Spacing			100		GHz	
Operating Wavelength Range	λc	λ-100	λ	λ+100	nm	4
Spectral Width(-20dB)	Δλ			0.3	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	9			dB	
Transmitter OFF Output Power	POff			-45	dBm	
Differential Line Input Impedance	RIN	90	100	110	Ohm	
Output Eye Diagram	Compliant with IEEE802.3ae eye mask					

Optical receiver Characteristics							
Parameter		Symbol	Min	Typical	Max	Unit	Notes
Receiver Sensitivity		S			-30	dBm	5
Wavelength Range		λc	1270		1610	nm	
Optical Power Input Overload		P_{in-max}	-6			dBm	
Receiver Damage Threshold					5	dBm	
LOS	Optical De-assert	Pd			-31	dBm	
	Optical Assert	Pa	-40				
LOS hysteresis			0.5	2	6	dB	

Notes:

3) Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.

4) "λ" specified ITU center wavelength，please the "Wavelength selection".

5) Receiver Reflectance Measured with a PRBS 2^{23}-1 test pattern, @1250Mbps, ER=9dB, BER<10^{-12}.

Pin Descriptions

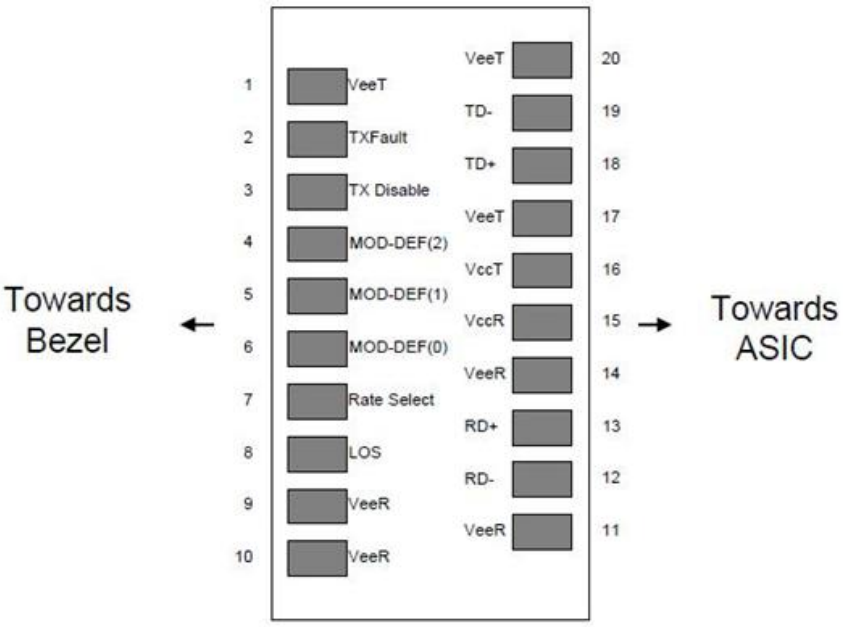


Diagram of Host Board Connector Block Pin Numbers and Name

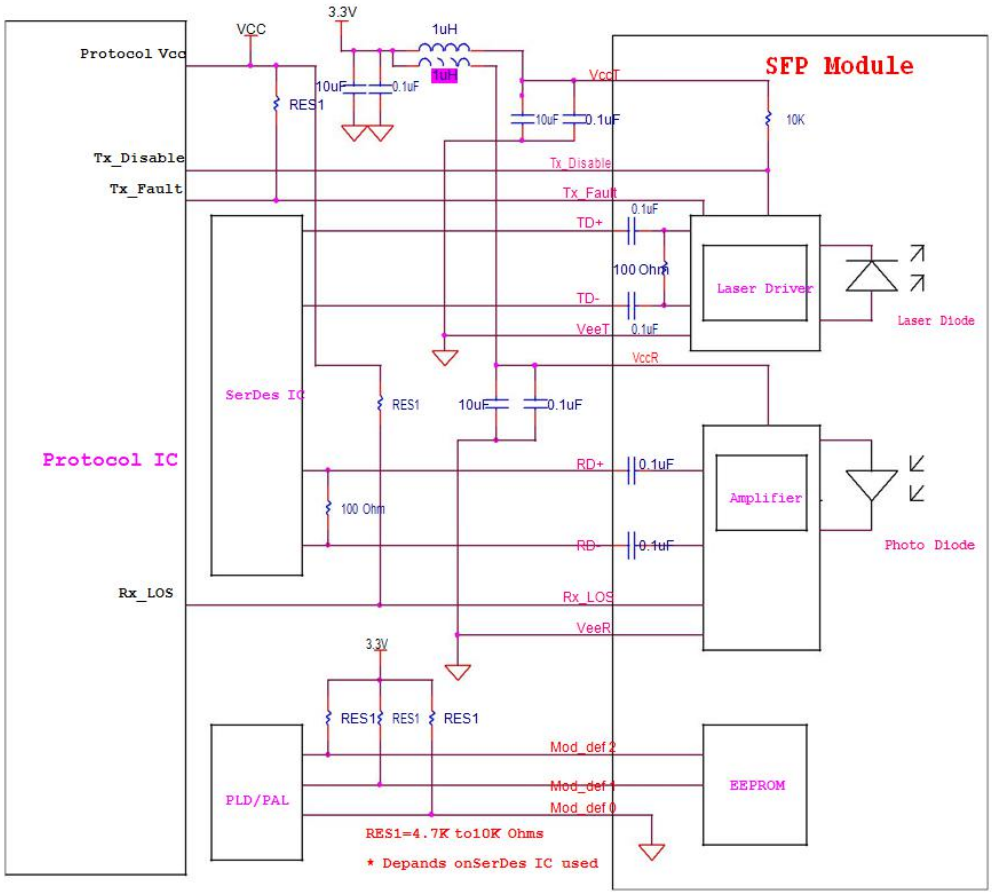
Pin Assignment

Pin	Symbol	Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground)	1
2	TX_Fault	Transmitter Fault, Low: normal; High: abnormal	2
3	TX_Disable	Transmitter Disable High: Transmitter off Low: Transmitter on	3
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. CML-O	
13	RD+	Receiver Non-inverted DATA out. AC Coupled. CML-O	
14	VeeR	Receiver Ground	1
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. CML-I	
19	TD-	Transmitter Inverted DATA in. AC Coupled. CML-I	
20	VeeT	Transmitter Ground (Common with Receiver Ground)	1

Notes:

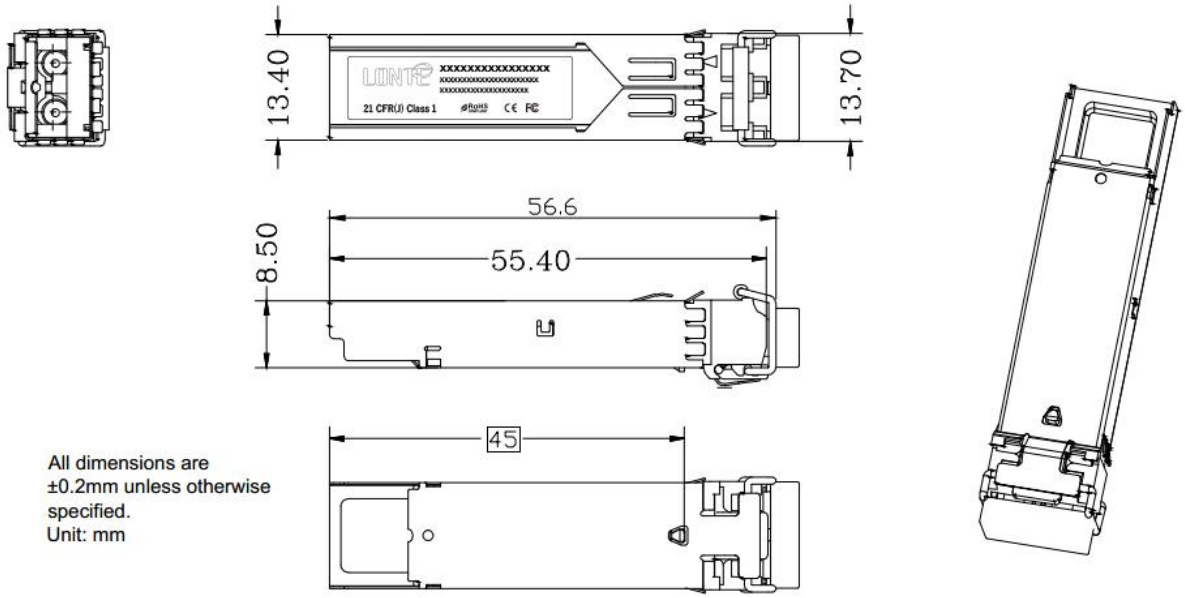
1) Circuit ground is internally isolated from chassis ground.
2) TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault 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 TDIS >2.0V or open, enabled on TDIS <0.8V.
4) This is an optional input used to control the receiver bandwidth for compatibility with multiple data rates (most likely Fiber 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
5) LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a typical 3.3V voltage. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Block Diagram



Package Outline

Dimensions are in millimeters. All dimensions are ±0.2mm unless otherwise specified. (Unit: mm)



Regulatory Compliance

Feature	Test	Method
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>1000V for SFI pins, >2000Vfor other pins.)
Electrostatic Discharge (ESD) Immunity	IEC61000-4-2	Class 2(>4.0kV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B FCC Class B CENELEC EN55022 VCCI Class 1	Comply with standard
Immunity	IEC61000-4-3	Comply with standard
Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1,2	Compatible with Class I laser Product

Ordering information

Part. No	Specifications								
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	RX	Sen (dBm)	Temp (℃)	Reach (km)	DDM
AC-SF-Q2G1-120	SFP	1.25	DWDM DFB	0~5	APD	＜-30	0~70	120	Y
AC-SF-Q2G1-120F	SFP	1.25	DWDM DFB	0~5	APD	＜-30	-40~85	120	Y