

PRODUCT SPECIFICATION

Part No.:	AC-XF-Q2G10-40	
Description:	10G XFP Transceiver, DWDM 40km	
Release Date	Rev.	Revision Change Description
2016/07/16	A0	New Release
2020/12/28	A1	Template Update

Features

- ✧ Supports 9.95Gbps to 11.3Gbps bit rates
- ✧ Cooled DWDM EML and PIN receiver
- ✧ Supports Lineside and XFI loopback
- ✧ Full Duplex LC connector
- ✧ Metal enclosure, for lower EMI
- ✧ Single +3.3V power supply
- ✧ Hot-pluggable XFP footprint
- ✧ Power dissipation < 2.5W
- ✧ Operating temperature range:
- ✧ Commercial: 0°C~+70°C
- ✧ Industrial: -40 to +85°C
- ✧ RoHS Compliant
- ✧ No Reference Clock required
- ✧ Built-in digital diagnostic functions
- ✧ Standard bail release mechanism
- ✧ Maximum link length of 40km

Application

- ✧ 10GBASE-ER/EW
- ✧ 10G Ethernet
- ✧ SONET OC-192 &SDH STM 64

Standard

- ✧ Compliant with SFF-8472
- ✧ Compliant with XFP MSA
- ✧ Compliant to IEEE 802.3ae

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	°C
Power Supply Voltage	Vcc3	-0.3	+3.6	V
Power Supply Voltage	Vcc2	-0.3	+2.0	V
Relative Humidity	RH	5	95	%
Signal Input Voltage		Vcc-0.3	Vcc+0.3	V

Recommended Operating Conditions

Parameter		Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard	Tc	0		+70	°C
	Industrial		-40		+85	°C
Power Supply Voltage		Vcc3	3.13	3.30	3.47	V
Power Supply Current		Vcc3			640	mA
Data Rate				10.3	11.3	Gbps
Fiber Length 9/125μm core SMF			-	40	-	km

Electrical Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Supply Voltage – 1.8V supply	Vcc2	1.71		1.89	V	
Supply Voltage – 3.3V supply	Vcc3	3.13		3.47	V	
Supply Current – 1.8V supply	Icc2			180	mA	
Supply Current – 3.3V supply	Icc3			640	mA	
Module total power	P			2.5	W	
Transmitter differential input voltage	Vin,pp	120		820	mV	
Receiver differential output Voltage	Vout,pp	340	650	850	mV	
Input differential impedance	Rin		100		Ω	1
LOS Fault	VLOS fault	Vcc-0.5		VccHost	V	2
LOS Normal	VLOS norm	GND		GND+0.5	V	2
Transmit disable voltage	VIH	2.0		Vcc	V	
Transmit enable voltage	VIL	GND		GND+0.8	V	
Data output rise time	Tr	38			ps	
Data output fall time	Tf	38			ps	
Transmit Disable Assert Time				10	us	
Power Supply Rejection	PSR			100	mVpp	3

Notes:

- 1) Connected directly to TX data input pins. AC coupled thereafter.
- 2) Loss Of Signal is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
- 3) 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 transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Launched Power (avg.)	P _{out}	-1		4	dBm	1
Operating Wavelength Range	λ_c	$\lambda-0.1$		$\lambda+0.1$	nm	2
Center Wavelength Spacing			100		GHz	
Spectral Width(-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	8.2			dB	
Average Launch power of OFF transmitter	P _{OFF}			-30	dB	
Output Eye Diagram	Compliant with IEEE802.3ae eye mask					
Optical receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Sensitivity	S			-16.5	dBm	3
Input Saturation Power (Overload)	P _{sat}	0.5			dBm	
Wavelength Range	λ_c	1270		1610	nm	
Receiver Reflectance	R _f			-27	dBm	
LOS	Optical De-assert	P _d		-18	dBm	
	Optical Assert	P _a	-32			
LOS hysteresis		0.5			dB	

Notes:

- 4) Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.
- 5) “ λ ” please the “product selection”.
- 6) Receiver Reflectance Measured with a PRBS 2³¹-1 test pattern, @10.3125Gbps, ER=8.2dB, BER<10⁻¹².

Digital Diagnostic Monitoring Information

As defined by the XFP MSA, LONTE XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

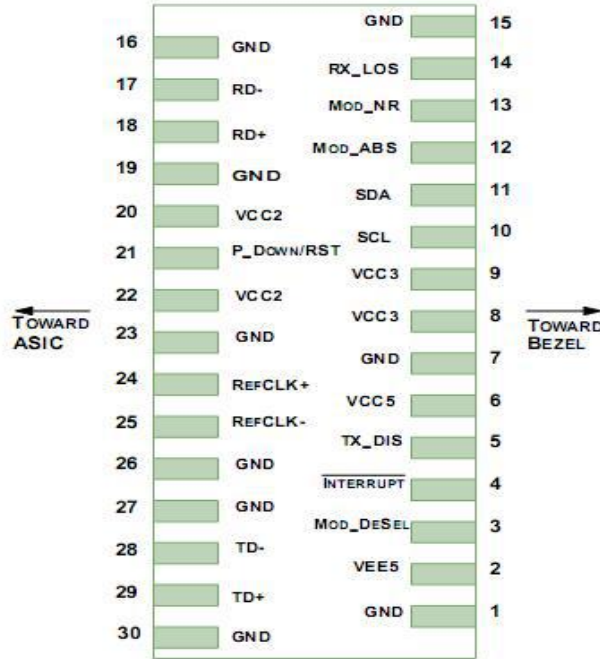
- Transceiver temperature
- Laser bias current
- Transmitted optical power
- Received optical power
- Transceiver supply voltage

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the host. The positive edge clocks data into the XFP transceiver into those segments of its memory map that are not write-protected. The negative edge clocks data from the XFP transceiver. The serial data signal (SDA pin) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories

are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory. For more detailed information including memory map definitions, please see the XFP MSA Specification.

Pin Descriptions



Pin Assignment

Pin	Symbol	Description	Notes
1	GND	Module Ground(Common with Receiver Ground)	1
2	VEE5	Optional -5.2 Power Supply – Not required	
3	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6	VCC5	+5 Power Supply	
7	GND	Module Ground	1
8	VCC3	+3.3V Power Supply	
9	VCC3	+3.3V Power Supply	
10	SCL	Serial 2-wire interface clock	2
11	SDA	Serial 2-wire interface data line	2
12	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	2
13	Mod_NR	Module Not Ready; XGIGA defines it as a logical OR between RX_LOS and Loss of Lock in TX/RX.	2
14	RX_LOS	Receiver Loss of Signal indicator	2
15	GND	Module Ground	1

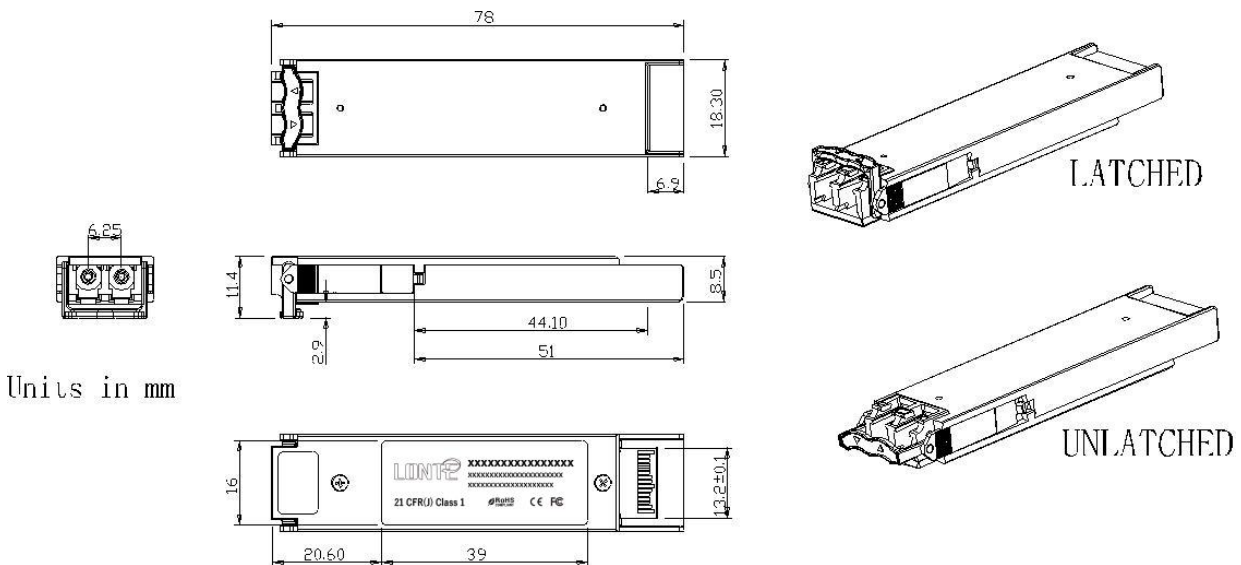
16	GND	Module Ground	1
17	RD-	Receiver inverted data output	
18	RD+	Receiver non-inverted data output	
19	GND	Module Ground	1
20	VCC2	+1.8V Power Supply – Not required	
21	P_Down/RST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset	
		Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22	VCC2	+1.8V Power Supply – Not required	
23	GND	Module Ground	1
24	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	3
25	RefCLK-	Reference Clock inverted input, AC coupled on the host board – Not required	3
26	GND	Module Ground	1
27	GND	Module Ground	1
28	TD+	Transmitter inverted data input	
29	TD-	Transmitter non-inverted data input	
30	GND	Transmitter Ground	1

Notes:

- 1) Module circuit ground is isolated from module chassis ground within the module.
- 2) Open collector; should be pulled up with 4.7k – 10kohms on host board to a voltage between 3.15V and 3.6V.
- 3) A Reference Clock input is not required by the XFP-10GER. If present, it will be ignored.

Package Outline

Dimensions are in millimeters. All dimensions are $\pm 0.2\text{mm}$ 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 (°C)	Reach (km)	DDM
AC-XF-Q2G10-40	XFP	10.3125	DWDM EML	-1~4	PIN	<-16.5	0~70	40	Y
AC-XF-Q2G10-40F	XFP	10.3125	DWDM EML	-1~4	PIN	<-16.5	-40~85	40	Y