FTQ-S4XG-S31L-040D

QSFP+ 40GBase-ER4, single-mode, 40km

Description

FTQ-S4XG-S31L-040D series QSFP+ transceiver can be used to setup a reliable, high speed (up to 40Gbps) serial data link over pair of single-mode fibers. Maximum link span can reach 40km. This transceiver offer four independent transmit and receive channels. Thanks to adoption of CWDM technology all four channels can carry data over the same fiber. Thanks to module's compact size port density of host device can be archived easily. Casing made fully from metal alloys ensures very good EMI immunity. Module is fully compliant with QSFP+ MSA and IEEE 802.3ba 40GBASE-ER4 specification. Host device can access module internal EEPROM memory and DDMI via I2C interface.

Built-in digital diagnostic interface (DOM, DDMI) allows a network administrator to monitor each channel's parameters such as: transmitted and received optical power, temperature, supply voltage and laser current. Those information and data are very helpful e.g. in prediction and prevention of connection failures. A module is available in various dedicated versions, which can be compatible with devices from vendors such as Cisco, HP, Juniper, Extreme Networks, Alcatel-Lucent, 3Com, Linksys and more.

Applications

- 40G Ethernet
- Infiniband 4x SDR, DDR, QDR
- Fibre Channel
- Rack to rack connections

Fibrain Co., Ltd.
Address: ul. Wspólna 4A, 35-205 Rzeszów, Poland
Tel: +48 17 86-60-811, +48 17 86-60-812
Fax: +48 17 86-60-810
Email: info@fibrain.com http://www.fibrain.com

QSFP+ Transceivers

Key features

- LC Duplex receptacle
- Transmission distance up to 40km
- CWDM DFB laser, APD receiver
- Throughput up to 40Gb/s
- Fully compliant with QSFP+ MSA SFF-8436
- Hot-Pluggable
- RoHS compliant
- Class 1 laser safety
- Low power dissipation (<3.5W)
- Metal case for low EMI
- Operating case temperature: 0~70°C

Specification

Supported transmission technology
40G Ethernet, Fibre Channel

Speed supported for Ethernet technology
40Gbps, 10Gbps

Speed supported for Fibre Channel technology
40GFCoE, 10GFCoE

Transmission medium
Single-mode fiber 9/125µm

Transmission distance*
40km

Receptacle type
LC Duplex

Wavelength
1271nm, 1291nm, 1311nm, 1331nm

Output power
-2.7 ~ +4.5dBm (each line)

Receiver sensitivity
-19dBm

Power supply voltage
3.3V

Total power consumption
< 3.5W

Operating environment – temperature
0~70°C

Operating environment - humidity
5~95% non-condensing

Dimensions
Compliant with QSFP+ Multi-Source Agreement

* - transmission distance depends on optical link attenuation

Fibrain Co., Ltd.
Address: ul. Wspólna 4A, 35-205 Rzeszów, Poland
Tel: +48 17 86-60-811, +48 17 86-60-812
Fax: +48 17 86-60-810
Email: info@fibrain.com http://www.fibrain.com

Detailed technical specification

Pin Description

Pin	Name	Function/Description	Notes
1	GND	Transmitter Ground (Common with Receiver Ground)	1
2	Tx2-	Transmitter Inverted Data Input	-
3	Tx2+	Transmitter Non-Inverted Data output	-
4	GND	Transmitter Ground (Common with Receiver Ground)	1
5	Tx4-	Transmitter Inverted Data Input	-
6	Tx4+	Transmitter Non-Inverted Data output	-
7	GND	Transmitter Ground (Common with Receiver Ground)	1
8	ModSelL	Module Select	2
9	ResetL	Module Reset	2
10	VccRx	3.3V Power Supply Receiver	-
11	SCL	2-Wire serial Interface Clock	2
12	SDA	2-Wire serial Interface Data	2
13	GND	Transmitter Ground (Common with Receiver Ground)	1
14	Rx3+	Receiver Non-Inverted Data Output	-
15	Rx3-	Receiver Inverted Data Output	-
16	GND	Transmitter Ground (Common with Receiver Ground)	1
17	Rx1+	Receiver Non-Inverted Data Output	-
18	Rx1-	Receiver Inverted Data Output	-
19	GND	Transmitter Ground (Common with Receiver Ground)	1
20	GND	Transmitter Ground (Common with Receiver Ground)	1
21	Rx2-	Receiver Inverted Data Output	-
22	Rx2+	Receiver Non-Inverted Data Output	-
23	GND	Transmitter Ground (Common with Receiver Ground)	1
24	Rx4-	Receiver Inverted Data Output	1
25	Rx4+	Receiver Non-Inverted Data Output	-
26	GND	Transmitter Ground (Common with Receiver Ground)	1
27	ModPrsl	Module Present	-
28	IntL	Interrupt	2
29	VccTx	3.3V power supply transmitter	-
30	Vcc1	3.3V power supply	-
31	LPMode	Low Power Mode	2
32	GND	Transmitter Ground (Common with Receiver Ground)	1
33	Tx3+	Transmitter Non-Inverted Data Input	-
34	Tx3-	Transmitter Inverted Data Output	-
35	GND	Transmitter Ground (Common with Receiver Ground)	1
36	Tx1+	Transmitter Non-Inverted Data Input	-
37	Tx1-	Transmitter Inverted Data Output	-
38	GND	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.

Fibrain Co., Ltd.
Address: ul. Wspólna 4A, 35-205 Rzeszów, Poland
Tel: +48 17 86-60-811, +48 17 86-60-812
Fax: +48 17 86-60-810
Email: info@fibrain.com http://www.fibrain.com

Electrical parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter Differential Input Volt	+/-TX_DAT	150		1200	mV p-p	1
Receiver Differential Output Volt	+/-RX_DAT	350		950	mV p-p	2
Tx_Disable Input Voltage – Low	V_{IL}	0		0.8	V	
Tx_Disable Input Voltage – High	V_{IH}	2.0		Vcc	V	
Tx_Fault Output Voltage – Low	V_{OL}	0		0.8	V	3
Tx_Fault Output Voltage – High	V_{OH}	2.0		Vcc	V	3
Rx_LOS Output Voltage- Low	V_{OL}	0		0.8	V	3
Rx_LOS Output Voltage- High	V_{OH}	2.0		Vcc	V	3
Throughput	B			40	Gb/s	
Total current requirement				1100	mA	

Transmitter parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Central wavelength	λ0	1264.5	1271	1277.5	nm	
	λ1	1284.5	1291	1297.5		
	λ2	1304.5	1311	1317.5		
	λ3	1324.5	1331	1337.5		
Spectral width	Δλ			1	nm	
Launch optical power, per line	P_{line}	-2.7		+4.5	dBm	4
Total average optical launch power	P_O			+10.5	dBm	
Extinction ratio	EX	5.5			dB	
Transmitter dispersion penalty	TDP			2.6	dB	
Optical return loss	ORLT			20	dB	
Optical rise/fall time	T_{rise}/T_{fall}			35	ps	5
Eye diagram	Compliant with IEEE802.3-2005 40GBASE-ER4					

Receiver parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Sensitivity, per line	P_{min}			-19	dBm	6,7
Central wavelength	λc	1260		1340	nm	
Stressed receiver sensitivity in OMA				-16.8	dBm	
Receiver overload	P_{MAX}	3.8			dBm	6,7
Receiver reflactance				-26	dB	
RX_LOS Asserted	S_A	-35			dBm	
RX_LOS De-Asserted	S_D			-22	dBm	
RX_LOS Hysteresis	-		3.0		dB	
Optical return loss	ORL	12			dB	

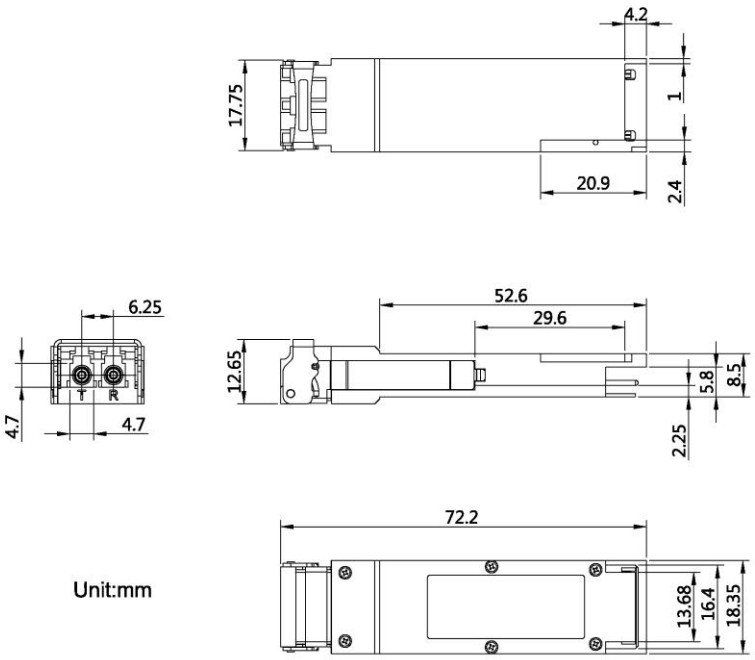
Notes:

1. Internally AC coupled and terminated to 100Ω differential load.
2. Internally AC coupled, but requires a 100Ω differential termination or internal to Serializer/Deserializer.
3. It is open collector/drain output which should be pulled up externally to Vcc with a 4.7KΩ-10KΩ resistor on the host board. LOS: logic 0 indicates normal operation; logic 1 indicates no signal detected.

Fibrain Co., Ltd.
Address: ul. Wspólna 4A, 35-205 Rzeszów, Poland
Tel: +48 17 86-60-811, +48 17 86-60-812
Fax: +48 17 86-60-810
Email: info@fibrain.com http://www.fibrain.com

4. Optical power is launched into SMF
5. 20-80%
6. Measured with PRBS 2^{31}-1 at test pattern @10.3125Gbps.
7. Per channel.

Mechanical specification



Recommended environment conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature Range	T	0	25	70	^{0}C
Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Relative Humidity	RH	5	-	95	%

Ordering information

FTQ-S4XG-S31L-040**D**– 40km, single-mode, LC duplex, **DDMI**, commercial temperature (0~70°C)

For further information regarding host device PCB layout recommendation, power supply requirements, EEPROM memory map, DDMI specification please check:

SFF-8436 - Technical specification for QSFP transceiver

Pictures used for reference only, actual product look may differ. For most actual information please contact technical support via aktywa@fibrain.pl

Fibrain Co., Ltd.
Address: ul. Wspólna 4A, 35-205 Rzeszów, Poland
Tel: +48 17 86-60-811, +48 17 86-60-812
Fax: +48 17 86-60-810
Email: info@fibrain.com http://www.fibrain.com