

40G QSFP+ Passive Direct Attach Copper Twinax Cable for InfiniBand FDR10



Application

- InfiniBand FDR10

Standards

- IEEE 802.3ba 40GBASE-CR4
- QSFP+ MSA
- SFF-8436

Features

- Max. Power Consumption 0.5W
- 4-Channel Full-Duplex Passive Copper Cable Transceiver
- Maximum Data Rate per Channel: 10.3Gb/s
- Maximum Aggregate Data Rate: 41.2Gb/s
- 0~70 °C Case Operating Temperature
- Single 3.3V Supply Voltage
- 30AWG and 26AWG Cable Sizes
- Maximum Link Length Up to 5m
- AC Coupling of PECL Signals
- All-metal Housing for Superior EMI Performance
- High-Density QSFP 38-PIN Connector
- Shielded Copper Twinaxial Design for Reduced Skew Rate and Cross-talk

Product Description

The FS's 40G QSFP+ Passive Direct Attach Copper Twinax Cable is designed for use in 40Gb/s FDR10 InfiniBand systems and provides connectivity between devices using QSFP+ ports. This cable is compliant with IEEE 802.3ba, QSFP MSA and SFF-8436 standards. With these features, this easy to install, high speed, cost-effective direct attach copper twinax cable is suitable for short-distance connectivity within a rack or between adjacent racks in data centers.

Product Specifications

I. Absolute Maximum Ratings

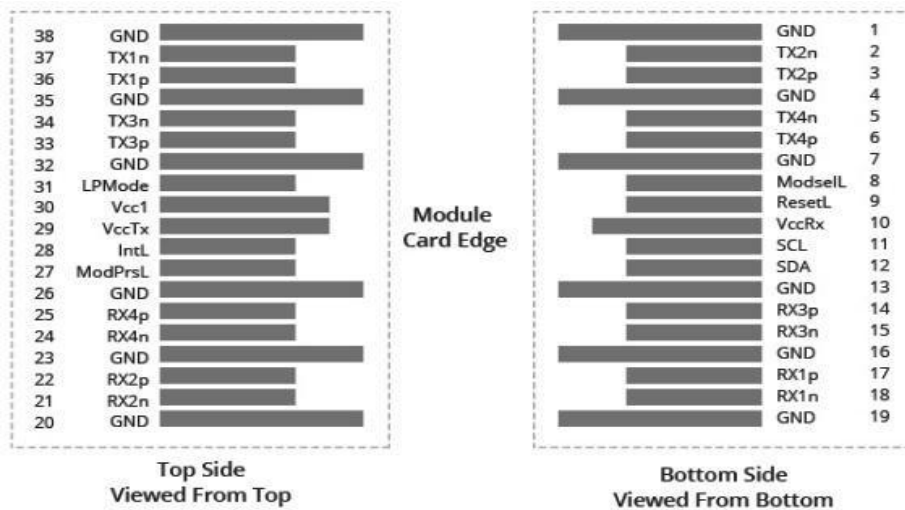
Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Case Temperature	T_C	0		70	°C
Relative Humidity	RH			85	%
Supply Voltage	V_{CC}	-0.3	3.3	3.6	V
Data Rate per Lane		1		10.3	

II. Electrical Characteristics

Test Type	Test Item	26AWG	30AWG
Electrical Characteristics	Differential Impedance	$100 \pm 5\Omega$	110
	Mutual Capacitance	14pF/ft Nominal	14pF/ft Nominal
	Time Delay	1.35ns/ft Nominal	1.35ns/ft Nominal, (4.3ns/m) Nominal
	Time Delay Skew (within Pairs)	120ps/8.5m Maximum	50ps/5.5m Maximum
	Time Delay Skew (between Pairs)	500ps/8.5m Maximum	350ps/5.5m Maximum
	Attenuation	10dB/8.5m Maximum @1.25Ghz	8.4dB/5.5m Maximum @1.25Ghz

Test Type	Test Item	26AWG	30AWG
Physical Characteristics	Conductor DC Resistance	0.04Ω/ft Maximum@20°C	0.01Ω/ft Maximum @20°C
	Conductors (Two Pair)	26AWG Solid, Silver Plated Copper	30AWG Solid, Silver Plated Copper
	Insulation	Foam Polyolefin	Foam Polyolefin
	Pair Drain Wire	28AWG Solid, Silver Plated Copper	30AWG Solid, Silver Plated Copper
	Overall Cable Shield	Aluminum/Polyester Tape, 125% Coverage, Tin Plated Copper Braid, 38AWG, 85% Coverage	Aluminum/Polyester Tape, 125% Coverage, Tin Plated Copper Braid, 38AWG, 85% Coverage
	Outer Diameter	5.2mm	4.2mm

III. PIN Definitions



Pin	Logic	Symbol	Name/Description	Notes
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	

Pin	Logic	Symbol	Name/Description	Notes
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	
7		GND	Ground	1
8	LVTTTL-I	ModselL	Module Select	
9	LVTTTL-I	ResetL	Module Reset	
10		V _{cc} Rx	3.3V Power Supply Receiver	
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	2
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	2
13		GND	Ground	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	

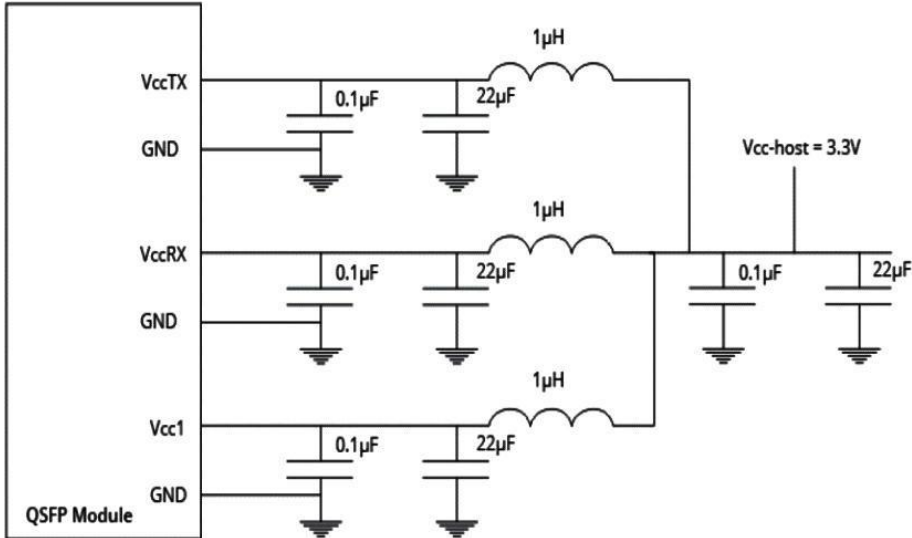
Pin	Logic	Symbol	Name/Description	Notes
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTTL-O	ModPrsL	Module Present	2
28	LVTTTL-O	IntL	Interrupt	2
29		V _{CC} Tx	3.3V Power Supply Transmitter	
30		V _{CC} 1	3.3V Power Supply	
31	LVTTTL-I	LPMODE	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Input	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Input	
38		GND	Ground	1

Notes:

1. Module ground pins GND are isolated from the module case and chassis ground within the module.
2. Shall be pulled up with 4.7K-10Kohms to a voltage between 3.14V and 3.47V on the host board.

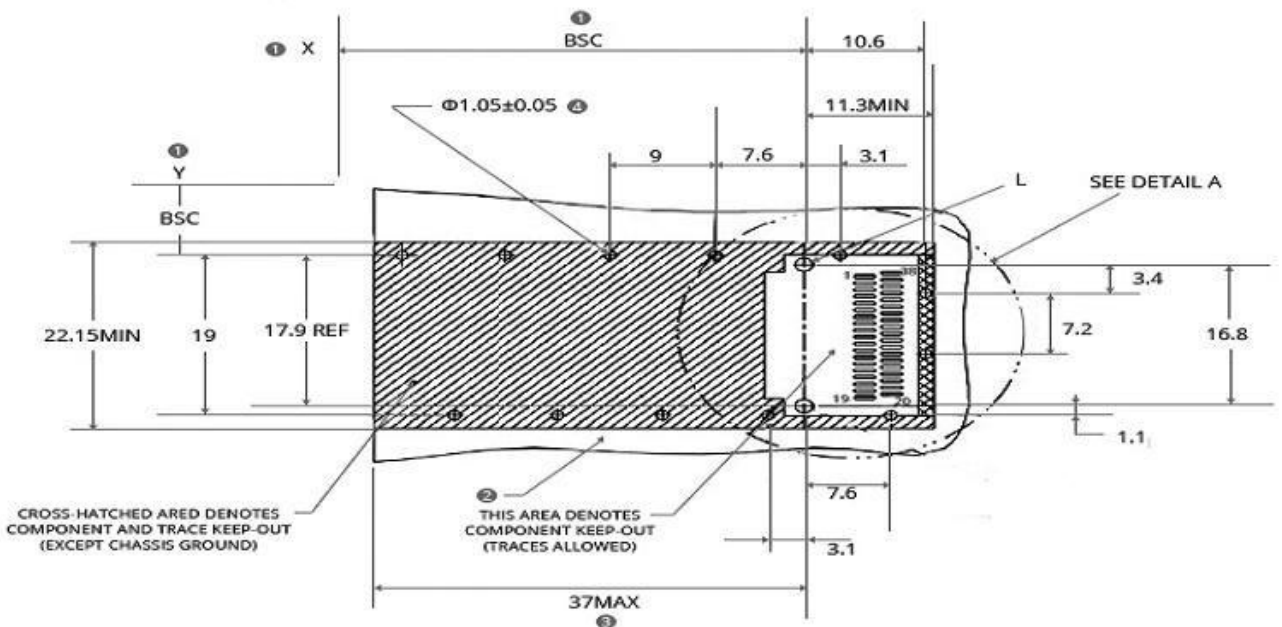
IV. Recommended Power Supply Filtering Example

A typical host board mechanical layout for attaching the QSFP+ transceiver is presented below. The recommended host electrical connector should be a 38-pin IPASS right angle connector assembly and the cage assembly should be QSFP+ single cage.

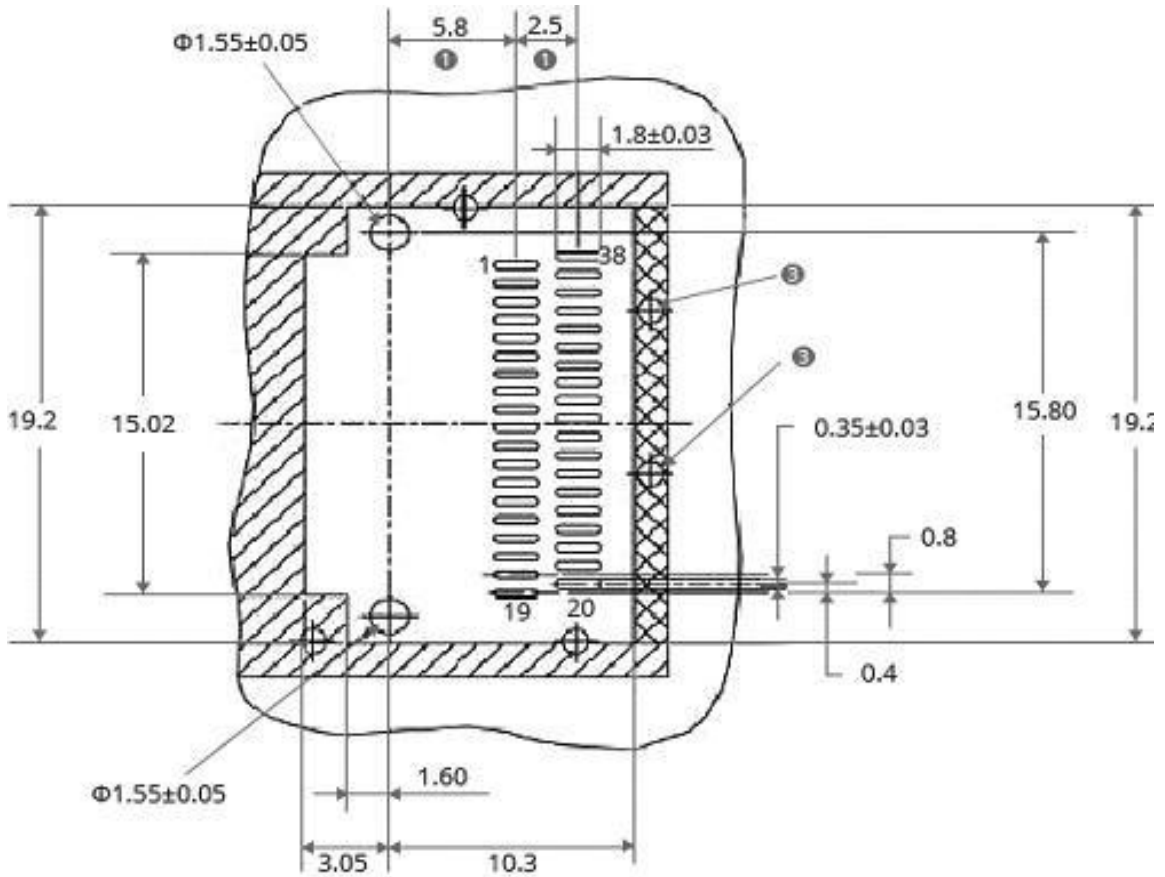


V. Recommended PCB layout

A typical host board mechanical layout for attaching the QSFP transceiver is presented below. The recommended host electrical connector should be a 38-pin IPASS right angle connector assembly and the cage assembly should be QSFP single cage.

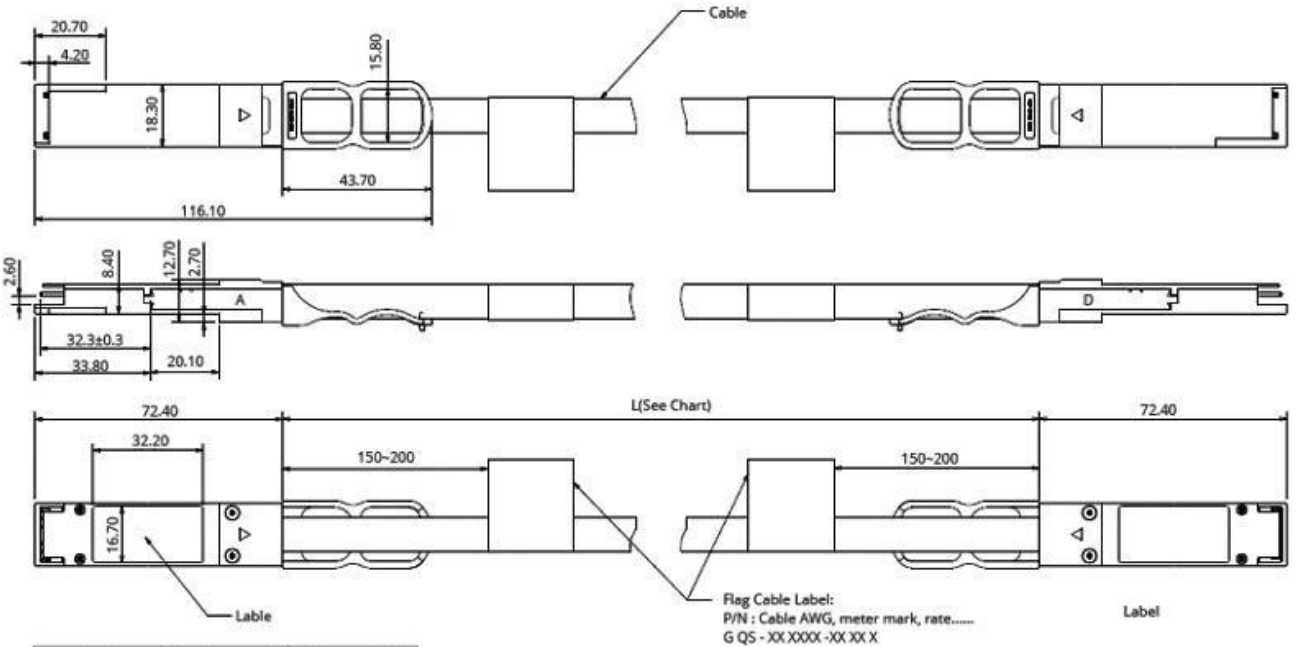


- ① DATUM "X" AND "Y" ESTABLISHED BY CUSTOMER'S FIDUCIAL
- ② DATUM "A" IS TOP SURFACE OF HOST BOARD.
- ③ LOCATION OF EDGE OF PCB IS APPLICATION SPECIFIC.
- ④ FINISHED HOLE SIZE.

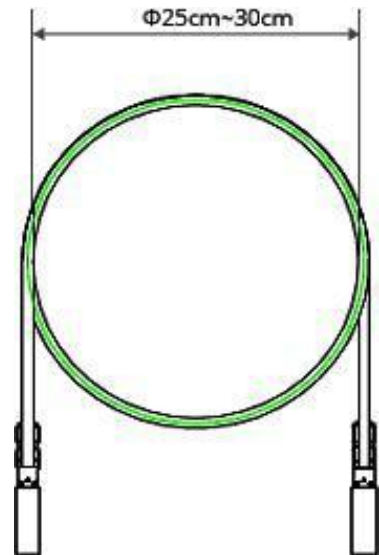
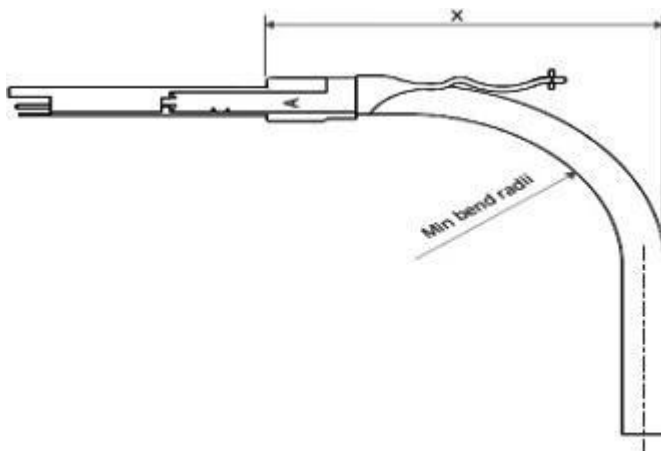


- ❶ CENTERLINE OF PAD
- ❷ SURFACE TRACES PERMITTED WITHIN THIS LENGTH.
- ❸ INDICATED HOLES ARE OPTIONAL

VI. Mechanical Specifications



Code	Length range(m)	Tolerance(cm)
L	$L \leq 0.5$	± 3
	$0.5 < L \leq 5$	± 5
	$5 < L \leq 20$	± 8
	$20 < L$	± 10



Unit : mm

CABLE AWG	OD	min bend radii	"X"min. Distance 1X bend
30	4.2	21	59
26	5.2	26	72.5

Test Center

I. Compatibility Testing

Each fiber optical transceiver has been tested in host device on site in FS Assured Program to ensure full compatibility with over 200 vendors.



Cisco Catalyst C9500-24Y4C



Cisco MS425-16



Brocade VDX 6940-144S



Dell EMC Networking Z9100-ON



Force@tm S60-44T

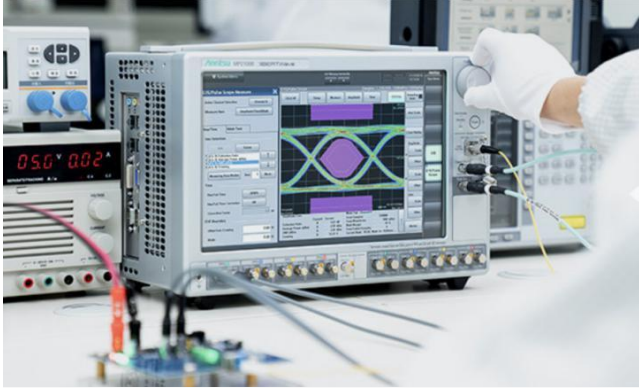


HUAWEI S6720-30L-HI-24S

Above is part of our test bed network equipment. For more information, please click the Test Bed PDF. It will be updated in real time as we expand our portfolio.

II. Performance Testing

Each fiber optical transceiver has been fully tested in FS Assured Program equipped with world's most advanced analytical equipment to ensure that our transceivers work perfectly on your device.



1. TX/RX Signal Quality Testing

Equipped with the all-in-one tester integrated 4ch BERT & sampling oscilloscope, and variable optical attenuator to ensure the input and output signal quality.

- Eye Pattern Measurements: jitter, Mask Margin, etc
- Average Output Power
- OMA
- Extinction Ratio
- Receiver Sensitivity
- BER Curve

2. Reliability and Stability Testing

Subject the transceivers to dramatic changes in temperature on the thermal shock chamber to ensure reliability and stability of the transceivers.

- Commercial: 0 °C to 70 °C
- Extended: -5 °C to 85 °C
- Industrial: -40 °C to 85 °C



3. Transfer Rate and Protocol Testing

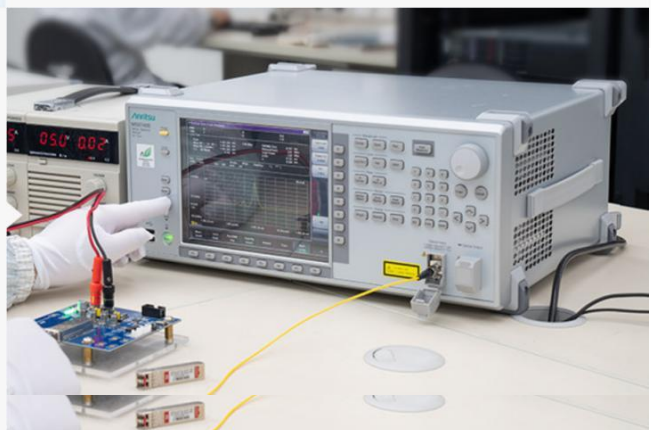
Test the actual transfer data rate and the transmission ability under different protocols with Network Master Pro.

- Ethernet
- Fibre Channel
- SDH/SONET
- CPRI

4. Optical Spectrum Evaluation

Evaluate various important parameters with the Optical Spectrum Analyzer to meet the industry standards.

- Center Wavelength, Level
- OSNR
- SMSR
- Spectrum Width



Ordering Information

Part Number	Data Rate	Length	Wire Gauge	Connector Type	Temp. Range	Cable Jacket
QSFP-PC005	40G	0.5m	30AWG	Passive Copper	0-70°C	PVC
QSFP-PC01	40G	1m	30AWG	Passive Copper	0-70°C	PVC
QSFP-PC02	40G	2m	30AWG	Passive Copper	0-70°C	PVC
QSFP-PC025	40G	2.5m	30AWG	Passive Copper	0-70°C	PVC
QSFP-PC03	40G	3m	30AWG	Passive Copper	0-70°C	PVC
QSFP-PC04	40G	4m	26AWG	Passive Copper	0-70°C	PVC
QSFP-PC05	40G	5m	26AWG	Passive Copper	0-70°C	PVC



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