

## 40Gbps QSFP+ Active High Speed Cable

### PQS40-DA85XXM

#### Product Description

The active copper cables are 40Gb/s cables assembly. The cables are compliant with InfiniBand Architecture, SFF-8436 specifications and provide connectivity between devices using QSFP ports.

The QSFP cable is an assembly of 4 full-duplex lanes, where each lane is capable of transmitting data at rates up to 10Gb/s per direction, providing an aggregated rate of 40Gb/s. The cables use state-of-the-art signal processing technology to fill the expanding need for cost effective data center interconnects that cannot be served with passive copper solutions. unique low power cable solutions consume 50-75% less power than optical interconnects. Optimizing systems to operate with active copper cables significantly reduce power consumption and EMI emission, eliminating the use of EDC hosts. Rigorous cable production testing ensures best out-of-the-box installation experience, performance and durability.

#### Product Features

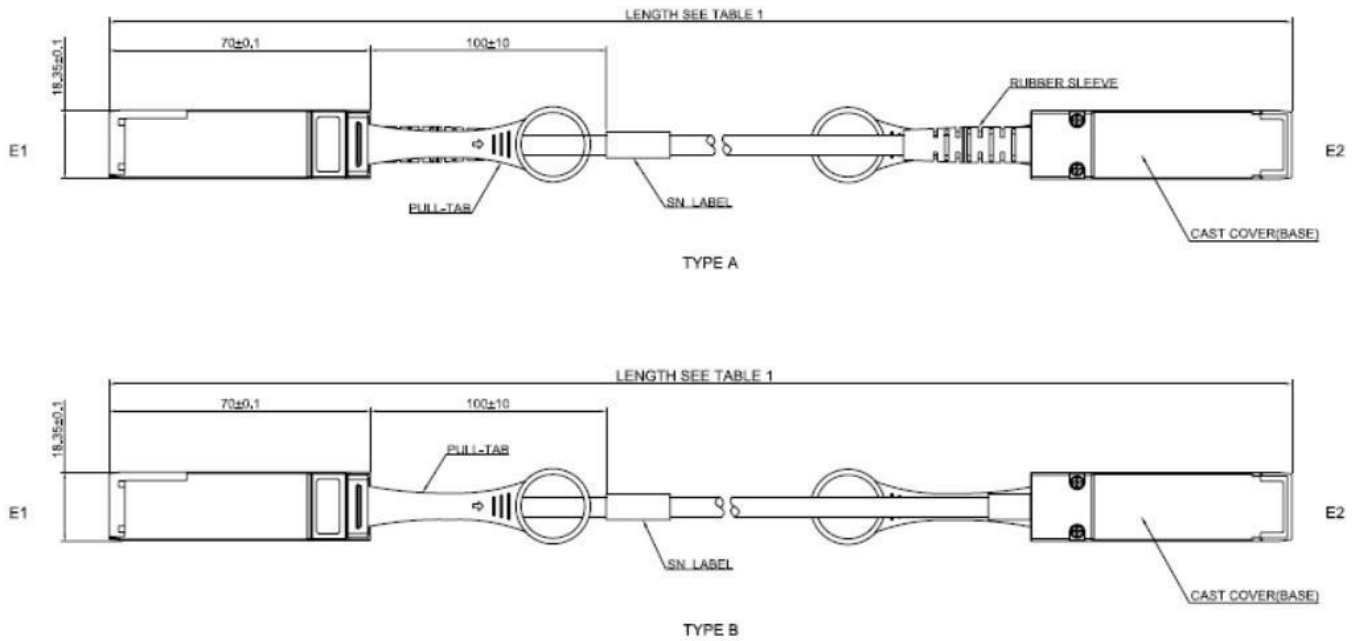
- Compliant with SFF-8436
- Fully compatible with IEEE802.3ba and Infiniband
- QDR specifications 40 Gb/s total bandwidth
- 4 independent duplex channels operating at 10Gbps,
- also support for 2.5Gbps, 5Gbps data rates
- Low power <1.5W, low latency analog circuitry
- Uses advanced analog signal processing technology
- All-metal housing for superior EMI performance
- BER better than 10<sup>-15</sup>
- AC coupling of PECL signals

- Ultralow crosstalk for improved performance
- EEPROM for cable signature & system communications
- 30 AWG to 26 AWG cable sizes available
- Tested in an end-to-end system
- RoHS compliant

## Applications

- Data
- Servers
- Networked storage systems
- Routers
- External storage systems
- Data Center networking
- Communications
- Switches
- Routers
- Industry Standards
- InfiniBand Trade Association (IBTA)
- IEEE802.3ba
- 40Gigabit Ethernet ( 40G BASE –CR4)

### Outline drawing



### Wiring Diagram

X1	X2	REMARKS	X1	X2	REMARKS
18(RX1-)	37(TX1-)	pair	37(TX1-)	18(RX1-)	pair
17(RX1+)	36(TX1+)		36(TX1+)	17(RX1+)	
15(RX3-)	34(TX3-)	pair	34(TX3-)	15(RX3-)	pair
14(RX3+)	33(TX3+)		33(TX3+)	14(RX3+)	
6 (TX4+)	25(RX4+)	pair	25(RX4+)	6 (TX4+)	pair
5 (TX4-)	24(RX4-)		24(RX4-)	5 (TX4-)	
3 (TX2+)	22(RX2+)	pair	22(RX2+)	3 (TX2+)	pair
2 (TX2-)	21(RX2-)		21(RX2-)	2 (TX2-)	
1, 4, 7, 13, 16, 19, 20, 23, 26, 32, 35, 38	1, 4, 7, 13, 16, 19, 20, 23, 26, 32, 35, 38	GND	8, 9, 10, 11, 12, 27, 28, 29, 30, 31	8, 9, 10, 11, 12, 27, 28, 29, 30, 31	EEPROM point at both ends

## Recommended Operation Conition

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature See Notes	Topc	0	--	70	degC
Relative Humidity (non-condensation)	RS	-	-	85	%
Supply Voltage	VCC3	3.135	3.30	3.465	V
Power Supply Current	ICC3	-	70	80	mA
Total Power Consumption	Pd	-	-	0.5	W
Differential Input Voltage Swing	V DIFF	100		1800	mVp-p
Differential Output Voltage Swing	V DIFF			600	mVp-p
Total Power Consumption	Pd		1.5		W
Data Output Rise Time/Fall Time	Tr,Tf			120	ps
Bit Error Ratio	BER		<10-12		/

**Notes:**

Stress or conditions exceed the above range may cause permanent damage to the device.

This is a stress rating only and functional operation of the device at these or any other conditions above those listed in the operational sections of this specification is not applied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## Electrical Performance

Parameter	Symbol	Min	Typ	Max	Unit	Note
<b>Transmitter</b>						
Reference Differential Input Impedance	Zd		100		Ω	
Termination Mismatch	$\frac{\Delta Z}{M}$			5	%	
Input AC Common Mode Voltage				25	mV (RMS)	
Differential Input S- parameter	SDD11	$< -12 + 2 \times \text{SQRT}(f)$ , with f in GHz.			dB	0.01-4.1GHz
		$< -6.3 + 13 \times \log_{10}(f/5.5)$ , with f in GHz			dB	4.1-11.1GHz
Reflected Differential to Common Mode Conversion	SCD11			-10	dB	0.01-11.1GHz
Total Jitter				0.40	UI	
Deterministic Jitter				0.15	UI	
<b>Receive</b>						
Reference Differential Input Impedance	Zd		100		Ω	
Termination Mismatch	$\Delta Z$			5	%	

	M					
Output AC Common Mode Voltage				15	mV (RMS)	
Differential Output S-parameter	SDD22	$< -12 + 2 \times \text{SQRT}(f)$ , with f in GHz			dB	0.01-4.1GHz
		$< -6.3 + 13 \times \log_{10}(f/5.5)$ , with f in GHz			dB	4.1-11.1GHz
Common Mode Output Reflection Coefficient	SCC22	$< -7 + 1.6 \times f$ , with f in GHz.			dB	0.01-2.5GHz
				-3	dB	2.5-11.1GHz
Total Jitter				0.38	UI	
Deterministic Jitter				0.64	UI	

## Environment Performance

ITEM	REQUIREMENT	TEST CONDITON
Thermal Cycling Non-Powered	No evidence of physical damage	EIA-364-32D, Method A, -25 to 90C, 100 cycles, 15 min. dwells
Salt Spraying	48 hours salt spraying after shell corrosive area less than 5%.	EIA-364-26
Mixed Flowing Gas	Pass electrical tests per 3.1 after stressing. (For connector only)	EIA-364-35 Class II, 14 days.
Temp. Life	No evidence of physical damage	EIA-364-17C w/ RH, Damp heat 90°C at 85% RH for 500 hours then return to ambient
Cable Cold Bend	4H, No evidence of physical damage	Condition: -20°C±2°C, mandrel diameter is 6 times the cable diameter.

## Mechanical and Physical Characteristics

ITEM	REQUIREMENT	TEST CONDITON
Vibration	Pass electrical tests per 3.1 after stressing.	Clamp & vibrate per EIA-364-28E, TC-VII, test condition letter – D, 15 minutes in X, Y & Z axis.
Cable Flex	No evidence of physical damage	Flex cable 180° for 20 cycles (±90° from nominal position) at 12 cycles per minute with a 1.0kg load applied to the cable jacket. Flex in the boot area 90° in each direction from vertical. Per EIA-364-41C
Cable Plug Retention in	90N Min.	Force to be applied axially with no damage

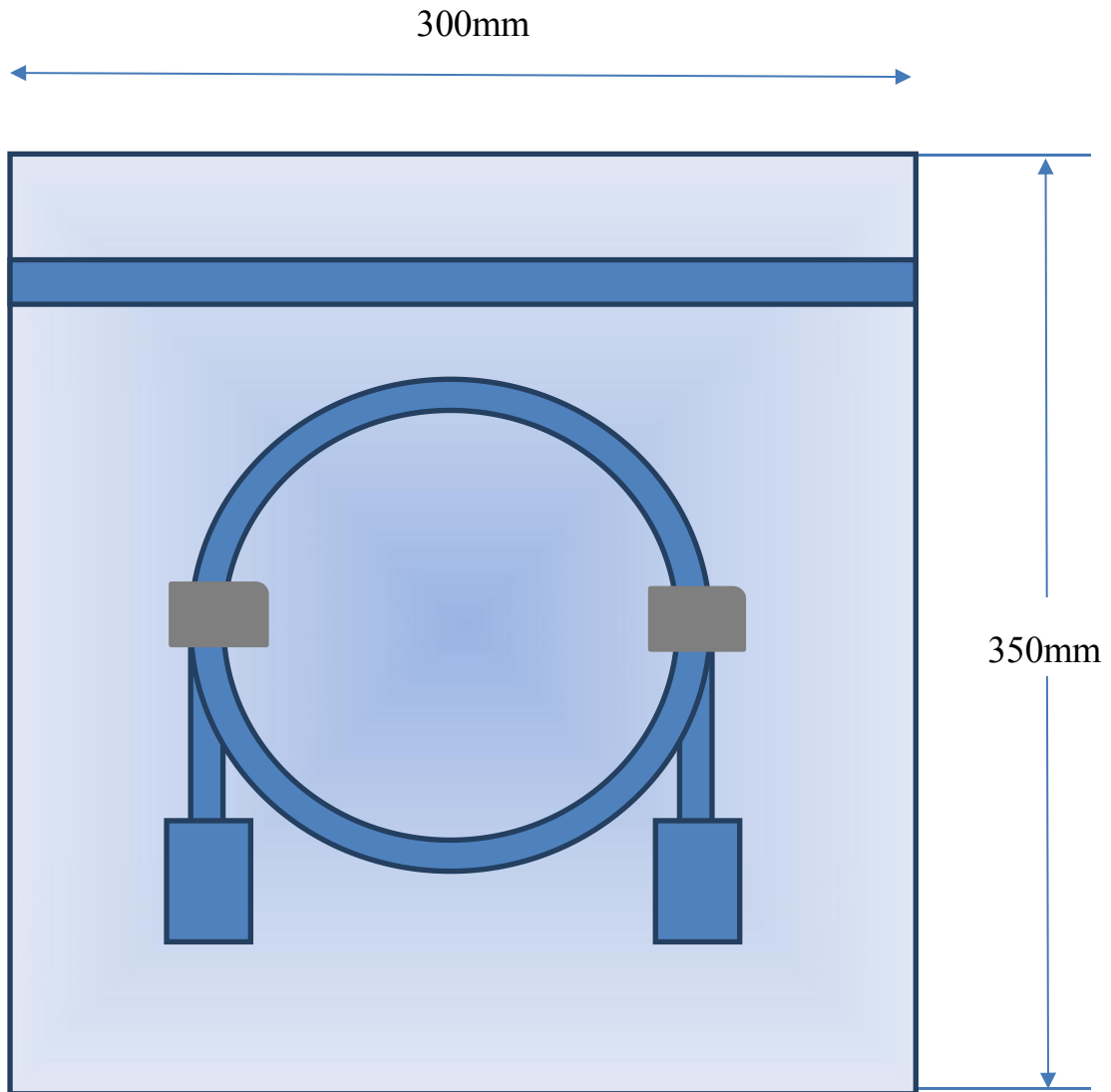
Cage	No evidence of physical damage	to cage. Per SFF 8661 Rev 2.1 Pull on cable jacket approximately 1 ft behind cable plug. No functional damage to cable plug below 90N. Per SFF-8432 Rev 5.0
Cable Retention in Plug	90N Min. No evidence of physical damage	Cable plug is fixtured with the bulk cable hanging vertically. A 90N axial load is applied (gradually) to the cable jacket and held for 1 minute. Per EIA-364-38B
Mechanical Shock	Pass electrical tests Per 3.1 after stressing.	Clamp and shock per EIA-364-27B, TC-G,3 times in 6 directions, 100g, 6ms.
Cable Plug Insertion	40N Max.	Per SFF-8436 Rev 5.4.1.
Cable plug Extraction	30N Max.	Place axial load on de-latch to de-latch plug.Per SFF-8436 Rev 5.4.1.
Durability	50 cycles,No evidence of physical damage	EIA-364-09, perform plug &unplug cycles:Plug and receptacle mate rate: 250times/hour. 50times for module (CONNECTOR TO PCB)

## Package diagram

Connector should be protected by defending cap, putting cable to an individual inner antistatic bag .

<=2m : 200mm\*300mm

>2m: 300mm\*350mm



### Order information

Length	M.P/N	AWG	Length Tolerance (mm)
1m	PQS40-DA8501M	30	±25
2M	PQS40-DA8502M	30	±30
3M	PQS40-DA8503M	30	±45
5M	PQS40-DA8505M	30	±65
7M	PQS40-DA8507M	30	±90
10M	PQS40-DA8510M	28	±100
15M	PQS40-DA8515M	26	±150

## Contact Information

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