

40G QSFP+ to QSFP+ Passive Copper Cable (PCC)



- 4-channel full-duplex passive copper cable transceiver
- Up to 10.3 Gb/s per channel
- Up to 41.2 Gb/s maximum aggregate data rate
- Wire AWG: 30AWG/26AWG
- AC coupling of PECL signals
- All-metal housing
- Single 3.3 V power supply
- Low power consumption: < 2 W
- High-density QSFP 38-pin connector
- Shielded copper twin axial design
- Compliant with QSFP MSA specifications
- Compliant with industry-standard QSFP+ form factor SFF-8436

Ascent's QSFP+ (Quad Small Form-factor Pluggable Plus) DAC passive cable assemblies are high performance, cost effective I/O solutions for 40G LAN, HPC and SAN applications.

QSFP+ copper direct-attach cables are suitable for very short distances and offer a highly cost-effective way to establish a 40-Gigabit link between QSFP+ ports of QSFP+ switches within racks and across adjacent racks.

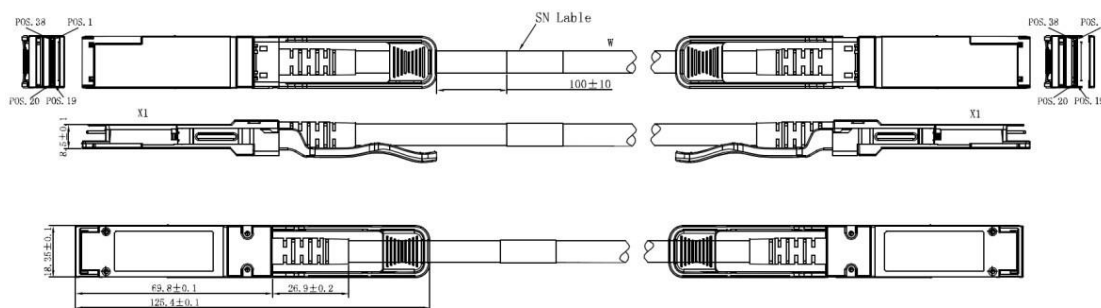
Ascent's QSFP+ passive copper cables are compliant with SFF-8436, QSFP+ MSA, and IEEE 802.3ba 40GBASE-CR4.

They offer a low power consumption, short-reach interconnected applications. The cable each lane is capable of transmitting data at rates up to 10 Gb/s, providing an aggregated rate of 40 Gb/s.

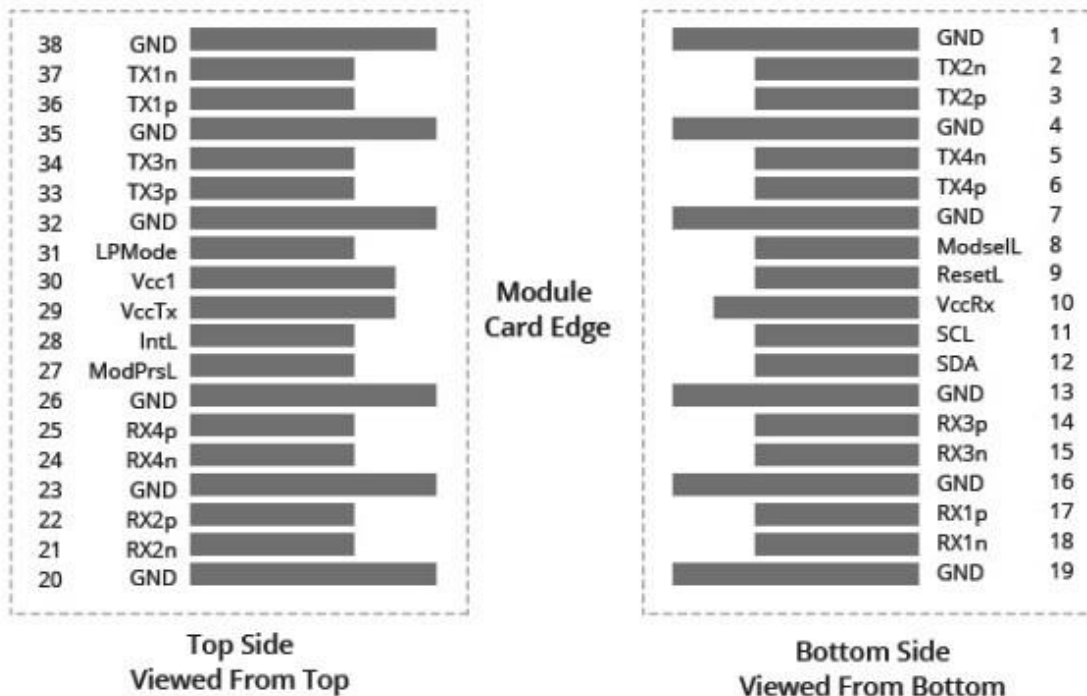
Key Features

- 4-channel full-duplex passive copper cable transceiver
- Support for multi-gigabit data rates: Up to 10.3 Gb/s per channel
- Maximum aggregate data rate: 41.2 Gb/s
- Wire AWG: 30AWG/26AWG/24AWG
- AC coupling of PECL signals
- All-metal housing for superior EMI performance
- Available lengths (in meters): 1, 3, 5, 7
- Single 3.3 V power supply
- Low power consumption: < 2 W
- High-density QSFP 38-pin connector
- Shielded copper twin axial design for reduced skew rate and cross-talk
- Compliant with QSFP MSA specifications
- Compliant with industry-standard QSFP+ form factor SFF-8436
- Compatible with Juniper, Cisco, etc

Outline Dimensions



Pin Assignment



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	
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	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		Vcc 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	

22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
21	CML-O	Rx2n	Receiver Inverted Data Output	
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		Vcc Tx	+3.3V Power Supply Transmitter	
30		Vcc1	+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 4.7 k Ω to 10 k Ω to a voltage between 3.14 V and 3.47 V on the host board.

Specifications

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Temperature	T _{st}	-40	125	°C	
Operating Case Temperature	T _c	-40	85	°C	
Relative Humidity (Non-Condensing)	RH	0	85	%	
Power Supply Voltage	V _{CC3}	-0.3	3.6	V	
Voltage on LVTTTL Input	V _{ilvttl}	-0.3	V _{CC3} +0.2	V	
Data Rate per Lane		1	10.3	Gb/s	

Recommended Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Operating Case Temperature	T _c	-40	85	°C	
Relative Humidity (Non-Condensing)	RH	0	85	%	
Power Supply Voltage	V _{CC3}	3.135	3.465	V	
Power Supply Current	I _{CC3}	750	-	mA	
Total Power Consumption	P _d	-	2.0	W	

Product Characteristics

Number of Lanes	Tx & Rx
Channel Data Rate	10.3125 Gbps
Operating Temperature	0 to + 70°C
Storage Temperature	-40 to + 85°C
Supply Voltage	3.3 V nominal
Electrical Interface	38 pins edge connector
Management Interface	Serial, I2C

High Speed Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Differential Impedance	TDR	90	100	110	Ω	
Insertion loss	SDD21	-17.04			dB	At 5.15625 GHz
Differential Return Loss	SDD11 SDD22			See 1	dB	At 0.05 GHz to 4.1 GHz
				See 2	dB	At 4.1 GHz to 11.1 GHz
Differential to common-mode return loss	SCD11 SCD22			-10	dB	At 0.2 to 11.1 GHz
Common-mode to common-mode output return loss	SCC11 SCC22	-3			dB	At 0.01 to 11.1 GHz

Notes:

1. Reflection Coefficient given by equation $SDD11(dB) < -12 + 2 \times \sqrt{f}$, with f in GHz
2. Reflection Coefficient given by equation $SDD11(dB) < -6.3 + 13 \times \log_{10}(f/5.5)$, with f in GHz

Ordering Information

Product Name	Product Description
QSFP-40-DAC-001	40G QSFP+ to QSFP+ Passive Direct Attach Copper Cable 1 m AWG30
QSFP-40-DAC-003	40G QSFP+ to QSFP+ Passive Direct Attach Copper Cable 3 m AWG30
QSFP-40-DAC-005	40G QSFP+ to QSFP+ Passive Direct Attach Copper Cable 5 m AWG26
QSFP-40-DAC-007	40G QSFP+ to QSFP+ Passive Direct Attach Copper Cable 7 m AWG24
JQ-40-DAC-001	40G QSFP+ to QSFP+ Passive Direct Attach Copper Cable 1 m AWG30, Compatible with Juniper
JQ-40-DAC-003	40G QSFP+ to QSFP+ Passive Direct Attach Copper Cable 3 m AWG30, Compatible with Juniper
JQ-40-DAC-005	40G QSFP+ to QSFP+ Passive Direct Attach Copper Cable 5 m AWG26, Compatible with Juniper
JQ-40-DAC-007	40G QSFP+ to QSFP+ Passive Direct Attach Copper Cable 7 m AWG24, Compatible with Juniper

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