Datasheet
40G QSFP+ Passive Copper Cable (PCC)

ZeeVee Part #:   Z4KDAC40GB-2M

Features:

- 4-Channel Full-Duplex Passive Copper Cable Transceiver
- Support for multi-gigabit data rates up to 10.3Gbps (per channel)
- Maximum aggregate data rate: 41.2Gb/s
- Wire AWG: AWG30
- AC coupling of PECL signals
- All metal housing for superior EMI performance
- Available length (in meters): 2
- Commercial temperature range (COM): 0~ 70 °C
- Low power consumption < 2.0W
- Power supply: +3.3V
- High-Density QSFP 38-PIN Connector
- Shielded copper twin axial design for reduced skew rate and crosstalk
- Compliant QSFP MSA specifications
- Compliant with industry standard QSFP+ form factor SFF-8436

Description

QSFP+ (Quad Small Form-factor Pluggable Plus) 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.

QSFP+ passive copper cables are compliant with SFF-8436, QSFP+ MSA and IEEE 802.3ba 40GBASE-CR4. It offers a low power consumption, short reach interconnect solution. Each cable lane is capable of transmitting data at rates up to 10Gb/s, providing an aggregated rate of 40Gb/s.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit
Operating Case Temp	Tc	0	25	70	℃
Relative Humidity	RH	5		85	%
Supply Voltage	VCC3	3.0	3.3	3.6	V
Data Rate Per Lane		1		10.3	Gb/s

II. Performance Specification

Electrical	
Min. Dielectric Withstand Voltage	300 VDC
Insulation Resistance	1000 Mohms
Current Rating	0.5 Amp Min/Signal Contact

| General	
Operating Temperature	0 to 70 ℃
Flammability Rating	UL 94 V-0
Green Features	RoHS, Lead-Free
Shield	Braid/Foil

Plug	
Backshell Material	Nickel-Plated Zinc Diecast
Contact Material	PCB with Gold-Plated Pads
Latch	Positive Latching w/Pull Tab
Insertion Force	40N Max
Withdrawal Force	30N Max
Retention Force	90N Max
Durability	50 Cycles Min

Cable	
Conductor	Solid
Wire Gauge	AWG30
Impedance	100 +/- 5 ohms
Cable OD	AWG30: 4.2mm
Jacket Type	PVC
Bend Radius	5X Cable OD-Single 10X Cable OD-Repeated

III. Electrical Characteristics

Test Type	Test Item	30AWG
Electrical Characteristics	Differential Impedance	100±5Ω @ TDR
	Mutual Capacitance	14pF/ft nominal
	Time Delay	1.35ns/ft nominal (4.3ns/m) nominal
	Time Delay Skew (within pairs)	50ps/5.5m maximum
	Time Delay Skew (between pairs)	350ps/5.5m maximum
	Attenuation	8.4dB/5.5m maximum @ 1.25Ghz
	Conductor DC Resistance	0.01Ω/ft maximum @ 20°C
Physical Characteristics	Conductors (two pair)	30AWG Solid, Silver plated copper
	Insulation	Foam polyolefin
	Overall cable shield	Aluminum/polyester tape, 125% coverage, Tin plated copper braid, 38AWG, 85% coverage
	Outer diameter	4.2mm

IV. Pin Designation

38	GND		1	GND

Top Side
Viewed From Top

Module
Card Edge

Bottom Side
Viewed From Bottom
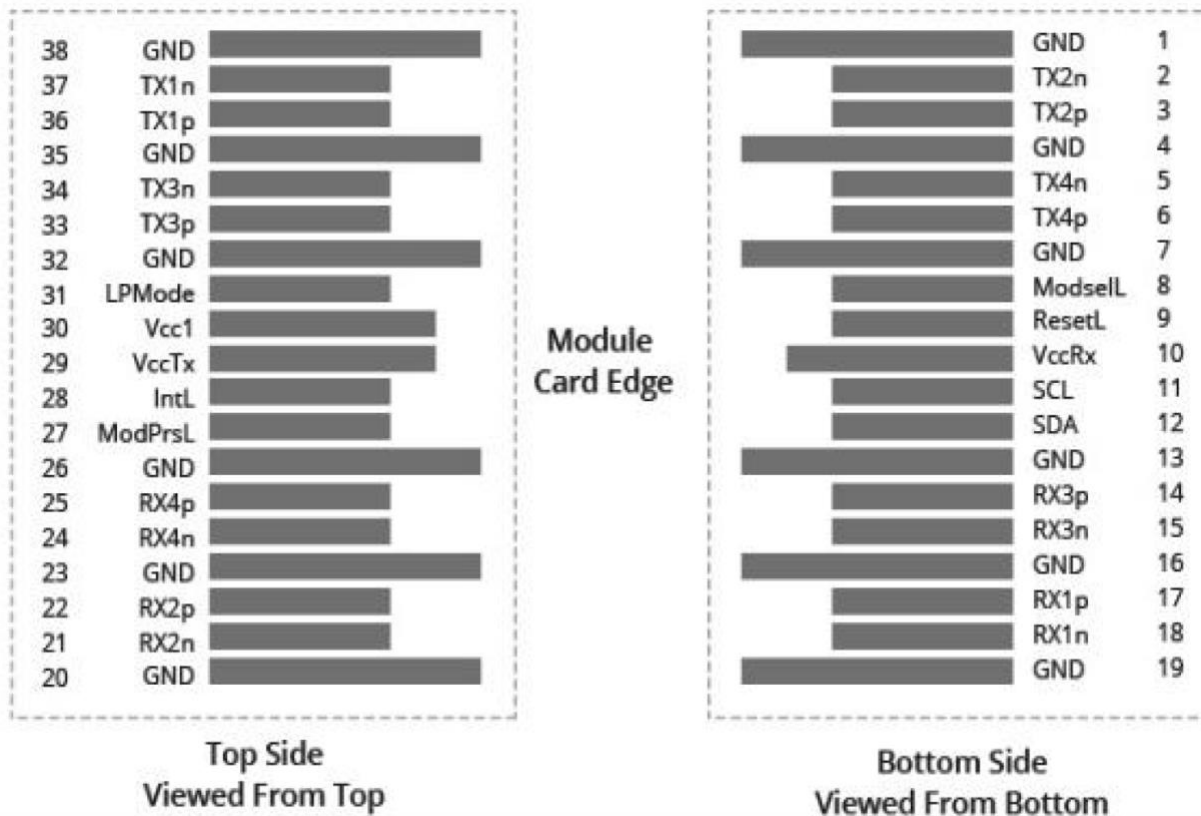
Pin	Logic	Symbol	Name/Description
1		GND	Ground
2	CML-I	Tx2n	Transmitter Inverted Data Input
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input
4		GND	Ground
5	CML-I	Tx4n	Transmitter Inverted Data Input
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input
7		GND	Ground
8	LVTTL-I	ModSelL	Module Select
9	LVTTL-I	ResetL	Module Reset
10		Vcc Rx	+3.3V Power Supply Receiver
11	LVCMOS-I/O	SCl	2-Wire Serial Interface Clock
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data
13		GND	Ground
14	CML-O	Rx3p	Receiver Non-Inverted Data Output
15	CML-O	Rx3n	Receiver Inverted Data Output
16		GND	Ground

17	CML-O	Rx1p	Receiver Non-Inverted Data Output
18	CML-O	Rx1n	Receiver Inverted Data Output
19		GND	Ground
20		GND	Ground
21	CML-O	Rx2n	Receiver Inverted Data Output
22	CML-O	Rx2p	Receiver Non-Inverted Data Output
23		GND	Ground
24	CML-O	Rx4n	Receiver Inverted Data Output
25	CML-O	Rx4p	Receiver Non-Inverted Data Output
26		GND	Ground
27	LVTTL-O	ModPrsL	Module Present
28	LVTTL-O	IntL	Interrupt
29		VccTx	+3.3V Power Supply Transmitter
30		Vcc1	+3.3V Power Supply
31	LVTTL-I	LPMode	Low Power Mode
32		GND	Ground
33	CML-I	Tx3p	Transmitter Non-inverted Data Input
34	CML-I	Tx3n	Transmitter Inverted Data Input
35		GND	Ground
36	CML-I	Tx1p	Transmitter Non-inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input
38		GND	Ground

V. Low Speed Electrical Hardware Pins

In addition to the 2-wire serial interface, the 40G QSFP+ module has the following low speed pins for control and status:

(1) ModPrsL
ModPrsL is an output pin. When "low", indicates the module is present. The ModPrsL is asserted "Low" when inserted and de-asserted "High" when the module is physically absent from the host connector.

(2) IntL
IntL is an output pin. When "Low", it indicates a possible module operational fault or a status critical to the host system. The source of the interrupt could be identified by using the 2-wire serial interface.

(3) LPMode
LPMode is a control pin. When "High", it could be used to set the module in low power mode (<2.0W). This pin, along with Power_overide bit and Power_set bit in management interface

could be used to avoid system power crash. 40G QSFP+ passive copper cable, however consumes less than 2.0W. Therefore, this pin takes no effect.

(4) ModSelL

ModSelL is an input signal. When held low by the host, the module responds to two-wire serial communication commands. The ModSelL signal allows multiple QSFP modules to be on a single two-wire interface bus. When the ModSelL signal is "High", the module will not respond to or acknowledge any two-wire interface communication from the host. The ModSelL signal input pin is biased to a "High" state in the module.

In order to avoid conflicts, the host system must not attempt two-wire interface communications within the ModSelL de-assert time after any QSFP modules are de-selected. Similarly, the host must wait for the period of the ModSelL assert time before communicating with the newly selected module. The assert and de-assert periods of different modules may overlap as long as the above timing requirements are met.

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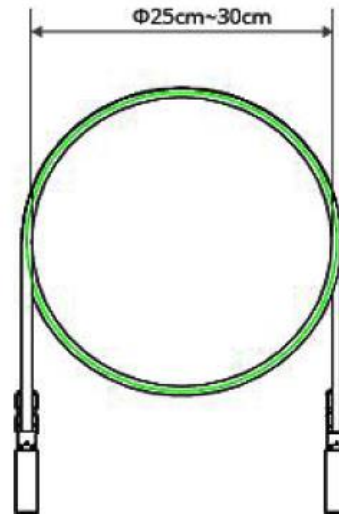
VI: Mechanical Dimensions
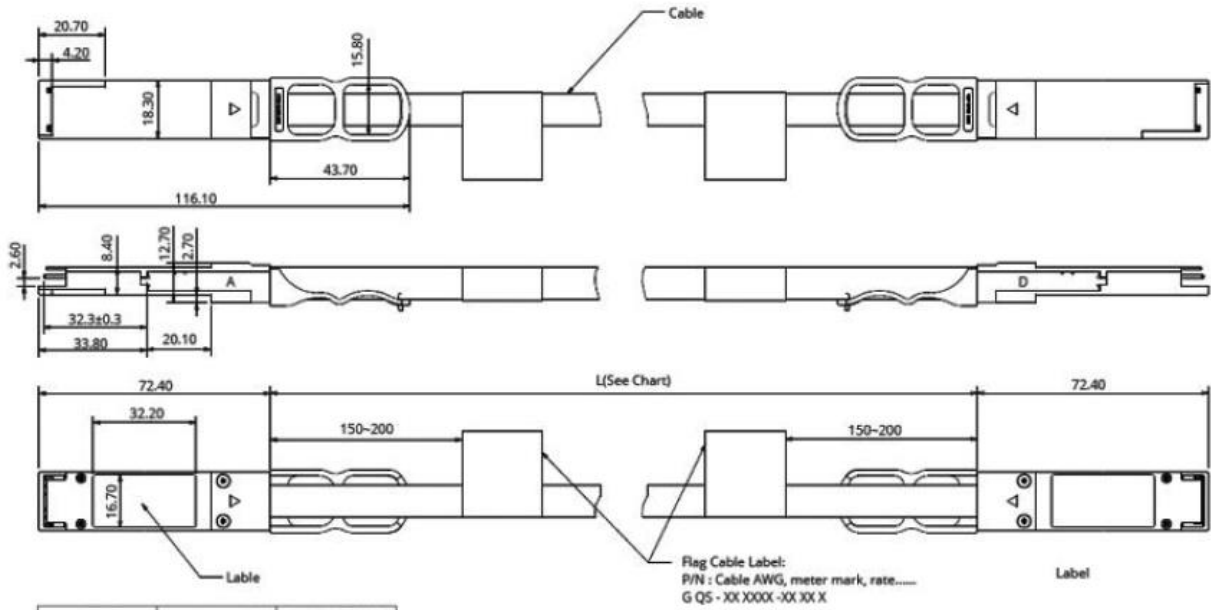
Code	Length range(m)	Tolerance(cm)
L	L ≤ 0.5	±3
	0.5<L≤5	±5
	5<L≤20	±8
	20<L	±10
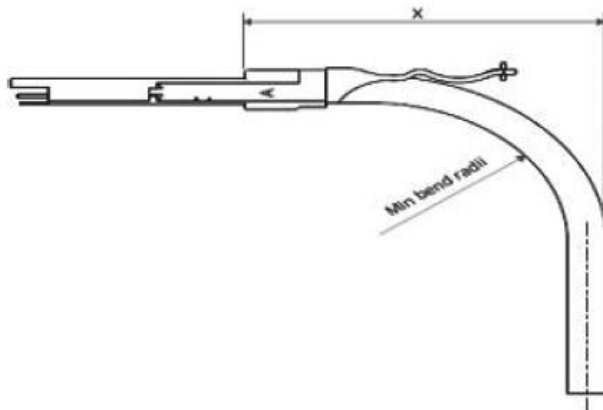
Unit : mm

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

Caution:
Follow accepted ESD practices when handling QSFP+ connectors to prevent damage to the internal components within the connector. ESD (electrostatic discharge) is the sudden flow of electricity between two objects at different voltage potentials caused by contact. The basis of any ESD protection strategy is to ground or bring all elements in the ESD protected area to the same potential. An ESD wrist strap should be used for everything in the ESD protected area including personnel, tools, cabinets and components.

A. Installing QSFP+ Modules

Follow these steps to install a QSFP+ cable assembly:

Step 1. Remove the protective ESD cap from the connector.

Step 2. Slide the QSFP+ cable end into the slot until it locks into position.

There is an audible click when the connector is properly seated.

Caution:
The latching mechanism locks the QSFP+ connector into place when cables are connected. Do not pull on the cable in an attempt to remove the QSFP+ connector.

B. Removing QSFP+ Modules

Follow these steps to remove a QSFP+ cable assembly:

Step 1. Pull on the QSFP+ latch pull lanyard.

Step 2. Grasp the QSFP+ connector on both sides and remove it from the system.

Step 3. If possible, replace the ESD protective cap or put the QSFP+ into an ESD protected bag.

Order Information

Part Number	Description	Length
ZV-40Gb-DAC-2.0M	40G QSFP+ Passive Copper Cable (PCC)	2.0m