

Dolphin PCPR5FC PCIe 5.0 Cable Data Sheet



PCIe 5.0 x16 CopprLink 1.0 AOC, CDFP Connectors

The CopprLink 1.0 cable assemblies are engineered to meet the evolving requirements of data centers and high-performance computing applications, offering high-density interconnect systems capable of delivering 32 GT/s per lane (PCIe 5.0) over multi-mode fiber. With 16 lanes, the cable supports data transfer rates up to 512 GT/s. This interconnection system fully complies with the prevailing industry standard, SFF-TA-1032.



Features

- Cable lengths 1m to 50m
- PCIe 5.0 x16 support
- Full sideband over optics
- PCI-SIG CopprLink 1.0 compliant
- 2 EEPROMs
- RoHS compliant

Part Numbers

| Part | Length | Fiber |
|------------------|-----------|-------|
| PCPR5FC-444-010M | 10 Meters | OM3 |
| PCPR5FC-444-050M | 50 Meters | OM3 |

Pin-Out

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|
| D | GND | PERp11 | PERn11 | GND | PERp10 | PERn10 | GND | PERp9 | PERn9 | GND | PERp8 | PERn8 | GND | REFCLK_U S_OUT_P | REFCLK_U S_OUT_N |
| C | GND | PERp12 | PERn12 | GND | PERp13 | PERn13 | GND | PERp14 | PERn14 | GND | PERp15 | RXn15 | GND | NC | NC |
| B | GND | PETp11 | PETn11 | GND | PETp10 | PETn10 | GND | PETp9 | PETn9 | GND | PETp8 | PETn8 | GND | REFCLK_D S_IN_P | REFCLK_DS_IN_N |
| A | GND | PETp12 | PETn12 | GND | PETp13 | PETn13 | GND | PETp14 | PETn14 | GND | PETp15 | PETn15 | GND | NC | NC |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| D | GND | PERp7 | PERn7 | GND | PERp6 | PERn6 | GND | PERp5 | PERn5 | GND | PERp4 | PERn4 | GND | SCL | SDA |
| C | GND | PERp0 | PERn0 | GND | PERp1 | PERn1 | GND | PERp2 | PERn2 | GND | PERp3 | PERn3 | GND | VCC3.3V | PERST# |
| B | GND | PETp7 | PETn7 | GND | PETp6 | PETn6 | GND | PETp5 | PETn5 | GND | PETp4 | PETn4 | GND | VCC12V | PRPE |
| A | GND | PETp0 | PETn0 | GND | PETp1 | PETn1 | GND | PETp2 | PETn2 | GND | PETp3 | PETn3 | GND | 2WCL | 2WDA |

Signal positions at the P1 connector

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|
| D | GND | PERp11 | PERn11 | GND | PERp10 | PERn10 | GND | PERp9 | PERn9 | GND | PERp8 | PERn8 | GND | REFCLK_D S_OUT_P | REFCLK_D S_OUT_N |
| C | GND | PERp12 | PERn12 | GND | PERp13 | PERn13 | GND | PERp14 | PERn14 | GND | PERp15 | PERn15 | GND | NC | NC |
| B | GND | PETp11 | PETn11 | GND | PETp10 | PETn10 | GND | PETp9 | PETn9 | GND | PETp8 | PETn8 | GND | REFCLK_U S_IN_P | REFCLK_U S_IN_N |
| A | GND | PETp12 | PETn12 | GND | PETp13 | PETn13 | GND | PETp14 | PETn14 | GND | PETp15 | PETn15 | GND | NC | NC |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| D | GND | PERp7 | PERn7 | GND | PERp6 | PERn6 | GND | PERp5 | PERn5 | GND | PERp4 | PERn4 | GND | SCL | SDA |
| C | GND | PERp0 | PERn0 | GND | PERp1 | PERn1 | GND | PERp2 | PERn2 | GND | PERp3 | PERn3 | GND | VCC3V | PERST# |
| B | GND | PETp7 | PETn7 | GND | PETp6 | PETn6 | GND | PETp5 | PETn5 | GND | PETp4 | PETn4 | GND | VCC12V | PRPE |
| A | GND | PETp0 | PETn0 | GND | PETp1 | PETn1 | GND | PETp2 | PETn2 | GND | PETp3 | PETn3 | GND | 2WCL | 2WDA |

Signal positions at the P2 connector

Wiring Table

| P1 | | Direction | P2 | |
|-----|--------|---------------|--------|-----|
| Pin | Signal | | Signal | Pin |
| A1 | GND | ----- | GND | C1 |
| A2 | PETp12 | -----> | PERp12 | C2 |
| A3 | PETn12 | -----> | PERn12 | C3 |
| A4 | GND | ----- | GND | C4 |
| A5 | PETp13 | -----> | PERp13 | C5 |
| A6 | PETn13 | -----> | PERn13 | C6 |
| A7 | GND | ----- | GND | C7 |
| A8 | PETp14 | -----> | PERp14 | C8 |
| A9 | PETn14 | -----> | PERn14 | C9 |
| A10 | GND | ----- | GND | C10 |
| A11 | PETp15 | -----> | PERp15 | C11 |
| A12 | PETn15 | -----> | PERn15 | C12 |
| A13 | GND | ----- | GND | C13 |
| A14 | NC | Not Connected | NC | C14 |
| A15 | NC | Not Connected | NC | C15 |
| A16 | GND | ----- | GND | C16 |
| A17 | PETp0 | -----> | PERp0 | C17 |
| A18 | PETn0 | -----> | PERn0 | C18 |
| A19 | GND | ----- | GND | C19 |
| A20 | PETp1 | -----> | PERp1 | C20 |
| A21 | PETn1 | -----> | PERn1 | C21 |
| A22 | GND | ----- | GND | C22 |
| A23 | PETp2 | -----> | PERp2 | C23 |
| A24 | PETn2 | -----> | PERn2 | C24 |
| A25 | GND | ----- | GND | C25 |
| A26 | PETp3 | -----> | PERp3 | C26 |
| A27 | PETn3 | -----> | PERn3 | C27 |
| A28 | GND | ----- | GND | C28 |
| A29 | 2WCL | -----> | 2WCL | A29 |
| A30 | 2WDA | <-----> | 2WDA | A30 |

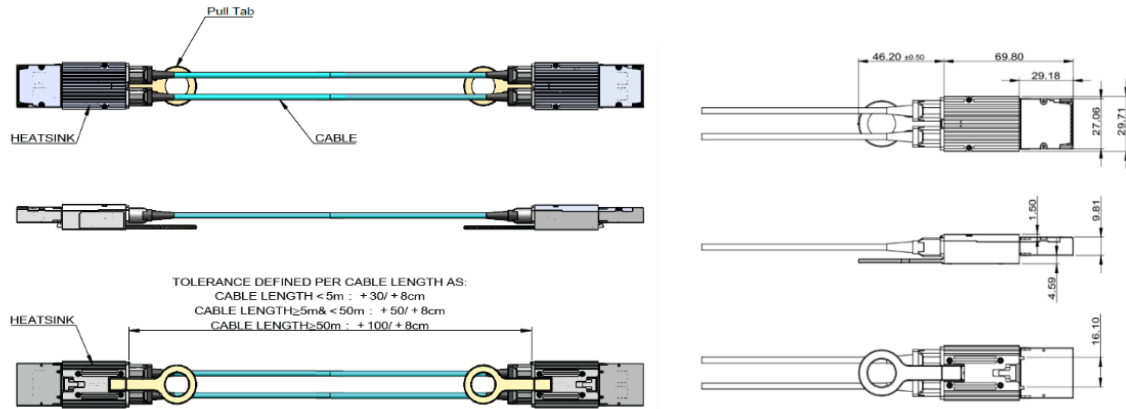
| P1 | | Direction | P2 | |
|-----|---------|---------------|---------|-----|
| Pin | Signal | | Signal | Pin |
| C1 | GND | ----- | GND | A1 |
| C2 | PERp12 | <----- | PETp12 | A2 |
| C3 | PERn12 | <----- | PETn12 | A3 |
| C4 | GND | ----- | GND | A4 |
| C5 | PERp13 | <----- | PETp13 | A5 |
| C6 | PERn13 | <----- | PETn13 | A6 |
| C7 | GND | ----- | GND | A7 |
| C8 | PERp14 | <----- | PETp14 | A8 |
| C9 | PERn14 | <----- | PETn14 | A9 |
| C10 | GND | ----- | GND | A10 |
| C11 | PERp15 | <----- | PETp15 | A11 |
| C12 | PERn15 | <----- | PETn15 | A12 |
| C13 | GND | ----- | GND | A13 |
| C14 | NC | Not Connected | NC | A14 |
| C15 | NC | Not Connected | NC | A15 |
| C16 | GND | ----- | GND | A16 |
| C17 | PERp0 | <----- | PETp0 | A17 |
| C18 | PERn0 | <----- | PETn0 | A18 |
| C19 | GND | ----- | GND | A19 |
| C20 | PERp1 | <----- | PETp1 | A20 |
| C21 | PERn1 | <----- | PETn1 | A21 |
| C22 | GND | ----- | GND | A22 |
| C23 | PERp2 | <----- | PETp2 | A23 |
| C24 | PERn2 | <----- | PETn2 | A24 |
| C25 | GND | ----- | GND | A25 |
| C26 | PERp3 | <----- | PETp3 | A26 |
| C27 | PERn3 | <----- | PETn3 | A27 |
| C28 | GND | ----- | GND | A28 |
| C29 | VCC3p3V | Not Connected | VCC3p3V | C29 |
| C30 | PERST# | -----> | PERST# | C30 |

Wiring Table-Continue

| P1 | | Direction | P2 | |
|-----|----------------|---------------|-----------------|-----|
| Pin | Signal | | Signal | Pin |
| B1 | GND | ----- | GND | D1 |
| B2 | PETp11 | -----> | PERp11 | D2 |
| B3 | PETn11 | -----> | PERn11 | D3 |
| B4 | GND | ----- | GND | D4 |
| B5 | PETp10 | -----> | PERp10 | D5 |
| B6 | PETn10 | -----> | PERn10 | D6 |
| B7 | GND | ----- | GND | D7 |
| B8 | PETp9 | -----> | PERp9 | D8 |
| B9 | PETn9 | -----> | PERn9 | D9 |
| B10 | GND | ----- | GND | D10 |
| B11 | PETp8 | -----> | PERp8 | D11 |
| B12 | PETn8 | -----> | PERn8 | D12 |
| B13 | GND | ----- | GND | D13 |
| B14 | REFCLK_DS_IN_P | <-----> | REFCLK_US_OUT_P | D14 |
| B15 | REFCLK_DS_IN_N | <-----> | REFCLK_US_OUT_N | D15 |
| B16 | GND | ----- | GND | D16 |
| B17 | PETp7 | -----> | PERp7 | D17 |
| B18 | PETn7 | -----> | PERn7 | D18 |
| B19 | GND | ----- | GND | D19 |
| B20 | PETp6 | -----> | PERp6 | D20 |
| B21 | PETn6 | -----> | PERn6 | D21 |
| B22 | GND | ----- | GND | D22 |
| B23 | PETp5 | -----> | PERp5 | D23 |
| B24 | PETn5 | -----> | PERn5 | D24 |
| B25 | GND | ----- | GND | D25 |
| B26 | PETp4 | -----> | PERp4 | D26 |
| B27 | PETn4 | -----> | PERn4 | D27 |
| B28 | GND | ----- | GND | D28 |
| B29 | VCC12V | Not Connected | VCC12V | B29 |
| B30 | PRPE | <-----> | PRPE | B30 |

| P1 | | Direction | P2 | |
|-----|-----------------|---------------|----------------|-----|
| Pin | Signal | | Signal | Pin |
| D1 | GND | ----- | GND | B1 |
| D2 | PERp11 | <-----> | PETp11 | B2 |
| D3 | PERn11 | <-----> | PETn11 | B3 |
| D4 | GND | ----- | GND | B4 |
| D5 | PERp10 | <-----> | PETp10 | B5 |
| D6 | PERn10 | <-----> | PETn10 | B6 |
| D7 | GND | ----- | GND | B7 |
| D8 | PERp9 | <-----> | PETp9 | B8 |
| D9 | PERn9 | <-----> | PETn9 | B9 |
| D10 | GND | ----- | GND | B10 |
| D11 | PERp8 | <-----> | PETp8 | B11 |
| D12 | PERn8 | <-----> | PETn8 | B12 |
| D13 | GND | ----- | GND | B13 |
| D14 | REFCLK_DS_OUT_P | <-----> | REFCLK_US_IN_P | B14 |
| D15 | REFCLK_DS_OUT_N | <-----> | REFCLK_DS_IN_N | B15 |
| D16 | GND | ----- | GND | B16 |
| D17 | PERp7 | <-----> | PETp7 | B17 |
| D18 | PERn7 | <-----> | PETn7 | B18 |
| D19 | GND | ----- | GND | B19 |
| D20 | PERp6 | <-----> | PETp6 | B20 |
| D21 | PERn6 | <-----> | PETn6 | B21 |
| D22 | GND | ----- | GND | B22 |
| D23 | PERp5 | <-----> | PETp5 | B23 |
| D24 | PERn5 | <-----> | PETn5 | B24 |
| D25 | GND | ----- | GND | B25 |
| D26 | PERp4 | <-----> | PETp4 | B26 |
| D27 | PERn4 | <-----> | PETn4 | B27 |
| D28 | GND | ----- | GND | B28 |
| D29 | SCL | Not Connected | SCL | B29 |
| D30 | SDA | Not Connected | SDA | B30 |

Cable Drawing



Technical Specification

| General | | | |
|----------------------------------|------------------------------------|------|------|
| Parameter | Value | Unit | Note |
| Number of Lanes | 16 Tx and 16 Rx | | |
| Maximum Data Rate per Lane | 32 | GT/s | |
| Minimum Cable Bend Radius | 75 | Mm | |
| Bifurcation | Single x16 | | |
| Electrical Interface and Pin-Out | CDFP 120-pin edge connector | | 1 |
| Maximum Power Consumption | 12(per end) | W | 2 |
| Latency | <1ns+time of flight | | |
| Cable Sideband Support | REFCLK / PERST# / PRPE WCL/SCL/SDA | | |
| BER | 1E-12 | | |

1. CopprLink Specification 1.0.0x16.

2. The maximum total power value is specified across the full temperature and voltage

| Operating Conditions | | | |
|--------------------------------------|-------|-------|------|
| Parameter | Min | Max | Unit |
| Case Operating Temperature | 0 | 70 | °C |
| Storage temperature | -40 | 85 | °C |
| Relative Humidity (non-condensation) | 10 | 85 | % |
| Supply Voltage 3.3V | 3.135 | 3.465 | V |
| Supply Voltage 12V | 11.4 | 12.6 | V |
| Total Power Consumption | | 12 | W |
| Supply Current 3.3V | | 0.8 | A |
| Supply Current 12V | | 0.8 | A |

| Electrical Characteristics | | | | | |
|--------------------------------------|--------------|---------|-----|------|------|
| Parameters | Min | Typical | Max | Unit | Note |
| Transmitter | | | | | |
| Signaling Rate Per Lane | 32 ±100 ppm | | | GT/s | |
| Differential Input Voltage Per Lane | 400 | | 900 | mV | |
| Differential Input Impedance | | 100 | | Ω | |
| Receiver | | | | | |
| Signaling Rate Per Lane | 32 ±100 ppm. | | | GT/s | |
| Differential Output Voltage Per Lane | 200 | | | mV | 2,3 |
| Differential Output Impedance | | 100 | | Ω | |

1. The maximum total power value is specified across the full temperature and voltage range.

2. Using 32GT/s NRZ signal format.

3. Does not include SSC variations.

Handling

Care should be taken to restrict exposure to the conditions defined in the Absolute Maximum Ratings. Place the product on a stable, level surface. If the product falls or drops, it may cause an injury or malfunction. The cable must not be subjected to excessive bending during installation or in operation. If you bend the cable beyond its minimum bend radius, it may be damaged. Don't twist or pull the cable ends by force, as this may cause a malfunction.



DO NOT
Kink
the
Cable



DO NOT
Over-Bend
the Cable
Behind the
Connector



DO NOT
Twist
the
Connector

Regulatory Marking

The cables hold the following regulatory markings:

