



- ✧ Maximum aggregate data rate: 41.25Gbps (4 ×10.3125Gbit/s)
- ✧ Hybrid cable link length up to x(x=1,3,5,7m)
- ✧ Power Supply: +3.3V
- ✧ Low power consumption: 0.02 W (typ.)
- ✧ Temperature Range: 0~ 70°C

**Features:**

- ✧ High-Density QSFP 38-PIN and 4×SFP 20-PIN Connector
- ✧ Hybrid cable conforms to the Small Form Factor SFF-8436 and SFF-8431

**Applications:**

- ✧ 10G/40Gigabit Ethernet
- ✧ InfiniBand SDR, DDR, QDR
- ✧ Switches, Routers, and HBAs
- ✧ Data Centers

● **Ordering information**

| PN       | Description                                      |
|----------|--|
| OPQCT1-4 | QSFP+ To 4X SFP+ Passive Cables, 1m, 0°C ~ +70°C |
| OPQCT3-4 | QSFP+ To 4X SFP+ Passive Cables, 3m, 0°C ~ +70°C |
| OPQCT5-4 | QSFP+ To 4X SFP+ Passive Cables, 5m, 0°C ~ +70°C |
| OPQCT7-4 | QSFP+ To 4X SFP+ Passive Cables, 7m, 0°C ~ +70°C |

**Description:**

The OPQCTx-4 QSFP+ to 4×SFP+ Passive cable assemblies are high performance, cost effective for SFP+ and QSFP+ equipment interconnects . The Hybrid cables are compliant with SFF-8436 and SFF-8431 specifications. It is offer a low power consumption, short reach interconnect applications. The cable each lane is capable of transmitting data at rates up to 10Gb/s, providing an aggregated rate of 40Gb/s.

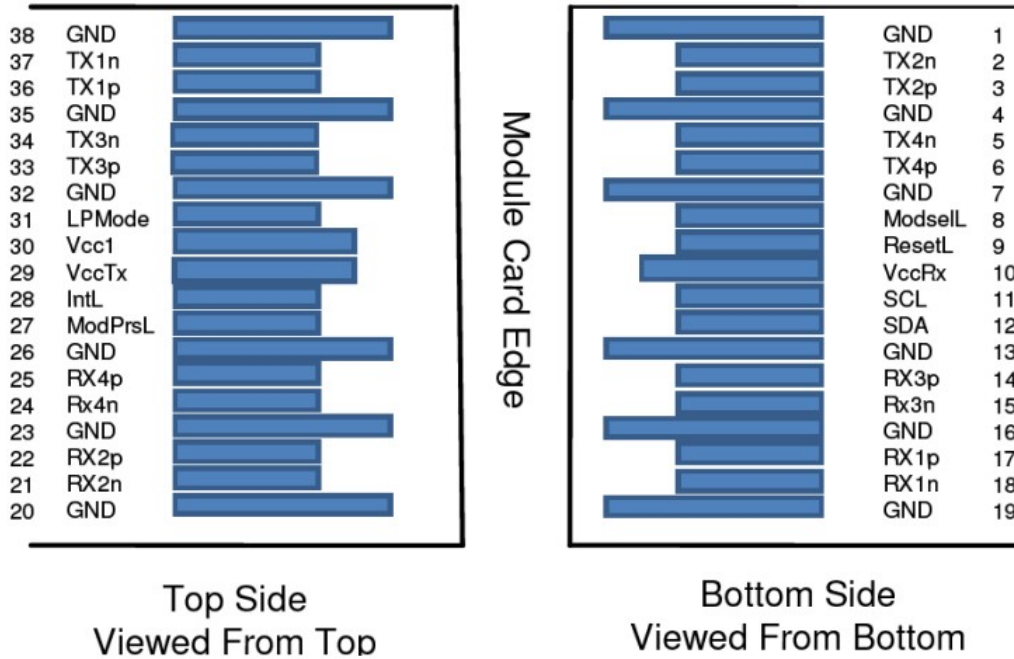
● **Absolute Maximum Ratings**

| Parameter           | Symbol               | Min. | Typical | Max. | Unit |
|---------------------|----------------------|------|---------|------|------|
| Storage Temperature | T <sub>s</sub>       | -40  |         | +85  | °C   |
| Supply Voltage      | V <sub>CC</sub> T, R | -0.5 |         | 4    | V    |
| Relative Humidity   | RH                   | 0    |         | 85   | %    |

● **Recommended Operating Environment:**

| Parameter                  | Symbol              | Min.  | Typical | Max.  | Unit |
|----------------------------|---------------------|-------|---------|-------|------|
| Case operating Temperature | T <sub>C</sub>      | 0     |         | +70   | °C   |
| Supply Voltage             | V <sub>CCT, R</sub> | +3.13 | 3.3     | +3.47 | V    |
| Power Dissipation          | PD                  |       |         | 0.02  | W    |

● **QSFP+ Module Pad Layout**



● **QSFP+ Pin Descriptions**

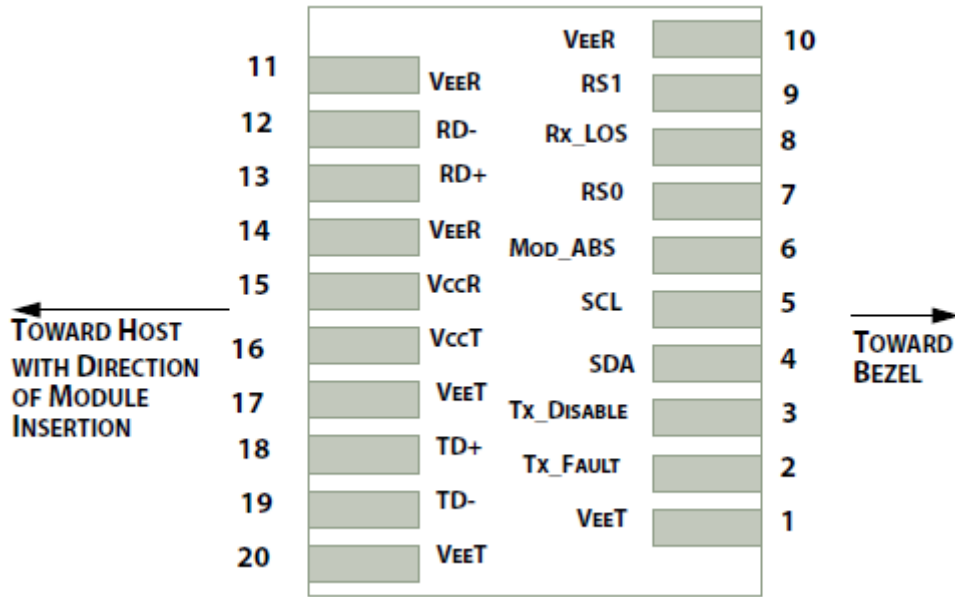
| Pin | Logic.     | Symbol  | Name/Description                    | Note |
|-----|------------|---------|-------------------------------------|------|
| 1   |            | GND     | Ground                              | 1    |
| 2   | CML-I      | Tx2n    | Transmitter Inverted Data Input     |      |
| 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         | 2    |
| 11  | LVC MOSI/O | SCL     | 2-wire serial interface clock       |      |
| 12  | LVC MOSI/O | SDA     | 2-wire serial interface data        |      |
| 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    |   |
| 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 | LVTTL-O | ModPrsL | Module Present                       |   |
| 28 | LVTTL-O | IntL    | Interrupt                            |   |
| 29 |         | Vcc Tx  | +3.3V Power supply transmitter       | 2 |
| 30 |         | Vcc1    | +3.3V Power supply                   | 2 |
| 31 | LVTTL-I | LPMODE  | Low Power Mode                       |   |
| 32 |         | GND     | Ground                               | 1 |
| 33 | CML-I   | Tx3p    | Transmitter Non-Inverted Data Input  |   |
| 34 | CML-I   | Tx3n    | Transmitter Non-Inverted Data Output |   |
| 35 |         | GND     | Ground                               | 1 |
| 36 | CML-I   | Tx1p    | Transmitter Inverted Data Output     |   |
| 37 | CML-I   | Tx1n    | Transmitter Non-Inverted Data Output |   |
| 38 |         | GND     | Ground                               | 1 |

Note:

1. GND is the symbol for signal and supply (power) common for the QSFP+ module. All are common within the QSFP+ module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Vcc Rx Vcc1 and Vcc Tx may be internally connected with- in the QSFP+ Module module in any combination. The connector pins are each rated for a maximum current of 500 mA.

● **Host PCB SFP+ pad contact assignment**



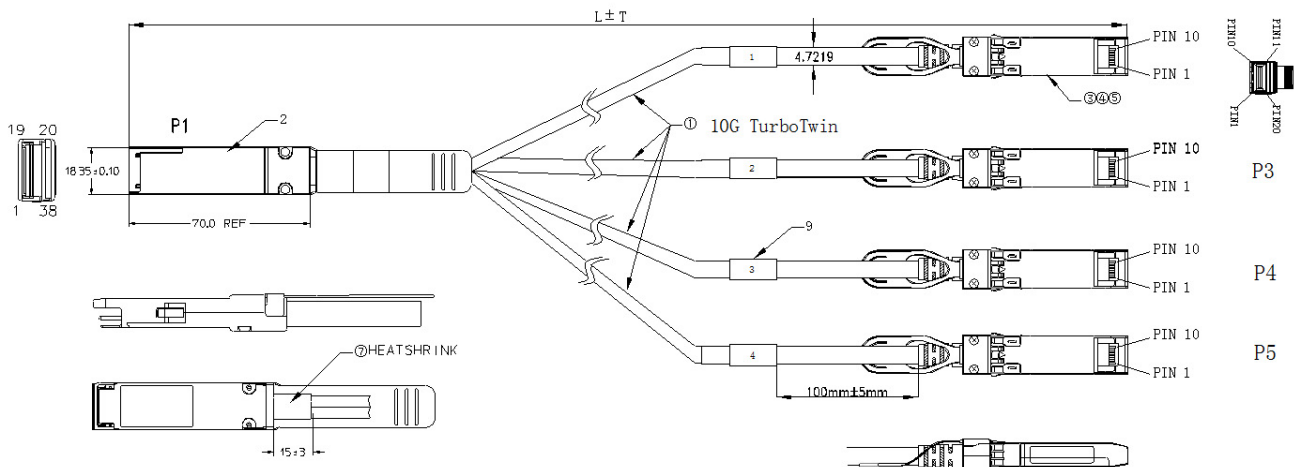
● **SFP+ Module and Host Electrical Pin Descriptions**

| Pin | Logic      | Symbol   | Name/Description                | Note |
|-----|------------|----------|---------------------------------|------|
| 1   |            | VeeT     | Transmitter Ground              |      |
| 2   | LV-TTL-O   | TX_Fault | N/A                             | 1    |
| 3   | LV-TTL-I   | TX_DIS   | Transmitter Disable             | 2    |
| 4   | LV-TTL-I/O | SDA      | Tow Wire Serial Data            |      |
| 5   | LV-TTL-I   | SCL      | Tow Wire Serial Clock           |      |
| 6   |            | MOD_DEF0 | Module present, connect to VeeT |      |
| 7   | LV-TTL-I   | RS0      | N/A                             | 1    |
| 8   | LV-TTL-O   | LOS      | LOS of Signal                   | 2    |
| 9   | LV-TTL-I   | RS1      | N/A                             | 1    |
| 10  |            | VeeR     | Reciever Ground                 |      |
| 11  |            | VeeR     | Reciever Ground                 |      |
| 12  | CML-O      | RD-      | Reciever Data Inverted          |      |
| 13  | CML-O      | RD+      | Reciever Data Non-Inverted      |      |
| 14  |            | VeeR     | Reciever Ground                 |      |
| 15  |            | VccR     | Reciever Supply 3.3V            |      |
| 16  |            | VccT     | Transmitter Supply 3.3V         |      |
| 17  |            | VeeT     | Transmitter Ground              |      |
| 18  | CML-I      | TD+      | Transmitter Data Non-Inverted   |      |
| 19  | CML_I      | TD-      | Transmitter Data Inverted       |      |
| 20  |            | VeeT     | Transmitter Ground              |      |

**Note**

1. Signals not supported in SFP+ Copper pulled-down to VeeT with 30K ohms resistor
2. Passive cable assemblies do not support LOS and TX\_DIS ( SFF-8431 2.4 )

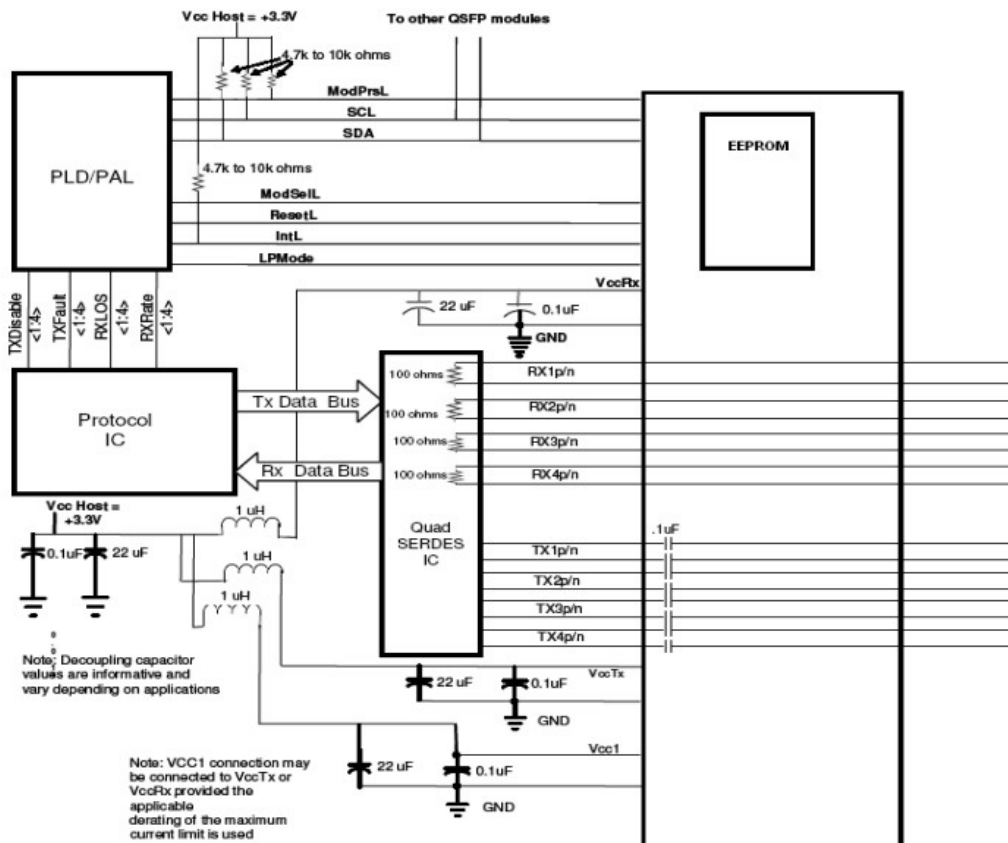
**Mechanical Dimensions:**



Mechanical Drawing

| Length (m)       | Tolerance (cm) | Length (m)  | Tolerance (cm) |
|------------------|----------------|-------------|----------------|
| $L \leq 0.5$     | +3/-3          | $L1 = 4/5L$ | +6/-6          |
| $0.5 < L \leq 3$ | +5/-5          | $L1 = 4/5L$ | +10/-10        |
| $3 < L \leq 10$  | +8/-8          | $L1 = 4/5L$ | +16/-16        |

● **QSFP+ Host Board Schematic for passive copper cables**



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