# 200G QSFP56 Active Optical Cable

## Features

- Up to 200Gb/s data rate
- 4x 50Gb/s PAM4 modulation
- SFF-8665 compliant QSFP56 port
- SFF-8636 compliant $I^2C$ management
- Single 3.3V power supply
- 4.5W power dissipation each end, with retiming
- Operating case temp Commercial: 0°C to +70 °C
- Hot pluggable
- RoHS compliant

## Applications

- Other optical links

## Absolute Maximum Ratings

**Table1-Absolute Maximum Ratings**

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Storage Temperature | TSTG | -5 | - | +75 | ºC | |
| Relative Humidity (non-condensation) | RH | 5 | - | 85 | % | |
| Power Supply Voltage | VCC | -0.5 | - | +3.6 | V | |

## Recommended Operating Conditions

**Table2-Recommended Operating Conditions**

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Case temperature | Tc | 0 | - | +70 | ℃ | |
| 3.3V Supply Voltage | VCC | 3.135 | 3.3 | 3.465 | V | |
| Standard Cable Lengths | | 1 | | 100 | m | |

## Electrical Characteristic

**Tested under recommended operating conditions, unless otherwise noted**

**Table3- Electrical Characteristic**

| Parameter | Symbol | Unit | Min | Typical | Max | Notes |
|---|---|---|---|---|---|---|
| **Transmitter** | | | | | | |
| Signaling rate (each lane) | SR | GBd | 26.5625 ± 100 ppm | | | |
| Differential data input voltage per lane | Vin,pp,diff | mV | 900 | | | |
| Differential termination mismatchal | | % | | | 10 | |
| Single-ended voltage tolerance range | | V | -0.4 | | 3.3 | |
| DC common mode voltage | | mV | -350 | | 2850 | |
| **Receiver** | | | | | | |
| Signaling rate (each lane) | SR | GBD | 26.5625 ± 100 ppm | | | |
| Differential output voltage | | mV | | | 900 | |
| Differential termination mismatch | | % | | | 10 | |
| Transition time (min, 20% to 80%) | | ps | 9.5 | | | |
| DC common mode voltage | | mv | -350 | | 2850 | |
| Error Bit Rate | BER | | | | 2.4E-4 | PRBS31Q@26.5625Gbd PAM4 |

## Recommended Interface Circuit

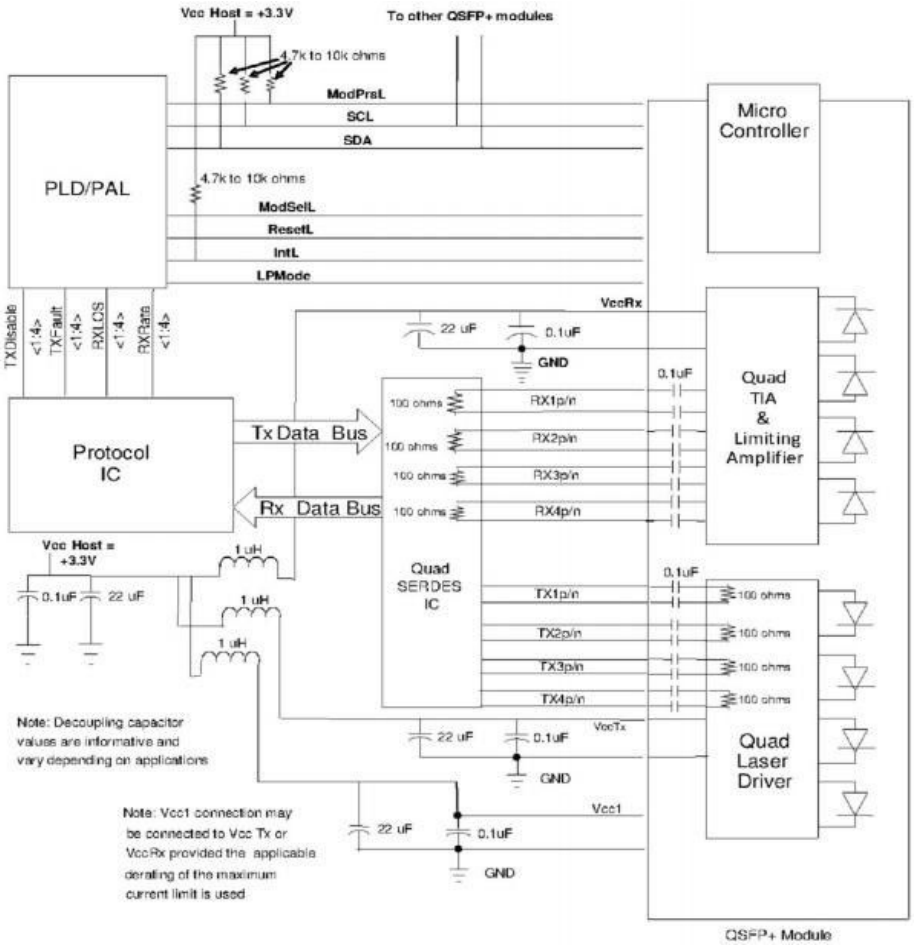



**Figure1 Recommended Interface Circuit**

## Pin Description

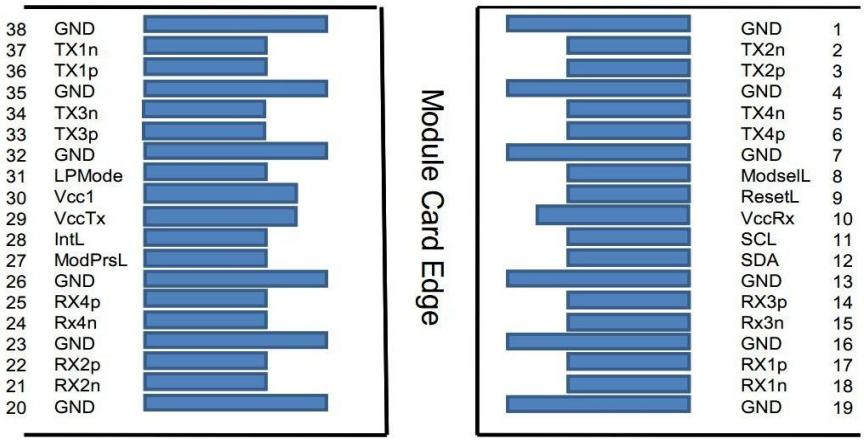



**Figure2 Pin view**

**Table4-Pin Function Definitions**

| Pin | Logic | Symbol | Name/Description | Note |
|---|---|---|---|---|
| 1 | G | GND | Ground | 1 |
| 2 | S | Tx2n | Transmitter Inverted Data Input | |
| 3 | S | Tx2p | Transmitter Non-Inverted Data Input | |
| 4 | G | GND | Ground | 1 |
| 5 | S | Tx4n | Transmitter Inverted Data Input | |
| 6 | S | Tx4p | Transmitter Non-Inverted Data Input | |
| 7 | G | GND | Ground | 1 |
| 8 | IO | ModSelL | Module Select | |
| 9 | IO | ResetL | Module Reset | |
| 10 | Power | Vcc Rx | +3.3V Power Supply Receiver | |
| 11 | IO | SCL | 2-wire serial interface clock | |
| 12 | IO | SDA | 2-wire serial interface data | |
| 13 | G | GND | Ground | 1 |
| 14 | S | Rx3p | Receiver Non-Inverted Data Output | |
| 15 | S | Rx3n | Receiver Inverted Data Output | |
| 16 | G | GND | Ground | 1 |
| 17 | S | Rx1p | Receiver Non-Inverted Data Output | |
| 18 | S | Rx1n | Receiver Inverted Data Output | |
| 19 | G | GND | Ground | 1 |
| 20 | G | GND | Ground | 1 |
| 21 | S | Rx2n | Receiver Inverted Data Output | |
| 22 | S | Rx2p | Receiver Non-Inverted Data Output | |
| 23 | G | GND | Ground | 1 |

| | | | | |
|---|---|---|---|---|
| 24 | S | Rx4n | Receiver Inverted Data Output | |
| 25 | S | Rx4p | Receiver Non-Inverted Data Output | |
| 26 | G | GND | Ground | 1 |
| 27 | IO | ModPrsL | Module Present | |
| 28 | IO | IntL | Interrupt | |
| 29 | Power | VccTx | +3.3V Power supply transmitter | |
| 30 | Power | Vcc1 | +3.3V Power supply | |
| 31 | IO | LPMode | Low Power Mode | |
| 32 | G | GND | Ground | 1 |
| 33 | S | Tx3p | Transmitter Non-Inverted Data Input | |
| 34 | S | Tx3n | Transmitter Inverted Data Input | |
| 35 | G | GND | Ground | 1 |
| 36 | S | Tx1p | Transmitter Non-Inverted Data Input | |
| 37 | S | Tx1n | Transmitter Inverted Data Input | |
| 38 | G | GND | Ground | 1 |

Notes：

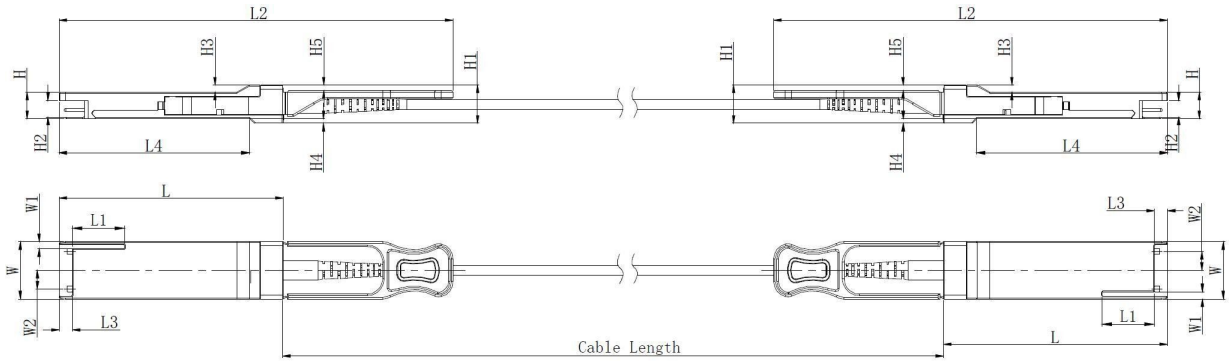
[1] Circuit ground is internally isolated from chassis ground.

## Monitoring Specification

| 2-Wire Serial Address 1010000x | | | |
|---|---|---|---|
| Lower Page 00h | | | |
| 0 Identifier | | | |
| 1- 2 Status | | | |
| 3- 21 Interrupt Flags | | | |
| 22- 33 Free Side Device Monitors | | | |
| 34- 81 Channel Monitors | | | |
| 82- 85 Reserved | | | |
| 86- 98 Control | | | |
| 99 Reserved | | | |
| 100-104 Hardware Interrupt Pin Masks | | | |
| 105-106 Vendor Specific | | | |
| 107 Reserved | | | |
| 108-110 Free Side Device Properties | | | |
| 111-112 Assigned for use by PCI Express | | | |
| 113 Free Side Device Properties | | | |
| 114-118 Reserved | | | |
| 119-122 Password Change Entry Area (Optional) | | | |
| 123-126 Password Entry Area (Optional) | | | |
| 127 Page Select Byte | | | |
| **Upper Page 00h** | **Optional Page 01h** | **Optional Page 02h** | **Optional Page 03h** |
| 128 Identifier | 128 CC_APPS | 128-255 User EEPROM Data | 128-175 Free Side Device Thresholds |
| 129-191 Base ID Fields | 129 AST Table Length (TL) | | |
| | 130-131 Application Code Entry 0 | | |
| | 132-133 Application Code Entry 1 | | |
| | 134-253 other entries | | |
| 192-223 Extended ID | | | 176-223 Channel Thresholds |
| 224-255 Vendor Specific ID | | | 224 Tx EQ & Rx Emphasis Magnitude ID |
| | | | 225 RX output amplitude indicators |
| | | | 226-241 Channel Controls |
| | | | 242-251 Channel Monitor Masks |
| | 254-255 Application Code Entry TL | | 252-255 Reserved |

**Figure3 Memory map**

## Mechanical




## Unit mm

| | L | L1 | L2 | L3 | L4 | W | W1 | W2 | H | H1 | H2 | H3 | H4 | H5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max | 72.2 | - | 128 | 4.35 | 61.4 | 18.45 | - | 6.2 | 8.6 | 12.4 | 5.35 | 2.5 | 1.6 | 2.0 |
| Type | 72.0 | - | - | 4.20 | 61.2 | 18.35 | - | - | 8.5 | 12.2 | 5.2 | 2.3 | 1.5 | 1.8 |
| Min | 68.8 | 16.5 | 124 | 4.05 | 61.0 | 18.25 | 2.2 | 5.8 | 8.4 | 12.0 | 5.05 | 2.1 | 1.3 | 1.6 |

## Cable Length

**Table5-Cable Length**

| Parameter | Value | Units |
|---|---|---|
| Diameter | 3±0.2 | mm |
| Minimum bend radius | 30 | mm |
| Length tolerance | 1 m ≤length ≤ 4.5 m +15 / -0 | cm |
| | 5 m ≤length ≤ 14.5 m +30 / -0 | cm |
| | Length≥15.0 m +2% / -0 | m |
| Cable color | Aqua | |

### Warnings

**Handling Precautions:** This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

**Laser Safety:** Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to