

QSFP-56G-AOC-XFM

56Gbps QSFP+ to QSFP+ Active Optical Cables

1M, 2M, 3M, 5M, 10M, 15M, 20M, 25M, 30M 50M Reach



Product Features

- ❖ Support Infiniband and Fibre Channel application
- ❖ Compliant to QSFP+ Electrical MSA SFF-8436
- ❖ Multi rate of up to 14.025Gbps
- ❖ +3.3V single power supply
- ❖ Transmission distance up to 150m
- ❖ Low power consumption

- ❖ Operating case temp Commercial: 0°C to +70 °C
- ❖ RoHS compliant

Applications

- ❖ InfiniBand FDR at 56Gb
- ❖ 16G Fibre Channel at 14Gb per lane
- ❖ Super Computer
- ❖ Other optical links

Absolute Maximum Ratings

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|---------------------|------------------|------|---------|------|------|-----------------|
| Supply Voltage | Vcc ₃ | -0.5 | - | +3.6 | V | |
| Storage Temperature | Ts | -10 | - | +70 | °C | |
| Operating Humidity | RH | +5 | - | +85 | % | No condensation |

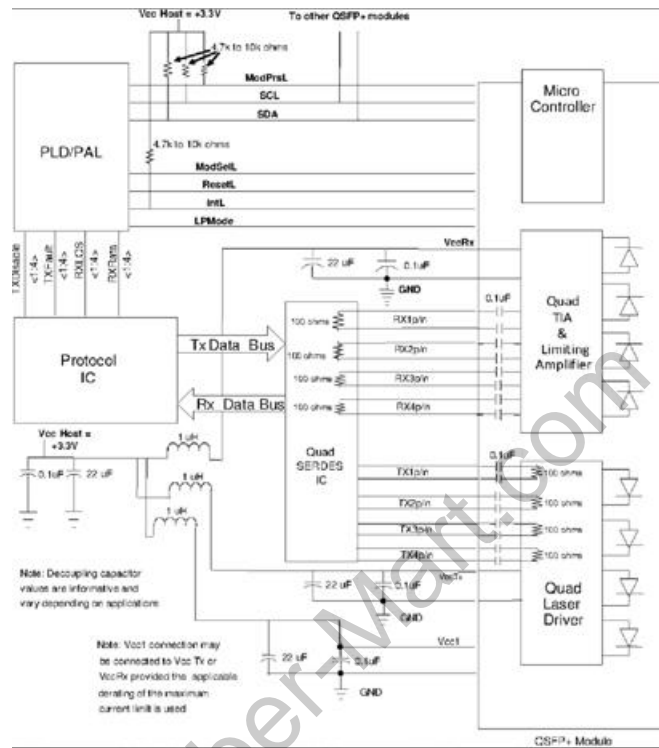
Recommended Operating Conditions & Su

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|----------------------------|--------|------|---------|------|------|--------------|
| Operating Case Temperature | TC | 0 | - | +70 | °C | |
| Power Supply Voltage | Vcc | 3.14 | 3.3 | 3.47 | V | |
| Power Dissipation | Pd | - | - | 1.5 | W | Per terminal |
| Bit Rate | BR | 1.25 | 14.025 | - | Gbps | |

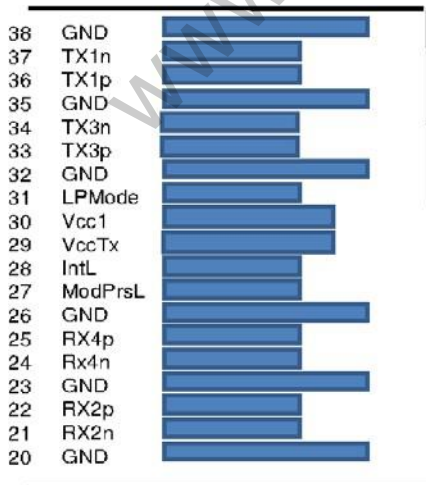
Electrical Characteristics

| Parameter | | Symbol | Min | Typical | Max | Units | Notes |
|---|------------------|--------------|-----|---------|--------------|----------|-----------------------------------|
| ModSelL | Module Select | V_{OL} | 0 | - | 0.8 | V | |
| | Module Unselect | V_{OH} | 2.5 | - | V_{CC} | V | |
| LPMode | Low Power Mode | V_{IL} | 0 | - | 0.8 | V | |
| | Normal Operation | V_{IH} | 2.5 | - | $V_{CC}+0.3$ | V | |
| ResetL | Reset | V_{IL} | 0 | - | 0.8 | V | |
| | Normal Operation | V_{IH} | 2.5 | - | $V_{CC}+0.3$ | V | |
| ModPrsL | Normal Operation | V_{OL} | 0 | - | 0.4 | V | |
| IntL | Interrupt | V_{OL} | 0 | - | 0.4 | V | |
| | Normal Operation | V_{oH} | 2.4 | - | V_{CC} | V | |
| Electrical Transmitter Characteristics | | | | | | | |
| Differential Data Input Swing | | V_{out} | 200 | - | 1600 | mV | |
| Output Differential Impedance | | Z_D | 90 | 100 | 110 | Ω | |
| Electrical Receiver Characteristics | | | | | | | |
| Differential Data Output Swing | | $V_{in,P-P}$ | 350 | - | 800 | mVPP | |
| Bit Error Rate | | BER | | | E-12 | | PRBS2 ³¹ -1@14.025Gbps |
| Input Differential Impedance | | Z_{IN} | 90 | 100 | 110 | Ω | |

Recommended Interface Circuit

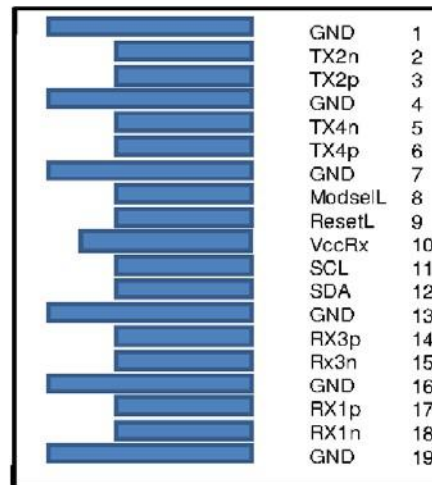


Pin Arrangement



Top Side
Viewed From Top

Module Card Edge



Bottom Side
Viewed From Bottom

Pin Function Definitions

| Pin | Symbol | Name/Description | Notes |
|-----|---------|-------------------------------------|-------|
| 1 | GND | Ground | 1 |
| 2 | Tx2n | Transmitter Inverted Data Input | |
| 3 | Tx2p | Transmitter Non-Inverted Data Input | |
| 4 | GND | Ground | 1 |
| 5 | Tx4n | Transmitter Inverted Data Input | |
| 6 | Tx4p | Transmitter Non-Inverted Data Input | |
| 7 | GND | Ground | 1 |
| 8 | ModSelL | Module Select | |
| 9 | ResetL | Module Reset | |
| 10 | Vcc Rx | +3.3V Power Supply Receiver | |
| 11 | SCL | 2-wire serial interface clock | |
| 12 | SDA | 2-wire serial interface data | |
| 13 | GND | Ground | 1 |
| 14 | Rx3p | Receiver Non-Inverted Data Output | |
| 15 | Rx3n | Receiver Inverted Data Output | |
| 16 | GND | Ground | 1 |
| 17 | Rx1p | Receiver Non-Inverted Data Output | |
| 18 | Rx1n | Receiver Inverted Data Output | |
| 19 | GND | Ground | 1 |
| 20 | GND | Ground | 1 |
| 21 | Rx2n | Receiver Inverted Data Output | |
| 22 | Rx2p | Receiver Non-Inverted Data Output | |
| 23 | GND | Ground | 1 |
| 24 | Rx4n | Receiver Inverted Data Output | |
| 25 | Rx4p | Receiver Non-Inverted Data Output | |
| 26 | GND | Ground | 1 |

| | | | |
|----|---------|-------------------------------------|---|
| 27 | ModPrsL | Module Present | |
| 28 | IntL | Interrupt | |
| 29 | Vcc Tx | +3.3V Power supply transmitter | |
| 30 | Vcc1 | +3.3V Power supply | |
| 31 | LPMode | Low Power Mode | |
| 32 | GND | Ground | 1 |
| 33 | Tx3p | Transmitter Non-Inverted Data Input | |
| 34 | Tx3n | Transmitter Inverted Data Input | |
| 35 | GND | Ground | 1 |
| 36 | Tx1p | Transmitter Non-Inverted Data Input | |
| 37 | Tx1n | Transmitter Inverted Data Input | |
| 38 | GND | Ground | 1 |

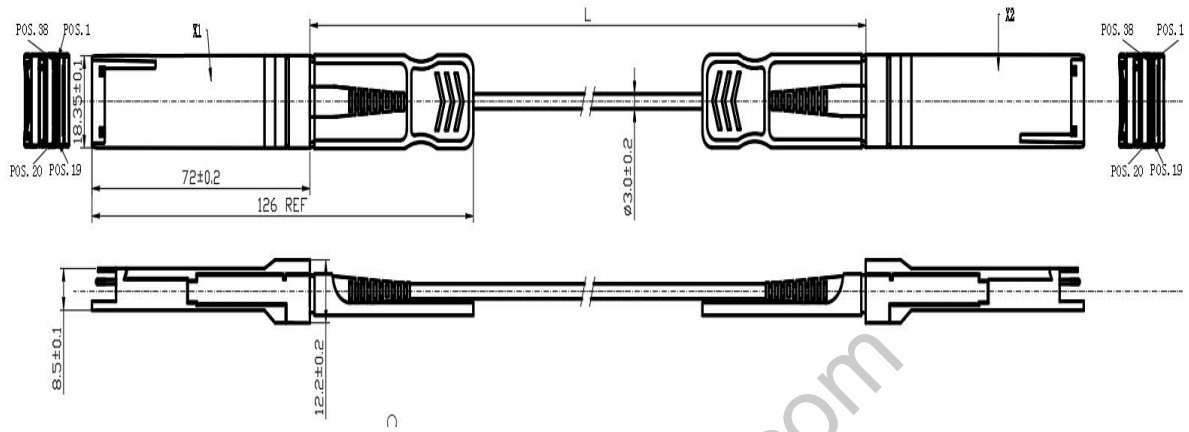
Note: 1. Circuit ground is internally isolated from chassis ground.

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) | | 176-223 Channel Thresholds |
| | 130-131 Application Code Entry 0 | | |
| | 132-133 Application Code Entry 1 | | |
| | 134-253 other entries | | |
| 192-223 Extended ID | | 224 Tx EQ & Rx Emphasis Magnitude ID | |
| 224-255 Vendor Specific ID | | 225 RX output amplitude indicators | |
| | | 226-241 Channel Controls | |
| | | 242-251 Channel Monitor Masks | |
| | 254-255 Application Code Entry TL | | 252-255 Reserved |

Mechanical Dimensions



Ordering Information

| Part Number | Product Description |
|-------------------|--|
| QSFP-56G-AOC-1FM | 56G QSFP+ to QSFP+ Active Optical Cable, 1m (3ft), 0° C ~ +70° C |
| QSFP-56G-AOC-2FM | 56G QSFP+ to QSFP+ Active Optical Cable, 2m (7ft), 0° C ~ +70° C |
| QSFP-56G-AOC-3FM | 56G QSFP+ to QSFP+ Active Optical Cable, 3m (10ft), 0° C ~ +70° C |
| QSFP-56G-AOC-5FM | 56G QSFP+ to QSFP+ Active Optical Cable, 5m (16ft), 0° C ~ +70° C |
| QSFP-56G-AOC-10FM | 56G QSFP+ to QSFP+ Active Optical Cable, 10m (33ft), 0° C ~ +70° C |
| QSFP-56G-AOC-15FM | 56G QSFP+ to QSFP+ Active Optical Cable, 15m (49ft), 0° C ~ +70° C |
| QSFP-56G-AOC-20FM | 56G QSFP+ to QSFP+ Active Optical Cable, 20m (66ft), 0° C ~ +70° C |
| QSFP-56G-AOC-25FM | 56G QSFP+ to QSFP+ Active Optical Cable, 25m (82ft), 0° C ~ +70° C |
| QSFP-56G-AOC-30FM | 56G QSFP+ to QSFP+ Active Optical Cable, 30m (98ft), 0° C ~ +70° C |
| QSFP-56G-AOC-50FM | 56G QSFP+ to QSFP+ Active Optical Cable, 50m (164ft), 0° C ~ +70° C |