

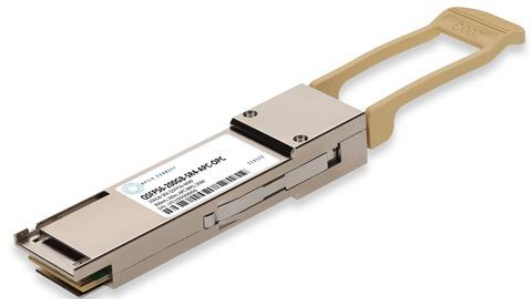


### **QSFP56-200GB-SR4-APC-OPC**

MSA and TAA Compliant 200GBase-SR4 QSFP56 Transceiver (MMF, 850nm, 100m, APC MPO, DOM)

#### **Features**

- Excellent ESD Protection
- Supports SFF-8636 Management Interface
- Metal with Lower EMI
- Multi-mode Fiber
- MPO-12 APC Connector
- 3.3V Power Supply
- Operating Temperature: 0 to 70 Celsius
- Hot Pluggable QSFP56 Form Factor
- 4 channels 850nm VCSEL array
- RoHS Compliant and Lead-Free



#### **Applications:**

- 200GBase Ethernet

#### **Product Description**

This MSA compliant QSFP56 transceiver provides 200GBase-SR4 Fibre Channel throughput up to 100m over multi-mode fiber (MMF) using a wavelength of 850nm via an APC MPO connector. It is guaranteed to be 100% compatible with the equivalent MSA compliant transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

OptioConnect's transceivers are RoHS compliant and lead-free.

## Absolute Maximum Ratings

| Parameter                  | Symbol           | Min. | Typ. | Max.   | Unit | Notes |
|----------------------------|------------------|------|------|--------|------|-------|
| Maximum Supply Voltage     | V <sub>cc</sub>  | 0    |      | 3.63   | V    |       |
| Storage Temperature        | T <sub>stg</sub> | -40  |      | 85     | °C   |       |
| Relative Humidity          | RH               | 5    |      | 85     | %    | 1     |
| Operating Case Temperature | T <sub>c</sub>   | 0    |      | 70     | °C   |       |
| Bit Error Ratio            | BER              |      |      | 2.4E-4 |      | 2     |

### Notes:

1. Non-condensing.
2. The typical BER is better than 1E-6 when measured with a transmitter to produce SECQ up to 3dB.

## Electrical Characteristics

| Parameter                                           | Symbol              | Min.  | Typ. | Max.  | Unit | Notes |
|-----------------------------------------------------|---------------------|-------|------|-------|------|-------|
| Module Supply Voltage                               | V <sub>cc</sub>     | 3.135 | 3.3  | 3.465 | V    |       |
| Module Supply Current                               | I <sub>cc</sub>     |       |      | 1600  | mA   |       |
| Module Power Dissipation                            | P <sub>D</sub>      |       |      | 5     | W    |       |
| Transmitter                                         |                     |       |      |       |      |       |
| Differential Data Input Voltage Peak-to-Peak Swing  | V <sub>IN,pp</sub>  |       |      | 900   | mV   |       |
| Receiver                                            |                     |       |      |       |      |       |
| Differential Data Output Voltage Peak-to-Peak Swing | V <sub>OUT,pp</sub> |       |      | 900   | mV   |       |

## Optical Characteristics

| Parameter                                                        | Symbol          | Min. | Typ.                                                              | Max.                   | Unit  | Notes |
|------------------------------------------------------------------|-----------------|------|-------------------------------------------------------------------|------------------------|-------|-------|
| <b>Transmitter</b>                                               |                 |      |                                                                   |                        |       |       |
| Signaling Rate Per Lane                                          | Rate            |      | 26.5625                                                           |                        | GBd   |       |
| Modulation Format                                                | MF              |      | PAM4                                                              |                        |       |       |
| Signaling Speed Accuracy                                         | SSA             | -100 |                                                                   | 100                    | ppm   |       |
| Center Wavelength                                                | $\lambda$       |      | 850                                                               |                        | nm    |       |
| RMS Spectral Width                                               | $\Delta\lambda$ |      |                                                                   | 0.6                    | nm    |       |
| Optical Return Loss Tolerance                                    | ORLT            |      |                                                                   | 12                     | dB    |       |
| Average Optical Power                                            | Pavg            | -6.5 |                                                                   | +4                     | dBm   |       |
| Extinction Ratio                                                 | ER              | 3    |                                                                   |                        | dB    |       |
| Optical Modulation Amplitude Per Lane                            | OMA             | -4.5 |                                                                   | +3                     | dBm   |       |
| Launch Power in OMA Outer Minus TDECQ Per Lane                   |                 | -5.9 |                                                                   |                        | dBm   |       |
| Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane | TDECQ           |      |                                                                   | 4.5                    | dB    |       |
| TDECQ – $10 \cdot \log_{10}(\text{Ceq})$ Per Lane                |                 |      |                                                                   | 4.5                    | dB    |       |
| Relative Intensity Noise                                         | RIN             |      |                                                                   | -128                   | dB/Hz |       |
| Transmitter Transition Time Per Lane                             |                 |      |                                                                   | 34                     | ps    |       |
| Laser Off Power                                                  |                 |      |                                                                   | -30                    | dBm   |       |
| Encircled Flux                                                   | EF              |      | $\geq 86\%$ at $19\mu\text{m}$<br>$\leq 30\%$ at $4.5\mu\text{m}$ |                        |       |       |
| <b>Receiver</b>                                                  |                 |      |                                                                   |                        |       |       |
| Signaling Rate Per Lane                                          | Rate            |      | 26.5625                                                           |                        | GBd   |       |
| Modulation Format                                                | MF              |      | PAM4                                                              |                        |       |       |
| Signaling Speed Accuracy                                         | SSA             | -100 |                                                                   | +100                   | ppm   |       |
| Center Wavelength                                                | $\lambda$       |      | 850                                                               |                        | nm    |       |
| Average Receive Power Per Lane                                   | Pavg            | -8.4 |                                                                   | +4                     | dBm   |       |
| Receive Power Per Lane OMA                                       | Po              |      |                                                                   | 3                      | dBm   |       |
| Receiver Reflectance                                             | RL              |      |                                                                   | -12                    | dB    |       |
| Receiver Sensitivity OMA Per Lane                                | S               |      |                                                                   | Max = (-6.5, SECQ-7.9) | dBm   | 1     |
| Damage Threshold                                                 | THd             | 5    |                                                                   |                        | dBm   |       |

### Notes:

1. Receiver sensitivity is informative and defined for a transmitter with a value of SECQ up to 4.5dB.

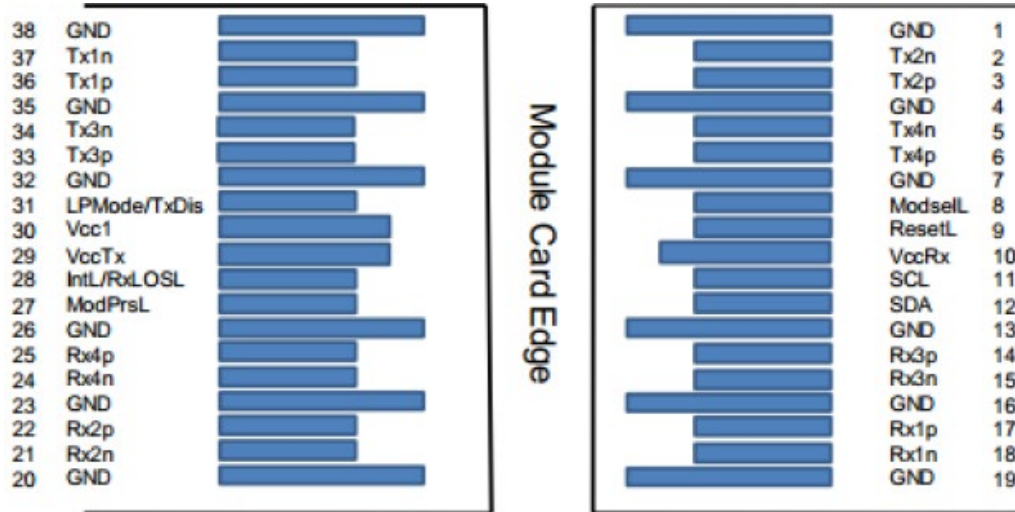
## Pin Descriptions

| Pin | Symbol       | Description                                                                               | Notes |
|-----|--------------|-------------------------------------------------------------------------------------------|-------|
| 1   | GND          | Ground.                                                                                   | 1     |
| 2   | Tx2-         | Transmitter Inverted Data Input.                                                          |       |
| 3   | Tx2+         | Transmitter Non-Inverted Data Input.                                                      |       |
| 4   | GND          | Ground.                                                                                   | 1     |
| 5   | Tx4-         | Transmitter Inverted Data Input.                                                          |       |
| 6   | Tx4+         | Transmitter Non-Inverted Data Input.                                                      |       |
| 7   | GND          | Ground.                                                                                   |       |
| 8   | ModSelL      | Module Select.                                                                            |       |
| 9   | ResetL       | Module Reset.                                                                             |       |
| 10  | VccRx        | +3.3V Power Supply Receiver.                                                              | 2     |
| 11  | SCL          | 2-Wire Serial Interface Clock.                                                            |       |
| 12  | SDA          | 2-Wire Serial Interface Data.                                                             |       |
| 13  | GND          | Ground.                                                                                   |       |
| 14  | Rx3+         | Receiver Non-Inverted Data Output.                                                        |       |
| 15  | Rx3-         | Receiver Inverted Data Output.                                                            |       |
| 16  | GND          | Ground.                                                                                   | 1     |
| 17  | Rx1+         | Receiver Non-Inverted Data Output.                                                        |       |
| 18  | Rx1-         | Receiver Inverted Data Output.                                                            | 1     |
| 19  | GND          | Ground.                                                                                   | 1     |
| 20  | GND          | Ground.                                                                                   |       |
| 21  | Rx2-         | Receiver Inverted Data Output.                                                            |       |
| 22  | Rx2+         | Receiver Non-Inverted Data Output.                                                        |       |
| 23  | GND          | Ground.                                                                                   |       |
| 24  | Rx4-         | Receiver Inverted Data Output.                                                            |       |
| 25  | Rx4+         | Receiver Non-Inverted Data Output.                                                        |       |
| 26  | GND          | Ground.                                                                                   | 1     |
| 27  | ModPrsL      | Module Present.                                                                           |       |
| 28  | IntL/RxLOSL  | Interrupt. Optionally configurable as RxLOSL via the management interface (SFF-8636).     |       |
| 29  | VccTx        | +3.3V Power Supply Transmitter.                                                           | 2     |
| 30  | Vcc1         | +3.3V Power Supply.                                                                       | 2     |
| 31  | LPMode/TxDis | Low-Power Mode. Optionally configurable as TxDis via the management interface (SFF-8636). |       |
| 32  | GND          | Ground.                                                                                   | 1     |
| 33  | Tx3+         | Transmitter Non-Inverted Data Input.                                                      |       |
| 34  | Tx3-         | Transmitter Inverted Data Input.                                                          |       |
| 35  | GND          | Ground.                                                                                   | 1     |
| 36  | Tx1+         | Transmitter Non-Inverted Data Input.                                                      |       |
| 37  | Tx1-         | Transmitter Inverted Data Input.                                                          |       |
| 38  | GND          | Ground.                                                                                   | 1     |

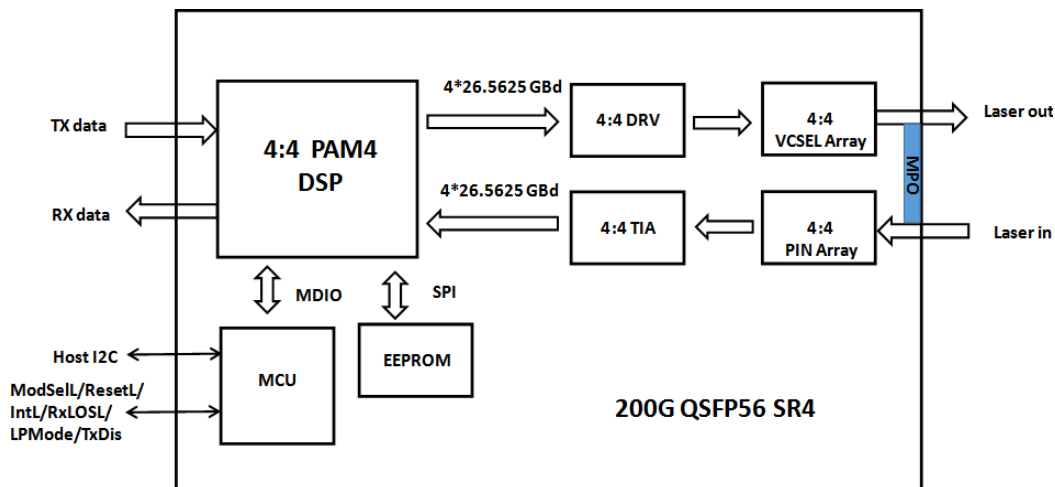
## Notes:

1. GND is the symbol for signal and supply (power) common for the module. All are common within the 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. VccRx, Vcc1, and VccTx are applied concurrently and may be internally connected within the module in any combination.

## Pin-Out Definitions



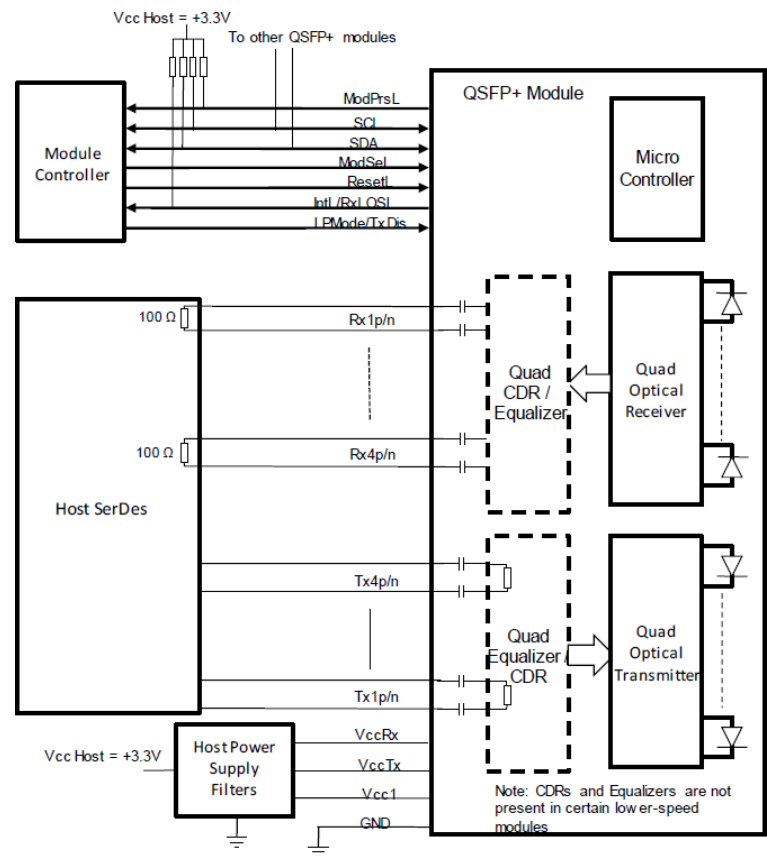
## Block Diagram of Transceiver



**Transmitter Section:** This module converts 4-channel 53.125Gbps electrical data to 4-channel 850nm 53.125Gbps optical signals for 212Gbps optical transmission.

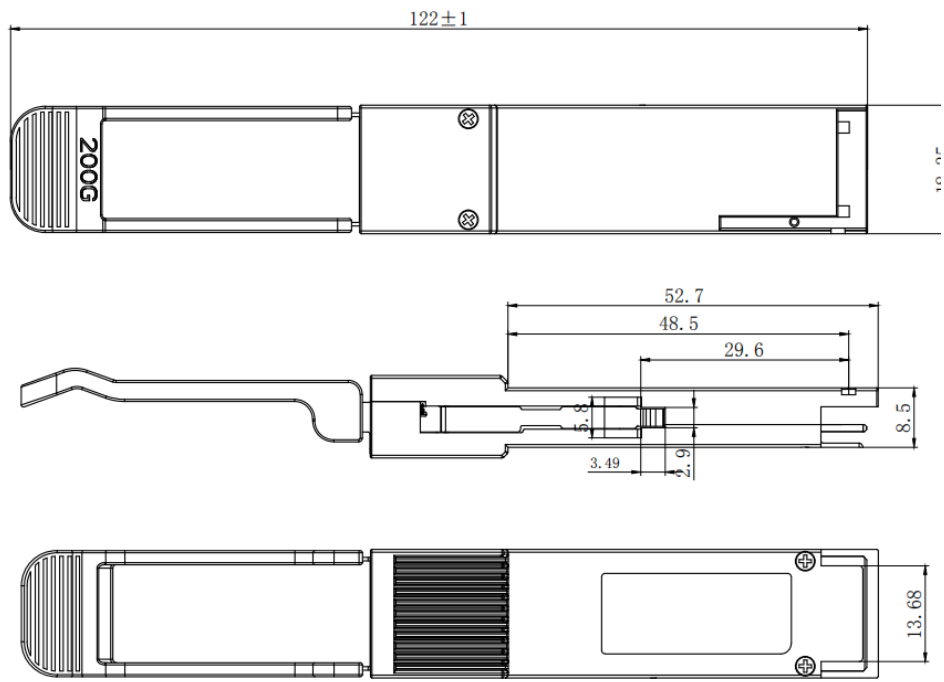
**Receiver Section:** Similarly, this module optically converts 4-channel 850nm 53.125Gbps optical signals to 4-channel electrical data output on the receiver side.

Recommended Interface Circuit



Mechanical Specifications

Unit is millimeter. All dimensions are ±0.1mm unless otherwise specified.



## **OptioConnect**

### **Innovation for the Future of High-Speed Networking**

#### **Who We Are**

OptioConnect is reshaping the landscape of communication and high-speed networking through intelligent technology. With a core focus on cutting edge technology, we deliver smarter fiber optic solutions for enterprise networks, data centers, and next-gen telecom infrastructures.

#### **What We Do**

At OptioConnect, we fuse advanced engineering with intelligent automation to drive the future of networking. Our AI-integrated solutions are designed to optimize performance and streamline operations with:

- Superior Performance
- Network and traffic optimization
- Intelligent energy management
- Seamless OEM compatibility
- Scalable cost-efficiency

#### **Smarter Networks by Design**

Innovation isn't just a goal—it's our process. We embed AI and machine learning across our R&D and product lines, enabling adaptive performance, automated tuning, and faster deployment cycles. The result? Networks that don't just work—they learn, evolve, and outperform.

#### **Our Team**

Our engineers, data scientists, and network architects bring decades of experience and a future-focused mindset. We provide hands-on support with intelligent insights that turn complex challenges into simple solutions.

#### **Our Mission**

To deliver AI-enhanced connectivity that reduces cost, increases speed, and maximizes efficiency—empowering our partners to operate at the forefront of a rapidly evolving digital world.

#### **Let's Connect**

Discover how OptioConnect's intelligent infrastructure solutions can power your network's next leap forward.

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