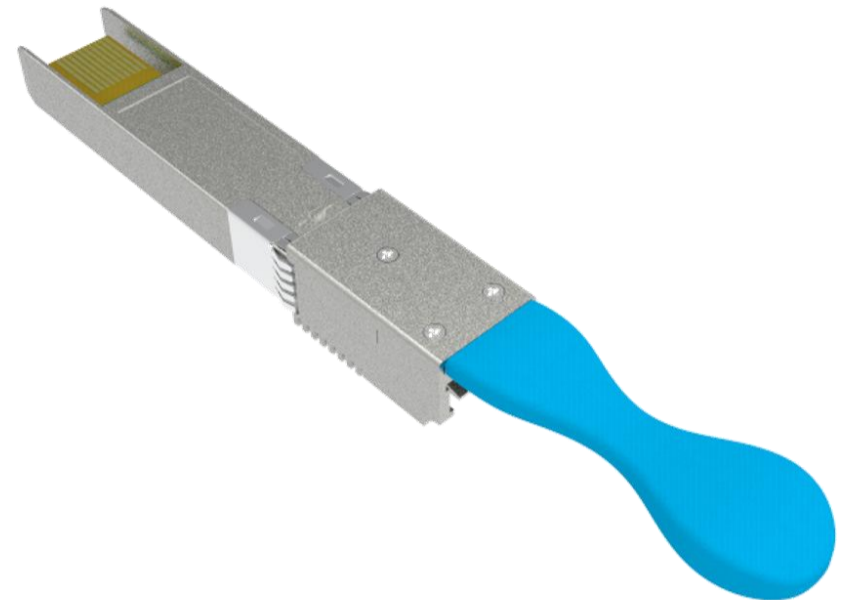


# QSFP to SFP+ Adapter (QSA) Module

## Features

- Trouble-free installation and network bring-up
- Compliant to industry standards: SFF-8436
- Compliant to industry standards: SFF-8432
- Precision process control for minimization of pair-to-pair skew
- 1 independent duplex channels operating at 10Gbps, also support for 5Gbps data rates
- All-metal housing for superior EMI performance
- 100ohm differential impedance system
- Operating case temperature: -20 to 85°C
- Low insertion loss
- Low crosstalk
- Secure latching mechanism
- RoHS compliant
- Compatible with RoHS
- Single +3.3V power supply



## Applications

- Low EMI radiation Switches, servers and routers
- Telecommunication and wireless infrastructure
- Test and measurement equipment
- Networked storage systems
- Data Center networks
- Storage area networks

## Product Description

The FIBERSTAMP QSFP to SFP+ Adapter (QSA) Module offers 10Gigabit Ethernet connectivity for Quad Small Form-Factor Pluggable (QSFP)-only platforms. It allows smooth and cost-effective migration to 40 Gigabit Ethernet by providing an option to use lower-speed Enhanced Small Form-Factor Pluggable (SFP+) modules in empty QSFP ports or when the other end of the network is running at lower speeds.

The QSA Module interoperates with all major optical modules and direct attached copper cable vendors. Its design assures minimum loss on the conversion path between the QSFP cage and the SFP+ receptacle. The high-speed data channel of the SFP+ receptacle is connected to lane 1 of the QSFP connector. The three remaining channels on the QSFP connector are not connected. With this adapter, customers have the flexibility to use any SFP+ module or cable to connect to a lower-speed port on the other end of the network. This flexibility allows a cost-effective transition to 40 Gigabit Ethernet by maximizing the use of high-density 40 Gigabit Ethernet QSFP platforms. This adapter supports all SFP+ optics and cable reaches. Compatible switch models and SFP+ modules. A list of SFP+ modules that can be plugged into the QSA module is provided in Table 1

It is qualified for 10GbE SFP+ and 1GbE SFP transceivers meeting the Small Form Factor Pluggable (SFP) Transceiver Multi-source Agreement (MSA). The QSA module provides a solution for integrating systems using different vendors' equipment, is vendor agnostic and provides a direct path to the SFP port unit's memory.



**Table 1.**

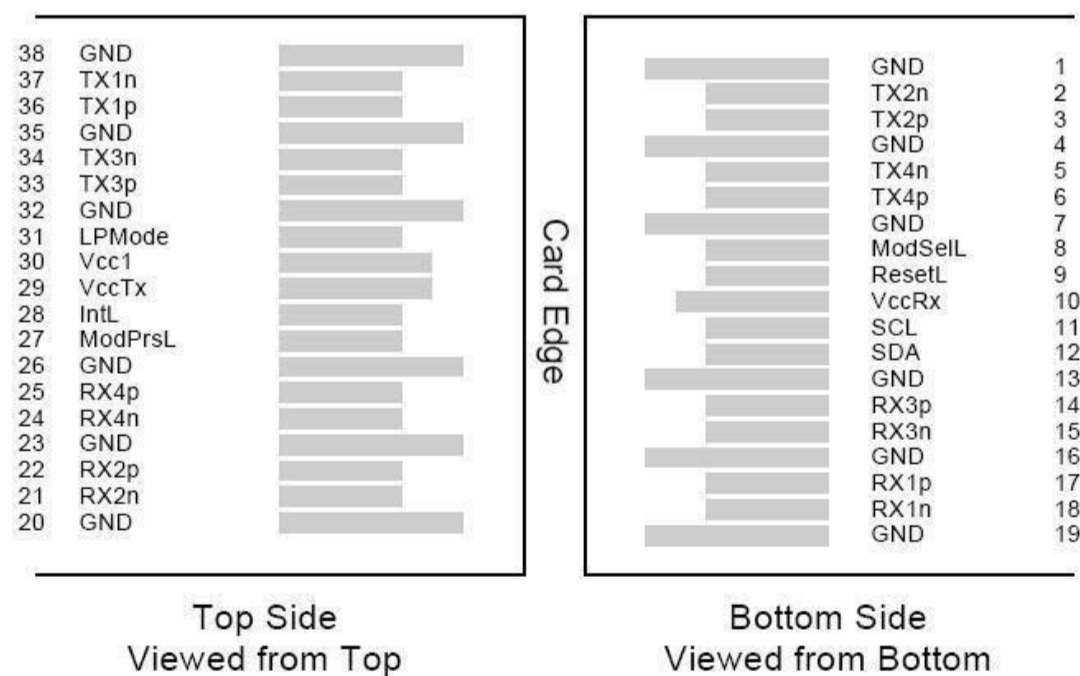
| Item | Product Name | Product Description                             |
|------|--------------|---|
| 1    | 10G SFP+ SR  | 10GBASE-SR SFP+ Module for Multimode Fiber      |
| 2    | 10G SFP+ LR  | 10GBASE-LR SFP+ Module for Single-Mode Fiber    |
| 3    | 10G SFP+ ER  | 10GBASE-ER SFP+ Module for Single-Mode Fiber    |
| 4    | 10G SFP+ ZR  | DWDM SFP+ Modules for Single-Mode Fiber         |
| 5    | 10G SFP+ DAC | SFP+ Twinax Copper Cables (1-m to 10-m lengths) |
| 6    | 10G SFP+ AOC | SFP+ Active Optical Cable Assembly              |

**Recommended Operation Condition**

| Parameter                            | Symbol | Min  | Max  | Unit |
|--------------------------------------|--------|------|------|------|
| Operating Case Temperature           | Topc   | -20  | 85   | degC |
| Storage Temperature                  | Tst    | -40  | 85   | degC |
| Relative Humidity (non-condensation) | RS     | -    | 85   | %    |
| Supply Voltage                       | VCC3   | 3.15 | 3.45 | V    |
| Power consumption                    | Pout   |      | 0.3  | W    |
| Characteristic Impedance             | Im     | 90   | 110  | Ohm  |
| Data Rate                            |        | 1    | 25   | Gbps |

**QSFP Host board Connector Pinout**

**Figure 1: MSA compliant Connector**



**Figure 2: Pin Definitions**

| Pin | Logic | Symbol | Name/Description                | Note |
|-----|-------|--------|---------------------------------|------|
| 1   |       | GND    | Ground                          | 1    |
| 2   | CML-I | Tx2n   | Transmitter Inverted Data Input |      |



| Pin | Logic      | Symbol  | Name/Description                     | Note |
|-----|------------|---------|--------------------------------------|------|
| 3   | CML-I      | Tx2p    | Transmitter Non-Inverted Data output |      |
| 4   |            | GND     | Ground                               | 1    |
| 5   | CML-I      | Tx4n    | Transmitter Inverted Data Input      |      |
| 6   | CML-I      | Tx4p    | Transmitter Non-Inverted Data output |      |
| 7   |            | GND     | Ground                               | 1    |
| 8   | LVTTLL-I   | ModSelL | Module Select                        |      |
| 9   | LVTTLL-I   | ResetL  | Module Reset                         |      |
| 10  |            | VccRx   | + 3.3V Power Supply Receiver         | 2    |
| 11  | LVCNOS-I/O | SCL     | 2-Wire Serial Interface Clock        |      |
| 12  | LVCNOS-I/O | SDA     | 2-Wire Serial Interface Data         |      |
| 13  |            | GND     | Ground                               |      |
| 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        | 1    |
| 25  | CML-O      | Rx4p    | Receiver Non-Inverted Data Output    |      |
| 26  |            | GND     | Ground                               | 1    |
| 27  | LVTTTL-O   | ModPrsL | Module Present                       |      |
| 28  | LVTTTL-O   | IntL    | Interrupt                            |      |
| 29  |            | VccTx   | +3.3 V Power Supply transmitter      | 2    |
| 30  |            | Vcc1    | +3.3 V Power Supply                  | 2    |
| 31  | LVTTTL-I   | LPMode  | Low Power Mode                       |      |
| 32  |            | GND     | Ground                               | 1    |
| 33  | CML-I      | Tx3p    | Transmitter Non-Inverted Data Input  |      |
| 35  |            | GND     | Ground                               | 1    |
| 36  | CML-I      | Tx1p    | Transmitter Non-Inverted Data Input  |      |
| 37  | CML-I      | Tx1n    | Transmitter Inverted Data Output     |      |
| 38  |            | GND     | Ground                               | 1    |

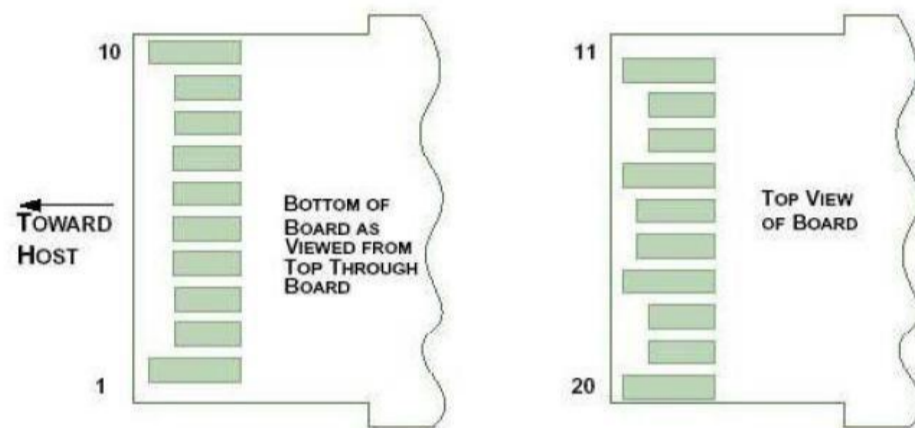


**Note:**

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

**SFP Host board Connector Pinout**

**Figure 3: MSA compliant Connector**



**Figure 4: Pin Definitions**

| Pin | Logic      | Symbol     | Name/Description                            | Note |
|-----|------------|------------|---|------|
| 1   |            | VeeT       | Module Transmitter Ground                   | 1    |
| 2   | LVTTTL-O   | Tx_Fault   | Transmitter Fault                           | 2    |
| 3   | LVTTTL-I   | Tx_Disable | Transmitter Disable                         | 3    |
| 4   | LVTTTL-I/O | SDA        | MOD-DEF2 2-wire serial interface data line  | 4    |
| 5   | LVTTTL-I/O | SCL        | MOD-DEF1 2-wire serial interface clock line | 4    |
| 6   |            | Mod_Abs    | Module Absent                               | 5    |
| 7   | LVTTTL-I   | RS0        | Rate Select Zero                            |      |
| 8   | LVTTTL-O   | Rx_LOS     | Module Receiver Loss of Signal              | 2    |
| 9   | LVTTTL-I   | RS1        | Rate Select One                             |      |
| 10  |            | VeeR       | Module Receiver Ground                      | 1    |
| 11  |            | VeeR       | Module Receiver Ground                      | 1    |
| 12  | CML-O      | RD-        | Receiver Inverted Data Output               |      |
| 13  | CML-O      | RD+        | Receiver Non-Inverted Data Output           |      |
| 14  |            | VeeR       | Module Receiver Ground                      | 1    |
| 15  |            | VccR       | Module Receiver 3.3V Supply                 |      |
| 16  |            | VccT       | Module Transmitter 3.3V Supply              |      |
| 17  |            | VeeT       | Module Transmitter Ground                   | 1    |
| 18  | CML-I      | TD+        | Transmitter Non-Inverted Data Input         |      |

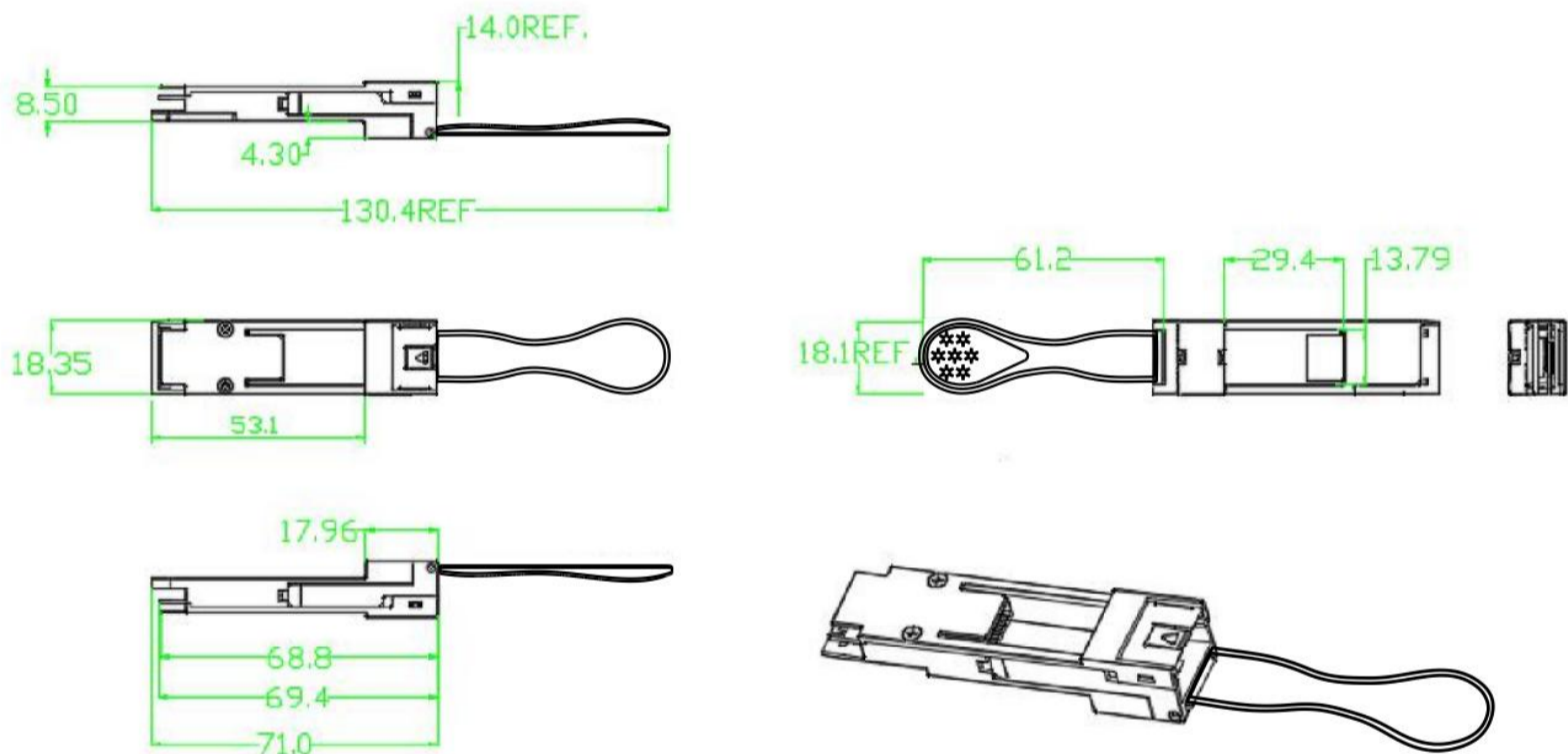


| Pin | Logic | Symbol | Name/Description                | Note |
|-----|-------|--------|---------------------------------|------|
| 19  | CML-I | TD-    | Transmitter Inverted Data Input |      |
| 20  |       | VeeT   | Module Transmitter Ground       | 1    |

**Notes:**

1. The module signal grounds, VeeR and VeeT, shall be isolated from the module case.
2. This is an open collector/drain output and shall be pulled up with 4.7-10k to Vcc\_Host on the host board. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module has voltage exceeding module VccT/R + 0.5 V.
3. This is an open collector/drain input and shall be pulled up with 4.7-10k to VccT in the module.
4. See 2-wire electrical specifications.
5. This shall be pulled up with 4.7-10k to Vcc\_Host on the host board.

**Mechanical Dimensions**



**Ordering Information**

| Part Number | Description   |
|-------------|---|
| GQS-SFP+-A  | QSFP to SFP+ Adapter (QSA) Module, I2C read port information comes from SFP port module     |
| GQS-SFP+-B  | QSFP to SFP+ Adapter (QSA) Module, I2C read port information from QSA adapter, support DDMI |

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