

### F5-UPG-QSFP+-PRO

F5 Networks® F5-UPG-QSFP+ Compatible TAA Compliant 40GBase-SR4 QSFP+ Transceiver (MMF, 850nm, 150m, DOM, 0 to 70C, MPO)

#### Features

- SFF-8436 Compliance
- MPO Connector
- Commercial Temperature 0 to 70 Celsius
- Multi-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



#### Applications:

- 40GBase Ethernet
- 4x10G Breakout Option
- Access and Enterprise

#### Product Description

This F5 Networks® F5-UPG-QSFP+ compatible QSFP+ transceiver provides 40GBase-SR4 throughput up to 150m over multi-mode fiber (MMF) using a wavelength of 850nm via an MPO connector. It is guaranteed to be 100% compatible with the equivalent F5 Networks® 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.

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

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products.



## Absolute Maximum Ratings

| Parameter                  | Symbol           | Min. | Typ.    | Max. | Unit |
|----------------------------|------------------|------|---------|------|------|
| Supply Voltage             | V <sub>CC</sub>  | -0.5 |         | 4.0  | V    |
| Storage Temperature        | T <sub>stg</sub> | -40  |         | 85   | °C   |
| Operating Case Temperature | T <sub>c</sub>   | 0    | 25      | 70   | °C   |
| Relative Humidity          | RH               | 5    |         | 95   | %    |
| Data Rate Per Channel      |                  |      | 10.3125 |      | Gbps |

## Electrical Characteristics

| Parameter                       | Symbol                         | Min.  | Typ. | Max.  | Unit  | Notes |
|---------------------------------|--------------------------------|-------|------|-------|-------|-------|
| Supply Voltage                  | V <sub>CC</sub>                | 3.135 | 3.3  | 3.465 | V     |       |
| Module Supply Current           | I <sub>CC</sub>                |       |      | 430   | mA    |       |
| Power Dissipation               | P <sub>DISS</sub>              |       |      | 1.5   | W     |       |
| <b>Transmitter</b>              |                                |       |      |       |       |       |
| Input Differential Impedance    | Z <sub>IN</sub>                |       | 100  |       | Ω     |       |
| Differential Data Input Swing   | V <sub>IN,pp</sub>             | 180   |      | 900   | mVp-p |       |
| <b>Receiver</b>                 |                                |       |      |       |       |       |
| Output Differential Impedance   | Z <sub>OUT</sub>               |       | 100  |       | Ω     |       |
| Differential Data Output Swing  | V <sub>OUT,pp</sub>            | 300   |      | 850   | mVp-p | 1     |
| Data Output Rise Time/Fall Time | T <sub>r</sub> /T <sub>f</sub> | 28    |      |       | ps    | 2     |

### Notes:

1. Internally AC coupled but requires an external 100Ω differential load termination.
2. 20 – 80 %.

## Optical Characteristics

| Parameter                                | Symbol                      | Min. | Typ. | Max. | Unit | Notes |
|--|-----------------------------|------|------|------|------|-------|
| <b>Transmitter</b>                       |                             |      |      |      |      |       |
| Launch Optical Power                     | P <sub>o</sub>              | -7.6 |      | +2.4 | dBm  | 1     |
| Center Wavelength Range                  | λ <sub>C</sub>              | 830  | 850  | 860  | nm   |       |
| Extinction Ratio                         | ER                          | 3    |      |      | dB   | 2     |
| Spectral Width (RMS)                     | Δλ                          |      |      | 0.65 | nm   |       |
| Transmitter and Dispersion Penalty       | TDP                         |      |      | 3.2  | dB   |       |
| Optical Return Loss Tolerance            | ORLT                        |      |      | 12   | dB   |       |
| Eye Diagram                              | IEEE Std 802.3ba Compatible |      |      |      |      |       |
| <b>Receiver</b>                          |                             |      |      |      |      |       |
| Center Wavelength                        | λ <sub>C</sub>              | 830  | 850  | 860  | nm   |       |
| Receiver Sensitivity (P <sub>avg</sub> ) | S                           |      |      | -9.5 | dBm  | 3     |
| Damage Threshold                         | P <sub>OL</sub>             | 2.5  |      |      | dBm  | 3     |
| Optical Return Loss                      | ORL                         | 12   |      |      | dB   |       |
| LOS Assert                               | LOSA                        | -30  |      |      | dBm  |       |
| LOS De-Assert                            | LOSD                        |      |      | -11  | dBm  |       |
| LOS Hysteresis                           |                             | 0.5  |      |      | dB   |       |

### Notes:

1. The optical power is launched into OM3 MMF.
2. Measured with a PRBS 2<sup>31</sup>-1 test pattern @10.3125Gbps.
3. Measured with PRBS 2<sup>31</sup>-1 test pattern, 10.3125Gbps, and BER<10<sup>-12</sup>.

## Pin Descriptions

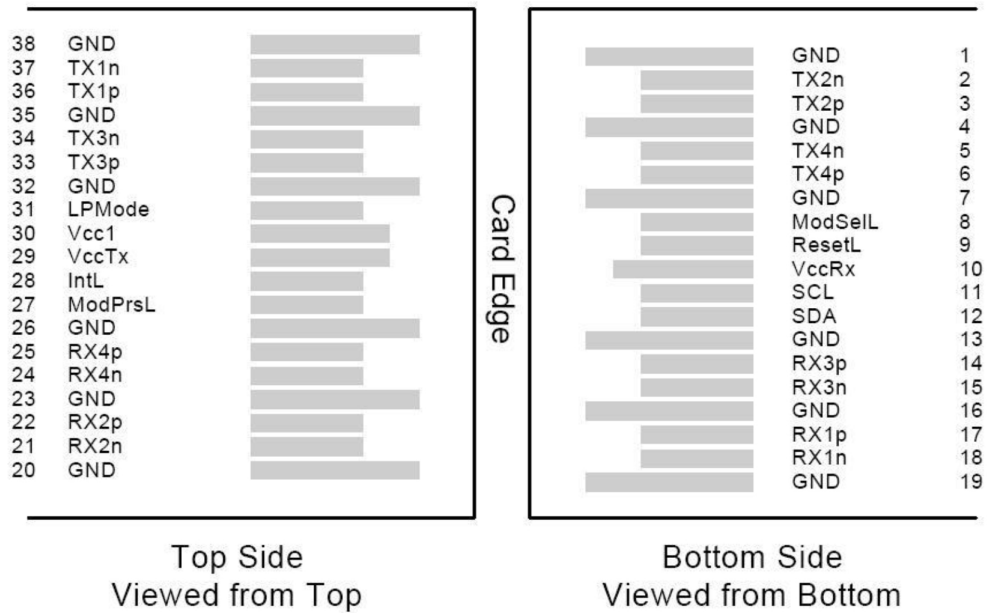
| Pin | Logic      | Symbol  | Name/Descriptions  | Notes |
|-----|------------|---------|--|-------|
| 1   |            | GND     | Module Ground.   | 1     |
| 2   | CML-I      | Tx2-    | Transmitter Inverted Data Input.                         |       |
| 3   | CML-I      | Tx2+    | Transmitter Non-Inverted Data Input.                     |       |
| 4   |            | GND     | Module Ground.   | 1     |
| 5   | CML-I      | Tx4-    | Transmitter Inverted Data Input.                         |       |
| 6   | CML-I      | Tx4+    | Transmitter Non-Inverted Data Input.                     |       |
| 7   |            | GND     | Module Ground.   | 1     |
| 8   | LVTTTL-I   | ModSelL | Module Select.   | 2     |
| 9   | LVTTTL-I   | ResetL  | Module Reset.  | 2     |
| 10  |            | VccRx   | +3.3V Receiver Power Supply.                             |       |
| 11  | LVCNOS-I   | SCL     | 2-Wire Serial Interface Clock.                           | 2     |
| 12  | LVCNOS-I/O | SDA     | 2-Wire Serial Interface Data.                            | 2     |
| 13  |            | GND     | Module Ground.   | 1     |
| 14  | CML-O      | Rx3+    | Receiver Non-Inverted Data Output.                       |       |
| 15  | CML-O      | Rx3-    | Receiver Inverted Data Output.                           |       |
| 16  |            | GND     | Module Ground.   | 1     |
| 17  | CML-O      | Rx1+    | Receiver Non-Inverted Data Output.                       |       |
| 18  | CML-O      | Rx1-    | Receiver Inverted Data Output.                           |       |
| 19  |            | GND     | Module Ground.   | 1     |
| 20  |            | GND     | Module Ground.   | 1     |
| 21  | CML-O      | Rx2-    | Receiver Inverted Data Output.                           |       |
| 22  | CML-O      | Rx2+    | Receiver Non-Inverted Data Output.                       |       |
| 23  |            | GND     | Module Ground.   | 1     |
| 24  | CML-O      | Rx4-    | Receiver Inverted Data Output.                           | 1     |
| 25  | CML-O      | Rx4+    | Receiver Non-Inverted Data Output.                       |       |
| 26  |            | GND     | Module Ground.   | 1     |
| 27  | LVTTTL-O   | ModPrsL | Module Present. Internally pulled down to GND.           |       |
| 28  | LVTTTL-O   | IntL    | Interrupt Output. Should be pulled up on the host board. | 2     |
| 29  |            | VccTx   | +3.3V Transmitter Power Supply.                          |       |
| 30  |            | Vcc1    | +3.3V Power Supply.                                      |       |
| 31  | LVTTTL-I   | LPMODE  | Low-Power Mode.  | 2     |
| 32  |            | GND     | Module Ground.   | 1     |
| 33  | CML-I      | Tx3+    | Transmitter Non-Inverted Data Input.                     |       |
| 34  | CML-I      | Tx3-    | Transmitter Inverted Data Input.                         |       |

|    |       |      |                                      |   |
|----|-------|------|--------------------------------------|---|
| 35 |       | GND  | Module Ground.                       | 1 |
| 36 | CML-I | Tx1+ | Transmitter Non-Inverted Data Input. |   |
| 37 | CML-I | Tx1- | Transmitter Inverted Data Input.     |   |
| 38 |       | GND  | Module Ground.                       | 1 |

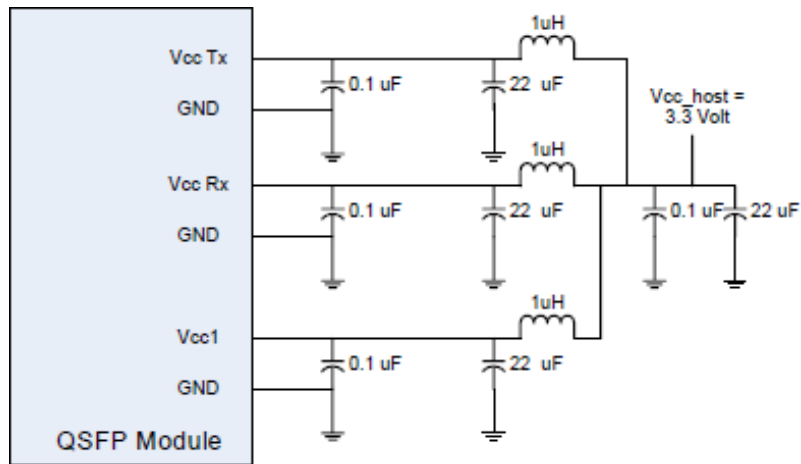
**Notes:**

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7kΩ-10kΩ pull-up resistor to the Host\_Vcc.

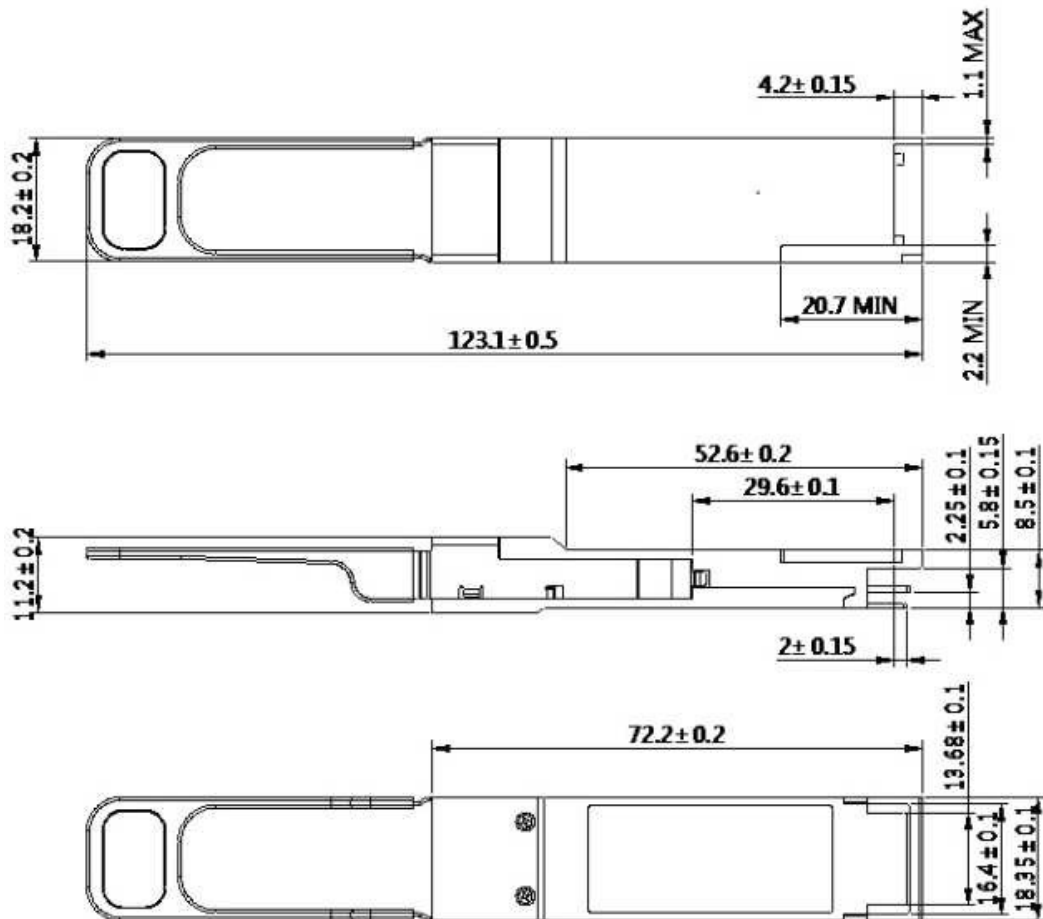
**Electrical Pin-Out Details**



### Recommended Host Board Power Supply Filter Network



### Mechanical Specifications



**About Us:**

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.



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