

40GBASE-SR4 QSFP+ 850nm 150m MTP/MPO Transceiver for MMF

SFP-10GE-T80-LL



Application

- 40GBASE-SR4 40G Ethernet
- Breakout to 4 x 10GBASE-SR Ethernet
- Proprietary interconnections

Features

- Four-channel full-duplex transceiver module
- Hot Pluggable QSFP+ form factor
- Maximum link length of 100m on OM3 Multimode Fiber (MMF) and 150m on OM4 MMF
- Single 1x12 MPO receptacle
- Unretimed XLPP electrical interface
- Max power dissipation <1.5W
- Reliable VCSEL array technology
- Built-in digital diagnostic functions, including optical power monitoring
- Commercial operating case temperature range: 0° C to 70° C

Description

QSFP+ transceiver modules are designed for use in 40 Gigabit per second links over multimode fiber. They are compliant with the QSFP + MSA and IEEE 802.3ba 40GBASE-SR4 and breakout to 4 10GBASE-SR. Digital diagnostics functions are available via an I2C interface, including Tx and Rx power monitoring. The optical transceiver is compliant per the RoHS Directive 2011/65/EU.

Product Specifications

I. General Product Characteristics

| Parameter | Symbol | Min | Typ. | Max | Unit | Ref. |
|-------------------------------------|--------|-------|---------|-------|------|------|
| Operating Case Temperature | TOPR | 0 | - | 70 | °C | |
| Power Supply Voltage | Vcc | 3.135 | 3.3 | 3.465 | V | |
| Power Supply Current | Icc | | | 475 | mA | |
| Maximum Power Dissipation | PD | - | - | 1.5 | W | |
| Data Rate per Lane | DR | - | 10.3125 | - | Gb/s | |
| Operating Distance (MMF OM3) | - | 0.5 | - | 100 | m | |
| Operating Distance (MMF OM4) | - | 0.5 | - | 150 | m | |

II. Absolute Maximum Ratings

| Parameter | Symbol | Min | Typ. | Max | Unit | Ref. |
|---|-----------------|------|------|----------------------|------|------|
| Storage Temperature | T _s | -40 | - | +85 | °C | |
| Relative Humidity (non-condensing) | RH | 5 | - | 95 | % | |
| Supply Voltage | V _{cc} | -0.5 | - | 3.6 | V | |
| Input Voltage | V _{in} | -0.5 | - | V _{cc} +0.5 | V | |

III. Electrical Characteristics (TOP= 0 to 70 °C, VCC = 3.315 to 3.465 Volts)

| Parameter | Symbol | Min | Typ. | Max | Unit | Ref. |
|---------------------------------------|-----------|---------|------|-------|------|------|
| Supply Voltage | Vcc | 3.315 | | 3.465 | V | |
| Supply Current | Icc | | | 450 | mA | |
| Input Differential Impedance | | 90 | 100 | 110 | | |
| Differential Data Input Swing | VIN, P-P | 300 | - | 1100 | mVpp | |
| Differential Data Output Swing | Vout, P-P | 300 | | 850 | mVpp | |
| Input Logic Level High | | 2 | | Vcc | | |
| Input Logic Level Low | | 0 | | 0.8 | | |
| Output Logic Level High | | Vcc-0.5 | | Vcc | | |
| Output Logic Level Low | | 0 | | 0.4 | | |

| Parameter | Symbol | Min | Typ. | Max | Unit | Ref. |
|--|-------------|------------------------|------|------------------------|------|------|
| Host 2-wire Vcc voltage | Vcc_Host_2w | 3.14 | - | 3.46 | V | |
| SCL and SDA Voltage | V_OL | 0 | - | 0.4 | V | |
| SCL and SDA Voltage | V_OH | $V_{cc_Host_2w}-0.5$ | - | $V_{cc_Host_2w}+0.3$ | V | |
| SCL and SDA Voltage | V_IL | -0.3 | - | $V_{ccT} \cdot 0.3$ | V | |
| SCL and SDA Voltage | V_IH | $V_{ccT} \cdot 0.7$ | - | $V_{ccT} + 0.5$ | V | |
| Input current on the SCL and SDA contacts | li | -10 | - | 10 | mA | |

IV. Optical Characteristics (TOP = 0 to 70°C, VCC = 3.315 to 3.465 Volts)

Transmitter (per Lane)

| Parameter | Symbol | Min | Typ. | Max | Unit | Ref. |
|---|--------|------|---------|------|------|------|
| Mean Wavelength (Each Lane) | | 840 | 850 | 860 | nm | |
| Data rate per lane | DR | | 10.3125 | | Gbps | |
| Spectral Width (RMS) | | | | 0.65 | nm | |
| Optical Power (Each Lane) | POUT | -7.6 | - | 2.4 | dBm | |
| OMA per lane | Poma | -5.6 | | 3 | dBm | |
| Peak power, each lane | P_peak | | | 4 | dBm | |
| Extinction Ratio | ER | 3 | 50 | | dB | |
| TDP, each lane | TDP | | | 3.5 | dB | |
| Optical return loss tolerance | | | | 12 | dB | |
| Average Launch Power Tx_ Off (Each Lane) | Jt2 | | | | | |

Receiver (per Lane)

| Parameter | Symbol | Min | Typ. | Max | Unit | Ref. |
|--|--------|-------|---------|------|------|------|
| Wavelength (Each Lane) | | 840 | 850 | 860 | nm | |
| Data rate per lane | DR | | 10.3125 | | Gbps | |
| Average power at receiver, each lane | - | -0.95 | - | 2.4 | dBm | |
| Rx OMA per Lane | OMA | - | - | 3 | dBm | |
| Stressed Receiver Sensitivity OMA (Each Lane) | SRS | - | - | -5.4 | dBm | |
| Peak Power (Each lane) | - | - | - | 4 | dBm | |
| Receiver Reflectance | RXR | - | - | -12 | dB | |
| LOS Assert | LOSA | -30 | - | - | dBm | |
| LOS De-Assert | LOSD | - | - | -12 | dBm | |
| LOS Hysteresis | - | 0.5 | - | | dB | |

Notes:

Measured with a PRBS231-1 test pattern @10.3125Gbps, BER 10⁻¹²

V. Pin Description

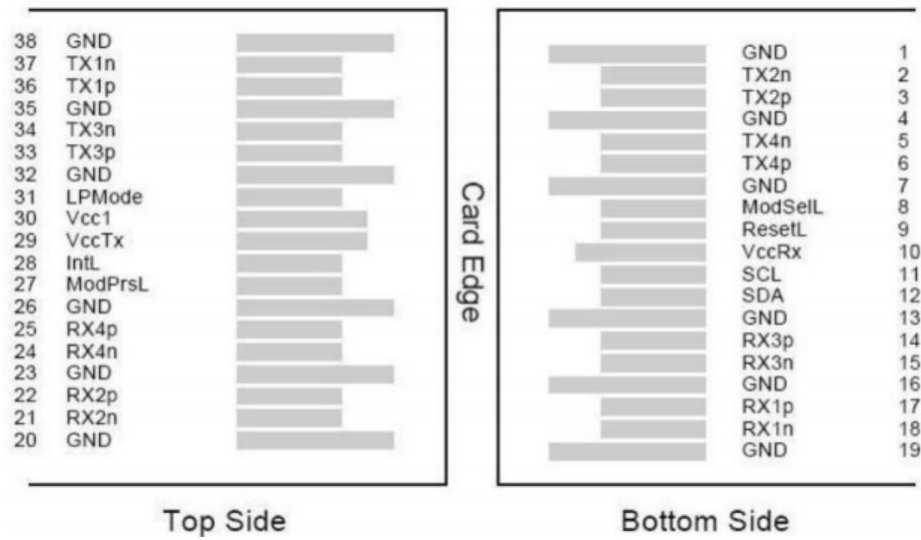


Figure1 QSFP+ Module Pad Layout

| 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 | +3.3 V 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 | +3.3 V Power supply transmitter | 2 |
| 30 | Vcc1 | +3.3 V Power Supply | 2 |
| 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. GND is the symbol for signal and supply (power) common for the QSFP+ module. All are common within the QSFP+ 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. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. 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 500 mA.

VI. Mechanical Specifications

