

CFP4-100GB-LR4-C

MSA and TAA 100GBase-LR4 CFP4 Transceiver (SMF, 1310nm, 10km, LC, DOM)

Features:

- CFP MSA 1.1 Compliance
- Duplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



Applications:

- 100GBase Ethernet
- ITU-T OTU4
- Access and Enterprise

Product Description

This MSA compliant CFP4 transceiver provides 100GBase-LR4 throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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.

ProLabs' 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 | Notes |
|--|--------|---------|----------|---------|------|-------|
| Operating Case Temperature | Tc | 0 | | 70 | °C | |
| Storage Temperature | Tstg | -40 | | 85 | °C | |
| Power Supply Voltage | Vcc | -0.3 | | 4 | V | |
| Signal Input Voltage | | Vcc-0.3 | | Vcc+0.3 | V | |
| Relative Humidity | RH | 5 | | 95 | % | |
| Receive Input Optical Power (Damage Threshold) | Pdmg | | | 5.0 | dBm | |
| Signaling Rate Per Lane | | | 25.78125 | | Gbps | |

Low-Speed Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|--------|---------|------|-----------|------|--------------|
| Power Supply Voltage | Vcc | 3.2 | 3.3 | 3.4 | V | 1 |
| Power Supply Current | Icc | | | 1.8 | A | |
| Power Dissipation | PD | | | 6.0 | W | |
| Power Dissipation (Low-Power Mode) | PDLP | | | 1.0 | W | |
| Low-Speed Control and Sense Signals (3.3V LVCMOS) | | | | | | |
| Output Low Voltage | VOL | 0.3 | | 0.2 | V | IOH = 100µA |
| Output High Voltage | VOH | Vcc-0.2 | | Vcc+0.3 | V | IOH = -100µA |
| Input Low Voltage | VIL | -0.3 | | 0.8 | V | |
| Input High Voltage | VIH | 2 | | Vcc3+ 0.3 | V | |
| Input Leakage Current | Iin | -10 | | 10 | µA | |
| Low-Speed Control and Sense Signals (1.2V LVCMOS) | | | | | | |
| Output Low Voltage | VOL | -0.3 | | 0.2 | V | |
| Output High Voltage | VOH | 1.0 | | 1.5 | V | |
| Output Low Current | Iol | 4 | | | mA | |
| Output High Current | Ioh | | | -4 | mA | |
| Input Low Voltage | VIL | -0.3 | | 0.36 | V | |
| Input High Voltage | VIH | 0.84 | | 1.5 | V | |
| Input Leakage Current | Iin | -100 | | 100 | µA | |
| Input Capacitance | C | | | 10 | pF | |
| MDC Clock Rate | | 0.1 | | 4 | MHz | |

Notes:

1. With respect to the GND.

High-Speed Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|--------|------|------|------|------|--------|
| Transmitter Electrical Input from Host | | | | | | |
| Differential Voltage Pk-Pk | | 100 | | 1200 | mV | |
| Common-Mode Noise (RMS) | | | | 17.5 | mV | |
| Differential Termination Mismatch | | | | 10 | % | |
| Transition Time | | 10 | | | ps | 20-80% |
| Common-Mode Voltage | | -0.3 | | 2.8 | V | |
| Receiver Electrical Output from Host | | | | | | |
| Differential Voltage Pk-Pk | | 100 | | 1200 | mV | |
| Common-Mode Noise (RMS) | | | | 17.5 | mV | |
| Differential Termination Mismatch | | | | 10 | % | |
| Transition Time | | 9.5 | | | ps | 20-80% |

Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|--|-----------------------|------------------------------------|---------|---------|-------|-------|
| Transmitter | | | | | | |
| Center Wavelength | λ_0 | 1294.53 | 1295.56 | 1296.59 | nm | |
| | λ_1 | 1299.02 | 1300.05 | 1301.09 | nm | |
| | λ_2 | 1303.54 | 1304.58 | 1305.63 | nm | |
| | λ_3 | 1308.09 | 1309.14 | 1310.19 | nm | |
| Rate Tolerance | | -100 | | 100 | ppm | 1 |
| Side-Mode Suppression Ratio | SMSR | 30 | | | dB | |
| Total Output Power | POUT | | | 10.5 | dBm | |
| Average Launch Power Per Lane | | -4.3 | | 4.5 | dBm | |
| Extinction Ratio | ER | 4 | | | dB | |
| Optical Modulation Amplitude Per Lane | OMA | -1.3 | | 4.5 | dBm | |
| Difference in Launch Power Between Any Two Lanes | OMA | | | 5 | dB | |
| Transmitter and Dispersion Penalty Per Lane | TDP | | | 2.2 | dB | |
| Average Launch Power Off Per Lane | Poff | | | -30 | dBm | |
| Relative Intensity Noise | RIN ₂₀ OMA | | | -130 | dB/Hz | |
| Transmitter Reflectance | | | | -120dB | | |
| Output Eye Mask Definitions: {X1, X2, X3, Y1, Y2, Y3} | | {0.25, 0.4, 0.45, 0.25, 0.28, 0.4} | | | | |
| Receiver | | | | | | |
| Center Wavelength | λ_0 | 1294.53 | 1295.56 | 1296.59 | nm | |

| | | | | | | |
|---|-------------|---------|---------|---------|-----|---|
| | $\lambda 1$ | 1299.02 | 1300.05 | 1301.09 | nm | |
| | $\lambda 2$ | 1303.54 | 1304.58 | 1305.63 | nm | |
| | $\lambda 3$ | 1308.09 | 1309.14 | 1310.19 | nm | |
| Rate Tolerance | | -100 | | 100 | ppm | 1 |
| Average Receiver Power Per lane | Pavg | -10.6 | | 4.5 | dBm | |
| Receiver Power (OMA) Per Lane | RXPx | | | 4.5 | dBm | |
| Difference in Launch Power Between Any Two Lanes | | | | 5.5 | dB | |
| Receiver Sensitivity (OMA) Per Lane | RxSENS | | | -8.6 | dBm | 2 |
| Stressed Receiver Sensitivity (OMA) Per Lane | SRS | | | -6.8 | dBm | |
| Stressed Receiver Sensitivity Test Conditions | | | | | | |
| Vertical Eye Closure Penalty Per Lane | VECP | | 1.8 | | dB | |
| Stressed Eye J2 Jitter Per Lane | | | 0.3 | | UI | 3 |
| Stressed Eye J9 Jitter Per Lane | | | 0.47 | | UI | 3 |
| Receiver Reflectance | RR | | | -26 | dB | |
| LOS Assert | LOSA | -30 | | | dBm | |
| LOS De-Assert | LOSD | | | -12 | dBm | |
| LOS Hysteresis | LOSH | 0.5 | | -26 | dB | |

Notes:

1. From the normal rate.
2. Receiver sensitivity OMA per lane is informative.
3. Vertical Eye Closure Penalty, Stressed Eye J2 Jitter, and Stressed Eye J9 Jitter test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

Pin Descriptions

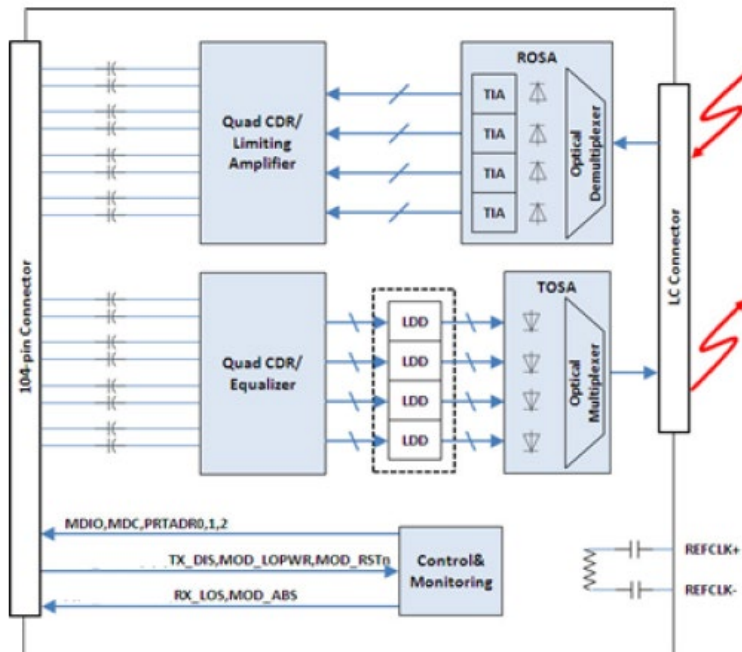
| Pin | Symbol | Name/Description |
|-----|-----------|---|
| 1 | 3.3V_GND | 3.3V Module Supply Voltage Return Ground. Can be separate or tied together with the Signal Ground. |
| 2 | 3.3V_GND | 3.3V Module Supply Voltage Return Ground. Can be separate or tied together with the Signal Ground. |
| 3 | 3.3V | 3.3V Module Supply Voltage. |
| 4 | 3.3V | 3.3V Module Supply Voltage. |
| 5 | 3.3V | 3.3V Module Supply Voltage. |
| 6 | 3.3V | 3.3V Module Supply Voltage. |
| 7 | 3.3V_GND | 3.3V Module Supply Voltage Return Ground. Can be separate or tied together with the Signal Ground. |
| 8 | 3.3V_GND | 3.3V Module Supply Voltage Return Ground. Can be separate or tied together with the Signal Ground. |
| 9 | NUC | Module Vendor I/O. Must not connect at the host board. |
| 10 | NUC | Module Vendor I/O. Must not connect at the host board. |
| 11 | Tx_DIS | Transmitter Disable for All Lanes. "1" or NC = transmitter disabled. "0" = transmitter enabled. |
| 12 | Rx_LOS | Receiver Loss of Optical Signal. "1" = low optical signal. "0" = normal condition. |
| 13 | GLB_ALRMn | Global Alarm. "0" = alarm condition in any MDIO alarm register. "1" = no alarm condition. Open drain. Pull-up resistor on the host. |
| 14 | MOD_LOPWR | Module Low-Power Mode. "1" or NC = module in low-power (safe) mode. "0" = power-on enabled. |
| 15 | MOD_ABS | Module Absent. "1" or NC = module absent. "0" = module present. Pull-up resistor on the host. |
| 16 | MOD_RSTn | Module Reset. "0" resets the module. "1" or NC = module enabled. Pull-down resistor in the module. |
| 17 | MDC | Management Data Clock. Electrical specs as per 802.3ae and 802.3ba. |
| 18 | MDIO | Management Data I/O Bi-Directional Data. Electrical specs as per 802.3ae and 802.3ba). |
| 19 | PRTADR0 | MDIO Physical Port Address Bit 0. |
| 20 | PRTADR1 | MDIO Physical Port Address Bit 1. |
| 21 | PRTADR2 | MDIO Physical Port Address Bit 2. |
| 22 | NUC | Module Vendor I/O. Must not connect at the host board. |
| 23 | NUC | Module Vendor I/O. Must not connect at the host board. |
| 24 | NUC | Module Vendor I/O. Must not connect at the host board. |
| 25 | GND | |
| 26 | Tx_MCLKn | Tx Monitor Clock Output (Positive). |
| 27 | Tx_MCLKp | Tx Monitor Clock Output (Negative). |
| 28 | GND | |
| 29 | GND | |
| 30 | Rx0+ | Lane 0 Receiver Output (Positive). |
| 31 | Rx0- | Lane 0 Receiver Output (Negative). |
| 32 | GND | |
| 33 | Rx1+ | Lane 1 Receiver Output (Positive). |
| 34 | Rx1- | Lane 1 Receiver Output (Negative). |
| 35 | GND | |

| | | |
|----|--------------|--|
| 36 | Rx2+ | Lane 2 Receiver Output (Positive). |
| 37 | Rx2- | Lane 2 Receiver Output (Negative). |
| 38 | GND | |
| 39 | Rx3+ | Lane 3 Receiver Output (Positive). |
| 40 | Rx3- | Lane 3 Receiver Output (Negative). |
| 41 | GND | |
| 42 | REFCLKp(NUC) | Reference Clock Input (Positive) (Optional). |
| 43 | REFCLKn(NUC) | Reference Clock Input (Negative) (Optional). |
| 44 | GND | |
| 45 | Tx0+ | Lane 0 Transmitter Input (Positive). |
| 46 | Tx0- | Lane 0 Transmitter Input (Negative). |
| 47 | GND | |
| 48 | Tx1+ | Lane 1 Transmitter Input (Positive). |
| 49 | Tx1- | Lane 1 Transmitter Input (Negative). |
| 50 | GND | |
| 51 | Tx2+ | Lane 2 Transmitter Input (Positive). |
| 52 | Tx2- | Lane 2 Transmitter Input (Negative). |
| 53 | GND | |
| 54 | Tx3+ | Lane 3 Transmitter Input (Positive). |
| 55 | Tx3- | Lane 3 Transmitter Input (Negative). |
| 56 | GND | |

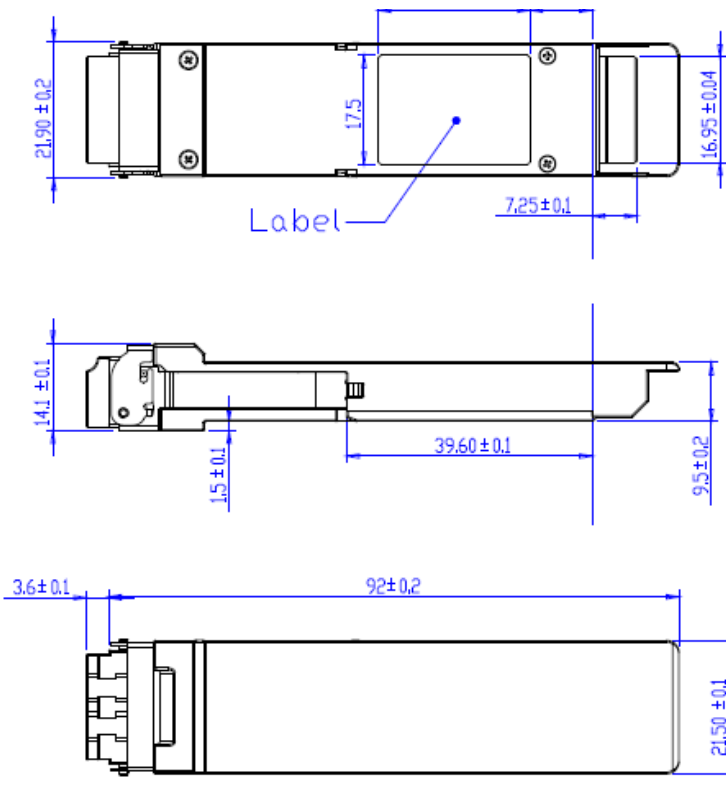
Pin Definitions

| Top Row | | Bottom Row | |
|---------|-----------|------------|-----------|
| PIN# | Name | PIN# | Name |
| 56 | GND | 1 | 3.3V_GND |
| 55 | TX3n | 2 | 3.3V_GND |
| 54 | TX3p | 3 | 3.3V |
| 53 | GND | 4 | 3.3V |
| 52 | TX2n | 5 | 3.3V |
| 51 | TX2p | 6 | 3.3V |
| 50 | GND | 7 | 3.3V_GND |
| 49 | TX1n | 8 | 3.3V_GND |
| 48 | TX1p | 9 | NUC |
| 47 | GND | 10 | NUC |
| 46 | TX0n | 11 | TX_DIS |
| 45 | TX0p | 12 | RX_LOS |
| 44 | GND | 13 | GLB_ALRMn |
| 43 | (REFCLKn) | 14 | MOD_LOPWR |
| 42 | (REFCLKp) | 15 | MOD_ABS |
| 41 | GND | 16 | MOD_RSTn |
| 40 | RX3n | 17 | MDC |
| 39 | RX3p | 18 | MDIO |
| 38 | GND | 19 | PRTADR0 |
| 37 | RX2n | 20 | PRTADR1 |
| 36 | RX2p | 21 | PRTADR2 |
| 35 | GND | 22 | NUC |
| 34 | RX1n | 23 | NUC |
| 33 | RX1p | 24 | NUC |
| 32 | GND | 25 | GND |
| 31 | RX0n | 26 | TX_MCLKn |
| 30 | RX0p | 27 | TX_MCLKp |
| 29 | GND | 28 | GND |

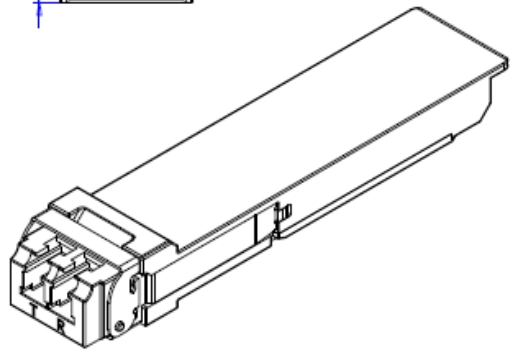
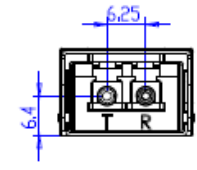
Block Diagram



Mechanical Specifications



Units in mm



About ProLabs

Our extensive experience comes as standard. For over 20 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with more than 100 optical switching and transport platforms.

A Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 1.6T while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

The Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure compatible products, and immediate answers to your questions. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



Contact Information

ProLabs US

Email: sales@prolabs.com

Telephone: 952-852-0252

ProLabs UK

Email: salessupport@prolabs.com

Telephone: +44 1285 719 600