

XFP-10GB-DW46-40-PRO

MSA and TAA Compliant 10GBase-DWDM 100GHz XFP Transceiver (SMF, 1540.56nm, 40km, DOM, 0 to 70C, LC)

Features

- INF-8077i Compliance
- Temperature-stabilized EML transmitter and PIN receiver
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



Applications:

- 10x Gigabit Ethernet over DWDM
- 8x/10x Fibre Channel
- Access, Metro and Enterprise

Product Description

This MSA Compliant XFP transceiver provides 10GBase-DWDM throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1540.56nm via an LC connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. 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.



Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

Wavelength Guide (100GHz ITU-T Channel)

| Channel # | Frequency (THz) | Center Wavelength (nm) |
|-----------|-----------------|------------------------|
| 17 | 191.7 | 1563.86 |
| 18 | 191.8 | 1563.05 |
| 19 | 191.9 | 1562.23 |
| 20 | 192.0 | 1561.42 |
| 21 | 192.1 | 1560.61 |
| 22 | 192.2 | 1559.79 |
| 23 | 192.3 | 1558.98 |
| 24 | 192.4 | 1558.17 |
| 25 | 192.5 | 1557.36 |
| 26 | 192.6 | 1556.55 |
| 27 | 192.7 | 1555.75 |
| 28 | 192.8 | 1554.94 |
| 29 | 192.9 | 1554.13 |
| 30 | 193.0 | 1553.33 |
| 31 | 193.1 | 1552.52 |
| 32 | 193.2 | 1551.72 |
| 33 | 193.3 | 1550.92 |
| 34 | 193.4 | 1550.12 |
| 35 | 193.5 | 1549.32 |
| 36 | 193.6 | 1548.51 |
| 37 | 193.7 | 1547.72 |
| 38 | 193.8 | 1546.92 |
| 39 | 193.9 | 1546.12 |
| 40 | 194.0 | 1545.32 |
| 41 | 194.1 | 1544.53 |
| 42 | 194.2 | 1543.73 |
| 43 | 194.3 | 1542.94 |
| 44 | 194.4 | 1542.14 |

| | | |
|----|-------|---------|
| 45 | 194.5 | 1541.35 |
| 46 | 194.6 | 1540.56 |
| 47 | 194.7 | 1539.77 |
| 48 | 194.8 | 1538.98 |
| 49 | 194.9 | 1538.19 |
| 50 | 195.0 | 1537.40 |
| 51 | 195.1 | 1536.61 |
| 52 | 195.2 | 1535.82 |
| 53 | 195.3 | 1535.04 |
| 54 | 195.4 | 1534.25 |
| 55 | 195.5 | 1533.47 |
| 56 | 195.6 | 1532.68 |
| 57 | 195.7 | 1531.90 |
| 58 | 195.8 | 1531.12 |
| 59 | 195.9 | 1530.33 |
| 60 | 196.0 | 1529.55 |
| 61 | 196.1 | 1528.77 |

Absolute Maximum Ratings

| Parameter | Symbol | Min. | Max. | Unit |
|----------------------------|--------|------|------|------|
| Maximum Supply Voltage | Vcc3 | -0.5 | 4.0 | V |
| | Vcc5 | -0.5 | 6.0 | V |
| Storage Temperature | TS | -40 | 85 | °C |
| Operating Case Temperature | TO | 0 | 70 | °C |
| Relative Humidity | RH | 5 | 95 | % |
| Data Rate | | 9.95 | 11.3 | Gb/s |

Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|----------------------------------|----------|-------------|------|-------------|----------|-------|
| Power Supply Voltage | Vcc3 | 3.135 | 3.3 | 3.465 | V | |
| | Vcc5 | 4.75 | 5.00 | 5.25 | V | |
| Power Supply Current | Icc3 | | | 750 | mA | |
| | Icc5 | | | 500 | | |
| Power Dissipation | Pd | | | 3500 | mW | |
| Transmitter | | | | | | |
| Differential data input swing | Vin,pp | 120 | | 1000 | mVp-p | |
| Input differential impedance | Zin | | 100 | | Ω | |
| TX_Disable, P_Down/RST | VIH | 2.0 | | Vcc3+0.3 | V | |
| | VIL | -0.3 | | 0.8 | V | |
| Transmit Disable Assert Time | | | | 10 | us | |
| Receiver | | | | | | |
| Differential data output swing | Vout, pp | 340 | | 850 | mVp-p | 1 |
| Output differential impedance | Zo | | 100 | | Ω | |
| Data Output Rise Time, Fall Time | tr, tf | 24 | | | ps | 2 |
| Rx_LOS, Mod-NR, Interrupt | VOH | VccHost-0.5 | | VccHost+0.3 | V | 3 |
| | VOL | 0 | | 0.4 | V | 3 |

Notes:

1. Internally AC coupled, but requires an external 100 Ω differential termination.
2. 20-80%.
3. Loss of Signal is an open collector output. Should be pulled up with a 4.7k Ω -10k Ω resistor on the host board.

Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|------------------------------|-------------------|---------|------|---------|------|-------|
| Transmitter | | | | | | |
| Launch Average Optical Power | Po | -1 | | +4 | dBm | 1 |
| Center Wavelength Range | λ_c | 1528.77 | | 1563.86 | nm | |
| Center Wavelength Spacing | | | 100 | | GHz | |
| Center Wavelength Tolerance | $\Delta\lambda_c$ | -100 | | 100 | pm | |
| Extinction Ratio | ER | 9 | | | dB | 2 |
| Spectral Width (-20dB) | $\Delta\lambda$ | | | 0.3 | nm | |
| Side Mode Suppression Ratio | SMSR | 30 | | | dB | |

| | | | | | | |
|--------------------------------------------|------------------------------------------|------|--|-------|-----|---|
| Average Optical Power (Laser Off) | P _{off} | | | -30 | dBm | 1 |
| Eye Diagram | ITU-T G.691 SDH STM-64 L-64.2 compatible | | | | | 2 |
| Receiver | | | | | | |
| Center Wavelength | λ_c | 1528 | | 1565 | nm | |
| Receiver Sensitivity @ 9.953Gb/s | S | | | -24.0 | dBm | 3 |
| Receiver Sensitivity @ 11.1 Gb/s | S | | | -15 | dBm | 4 |
| Receiver overload (P_{avg}) | POL | -1 | | | dBm | 3 |
| Path Penalty @1600ps @9.953Gb/s | PP1 | | | 2 | dB | 3 |
| Path Penalty @1600ps @11.1 Gb/s | PP2 | | | 3 | dB | 4 |
| Optical Return Loss | ORL | 27 | | | dB | |
| LOS De-Assert | LOSD | | | -27 | dBm | |
| LOS Assert | LOSA | -38 | | | dBm | |
| LOS Hysteresis | | 0.5 | | | dB | |

Notes:

1. Measured with worst ER; 1550nm; PRBS 2³¹-1 test pattern @ 9.953 Gb/s, BER<10⁻¹².
2. Measured with worst ER; 1550nm; PRBS 2³¹-1 test pattern @ 11.1 Gb/s, BER<10⁻¹².

Pin Descriptions

| Pin | Logic | Symbol | Name/Descriptions | Ref. |
|-----|------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 1 | | GND | Module Ground | 1 |
| 2 | | Vee5 | Optional -5.2v Power Supply (not required) | |
| 3 | LVTTTL-I | MOD_DESEL | Module De-select; When Held low allows the module to respond to 2-wire serial interface. | |
| 4 | LVTTTL-O | INTERRUPT | Interrupt; Indicates presence of an important condition which can be read via the 2-wire serial interface. | 2 |
| 5 | LVTTTL-I | TX_DIS | Transmitter Disable; Turns off transmitter laser output | |
| 6 | | VCC5 | +5V Power Supply | |
| 7 | | GND | Module Ground | 1 |
| 8 | | VCC3 | +3.3V Power Supply | |
| 9 | | VCC3 | +3.3V Power Supply | |
| 10 | LVTTTL-I/O | SCL | 2-Wire Serial Interface Clock. | 2 |
| 11 | LVTTTL-I/O | SDA | 2-Wire Serial Interface Data Line. | 2 |
| 12 | LVTTTL-O | MOD_Abs | Indicates Module is not present. Grounded in the Module. | 2 |
| 13 | LVTTTL-O | MOD_NR | Module Not Ready; Indicating Module Operational Fault. | 2 |
| 14 | LVTTTL-O | RX_LOS | Receiver Loss of Signal Indicator | 2 |
| 15 | | GND | Module Ground | 1 |
| 16 | | GND | Module Ground | 1 |
| 17 | CML-O | RD- | Receiver Inverted Data Output | |
| 18 | CML-O | RD+ | Receiver Non-Inverted Data Output. | |
| 19 | | GND | Module Ground | 1 |
| 20 | | VCC2 | +1.8V Power Supply (Not required). | |
| 21 | LVTTTL-I | P_DOWN/RST | Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode. Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle. | |
| 22 | | VCC2 | +1.8V Power Supply (Not required) | |
| 23 | | GND | Module Ground | 1 |
| 24 | PECL-I | REFCLK+ | Reference Clock Non-Inverted Input, AC coupled on the host board- not required. | 3 |
| 25 | | REFCLK- | Reference Clock Inverted Input, AC coupled on the host board-Not Required | 3 |
| 26 | | GND | Module Ground | 1 |
| 27 | | GND | Module Ground | 1 |
| 28 | CML-I | TD- | Transmitter Inverted Data Input. | |
| 29 | CML-I | TD+ | Transmitter Non-Inverted Data Input. | |
| 30 | | GND | Module Ground | 1 |

Notes:

1. Module ground pins GND are isolated from the module case.
2. Shall be pulled up with 4.7KΩ to 10KΩ to a voltage between 3.15V and 3.45V on the host board.
3. Reference Clock is not required. If present, it will be ignored.



Pin-out of connector Block on Host board

OSNR Characteristics

| Bit Rate (Gbps) | Dispersion (ps/nm) | OSNR (dB) | Receiver Sensitivity (dBm) | BER |
|--------------------|--------------------|-----------|----------------------------|--------|
| 9.95/10.3 | 0 | >30 | -24 ~ -7 | 10E-12 |
| | | >25 | -18 ~ -7 | |
| | 1200 | >30 | -23 ~ -7 | |
| | | >27 | -18 ~ -7 | |
| | 1600 | >30 | -22 ~ -7 | |
| | | >28 | -18 ~ -7 | |
| 10.7/11.1 with FEC | 0 | >30 | -26 ~ -7 | 10E-4 |
| | | >16 | -18 ~ -7 | |
| | 1200 | >30 | -25 ~ -7 | |
| | | >18 | -18 ~ -7 | |
| | 1600 | >30 | -22 ~ -7 | |
| | | >20 | -18 ~ -7 | |

Recommended Application Interface Block Diagram



Recommended Host Board Power Supply Filter Network



Management Interface



Mechanical Specifications

Small Form Factor Pluggable (XFP) transceivers are compatible with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).



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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