

Lightem 10G DWDM 100GHz XFP Duplex LC Transceiver 80km LXFPDW100xxx80

FEATURES

- 100GHz channel spacing DWDM
- Up to 11.1Gbps Data Links
- Maximum link length of 80km on SMF
- Power dissipation < 3.0W
- Cooled DWDM EML transmitter (100GHz), APD photo-detector
- Metal enclosure, for lower EMI
- 2-wire interface with integrated Digital Diagnostic monitoring
- Hot-pluggable XFP footprint
- No Reference Clock required
- Single 3.3V power supply
- Standard Operating Range: 0°C to 70°C Operating temperature
- Optional Industrial grade: -40°C to 85°C Operating temperature



APPLICATIONS

- 10GBASE-ER
- 10G SONET/SDH, OTU2/2e

ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Note |
|----------------------|--------|---------|------|---------|------|------|
| Storage Temperature | Ts | -40 | - | 85 | °C | |
| Relative Humidity | RH | 5 | - | 95 | % | |
| Power Supply Voltage | VCC | -0.3 | - | +4 | V | |
| Signal Input Voltage | | Vcc-0.3 | - | Vcc+0.3 | V | |

RECOMMENDED OPERATING CONDITIONS

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Note |
|----------------------------|--------|------|------------------|------|------|------------------|
| Case Operating Temperature | Tcase | -5 | - | +70 | °C | Commercial grade |
| | Tcase | -40 | - | +85 | °C | Industrial grade |
| Power Supply Voltage | VCC | 3.14 | 3.3 | 3.47 | V | |
| Power Supply Current | ICC | - | - | 760 | mA | |
| Data Rate | BR | | 10.3125 | | Gbps | |
| Transmission Distance | TD | | - | 40 | km | |
| Coupled Fiber | | | Singlemode Fiber | | | SMF |

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ELECTRICAL CHARACTERISTICS

| Parameter | Symbol | Min | Typ | Max | Unit | Note |
|-------------------------------|------------|-----------|-----|----------|----------|------|
| Supply Voltage 1.8v supply | Vcc2 | 1.71 | | 1.89 | V | |
| Supply Voltage 3.3v supply | Vcc3 | 3.13 | | 3.47 | V | |
| Supply Current 1.8v Supply | Icc2 | | | 180 | mA | |
| Supply Current 3.3v Supply | Icc3 | | | 640 | mA | |
| Module total power | P | | | 2.5 | W | 1 |
| Transmitter | | | | | | |
| Input differential impedance | RIN | | 100 | | Ω | 2 |
| Differential data input swing | Vin, pp | 120 | | 820 | mV | |
| Transmit disable voltage | VD | 2.0 | | Vcc | V | 3 |
| Transmit enable volatage | Ven | GND | | GND+0.8 | V | |
| Receiver | | | | | | |
| Differential data out swing | Vout, pp | 3.40 | 650 | 850 | mV | 4 |
| Data output rise time | tr | | | 38 | ps | 5 |
| Data output fall time | tr | | | 38 | ps | 5 |
| LOS Fault | VLOS fault | Vcc - 0.5 | | Vcc Host | V | 6 |
| LOS Normal | VLOS norm | GND | | GND+0.5 | V | 6 |

- Notes:
1. Maximum total power value is specified across the full temperature and voltage range.
 2. After internal AC coupling.
 3. Or open circuit.
 4. Into 100 ohms differential termination.
 5. Loss Of Signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

OPTICAL CHARACTERISTICS

| Parameter | Symbol | Min | Typ | Max | Unit | Note |
|-----------------------------------|-----------------------------|-----------------|-----|-----------------|------|------|
| Transmitter | | | | | | |
| Average Launch Power | POUT | -1 | | 5 | dBm | 1 |
| Optical Wavelength | λ_c | $\lambda_c-0.1$ | | $\lambda_c+0.1$ | nm | |
| Optical Wavelength Spacing | | | 100 | | GHz | |
| Optical Extinction Ratio | ER | 8.2 | | | dB | |
| Output Eye Mask | Compliant with IEEE 802.3aq | | | | | |
| Receiver | | | | | | |
| Receiver Sensitivity | | | | -24 | dBm | 2 |
| Input Saturation Power (Overload) | Sen | -6 | | | dBm | |
| Wavelength Range | Psat | 1260 | | 1610 | nm | |
| LOS De -Assert | λ_C | | | -27 | dBm | |
| LOS Assert | LOSD | -37 | | | dBm | |
| LOS Hysteresis | | 0.5 | | | dB | |

- Notes:
1. Corresponds to approximately 04 nm.
 2. Measured with BER<10-12@10.3Gbps, 231 – 1 PRBS.

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PIN DESCRIPTION

| Pin | Symbol | Symbol | Name /Description | NOTE |
|-----|------------|------------|--|------|
| 1 | | GND | Module Ground | 1 |
| 2 | | VEE5 | Optional -5.2 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 commands | |
| 4 | LVTTTL-O | Interrupt | Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface | 2 |
| 5 | LVTTTL-I | TX_DIS | Transmitter Disable; Transmitter laser source turned off | |
| 6 | | VCC5 | +5 Power Supply – Not required | |
| 7 | | GND | Module Ground | 1 |
| 8 | | VCC3 | +3.3V Power Supply | |
| 9 | | VCC3 | +3.3V Power Supply | |
| 10 | LVTTTL-I | SCL | Serial 2-wire interface clock | |
| 11 | LVTTTL-I/O | SDA | Serial 2-wire interface data line | 2 |
| 12 | LVTTTL-O | Mod_Abs | Module Absent; Indicates module is not present. Grounded in the module. | 2 |
| 13 | LVTTTL-O | Mod_NR | Module Not Ready; XGIGA's defines it as a logical OR between RX_LOS and Loss of Lock in TX/RX. | 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, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset 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 | PECL-I | 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 circuit ground is isolated from module chassis ground within the module.
2. Open collector; should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 3.15V and 3.6V.
3. A Reference Clock input is not required by the XGXF-1396-10D. If present, it will be ignored.

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PIN OUT OF CONNECTOR BLACK ON HOST BOARD

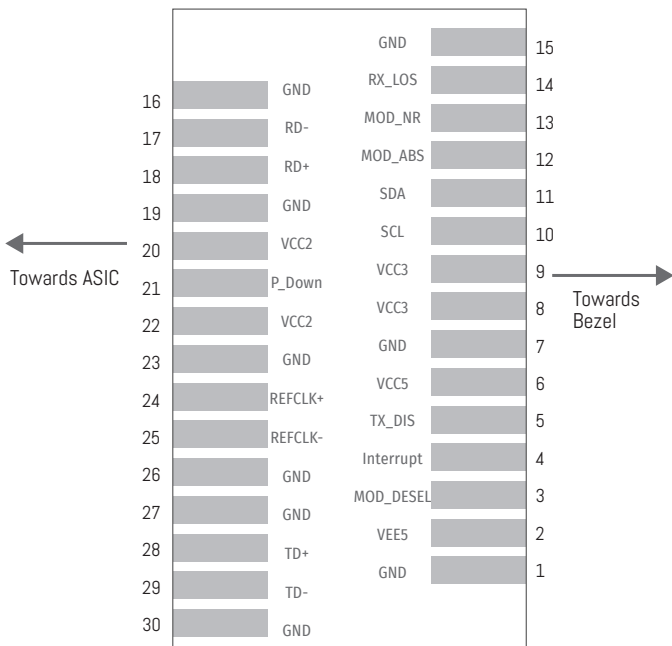
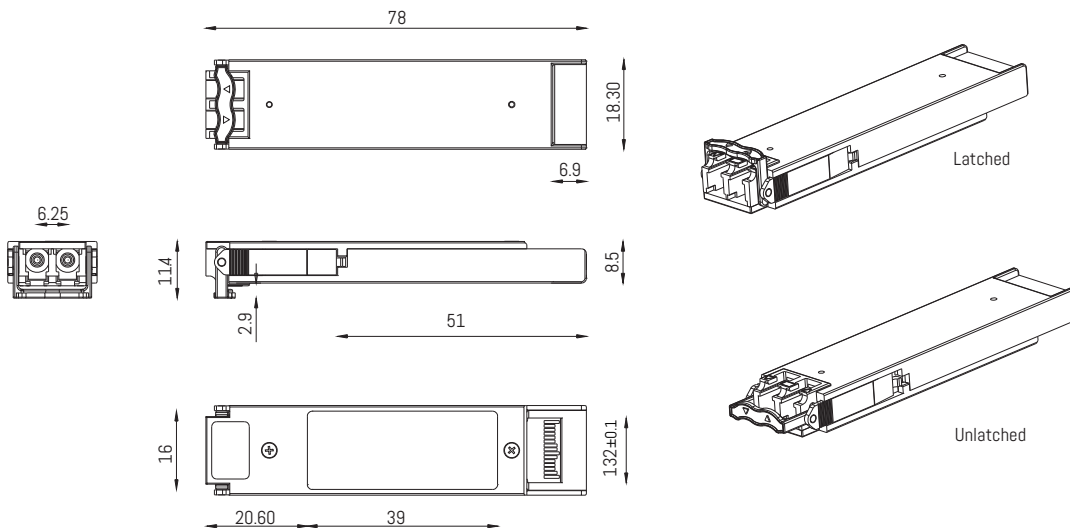


Diagram of Host Board Connector Block Pin Numbers and Name

MECHANICAL DIMENSIONS



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CHANNEL SELECTION

| Channel | Wavelength(nm) | Frequency (THz) | Channel | Wavelength(nm) | Frequency (THz) |
|---------|---|-----------------|---------|----------------|-----------------|
| C17 | 1563.86 | 191.70 | C39 | 1546.12 | 193.90 |
| C18 | 1563.05 | 191.80 | C40 | 1545.32 | 194.00 |
| C19 | 1562.23 | 191.90 | C41 | 1544.53 | 194.10 |
| C20 | 1561.42 | 192.00 | C42 | 1543.73 | 194.20 |
| C21 | 1560.61 | 192.10 | C43 | 1542.94 | 194.30 |
| C22 | 1559.79 | 192.20 | C44 | 1542.14 | 194.40 |
| C23 | 1558.98 | 192.30 | C45 | 1541.35 | 194.50 |
| C24 | 1558.17 | 192.40 | C46 | 1540.56 | 194.60 |
| C25 | 1557.36 | 192.50 | C47 | 1539.77 | 194.70 |
| C26 | 1556.55 | 192.60 | C48 | 1538.98 | 194.80 |
| C27 | 1555.75 | 192.70 | C49 | 1538.19 | 194.90 |
| C28 | 1554.94 | 192.80 | C50 | 1537.40 | 195.00 |
| C29 | 1554.13 | 192.90 | C51 | 1536.61 | 195.10 |
| C30 | 1553.33 | 193.00 | C52 | 1535.82 | 195.20 |
| C31 | 1552.52 | 193.10 | C53 | 1535.04 | 195.30 |
| C32 | 1551.72 | 193.20 | C54 | 1534.25 | 195.40 |
| C33 | 1550.92 | 193.30 | C55 | 1533.47 | 195.50 |
| C34 | 1550.12 | 193.40 | C56 | 1532.68 | 195.60 |
| C35 | 1549.32 | 193.50 | C57 | 1531.90 | 195.70 |
| C36 | 1548.51 | 193.60 | C58 | 1531.12 | 195.80 |
| C37 | 1547.72 | 193.70 | C59 | 1530.33 | 195.90 |
| C38 | 1546.92 | 193.80 | C60 | 1529.55 | 196.00 |
| Non ITU | Peak wavelength between 1528.77nm-1563.86 | | C61 | 1528.77 | 196.10 |

ORDERING INFORMATION

| | |
|----------------------|---|
| PN | |
| LXFPSDW100xxx80-x | Lightem 10G DWDM 100GHz XFP Duplex LC SM Chxx 80km |
| xxx- | Channel |
| | - C17-C61 |
| x- | I -optional industrial grade |
| eg LXFPSDW100C3780-I | Lightem 10G DWDM 100GHz XFP Duplex LC SM Ch37 80km Industrial grade |