# QSP-40DWxx-80CL

40Gbps QSFP DWDM Transceiver, 80km Reach

## Features

- Single wavelength 40Gbps transmission
- Fixed wavelengths on DWDM 100GHz Grid
- Up to 80km over SMF (with DCM and EDFA)
- Duplex LC connector
- Power dissipation 3.5W (Max)
- 4 x 10G Electrical interface at host side
- Compliant with QSFP+ MSA SFF-8679
- Compliant with QSFP+ MSA SFF-8636
- QSFP+ MSA digital monitoring functions
- Safety Certification: TUV/UL/FDA*Note1
- RoHS Compliant

## Applications

- 40GbE signal DWDM transmission

## Description

AscentOptics 40GE DWDM QSFP+ pluggable optical transceiver modules are designed for multiple 40GE links up to 80km distance over standard G.652 single mode optical fibers (SMF). For short distances, e.g. several kilometers, no EDFA and dispersion compensation modules (DCM) are required. But for relative longer distances, EDFA and DCM are required to compensate the fiber link loss and fiber dispersion.
The module's DWDM transmitter is on the ITU-T defined 100GHz spacing DWDM grid, and is Laser Class 1 compliant according to International Safety Standard IEC-60825. The receiver section uses a wideband PIN-PD detector and is DWDM channel independent. Digital diagnostics functions are available via the I2C interface as specified by QSFP+ MSA specification SFF-8636.

## Absolute Maximum Ratings

### Table 1 - Absolute Maximum Ratings

| Parameter | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Storage Temperature | Ts | -40 | +85 | °C |
| Supply Voltage | Vcc | 0 | 3.5 | V |
| Operating Relative Humidity | RH | 5 | 85 (Non-condening) | % |
| Receiver Damage Threshold | | 5 | | dBm |

**Note:** Exceeding any of these maximum ratings may cause permanent damage to the device.

## Recommended Operating Environment

### Table 2 - Recommended Operating Environment

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|---|---|---|---|---|
| Operating Case Temperature*(note4) | Tc | 0 | 25 | 70 | °C |
| Power Supply Voltage | Vcc | 3.15 | 3.3 | 3.45 | V |
| Power Dissipation | PD | | 3.2 | 3.5 | W |

**Note:** Case temperature measured at the hottest point on the module case.

## Performance Specifications – Electrical

### Table 3- Performance Specifications – Electrical

| Parameter | Symbol | Min. | Typ. | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| HS Data rate per lane | | | 10.3125 | | Gbit/s | Total 4 lanes |
| Data rate variation | | -100 | | +100 | ppm | |
| **Transmitter** | | | | | | |
| Input swing (differential) | Vin | 250 | | 800 | mVpp | AC coupled |
| Input impedance (differential) | Zin | 90 | 100 | 110 | Ohm | |
| **Receiver** | | | | | | |
| Output swing (differential) | Vout | 450 | | | mVpp | AC coupled |
| Output impedance (differential) | Zout | 90 | 100 | 110 | Ohm | |
| **Low Speed Signals** | | | | | | |
| LPMode, Reset, ModSel | VIL | -0.3 | | 0.8 | V | |
| | VIH | 2 | | Vcc | | |
| ModPrs, Int | VOL | 0 | | 0.4 | V | IOL=2.0mA |
| | VOH | Vcc-0.5 | | Vcc+0. 3 | | |
| SCL, SDA | VIL | -0.3 | | 0.3*Vcc | V | |
| | VIH | 0.7*Vcc | | Vcc | | |
| SCL, SDA | VOL | 0 | | 0.4 | V | (max)=3.0m A |
| | VOH | Vcc-0.5 | | Vcc+0. 3 | | |

## Optical Characteristics

### Table 4- Optical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|---|---|---|---|---|
| Data Rate*(note5) | | | 42.5 | | Gbps |
| **Transmitter** | | | | | |
| Optical Central Wavelength | λc | | See Table 1 | | nm |
| Central Wavelength Stability | | λc -0.1 | | λc +0.1 | nm |
| Average Output Power | Pout | 0 | | 4 | dBm |
| Optical Output Power (Tx: OFF) | Poff | | | -30 | dBm |
| **Receiver** | | | | | |
| Operating Wavelength | | 1300 | | 1570 | nm |
| Receiver Sensitivity (ave. power)*(note6) | Psen | | -11 | | dBm |
| Receiver damage threshold | | 5 | | | dBm |
| Receiver Overload (ave. power) *(note6) | Psat | +4 | | | dBm |
| Optical Return Loss | ORL | -27 | | | dB |
| Receiver Dispersion Tolerance*(note7) | | -50 | | 150 | ps/nm |
| Rx power (avg) range at OSNR 37dB*(note8) | | -8 | | 4 | dBm |
| LOS Asserted | LOSA | -15 | | | dBm |
| LOS De-asserted | LOSD | | | -11 | dBm |
| LOS Hysteresis | | 1 | | | dB |

**Note:**

1.Data rate includes the KP4 FEC code.

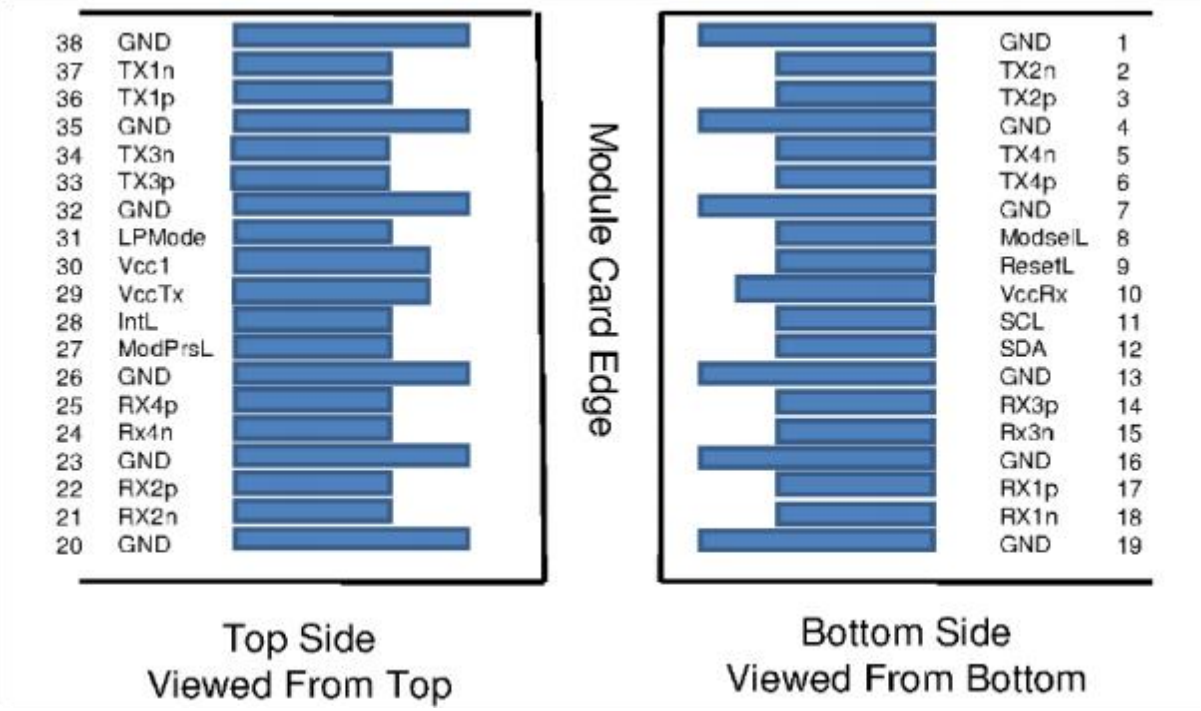
2.Rx sensitivity and overload are the average Rx power for pre-FEC BER < 5E-5 without dispersion and noise load.

3.Dispersion tolerance is for dispersion values that cause Rx sensitivity penalty < 2 dB when compared with no dispersion.

4.Rx power range at OSNR 37dB is the average Rx power for pre-FEC BER < 5E-5 without dispersion.

## Pin Assignment

Pin Diagram




## Pin Descriptions

**Table 5- Pin Descriptions**

| Pin | Logic | Symbol | Description | Plug Sequence | Notes |
|---|---|---|---|---|---|
| 1 | | GND | Ground | 1 | 1 |
| 2 | CML-I | Tx2n | Transmitter Inverted Data Input | 3 | |
| 3 | CML-I | Tx2p | Transmitter Non-Inverted Data Input | 3 | |
| 4 | | GND | Ground | 1 | 1 |
| 5 | CML-I | Tx4n | Transmitter Inverted Data Input | 3 | |
| 6 | CML-I | Tx4p | Transmitter Non-Inverted Data Input | 3 | |
| 7 | | GND | Ground | 1 | 1 |
| 8 | LVTTL-I | ModSelL | Module Select | 3 | |
| 9 | LVTTL-I | ResetL | Module Reset | 3 | |
| 10 | | VccRx | +3.3V Power Supply Receiver | 2 | 2 |
| 11 | LVCMOS- I/O | SCL | 2-wire serial interface clock | 3 | |
| 12 | LVCMOS- I/O | SDA | 2-wire serial interface data | 3 | |
| 13 | | GND | Ground | 1 | 1 |
| 14 | CML-O | Rx3p | Receiver Non-Inverted Data Output | 3 | |
| 15 | CML-O | Rx3n | Receiver Inverted Data Output | 3 | |
| 16 | | GND | Ground | 1 | 1 |
| 17 | CML-O | Rx1p | Receiver Non-Inverted Data Output | 3 | |
| 18 | CML-O | Rx1n | Receiver Inverted Data Output | 3 | |
| 19 | | GND | Ground | 1 | 1 |

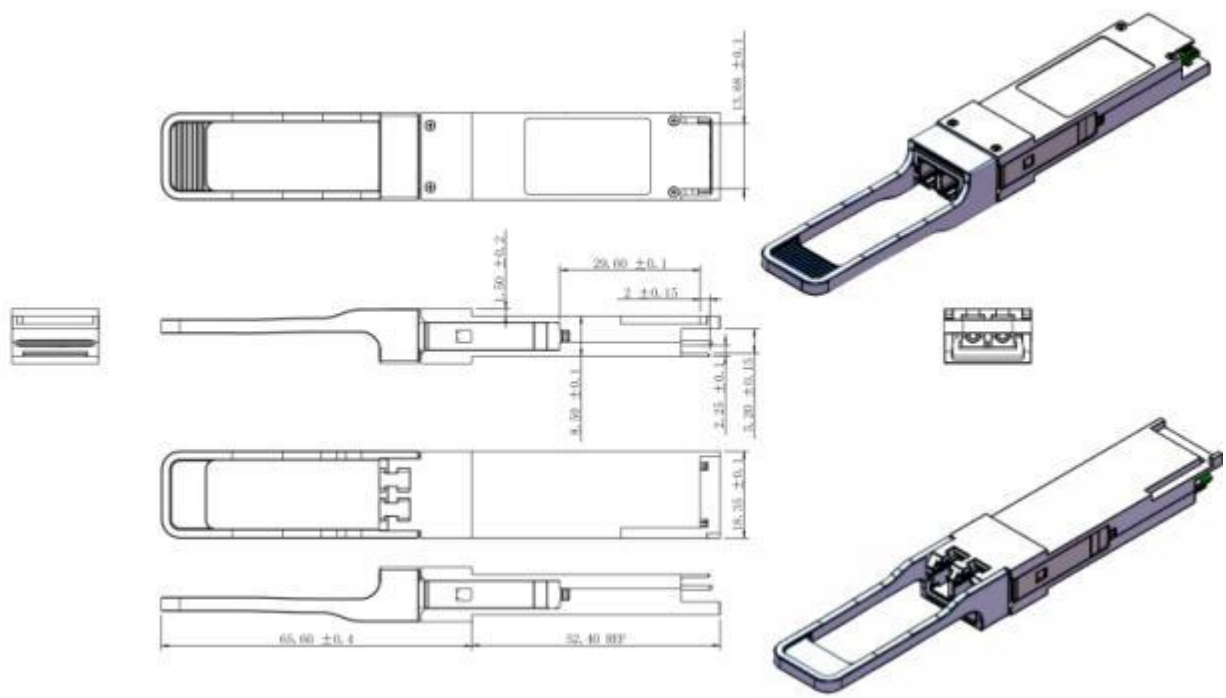
| | | | | | |
|---|---|---|---|---|---|
| 20 | | GND | Ground | 1 | 1 |
| 21 | CML-O | Rx2n | Receiver Inverted Data Output | 3 | |
| 22 | CML-O | Rx2p | Receiver Non-Inverted Data Output | 3 | |
| 23 | | GND | Ground | 1 | 1 |
| 24 | CML-O | Rx4n | Receiver Inverted Data Output | 3 | |
| 25 | CML-O | Rx4p | Receiver Non-Inverted Data Output | 3 | |
| 26 | | GND | Ground | 1 | 1 |
| 27 | LVTTL-O | ModPrsL | Module Present | 3 | |
| 28 | LVTTL-O | IntL | Interrupt | 3 | |
| 29 | | VccTx | +3.3V Power supply transmitter | 2 | 2 |
| 30 | | Vcc1 | +3.3V Power supply | 2 | 2 |
| 31 | LVTTL-I | LPMode | Low Power Mode | 3 | |
| 32 | | GND | Ground | 1 | 1 |
| 33 | CML-I | Tx3p | Transmitter Non-Inverted Data Input | 3 | |
| 34 | CML-I | Tx3n | Transmitter Inverted Data Input | 3 | |
| 35 | | GND | Ground | 1 | 1 |
| 36 | CML-I | Tx1p | Transmitter Non-Inverted Data Input | 3 | |
| 37 | CML-I | Tx1n | Transmitter Inverted Data Input | 3 | |
| 38 | | GND | Ground | 1 | 1 |

**Note:**

1.GND is the symbol for signal and supply (power) common for the QSFP+ module. 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

## Mechanical Specifications



## Ordering information

### Table 6- Ordering information

| Part Number | Description |
|---|---|
| QSP-40DWxx-80CL | 40Gbps, DWDM,80KM,SMF, LC,0 C~ + 7 0 C,with DDM |

### Table 7 ： ITU-T 100GHz Spacing Channel Numbers (xx)

| Ch(nm) | Freq(THz) | Central Wavelength(nm) | Ch(nm) | Freq(THz) | Central Wavelength(nm) |
|---|---|---|---|---|---|
| 21 | 192.1 | 1560.61 | 41 | 194.1 | 1544.53 |
| 22 | 192.2 | 1559.79 | 42 | 194.2 | 1543.73 |
| 23 | 192.3 | 1558.98 | 43 | 194.3 | 1542.94 |
| 24 | 192.4 | 1558.17 | 44 | 194.4 | 1542.14 |
| 25 | 192.5 | 1557.36 | 45 | 194.5 | 1541.35 |
| 26 | 192.6 | 1556.55 | 46 | 194.6 | 1540.56 |
| 27 | 192.7 | 1555.75 | 47 | 194.7 | 1539.77 |
| 28 | 192.8 | 1554.94 | 48 | 194.8 | 1538.98 |
| 29 | 192.9 | 1554.13 | 49 | 194.9 | 1538.19 |
| 30 | 193.0 | 1553.33 | 50 | 195.0 | 1537.40 |
| 31 | 193.1 | 1552.52 | 51 | 195.1 | 1536.61 |
| 32 | 193.2 | 1551.72 | 52 | 195.2 | 1535.82 |
| 33 | 193.3 | 1550.92 | 53 | 195.3 | 1535.04 |
| 34 | 193.4 | 1550.12 | 54 | 195.4 | 1534.25 |
| 35 | 193.5 | 1549.32 | 55 | 195.5 | 1533.47 |
| 36 | 193.6 | 1548.51 | 56 | 195.6 | 1532.68 |
| 37 | 193.7 | 1547.72 | 57 | 195.7 | 1531.90 |
| 38 | 193.8 | 1546.92 | 58 | 195.8 | 1531.12 |
| 39 | 193.9 | 1546.12 | 59 | 195.9 | 1530.33 |
| 40 | 194.0 | 1545.32 | 60 | 196.0 | 1529.55 |

E-mail: sales@ascentoptics.com
Web : http://www.ascentoptics.com