

SO-QSFP-40G-Dxxxx

QSFP+ 40G Ethernet DWDM 100GHz 10dB 8km D9210-D9600

OVERVIEW

The SO-QSFP-40G-Dxxxx is a QSFP+ form-factor DWDM transceiver for 40Gbps Ethernet applications. It is intended for use in interconnect applications between data centers between switches, routers, storage equipment etc. The transceiver is intended for active links using optical amplifiers and dispersion compensation units.

The transceiver is provided in 40 channel versions at the 100GHz DWDM grid as specified in the ITU-T 694.1 standard.

Digital diagnostics functions are available via the I²C interface as specified by the QSFP+ MSA specification SFF 8636.

TECHNICAL DATA

| Parameter | Value |
|-----------------------|----------------------------|
| Technology | DWDM QSFP+ |
| Transmission media | SM (2x LC) |
| Typical reach | 8km |
| Nominal wavelengths | 192.10 – 196.00 THz (40ch) |
| Interface standards | 40GBASE |
| Bit rate support | 42.5Gbps ¹⁾ |
| Protocol support | 40GbE |
| Power budget | 0 – 10dB |
| Dispersion tolerance | -50 to +150ps/nm |
| Dispersion penalty | Max 2dB |
| Power consumption | < 3.5W |
| Operating temperature | 0°C to +70°C |
| Storage temperature | -40°C to +85°C |

¹⁾ Includes KP4 FEC

²⁾ Average power

³⁾ pre FEC BER < 5E-5 without dispersion and noise load.

⁴⁾ Average Rx power for pre FEC BER < 5E-5 without dispersion

Safety/regulatory compliance:

TUV/UL/FDA (contact Smartoptics for latest certification information)

RoHS compliance

| Parameter | Value |
|--------------------------|--|
| Transmitter data: | |
| Output power | Min: -1.0 dBm ²⁾ Max: +3.0 dBm ²⁾ |
| Transmit wavelengths | 192.10 – 196.00 THz (40ch) 100GHz grid (G.694.1) |
| Receiver data: | |
| Minimum input power | -11 dBm ^{2) 3)} |
| Overload (max power) | +4 dBm ^{2) 3)} |
| Power range at OSNR 37dB | -8 to +4dBm ⁴⁾ |
| LOS Asserted | Min -15dBm |
| LOS De-asserted | Max -11dBm |
| LOS hysteresis | 1dB |
| Wavelength range | 1300 – 1570nm |
| DDM | Yes |
| MSA compliance | SFF-8679 SFF-8636 |



ORDERING INFORMATION

| Part number | Freq. THz | λ nm |
|-------------------|-----------|--------------|
| SO-QSFP-40G-D9210 | 192.10 | 1560.61 |
| SO-QSFP-40G-D9220 | 192.20 | 1559.79 |
| SO-QSFP-40G-D9230 | 192.30 | 1558.98 |
| SO-QSFP-40G-D9240 | 192.40 | 1558.17 |
| SO-QSFP-40G-D9250 | 192.50 | 1557.36 |
| SO-QSFP-40G-D9260 | 192.60 | 1556.55 |
| SO-QSFP-40G-D9270 | 192.70 | 1555.75 |
| SO-QSFP-40G-D9280 | 192.80 | 1554.94 |
| SO-QSFP-40G-D9290 | 192.90 | 1554.13 |
| SO-QSFP-40G-D9300 | 193.00 | 1553.33 |
| SO-QSFP-40G-D9310 | 193.10 | 1552.52 |
| SO-QSFP-40G-D9320 | 193.20 | 1551.72 |
| SO-QSFP-40G-D9330 | 193.30 | 1550.92 |
| SO-QSFP-40G-D9340 | 193.40 | 1550.12 |
| SO-QSFP-40G-D9350 | 193.50 | 1549.32 |
| SO-QSFP-40G-D9360 | 193.60 | 1548.51 |
| SO-QSFP-40G-D9370 | 193.70 | 1547.72 |
| SO-QSFP-40G-D9380 | 193.80 | 1546.92 |
| SO-QSFP-40G-D9390 | 193.90 | 1546.12 |
| SO-QSFP-40G-D9400 | 194.00 | 1545.32 |

| Part number | Freq. THz | λ nm |
|-------------------|-----------|--------------|
| SO-QSFP-40G-D9410 | 194.10 | 1544.53 |
| SO-QSFP-40G-D9420 | 194.20 | 1543.73 |
| SO-QSFP-40G-D9430 | 194.30 | 1542.94 |
| SO-QSFP-40G-D9440 | 194.40 | 1542.14 |
| SO-QSFP-40G-D9450 | 194.50 | 1541.35 |
| SO-QSFP-40G-D9460 | 194.60 | 1540.56 |
| SO-QSFP-40G-D9470 | 194.70 | 1539.77 |
| SO-QSFP-40G-D9480 | 194.80 | 1538.98 |
| SO-QSFP-40G-D9490 | 194.90 | 1538.19 |
| SO-QSFP-40G-D9500 | 195.00 | 1537.40 |
| SO-QSFP-40G-D9510 | 195.10 | 1536.61 |
| SO-QSFP-40G-D9520 | 195.20 | 1535.82 |
| SO-QSFP-40G-D9530 | 195.30 | 1535.04 |
| SO-QSFP-40G-D9540 | 195.40 | 1534.25 |
| SO-QSFP-40G-D9550 | 195.50 | 1533.47 |
| SO-QSFP-40G-D9560 | 195.60 | 1532.68 |
| SO-QSFP-40G-D9570 | 195.70 | 1531.90 |
| SO-QSFP-40G-D9580 | 195.80 | 1531.12 |
| SO-QSFP-40G-D9590 | 195.90 | 1530.33 |
| SO-QSFP-40G-D9600 | 196.00 | 1529.55 |

GENERAL DEFINITIONS

| Parameter | Description |
|------------------------------|--|
| Technology | Grey; Transceiver type for non-WDM applications. Electrical or optical. CWDM; Transceiver type for CWDM applications using G.694.2 channel grid. DWDM; Transceiver type for DWDM applications using G.694.1 channel grid. BiDi; Transceiver pair using two different wavelength channels operating on a single-fiber. DAC: Direct Attach Cable. Electrical cable with attached connectors. AOC: Active Optical Cable. Optical cable with attached connectors. |
| Transmission Media | Type of fiber, e.g. Multimode (MM) or Singlemode (SM). Number of and connector type within brackets (e.g. 2x LC, 1x MPO). |
| Typical reach | Nominal distance performance based on typical fiber dispersion, fiber loss and power budget properties, i.e. w/o dispersion compensation and optical amplification. Actual distance is dependent on actual optical path loss and dispersion properties. |
| Bit rate range | Supported bit rate range in Gigabit or Megabit per second (Gbps or Mbps). |
| Protocols | Protocols within supported bit rate range. |
| Nominal wavelength | Typical wavelength(s) from transmitter. |
| Interface standards | Referenced interface standards or MSA's, e.g. IEEE 802.3 standard for 10GbE services or 100G 4WDM-10 etc. |
| Power budget | Min and max power budget between Transmitter and Receiver w/o optical path penalties. |
| Dispersion tolerance/penalty | Maximum amount of tolerated dispersion and required reduction of power budget to maintain stipulated Bit Error Rate (BER) and at a given bit rate. |
| Temperature range | Max operating case temperature range. Standard temperature range (C-temp): typically 0°C to +70°C (32°F to +158°F) Extended temperature range (E-temp): typically -20°C to +75°C (-4°F to +167°F) Industrial temperature range (I-temp): -40°C to +85°C (-40°F to +185°F) |
| Power consumption | Worst case power consumption. Will vary over temperature. |
| Transmitter Output power | Average output power. Provided in min and max values. |
| Receiver minimum input power | Minimum average input power at specified BER, normally $1E^{-12}$. Note that some protocols require FEC to achieve sufficient BER. |
| Receiver max input power | Maximum average input power giving a BER, normally $1E^{-12}$. |
| DDM | Digital Diagnostic Monitoring functionality as defined in e.g. SFF-8472 MSA. |

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