

# SO-QSFP-40G-Dxxxx

QSFP+ 40G Ethernet DWDM 100GHz 11dB 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. The transceiver has an integrated FEC functionality and requires that the signal from the host equipment is without FEC coding.

Digital diagnostics functions are available via the I<sup>2</sup>C 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 – 196.00THz (40ch)
Interface standards	40GBASE
Bit rate support	42.5Gbps <sup>1)</sup>
Protocol support	40GbE
Power budget	0 – 11dB
Dispersion tolerance	-50 to +150ps/nm (un-amplified) -50 to +50ps/nm (amplified)
Dispersion penalty	Max 2dB
Power consumption	< 3.5W
Operating temperature	0°C to +70°C
Storage temperature	-40°C to +85°C

<sup>1)</sup> Includes KP4 FEC

<sup>2)</sup> Average power

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

<sup>4)</sup> 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
<b>Transmitter data:</b>	
Output power	Min: 0dBm <sup>2)</sup> Max: +4.0dBm <sup>2)</sup>
Transmit wavelengths	192.10 – 196.00THz (40ch) 100GHz grid (G.694.1)
<b>Receiver data:</b>	
Minimum input power	-11 dBm <sup>2) 3)</sup> un-amplified
Overload (max power)	+4 dBm <sup>2) 3)</sup>
OSNR sensitivity	33dB
Power range at OSNR 33dB	-7 to +4dBm <sup>4)</sup>
LOS Asserted	Min -15dBm
LOS De-asserted	Max -11dBm
LOS hysteresis	1dB
Wavelength range	1300 – 1570nm
DDM	Yes
MSA compliance	SFF-8636, SFF-8679



## ORDERING INFORMATION

Part number	Freq. THz	$\lambda$ 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	$\lambda$ 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.

Smartoptics makes no warranties or representations, expressed or implied, of any kind relative to the information or any portion thereof contained in this document or its adaptation or use, and assumes no responsibility or liability of any kind, including, but not limited to, indirect, special, consequential or incidental damages, for any errors or inaccuracies contained in the information or arising from the adaptation or use of the information or any portion thereof. The information in this document is subject to change without notice.

Subject to change without notice.

For more information visit [smartoptics.com](http://smartoptics.com).

smartoptics