

40G Four-Channel Small Form (QSFP) Optical Transceivers



Features

- 850 nm for 100 m and 1310 nm for 10 km
- Four channels of 10.3 Gb/s for 40 Gb/s
- QSFP+ MSA and 40GBASE-SR Ethernet compliant
- Single MPO optical connector
- 38-pin connector z-axis hot pluggable

Applications

- ✓ 40 Gigabit Ethernet
- ✓ SONET OC-192/SDH STM-64
- ✓ ITU-T G.709 DWDM networks
- ✓ Data Communication for SAN and LAN
- ✓ Routers and switches, computer cluster cross-connect



Products Selection Guide					
Part Number	Wavelength	Data Rate	Power Budget	Distance*	Temp. Range
850 nm, Multimode Applications					
QFP-40GMPSX-AT100M	850 nm	10 Gb/s	>4 dB	100 m	0 – 70°C
1310 nm, Single Mode Applications					
QFP-40GLCLX-AT10K	1310 nm	10 Gb/s	>4 dB	10 km	0 – 70°C

*: The indicated distance is for reference only, not guaranteed specifications. The actual transmission distance depends on system configuration and power budget. For single mode fibers, the typical loss is 0.25 dB/km @ 1550 nm and 0.35 dB/km @ 1310 nm.

40 Gb/s (4x 10 Gb/s) 850 nm, Multimode, 100 m QSFP+ MPO Package

Description

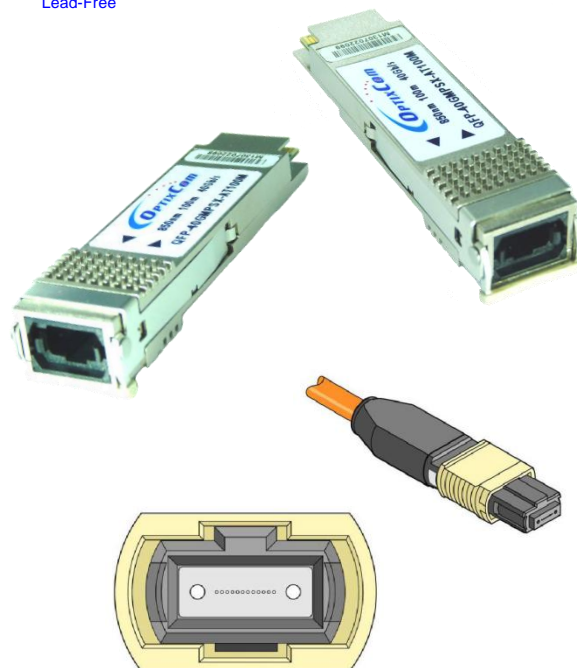
OptixCom's 40 Gb/s QSFP+ is a 4-lane parallel pluggable fiber optics transceiver designed with advanced 850 nm VCSEL laser arrays and high speed electronics to achieve the optimum performance for optical interconnect applications. It is compliant with 40G Ethernet standard and QSFP+ Multi-Source Agreement (MSA) SFF-8436 for datacom applications.

The transceiver uses an 8-fiber MPO multimode connector interface to transmit and receive 4 lanes of 10 Gb/s optical data respectively. It is hot pluggable in the z-axis with a 38-pin connector. The transceiver has 2-12 dB of power budget and reaches up to 100 meters of transmission distance with OM3 multimode fibers. The product is RoHS compliant. Total power consumption is < 1.5W.



Lead-Free

QFP-40GMPSX-AT100M



Key Features

- 850 nm multimode, 40 Gb/s data rate
- 4-channel duplex transceiver; 10Gb/s each lane
- 100 m with OM3 MMF and 150 m with OM4 MMF
- 2-12 dB power budget
- Single 8-fiber MPO connector optical interface
- 38-pin Z-axis hot pluggable connector
- Compliant with QSFP+ MSA standard
- Compliant with IEEE 802.3ba, 40GBASE-SR
- Single 3.3V power supply
- RoHS compliant

Ordering Information

Part Number: QFP-40GMPSX-AT100M

Description:

850 nm 40 Gb/s, multimode, QSFP+ fiber optics transceiver, 100 m reach, 0-70°C

Applications

- ✓ 40G Fiber Channel and Ethernet
- ✓ InfiniBand 4X SDR DDR QDR
- ✓ Data Communication for SAN and LAN
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate (Each Lane)	---	---	10.3	Gb/s
Supply Voltage	3.1	3.3	3.5	V
Supply Current	---	350	450	mA

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	T_{st}	-20	85	°C
Supply Voltage	V_{CC}	-0.3	3.6	V
Input Voltage	V_{IN}	-0.3	$V_{CC} + 0.3$	V
Relative Humidity	<i>R.H.</i>	5	95	%
Output Current	I_o	---	50	mA

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage ¹	ΔV_i	0.3	---	1.0	V
Differential Input Impedance ²	Z	---	100	---	ohm
Optical Output Power ³	P_o	-7.5	---	2.5	dBm
Optical Power Difference BTW Lanes (OMA)	P_{od}	---	---	4	dBm
Transmitter & Dispersion Penalty	TDP	---	---	3.5	dB
Optical Wavelength	λ_o	840	850	860	nm
Extinction Ratio	ET	3	---	---	dB
Spectral Width (rms)	$\Delta\lambda$	---	---	0.65	nm
Skew	T_{sw}	---	---	300	ps
TX Disable Asserted	P_{OFF}	---	---	-30	dBm
Input Voltage – Logic High	V_{DH}	2.0	---	V_{CC}	V
Input Voltage – Logic Low	V_{DL}	0	---	0.4	V
Reset Initial Assert Time	T_{rsass}	---	---	2	μs
Reset Assert Time	T_{riass}	---	---	2000	ms
Time to Initialize	T_{ini}	---	---	2000	ms
TX Fault Assert Time	T_{fxass}	---	---	200	ms
Flag Assert Time	T_{fgass}	---	---	200	ms

Notes:

1. Module is designed for AC coupling. DC voltage will be filtered by internal capacitors.
2. Single ended will be 50 ohm for each signal line.
3. Output of coupling optical power into 50/125 μm MMF.
4. Refer to OptixCom "QSFP Design Reference Guide" for more design details.

**Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11**



Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_c	840	---	860	nm
Receiver Overload	P_{max}	2.4	---	---	dBm
Receiver Sensitivity ¹	P_I	---	---	-9.5	dBm
Stressed Receiver Sensitivity in OMA	P_{IS}	---	---	-5.4	dBm
LOS Hysteresis	L_{hs}	0.5	---	---	dB
Differential Output Voltage	ΔV_o	0.5	---	0.8	V
Differential Input Impedance ²	Z	---	100	---	Ohm
Optical Return Loss	OL	12	---	---	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	40	ps
RX Signal Loss – Asserted	P_{SD+}	---	---	-7.5	dBm
RX Signal Loss – Deasserted	P_{SD-}	-30	---	---	dBm
Output Voltage – Logic High	V_{RL+}	2.0	---	V_{CC}	V
Output Voltage – Logic Low	V_{RL-}	0	---	0.4	V
RX LOS Assert Time	T_{RL+}	---	---	100	ms
RX LOS Deassert Time	T_{RL-}	---	---	100	ms
ModSel Assert Time	$T_{ModSelAss}$	---	---	100	μ s
ModSel Deassert Time	$T_{ModSelDea}$	---	---	100	μ s

Notes:

1. Test at 10 Gb/s, 2³¹ – 1 PRBS data pattern, and > 1x10⁻¹² of Bit-Error-Rate (BER).
2. Single ended will be 50 ohm for each signal line.
3. Refer to OptixCom "QSFP Design Reference Guide" for more design details.

Typical Transmission Distance for Multimode Fibers @ 850 nm

Data Rate	Fiber Type	Distance (m)	Data Rate	Fiber Type	Distance (m)
1.25 Gb/s	50 μ m, 500 MHz*km	550	10 Gb/s	50 μ m, 2000 MHz*km	300
	50 μ m, 400 MHz*km	500		50 μ m, 500 MHz*km	82
	62.5 μ m, 200 MHz*km	275		62.5 μ m, 200 MHz*km	33
	62.5 μ m, 160 MHz*km	220		62.5 μ m, 160 MHz*km	26

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