

40 Gb/s (4x10 Gb/s), 10 km CWDM LR4, Singlemode QSFP+ Dual LC Package

Description

OptixCom's 40 Gb/s QSFP+ LR4 optical transceiver is designed to operate with 4x CWDM channels for up to 10 km of transmission distance. The transceiver uses 1271, 1291, 1311, and 1331 nm DFB laser wavelengths, with each wavelength running at 10 Gb/s. They are then multiplexed together into a single channel to achieve 40 Gb/s of data transmission.

On the receiver side, the 40 Gb/s data signal is demultiplexed and converted to the same 4x CWDM channels as the transmitter side. It is compliant with 40G Ethernet standard and QSFP+ Multi-Source Agreement (MSA) SFF-8436 for datacom applications.

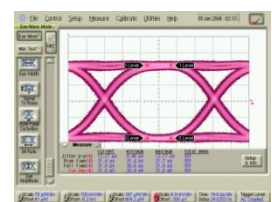
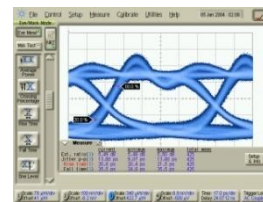
The transceiver uses dual LC connector for single mode applications. It is hot pluggable in the z-axis with a 38-pin connector. The product is RoHS compliant. Total power consumption is < 3.5 W.



QFP-40GLR4-AT10K



10 Gb/s, 2²³-1 NRZ data eye pattern
TX RX



Key Features

- 4x CWDM channels 1271, 1291, 1311, and 1331 nm.
- 40 Gb/s, 10 Gb/s for each LR4 wavelength
- 10 km transmission distance for SMF
- Duplex LC singlemode interface connector
- 38-pin Z-axis hot pluggable connector
- Compliant with QSFP+ MSA standard
- Compliant with IEEE 802.3ba, 40GBASE-LR4
- Single 3.3V power supply
- RoHS compliant

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

Ordering Information

Part Number: QFP-40GLR4-AT10K

Description:

QSFP+, 4x CWDM LR4, 40 Gb/s, single mode, dual LC fiber optics transceiver, 10 km reach, 0-70°C

Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate (Each Lane)	---	10.3	11.1	Gb/s
Supply Voltage	3.14	3.3	3.46	V
Supply Current	---	---	900	mA

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	T_{st}	-40	85	°C
Supply Voltage	V_{CC}	-0.3	4	V
Input Voltage	V_{IN}	$V_{CC}-0.3$	$V_{CC}+0.3$	V
Relative Humidity	$R.H.$	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 per Lane ³	P_o	-7	---	2.3	dBm
Total Optical Power	P_T	---	---	8.3	dBm
Optical Wavelength 1	λ_o	1264.5	1271	1277.5	nm
Optical Wavelength 2	λ_o	1284.5	1291	1297.5	nm
Optical Wavelength 3	λ_o	1304.5	1311	1317.5	nm
Optical Wavelength 4	λ_o	1324.5	1331	1337.5	nm
Side Mode Suppression Ratio	SMSR	30	---	---	dB
Relative Intensity Noise	RIN	---	---	-128	dB/Hz
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Transmitter & Dispersion Penalty	TDP	---	---	2.3	dB
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
TX Enabled Assert Time	T_{TAss}	---	---	100	ms
TX Disabled Deassert Time	T_{TDis}	---	---	400	μs
Reset Initial Assert Time	T_{RSAss}	---	---	2	μs

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.

Transmitter Electro-Optical Characteristics (Cont.)

Parameter	Symbol	Min.	Typical	Max.	Units
Reset Assert Time	T_{riass}	---	---	2000	ms
Time to Initialize	T_{ini}	---	---	2000	ms
TX Fault Assert Time	T_{txass}	---	---	200	ms
Flag Assert Time	T_{fgass}	---	---	200	ms

Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Operating Wavelength	λ_c	1250	---	1360	nm
Receiver Overload	P_{max}	2.3	---	---	dBm
Receiver Sensitivity per Lane ¹	P_I	---	---	-11.5	dBm
Differential Output Voltage	ΔV_o	0.3	---	0.8	V
Differential Input Impedance ²	Z	---	100	---	Ohm
Receiver Reflectance	OL	---	---	-26	dB
Rise/Fall Time (20% - 80%)	T_r/T_f	---	---	28	ps
RX Signal Loss – Asserted	P_{SD+}	---	---	-12	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, $2^{31} - 1$ PRBS data pattern, and $> 1 \times 10^{-12}$ 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.