

4L-Q562GFR4-L02

QSFP56 200GBASE-FR4, 1310nm, SM, FEC, DDM, LC, 2Km



Applications

- Compliant with 200GBASE-FR4 Ethernet
- Up to 212.5 Gbps Bit Rate
- Datacenter backbones
- High-speed servers
- SAN, Routers, Hubs, Load Balancer
- High-performance Computing Clusters
- Other optical links

Features

- QSFP56 200G Optical Transceiver
- QSFP56 MSA Compliant
- Up to 2Km links on SMF with FEC
- DFB laser transmitter
- Duplex LC receptacles
- 4 CWDM lanes MUX/DEMUX design
- Digital Diagnostic Monitoring
- RoHS-6 and Lead Free
- Operating temperature: 0°C ~ +70°C

Description

The 4L-Q562GFR4-L02 is a QSFP56 four channel full duplex transceiver module for singlemode (SMF) 200GBASE-FR4 / 200 Gigabit optical data communications.

This modules are compatible with most switch/router/server brands and designed to operate with single mode fiber (SMF) and Duplex LC connectors, using 4 channels of 50Gb/s CWDM with up to 2km reach.

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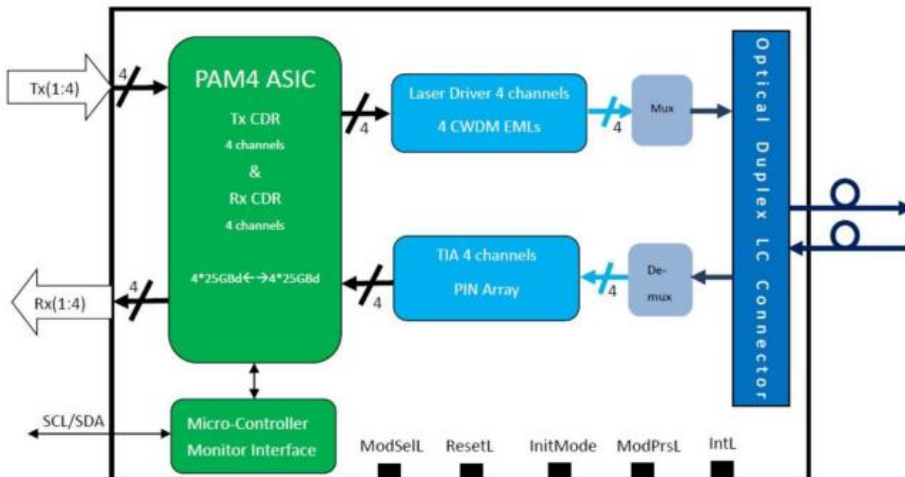
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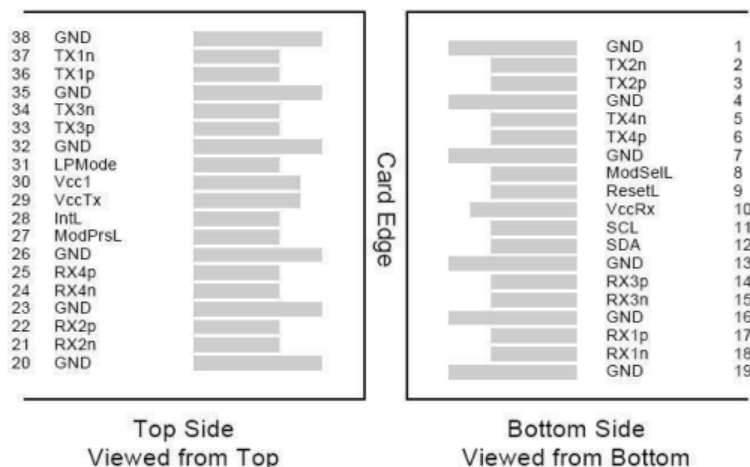
Functional Description

The 4L-Q562GFR4-L02 converts the 4-channel 200Gb/s(PAM4) electrical input data into CWDM optical signals(light), by a driven 4-wavelength EMLs. The light is combined by the MUX parts as a 200Gb/s data, propagating out of the transmitter module from the SMF. The receiver module accepts the 200Gb/s CWDM optical signals input, and de-multiplexes it into 4 individual 50Gb/s channels with different wavelength. Each wavelength light is collected by a discrete photo diode, and then outputted as electric data after amplified by a TIA and a post amplifier. Analog CDR is used to recovery PAM4 signals.

Transceiver Block Diagram



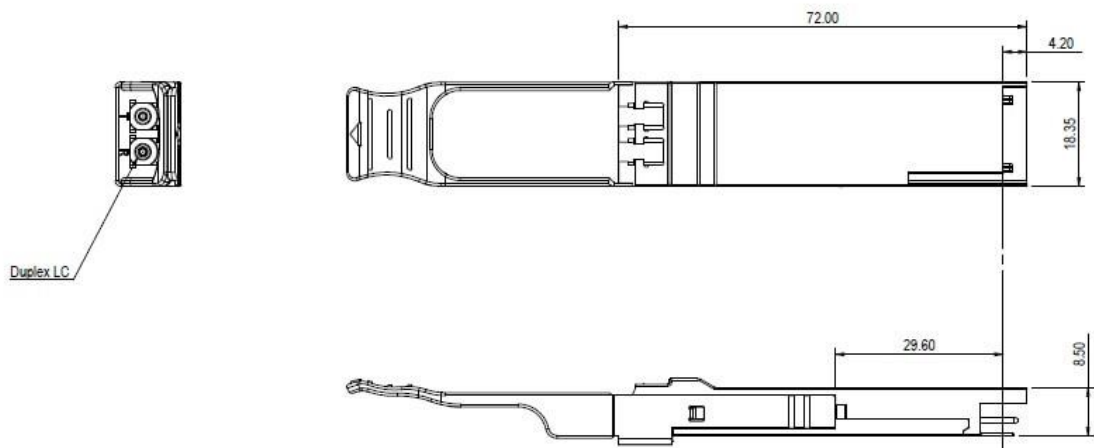
Pin Definition



General Specifications – Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max
Max Link Length	Lmax			2Km on SMF
Supply Voltage	Vcc	-0.5v		3.6v
Power Consumption			6.5w	
Storage Temperature	T _s	-40°C		85°C
Case Operating Temperature	T _{OP}	10°C		60°C
Relative Humidity	RH	0		85%
Receiver Damage Threshold, per Lane	pRdmg	3.5		
Bit Rate (all lanes)	BR			212.5Gb/s
Bit Error Ratio – pre FEC	BER			2.4x10 ⁻⁴
Bit Error Ratio – post FEC	BER			1x10 ⁻¹²

Mechanical Specifications



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Optical Specifications - Transmitter

Parameter	Symbol	Min	Typ	Max	Unit
Signaling Speed per lane (NRZ)			53.125±100ppm		Gb/s
Optical Data Rate (PAM4)			26.5625		GBaud
Center Wavelength		1304.5	1310	1317.5	nm
Total Average Launch Power	Pt			10.7	dBm
Average Launch Power	pTX	-4.2		4.5	dBm
Outer Optical Modulation Amplitude	POMA	-1.2		4.5	dB
Transmitter and Dispersion Eye Closure for PAM4	TDECQ			3.3	dB
Launch Power in OMA minus TDECQ	ER	-2.6 (ER>4.5dB)		-2.5 (ER<4.5dB)	dB
Side Mode Suppression Ratio	SMSR	30			dB
Relative Intensity Noise	RIN			-132	dB/Hz
Transmitter Reflectance	Rt			-26	dB
Optical Return Loss Tolerance	TOL			16.5	dB
Average Launch Power of OFF Transmitter	Poff			-20	dBm
LOS Assert Level	LOSA		50		mV
LOS Deassert Level	LOSD		100		mV

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Optical Specifications – Receiver

Parameter	Symbol	Min	Typ	Max	Unit
Signaling Speed per lane			53.125±100ppm		Gb/s
Optical Center Wavelength (L0 Lane)	λ_c	1264.5	1271	1277.5	nm
Optical Center Wavelength (L1 Lane)	λ_c	1284.5	1291	1297.5	nm
Optical Center Wavelength (L2 Lane)	λ_c	1304.5	1311	1317.5	nm
Optical Center Wavelength (L3 Lane)	λ_c	1324.5	1331	1337.5	nm
Average Receive Power, each lane	PRX	-8.2		4.7	dBm
Receiver Power (OMA), each Lane				4.5	dBm
Receiver Sensitivity (OMA), each Lane				-6	dBm
Stressed Receiver Sensivity				-3.6	dBm
Damage Threshold, each Lane		5.7			dBm
LOS Assert	LOS _A	-30			dBm
LOS De-Assert	LOS _D			-12	dBm
LOS Hysteresis	LOS _H	0.5			dB

Electrical Specifications - Transmitter

Parameter	Symbol	Min	Typ	Max	Unit
Signaling Rate per lane		53.125±100ppm			Gb/s
Differential data input swing	v _{IN_PP}	900			mV
Transmit disable voltage	V _D	V _{CC} -1.3		v _{CC}	V
Transmit enable voltage	v _{EN}	v _{EE}		V _{EE} +0.8	V

Electrical Specifications - Receiver

Parameter	Symbol	Min	Typ	Max	Unit
Signaling Rate per lane		53.125±100ppm			Gb/s
Differential data output swing	v _{OUT_PP}			900	mV
Data output rise time (20%-80%)	t _r		12		ps
Data output fall time (20%-80%)	t _f		12		ps
LOS Fault	LOS _A	V _{CC} -1.3		v _{CC_HOST}	V
LOS Normal	LOS _D	v _{EE}		V _{EE} +0.5	V

Ordering Information

Part Number	Description
4L-Q562GSR4-M001	QSFP56 200GBASE-SR4, 850nm, MM, DDM, MPO/MTP, 100m
4L-Q562GFR4-L02	QSFP56 200GBASE-FR4, 1310nm, SM, DDM, Duplex LC, 2Km
4L-Q562GLR4-L10	QSFP56 200GBASE-LR4, 1310nm, SM, DDM, Duplex LC, 10Km
4L-Q562GER4-L40	QSFP56 200GBASE-ER4, 1310nm, SM, DDM, Duplex LC, 40Km

Note

This modules have been tested by 4LAN on equipment like Cisco, Juniper, Dell, HP, Mikrotik, Huawei, and other brands. The equipment brand must be informed before shipping the order, so the transceivers are reprogrammed to the corresponding brand.

Contact Information

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