

# 40Gbps QSFP+ ER4 40km Transceiver CLQSFP40GER4

### **Product Features:**

- Hot-pluggable QSFP+ form factor
- Supports 41.3 Gb/s aggregate bit rate
- Power dissipation < 3.5W
- 18.5 dB link insertion loss budget
- RoHS-6 compliant
- Commercial case temperature range 0°C to 70°C
- Single 3.3V power supply
- Maximum link length of 40km on Single Mode Fiber (SMF)
- Uncooled 4x10Gb/s CWDM transmitter + APD Receiver
- XLPPI electrical interface
- Duplex LC receptacles
- Built-in digital diagnostic functions, including Tx/Rx power monitoring

### **Functional Characteristics (Optical)**

The following tables list the performance specifications for the various functional blocks of the integrated optical transceiver module.

### Table 1 – Transmitter Optical Specifications

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Signaling Speed per Lane			10.3125		GBd	1
Lane center wavelengths (range)			1264.5 – 1277.5 1284.5 – 1297.5 1304.5 – 1317.5 1324.5 – 1337.5	5 5 5	nm	
Total Average Launch Power	POUT			10.5	dBm	
Transmit OMA per Lane	TxOMA	0.3		5.0	dBm	
Average Launch Power per Lane	TXPx	-0.5		4.5	dBm	2
Difference in launch power between any two lanes (OMA)				4.7	dB	
Transmitter Dispersion Penalty	TDP			2.6	dB	
Launch power (OMA) minus TDP per lane		-0.5			dBm	
Optical Extinction Ratio	ER	5.5			dB	
Sidemode Suppression ratio	SSRmin	30			dB	
Average launch power of OFF transmitter, per lane				-30	dBm	
Relative Intensity Noise	RIN			-128	dB/Hz	3
Optical Return Loss Tolerance				20	dB	
Transmitter Reflectance				-12	dB	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		$\{0.25, 0.4, 0.45, 0.25, 0.28, 0.4\}$				

Notes1:Transmitter consists of 4 lasers operating at up to 10.3 Gb/s each, ± 100ppm Notes2:Minimum value is informative.

Notes3:RIN is scaled by 10\*log(10/4) to maintain SNR outside of transmitter.





Notes4:Receiver consists of 4 photodetectors operating at up to 10.3125 Gb/s each,  $\pm$  100ppm Notes5:Minimum value is informative, equals min TxOMA with infinite ER and max channel insertion loss.

Notes6:Maximum value is based on a min. of 9dB loss. Additional attenuation may be required when connected in loopback or short fiber link.

#### Table 2 – Receiver Optical Specifications

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Signaling Speed per Lane			10.3125		GBd	4
Lane center wavelengths (range)		1264.5 - 1277.5 1284.5 - 1297.5 1304.5 - 1317.5 1324.5 - 1337.5			nm	
Receive Power (OMA) per Lane	RxOMA			-4.0	dBm	
Average Receive Power per Lane	RXPx	-21.2		-4.5	dBm	5,6
Receiver Sensitivity (OMA) per Lane	Rxsens			-19	dBm	
Stressed Receiver Sensitivity (OMA) per Lane	SRS			-16.8	dBm	
Damage Threshold per Lane	PMAX	-4.5			dBm	
Return Loss	RL			-26	dB	
Vertical eye closure penalty, per lane				2.2	dB	
Receive electrical 3 dB upper cutoff frequency, per lane				12.3	GHz	
LOS De-Assert	LOSD			-19	dBm	
LOS Assert	LOSA	-35			dBm	
LOS Hysteresis			1		dB	

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Notes3:RIN is scaled by 10\*log(10/4) to maintain SNR outside of transmitter.

Notes4:Receiver consists of 4 photodetectors operating at up to 10.3125 Gb/s each,  $\pm$  100ppm

Notes5:Minimum value is informative, equals min TxOMA with infinite ER and max channel insertion loss.

Notes6: Maximum value is based on a min. of 9dB loss. Additional attenuation may be required when connected in loopback or short fiber link.

## **Ordering Information**

#### **Table 3 - Ordering Information**

Part No.	Data Rate	DDM	Laser Source	Fiber Type	Dist.	Temp.	Optical Interface
CLQSFP40GER4	40Gbps	Yes	1310nm	SMF	40km	0~70℃	LC

### **CONTACT:**

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