400G QSFP-DD ER4
CL400GQDDER4

Product Features:

- The module is designed for 30-40 km optical communication applications, and it is compliant with 100G Lambda MSA standard. This module can convert 8-channel 53.125 Gbps electrical data to 4-channel 106.25 Gbps optical signals, and multiplex them into a single channel for 425 Gbps optical transmission. Similarly, it optically de-multiplexes a 425 Gbps input into 4-channel signals, and converts them to 8-channel output electrical data on the receiver side.

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

Parameters	Min	Typ	Max	Unit	Notes
Data rate, each Lane		53.125 ± 100 ppm		GBd	
Modulation format		PAM4			
Line wavelengths	1264.5	1271	1277.5	nm	
	1284.5	1291	1297.5		
	1304.5	1311	1317.5		
	1324.5	1331	1337.5		
Total average launch power			9.5	dBm	
Average launch power, each lane	–2		6	dBm	
Optical modulation amplitude (OMA), each lane	0.2		4.2	dBm	
Extinction ratio (ER)	3.5			dB	
Side-mode suppression ratio (SMSR)	30			dB	
Launch power in OMA minus TDECQ, each lane, for ER ≥ 4.5 dB	–1.2			dB	
Launch power in OMA minus TDECQ, each lane, for ER < 4.5 dB	–1.1			dBm	
Transmitter and dispersion eye closure for PAM4, each Lane (TDECQ)			3.9	dB	
Difference in launch power between any two lanes (OMA outer)			4	dB	
RIN17.1OMA			–136	dB/Hz	
Optical return loss tolerance			17.1	dB	
Transmitter reflectance			–26	dB	
Average launch power of OFF transmitter, each Lane			–20	dBm	

Table 2 – Receiver Optical Specifications

Parameters	Min	Typ	Max	Unit	Notes
Data rate, each Lane	53.125 ± 100 ppm			GBd	
Modulation format	PAM4				
Damage threshold, each lane	4.5			dBm	
Line wavelengths	1264.5	1271	1277.5	nm	
	1284.5	1291	1297.5		
	1304.5	1311	1317.5		
	1324.5	1331	1337.5		
Average receiver power, each lane	–18.5		-4	dBm	
Receiver power, each lane (OMA)			4.2	dBm	
Difference in receiver power between any two lanes (OMA)			4.1	dB	
Receiver sensitivity (OMA outer), each lane (max)	Max -16.5			dBm	1
LOS assert	–25			dBm	
LOS deassert			–18	dBm	
LOS hysteresis	0.5			dB	
Receiver reflectance			–26	dB	
Conditions of stressed receiver sensitivity					
Stressed eye closure for PAM4 (SECQ), lane under test	0.9		3.4	dB	
OMA outer of each aggressor lane		1.5		dBm	
Long term performance test					
BER FLOOR	1E – 6 @ –3.1 ~ 2 dBm				

Ordering Information

Table 3 - Ordering Information

Part No.	Specifications									Application
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Temp	Reach	Other	
CL400GQDDER4	QSFP-DD	400G	EML	-2~6dBm	SOA	-16.5dBm	0~70°C	30-40km	DDM	400G Ethernet

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