









## VII. Optical Characteristics

100GBASE-LR4 Operation (EOL, TOP = 0 ~70 °C, VCC = 3.135 to 3.465 V)

Parameters	Symbol	Min	Typical	max	Unit	Note
Transmitter						
Signal Speed per Lane	BR	25.78125 ± 100 ppm			Gb/s	
Transmit wavelength	λ0	1294.53		1296.59	nm	
	λ1	1299.02		1301.09	nm	
	λ2	1303.54		1305.63	nm	
	λ3	1308.09		1310.19	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	Ptotal			10.5	dBm	
Average launch power, each lane	Pout	-4.3		4.5	dBm	
Optical Modulation Amplitude (OMA), each lane	POMA	-1.3		4.5	dBm	
Launch power OFF per lane				-30	dBm	
Transmitter and Dispersion Penalty (TDP), each lane	TDP			2.2	dB	
Extinction Ratio (ER)	ER	4			dB	
Transmitter eye mask definition {X1,X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				1
Mask margin		15			%	1
Receiver						
Signaling Speed per Lane	BR	25.78125 ± 100 ppm			Gb/s	
Receive wavelength	λ0	1294.53		1296.59	nm	
	λ1	1299.02		1301.09	nm	
	λ2	1303.54		1305.63	nm	
	λ3	1308.09		1310.19	nm	
Damage threshold, each lane		5.5			dBm	
Average receive power, each lane		-8.6		4.5	dBm	
Receive power, each lane(OMA)		-10.6		4.5	dBm	2
Receiver reflectance				-26	dB	
LOS Assert		-24		-13.6	dBm	
LOS De-Assert				-11.6	dBm	
LOS Hysteresis		0.5		6	dB	

### Notes

1. Hit ratio  $5 \times 10^{-5}$ .
2. Sensitivity is specified at BER@1E-12.

### VIII. OUT4 Operation (EOL, TOP = 0 ~70 °C, VCC = 3.135 to 3.465 V)

Parameters	Symbol	Min	Typical	max	Unit	Note
Transmitter						
Signal Speed per Lane	BR	27.9525 ± 100 ppm			Gb/s	
Transmit wavelength	λ0	1294.53		1296.59	nm	
	λ1	1299.02		1301.09	nm	
	λ2	1303.54		1305.63	nm	
	λ3	1308.09		1310.19	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	Ptotal			10	dBm	
Average launch power, each lane	Pout	-0.6		4	dBm	
Optical Modulation Amplitude (OMA), each lane	POMA	-1.3		4.5	dBm	
Launch power OFF per lane				-30	dBm	
Extinction Ratio (ER)	ER	4			dB	
Transmitter eye mask definition {X1,X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				1
Mask margin		15			%	1
Receiver						
Signaling Speed per Lane	BR	27.9525 ± 100 ppm			Gb/s	
Receive wavelength	λ0	1294.53		1296.59	nm	
	λ1	1299.02		1301.09	nm	
	λ2	1303.54		1305.63	nm	
	λ3	1308.09		1310.19	nm	
Damage threshold, each lane		5.5			dBm	
Average receive power, each lane		-8.4		4	dBm	2
Receive power, each lane(OMA)		-8.6		4.5	dBm	2
Receiver sensitivity (AOP), each lane				-8.4	dBm	2
Receiver reflectance				-26	dB	
LOS Assert		-24		-13.6	dBm	
LOS De-Assert				-11.6	dBm	
LOS Hysteresis		0.5		6	dB	

**Notes**

Hit ratio  $5 \times 10^{-5}$

Sensitivity is specified at BER@1E-6

## IX. Digital Diagnostic Monitoring Functions

6C-QSFP28-LR4-OTU4 support the I2C-based Diagnostic Monitoring Interface (DMI) defined in document SFF-8665. The host can access real-time performance of transmitter and receiver optical power, temperature, supply voltage and bias current.

Parameter	Accuracy	Unit
Case Temperature	±3	°C
Supply Voltage	±3%	V
Tx Bias Current	±10%	mA
Tx Optical Power	±3	dB
Rx Optical Power	±3	dB

## X. Regulatory Compliance

Feature	Reference	Performance
EMC	EN61000-3	Compatible with standards
Electrostatic Discharge (ESD)	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10, 1040.11 IEC/EN 60825-1, EC/EN 60825-2	Class 1 laser product
Component Recognition	IEC/EN 60950, L 60950	Compatible with standards
ROHS	2002/95/EC	Compatible with standards

## XI. Ordering information

Part Number	Product Description
6C-QSFP28-LR4-OTU4	100GBASE-LR4 OTU4 10km QSFP28 Optical Transceiver with DDM