

100G QSFP28 10km LR4 Transceivers

CC-QKKLL1L-SD

Features

- 4 Independent LAN-WDM channels
- Low Power Consumption <4.5W
- Wide Operating Temperature(0°C~70°C)
- Maximum link length of 10km via Single Mode Fiber (SMF)

Applications

- 100GBASE LR4 100G Ethernet
- High performance computing, data com and sever data links
- High speed access

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Min.	Max.	Unit
Storage Temperature	T _{Storage}		-40	+85	°C
Relative Humidity	RH		0	+85	%

Recommended Operating Conditions (T=25°C, unless noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Case Temperature	T _C		0		70	°C
Power Supply Voltage	V _{CC}		3.135	3.3	3.465	V
Signaling Rate each Channel				25.78125		Gbps
Supply Noise Rejection			---	---	100	mV
Receiver Differential Data Output			---	100		Ohm
Operating Distance	D		---	---	10	km

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Electrical Characteristics (T=25°C, unless noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Power Consumption					4.5	W
Supply Current	I _{cc}				1200	mA

Transmitter Characteristics (T=25°C, unless noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Signaling rate, each lane (range)	GBb			25.78125		GBb
Center Wavelength	λ ₀		1294.53		1296.59	nm
	λ ₁		1299.02		1301.09	nm
	λ ₂		1303.54		1305.63	nm
	λ ₃		1308.09		1310.19	nm
Side-mode suppression ratio	SMSR		30			dB
Total average launch power					10.5	dBm
Average launch power, each lane	P _f		-4.3		4.5	dBm
Optical Modulation Amplitude (OMA), each lane	T _x OMA		-1.3		4.5	dBm
Transmitter and Dispersion Penalty	TDP				2.2	dB
Average launch power of OFF transmitter, each lane					-30	dBm
Extinction ratio	ER		4			dB
Optical return loss tolerance					20	dB
Transmitter reflectance					-12	dB

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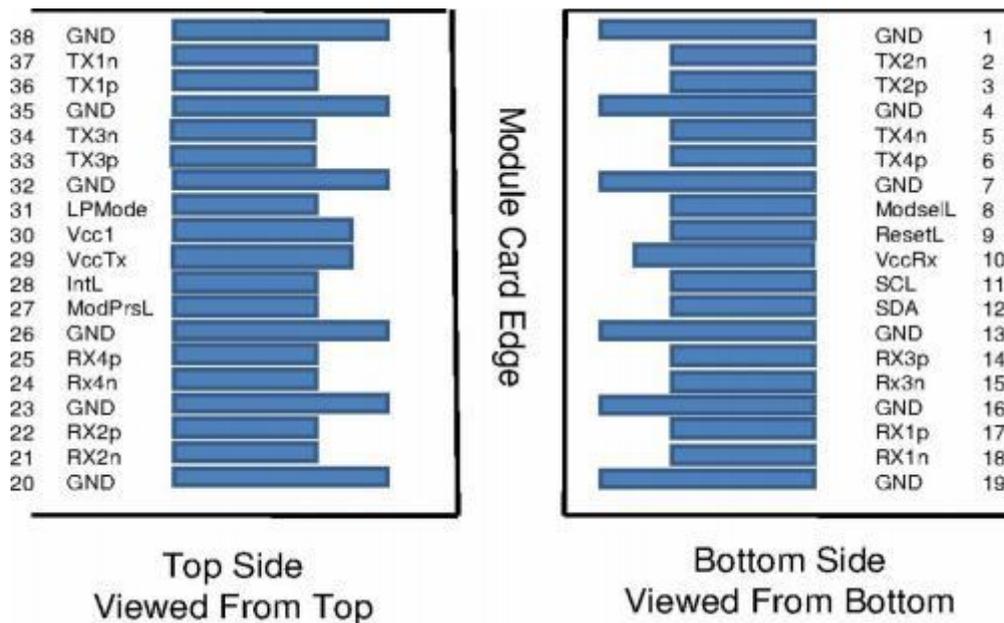
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Receiver Characteristics (T=25°C, unless noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Signaling rate, each lane (range)	GBb			25.78125		GBb
Center Wavelength	λ_0		1294.53		1296.59	nm
	λ_1		1299.02		1301.09	nm
	λ_2		1303.54		1305.63	nm
	λ_3		1308.09		1310.19	nm
Damage threshold			5.5			dBm
Average power at receiver input, each lane			-10.6		4.5	dBm
Receive power, each lane (OMA)					4.5	dBm
Return Loss	RL		-26			dB
Receiver sensitivity (OMA)	S _{OMA}	BER@10e-12			-8.6	dBm
LOS Assert	LOS _A		-24			dBm
LOS De-Assert	LOS _D				-10.8	dBm
LOS Hysteresis			0.5			dB

Pin Assignment



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Pin Description

PIN	Logic	Symbol	Name/Description	Note
1		GND	Ground	
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	
20		GND	Ground	
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	
30		Vcc1	+3.3 V Power Supply	
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	

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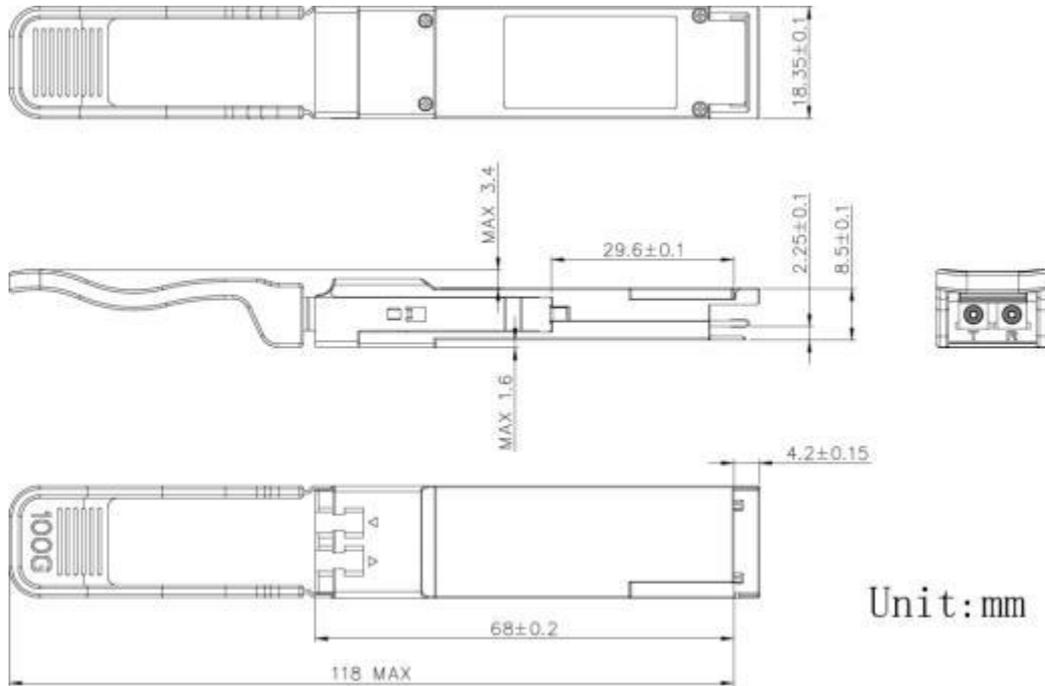
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Outline Dimensions



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Digital Diagnostic Monitor Accuracy

The following characteristics are defined over recommended operating conditions

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	deg.C
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB

Appendix A Document Revision

Version No.	Date	Description
V 1.2	2023-08-23	Whole article optimization
V 1.3	2025-02-24	Update LOS A/D Spec