

40Gb/s QSFP+ LR4 Optical Transceiver

CC-QJJCC1L-SD

Features

- Compliant with 40G Ethernet IEEE 802.3ba 40GBASE LR4 standards
- Uncooled 4x10Gb/s CWDM transmitter
- Supports Infiniband SDR, DDR and QDR
- Wide Operating Temperature(0°C~70°C)

Applications

- Data Center Backbone
- Ethernet Switches
- High-speed Servers
- High-performance Computing Clusters
- SAN, Routers, Hubs, Load Balancer

Description

This product is a transceiver module designed for 10km optical communication applications. The design is compliant to 40GBASE-LR4 of the IEEE P802.3ba standard. The module converts 4 inputs channels (ch) of 10Gb/s electrical data to 4 CWDM optical signals, and multiplexes them into a single channel for 40Gb/s optical transmission. Reversely, on the receiver side, the module optically de-multiplexes a 40Gb/s input into 4 CWDM channels signals, and converts them to 4 channel output electrical data.

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Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	$T_{Storage}$	-40	+85	°C
Relative Humidity (non-condensation)	RH	0	+85	%

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Case Temperature	T_C		0	40	70	°C
Power Supply Voltage	V_{CC}		3.135	3.3	3.465	V
Signaling Rate each Channel				10.3125		Gbps
Two Wire Serial (TWS) Interface Clock Rate			---	---	400	kHz
Power Supply Noise			---	---	50	mVpp
Supply Noise Rejection			---	---	100	mV
Receiver Differential Data Output			---	100		Ohm
Operating Distance	D		---	10	---	km

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Power Consumption					3.5	W
Supply Current	I_{CC}				1050	mA

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Signaling rate, each lane (range)	GBb			10.3125		GBb
Center Wavelength	λ_0		1264.5		1277.5	nm
	λ_1		1284.5		1297.5	nm
	λ_2		1304.5		1317.5	nm
	λ_3		1324.5		1337.5	nm
Side-mode suppression ratio	SMSR		30			dB
Total average launch power					8.3	dBm
Average launch power, each lane	Pf		-7		2.3	dBm
Optical Modulation Amplitude (OMA), each lane	TxOMA		-4		3.5	dBm

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Difference in launch power between any two lanes (OMA)					6.5	dB
Transmitter and Dispersion Penalty	TDP				2.6	dB
Launch power in OMA minus TDP, each lane	Tx-TDP		-4.8			dBm
Average launch power of OFF transmitter, each lane					-30	dBm
Extinction ratio	ER		3.5			dB
Relative Intensity Noise					-128	dB/Hz
Optical return loss tolerance					20	dB
Transmitter reflectance					-12	dB

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Signaling rate, each lane (range)	GBb			10.3125		GBb
Center Wavelength	λ_0		1264.5		1277.5	nm
	λ_1		1284.5		1297.5	nm
	λ_2		1304.5		1317.5	nm
	λ_3		1324.5		1337.5	nm
Damage threshold			3.3			dBm
Average power at receiver input, each lane			-11.5		2.3	dBm
Receive power, each lane (OMA)					3.5	dBm
Difference in receive power between any two lanes (OMA)					7.5	dBm
Receiver reflectance					-26	dB
Receiver sensitivity (OMA)	S _{OMA}	BER@10e-12			-11.5	dBm
LOS Assert	LOS _A		-28			dBm
LOS De-Assert	LOS _D				-11.5	dBm
LOS Hysteresis			0.5		6	dB

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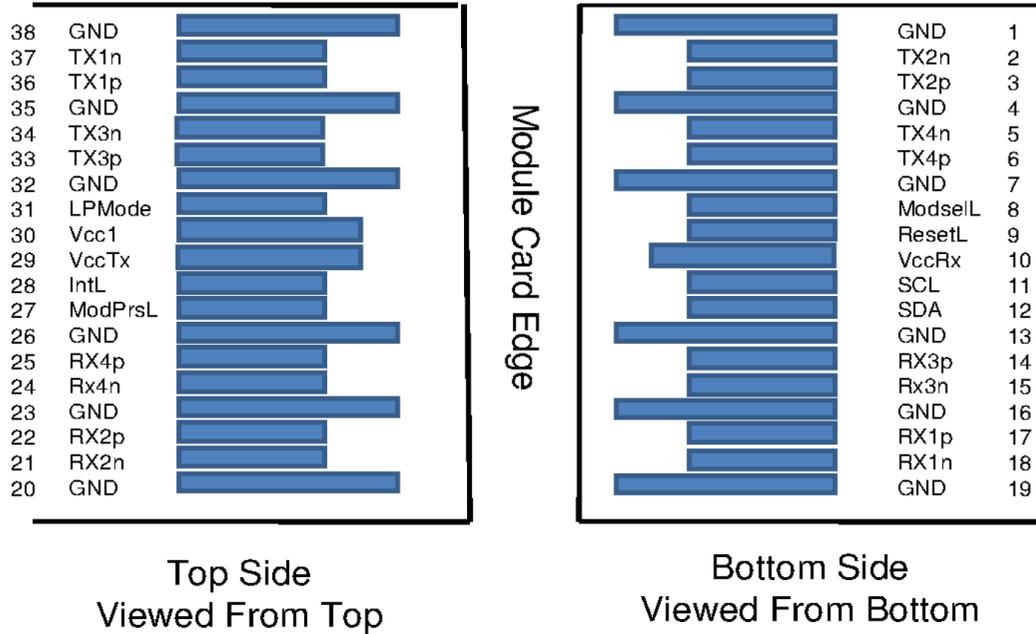
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PIN Assignment



Pin Description

PIN	Logic	Symbol	Name/Description	Notes
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	1
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
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	

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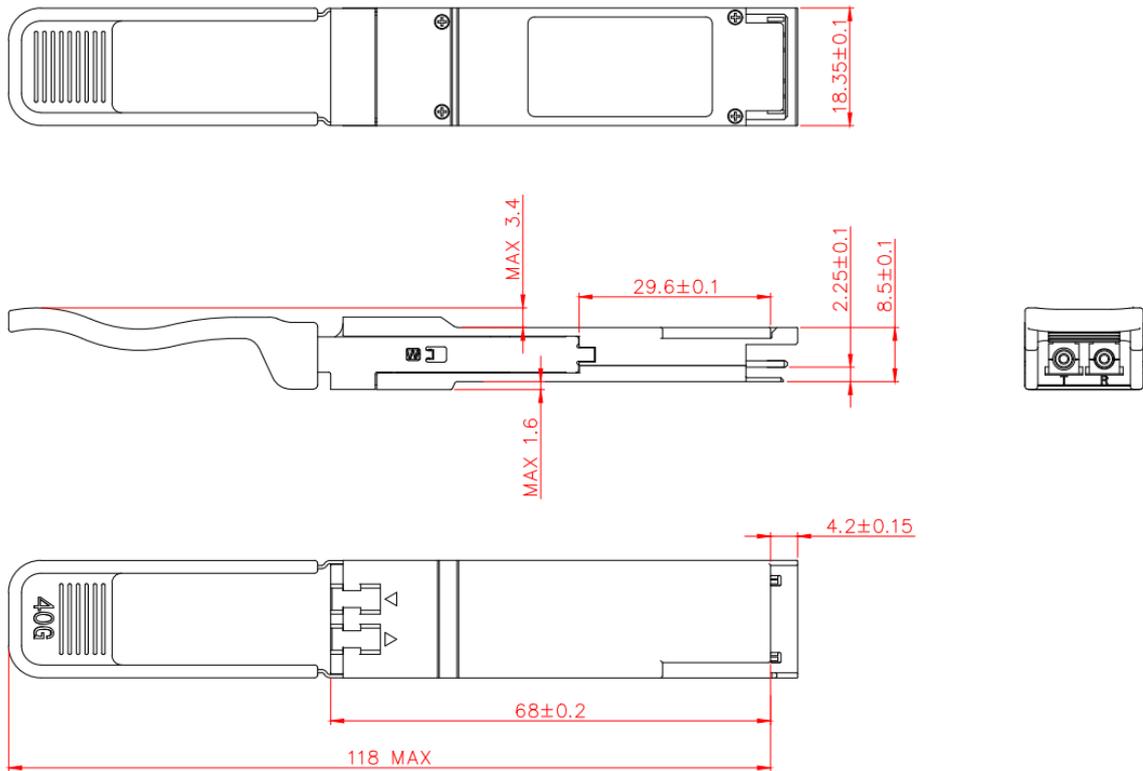
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PIN Assignment				
PIN	Logic	Symbol	Description	Notes
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	2
30		Vcc1	+3.3 V Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	1

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Outline Dimensions



Digital Diagnostic Monitor Accuracy

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

Ordering information

Part Number	Product Description
CC-QJCC1L-SD	QSFP+,40Gbps,CWDM,LC,10km,0°C ~ +70°C,With DDM

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