



# 40Gb/s QSFP+ BIDI 850/908nm Optical Transceiver

## CC-QJJ110L-SD

### Product Description

The CC-QJJ110L-SD is a QSFP+ Optical transceiver for 40Gbps interconnects. It operates from a 3.3V DC power supply. It is fabricated with a rugged die cast metal housing and cage assembly.

### Applications

- . Data Center
- . High performance computing interconnect

### Features

- . 40G Link Distances up to 70m over OM3, 100m over OM4
- . Hot Pluggable
- . Dual Wavelength VCSEL Bi-Directional Optical Interface, NRZ 2x20Gbps 850nm/908nm
- . Interface with Digital monitoring and maskable Interrupts for Expanded functionality
- . Case Operating Temperature:
  - . Range: 0 to 70°C
- . RoHS II Compliance
- . This product does not rely on any agreement, only this document prevails.
- . Operating Mode
  - . 4x10G NRZ to 2x20G NRZ

Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Units	Notes
Storage Ambient Temperature	$T_{stg}$	-40	+85	°C	Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device. RH is Non-condensing condition.
Relative Humidity - Storage	RH <sub>s</sub>	0	95	%	
Relative Humidity - Operating	RH <sub>o</sub>	0	85	%	
Module Supply Voltage	V <sub>cc</sub>	-0.5	3.6	V	



# 40Gb/s QSFP+ BIDI 850/908nm Optical Transceiver

## CC-QJJ110L-SD

Recommended Operating Conditions						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Case Operating Temperature	$T_{case}$	0	+25	+70	°C	
Module Supply Voltage	$V_{CC}$	3.135	3.3	3.465	V	
Signaling Speed Per electrical-channel(4x10G NRZ)	S	-	10.3125	-	Gb/s	
Power Consumption	P	-	-	3.5	W	

Transmitter Electrical Interfaces							
Parameter	Symbol	Min	Typ	Max	Units	Notes	
Tx_Data Differential Input Voltage	$V_{IN}$	200	-	900	mV		
Tx_Data Differential Input Impedance	$Z_{IN}$	-	100	-	$\Omega$		

Receiver Electrical Interfaces							
Parameter	Symbol	Min	Typ	Max	Units	Notes	
Rx_Data Differential Output Voltage	$V_{OUT}$	-	-	1200	mV		
Rx_Data Differential Output Impedance	$Z_{OUT}$	-	100	-	$\Omega$		

Timing requirement of control and status I/O							
Parameter	Symbol	Min	Typ	Max	Units	Notes	
Tx Squelch Deassert Time	toff_Txsq	-	-	4	s		
Rx Squelch Deassert Time	toff_Rxsq	-	-	2	s		

Electrical output specifications at TP4							
Parameter	Symbol	Min	Typ	Max	Units	Notes	
Output transition time, 20% to 80%		-	20	-	ps		



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## CC-QJJ110L-SD

Transmitter Optical Characteristics							
Parameter	Symbol	Test Point	CC-QJJ110L-SD			Units	Notes
			Min	Typ	Max		
Average Launch Power ,each lane	P <sub>OUT</sub>	TP2	-6.2	-	4	dBm	Average Optical Output
Optical modulation Amplitude , each lane	OMA	TP2	-4.2	-	3	dBm	
Optical Output with Tx OFF	P <sub>OFF</sub>	TP2	-	-	-30	dBm	
Extinction Ratio	ER	TP2	3	-	-	dB	
Center Wavelength 1	$\lambda$	TP2	840	850	868	nm	
Center Wavelength 2	$\lambda$	TP2	882	908	918	nm	
RMS Spectral Width	$\Delta\lambda$	TP2	-	-	0.65	nm	
Optical return loss tolerance	ORL	TP2	-	-	12	dB	
20.625 Gb/s Eye Mask: X1, X2, X3, Y1, Y2, Y3		TP2		{0.3, 0.38, 0.45, 0.35, 0.41, 0.5}		dB	Note1

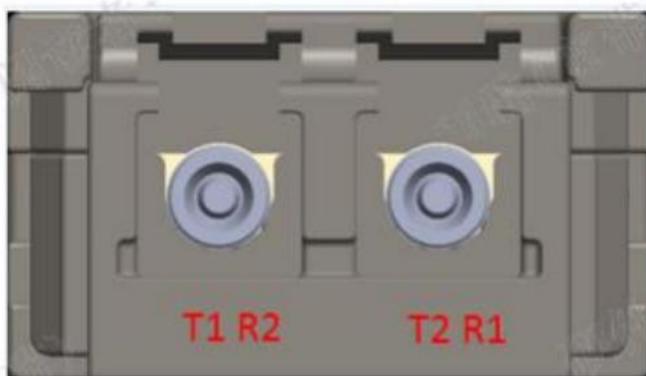
Note 1: Hit Ratio =  $1.5 \times 10^{-3}$ ; TP1 TX input electrical signal is 10.3125Gbps, pattern 2<sup>9</sup>-1.

Receiver Optical Characteristics (4x10G NRZ electrical output)							
Parameter	Symbol	Test Point	CC-QJJ110L-SD			Units	Notes
			Min	Typ	Max		
Average power at receive input, each lane	P <sub>IN</sub>	TP3	-8.2	-	4	dBm	Note1
Unstressed receiver sensitivity (OMA <sub>outer</sub> ), each lane	Sen	TP3	-	-	-7.1	dBm	Note2
Center Wavelength1	$\lambda$	TP3	840	850	868	nm	
Center Wavelength2	$\lambda$	TP3	882	908	918	nm	
Receiver Reflectance	RFL	TP3	-	-	-12	dB	
Rx_LOS of Signal - Assert	P <sub>A</sub>	TP3	-30	-	-	dBm	
Rx_LOS of Signal - Deassert	P <sub>D</sub>	TP3	-	-	-5.9	dBm	
Rx_LOS of Signal - Hysteresis	P <sub>Hy</sub>	TP3	0.5	-	-	dB	

Note 1: A received power below this value cannot be compliant; however, a value above this does not ensure compliance.  
Note 2: BER on the RX side: 1E-6.

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CC-QJJ110L-SD optical interface instruction



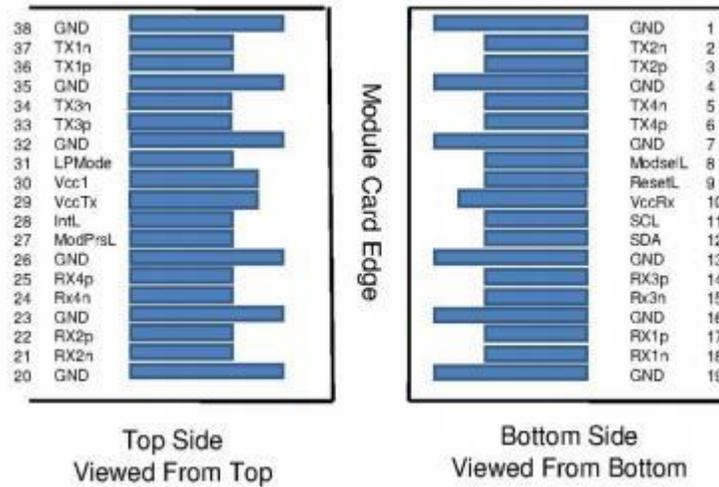
$\lambda 1$	840-868nm	T1,R1
$\lambda 2$	882-918nm	T2,R2



# 40Gb/s QSFP+ BIDI 850/908nm Optical Transceiver

## CC-QJJ110L-SD

### Pin Assignment



Pin Description			
Pin	Symbol	Description	Notes
1	GND	Ground	
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non Inverted Data Input	
4	GND	Ground	
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non Inverted Data Input	
7	GND	Ground	
8	ModselL	Module Select	
9	RetsetL	Module Reset	
10	V <sub>cc</sub> Rx	Receiver +3.3V DC Power Supply	
11	SCL	I <sup>2</sup> C Serial Clock	
12	SDA	I <sup>2</sup> C Serial Data	
13	GND	Ground	
14	Rx3p	Receiver Non Inverted Differential Output	
15	Rx3n	Receiver Inverted Differential Output	
16	GND	Ground	
17	Rx1p	Receiver Non Inverted Differential Output	
18	Rx1n	Receiver Inverted Differential Output	
19	GND	Ground	
20	GND	Ground	
21	Rx2n	Receiver Inverted Differential Output	
22	Rx2p	Receiver Non Inverted Differential Output	
23	GND	Ground	



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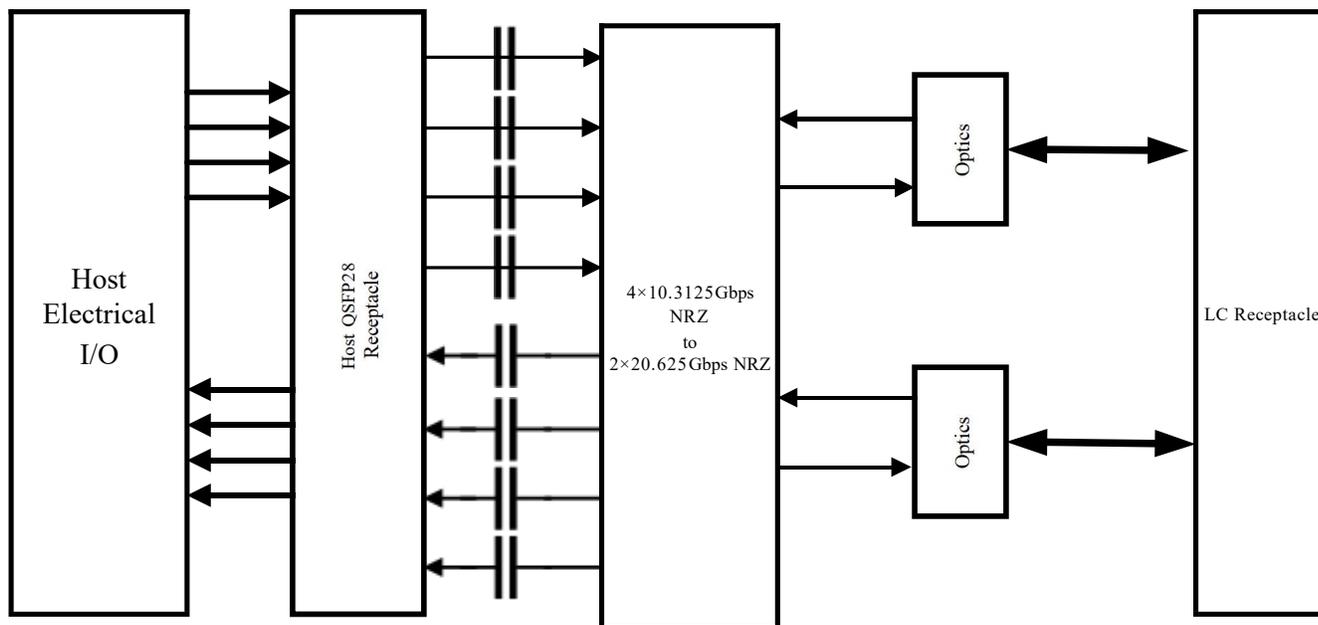
### CC-QJJ110L-SD

24	Rx4n	Receiver Inverted Differential Output	
25	Rx4p	Receiver Non Inverted Differential Output	
26	GND	Ground	
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	V <sub>CC</sub> Tx	Transmitter +3.3V DC Power Supply	
30	V <sub>CC1</sub>	+3.3V DC Power Supply	
31	LPMod	Low Power Mode	
32	GND	Ground	
33	Tx3p	Transmitter Non Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	
36	Tx1p	Transmitter Non Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	



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CC-QJJ110L-SDBlock Diagram

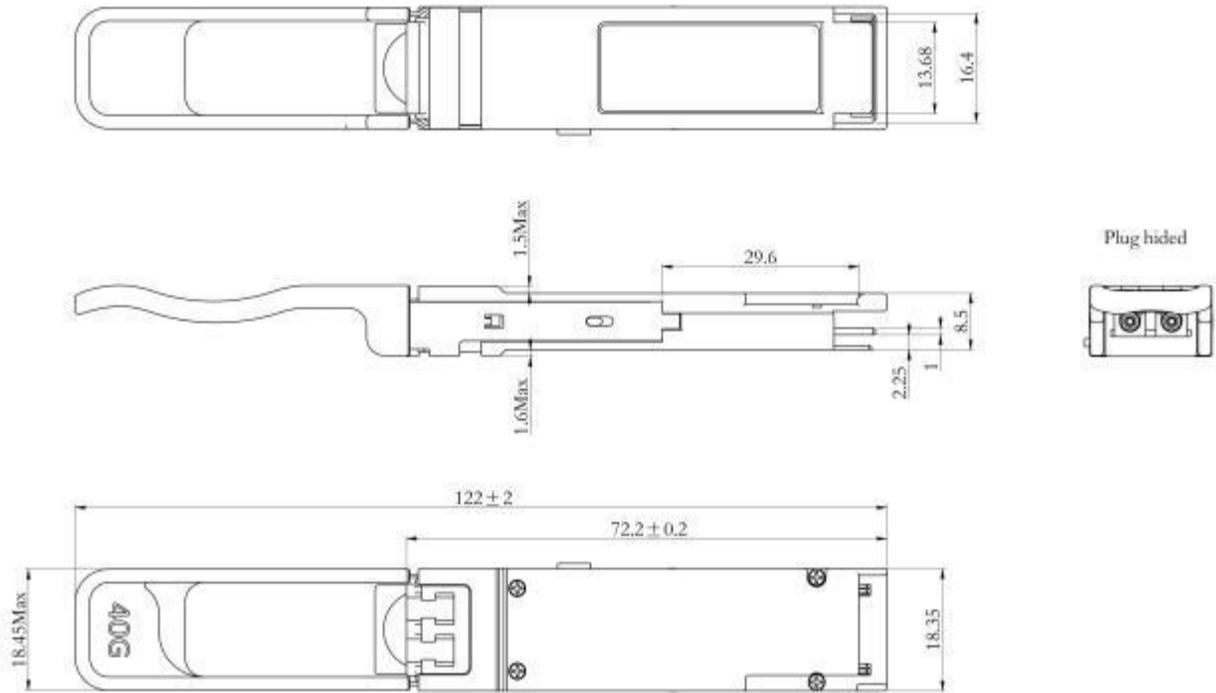




# 40Gb/s QSFP+ BIDI 850/908nm Optical Transceiver

## CC-QJJ110L-SD

### Mechanical Dimensions



#### NOTES:

- 1.TOLERANCE:  $\pm 0.1$ MM.
- 2.OTHERS ACCORDING WITH SFF-8661 MSA OR CUSTOMER SPEC.
- 3.LIGHT PORT ACCORDING WITH FIBER CONNECTOR SPEC.



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### Warnings

#### Handling Precautions:

This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

#### Laser Safety:

Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

#### Notice:

The information provided on this page contains the product target specifications which are subject to change without notice.

Check with your Ccloud Sales Office for product updates, changes in specifications, sample availability and production release dates.

#### EYE SAFETY

Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed.3., as described in Laser Notice No. 56, dated May 8, 2019.

Complies with IEC 60825-1:2014, EN 60825-1:2014+A11:2021 and IEC 60825-2: 2021, EN 60825-2:2004+A1:2007+A2:2010. Class 1 laser safety compliant.

INVISIBLE LASER RADIATION.

#### CAUTION:

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.