10Gb/s 850nm 300m SFP+ Optical Transceiver Module

CC-PII110L-xD

Features

- Hot Pluggable
- LC Duplex optical interface
- 850nm VCSEL transmitter, PIN receiver
- Operating case temperature:

  Commercial：0 to 70 °C

  Industrial:-40 to 85 °C
- Low power consumption
- Maximum link length of 300m on OM3 MMF
- All-metal housing for superior EMI performance
- Advanced firmware allow customer system encryption
- Information to be stored in transceiver
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- RoHS compliant (lead free)

Applications

- 10GBASE-SR/SW
- Other optical links

Standards

- IEEE 802.3ae 10GBASE-SR/SW
- SFF-8431, SFF-8432
- SFF-8472

Description

This 850nm SFP+ transceiver is designed to transmit and receive optical data over multimode fiber for 10G ethernet.

The module electrical interface is compliant to SFI electrical specifications. The transmitter input and receiver output impedance is 100 Ohms differential. Data lines are internally AC coupled. The module provides differential termination and reduce differential to common mode conversion for quality signal termination and low EMI.

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Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	Vcc	-0.5		4	V
Storage Temperature Range	Ts	-40		85	°C
Relative Humidity - Storage	RH_S	0		95	%
Relative Humidity - Operating	RH_O	0		85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Case Operating Temperature Range	Tc	0	-	70	°C
		-40	-	85	
Power Supply Voltage	V_{cc}	3.14	3.3	3.46	V
Supply Current	I_{cc}	-	-	250	mA
Data Rate	BR	-	10.3125	-	Gbps
Fiber Length	OM3	-		300	m

Electrical Characteristics

Transmitter Electrical Characteristics					
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**
Differential Input Voltage Swing	V_{IN}	180	-	700	mV
Tx Differential Input Impendence	Z_{IN}	-	100	-	Ω
Transmitter Disable Voltage	V_{DIS}	2.0	-	V_{CC}+0.3	V
Transmitter Enable Voltage	V_{EN}	0	-	0.8	V
T_{FAULT} Logic High	V_{TFH}	2.4	-	V_{CC}	V
T_{FAULT} Logic Low	V_{TFL}	V_{EE}	-	V_{EE}+0.4	V
Receiver Electrical Characteristics					
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**
Differential output Voltage Swing	V_{OUT}	300	-	850	mV
Rx Differential Output Impendence	Z_{OUT}	-	100	-	Ω
LOS Assert Voltage	V_{LOSA}	2.4	-	V_{CC}	V
LOS De-assert Voltage	V_{LOSD}	V_{EE}	-	V_{EE}+0.4	V

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Optical Characteristics

Transmitter Characteristics						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Laser Type			VCSEL			
Center Wavelength Range	λ	840	850	860	nm	
RMS Spectral Width	Δλ	-	-	0.45	nm	
Average Launch power of OFF transmitter	P_{OFF}	-	-	-30	dBm	
Launch Optical Power	Pout	-4.5	-	0	dBm	1
Extinction Ratio	ER	3.5	-	-	dB	
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	
Transmitter and Dispersion Penalty	TDP	-	-	3.2	dB	
Eye Diagram	Complies with IEEE802.3ae eye masks when filtered					
Receiver Characteristics						
Receiver Type			PIN			
Operating Central Wavelength	λ	840	850	860	nm	
Receiver Sensitivity (OMA)	Sen	-	-	-11.5	dBm	2
Receiver Overload	P_{SAT}	0.5	-	-	dBm	
Receiver Reflectance	RFL	-	-	-12	dB	
LOS Assert	LOSA	-30	-	-	dBm	
LOS De-Assert	LOSD	-	-	-14	dBm	
LOS Hysteresis	LOSH	0.5	3	5	dB	
Notes						
1. Average power figures are informative only, per IEEE 802.3ae.						
2. Measured with 2^{31}-1 PRBS@10.3125Gbps, BER<10^{-12}						

General Specifications

Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Notes**
Bit Rate	BR	-	10.3125	-	Gb/s	
Bit Error Ratio	BER	-	-	10^{-12}		
Fiber Type		**Operating range**				
62.5um MMF	L_{MAX}			26	m	160MHz·km
				33	m	OM1(200MHz·km)
50um MMF				66	m	400MHz·km
				82	m	OM2(500MHz·km)
				300	m	OM3(2000MHz·km)
				400	m	OM4(4700MHz·km)

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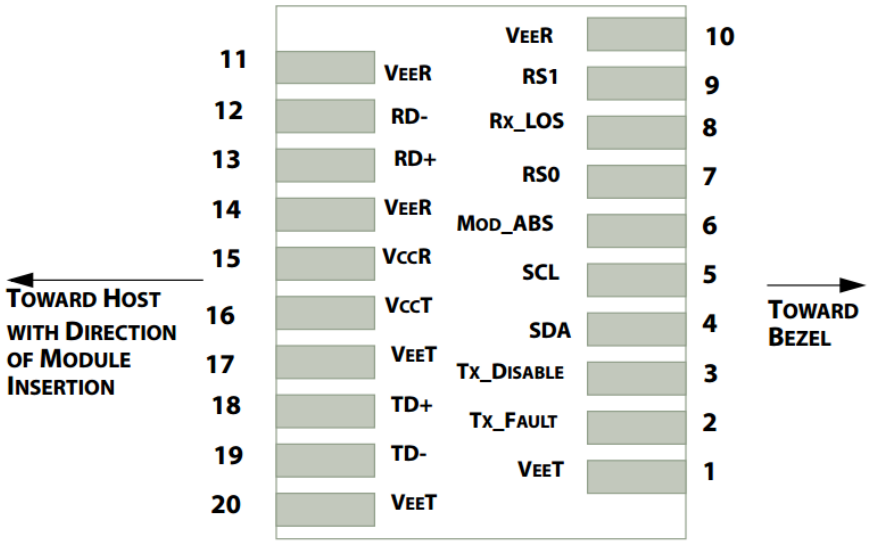
Pin Definitions



Pin	Symbol	Description	Notes
1	V_{EET}	Transmitter Ground	1
2	T_{FAULT}	Transmitter Fault	2
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open	3
4	SDA	2-wire Serial Interface Data Line	2
5	SCL	2-wire Serial Interface Clock Line	2
6	MOD_ABS	Module Absent. Grounded within the module	
7	RS0	Rate Select 0. Not Used.	4
8	RX_LOS	Loss of Signal indication. Logic 0 indicates normal operation	2
9	RS1	Rate Select 1. Not Used.	4
10	V_{EER}	Receiver Ground	1
11	V_{EER}	Receiver Ground	1
12	RD-	Receiver Inverted DATA out. AC Coupled.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled.	
14	V_{EER}	Receiver Ground	1
15	V_{CCR}	Receiver Power Supply	
16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V_{EET}	Transmitter Ground	1

Notes

1. Circuit ground is internally isolated from chassis ground.
2. Shall be pulled up with 4.7k-10k Ohms to a voltage between 3.15V and 3.6V on the host board.
3. Laser output disabled on T_{DIS} >2.0V or open, enabled on T_{DIS} <0.8V.
4. Internally pulled down per SFF-8431 Rev 4.1.

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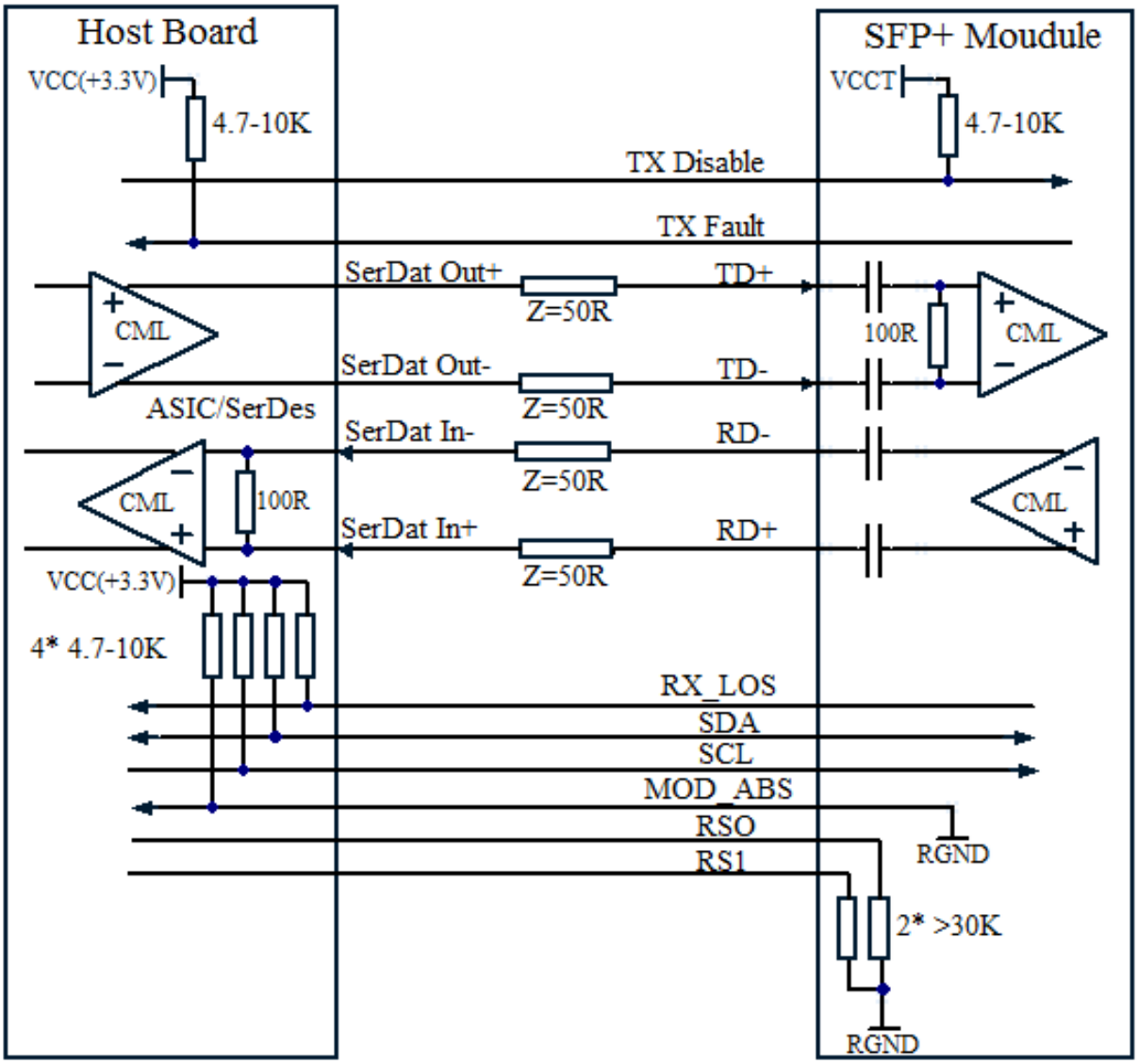
Recommended Interface Circuit



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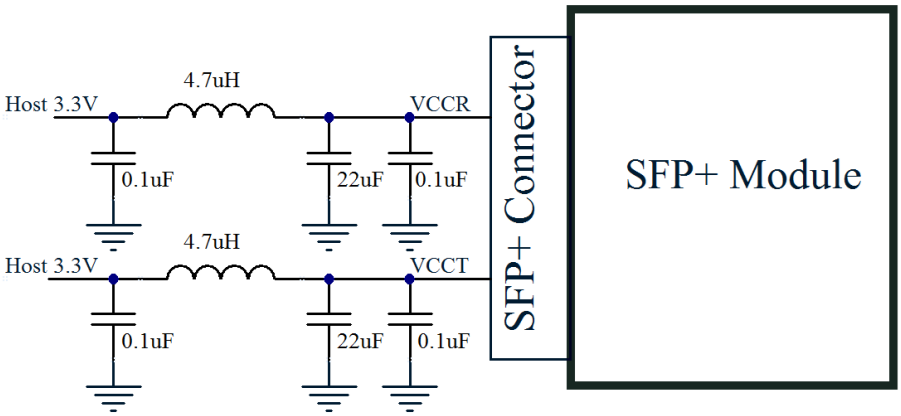
Recommended Host Board Supply Filtering Circuit

The Transceiver includes internal circuit components to filter power supply noise. Under some conditions of EMI and power supply noise, external power supply filtering may be necessary. If receiver sensitivity is found to be degraded by power supply noise, the filter network illustrated in the following figure may be used to improve performance. The values of the filter components are general recommendations and may be changed to suit a particular system environment. Shielded inductors are recommended.



Ordering information

Part Number	Product Description
CC-PII110L-ID	SFP+, 10.3125Gbps, 850nm, MM, 300m, -40ºC~+85ºC, With DDM
CC-PII110L-SD	SFP+, 10.3125Gbps, 850nm, MM, 300m, 0ºC~+70ºC, With DDM

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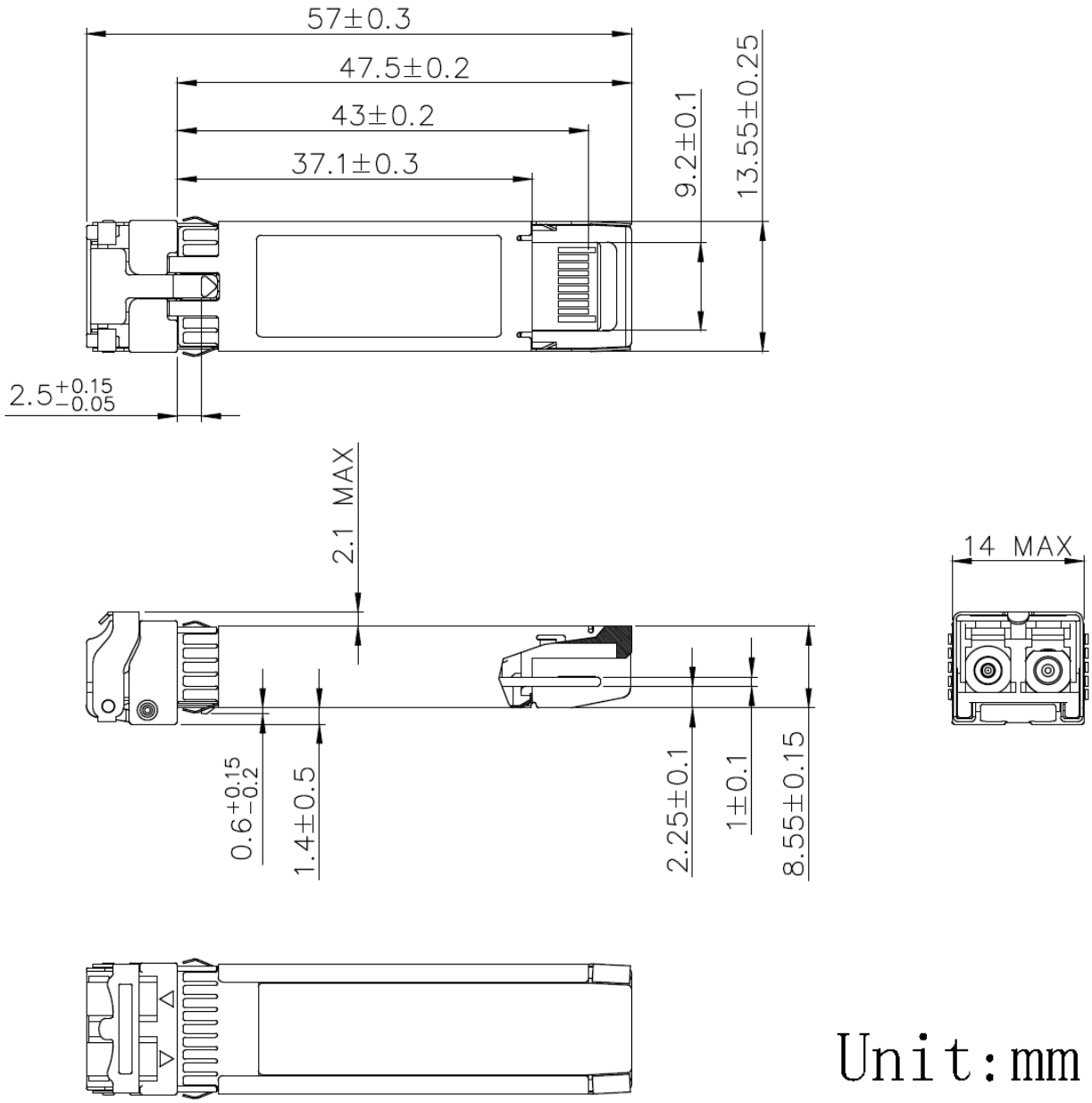
Mechanical Dimensions



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Regulatory Compliance

Ccloud's transceiver is designed to be Class 1 Laser safety compliant and is certified per the following standards.

Agency	Standard	Certificate /Comments
ISO9001	GB/T 19001-2016/ISO 9001:2015	SW21Q20855R1M
ISO14001	ISO 14001:2015	SW19E20246ROS
UL	UL 60950-1 CAN/CSA C22.2 No. 60950-1-07	20170123-E489408
TUV-MARK	IEC62368_1B	No.B 110644 0001 Rev.00
CE-EMC	EN 60825-1:2014,EN 60825-2:2004+A2:2010(LVD)	M:2018.201.N6868 AE 50372175 0001
	EN 55032: 2015 EN 55024: 2010+A1	
REACH	REACH 211	AGC 10204210401-001
FCC	FCC Rules and Regulations Part 15 Subpart B Class B	MTi190422E141C
RoHS	2011/65/EU and amendment (EU) 2015/863	68.420..21.1117.01

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ERRATA			
Date	**Rev No**	**Page**	**Description**
10 Apr 18	1.0	All	Initial Release.
13 Apr 18	1.1	All	Change to publisher version
04 Jun 19	1.2	All	Updated Logo
13 Apr 18	1.3	7	Mechanical Dimensions

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