

Product Specification Sheet

OLSBxx1XL-CD20

**RoHS Compliant 10Gb/s SFP+ Bi-Directional Transceiver, 20km Reach
1270/1330nm TX / 1330/1270 nm RX**



PRODUCT FEATURES

- Supports 9.95Gb/s to 10.3Gb/s data rates

- Simplex LC Connector Bi-Directional SFP+ Optical Transceiver
- Digital Diagnostic SFF-8472 Compliant
- Hot pluggable
- 1:1270nm DFB Laser transmitter, 1330nm receiver
2:1330nm DFB Laser transmitter, 1270nm receiver
- Up to 20km on 9/125um SMF
- Compliant with IEEE 802.3ae 10GBASE-LR and 10GBASE-LW
- SFP+ MSA SFF-8431 Compliant
- Operating case temperature: 0 to 70 °C

APPLICATIONS

- 10GBASE-LR at 10.3125Gbps
- 10GBASE-LW at 9.953Gbps
- Other optical links

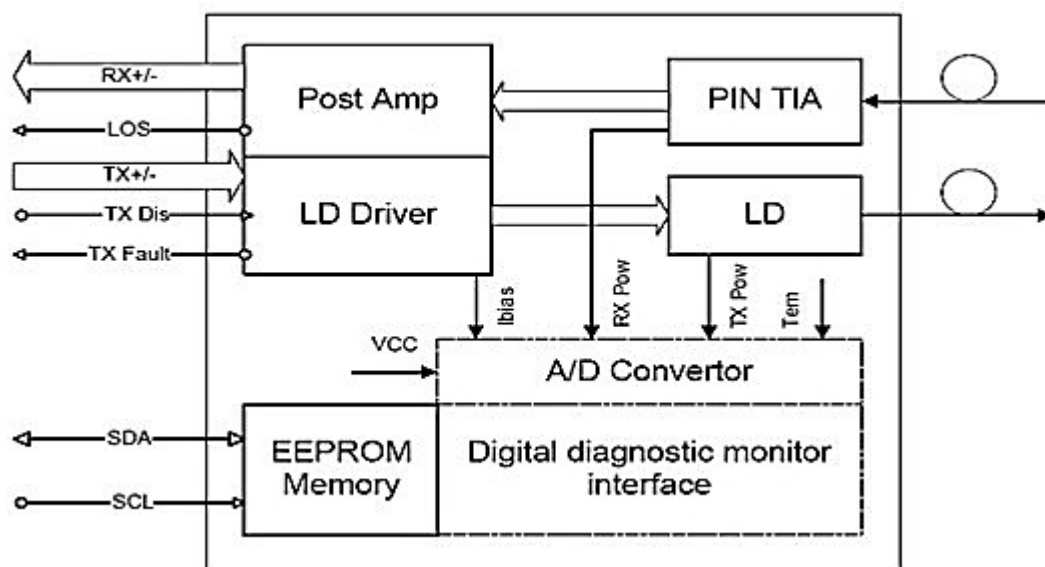
PRODUCT DESCRIPTIONS

The OLSBxx1XL-CD20 series single mode transceiver is small form factor pluggable module for duplex optical data communications such as 10GBASE-LR/LW defined by IEEE 802.3ae. It is with the SFP+ 20-pin connector to allow hot plug capability.

The OLSBxx1XL-CD20 module is designed for single mode fiber and operates at a nominal wavelength of 1270nm or 1330nm; The transmitter section uses a multiple quantum well DFB, which is class 1 laser compliant according to International Safety Standard IEC-60825.

The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

FUNCTIONAL DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the module

GERERAL OPERATING CHARACTERISTICS

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Ethernet		10.3125		Gb/s	
	Fiber Channel		10.518			
Supply Voltage	Vcc	3.13	3.3	3.47	V	
	Vcc				V	
Supply Current	Icc _s				mA	
	Icc ₃			400	mA	
Operating Case Temp.	Tc	0		70	°C	

ELECTRICAL INPUT/OUTPUT CHARACTERISTICS

● Transmitter

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Diff. input voltage swing		120		820	mVpp	1
Tx Disable input	H	VIH	2.0	Vcc+0.3	V	
	L	VIL	0	0.8		
Tx Fault output	H	VOH	2.0	Vcc+0.3	V	2
	L	VOL	0	0.8		
Input Diff. Impedance	Zin		100		Ω	

● Receiver

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Diff. output voltage swing		340	650	800	mVpp	3
Rx LOS Output	H	VOH	2.0	Vcc+0.3	V	2
	L	VOL	0	0.8		

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.

Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.

Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

OPTICAL CHARACTERISTICS

● Transmitter

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength		1260	1270	1280	nm	
		1320	1330	1340		
Ave. output power (Enabled)	Po	-3		3	dBm	1
Extinction Ratio	ER	4.5			dB	1
RMS spectral width	Δλ			1	nm	
Rise/Fall time (20%~80%)	Tr/Tf			50	ps	2
Optical modulation amplitude	OMA	-6.2			dBm	
Dispersion penalty				1	dB	
Output Optical Eye	Compliant with IEEE 0802.3ae					

● Receiver

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength		1320	1330	1340	nm	
		1260	1270	1280		
Sensitivity	Psen			-14.4	dBm	3

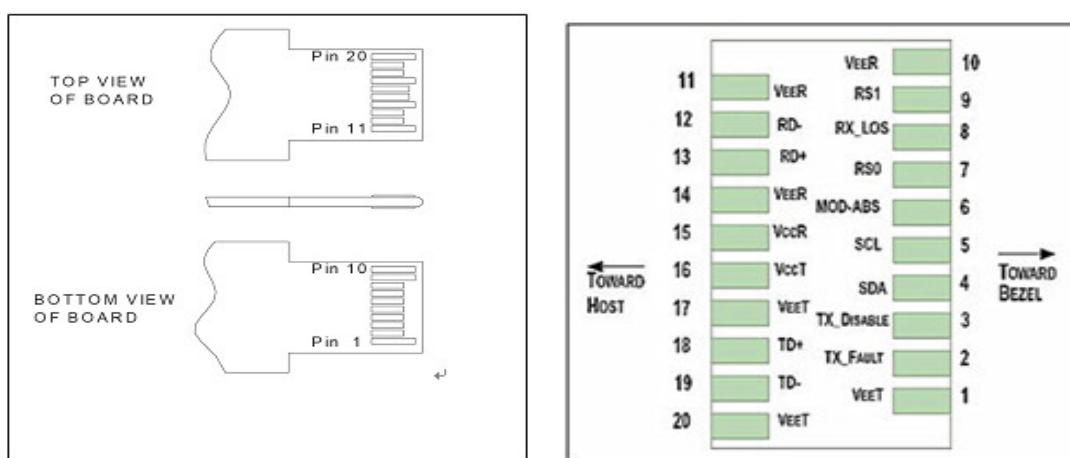
Min. overload	P _{imax}	0.5			dBm	
LOS Assert	P _a	-30			dBm	
LOS De-assert	P _d			-16	dBm	
LOS Hysteresis	P _d -P _a	0.5		4	dB	

Note 1) Measured at 10.3125b/s with PRBS 2³¹ – 1 NRZ test pattern.

Note 2) 20%~80%

Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS 2³¹ - 1 NRZ test pattern for BER < 1x10⁻¹²

PIN DEFINITIONS AND FUNCTIONS



Pin	Symbol	Name/Description
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled

14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

Notes:

[1] Module circuit ground is isolated from module chassis ground within the module.

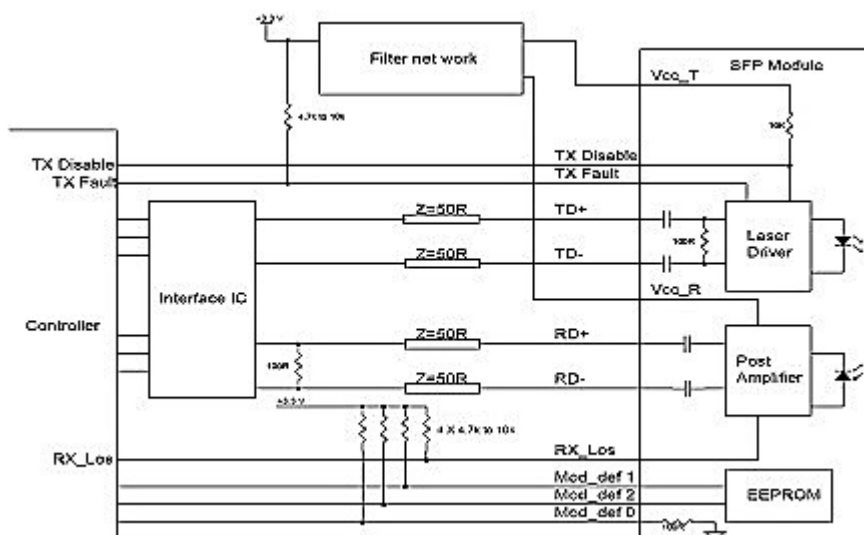
[2].should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

[3]Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VccT inside the module.

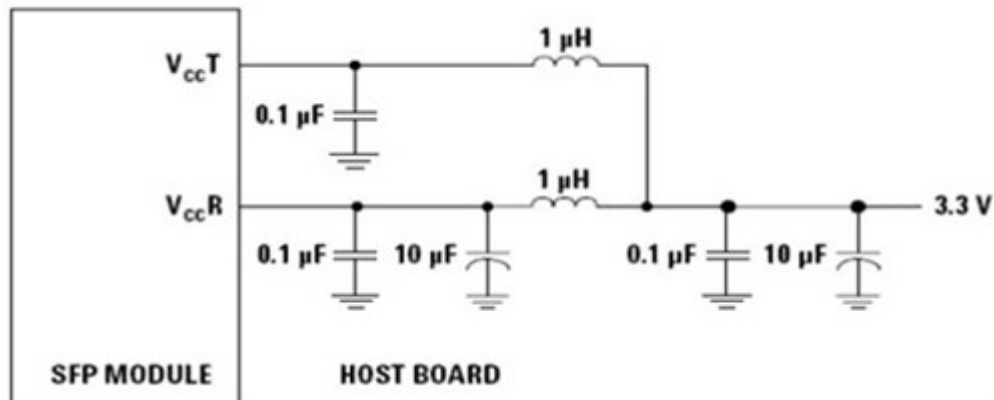
[4]Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 kΩ to 10 kΩ. Mod_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.

[5] RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.

TYPICAL INTERFACE CIRCUIT

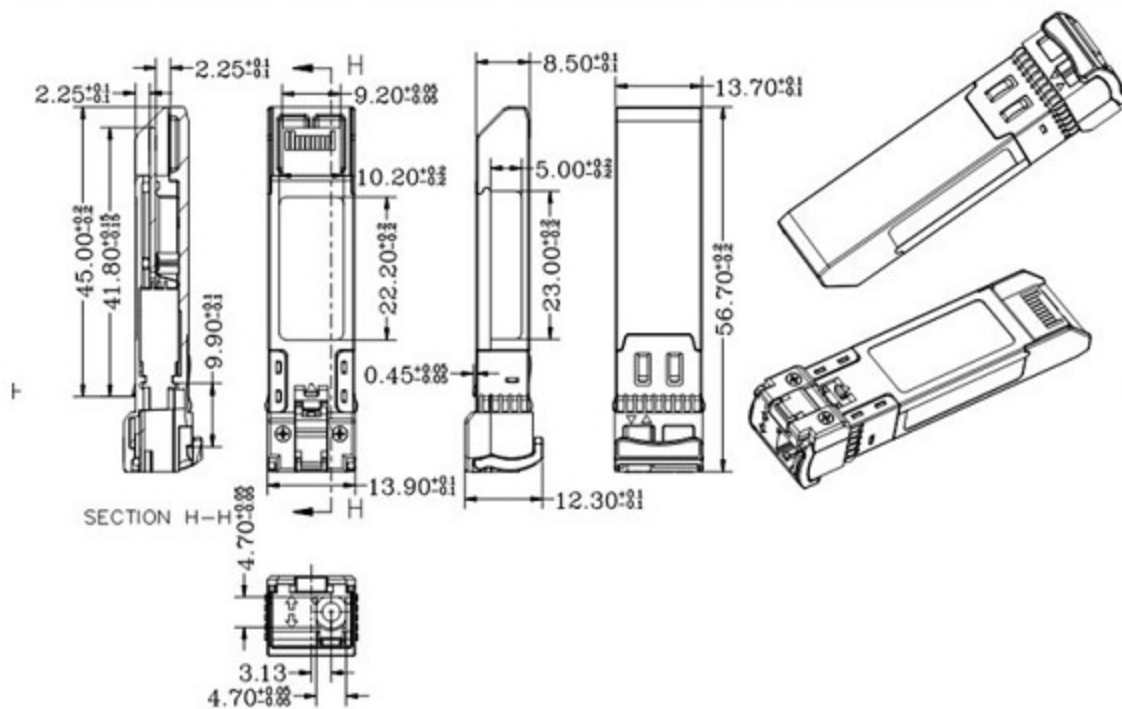


Recommended power supply filter



Note: Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value

PACKAGE DIMENSIONS



ORDERING INFORMATION

Part Number	Description
OLSB271XL-CD20	SFP+ Plus BiDi,10.3125Gbps,1270nm,20km,0~70 °C, with DDM
OLSB331XL-CD20	SFP+ Plus BiDi,10.3125Gbps,1330nm,20km,0~70°C, with DDM
	SFP+ Plus BiDi,10.3125Gbps,1330nm,20km,0~70 °C, with DDM