Product Specification Sheet

OLSP311XL-C(I)D02

RoHS Compliant 10Gb/s SFP+ 1310nm 2km Optical Transceiver



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Product Features

●Supports up to 11.3Gb/s bit rates
●Duplex LC connector
●Hot pluggable SFP+ footprint
●1310nm FP transmitter, PIN photo-detector
●Applicable for 2km SMF connection
●Low power consumption, < 1W
●Digital Diagnostic Monitor Interface
●Electrical interface compliant to SFF-8431
●Operating case temperature:
Commerical:0 to 70 °C
Industrial:-40 to 85 °C

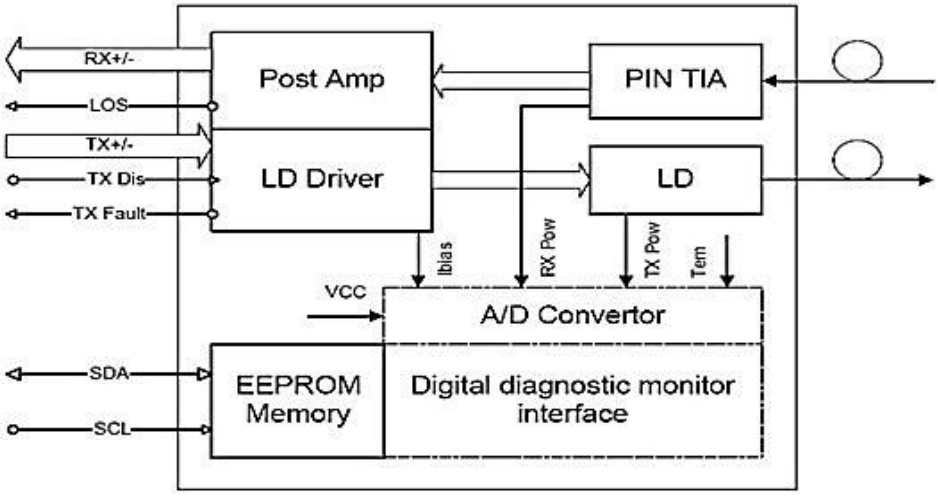
Applications

● 10GBASE-LR at 10.31Gbps
● 10GBASE-LW at 9.95Gbps
● 2.457 Gb/s CPRI
●3.072 Gb/s CPRI/LTE
● 4.915 Gb/s CPRI/LTE
● 6.144 Gb/s CPRI/OBSAI/LTE
● 9.8304 Gb/s CPRI/LTE
●Other optical links

Product Descriptions

Olinkphotonics' OLSP311XL-C(I)D02 are designed for use in Wireless basestation links up to 2 km at up to 11.3 Gb/s data rates for CPRI, OBSAI, LTE, or other Wireless applications. They are compliant with SFF-8431 , SFF-8432, SFF-8472, CPRI, and OBSAI.

. Functional Diagram



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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature	Ts	-40	85	℃	
Relative Humidity	RH	0	85	%	

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

General Operating Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate		2.457	10.3125	11.3	Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc_s			300	mA	
Operating Case Temp.	Tc	0		70	℃	
	TI	-40		85		

Electrical Characteristics ($T_{OP(C)}$ = 0 to 70 ℃, $T_{OP(I)}$ =-40 to 85 ℃, V_{CC} = 3.13 to 3.47 V)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Differential data input swing	VIN_{PP}	150		1200	mV_{pp}	1
Transmit Disable Voltage	V_D	2		Vcc	V	
Transmit Enable Voltage	V_{EN}	Vee		Vee+0.8		
Input differential impedance	Rin		100		Ω	
Receiver						
Differential data output swing	Vout,pp	350		700	mV_{pp}	2
Output rise time and fall time	Tr, Tf	28			Ps	3
LOS asserted	V_{LOS_F}	2		Vcc	V	4
LOS de-asserted	V_{LOS_N}	Vee		Vee+0.8	V	4

Note:

1. Connected directly to TX data input pins. AC coupling from pins into laser driver IC.
2. Into 100Ω differential termination.
3. 20 – 80%. Measured with Module Compliance Test Board and OMA test pattern. Use of four 1's and four 0's sequence in the PRBS 9 is an acceptable alternative.
4. LOS is an open collector output. Should be pulled up with 4.7kΩ – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1.

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Optical Characteristics ($T_{OP(C)}$ = 0 to 70 ℃, $T_{OP(I)}$ =-40 to 85 ℃, V_{CC} = 3.13 to 3.47 V)

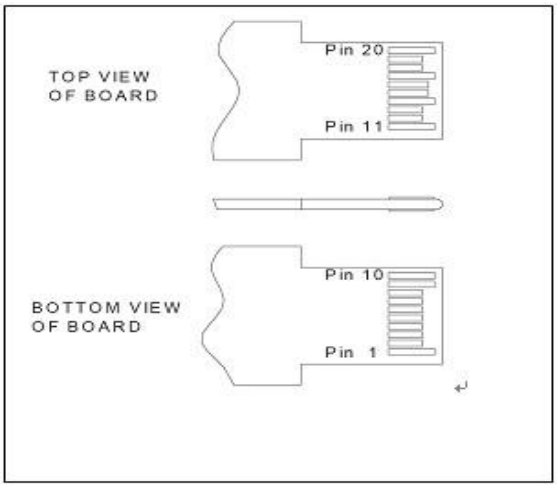
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λ	1260	1310	1355	nm	
Ave. output power (Enabled)	PAVE	-6		-1	dBm	1
Extinction Ratio	ER	3.0	4.5		dB	
Ave. Launch power of TX OFF	POFF			-30	dBm	
Dispersion penalty	TDP			3.2	dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Output Optical Eye	Compliant with IEEE 0802.3ae					
Receiver						
Operating Wavelength		1260		1610	nm	
Receiver Sensitivity	PSEN1			-14.4	dBm	2
Overload	PAVE			0.5	dBm	
Receiver Reflectance	Rrx			-12	dB	
LOS Assert	Pa	-30			dBm	
LOS De-assert	Pd			-18	dBm	
LOS Hysteresis	Pd-Pa	0.5			dB	

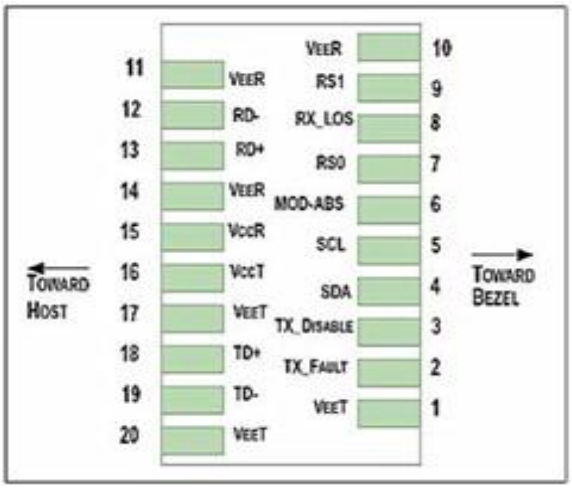
Notes:

1. Average power figures are informative only, per IEEE 802.3ae.

2.Measured at the BER less than 1E-12, back to back. The measure pattern is PRBS 2^{31-1} with worst ER=4.5@ 10.3125Gb/s.

Pin Defintion 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 3.15Vand 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 to10 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.

Serial Interface for ID and Digital Diagnostic Monitor

The OLSP311XL-C(I)D02 transceiver support the 2-wire serial communication protocol as defined in the SFP+ MSA. The standard SFP+ serial ID provides access to identification information that describes the transceiver’s capabilities, standard interfaces, manufacturer, and other information. Additionally, This SFP+ transceivers provide an enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

The SFP MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X(A0h), so the originally monitoring interface makes use of the 8 bit address(A2h), so the originally defined serial ID memory map remains unchanged. The structure of the memory map is shown in Table1.

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2 wire address 1010000X (**A0h**)	
Address	**Information**
0~95	Serial ID Defined by SFP MSA (96 bytes)
96~127	Vendor Specific (32 bytes)
128~255	Reserved,SFF8079 (128 bytes)

2 wire address 1010001X (**A2h**)	
Address	**Information**
0~55	Alarm and Warning Thresholds (56 bytes)
56~95	Calibration Constants (40 bytes)
96~119	Real Time Diagnostic Interface (24 bytes)
120~127	Vender Specific (8 bytes)
128~247	User Writable EEPROM (120 bytes)
248~255	Vender Specific (8 bytes)

Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)

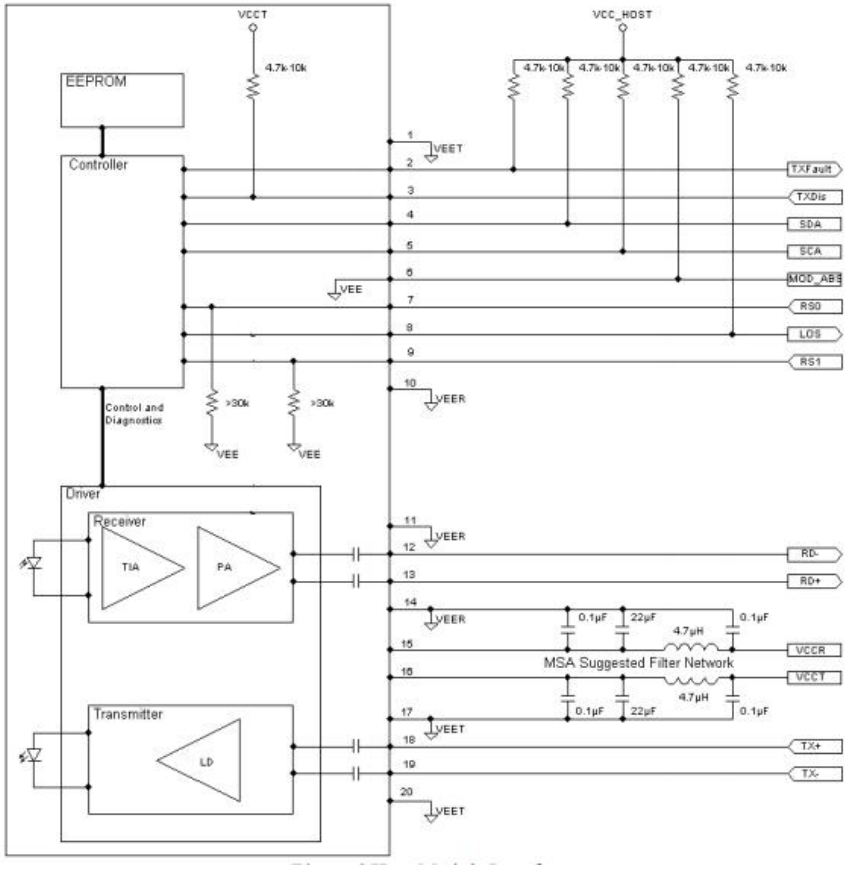
Digital Diagnostic Specifications

The OLSP311XL-C(I)D02 transceivers can be used in host systems that require either internally or externally calibrated digital diagnostics.

Parameter	Symbol	Units	Min.	Max.	Accuracy	Note
Transceiver temperature	D_{Temp-E}	ºC	-45	+90	±5ºC	1,2
Transceiver supply voltage	$D_{Voltage}$	V	2.8	4.0	±3%	
Transmitter bias current	D_{Bias}	mA	2	80	±10%	3
Transmitter output power	$D_{Tx-Power}$	dBm	-8	+1	±2dB	
Receiver average input power	$D_{Rx-Power}$	dBm	-16	0	±2dB	

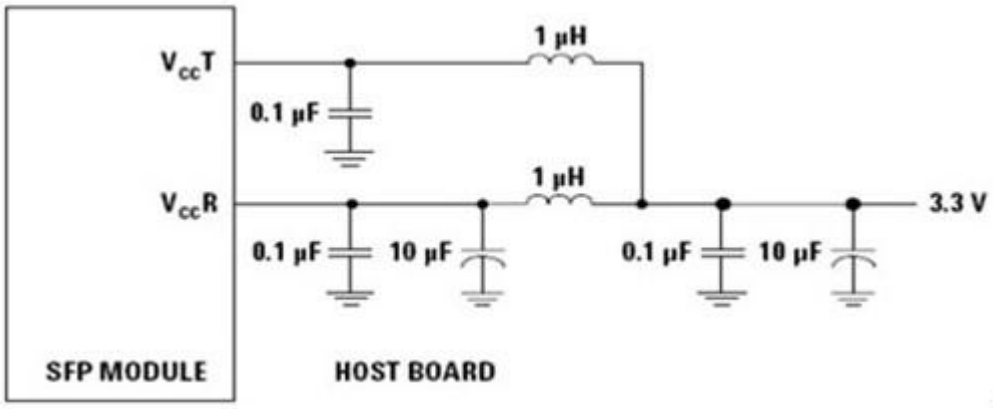
Notes:
1.When Operating temp.=0~70 ºC,the range will be min=-5,Max=+75
2. Internally measured
3. The accuracy of the Tx bias current is 10% of the actual current from the laser driver to the laser

Typical Interface Circuit



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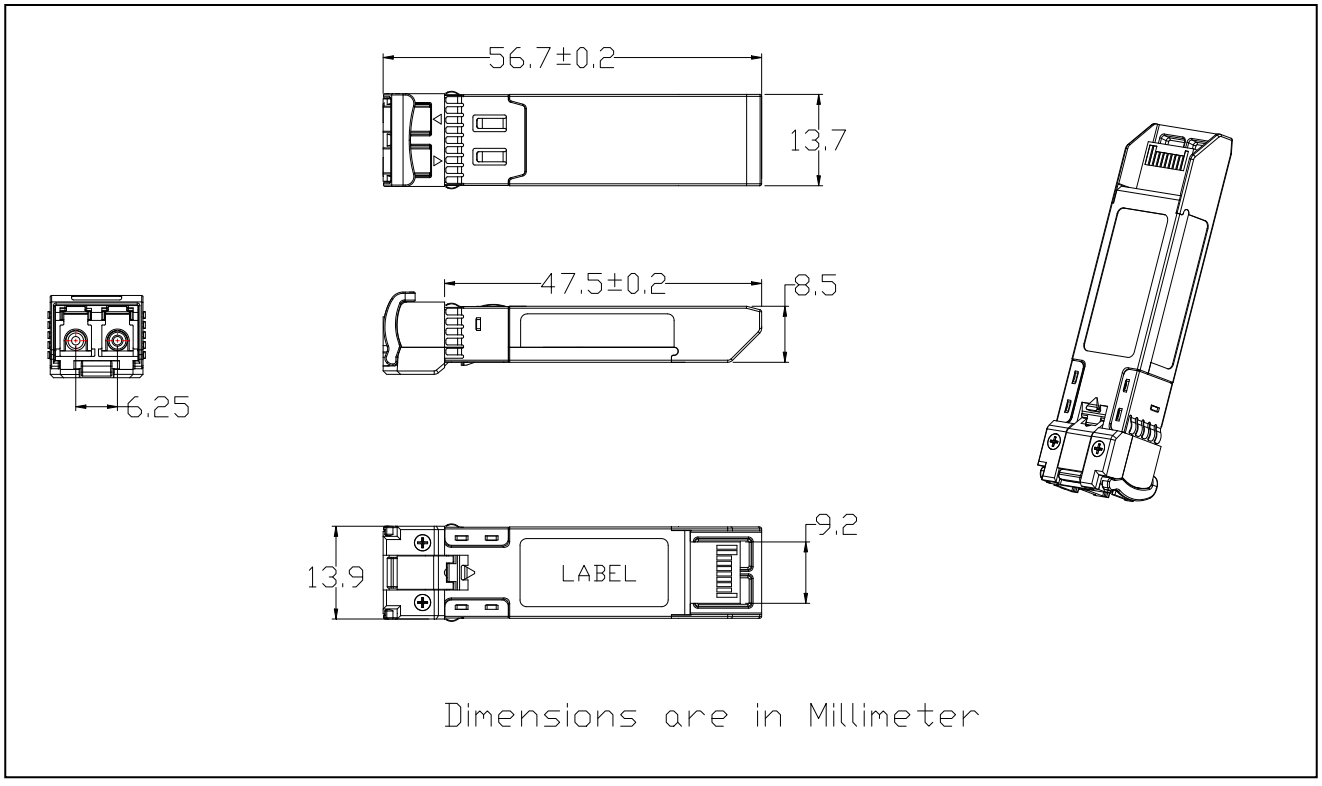
Recommended power supply filter



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
OLSP311XL-CD02	SFP+, up to Gb/s, 1310nm, 2km, 0~70℃, with Digital Diagnostic Monitor
OLSP311XL-ID02	SFP+, up to Gb/s, 1310nm, 2km, -40~85℃, with Digital Diagnostic Monitor

For More Information

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