

## Product Specification Sheet

### OLSP5501L-CDH3

RoHS Compliant 155Mbps 1550nm 120KM Reach SFP Optical Transceiver



### Product Features

- Up to 155Mbps data rate operation
- DFB 1550nm wavelengths laser and PIN photo detector for 120km transmission
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- RoHS compliant
- Case operating temperature Commercial: 0°C to +70°C

### Applications

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

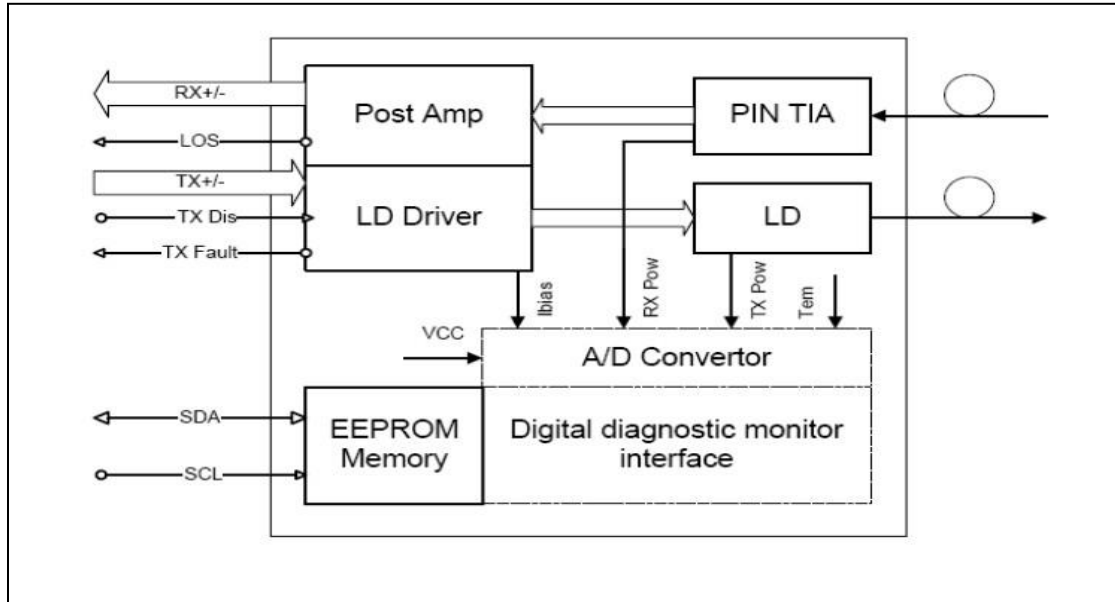
### Description

The SFP transceivers are high performance, cost effective modules supporting data-rate of 155Mbps and 120km transmission distance with SMF.

The transceiver consists of three sections: a DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements.

The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

### Functional Diagram



### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max	Unit	Notes
Supply Voltage	Vcc	-0.5	3.60	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	85	%	

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

### General Operating Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Rate			155		Mb/s	
Supply Voltage	Vcc	3.1	3.3	3.47	V	
Supply Current	Icc			280	mA	
Operating Case Temperature	Tc	0		70	°C	

### Electrical Input/Output Characteristics

#### • Transmitter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff. Input Voltage Swing		300		1860	mVpp	1
Tx Disable Input	H	$V_{IH}$	2.0	$V_{CC}+0.3$	V	
	L	$V_{IL}$	0	0.8		
Tx Fault Output	H	$V_{OH}$	2.0	$V_{CC}+0.3$	V	2
	L	$V_{OL}$	0	0.8		
Input Diff. Impedance	$Z_{in}$		100		$\Omega$	

#### • Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff. Output Voltage Swing		370		1800	mVpp	3
Rx LOS Output	H	$V_{OH}$	2.0	$V_{CC}+0.3$	V	2
	L	$V_{OL}$	0	0.8		

Note 1) TD+/- are internally AC coupled with 100 $\Omega$  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 10k $\Omega$  resistors on the host board. Pull up voltage between 2.0V and  $V_{CC}+0.3V$ .

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

### Optical Characteristics

#### • Transmitter

Parameter	Symbol	Min.	Type	Max.	Unit	Notes
Ave. Output Power (Enable)	$P_o$	1		+6	dBm	1
Extinction Ratio	ER	10			dB	2
Side mode Suppression Ratio	SMSR	30			dB	
Rise/Fall Time (20%-80%)	Tr-Tf			2.5	ns	
Wavelength Range		1530	1550	1570	nm	
Spectral Width (RMS)				4	nm	
Output Optical Eye	ITU G.957 Compliant					

### • Receiver

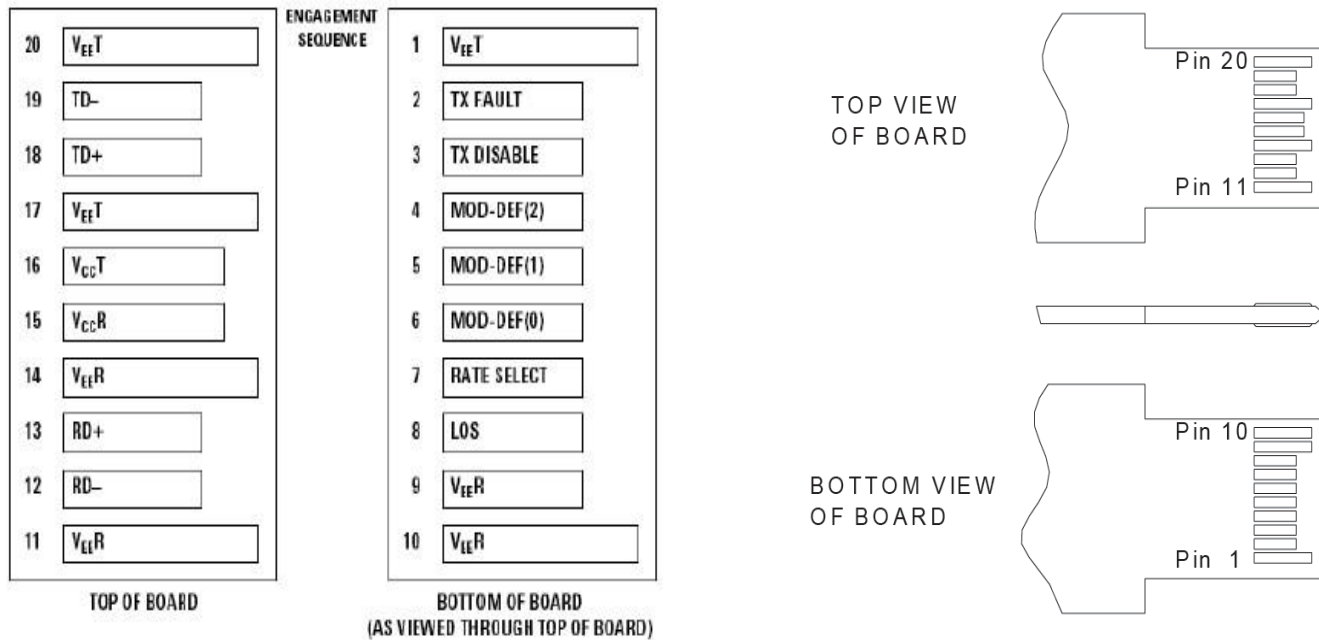
Parameter	Symbol	Min.	Type	Max.	Unit	Notes
Operating Wavelength		1270		1610	nm	
Sensitivity	P <sub>imin</sub>			-38	dBm	3
Min. Overload	P <sub>imax</sub>	-9			dBm	3
Optical Path Penalty				1	dB	
LOS Assert	Pa	-45			dBm	
LOS De-assert	Pd			-39	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measured at 155 Mb/s with PRBS 2<sup>23</sup> - 1 NRZ test pattern.

Note 2) Unfiltered, measured with a PRBS 2<sup>23</sup>-1 test pattern @155Mbps

Note 3) Measured at 155 Mb/s with PRBS 2<sup>23</sup> - 1 NRZ test pattern for BER < 1x10<sup>-10</sup>

### Pin Definitions and Functions





should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board

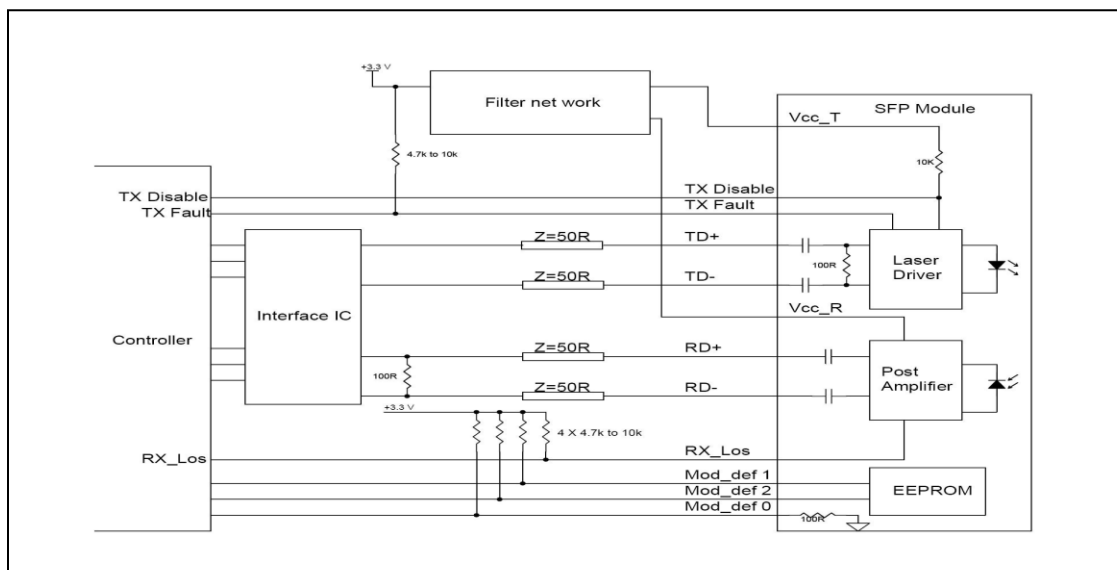
Note 6) TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

## Diagnostics

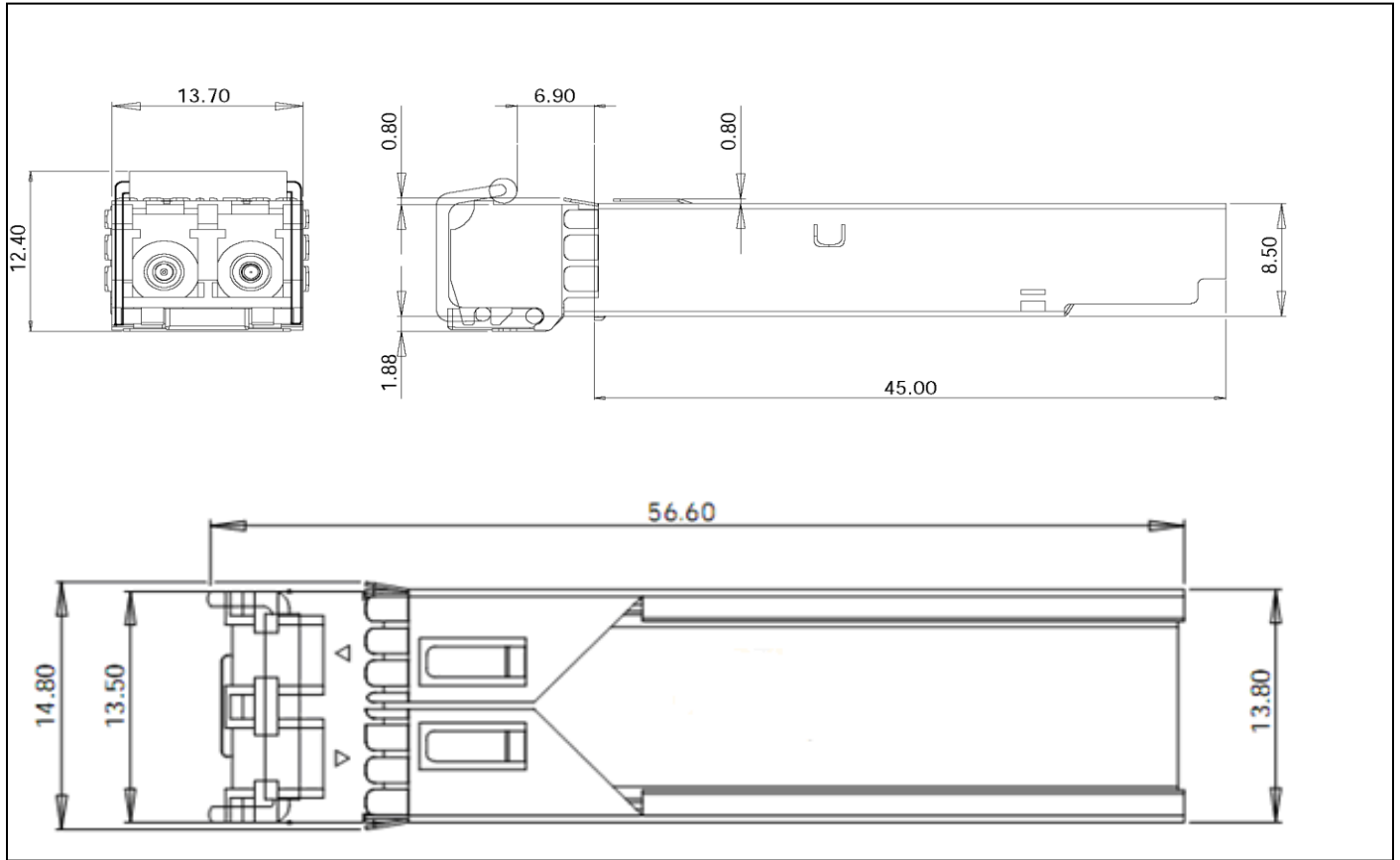
### Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70 -40 to +85	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	6 to -1	dBm	±3dB	Internal/ External
RX Power	-41 to 0	dBm	±3dB	Internal/ External

## Typical Interface Circuit



### Package Dimensions



### Ordering Information & Related Products

OLSP5501L-CDH3

Dual Fiber SFP, 155Mbps, 1550nm, 120KM, with DDM



