

Product Features

- Electrical interface specifications per SFF-8431
- Management interface specifications per SFF-8431 and SFF-8472
- SFP+ MSA package with duplex LC connector
- CWDM EML Transmitter
- Up to 14.025Gb/s bi-directional data links
- Build-in dual CDR at 14.025CDR and Bypass at 4.25Gb/s and 8.5Gb/s
- 100GHz ITU Grid, C-Band
- Single +3.3V power supply
- Class 1 laser safety certified
- Commercial operating temperature:0°C to +70°C
- Up to 20km on 9/125µm SMF
- RoHS Compliant



Applications

- Tri Rate 4.25 / 8.5 / 14.025 Gb/s Fibre Channel through Rate

Descriptions

LX581xCDH SFP+ transceivers, according to 16 Gigabit Small Form Factor Pluggable “SFP+” Multi-Sourcing Agreement (MSA) SFF-8431 Rev. 3.0 and SFF-8472 Rev. 11.0, are designed for use in Fibre Channel links up to 14.025Gb/s data rate and up to 20km link length. They are compatible with FC-PI-5 Rev. 6.10.

LX581xCDH are compliant with RoHS.

Ordering Information

Table 1. Ordering Information

Part Number	Transmitter	Output Power	Receiver	Sensitivity	Reach	Temp	DDM	RoHS
LX5811CDH	1471nm EML	-1~ +3dBm	PIN	< -14dBm	20km	0 ~ 70 °C	Available	Compliant
LX5812CDH	1491nm EML	-1~ +3dBm	PIN	< -14dBm	20km	0 ~ 70 °C	Available	Compliant
LX5813CDH	1511nm EML	-1~ +3dBm	PIN	< -14dBm	20km	0 ~ 70 °C	Available	Compliant
LX5814CDH	1531nm EML	-1~ +3dBm	PIN	< -14dBm	20km	0 ~ 70 °C	Available	Compliant
LX5815CDH	1551nm EML	-1~ +3dBm	PIN	< -14dBm	20km	0 ~ 70 °C	Available	Compliant
LX5816CDH	1571nm EML	-1~ +3dBm	PIN	< -14dBm	20km	0 ~ 70 °C	Available	Compliant
LX5817CDH	1591nm EML	-1~ +3dBm	PIN	< -14dBm	20km	0 ~ 70 °C	Available	Compliant
LX5818CDH	1611nm EML	-1~ +3dBm	PIN	< -14dBm	20km	0 ~ 70 °C	Available	Compliant

Pin Description

Table 2. Pin Description

Pin	Name	Function/Description	Notes
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault (LVTTTL-O) - High indicates a fault condition	2
3	TX_Disable	Transmitter Disable (LVTTTL-I) – High or open disables the transmitter	3
4	SDA	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	4
5	SCL	Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)	4
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	5
7	RS0	Rate Select 0 – Not used, Presents high input impedance	-
8	RX_LOS	Receiver Loss of Signal (LVTTTL-O)	2
9	RS1	Rate Select 1 – Not used, Presents high input impedance	-
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O)	-
13	RD+	Received Data out (CML-O)	-
14	VeeR	Receiver Ground	-
15	VccR	Receiver Power - +3.3V	-
16	VccT	Transmitter Power - +3.3 V	-
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Data In (CML-I)	-
19	TD-	Inverse Transmitter Data In (CML-I)	-
20	VeeT	Transmitter Ground	1

Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7K Ω to 10K Ω pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7K Ω to 10K Ω pull-up resistor to VccT.
4. Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that on the host board requires a 4.7K Ω to 10K Ω pull-up resistor to VccHost.

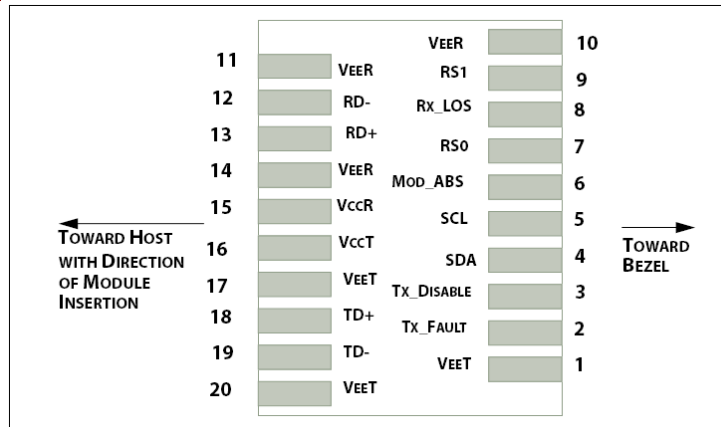


Figure 1. Host PCB SFP+ pad assignment top view

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Table 3. Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T _s	-40	85	°C
Relative Humidity	RH	5	95	%
Supply Voltage	V _{cc}	-0.5	4.0	V

Recommended Operating Conditions

Table 4. Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _c	0	25	70	°C
Supply Voltage	V _{cc}	3.135	3.3	3.465	V
Data Rate	-	-	4.25/8.5/14.025	-	Gb/s

Transceiver Electrical Characteristics

Table 5. Transceiver Electrical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Module Supply Current	I _{cc}	-	-	545	mA	-
Power Dissipation	P _D	-	-	1800	mW	-

Transmitter							
Input Differential Impedance		Z_{IN}	-	100	-	Ω	-
Differential Data Input Swing		$V_{IN, P-P}$	180	-	700	mV _{P-P}	-
TX_FAULT	Transmitter Fault	V_{OH}	2.0	-	V_{CCHOST}	V	-
	Normal Operation	V_{OL}	0	-	0.8	V	-
TX_DISABLE	Transmitter Disable	V_{IH}	2.0	-	V_{CCHOST}	V	-
	Transmitter Enable	V_{IL}	0	-	0.8	V	-
Receiver							
Output Differential Impedance		Z_O	-	100	-	Ω	-
Differential Data Output Swing		$V_{OUT, P-P}$	300	-	850	mV _{P-P}	1
Data Output Rise Time, Fall Time		t_r, t_f	28	-	-	ps	2
RX_LOS	Loss of signal (LOS)	V_{OH}	2.0	-	V_{CCHOST}	V	3
	Normal Operation	V_{OL}	0	-	0.8	V	3

Notes:

- Internally AC coupled, but requires a external 100 Ω differential load termination.
- 20–80%.
- LOS is an open collector output. Should be pulled up with 4.7K Ω on the host board.

Transmitter Optical Characteristics

Table 6. Transmitter Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power	P_o	-1	-	+3.0	dBm	1
Center Wavelength Range	λ_c	1464.5	-	1617.5	nm	-
Center Wavelength Tolerance	$\Delta\lambda_c$	-6.5	-	6.5	nm	-
Extinction Ratio	EX	6	-	-	dB	2
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Transmitter and Dispersion Penalty	TDP	-	-	4.0	dB	-
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	-
Optical Return Loss Tolerance	ORLT	-	-	21	dB	-
Pout @TX-Disable Asserted	P_{off}	-	-	-30	dBm	1

Notes:

- The optical power is launched into 9/125 μ m SMF.
- Measured with a PRBS 2³¹-1 test pattern @14.025Gbps.

Receiver Optical Characteristics

Table 7. Receiver Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Center Wavelength	λ_c	1460	-	1620	nm	-
Receiver Sensitivity (P_{avg})	S	-	-	-14	dBm	1
Receiver Overload (P_{avg})	P_{OL}	-1.0	-	-	dBm	1
Optical Return Loss	ORL	26	-	-	dB	-
LOS De-Assert	LOS_D	-	-	-15	dBm	-
LOS Assert	LOS_A	-35	-	-	dBm	-
LOS Hysteresis	-	0.5	-	-	dB	-

Notes:

1. Measured with PRBS $2^{31}-1$ test pattern, 14.025Gb/s, BER < 10^{-12} .
2. Comply with IEEE 802.3-2005.

Recommended Host Board Power Supply Filter Network

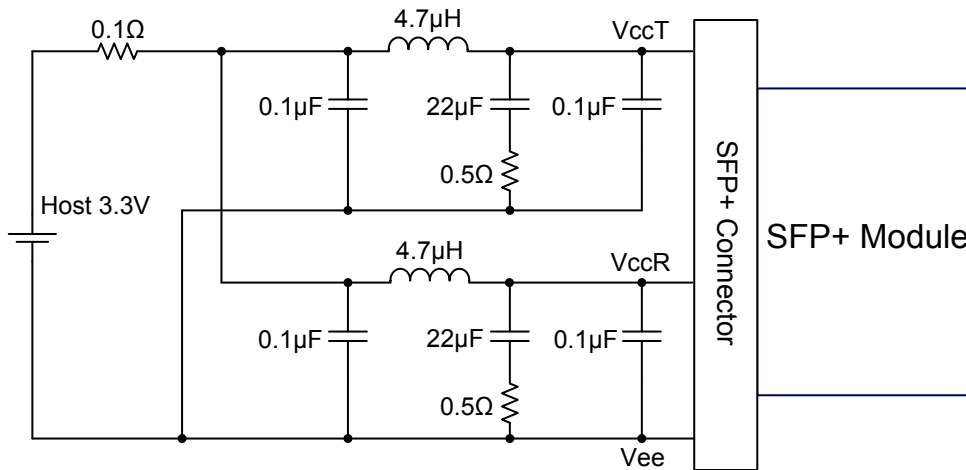


Figure 2. Recommended Host Board Power Supply Filter Network

Recommended Application Interface Block Diagram

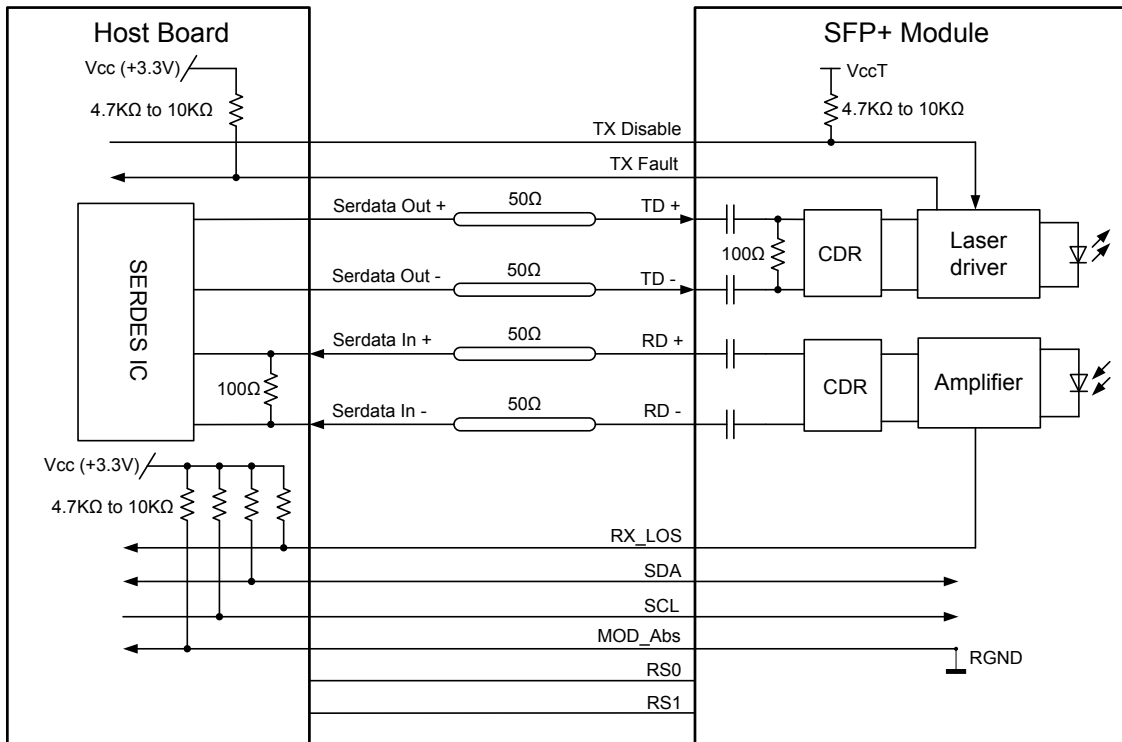


Figure 3. Recommended Application Interface Block Diagram

Mechanical specifications

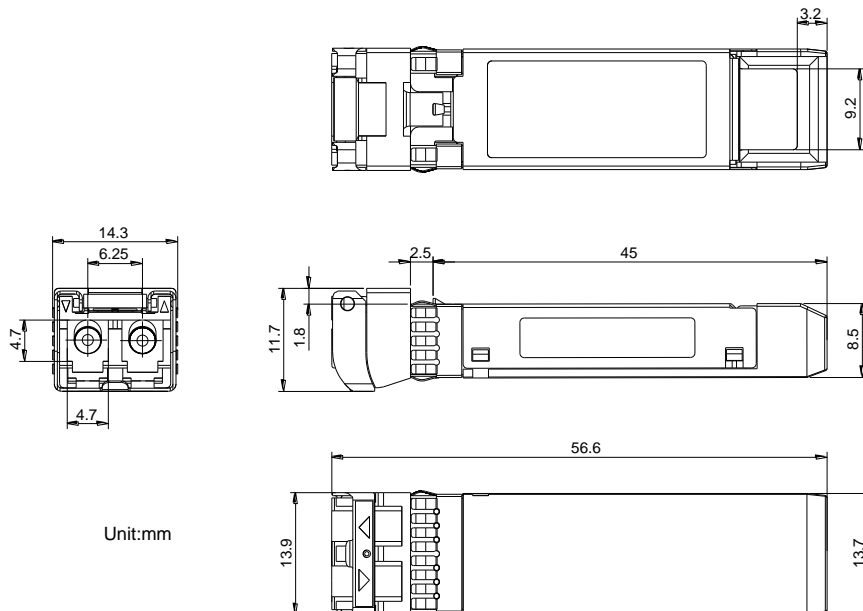


Figure 4. Outline Drawing

PCB layout recommendation



LX581xCDH
16G 20km CWDM SFP+ Transceiver
16G Fiber Channel

For More Information

Linktel Technologies Co., Ltd

sales@linkteltech.com

<http://www.linkteltech.com>

Linktel China

No.20 University Science Park Road, East-lake Hi-tech Development Zone, Wuhan, 430223, China

Tel: +86 27-87929302

Linktel USA

3311 Ingersoll Court, San Jose, CA 95148

Tel: +1(408)833-9142

linktelus@linkteltech.com