Product specification

LSP-L31-10DI

SFP28 25Gb/s 1310nm 10km DDM Transceiver

PRODUCT FEATURES

- Up to 25.7813Gbps Data Links
- 1310nm DFB laser transmitter and PIN/TIA receiver
- Maximum link length of 10km on Single Mode Fiber
- Hot-pluggable SFP28 footprint
- Duplex LC receptacles
- Low power dissipation
- RoHS compliant and lead-free
- Support Digital Diagnostic Monitor interface
- Single +3.3V power supply
- -40°C to +85°C case operating temperature

APPLICATIONS

- 25GBASE-LR Ethernet
- CPRI

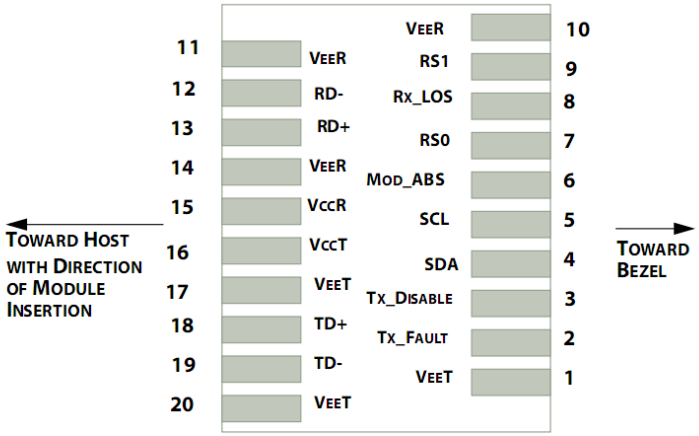
Compliance

- SFF-8472
- SFF-8402
- SFF-8432
- SFF-8431
- CEI-28G-VSR

Ordering information

Package	Product part NO.	Distance	Temperature Range
SFP28	LSP-L31-10DI	10km	-40~85℃

I. Pin Diagram



Pinout of Connector Block on Host Board

II. Pin Descriptions

Pin	Symbol	Name/Description	Ref.
1	V_{EET}	Transmitter Ground (Common with Receiver 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	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	No connection required	
8	LOS	Loss of Signal indication.Logic“0” indicates normal operation.	5
9	RS1	No connection required	
10	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out.AC Coupled	
13	RD+	Receiver Non-inverted DATA out.AC Coupled	
14	V_{EER}	Receiver Ground(Common with Transmitter Ground)	1
15	V_{CCR}	Receiver Power Supply	
16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	Transmitter Ground(Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V_{EET}	Transmitter Ground(Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. TFAULT is an open collector/drain output, which is pulled up with a 4.7kΩ – 10kΩ resistor on the host board, but is grounded inside the SFP+ cable plug.
3. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
4. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. MOD_ABS pull line low to indicate module is plugged in.
5. LOS is open collector output. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

III. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	TS	-40		85	℃	1
Case Operating Temperature	TOP	-40		85	℃	
Relative Humidity	RH	0		85	%	2

Notes:

1.Limited by the fiber cable jacket, not the activeends.

2.Non-condensing.

IV. Optical Characteristics(TOP = -40°C to 85°C, VCC = 3.3 ± 5% Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Transmitter						
Center Wavelength	λc	1295	1310	1325	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Spectral Width	Pm			1	nm	
Average Output Power	Pavg	-7		2	dBm	
Optical Modulation Amplitude (OMA)	Poma	-4		2.2	dBm	
Extinction Ratio	ER	3.5			dB	
Transmitter Dispersion Penalty	TDP			2.7	dB	
Relative Intensity Noise	Rin			-130	dB/Hz	
Optical Return Loss Tolerance	TOL			20	dB	
Transmitter OFF Output Power	POff			-30	dBm	
Transmitter eye mask definition {X1,X2,X3,Y1,Y2,Y3}, 25Gbase_LR		{ 0.31, 0.4, 0.45, 0.34, 0.38, 0.4 }				
Receiver						
Center Wavelength	λc	1295	1310	1325	nm	
Receiver Stress Sensitivity, OMA				-9.5	dBm	
Receiver Sensitivity, Average Power				-13.3	dBm	
Receiver Sensitivity, OMA				-12	dBm	
Receiver Reflectance	Rfl			-26	dBm	
Loss of Signal Assert	P_A	-30			dBm	
Loss of Signal De-assert	P_D			-16	dBm	
LOS Hysteresis	P_D- P_A	0.5			dB	

V. Electrical Characteristics (TOP = -40°C to 85°C, VCC = 3.3 ± 5% Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
SupplyVoltage	Vcc	3.135	3.3	3.465	V	
SupplyCurrent	Icc			300	mA	
Transmitter						
Input differential impedance	Rin		100			1
Differential data input swing	Vin,pp	180		900	mV	
Transmit Disable Voltage	V_D	2		V_{CC}	V	
Transmit Enable Voltage	V_{EN}	Vee		Vee+0.8	V	
Receiver						
Differential data output swing	Vout,pp	400		800	mV	2
LOS Fault	V_{LOS_fault}	2		VccHOST	V	3
LOS Normal	V_{LOS_norm}	Vee		Vee+0.8	V	3
Power Supply Noise Tolerance	V_{CCT}/V_{CCR}	Per SFF-8431 Rev 4.1			mVpp	4

Notes:

1.Connected directly to TX data input pins.AC coupling from pins into laser driver IC.

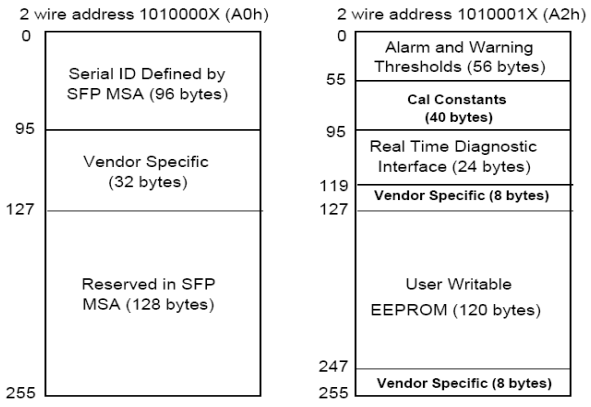
2.Into 100Ω differential termination.

3.20-80%.Measured with Module Compliance Test Board and OMA test pattern. Use of four 1's and four 0's in sequence in the PRBS^9 is an acceptable alternative. SFF-8431 Rev 4.1

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. Maximum pull-up voltage is 5.5V.

5. Testing methodology per SFF-8431. Rev 4.1.

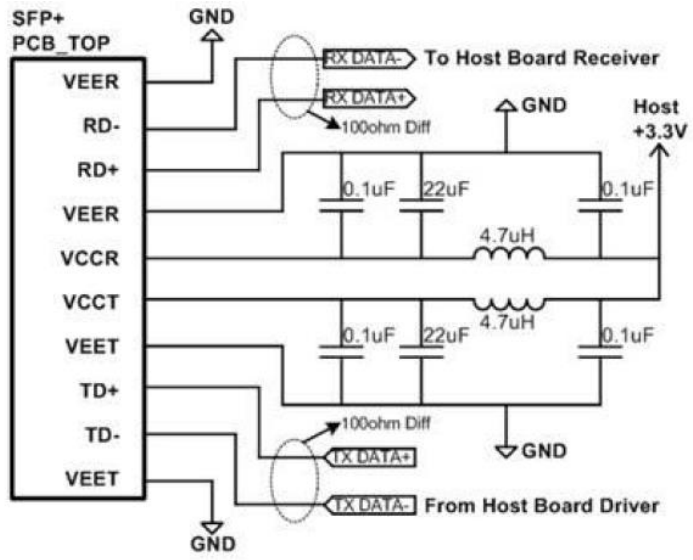
VI. Digital Diagnostic Memory Map

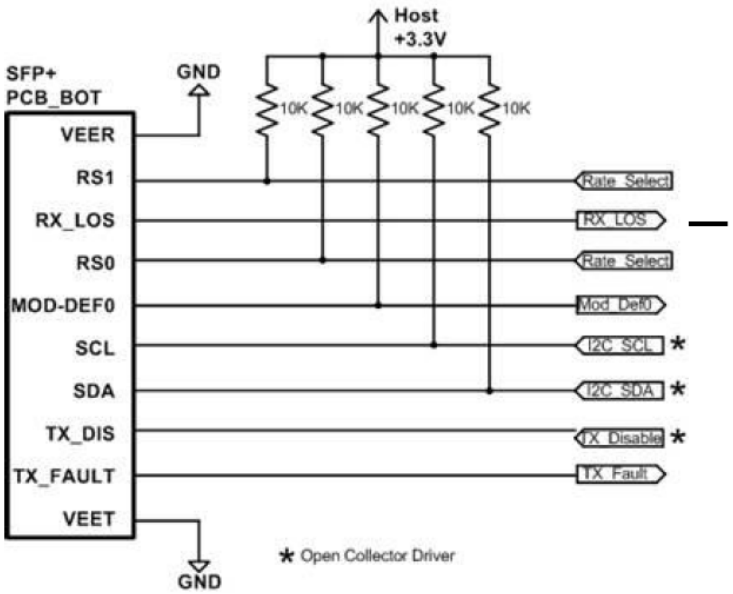


VII. Digital Diagnostic Monitoring Information

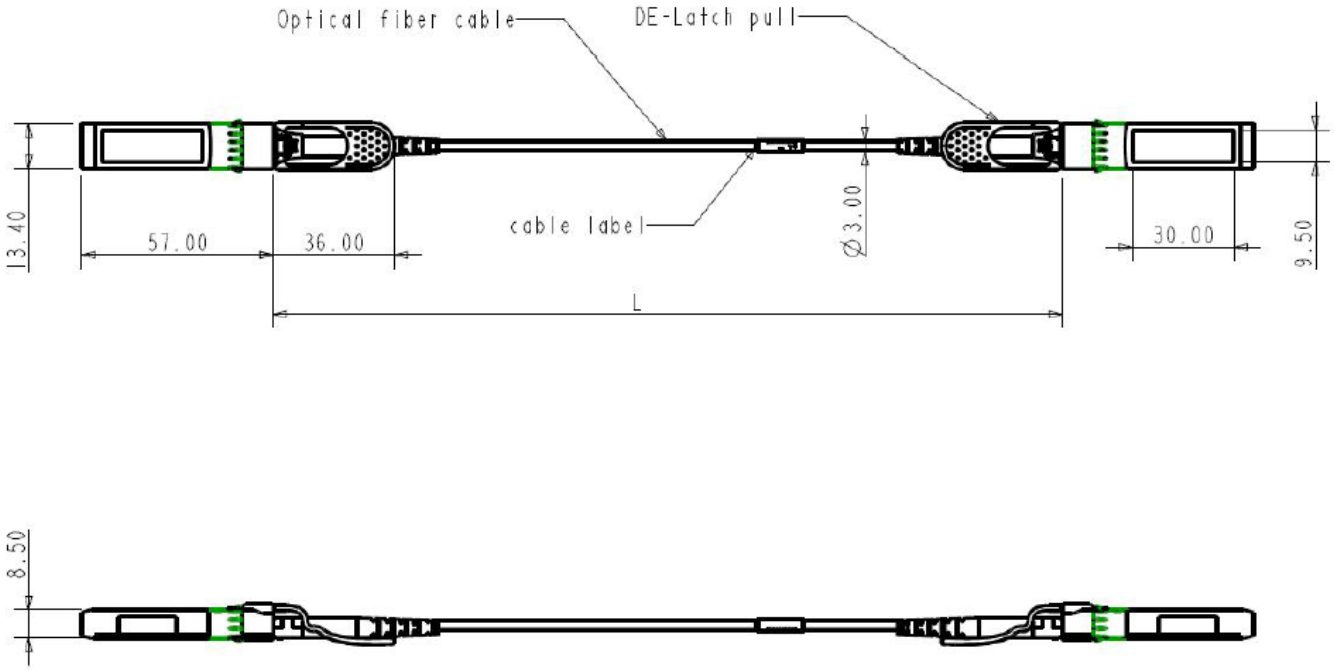
Parameter	Unit	Accuracy
Case Temperature	℃	±3
Supply Voltage	V	±3%
Tx Bias Current	mA	±10%
Tx Optical Power	dB	±3
Rx Optical Power	dB	±3

VIII. Recommended Interface Circuit





IX. Mechanical Dimensions



SFP wire mechanicaldrawing(Unit: mm)

Revision History

Version No.	Date	Description
1.0	June 24, 2019	Preliminary datasheet