HS031TxLR-31
25G 1310nm 10km
SFP28 Transceiver

Product Features

- Support 24.33Gb/s and 25.78Gb/s data links
- Electrical interface specifications per SFF-8431
- Management interface specifications per SFF-8472 and SFF-8432
- 1310nm uncooled DML Laser
- PIN photo detector
- Single +3.3V power supply
- Class 1 laser safety certified
- Typical power consumption less than 1W
- Operating temperature:

  Commercial： 0℃~70℃；
  Industrial： -40℃~85℃
- Up to 10km on 9/125um SMF
- RoHS Compliant

Applications

- 25.78Gb/s Ethernet links
- CPRI Application

Descriptions

HS031TxLR-31 SFP28 transceiver modules are designed for 25 Gigabit Ethernet over 10km single mode fiber. They are compliant with the SFF-8432 and IEEE 802.3ae. Each transceiver incorporates one direct modulated lasers with driver ICs, one PIN diodes with TIAs, over duplex LC connectors. Mechanical dimensions, connectors and the footprint of this product is SFP+ specifications compliant.

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Ordering Information

Table 1. Ordering Information

Part Number	Transmitter	Output Power	Receiver	Sensitivity	Reach	Temp	DDM	RoHS
HS031TCLR-31	1310nm DFB	-7~ +5dBm	PIN	-14dBm	10km	0~ 70 °C	Available	Compliant
HS031TILR-31	1310nm DFB					-40~85℃		

Pin Description

Table 2. Pin Description

Pin	Name	Function/Description	Notes
1	VeeT	Transmitter Ground ceiver Ground)	1
2	TX_Fault	Transmitter Fault(LVTTL-O) - High indicates a fault condition	2
3	TX_Disable	Transmitter Disable(LVTTL-O) - 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	6
8	RX_LOS	Receiver Loss of Signal (LVTTL-O)	2
9	RS1	Rate Select 1 – Not used, Presents high input impedance	6
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O), AC Coupled	
13	RD+	Received Data out (CML-O), AC Coupled	
14	VeeR	Receiver Ground	
15	VccR	Receiver Power - +3.3V	
16	VccT	Transmitter Power - +3.3V	
17	VeeT	Transmitter Ground	
18	TD+	Transmitter Data out (CML-O), AC Coupled	
19	TD-	Inverse Transmitter Data out (CML-O), AC Coupled	
20	VeeT	Transmitter Ground	

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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 4.7KΩ to 10KΩ pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7KΩ to 10KΩ 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 4.7KΩ to 10KΩ pull-up resistor to VccHost.
6. Rate select can also be set through the 2-wire bus in accordance with SFF-8472 v. 10.2, Rx Rate Select is set at Bit 3, Byte 110, Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h.

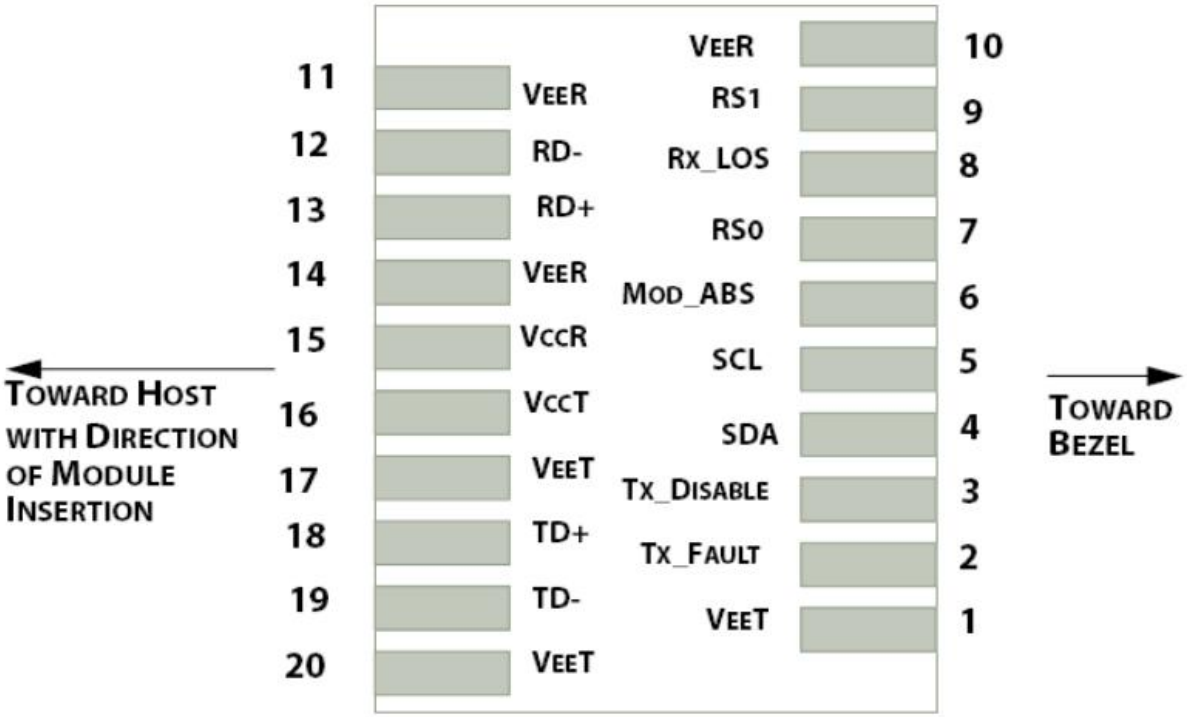

Figure 1. Host PCB SFP28 pad assignment top view

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	V

Recommended Operating Conditions

Table 4. Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T_C	-40	25	85	°C
Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Data Rate PER Channel	-	-	25.78125 ± 100ppm		Gb/s

Transceiver Electrical Characteristics

(Unless otherwise noted, Tc=+25°C, BOL)

Table 5. Transceiver Electrical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Module Supply Current	Icc	-	240	390	mA	-
Power Dissipation	P_D	-	-	1300	mW	-
Transmitter						
-Single-ended Input Voltage Tolerance	-	-0.3	-	3.6	V	-
Input Differential Impedance	Z_{IN}	-	100	-	Ω	-
Differential Data Input Swing	$V_{IN, P-P}$	190	-	900	mV_{P-P}	-
AC Common Mode Input Voltage Tolerance	-	15	-	-	mV	-
Differential Input Voltage Swing Threshold	-	50	-	-	mV_{P-P}	-
Receiver						
Single-ended Output Voltage	-	-0.3	-	3.6	V	

Output Differential Impedance	Zo	90	100	110	Ω	-
Differential Data Output Swing	$V_{OUT, P-P}$	300	-	900	mV_{P-P}	-

Transmitter Optical Characteristics

Table 6. Transmitter Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power per lane	Po	-7	-	+5	dBm	1
Center Wavelength Range	λ	1295	-	1325	nm	-
Extinction Ratio	EX	3	-		dB	1
Dispersion Penalty	DP			2.7	dB	
Spectral width(-20dB)	Δλ	-	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Optical Return Loss Tolerance				20	dB	

Notes:
1. Measured with a PRBS 2^{31}-1 test pattern @25.78125Gbps.
2. Transmitter reflectance is defined looking into the transmitter.
3. The optical power is launched into SMF.

Receiver Optical Characteristics

Table 7. Receiver Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Center Wavelength	λ	1295	-	1325	nm	-
Receiver sensitivity (OMA), each lane	S	-	-	-14	dBm	1
Receiver Overload（OMA）	Pol	+2.5	-	-	dBm	2
Average receive power, each lane		-10.6		+2.5	dBm	3
Receiver reflectance	ORL	-	-	-26	dB	-
LOS De-Assert	LOSD	-	-	-17	dBm	-
LOS Assert	LOSA	-28	-	-	dBm	-
LOS Hysteresis		0.5	-	-	dB	-

Notes:
1. Measured with PRBS 2^{31}-1 test pattern@ 25.78125Gb/s, BER5E-5;
2. The receiver shall be able to tolerate, without damage, continuous exposure to an optical signal having this average power level;
3. Average receive power, each lane(min) is informativeand not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.

Recommended Host Board Power Supply Filter Network

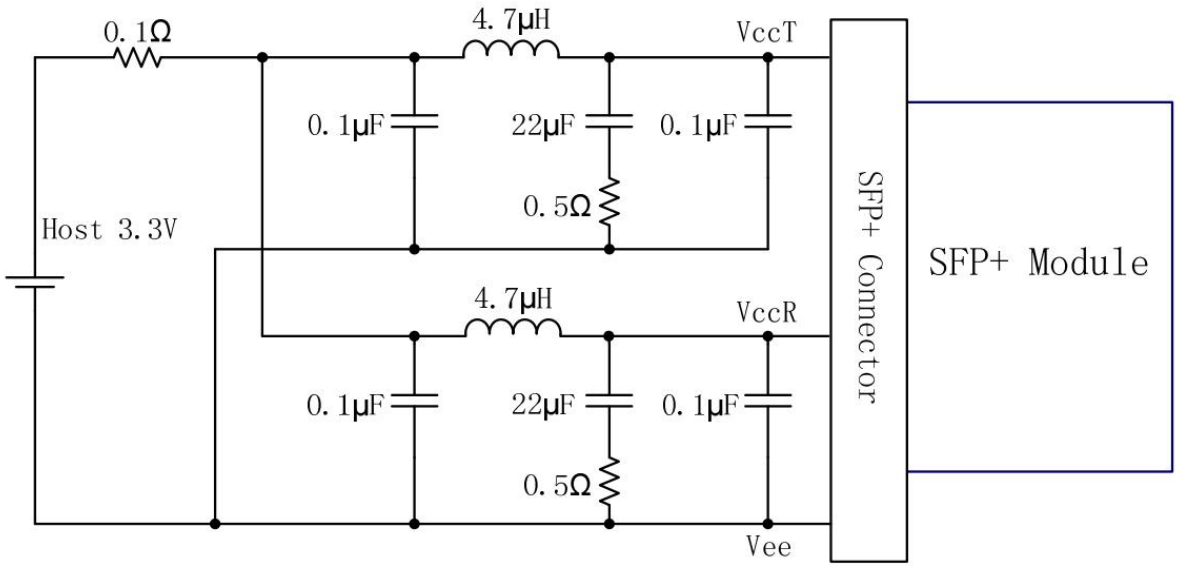

Figure 2. Recommended Host Board Power Supply Filter Network

Mechanical specifications

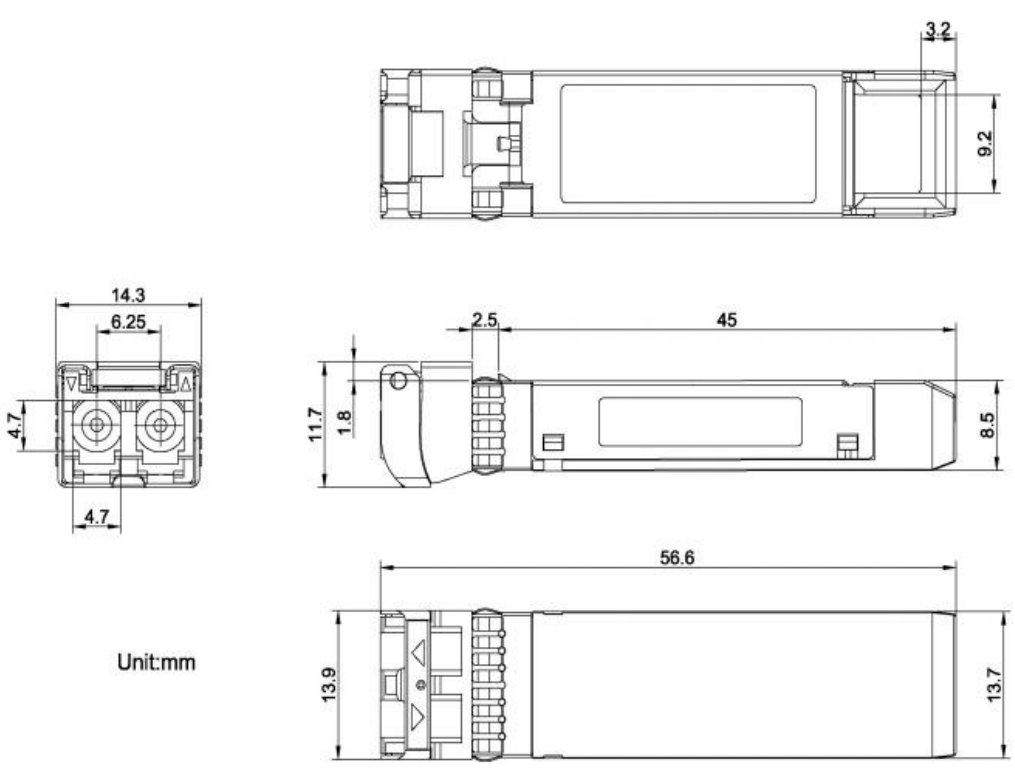

Figure 3. Outline Drawing

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For More Information