

# 25G CWDM SFP28 1270-1370nm 30km DOM Transceiver

0231A320-LL



## Application

- High-speed storage area networks
- CPRI 10

## Features

- UP to 25.78Gb/s data links
- Hot-Pluggable SFP28 footprint
- Duplex LC connector
- DML laser transmitter, APD photo-detector
- Up to 30km on SMF without FEC
- Up to 40km on SMF with FEC
- 2-wire interface for management specifications compliant with SFF 8472 digital diagnostic monitoring interface for optical transceiver
- Power Supply :+3.3V
- Operating case temperature Range: 0~ 70° C
- RoHS Compliant

## Description

Longline's SFP28 transceivers are designed for use in Ethernet links up to 25.78 Gb/s data rate and up to 30km(without FEC) 40KM(with FEC) link length .They are compliant SFF-8472 ,and compatible with SFF-8432 and applicable portions of SFF-8431 . The product is RoHS compliant and lead-free per Directive 2011/96/EU.

## Product Specifications

### I. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>Storage Temperature</b>	$T_S$	-40		+85	°C	
<b>Case Operating Temperature</b>	$T_A$	0		+70	°C	
<b>Maximum Supply Voltage</b>	$V_{CC}$	0		3.6	V	
<b>Relative Humidity(Non-condensing)</b>	RH	0		85	%	

### II. Electrical Characteristics ( $T_{OP} = 0$ to $70^{\circ}C$ , $V_{CC} = 3.15$ to $3.46$ Volts)

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>Supply Voltage</b>	$V_{CC}$	3.15		3.46	V	
<b>Supply Current</b>	$I_{CC}$			450	mA	
<b>Power Consumption</b>	$P$			1.5	W	
<b>Data Rate</b>	$R$		25.8		Gb/s	

#### Transmitter Section:

<b>Input differential impedance</b>	$R_{in}$		100		$\Omega$	1
<b>Differential input voltage swing</b>	$V_{in,pp}$	180		700	mV	2
<b>Transmit Disable Voltage</b>	$V_D$	2		$V_{CC}$	V	3

<b>Transmit Enable Voltage</b>	$V_{EN}$	Vee	Vee+0.8	V	
<b>Receiver Section:</b>					
<b>Single Ended Output Voltage Tolerance</b>	V	-0.3	4	V	
<b>Rx Output Diff Voltage</b>	$V_o$	185	800	mV	
<b>LOS Fault</b>	$V_{LOS\ fault}$	2	$V_{CCHOST}$	V	4
<b>LOS Normal</b>	$V_{LOS\ norm}$	Vee	$V_{EE}+0.8$	V	4

**Notes:**

- 1.Connected directly to TX data input pins. AC coupling from pins into laser driver IC.
- 2.Per SFF-8431 Rev 3.0
- 3.Into 100 ohms differential termination.
- 4.LOS is an open collector output. Should be pulled up with 4.7k – 10k $\Omega$  on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V.

**III. Optical Characteristics ( $T_{OP}=0$  to  $70^{\circ}C$  , $V_{CC}= 3.15$  to  $3.46$ Volts)**

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>Transmitter Section:</b>						
<b>Center Wavelength</b>	$\lambda_t$	$\lambda-6.5$	$\lambda$	$\lambda+6.5$	nm	
<b>spectral width(-20dB)</b>	$\Delta\lambda$			1	nm	
<b>Average Optical Power</b>	$P_{avg}$	0		+6	dBm	1
<b>Laser Off Power</b>	$P_{off}$			-30	dBm	
<b>Side Mode Suppression Ratio</b>		30				
<b>Extinction Ratio</b>	ER	4			dB	
<b>Optical Return Loss Tolerance</b>				-12	dB	

**Receiver Section:**

<b>Center Wavelength</b>	$\lambda_r$	1260	1370	nm	
<b>Receiver Sensitivity</b>	Sen		-19	dBm	2
<b>Los Assert</b>	LOS <sub>A</sub>	-30		dBm	
<b>Los Dessert</b>	LOS <sub>D</sub>		-19	dBm	
<b>Los Hysteresis</b>	LOS <sub>H</sub>	0.5		dB	
<b>Overload</b>		-6		dBm	

**Notes:**

1. Average power figures are informative only, per IEEE802.3cc.

2. Receiver sensitivity is informative. Shall be measured with conformance test signal for . BER =  $5 \times 10^{-5}$ .

#### IV. Timing Characteristics

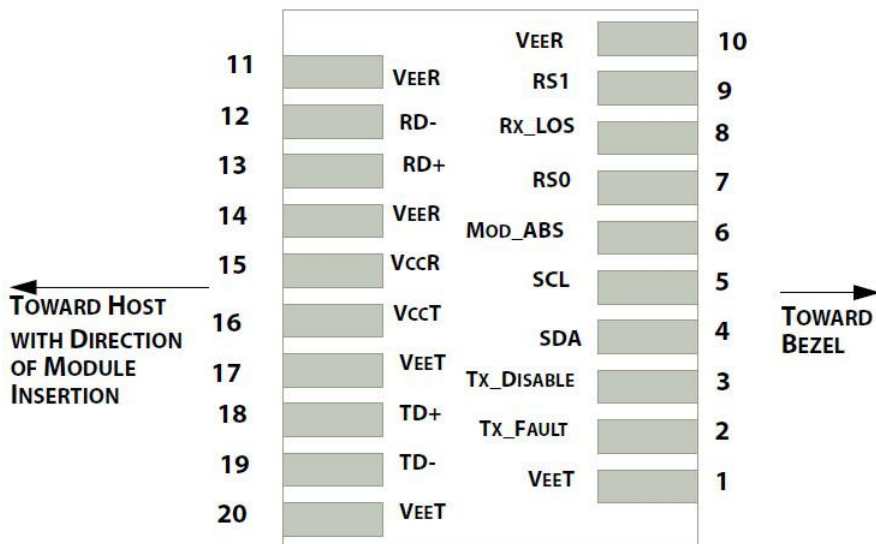
Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
<b>TX_Disable Assert Time</b>	t <sub>off</sub>			100	us	
<b>TX_Disable Negate Time</b>	t <sub>on</sub>			2	ms	
<b>Time to Initialize 2-wire interface</b>	t <sub>2w_start_up</sub>			300	ms	
<b>Time to Initialize</b>	t <sub>2w_start_up</sub>			300	ms	
<b>Time to Initialize cooled module and time to power up a cooled module to Power level II</b>	t <sub>start_up_cooled</sub>			90	s	
<b>Time to Power Up to Level II</b>	t <sub>power_level2</sub>			300	ms	
<b>Time to Power Down from Level II</b>	t <sub>power_down</sub>			300	ms	
<b>Tx_Fault assert</b>	Tx_Fault_on			1	ms	
<b>Tx_Fault assert for cooled module</b>	Tx_Fault_on_cooled			50	ms	
<b>TX_FAULT Reset</b>	t <sub>reset</sub>	10			us	

<b>Rx_LOS assert delay</b>	t_los_on			100	us	
<b>Rx_LOS negate delay</b>	t_los_off			100	us	

## V. Digital Diagnostics Specifications

Parameter	Symbol	Units	Min	Max	Accuracy
<b>Transceiver Temperature</b>	DDDTemp	°C	0	+70	± 3°C
<b>Transceiver Supply Voltage</b>	DDDVoltage	V	3.15	3.45	± 3%
<b>Transmitter Bias Current</b>	DDDBias	mA	0	35	± 10%
<b>Transmitter Output Power</b>	DDDTx-Power	dBm	-5	+5	± 2dB
<b>Receiver Average Optical Input Power</b>	DDDRx-Power	dBm	-16	-3	± 2dB

## VI. Pin Description



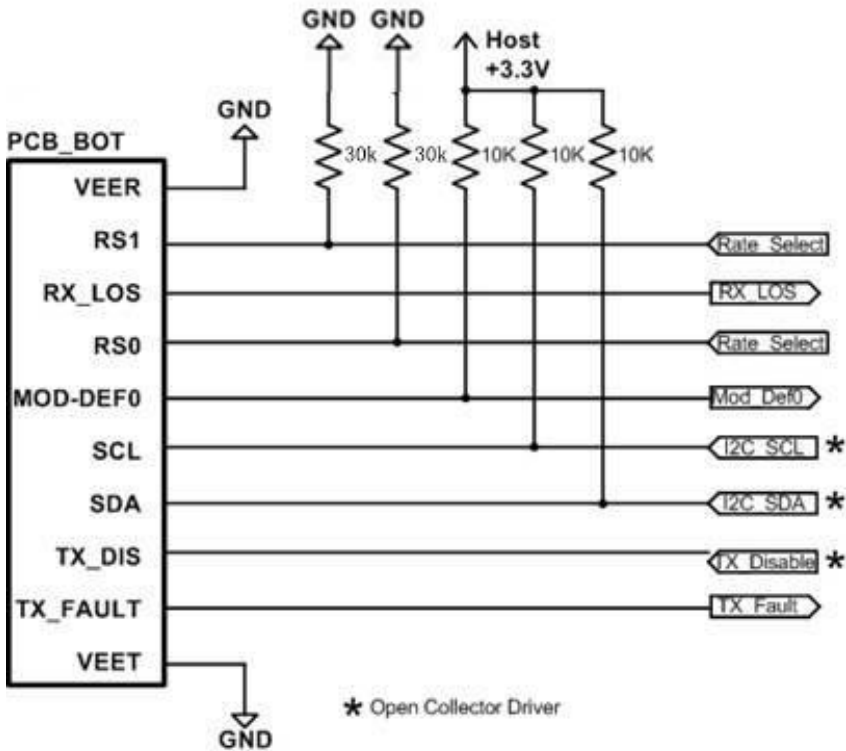
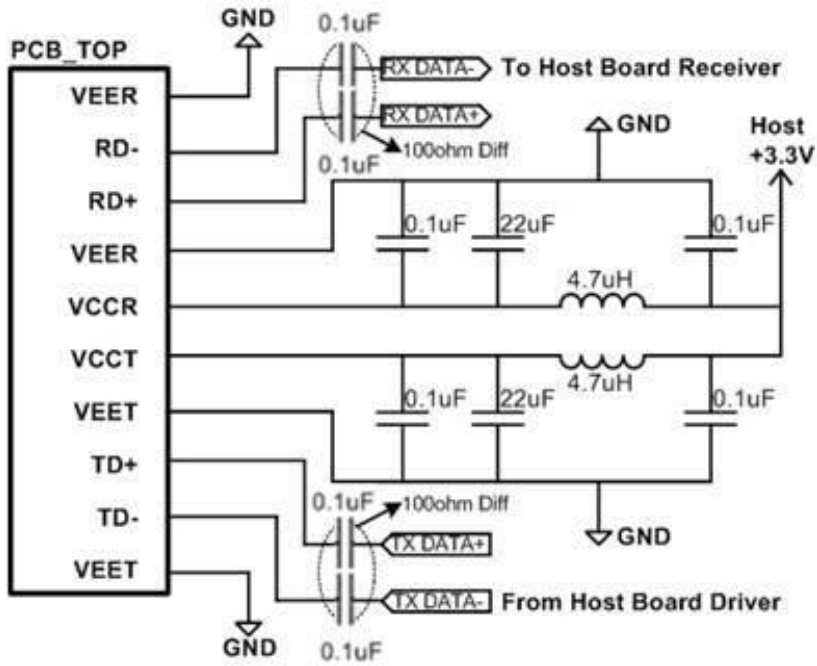
**Figure 1 – Diagram of Host Board Connector Block Pin Numbers and Names**

Pin	Name	Description	Notes
1	VeeT	Module transmitter ground	1
2	Fault	Module transmitter Fault	2
3	Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDL	2 wire serial interface data input/output (SDA)	4
5	SCL	2 wire serial interface clock input (SCL)	4
6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	2
7	RS0	Rate select0: module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.	
8	LOS	Receiver Loss of Signal Indication	
9	RS1	Rate select1: module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.	
10	VeeR	Module receiver ground	1
11	VeeR	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	1
15	VccR	Module receiver 3.3V supply	
16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	1
18	TD+	Transmitter non-inverted data out put	
19	TD-	Transmitter inverted data out put	
20	VeeT	Module transmitter ground	1

**Notes:**

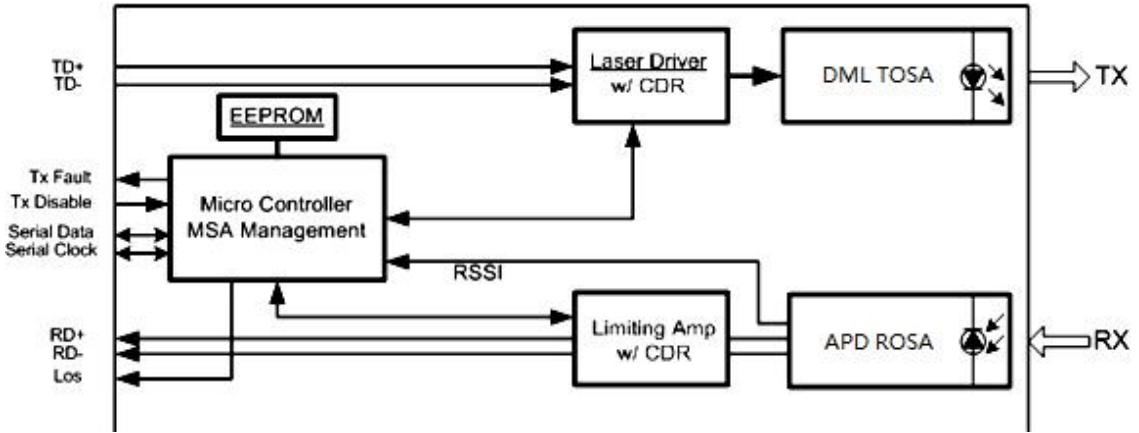
- 1.The module ground pins shall be isolated from the module case.
- 2.This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host\_Vcc on the host board.
- 3.This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.
- 4.This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host\_Vcc on the host board.

VII. Recommended Circuit



Recommended High-speed Interface Circuit

### VIII. Transceiver Block Diagram



### IX. Mechanical Dimensions

