

# 25GBASE-BX SFP28 1270nmTX/1330nmRX 10km DOM Transceiver

SFP-25GBX-D-10-LL



## Application

- 25GE LR
- eCPRI & CPRI

## Features

- Hot-pluggable SFP28 footprint
- UP to 25.78Gb/s bi-directional data links
- Simplex LC connector
- Up to 10km on 9/125m SMF
- 1271nm DFB laser transmitter for -2733
- 1331nm DFB laser transmitter for -3327
- Single 3.3V Power Supply
- Operating temperature: Commercial: 0~ 70° C
- RoHS compliant
- 2-wire interface for management specifications compliant with SFF 8472 digital diagnostic monitoring interface for optical transceivers

## Description

Longline's SFP28 transceivers are designed for use in Ethernet links up to 25.78 Gb/s data rate and up to 10 km 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. General Specifications

Parameter	Symbol	Min	Typ.	Max	Unit	Note
<b>Transmitter</b>						
<b>Center Wavelength</b>	$\lambda_t$	1265	1271	1277	nm	
		1325	1331	1337	nm	
<b>spectral width(-20dB)</b>	$\Delta\lambda$			1	nm	
<b>Average Optical Power</b>	$P_{avg}$	-5.0		+2.0	dBm	1
<b>Laser Off Power</b>	$P_{off}$			-30	dBm	
<b>Side Mode Suppression Ratio</b>		30				
<b>Extinction Ratio</b>	ER	3.5			dB	
<b>Optical Return Loss Tolerance</b>				-12	dB	
<b>Receiver</b>						
<b>Center Wavelength</b>	$\lambda_r$	1325	1331	1337	nm	
		1265	1271	1277	nm	
<b>Receiver Sensitivity</b>	$S_{en}$			-9	dBm	2
<b>Los Assert</b>	$LOS_A$	-30			dBm	
<b>Los Dessert</b>	$LOS_D$			-16	dBm	
<b>Los Hysteresis</b>	$LOS_H$	0.5			dB	
<b>Overload</b>		2			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 =  $5 \times 10^{-5}$  .

## II. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Maximum Supply Voltage	V <sub>CC</sub>	0		3.6	V	
Storage Temperature	T <sub>S</sub>	-40		85	° C	
Case Operating Temperature	T <sub>A</sub>	0		70	° C	Commercial
Relative Humidity	RH	0		85	%	1

### Notes:

1. Non-condensing.

## III. Electrical Characteristics (VCC = 3.14 to 3.46 Volts)

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Supply Voltage	V <sub>CC</sub>	3.14		3.46	V	
Supply Current	I <sub>CC</sub>			300	mA	Commercial
				360	mA	Extended
				360	mA	Industrial
Power Consumption	P			1	W	Commercial
				1.2	W	Extended
				1.2	W	Industrial
Data Rate	R	24.3		26.5	Gb/s	
Fiber Length	L			10	KM	

### Transmitter (Tx)

Input Differential Impedance	R <sub>in</sub>		100		Ω	1
Differential Data Input Swing	V <sub>in,pp</sub>	180		450	mV	2
Transmit Disable Voltage	V <sub>D</sub>	2		V <sub>CC</sub>	V	3
Transmit Enable Voltage	V <sub>EN</sub>	V <sub>EE</sub>		V <sub>EE</sub> + 0.8	V	

**Receiver (Rx)**

<b>Single Ended Output Voltage Tolerance</b>	V	-0.3		4	V	
<b>Rx Output Diff Voltage</b>	V <sub>o</sub>	180		450	mV	
<b>LOS asserted</b>	V <sub>LOS fault</sub>	2		V <sub>CCHOST</sub>	V	4
<b>LOS de-asserted</b>	V <sub>LOS norm</sub>	V <sub>ee</sub>		V <sub>ee</sub> +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 4.7kΩ – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V.

**IV. Optical Characteristics (VCC = 3.14 to 3.46 V)**

Parameter	Symbol	Min	Typ.	Max	Unit	Note
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**Transmitter (Tx)**

<b>Center Wavelength</b>	$\lambda_t$	1265	1271	1277	nm	
		1325	1331	1337	nm	
<b>Average Launch Power</b>	P <sub>AVE</sub>	-2		4	dBm	1
<b>Spectral Width(-20dB)</b>	$\Delta\lambda$			1	nm	
<b>Laser Off Power</b>	P <sub>off</sub>			-30	dBm	
<b>Side Mode Suppression Ratio</b>		30				
<b>Extinction Ratio</b>	ER	3.5			dB	
<b>Optical Return Loss Tolerance</b>				-12	dB	

**Receiver (Rx)**

<b>Center Wavelength</b>	$\lambda_r$	1325	1331	1337	nm	
		1265	1271	1277	nm	
<b>Receiver Sensitivity</b>	Sen			-13	dBm	2
<b>Overload</b>		2			dBm	
<b>LOS De-Assert</b>	LOS <sub>A</sub>			-14	dBm	

<b>LOS Assert</b>	LOS <sub>A</sub>	-30	-23		dBm	
<b>LOS Hysteresis</b>		0.5			dB	

**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 = $5 \times 10^{-5}$  .

## V. Digital Diagnostic Specifications

Parameter	Symbol	Units	Min	Max	Accuracy	Note
<b>Transceiver Temperature</b>	T		0	+70	± 5 °C	Commercial
<b>Transceiver Supply Voltage</b>	DD <sub>Voltage</sub>	V	3.15	3.15	± 3%	
<b>Transmitter Bias Current</b>	DD <sub>Bias</sub>	mA	0	35	± 10%	
<b>Transmitter Output Power</b>	DD <sub>Tx-Power</sub>	dBm	-5	+5	± 3dB	
<b>Receiver Average Optical Input Power</b>	DD <sub>Rx-Power</sub>	dBm	-16	-3	± 3dB	

## VI. Timing Characteristics

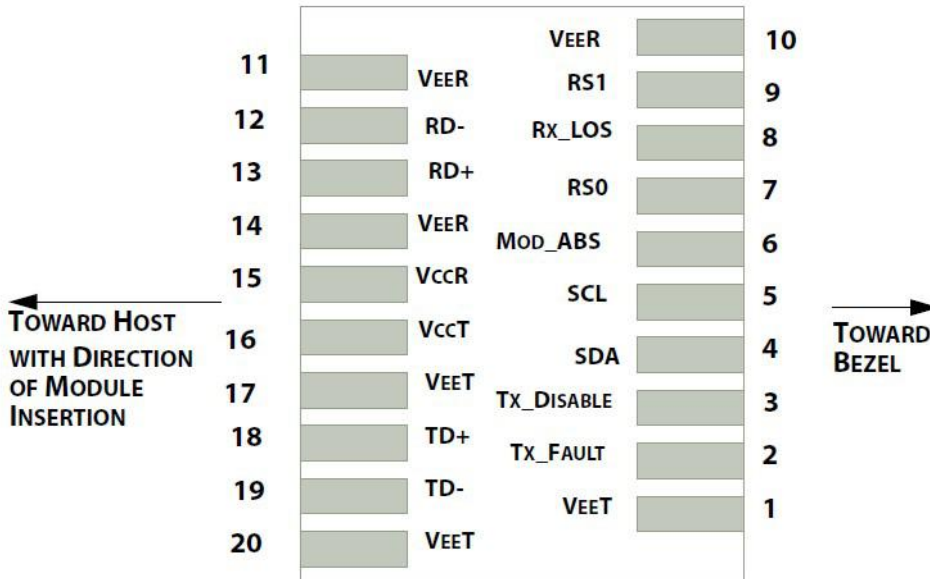
Parameter	Symbol	Min	Typ.	Max	Unit
<b>TX_Disable Assert Time</b>	t <sub>off</sub>			100	us
<b>TX_Disable Negate Time</b>	t <sub>on</sub>			2	ms
<b>Time to Initialize 2-wire interface</b>	t <sub>2w_start_up</sub>			300	ms
<b>Time to Initialize</b>	t <sub>start_up</sub>			300	ms
<b>Time to Initialize cooled 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 <sub>los_on</sub>			100	us
<b>Rx_LOS negate delay</b>	t <sub>los_off</sub>			100	us

## VII. Pin Description

Pin	Name	Function	Notes
1	V <sub>EET</sub>	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	V <sub>EER</sub>	Module receiver ground	1
11	V <sub>EER</sub>	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	V <sub>EER</sub>	Module receiver ground	1
15	V <sub>CCR</sub>	Module receiver 3.3V supply	
16	V <sub>CCT</sub>	Module transmitter 3.3V supply	
17	V <sub>EET</sub>	Module transmitter ground	1
18	TD+	Transmitter non-inverted data out put	
19	TD-	Transmitter inverted data out put	
20	V <sub>EET</sub>	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.



### VIII. Mechanical Specifications

