

# 25GBASE-BX 1270nmTX/1310nmRX 40km DOM Transceiver

SFP28-25G-BX40



## Application

- 25GE ER Lite
- eCPRI & CPRI

## Features

- UP to 25.78Gb/s bi-directional data links
- Hot-Pluggable SFP28 footprints
- Simplex LC connector
- 1271nm DFB laser transmitter for -2731
- Up to 30km on 9/125m SMF without FEC
- Up to 40km on 9/125m SMF with FEC
- 2-wire interface for management specifications compliant with SFF 8472 digital diagnostic monitoring interface for optical transceivers
- Power Supply :+3.3V
- Operating case temperature Range: Commercial: 0~ 70° C
- RoHS compliant

## Description

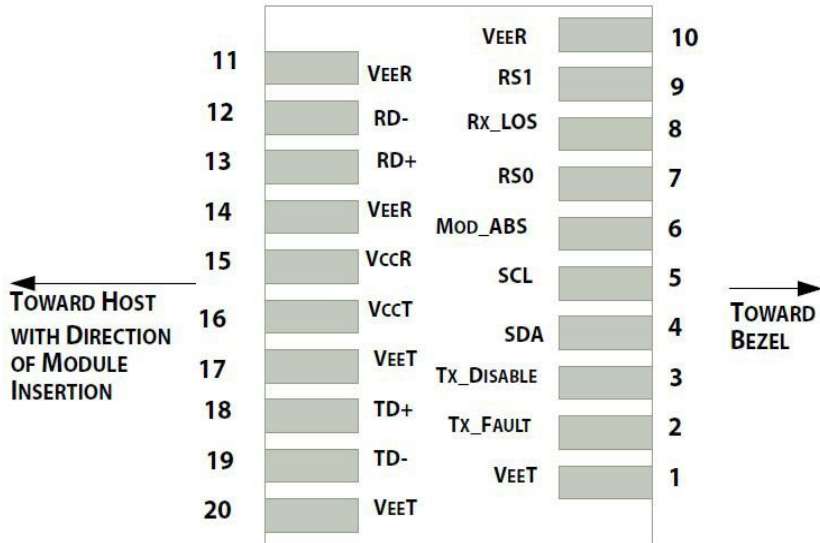
FS's SFP28 transceivers are designed for use in Ethernet links up to 25.78Gb/s data rate and up to 30 km link length. They are compliant SFF-8472, and compatible with SFF-8432 and applicable portions of SFF-8431. The product is RoHS compliant and lead-free per Directive 2011/96/EU.

## I. Pin Function Definitions

Pin No.	Name	Function	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	RX_LOSS
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.



**II. Absolute Maximum Ratings**

Parameter	Symbol	Min	Typical	Max	Unit	Note
Storage Temperature	TS	-40		+85	° C	
Case Operating Temperature	TA	0		+70	° C	Commercial
		-5		+85	° C	Extended
		-40		+85	° C	Industrial
Maximum Supply Voltage	Vcc	0		3.6	V	
Relative Humidity(Non-condensing)	RH	0		85	%	

### III. Electrical Characteristics ( $T_{OP} = -40$ to $85$ ° C, $V_{CC} = 3.15$ to $3.46$ Volts)

Parameter	Symbol	Min	Typical	Max.	Unit	Note
Supply Voltage	$V_{CC}$	3.14		3.46	V	
Supply Current	$I_{CC}$			360	mA	Commercial
				430	mA	Extended
				430	mA	Industrial
Power Consumption	$p$			1.2	W	Commercial
				1.4	W	Extended
				1.4	W	Industrial
Data Rate	$R$		25.8		Gb/s	
Fiber Length	$L$			30	KM	

#### Transmitter Section:

Input Differential Impedance	$R_{in}$		100		$\Omega$	1
Differential Input Voltage Swing	$V_{in,pp}$	180		450	mV	2
Transmit Disable Voltage	$V_D$	2		$V_{CC}$	V	3
Transmit Enable Voltage	$V_{EN}$	$V_{EE}$		$V_{EE}+0.8$	V	

#### Receiver Section:

Single Ended Output Voltage Tolerance	$V$	-0.3		4	V	
Rx Output Diff Voltage	$V_o$	180		450	mV	
LOS Fault	$V_{LOS\ fault}$	2		$V_{CC_{HOST}}$	V	4
LOS Normal	$V_{LOS\ norm}$	$V_{EE}$		$V_{EE}+0.8$	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.

**IV. Optical Characteristics (T<sub>OP</sub> = -40 to 85 ° C, VCC = 3.15 to 3.46 Volts)**

Parameter	Symbol	Min	Typical	Max.	Unit	Note
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**Transmitter Section:**

Center Wavelength	$\lambda_t$	1265	1271	1277	nm	
Spectral Width(-20dB)	$\Delta\lambda$			1	nm	
Average Optical Power	P <sub>avg</sub>	0		+6	dBm	1
Laser Off Power	P <sub>off</sub>			-30	dBm	
Side Mode Suppression Ratio		30				
Extinction Ratio	ER	3.5		1.4	dB	1
Optical Return Loss Tolerance				-12	dB	

**Receiver Section:**

Center Wavelength	$\lambda_r$	1305	1311	1317	nm	
Receiver Sensitivity				-18	dBm	2
Los Assert	LOSA	-30			dBm	3
Los Dessert	LOSD			-19	dBm	
Los Hysteresis	LOSH	0.5			dB	
Overload		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 = 5x 10<sup>-5</sup> .

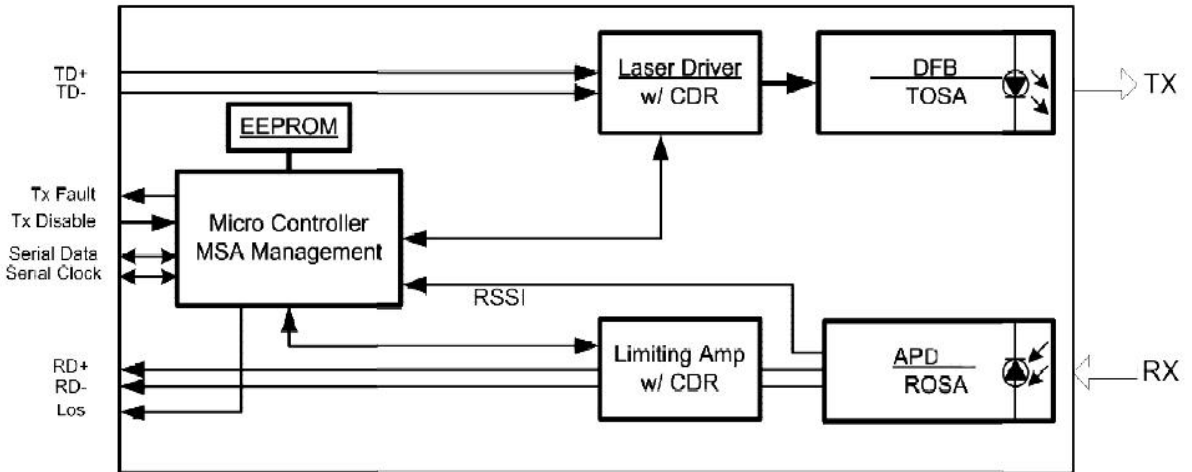
## V. Timing Characteristics

Parameter	Symbol	Min	Typical	Max.	Unit
TX_Disable Assert Time	T_off			100	us
TX_Disable Negate Time	T_on			2	ms
Time to Initialize 2-wire interface	T_2w_start_up			300	ms
Time to Initialize	T_start_up	0		300	ms
Time to Initialize Cooled Module and Time to Power Up a Cooled Module to Power Level II	T_start_up_cooled			90	s
Time to Power Up to Level II	T_power_level2	30		300	ms
Time to Power Down from Level II	T_power_down	3.5		300	ms
Tx_Fault assert	Tx_Fault_on			1	ms
Tx_Fault Assert for Cooled Module	Tx_Fault_on_cooled			50	ms
TX_FAULT Reset	T_reset	10			us
Rx_LOS Assert Delay	T_los_on			100	us
Rx_LOS Negate Delay	T_los_off			100	us

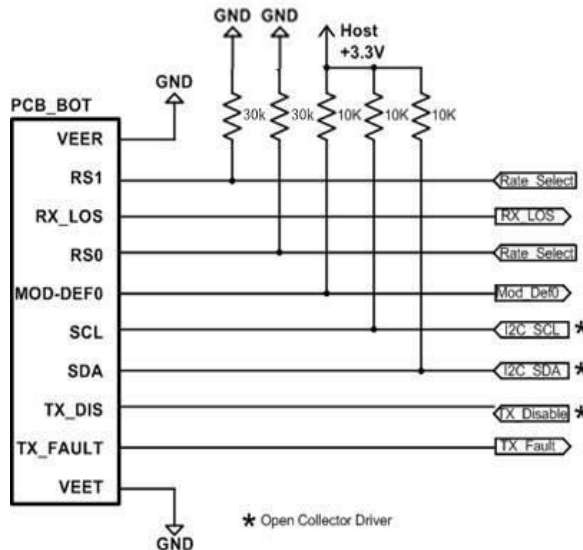
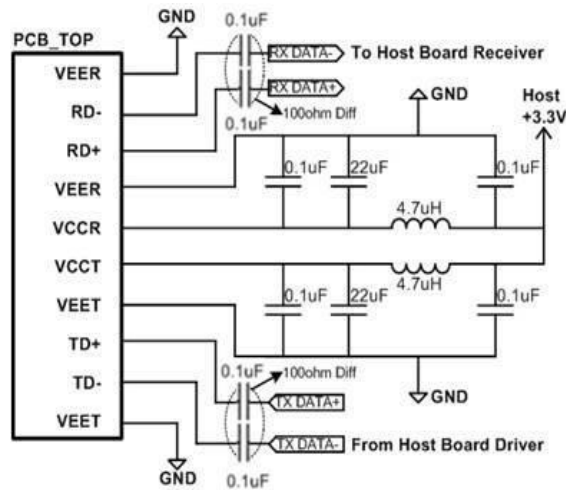
## VI. Digital Diagnostic Specifications

Parameter	Symbol	Units	Min	Max.	Accuracy	Note
Transceiver Temperature	DDDTemp	°C	-40	+85	±5°C	Industrial
			-5	+85	±5°C	Extended
			0	+70	±5°C	Commercial
Transceiver Supply Voltage	DDDVoltage	V	3.15	3.45	±3%	
Transmitter Bias Current	DDDBias	mA	0	35	±10%	
Transmitter Output Power	DDDTx-Power	dBm	-5	+5	±3dB	
Receiver Average Optical Input Power	DDDRx-Power	dBm	-16	-3	±3dB	

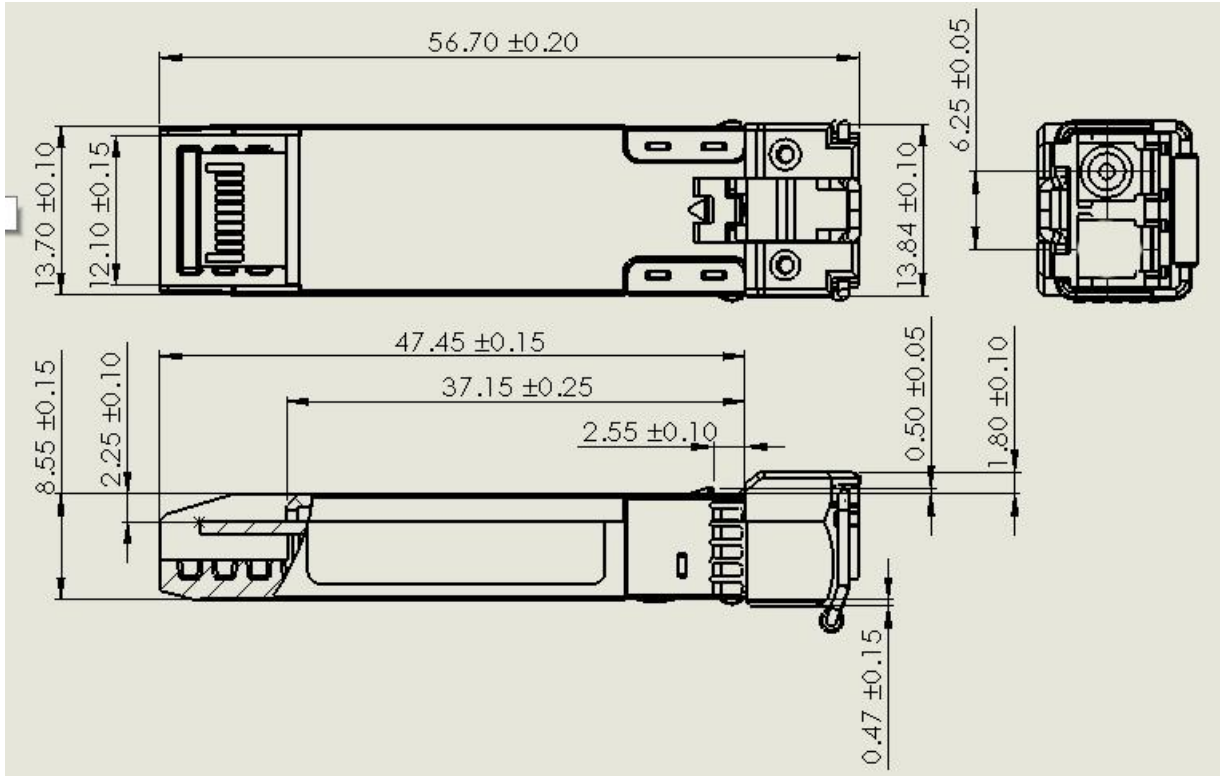
## VII. Transceiver Block Diagram



## Recommended Circuit:



**Mechanical Dimensions:**





## Test Center

FS.COM transceivers are tested to ensure connectivity and compatibility in our test center before shipped out. FS.COM test center is supported by a variety of mainstream original brand switches and groups of professional staff, helping our customers make the most efficient use of our products in their systems, network designs and deployments.

The original switches could be found nowhere but at FS.COM test center, eg: Juniper MX960 & EX 4300 series, Cisco Nexus 9396PX & Cisco ASR 9000 Series, HP 5900 Series & HP 5406R ZL2 V3(J9996A), Arista 7050S-64, Brocade ICX7750-26Q & ICX6610-48, Avaya VSP 7000 MDA 2, etc.



Cisco ASR 9000 Series(A9K-MPA-1X40GE)



ARISTA 7050S-64(DCS-7050S-64)



Juniper MX960



Brocade ICX 7750-26Q



Extreme Networks X670V VIM-40G4X



Mellanox M3601Q



Dell N4032F



HP 5406R ZL2 V3(J9996A)



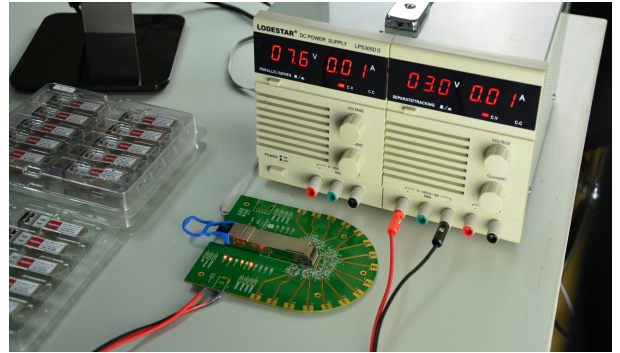
AVAYA 7024XLS(7002QQ-MDA)

## Test Assured Program

FS.COM truly understands the value of compatibility and interoperability to each optics. Every module FS.COM provides must run through programming and an extensive series of platform diagnostic tests to prove its performance and compatibility. In our test center, we care of every detail from staff to facilities—professionally trained staff, advanced test facilities and comprehensive original-brand switches, to ensure our customers to receive the optics with superior quality.



Our smart data system allows effective product management and quality control according to the unique serial number, properly tracing the order, shipment and every part.



Our in-house coding facility programs all of our parts to standard OEM specs for compatibility on all major vendors and systems such as Cisco, Juniper, Brocade, HP, Dell, Arista and so on.



With a comprehensive line of original-brand switches, we can recreate an environment and test each optics in practical application to ensure quality and distance.



The last test assured step to ensure our products to be shipped with perfect package.

## Order Information

Part Number	Description
SFP28-25G-BX	25G SFP28 1270nm-TX/1330nm-RX 10km DOM Transceiver
SFP28-25G-BX	25G SFP28 1330nm-TX/1270nm-RX 10km DOM Transceiver
SFP28-25G-BX40	25G SFP28 1270nm-TX/1310nm-RX 40km DOM Transceiver
SFP28-25G-BX40	25G SFP28 1310nm-TX/1270nm-RX 40km DOM Transceiver
SFP28-25G-BX-I	25G SFP28 1270nm-TX/1330nm-RX 10km Industrial DOM Transceiver
SFP28-25G-BX-I	25G SFP28 1330nm-TX/1270nm-RX 10km Industrial DOM Transceiver
SFP28-25G-BX40-I	25G SFP28 1270nm-TX/1310nm-RX 40km Industrial DOM Transceiver
SFP28-25G-BX40-I	25G SFP28 1310nm-TX/1270nm-RX 40km Industrial DOM Transceiver

**Note:**  
25G SFP28 transceiver module is individually tested on corresponding equipment such as Cisco, Arista, Juniper, Dell, Brocade and other brands, and passes the monitoring of FS.COM intelligent quality control system.



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