

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

SFP28-25G-BX



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

FS'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
Transmitter						
Center Wavelength	λ_t	1265	1271	1277	nm	
		1325	1331	1337	nm	
spectral width(-20dB)	$\Delta\lambda$			1	nm	
Average Optical Power	P_{avg}	-5.0		+2.0	dBm	1
Laser Off Power	P_{off}			-30	dBm	
Side Mode Suppression Ratio		30				
Extinction Ratio	ER	3.5			dB	
Optical Return Loss Tolerance				-12	dB	
Receiver						
Center Wavelength	λ_r	1325	1331	1337	nm	
		1265	1271	1277	nm	
Receiver Sensitivity	S_{en}			-9	dBm	2
Los Assert	LOS_A	-30			dBm	
Los Dessert	LOS_D			-16	dBm	
Los Hysteresis	LOS_H	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 = 5×10^{-5} .

II. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Maximum Supply Voltage	V _{CC}	0		3.6	V	
Storage Temperature	T _S	-40		85	° C	
Case Operating Temperature	T _A	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 _{CC}	3.14		3.46	V	
Supply Current	I _{CC}			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 _{in}		100		Ω	1
Differential Data Input 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 (Rx)

Single Ended Output Voltage Tolerance	V	-0.3		4	V	
Rx Output Diff Voltage	V _o	180		450	mV	
LOS asserted	V _{LOS fault}	2		V _{CCHOST}	V	4
LOS de-asserted	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 4.7kΩ – 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)

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

Receiver (Rx)

Center Wavelength	λ_r	1325	1331	1337	nm	
		1265	1271	1277	nm	
Receiver Sensitivity	Sen			-13	dBm	2
Overload		2			dBm	
LOS De-Assert	LOS _A			-14	dBm	

LOS Assert	LOS _A	-30	-23		dBm	
LOS Hysteresis		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 =5x 10⁻⁵ .

V. Digital Diagnostic Specifications

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

VI. Timing Characteristics

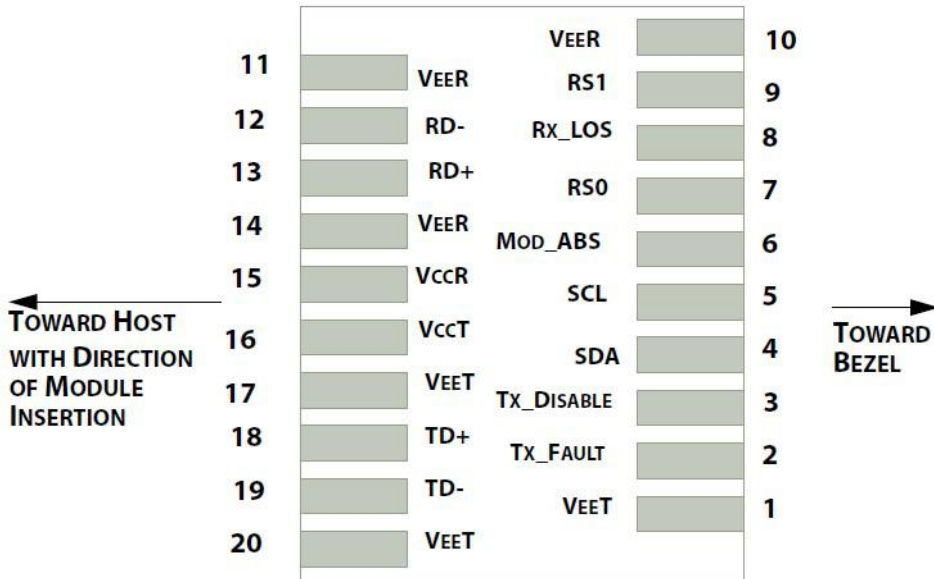
Parameter	Symbol	Min	Typ.	Max	Unit
TX_Disable Assert Time	t _{off}			100	us
TX_Disable Negate Time	t _{on}			2	ms
Time to Initialize 2-wire interface	t _{2w_start_up}			300	ms
Time to Initialize	t _{start_up}			300	ms
Time to Initialize cooled module and time to power up a cooled module to Power level II	t _{start_up_cooled}			90	s
Time to Power Up to Level II	t _{power_level2}			300	ms
Time to Power Down from Level II	t _{power_down}			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

VII. Pin Description

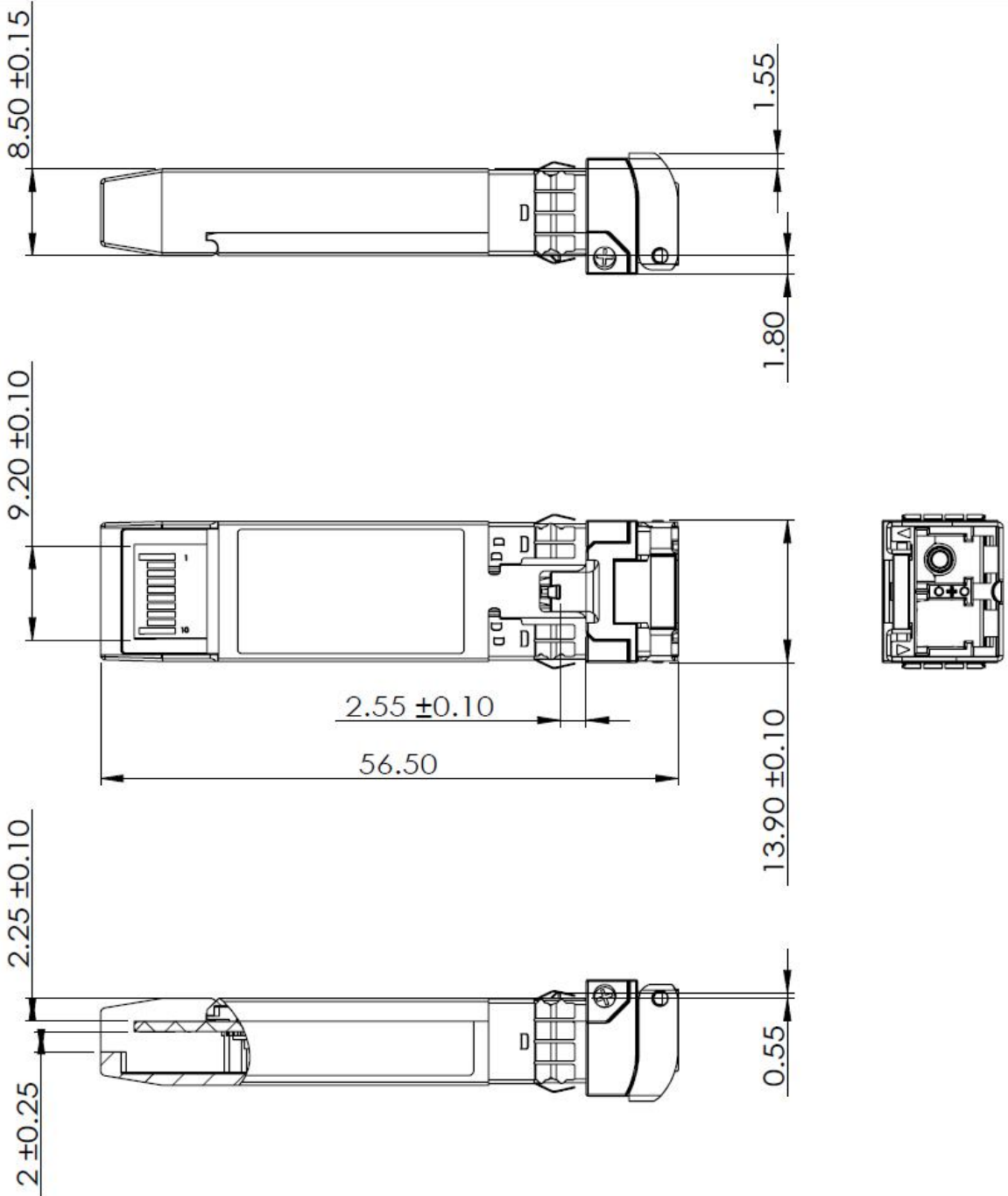
Pin	Name	Function	Notes
1	V _{EET}	Module transmitter ground	1
2	Fault	Module transmitter Fault	2
3	Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDL	2 wire serial interface data input/output (SDA)	4
5	SCL	2 wire serial interface clock input (SCL)	4
6	MOD_ABS	Module Absent, connect 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 _{EER}	Module receiver ground	1
11	V _{EER}	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	V _{EER}	Module receiver ground	1
15	V _{CCR}	Module receiver 3.3V supply	
16	V _{CCT}	Module transmitter 3.3V supply	
17	V _{EET}	Module transmitter ground	1
18	TD+	Transmitter non-inverted data out put	
19	TD-	Transmitter inverted data out put	
20	V _{EET}	Module transmitter ground	1

Notes:

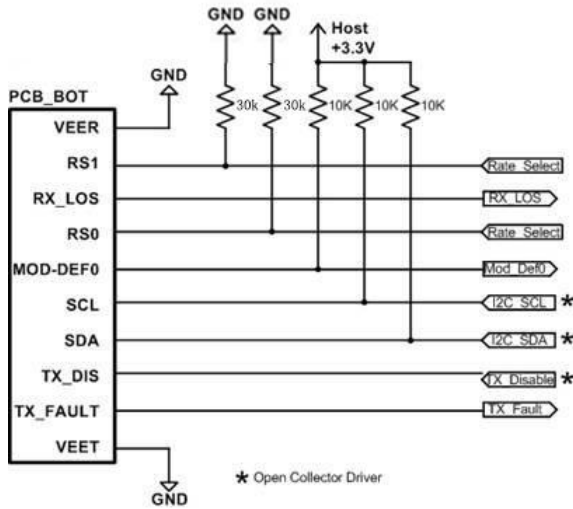
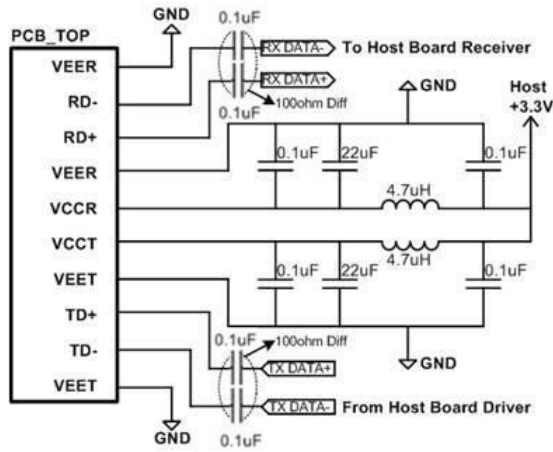
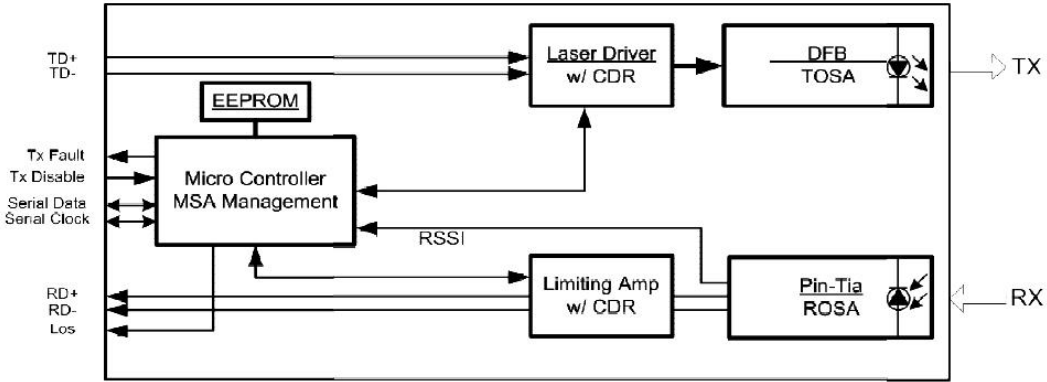
1. The module ground pins shall be isolated from the module case.
2. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.
3. This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.
4. This pin is an open collector/drain output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



VIII. Mechanical Specifications



IX. Transceiver Block Diagram



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.

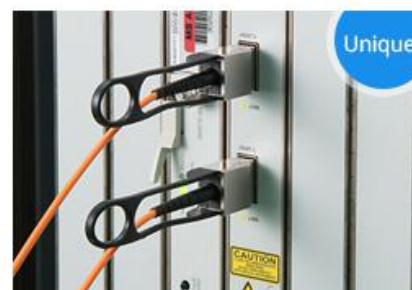
The original switches could be found nowhere but at FS.COM test center, eg: Juniper MX960 & EX 4300 series, Cisco Nexus 9396PX & Cisco ASR 9000 Series, HP 5900 Series & HP 5406R ZL2 V3(J9996A), Arista 7050S-64, Brocade ICX7750-26Q & ICX6610-48, Avaya VSP 7000 MDA 2, etc.



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)



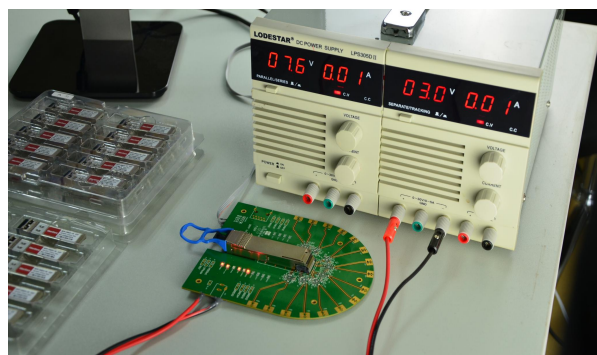
AVAYA 7024XLS(7002QQ-MDA)

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
SFP28-25GSR-85	25G SFP28 850nm 100m DOM Transceiver
SFP28-25GLR-31	25G SFP28 1310nm 10km DOM Transceiver
SFP28-25GER-31	25G SFP28 1310nm 30km DOM Transceiver
SFP28-25GER-31	25G SFP28 1310nm 40km DOM Transceiver
SFP28-25G-BX	25G SFP28 1270nm-TX/1330nm-RX 10km DOM Transceiver
SFP28-25G-BX	25G SFP28 1330nm-TX/1270nm-RX 10km DOM Transceiver
CWDM-SFP25G-10SP	25G CWDM SFP28 1270nm 10km DOM Transceiver
CWDM-SFP25G-10SP	25G CWDM SFP28 1290nm 10km DOM Transceiver
CWDM-SFP25G-10SP	25G CWDM SFP28 1310nm 10km DOM Transceiver
CWDM-SFP25G-10SP	25G CWDM SFP28 1330nm 10km DOM Transceiver
CWDM-SFP25G-10SP	25G CWDM SFP28 1350nm 10km DOM Transceiver
CWDM-SFP25G-10SP	25G CWDM SFP28 1370nm 10km DOM Transceiver

Notes:

1. 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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