

# 25GBASE- SFP28 1270nmTX/1310nmRX 40km Industrial DOM Transceiver

SFP28-25G-BX40-I



## Applications

- 25GBASE-ER
- CPRI Option 10/e CPRI

## Standards

- SFF-8472
- SFF-8402
- SFF-8432
- SFF-8431
- CEI-28G-VSR

## Features

- Up to 40 km Transmission Distance
- Low Power Consumption <1.5W
- Single 3.3V ±5% Power Supply
- LC Single Connector
- -40°C to 85°C Operating Case Temperature Range
- Compliant with SFF-8472

## Description

The SFP28 transceiver is designed for use in Ethernet/eCPRI/ CPRI links up to 25Gb/s data rate and up to 40km link length. They are compliant with SFF8472, SFF-8402, SFF-8432 and applicable portions of SFF-8431. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

## Product Specifications

### I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
<b>Storage Temperature</b>	$T_S$	-40	85	°C
<b>Supply Voltage</b>	$V_{CC}$	-0.3	3.6	V
<b>Relative Humidity</b>	RH	0	95	%

### II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
<b>Operating Case Temperature Range</b>	$T_C$	-40		85	°C
<b>Power Supply Voltage</b>	$V_{CC}$	3.135	3.3	3.465	V
<b>Bit Rate</b>	BR		25.78125		Gb/s
<b>Max Supported Link Length</b>	L			40	km

### III. Electrical Characteristics (T<sub>c</sub>=-40°C to 85°C and V<sub>cc</sub>= 3.135 to 3.465V)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
<b>Supply Voltage</b>	V <sub>CC</sub>	3.14	3.3	3.46	V	
<b>Supply Current</b>	I <sub>CC</sub>			360	mA	
<b>Transmitter</b>						
<b>Input Differential Impedance</b>	R <sub>in</sub>		100		Ω	
<b>Single Ended Data Input Swing</b>	V <sub>in</sub>	90		450	mVp-p	
<b>Transmit Disable Voltage</b>	V <sub>DIS</sub>	2		V <sub>CCHOST</sub>	V	
<b>Transmit Enable Voltage</b>	V <sub>EN</sub>	V <sub>EE</sub>		V <sub>EE</sub> +0.8	V	
<b>Transmit Fault Assert Voltage</b>	T <sub>FA</sub>	2.2		V <sub>CCHOST</sub>	V	
<b>Transmit Fault De-Assert Voltage</b>	V <sub>FDA</sub>	V <sub>EE</sub>		V <sub>EE</sub> +0.4	V	
<b>Receiver</b>						
<b>Single Ended Data Output Swing</b>	V <sub>OD</sub>	200		450	mVp-p	
<b>LOS Fault</b>	V <sub>LOSFT</sub>	2.2		V <sub>CCHOST</sub>	V	
<b>LOS Normal</b>	V <sub>LOSNR</sub>	V <sub>EE</sub>		V <sub>EE</sub> +0.4	V	

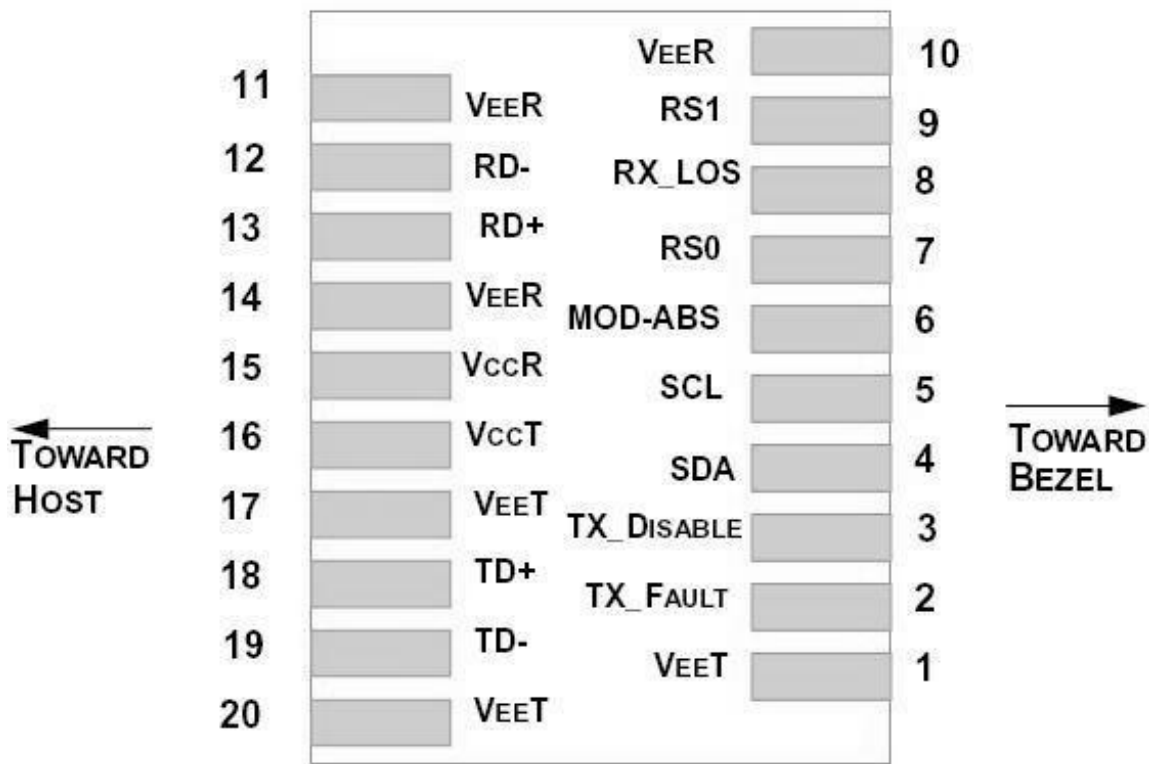
**IV. Optical Parameters** ( $T_{OP} = 0$  to  $70$  °C,  $V_{CC} = 3.00$  to  $3.60$  Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
<b>Transmitter</b>						
<b>Center Wavelength</b>	$\lambda$	1260	1270	1280	nm	1
		1300	1310	1320	nm	2
<b>Side Mode Suppression Ratio</b>	SMSR	30			dB	
<b>Optical Output Power</b>	$P_{av}$	0		6	dBm	
<b>Extinction Ratio</b>	ER	4			dB	
<b>Transmitter and Dispersion Penalty</b>	TDP			1.5	dB	
<b>Average Launch Power of OFF Transmitter</b>	$P_{OFF}$			-30	dBm	
<b>Receiver</b>						
<b>Center Wavelength</b>	$\lambda$	1300	1310	1320	nm	1
		1260	1270	1280	nm	2
<b>Overload</b>				-6	dBm	
<b>Receiver Power</b>	$P_{av}$	-18			dBm	3
<b>Assert LOS</b>	$LOS_A$	-30			dBm	
<b>De-Assert LOS</b>	$LOS_D$			-20	dBm	
<b>LOS Hysteresis</b>		0.5			dB	

**Note:**

1. RTX330-238.
2. RTX330-239.
3. Measured with 25.78125Gb/s, PRBS 231-1, NRZ, ER>4dB, BER<5E-5.

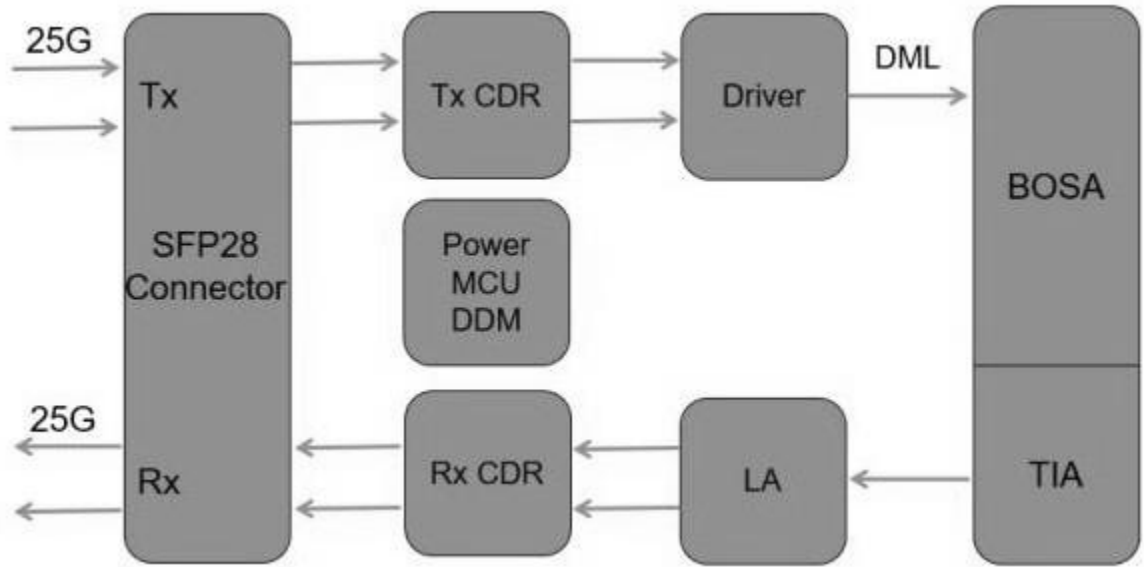
## V. Pin Assignment



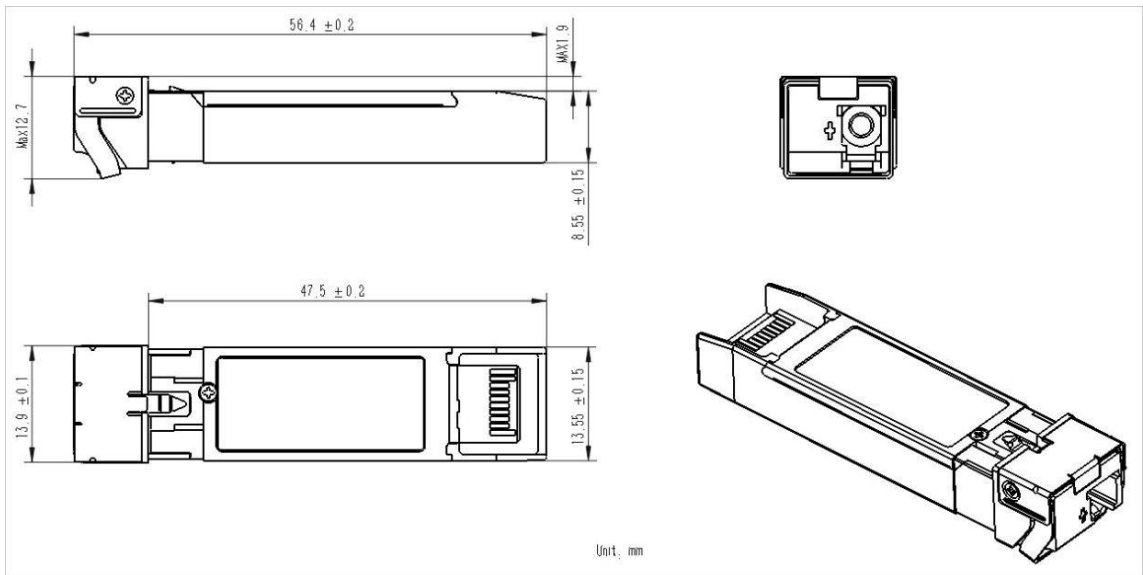
## VI. Transceiver Pin Descriptions

Pin No.	Symbol	Logic	Description
1,17,20	$V_{EE}T$		Connected to signal ground on the host board
2	TX Fault	LVTTTL Output	Module transmitter fault output
3	TX Disable	LVTTTL Input	Module transmitter disable control
4	SDA	LVTTTL Input/Output	2-wire serial interface data
5	SCL	LVTTTL Input/Output	2-wire serial interface clock
6	MOD-ABS		Module absent (connected to Module ground)
7	RS0	LVTTTL Input	Rate select 0 (Rx) :Low=CDR Bypass ; High=CDR Select
8	LOS	LVTTTL Output	Receiver loss of signal
9	RS1	LVTTTL Input	Rate select 1 (Tx) :Low=CDR Bypass ; High=CDR Select
10,11,14	$V_{EE}R$		Connected to signal ground on the host board.
12	RD-	CML Output	Receiver inverted data output, internally AC coupled and terminated
13	RD+	CML Output	Receiver non-inverted data output, internally AC coupled and terminated.
15	$V_{CC}R$		Receiver power 3.3V supply
16	$V_{CC}T$		Transmitter power 3.3V supply
18	TD+	CML Input	Transmitter non-inverted data input, internally AC coupled and terminated.
19	TD-	CML Input	Transmitter inverted data Input, internally AC coupled and terminated.

## VII. Principle Diagram



## VIII. Mechanical Dimensions:



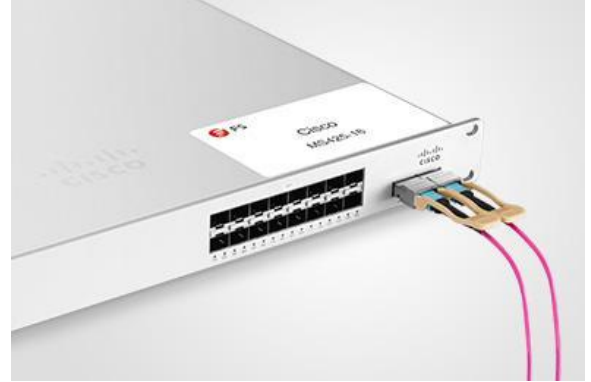
## Test Center

### I. Compatibility Testing

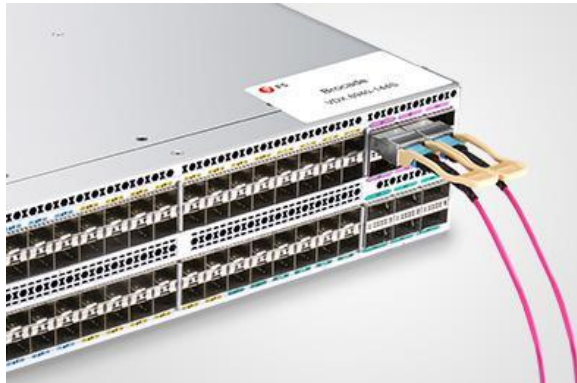
Each fiber optical transceiver has been tested in host device on site in FS Assured Program to ensure full compatibility with over 200 vendors.



Cisco Catalyst C9500-24Y4C



Cisco MS425-16



Brocade VDX 6940-144S



Dell EMC Networking Z9100-ON



Force@tm S60-44T



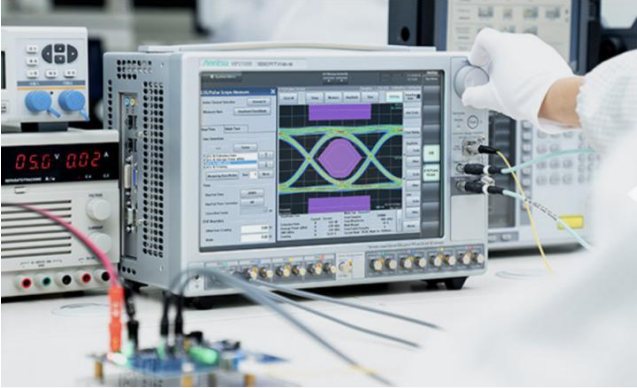
HUAWEI S6720-30L-HI-24S

Above is part of our test bed network equipment. For more information, please click the Test Bed PDF. It will be updated in real time as we expand our portfolio.



## II. Performance Testing

Each fiber optical transceiver has been fully tested in FS Assured Program equipped with world's most advanced analytical equipment to ensure that our transceivers work perfectly on your device.



### 1. TX/RX Signal Quality Testing

Equipped with the all-in-one tester integrated 4ch BERT & sampling oscilloscope, and variable optical attenuator to ensure the input and output signal quality.

- Eye Pattern Measurements: jitter, Mask Margin, etc
- Average Output Power
- OMA
- Extinction Ratio
- Receiver Sensitivity
- BER Curve

### 2. Reliability and Stability Testing

Subject the transceivers to dramatic changes in temperature on the thermal shock chamber to ensure reliability and stability of the transceivers.

- Commercial: 0 °C to 70 °C
- Extended: -5 °C to 85 °C
- Industrial: -40 °C to 85 °C



### 3. Transfer Rate and Protocol Testing

Test the actual transfer data rate and the transmission ability under different protocols with Network Master Pro.

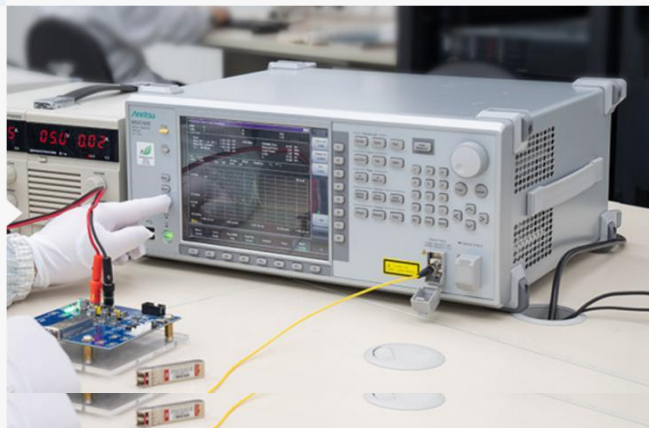
- Ethernet
- Fibre Channel
- SDH/SONET
- CPRI



### 4. Optical Spectrum Evaluation

Evaluate various important parameters with the Optical Spectrum Analyzer to meet the industry standards.

- Center Wavelength, Level
- OSNR
- SMSR
- Spectrum Width



## Ordering 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-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



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