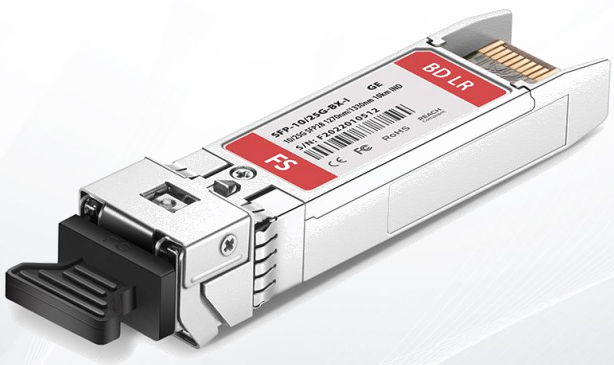
10/25GBASE-BX SFP28 1270nm-TX/1330nm-RX 10km Industrial DOM Transceiver

SFP-10/25G-BX-I



Application

- 10/25G Ethernet
- 25GBASE-LR
- Data Center
- CPRI Option 10 / eCPRI

Standards

- IEEE802.3cc
- SFF-8472
- SFF-8402
- SFF-8432
- SFF-8431
- CEI-28G-VSR

Features

- Maximum Power Consumption 1.5W
- Operating Data Rate Up to to 25.78Gbps
- Transmission Distance Up to 10km
- Industrial Temperature Range: -40~ +85°C
- Single 3.3V±5% Power Supply
- LC Single Connector
- Hot Pluggable SFP+ MSA and SFP28 MSA Compliat
- Digital Diagnostic Monitoring(DOM) Supported
- Class 1 Laser Safety

Description

FS's SFP28 transceiver supports up to 10km link lengths over OS2 SMF via an LC simplex connector and is suitable for 10/25G Ethernet, CPRI/eCPRI and Data Center applications.This bi-directional unit must be used with another transceiver or network equipment of complementary wavelengths. It is compliant with IEEE 802.3cc, SFP MSA, SFP28 MSA, SFF-8402, SFF-8472, SFF-8432, SFF-8431 and CEI-28G-VSR standards. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters.

The SFP-10/25G-BX-I is for industrial operating temperature range and can work in harsh industrial environments, such as telecommunication, data processing & management, the application of industrial and factory automation, outdoor applications, rail and intelligent transportation systems (ITSs), marine, oil and gas, mining etc.

Products Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature Range	T_C	-45	85	°C
Supply Voltage	V_{CC}	-0.3	3.6	V
Relative Humidity	RH	0	85	%

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature Range	T_S	-40		85	°C
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Bit Rate	BR	10.3125		25.78125	Gb/s
Max. Supported Link Length	L			10	km

III. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ	1260	1270	1280	nm	Upstream
		1320	1330	1340		Downstream
Spectral Width | -20dB				1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power(25Gbps)	P_{AVG}	-7		2.5	dBm	
Average Launch Power(10Gbps)	P_{AVG}	-8		1	dBm	
Transmitter and Dispersion Penalty 25G | BER=5E-5	TDP			2.7	dB	
Average Launch Power of OFF Transmitter	P_{OFF}			-30	dBm	
Extinction Ratio	ER	3			dB	
RIN20OMA	RIN			-130	dB/Hz	
Optical Return Loss Tolerance				20	dB	
Mask Margin		5			%	1
Receiver						
Center Wavelength	λ	1320	1330	1340	nm	Upstream
		1260	1270	1280		Downstream
Overload		2.5			dBm	

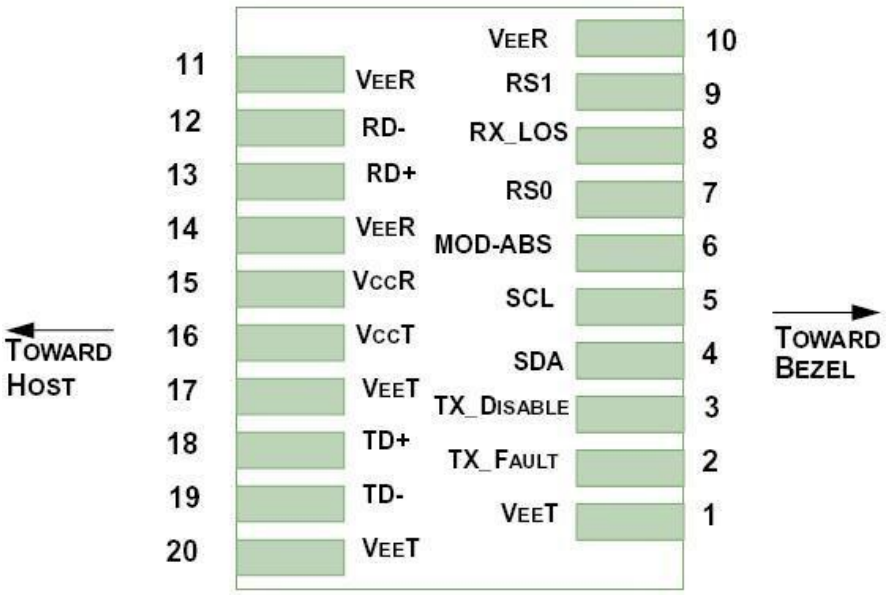
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
OMA Receiver Sensitivity Up to 25G 5E-5	P_{OMA}			-12	dBm	
Assert LOS	LOS_A	-30			dBm	
De-Assert LOS	LOS_D			-15	dBm	
LOS Hysteresis		0.5			dB	

NOTE 1: Template: {0.31, 0.40, 0.45, 0.34, 0.38, 0.40}, Hit Ratio: 5E-5.

IV. Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	V_{CC}	3.14	3.3	3.46	V	
Supply Current	I_{CC}			360	mA	@3.3V
Transmitter (Module Input, TP1)						
Input Differential Impedance	R_{IN}		100		Ω	
Single Ended Data Input Swing	V_{IN}	90		450	mV_{p-p}	
Transmit Disable Voltage	V_{DIS}	2		V_{CC}HOST	V	
Transmit Enable Voltage	V_{EN}	V_{EE}		V_{EE}+0.8	V	
Transmit Fault Assert Voltage	V_{FA}	2.2		V_{CC}HOST	V	
Transmit Fault De-Assert Voltage	V_{FDA}	V_{EE}		V_{EE}+0.4	V	
Receiver						
Single Ended Data Output Swing	V_{OD}	200		450	mV_{p-p}	
LOS Fault	V_{LOSFT}	2.2		V_{CC}HOST	V	
LOS Normal	V_{LOSNR}	V_{EE}		V_{EE}+0.4	V	

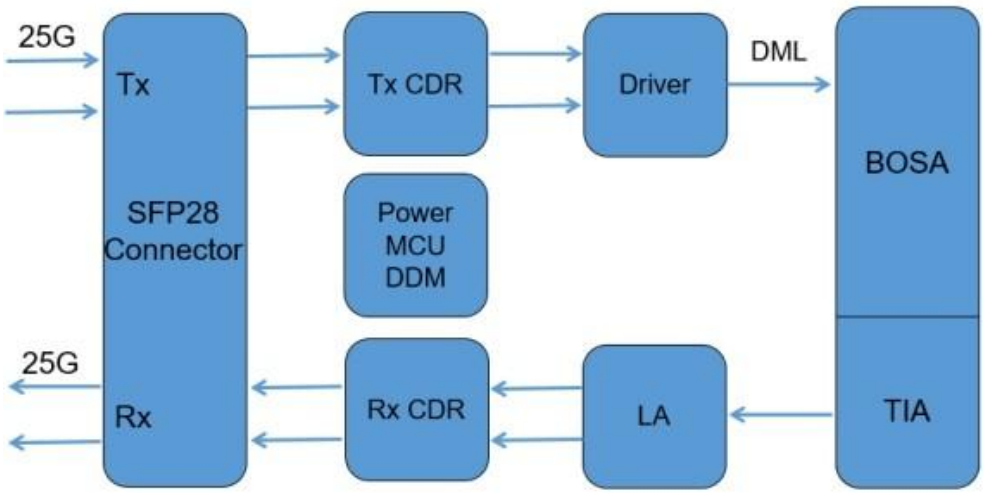
V. Pin Description



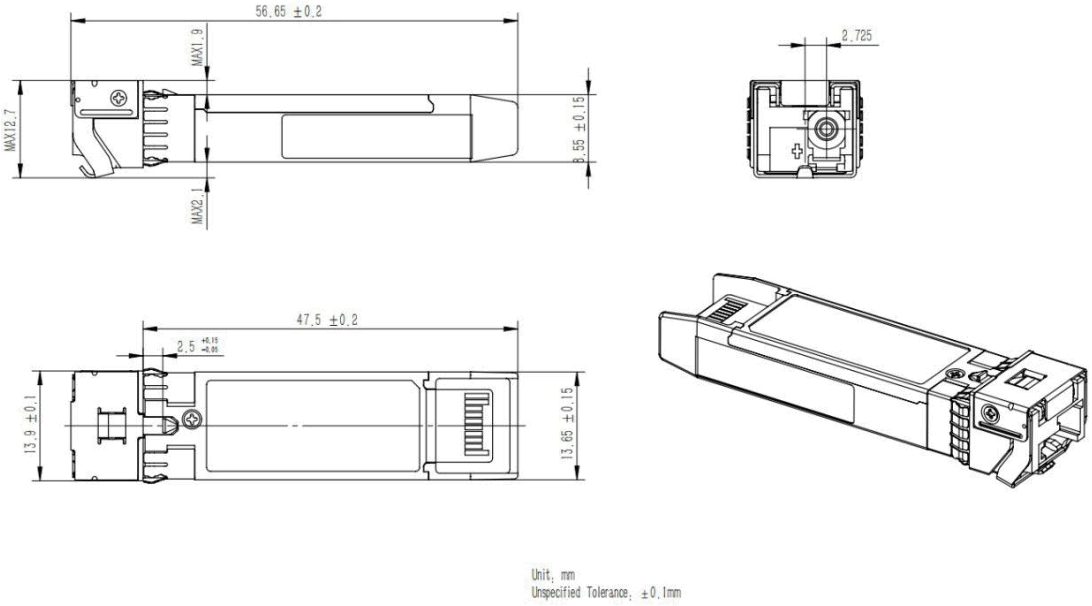
Pin Number	Symbol	Name	Description
1, 17, 20	$V_{ee}T$		Connected to Signal Ground on the Host Board
2	TX Fault	LVTTL Output	Module Transmitter Fault Output
3	TX Disable	LVTTL Input	Module Transmitter Disable Control
4	SDA	LVTTL Input/Output	2-wire Serial Interface Data
5	SCL	LVTTL Input/Output	2-wire Serial Interface Clock
6	MOD-ABS		Module Absent (Connected to Module Ground)
7	RS0	LVTTL Input	Rate Select 0 (Rx): Low=CDR Bypass; High=CDR Select
8	LOS	LVTTL Output	Receiver Loss of Signal
9	RS1	LVTTL 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

Pin Number	Symbol	Name	Description
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

VI. Principle Diagram



VII. Diagram Mechanial Drawing



VIII. Regulatory Compliance

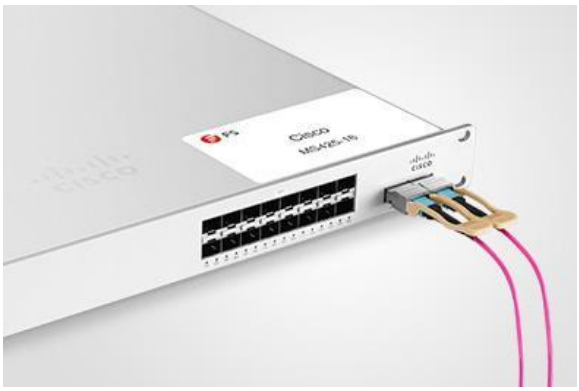
Feature	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883C Method 3015.7	Class 1 (> 1500 Volts)
Electrostatic Discharge (ESD) Immunity	Variation of IEC 61000-4-2	LV 4(Air Discharge :15KV; Contact Discharge: 8 KV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B EN55022 Class B FCC Class B	Compliant with Standards
Immunity	IEC61000-4-3 Class 2 EN55024	Typically Show No Measurable Effect from a 3v/m Field Swept from 80 to 1000mhz Applied to the Transceiver Without a Chassis Enclosure

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

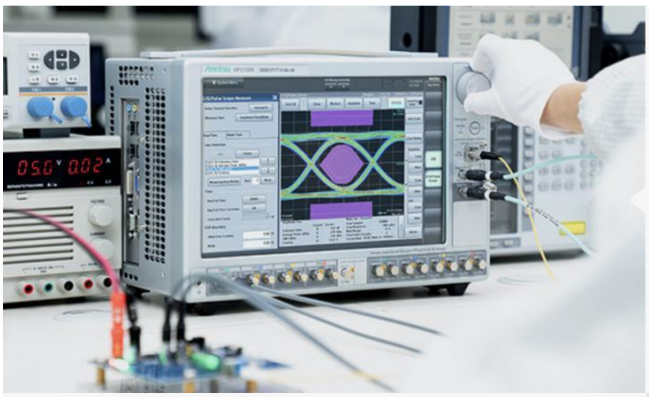
Force⑩tm S60-44T

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

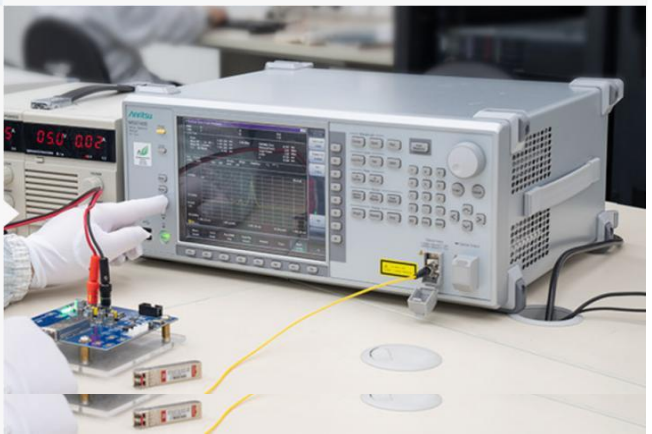
Test the actual transfer data rate and the transmission ability under different protocols with Network Master Pro.

- Ethernet
- Fibre Channel
- SDH/SONET
- CPRI

4. Optical Spectrum Evaluation

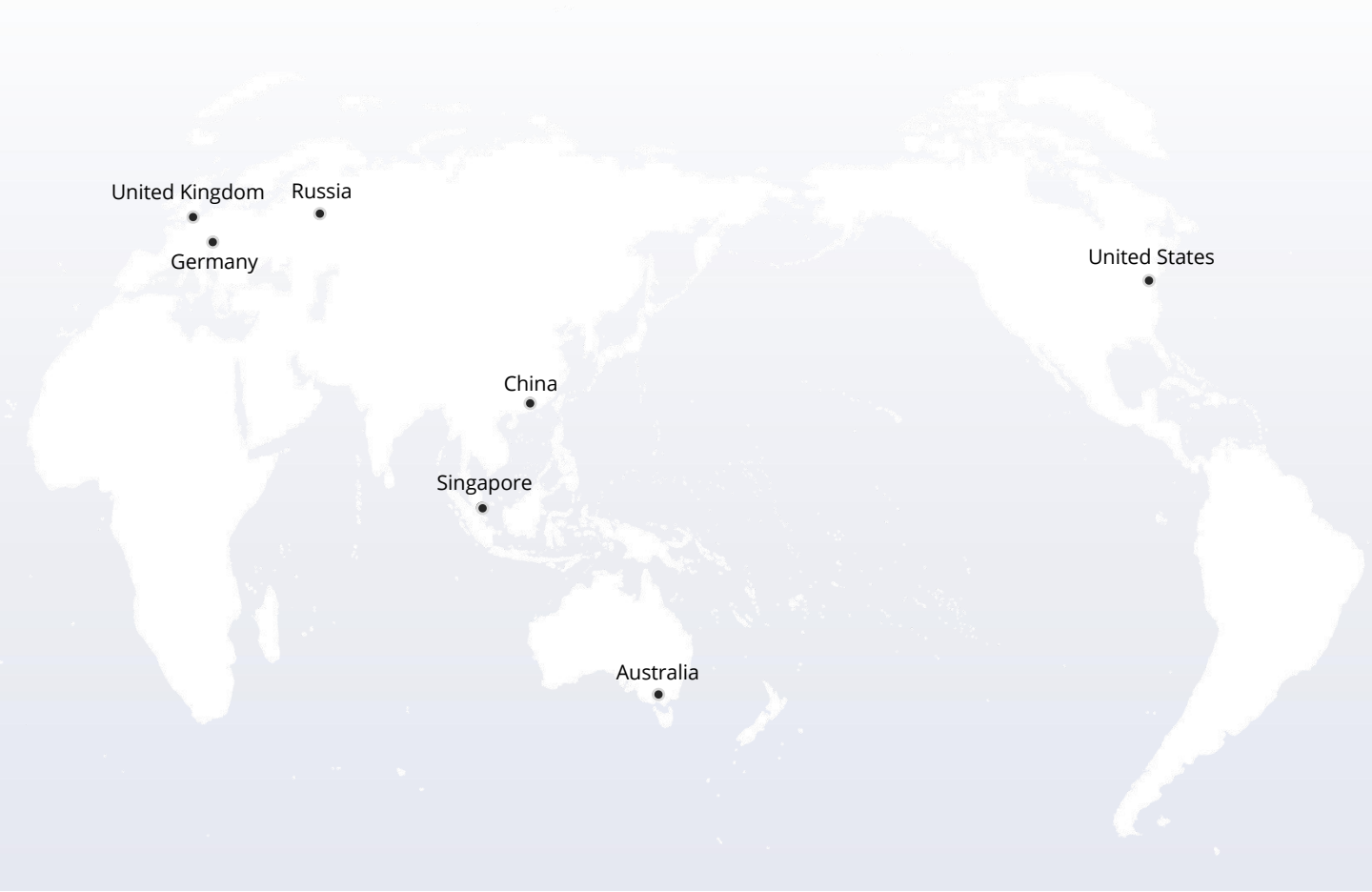
Evaluate various important parameters with the Optical Spectrum Analyzer to meet the industry standards.

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



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-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-BX20	25G SFP28 1270nm-TX/1330nm-RX 20km DOM Transceiver
SFP28-25G-BX20	25G SFP28 1330nm-TX/1270nm-RX 20km DOM Transceiver
SFP28-25G-BX20-I	25G SFP28 1270nm-TX/1330nm-RX 20km Industrial DOM Transceiver
SFP28-25G-BX20-I	25G SFP28 1330nm-TX/1270nm-RX 20km Industrial 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-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
SFP-10/25G-BX-I	10/25G SFP28 1270nm-TX/1330nm-RX 10km Industrial DOM Transceiver
SFP-10/25G-BX-I	10/25G SFP28 1310nm-TX/1270nm-RX 10km Industrial DOM Transceiver



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