10GBASE-T SFP+ Copper RJ-45 30m Transceiver

SFP-10G-T

Application

- 10GBASE-T 10G Ethernet

Features

- Hot-pluggable SFP footprint
- Support 10GBASE-T / 5GBASE-T / 2.5GBASE-T / 1000BASE-T
- Compact RJ-45 connector assembly
- Industrial temperature range: -40 to 85°C
- Commercial temperature range : 0 to 70°C
- Single +3.3V power supply
- 10 Gigabit Ethernet over Cat6a/Cat7 cable
- RoHS compliant and lead-free

Description

105GBASE-T / 2.5GBASE-T / 1000BASE-T standards as specified in IEEE Std 802.3. 10GBASE-T SFP+ copper transceivers use the SFP's RX_LOS pin for link indication. If pull up SFP's TX_DISABLE pin, PHY GBASE-T SFP+ copper transceivers are based on the SFP Multi-Source Agreement (MSA). They are compatible with the 10GBASE-T / IC will be reset.

Product Specifications

I.General Specifications

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Bit Rate	BR	1		10	Gb/sec	IEEE 802.3 compatible. See Notes 1 below

Note:

1. Clock tolerance is +/- 50 ppm

II. Environmental Specifications

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Operating Temperature	T_A	-40		85	℃	Case temperature
	T_A	0		75	℃	
Storage Temperature	Tsto	-40		85	℃	Ambient temperature

Note:

1.Automatic crossover detection is enabled. External crossover cable is not require

III. Transmission Distances

Standard	Cable	Reach	Host Port
10GBASE-T	Cat6a/Cat7	30m	XFI
5GBASE-T/2.5GBASE-T	Cat5e	50m	5GBASE-R/2.5GBASE-X
1000BASE-T	Cat5e	100m	1000BASE-FX

IV. Electrical Characteristics

MOD_DEF(1) (SCL) and MOD_DEF(2) (SDA), are open drain CMOS signals (see section VII, "Serial Communication Protocol"). Both MOD_DEF(1) and MOD_DEF(2) must be pulled up to host_Vcc

Low-Speed Signals, Electronic Characteristics					
Parameter	**Symbol**	**Min**	**Max**	**Unit**	**Notes/Conditions**
SFP Output LOW	VOL	0	0.5	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
SFP Output HIGH	VOH	host_Vcc -0.5	host_Vcc + 0.3	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
SFP Input LOW	VIL	0	0.8	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector
SFP Input HIGH	VIH	2	Vcc + 0.3	mV	4.7k to 10k pull-up to Vcc, measured at SFP side of connector

V. +3.3V Volt Electrical Power Interface

The SFP-10G-T has an input voltage range of 3.3 V +/- 5%. The 4V maximum voltage is not allowed for continuous operation.

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Supply Current	Is		700	900	mA	3.0W max power over full range of voltage and temperature. See caution note below.
Input Voltage	Vcc	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	Vmax			4	V	1
Surge Current	Isurge		TBD		mA	Hot plug above steady statecurrent. See caution notebelow.

Caution: Power consumption and surge current are higher than the specified values in the SFP MSA.

VI. High-Speed Electrical Interface

All high-speed signals are AC-coupled internally.

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
High-Speed Electrical Interface, Transmission Line-SFP						
Line Frequency	fL		125		MHz	5-level encoding, perIEEE 802.3
Tx Output Impedance	Zout,TX		100		Ohm	Differential, for allfrequencies between1MHz and 125MHz
Rx Input Impedance	Zin,RX		100		Ohm	Differential, for allfrequencies between1MHz and 125MHz
High-Speed Electrical Interface, Host-SFP						
Single ended data inputswing	Vinsing	250		1200	mV	Single ended
Single ended data outputswing	Voutsing	350		800	mV	Single ended
Rise/Fall Time	Tr,Tf		175		psec	20%-80%
Tx Input Impedance	Zin		50		Ohm	Single ended
Rx Output Impedance	Zout		50		Ohm	Single ended

VII. Serial Communication Protocol

All FS.COM SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFPs use an MCU, can be accessed with address of A0h.

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Serial Bus Timing, Requirements						
I ^{2}C Clock Rate		0		200,000	Hz	

VIII. Pin Description

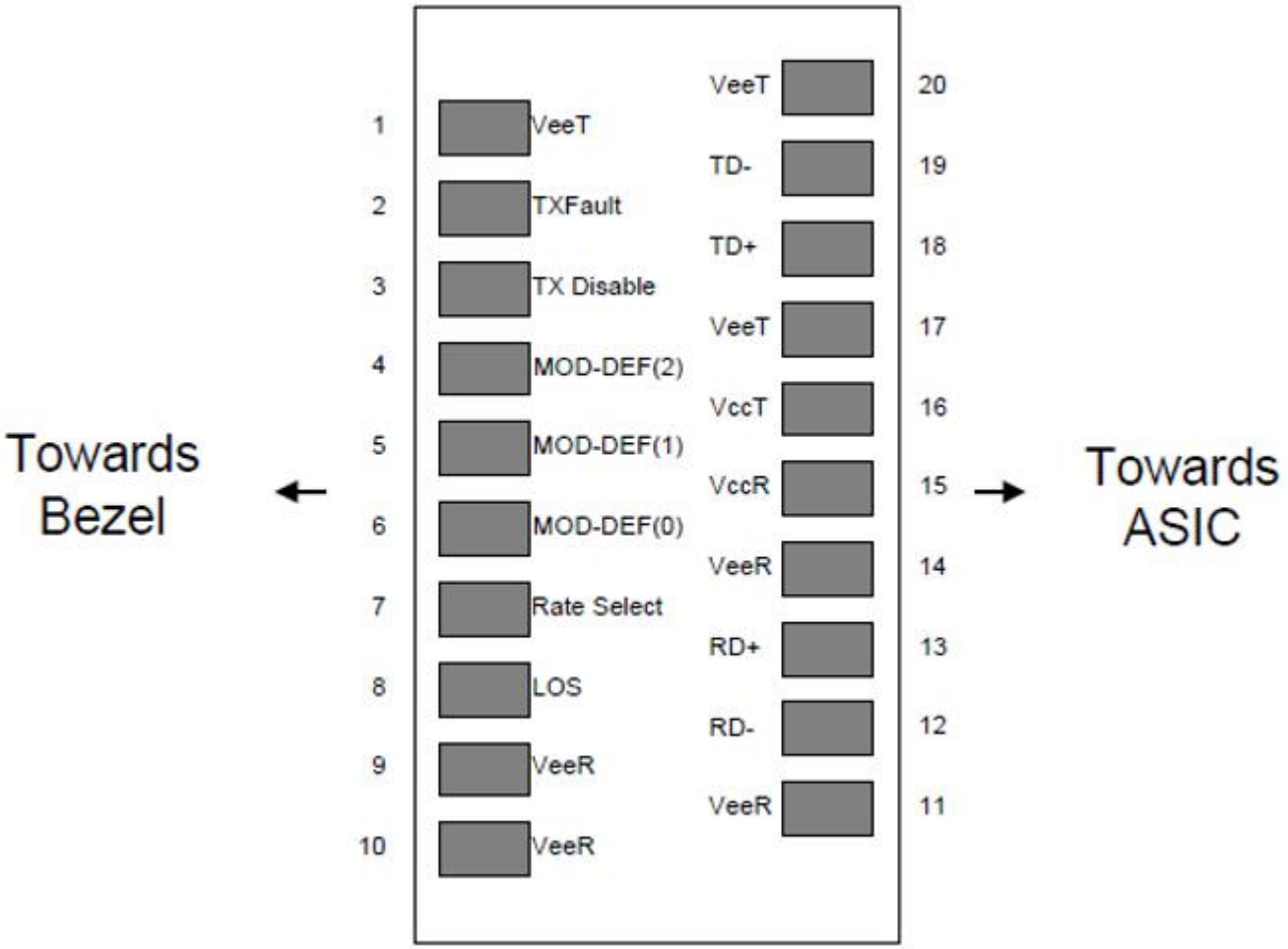


Figure 1. Diagram of Host Board Connector Block Pin Numbers and Names.

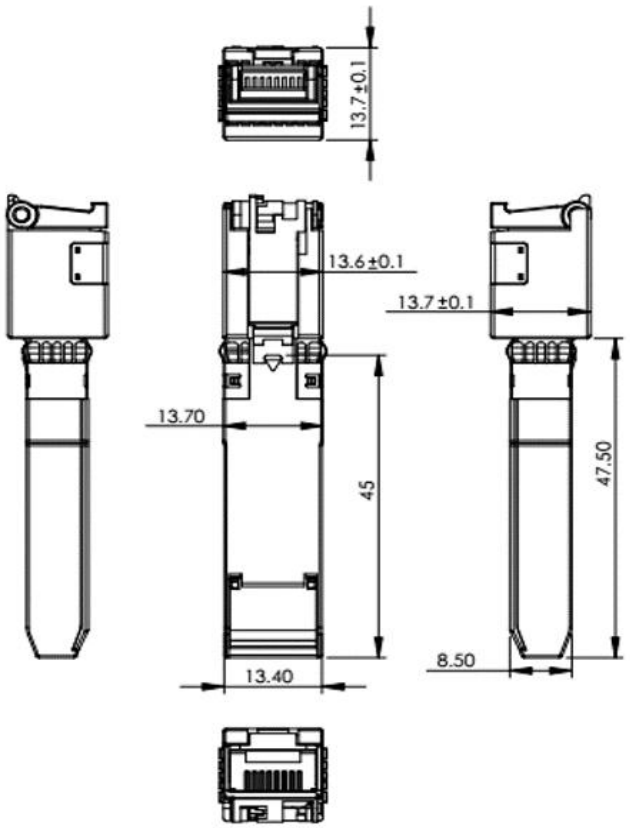
Pin	Symbol	Name/Description	Ref.
1	V_{EET}	Transmitter Ground(Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault. Not supported.	
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3

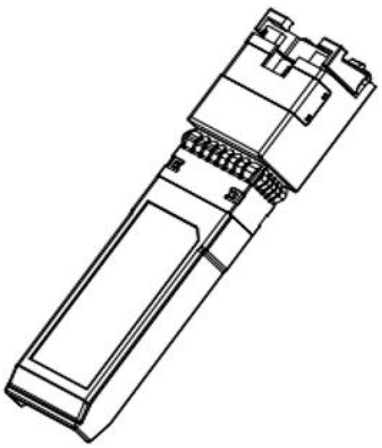
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required	
8	LOS	High indicates no linked. low indicates linked.	4
9	V_{EER}	Receiver Ground(Common with Transmitter Ground)	1
10	V_{EER}	Receiver Ground(Common with Transmitter Ground)	1
11	V_{EER}	Receiver Ground(Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled.	
14	V_{EER}	Receiver Ground(Common with Transmitter Ground)	1
15	V_{CCR}	Receiver Power Supply	
16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	Transmitter Ground(Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V_{EET}	Transmitter Ground(Common with Receiver Ground)	1

Notes:

1. Circuit ground is connected to chassis ground
2. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V
3. Should be pulled up with 4.7k - 10k Ohms on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LVTTL compatible with a maximum voltage of 2.5V.

IX. Mechanical Specifications



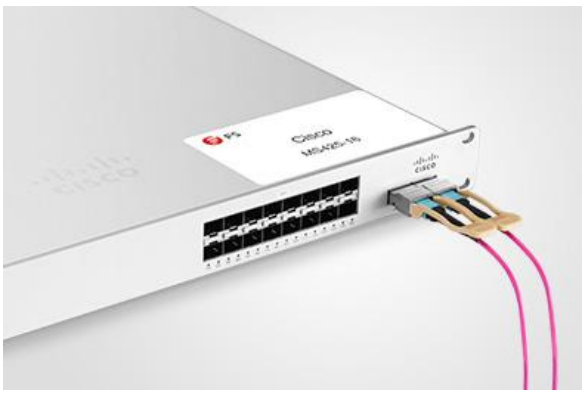


Test Center

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

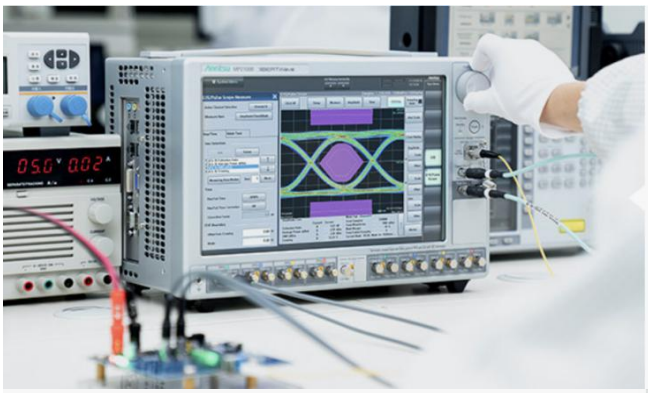
Force⑩tm S60-44T

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 Single Quality Testing

Equipped with the all-in-one tester integrated 4ch BERT & sampling oscilloscope, and variable optical attenuator 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 in temperature on the thermal shock chamber to ensure reliability and stability of the transceivers.

- Commercial: 0℃ to 70℃
- Extended: -5℃ to 85℃
- Industrial: -40℃ to 85℃

3. Transfer Rate and Protocol Testing

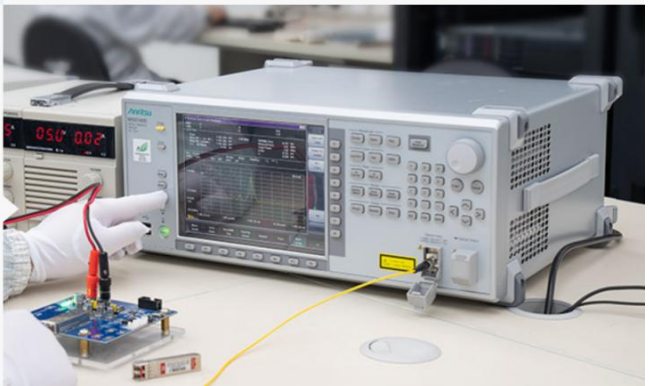
Test the actual transfer data rate and the transmission ability under different protocols with Networks Master Pro.

- Ethernet
- Fiber 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
SFP-10GSR-85	10GBASE-SR SFP+ 850nm 300m DOM Transceiver
SFP-10GLRM-31	10GBASE-LRM SFP+ 1310nm 220m DOM Transceiver
SFP-10GLR-31	10GBASE-LR SFP+ 1310nm 10km DOM Transceiver
SFP-10GER-55	10GBASE-ER SFP+ 1550nm 40km DOM Transceiver
SFP-10GZR-55	10GBASE-ZR SFP+ 1550nm 80km DOM Transceiver
SFP-10GZRC-55	10GBASE-ZR SFP+ 1550nm 100km DOM Transceiver
SFP-10GSR-85	Dual-Rate 1000BASE-SX and 10GBASE-SR SFP+ 850nm 300m DOM Transceiver
SFP-10GLR-31	Dual-Rate 1000BASE-LX and 10GBASE-LR SFP+ 1310nm 10km DOM Transceiver

Notes:

1. 10G SFP+ 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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