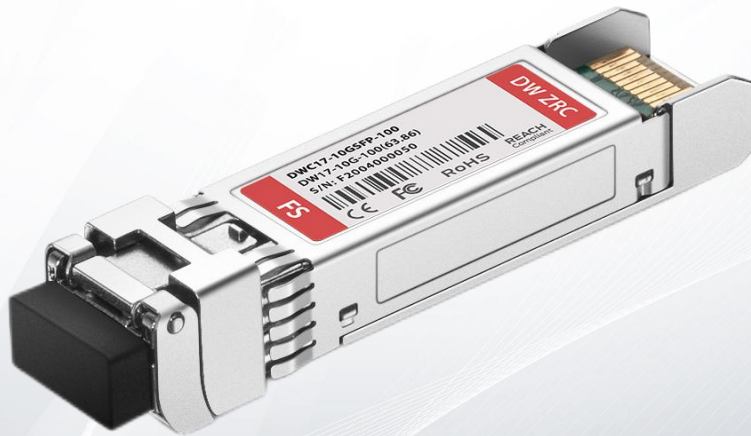


10G DWDM SFP+ 100GHz 1528.77nm-1563.86nm 100KM DOM Transceiver

DWxxx-10GSFP-100



Application

- 10GBASE-ZR/ZW & 10G Ethernet
- SDHSTM64 • Other Optical Links

Standards

- IEEE Std 802.3ae
- SFP+ MSA
- SFF-8472

Features

- Up to 11.3Gbps Data Links
- Up to 100km Transmission on SMF
- DWDM EML Transmitter and APD Receiver
- Duplex LC/UPC Type Pluggable Optical Interface
- Low Power Consumption $\leq 1.5W$
- Support Digital Diagnostic Monitoring Interface
- Dispersion Tolerance: 2000ps/nm
- Single 3.3V Power Supply
- Meet ESD Requirements, Resist 8KV Direct Contact Voltage
- Hot Pluggable SFP+ Footprint
- Case operating temperature
 - Commercial: 0~+70° C
 - Extended: -10~+80° C
 - Industrial: -40~+85° C

Description

FS’s SFP+ transceiver supports up to 100km link lengths over single-mode fiber (SMF) and is suitable for 10G Ethernet and Data Center applications. It is compliant with IEEE 802.3ae, SFP+ MSA, SFF-8472 standards. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters. It is suitable to be deployed in the DWDM networking equipment in metropolitan access and core networks.

Products Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature Range	T _c	-40	85	°C
Relative Humidity	RH	5	95	%
Power Supply Voltage	V _{CC}	0	3.6	V
RX Input Average Power	P _{max}		0	dBm

II. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Center Wavelength	AC	AC -0.1		AC +0.1	nm	
Center Wavelength Spacing			100		GHZ	
Optical Spectral Width	$\triangle \lambda$			1	nm	
Average Output Power	Pavg	1.0		7	dBm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	8.2			dB	
Transmitter and DispersionPenaltv	TDP			3	dB	
Average Launch Power of OFF Transmitter	POFF			-30	dBm	
Transmitter Eve Mask		Compliant with IEEE802.3ae				
Receiver						
Center Wavelength	Ac	1270		1610	nm	
Receiver Sensitivity(AVG)	RSENSE			-25	dBm	1
Input Saturation Power (Overload)	Psat	-8			dBm	
Optical Return Loss				-26	dB	
LOS Assert	LOSA	-35			dBm	
LOS De-Assert LOS	LOSD			-27	dBm	
LOS Hysteresis	RSENSE	0.5			dB	

Notes

- 1. λc refer to wavelength selection, and corresponds to approximately 0.8 nm.
- 2. Class 1 Laser Safety per FDA/CDRH and I EC-825-1 regulations.
- 3. Measured at 10.313Gbps,ER>3.5dBm, PRBS 231-1 and BER better than or equalto 10E-12

III. Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Data Rate	vcc		10.3125	11.1	Gbps	
Power Consumption	p			1500	mW	
Transmitter						
Input Differential Impedance	R _{IN}		100		Q	
Single-ended Data Input Swing	V _{IN}	180		700	mVp-p	
Transmit Disable Voltage	V _{DIS}	2		V _{CCHOST}	V	
Transmit Enable Voltage	V _{EN}	V _{EE}		V _{EE} +0.8	V	
Transmit Fault Assert Voltage	V _{FA}	2		V _{CCHOST}	V	
Transmit Fault De-Assert VoltageVoltage	V _{FDA}	V _{EE}		V _{EE} +0.4	V	
Receiver						
Single-ended Data Output Swing	V _{OD}	350		850	mVp-p	
LOS Fault	V _{LOSFT}	2		V _{CCHOS}	V	
LOS Normal	V _{LOSNR}	V _{EE}		V _{EE} +0.4	V	

IV. Pin Definition

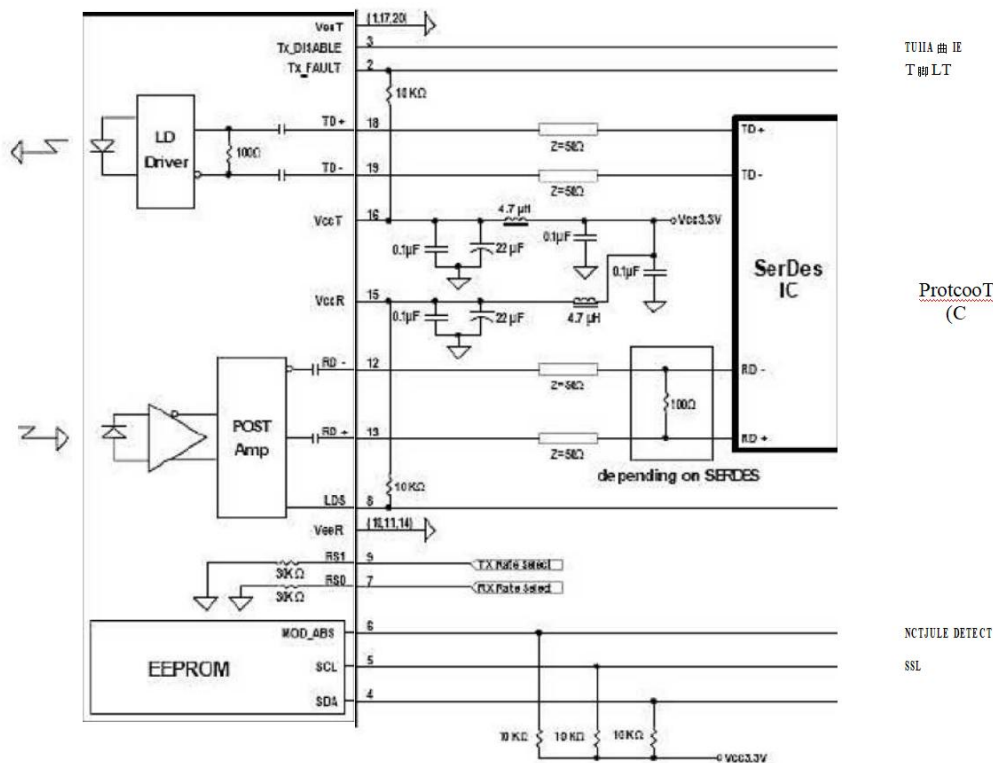
Pin	Symbol	Name/Description	Ref.
1	V _{EE} T	Transmitter Ground	1
2	Tx_FAULT	Transmitter Fault	2
3	Tx_DIS	Transmitter Disable. Laser Output Disabled on High or Open.	3
4	SDA	2-Wire Serial Interface Data Line	2
5	SCL	2-Wire Serial Interface Clock Line	2
6	MOD_ABS	Module Absent. Grounded within the Module	4
7	RS0	Rate Select 0	5
8	Rx_LOS	Loss of Signal Indication. Logic 0 Indicates Normal Operation	2
9	RS1	Rate Select 1	5
10	V _{EER}	Receiver Ground	1
11	V _{EER}	Receiver Ground	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver DATA out. AC Coupled	
14	V _{EER}	Receiver Ground	1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground	1
18	TD+	Transmitter DATA in. AC Coupled	

Pin	Symbol	Name/Description	Ref.
19	TD-	Transmitter Inverted DATA in. AC Coupled	1
20	VEET	Transmitter Ground	1

Notes

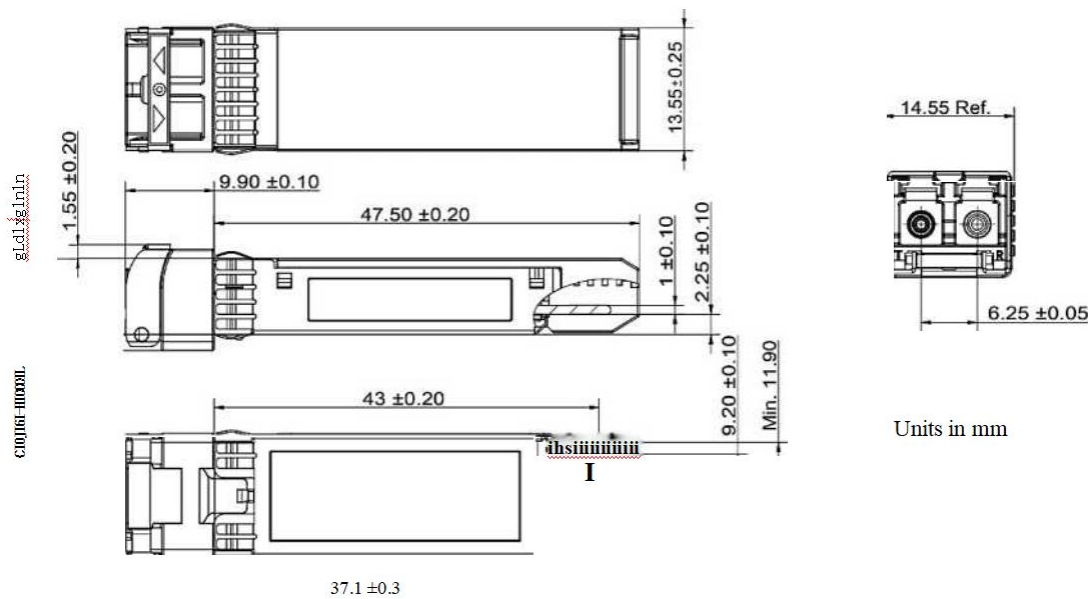
1. Module circuit ground is isolated from module chassis ground within the module.
2. Should be pulled up with 4.7k - 10k ohms on host board to a voltage between 3.15V and 3.6V.
3. Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VccT inside the module.
4. Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 kΩ to 10 kΩ. Mod_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.
5. RSO and RSI are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.

V. Typical Application Circuit



VI. Mechanical Dimensions

Unit: mm



VII. Wavelength Selection: C-Band Ac Wavelength Guide Pin Descriptions

Channel	Wavelength (nm)	Frequency (THZ)	Channel	Wavelength (nm)	Frequency (THZ)
C17	1563.86	191.7	C39	1546.12	193.9
C18	1563.05	191.8	C40	1545.32	194
C19	1562.23	191.9	C41	1544.53	194.1
C20	1561.42	192	C42	1543.73	194.2
C21	1560.61	192.1	C43	1542.94	194.3
C22	1559.79	192.2	C44	1542.14	194.4
C23	1558.98	192.3	C45	1541.35	194.5

Channel	Wavelength (nm)	Frequency (THZ)	Channel	Wavelength (nm)	Frequency (THZ)
C24	1558.17	192.4	C46	1540.56	194.6
C25	1557.36	192.5	C47	1539.77	194.7
C26	1556.55	192.6	C48	1538.98	194.8
C27	1555.75	192.7	C49	1538.19	194.9
C28	1554.94	192.8	C50	1537.4	195
C29	1554.13	192.9	C51	1536.61	195.1
C30	1553.33	193	C52	1535.82	195.2
C31	1552.52	193.1	C53	1535.04	195.3
C32	1551.72	193.2	C54	1534.25	195.4
C33	1550.92	193.3	C55	1533.47	195.5
C34	1550.12	193.4	C56	1532.68	195.6
C35	1549.32	193.5	C57	1531.9	195.7
C36	1548.51	193.6	C58	1531.12	195.8
C37	1547.72	193.7	C59	1530.33	195.9
C38	1546.92	193.8	C60	1529.55	196
Non-ITU	Peak wavelength between 1528.77nm-1563.86		C61	1528.77	196.1

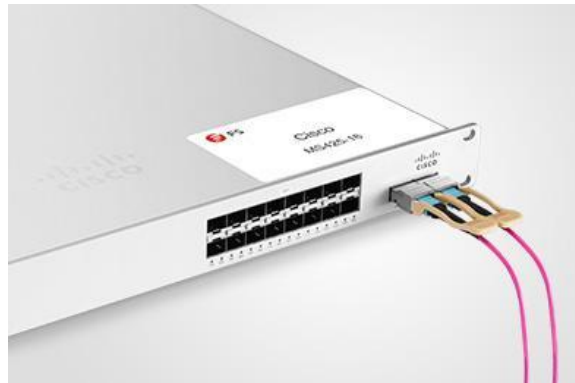
Test Center

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



Force10 S60-44T

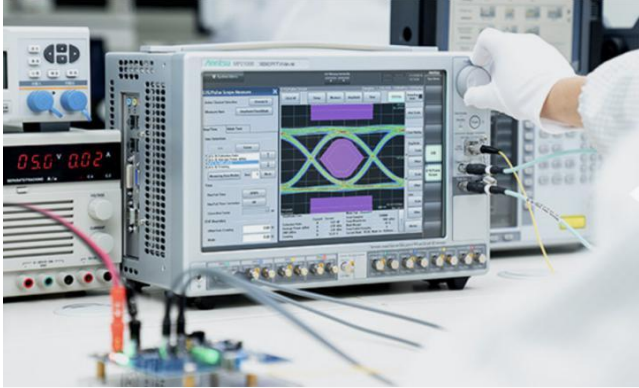


HUAWEI S6720-30L-HI-24S

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

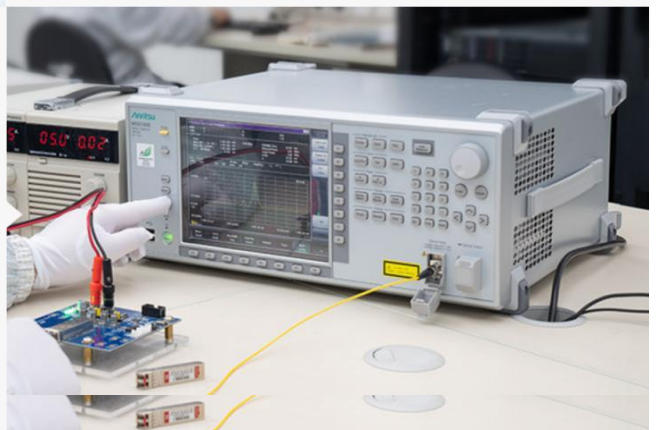
Test the actual transfer data rate and the transmission ability under different protocols with Network Master Pro.

- 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
DWDM-SFP10G-40	SFP+, 10GBase-ER, DWDM 100GHz 1528.77nm-1563.86nm, SMF, 40km, LC, DOM
DWDM-SFP10G-80	SFP+, 10GBase-ZR, DWDM 100GHz 1528.77nm-1563.86nm, SMF, 80km, LC, DOM
DWDM-SFP10G-C	SFP+, 10GBase-ZR, DWDM 50GHz, C-band Tunable, SMF, 80km, LC, DOM
DWDM-SFP10G-40-I	SFP+, 10GBase, DWDM 100GHz 1528.77nm-1563.86nm, SMF, 40km, LC, Industrial, DOM
DWDM-SFP10G-80-I	SFP+, 10GBase, DWDM 100GHz 1528.77nm-1563.86nm, SMF, 80km, LC, Industrial, DOM
DWxxx-10GSFP-100	SFP+, 10GBase-ZR, DWDM 100GHz 1528.77nm-1563.86nm, SMF, 100km, LC, DOM