

10G DWDM SFP 1528.77nm-1563.86nm 80km Industrial DOM Transceiver

DW-SFP10G80-xx-I



Applications

- 10G SONET & SDH
- 10GBASE-ZR/ZW
- 10G Fiber Channel

Features

- Compliant to SFP+ MSA
- Fully RoHS Compliant
- All Metal Housing for Superior EMI Performance
- Operating Data Rate 1.25 to 11.3Gbps
- Cooled EML DFB Laser
- High Sensitivity APD Photodiode and TIA
- LC Duplex Connector
- Hot Pluggable 20pin Connector
- Low Power Consumption <2W
- -40°C to 85°C Operating Wide Temperature Range
- Single +3.3V Power Supply
- Digital Monitoring SFF-8472 Rev 10.2 Compliant
- Real Time Monitoring of: Transmitted Optical Power Received Optical Power Laser Bias Current Temperature Supply Voltage

Description

The 10G DWDM SFP+ transceiver is designed to transmit and receive serial optical data over single mode optical fiber with 80Km. The transceivers are compliant with SFF-8431,SFF-8432, 10GFC Rev 4.0, and 10GBASE-ZR/ZW. The transmitter converts serial CML electrical data into serial optical data compliant with the IEEE 802.3ae standard. The receiver converts serial optical data into serial CML electrical data. 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
Storage Temperature Range	T _S	-40	85	°C
Relative Humidity	RH	0	95	%

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Case Temperature Range	T _C	-40		85	°C
Power Supply Voltage	V _{CC}	3.13	3.3	3.46	V
Bit Rate	BR	1.25		11.3	Gb/s
Bit Error Ratio	BER			10 ⁻¹²	
Max Supported Link Length	L			80	Km

III. Optical Characteristics

Tc=-40 °C to 85 °C and Vcc= 3.14 to 3.46V

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
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Transmitter

Nominal Wavelength	λ	1528		1565	nm	
Center wavelength Spacing			100		GHz	
Wavelength Tolerance		-50		50	GHz	
Side Mode Suppression Ratio	SMSR	30			dB	
Spectral Width(-20dB)	$\Delta\lambda$			0.4	nm	
Optical Output Power	Pav	-1		5	dBm	
Extinction Ratio	ER	6			dB	
Average Launch Power of OFF Transmitter	POFF			-30	dBm	
Relative Intensity Noise	RIN			-128	dB/Hz	

Receiver

Center Wavelength	λ_C	1270		1610	nm	
Receiver Sensitivity@10.3125Gb/s	RSENSE			-23	dBm	1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver Sensitivity at 1600ps/nm @10.3125Gb/s	RSENSE			-21	dBm	1.2
Overload		-6			dBm	
Optical Return Loss		27			dB	
LOS Assert	LOSA	-35			dBm	
LOS De-Assert LOS	LOSD			-24	dBm	
LOS Hysteresis		0.5		4	dB	

Note:

1. Measured at ER>8.2dBm, PRBS 2³¹-1 and BER better than or equal to 10E-12.
2. Loopback using 80km fiber (SMF-28).

IV. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V _{CC}	3.13	3.3	3.46	V	
Power Consumption	Por			2	W	
Transmitter						
Input Differential Impedance	R _{IN}	80	100	120	Ω	
Differential Data Input	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	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmit Fault Assert Voltage	V_{FA}	2		V_{CCHOST}	V	
Transmit Fault De-Assert Voltage	V_{FDA}	V_{EE}		$V_{EE}+0.4$	V	
Receiver						
Differential Data Output	V_{OD}	300		850	mVp-p	
Output Rise Time	t_{RISE}	25			pS	
Output Fall Time	t_{FALL}	25			pS	
LOS Fault	V_{LOSFT}	2		V_{CCHOST}	V	
LOS Normal	V_{LOSNR}	V_{EE}		$V_{EE}+0.4$	V	

V. Pin Definition

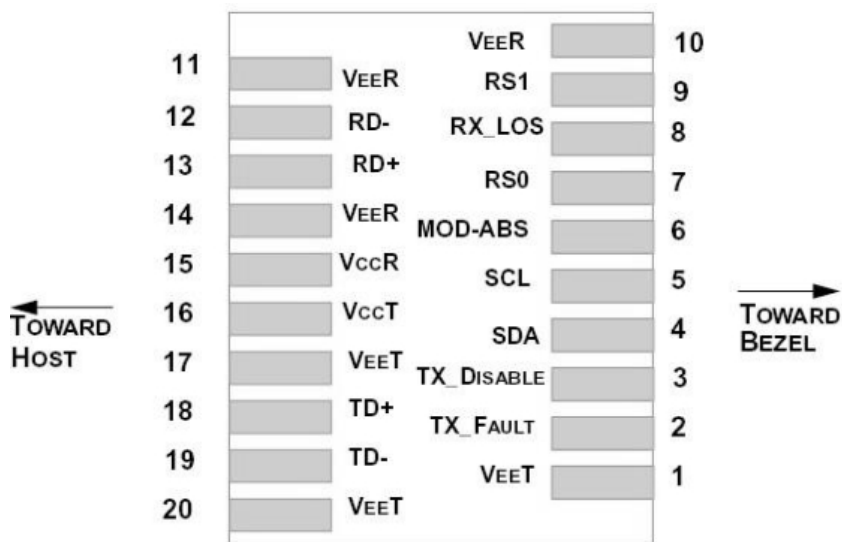


Figure 1.Pin Function Definitions

VI. Pin Description

Pin	Symbol	Definition	Description
1,17,20	VeeT	Transmitter Signal Ground	These pins should be connected to signal ground on the host board.
2	TX Fault	Transmitter Fault Out (OC)	Logic "1" Output = Laser Fault (Laser off before t_fault) Logic "0" Output = Normal Operation This pin is open collector compatible, and should be pulled up to Host V _{CC} with a 10kΩ resistor.
3	TX Disable	Transmitter Disable In (LVTTL)	Logic "1" Input (or no connection) = Laser off Logic "0" Input = Laser on This pin is internally pulled up to V _{CC} T with a 10 kΩ resistor.
4	SDA	Module Definition Identifiers	Serial ID with SFF 8472 Diagnostics Module Definition pins should be pulled up to Host V _{CC} with 10 kΩ resistors.
5	SCL		
6	MOD-ABS		
7	RS0	Receiver Rate Select (LVTTL) Transmitter Rate Select (LVTTL)	These pins have an internal 30kΩ pull-down to ground. A signal on either of these pins will not affect module performance.
9	RS1		
8	LOS	Loss of Signal Out (OC)	Sufficient optical signal for potential BER < 1x10 ⁻¹² = Logic "0" Insufficient optical signal for potential BER < 1x10 ⁻¹² = Logic "1" This pin is open collector compatible, and should be pulled up to Host V _{CC} with a 10kΩ resistor.
10,11,14	VeeR	Receiver Signal Ground	These pins should be connected to signal ground on the host board.
12	RD-	Receiver Negative DATA Out (CML)	Light on = Logic "0" Output Receiver DATA output is internally AC coupled and series terminated with a 50Ω resistor.
13	RD+	Receiver Positive DATA Out (CML)	Light on = Logic "1" Output Receiver DATA output is internally AC coupled and series terminated with a 50Ω resistor.
15	V _{CC} R	Receiver Power Supply	This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3.Recommended power supply filter
16	V _{CC} T	Transmitter Power Supply	This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3.Recommended power supply filter

Pin	Symbol	Definition	Description
18	TD+	Transmitter Positive DATA in (CML)	Logic "1" Input = Light on Transmitter DATA inputs are internally AC coupled and terminated with a differential 100Ω resistor.
19	TD-	Transmitter Negative DATA in (CML)	Logic "0" Input = Light on Transmitter DATA inputs are internally AC coupled and terminated with a differential 100Ω resistor.

VII. Typical Application Circuit

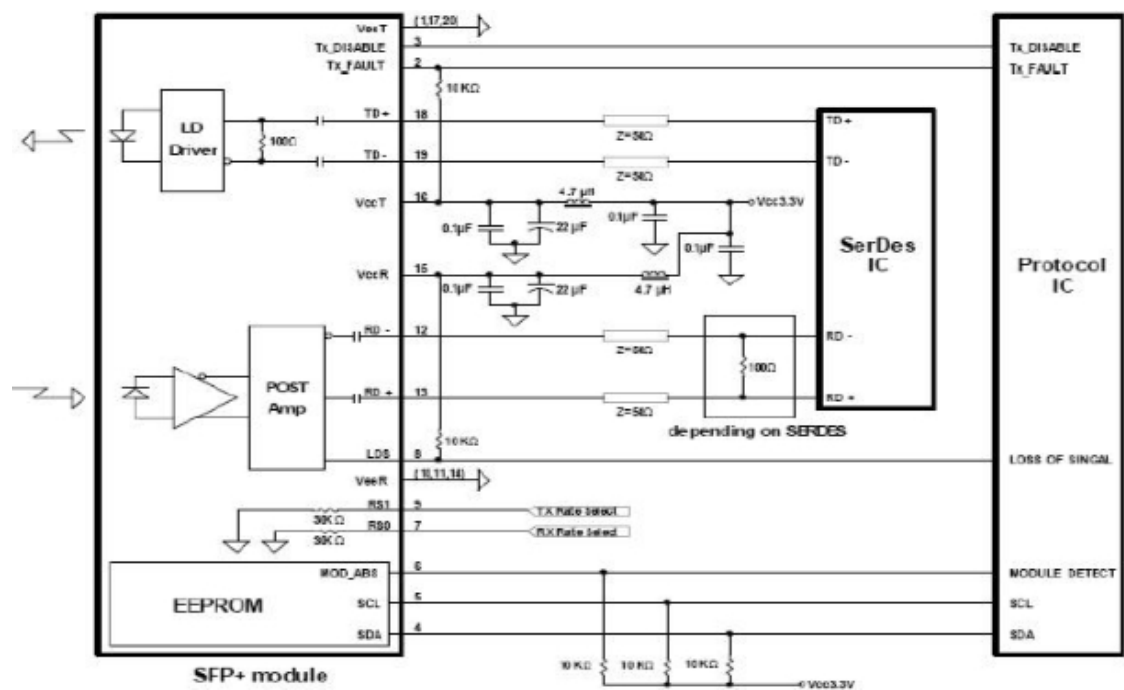


Figure 2. Typical Application Circuit

VIII. Block Diagram

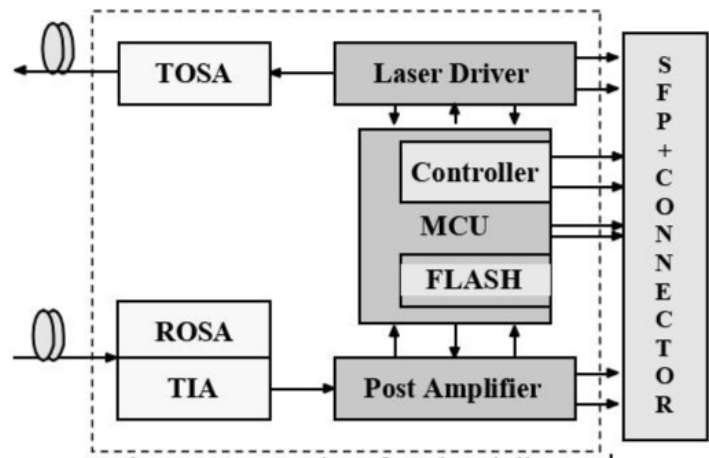


Figure 3. Transceiver Functional Diagram

IX. Mechanical Dimensions

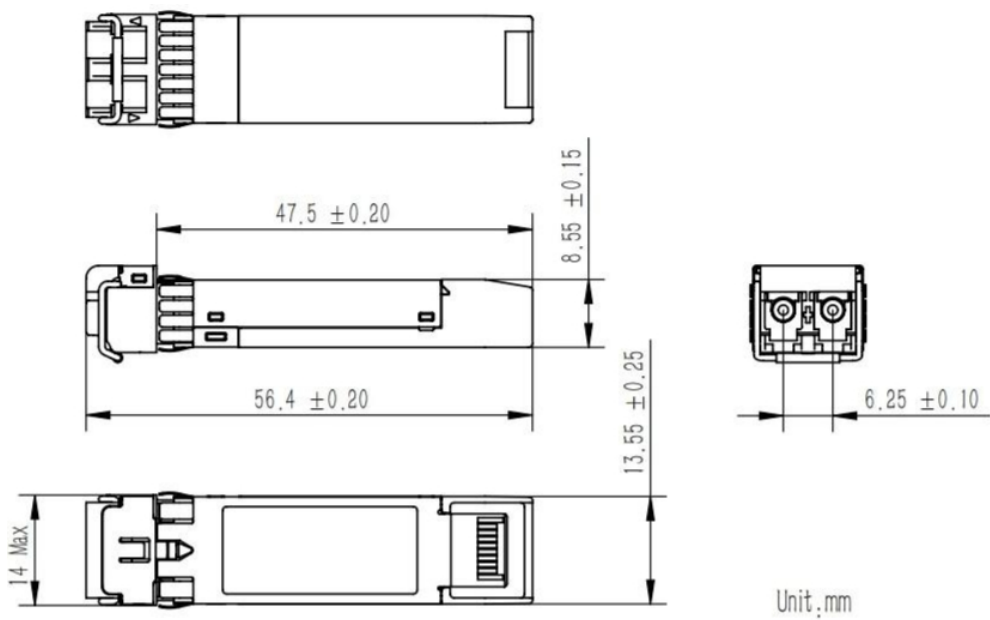


Figure 4. Package Outline

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

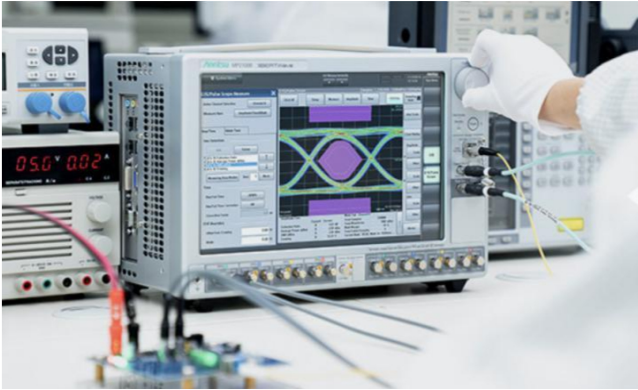


HUAWEI S6720-30L-HI-24S

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.

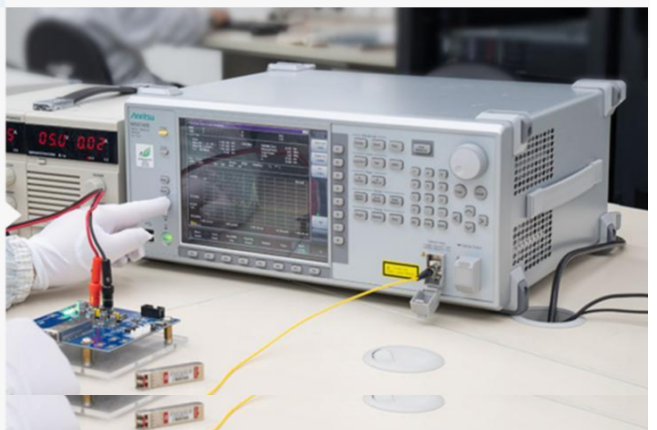
- Ethernet
- Fibre Channel
- SDH/SONET
- CPRI



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



Order Information

Part Number	Description
DWDM-SFP10G-40	10G DWDM SFP+ 100GHz 1528.77nm-1563.86nm Transceiver, Duplex LC, 40km over SMF
DW-SFP10G-40-C	10G DWDM C-band Tunable SFP+ 50GHz Transceiver, Duplex LC, 40km over SMF
DWDM-SFP10G-40-I	10G DWDM SFP+ 100GHz Industrial Transceiver, Duplex LC, 40km over SMF
DW-10GSFP-40-C-I	10G DWDM C-band Tunable SFP+ 50GHz Industrial Transceiver, Duplex LC, 40km over SMF
DWDM-SFP10G-80	10G DWDM SFP+ 100GHz 1528.77nm-1563.86nm Transceiver, Duplex LC, 80km over SMF
DW-SFP10G-80-C	10G DWDM C-band Tunable SFP+ 50GHz Transceiver, Duplex LC, 80km over SMF
DWDM-SFP10G80- xx-I	10G DWDM SFP+ 100GHz Industrial Transceiver, Duplex LC, 80km over SMF
DWDM-SFP10G-C	10G DWDM C-band Tunable SFP+ 50GHz Transceiver, Duplex LC, 80km over SMF
DW-10GSFP-80-C-I	10G DWDM C-band Tunable SFP+ 50GHz Industrial Transceiver, Duplex LC, 80km over SMF
DWC40-10GSFP-100	10G DWDM SFP+ 100GHz 1528.77nm-1563.86nm Transceiver, Duplex LC, 100km over SMF