10G CWDM SFP+ 1390nm-1450nm 40km DOM Transceiver

CWDM-SFP10G-40S

Application

- 10GBASE-ER/EW Ethernet
- 10GBASE-ER at 10.31Gbps
- 10GBASE-EW at 9.95Gbps

Features

- Up to 11.1Gbps Data Links
- Power Dissipation < 1.5W
- Metal Enclosure, for Lower EMI
- Uncooled CWDM DFB Laser and PIN Receiver
- Power Dissipation < 1.5W
- Specifications Compliant with SFF 8472
- Compliant with SFP+ MSA with LC Connector
- Hot-pluggable SFP+ Footprint
- Single 3.3V Power Supply
- Case Operating Temperature Range:0°C to 70°C
- 2-wire Interface with Integrated Digital Diagnostic Monitoring

Description

The CWDM-SFP10G-40S series optical transceiver is designed for fiber communications application such as 10G Ethernet, which fully compliant with the specification of SFP+ MSA SFF-8431.

This module is designed for single mode fiber and operates at a nominal wavelength of CWDM wavelength. There are ten center wavelengths available from 1270nm to 1450nm, with each step 20nm. A guaranteed optical link budget of 14 dB is offered.

The module is with the SFP+ connector to allow hot plug capability. Single 3.3V power supply is needed. The optical output can be disabled by LVTTL logic high-level input of TX_DIS. Loss of signal (RX_LOS) output is provided to indicate the loss of an input optical signal of receiver.

This module provides digital diagnostic functions via a 2-wire serial interface as defined by the SFF-8472 specification.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Storage Temperature	T_S	-40		85	℃
Relative Humidity	RH	5		95	%
Power Supply Voltage	V_{CC}	-0.3		4	V
Signal Input Voltage		V_{CC}-0.3		V_{CC}+0.3	V

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	T_{case}	0		70	℃	
Power Supply Voltage	V_{CC}	3.14	3.3	3.47	V	
Power Supply Current	I_{CC}			450	mA	
Data Rate	BR		10.3125		Gbps	TX Rate/RX Rate

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmission Distance	TD		40		KM	
Coupled Fiber	Single mode fiber					9/125um SMF

III. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Output Opt. Power(1270-1450nm)	P_{OUT}	1		7	dBm	1
Optical Wavelength	y	-6.5		6.5	nm	2
Spectral Width (-20dB)	σ			1	nm	
Optical Extinction Ratio	ER	3.5			dB	
Side mode Suppression ratio	SMSR	30			dB	
Output Eye Mask	Compliant with IEEE 802.3ae					
Receiver						
Receiver Sensitivity(1270-1410nm)	P_{sen}			-15	dBm	3
Input Saturation Power (Overload)	P_{SAT}	1			dBm	
Input Optical Wavelength	λ_{IN}	1270		1610	nm	
LOS -Assert Power	P_A	-30			dBm	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
LOS -Deassert Power	P_D			-17	dBm	
LOS -Hysteresis	P_{Hys}	0.5			dB	

Notes:

1. Class 1 Laser Safety per FDA/CDRH and IEC-825- 1 regulations.
2. y"is:1270~1611 , please the "product selection" .
3. Measured with a PRBS 2^{31} - 1 test pattern, @10.3125Gb/s, BER<10^{-12}

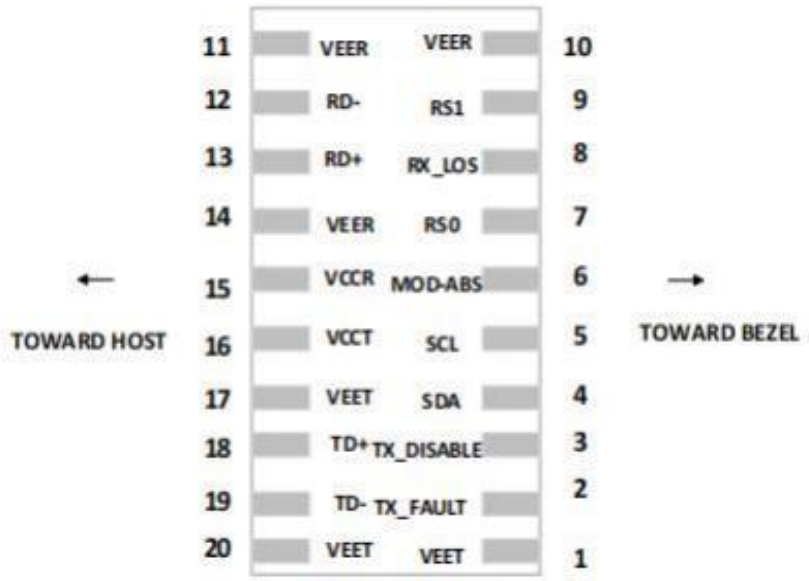
IV. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	Vin,pp	180		1200	mV	
Transmit Disable Voltage	V_{DIS}	V_{cc}– 1.3		Vcc	V	
Transmit Enable Voltage	V_{EN}	V_{ee}		V_{ee}+ 0.8	V	2
Receiver						
Differential data output swing	$V_{out,pp}$	300		850	mV	3
LOS Fault	$V_{LOS\ fault}$	V_{cc}– 1.3		V_{cc}HOST	V	4
LOS Normal	$V_{LOS\ norm}$	V_{ee}		V_{ee}+0.8	V	4

Notes:

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Or open circuit.
3. Input 100 ohms differential termination.
4. Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

V. Pin Descriptions



VI. Pin Definitions

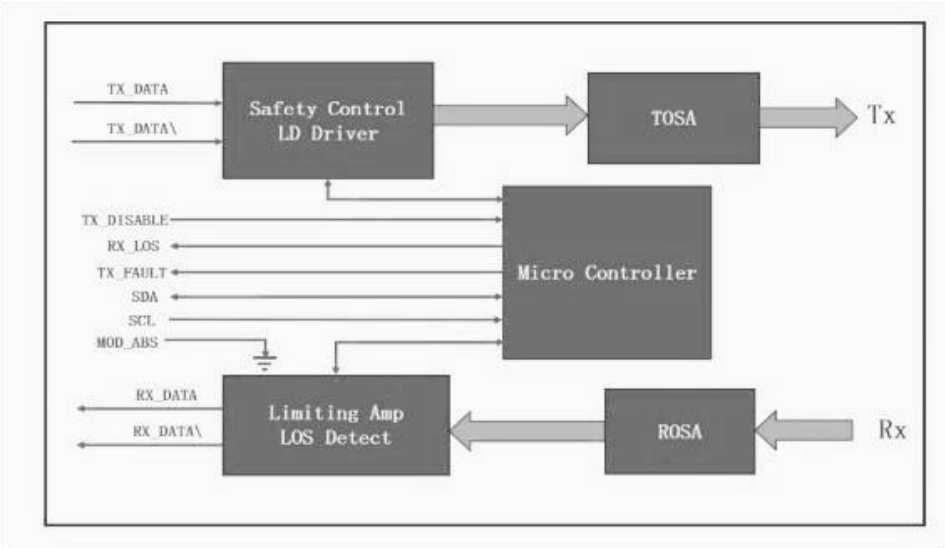
Pin	Symbol	Name/Description	Notes
1	$V_{ee}T$	Transmitter Ground (Common with Receiver Ground)	1
2	T_{Fault}	Transmitter Fault.	2
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD-ABS	Module Absent. Grounded within the module	4
7	RSO	Rate Select 0	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6

Pin	Name	Function	Notes
9	RS1	No connection required	1
10	$V_{ee}R$	Receiver Ground (Common with Transmitter Ground)	1
11	$V_{ee}R$	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	$V_{ee}R$	Receiver Ground (Common with Transmitter Ground)	1
15	$V_{cc}R$	Receiver Power Supply	
16	$V_{cc}T$	Transmitter Power Supply	
17	$V_{EE}T$	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	$V_{ee}T$	Transmitter Ground (Common with Receiver Ground)	1

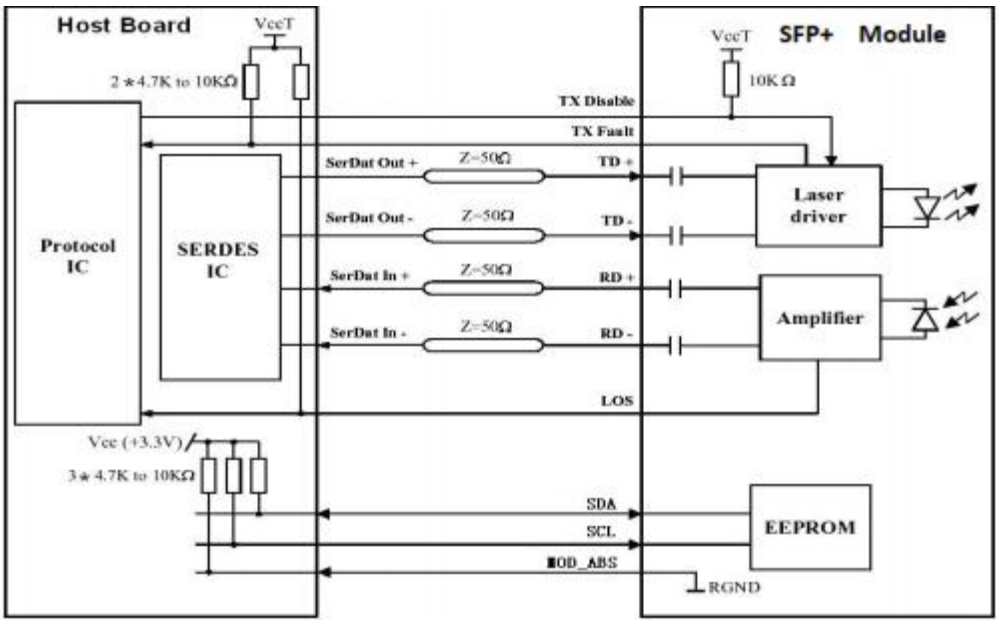
Notes:

1. Circuit ground is internally isolated from chassis ground.
2. TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds.A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on TDIS>2.0V or open, enabled on TDIS<0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

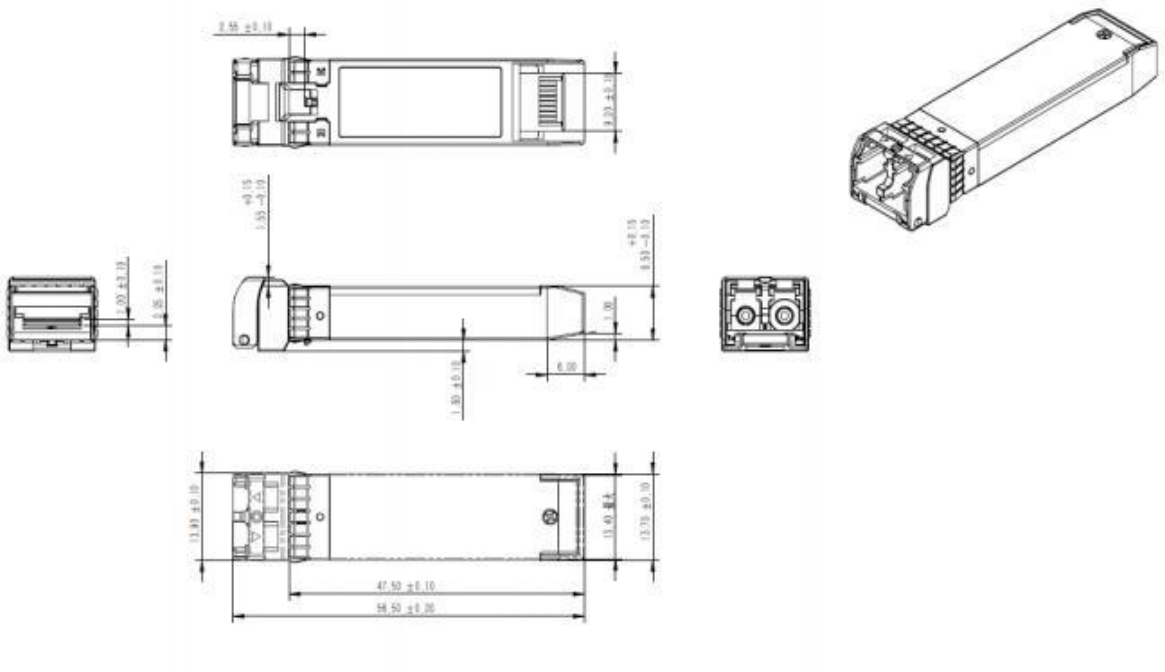
VII. Block Diagram of Transceiver



VIII. Recommended Interface Circuit



VX. Outline Dimensions

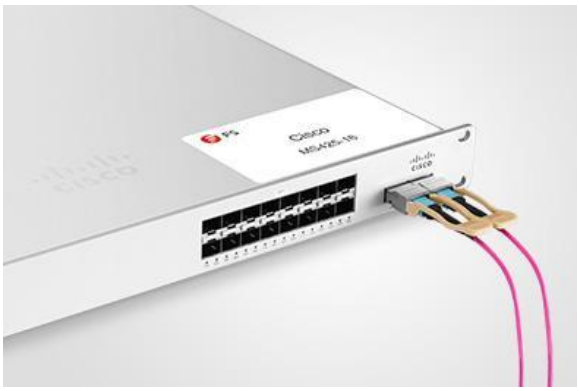


Test Center

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

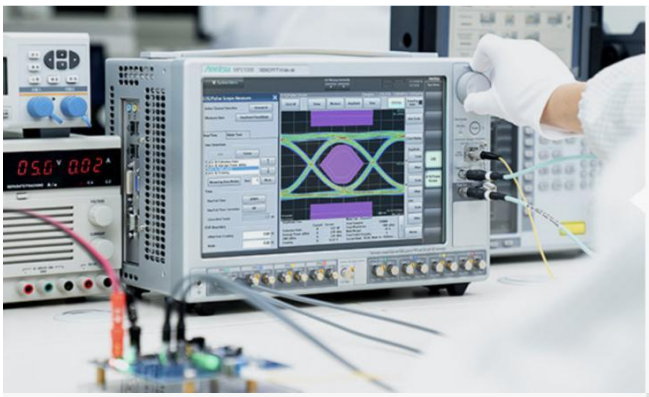
Force⑩tm S60-44T

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

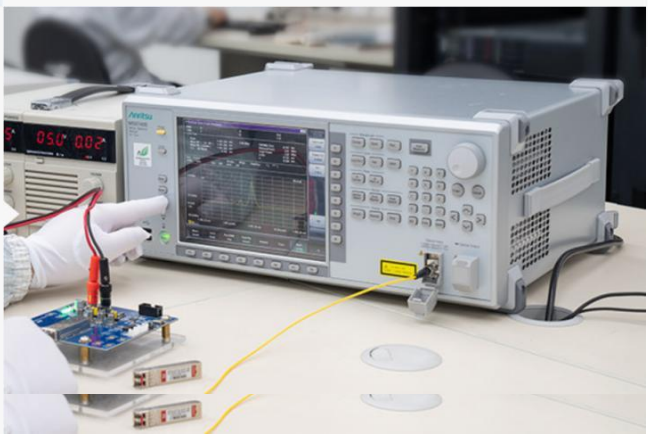
Test the actual transfer data rate and the transmission ability under different protocols with Network Master Pro.

- 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
CWDM-SFP10G-80L	10G CWDM SFP+ Transceiver, 1470nm-1610nm, Duplex LC, 80km over SMF
CWDM-SFP10G-40L	10G CWDM SFP+ Transceiver, 1270nm-1590nm, Duplex LC, 40km over SMF
CWDM-SFP10G-10M	10G CWDM SFP+ Transceiver, 1270nm-1590nm, Duplex LC, 10km over SMF
CWDM-SFP10G-20SP	10G CWDM SFP+ Transceiver, 1270nm-1590nm, Duplex LC, 20km over SMF
CWDM-SFP10G-10SP	10G CWDM SFP+ Transceiver, 1270nm-1590nm, Duplex LC, 10km over SMF
CWDM-SFP10G-40S	10G CWDM SFP+ Transceiver, 1270nm-1590nm, Duplex LC, 40km over SMF
CWDM-SFP10G-20S	10G CWDM SFP+ Transceiver, 1270nm-1590nm, Duplex LC, 20km over SMF
CWDM-SFP10G-20L	10G CWDM SFP+ Transceiver, 1270nm-1610nm, Duplex LC, 20km over SMF
CWDM-SFP10G-80-I	10G CWDM SFP+ Transceiver, 1470nm-1610nm, Duplex LC, 80km over SMF, Industrial
CWDM-SFP10G-40-I	10G CWDM SFP+ Transceiver, 1270nm-1610nm, Duplex LC, 40km over SMF, Industrial
CW31-10GSFP-10-I	10G CWDM SFP+ Transceiver, 1270nm-1570nm, Duplex LC, 10km over SMF, Industrial