1000BASE-DWDM SFP 100GHz 1528.77nm~1563.86nm 100km Transceiver Module

DWDM-SFP1G-EZX

Application

- Gigabit Ethernet
- 1×Fiber Channel
- DWDM Networks

Features

- Up to 1.25Gb/s Data Links
- Hot-Pluggable
- Duplex LC connector
- Up to 100km on 9/125μm SMF
- DWDM 100GHz ITU Grid C Band Available
- DWDM DFB laser transmitter
- Single +3.3V Power Supply
- Monitoring Interface Compliant with SFF-8472
- Low power dissipation <1W typically
- Operating temperature range: 0° C to 70° C
- RoHS compliant and Lead Free

Description

FS's DWDM-SFP1G-EZX Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA) and SFF-8472. The transceiver consists of two sections: The transmitter section incorporates a cooled DWDM DFB laser, And the receiver section consists of a APD photodiode integrated with a TIA. The module data link up to 100km in 9/125um single mode fiber. It offers a simple and convenient way to interface PCBs to single mode fiber optic cables in Dense Wavelength Division Multiplexing (DWDM) applications. It is a high performance, cost effective module for serial optical data communication applications

Product Specifications

I. General Specifications

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Data Rate	BR		1.25		Gb/s	
Bit Error Rate	BER			10-12		
Max. Supported Link Length on 9/125μm SMF@1.25Gb/s	LMAX		100		km	
Total System Budget	LB	32			dB	

II. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Storage Temperature	TS	-40		+85	° C	
Supply Voltage	VCC	-0.5		4	V	
Relative Humidity	RH	0		85	%	

III. Recommended Operating Environment

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Case operating Temperature	Tc	0		+70	° C	
Supply Voltage	VCC	3.135		3.465	V	
Supply Current	Icc			300	mA	
Inrush Current	Isurge			Icc+30	mA	
Maximum Power	Pmax			1	W	

IV. Electrical Characteristics(TOP =Tc, VCC = 3.135 to 3.465 Volts)

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Transmitter						
Input differential impedance	Rin	90	100	110		
Single ended data input swing	Vin PP	250		1200	mVp-p	
Transmit Disable Voltage	VD	Vcc – 1.3		Vcc	V	2
Transmit Enable Voltage	VEN	Vee		Vee+ 0.8	V	
Transmit Disable Assert Time	Tdessert			10	us	
Receiver						
Single ended data output swing	Vout,pp	300		800	mv	3
Data output rise time	tr			260	ps	4
Data output fall time	tf			260	ps	4
LOS Fault	Vlosfault	Vcc – 0.5		VCC_host	V	5
LOS Normal	Vlos norm	Vee		Vee+0.5	V	5
Power Supply Rejection	PSR	100			mVpp	6

Notes:
1. AC coupled.
2. Or open circuit.
3. Into 100 ohm differential termination.
4. 20 – 80 %
5. LOS is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
All transceiver specifications are compliant with a power supply sinusoidal modulation of 20 Hz to 1.5MHz up to specified value applied through the power supply filtering network shown on page 23 of the Small Form-factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 14, 2000

V.Optical Characteristics(TOP =Tc, VCC = 3.135 to 3.465 Volts)

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Transmitter						
Optical Wavelength-End Of Life	λ	X-100	X	X+100	pm	
Optical Wavelength-Beginning Of Life	λ	X-25	X	X+25	pm	
Width	σ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Output Power	Pout	0		+5	dBm	1
Optical Rise/Fall Time	tr / tf			260	ps	2
Extinction Ratio	ER	9			dB	
Generated Jitter (peak to peak)	JTXp-p			0.07	UI	3
Generated Jitter (rms)	JTXrms			0.007	UI	3
Eye Mask for Optical Output	Compliant with IEEE802.3z(class 1 laser safety)					
Receiver						
Optical Input Wavelength	λc	1480		1580	nm	
Receiver Overload	Pol	-8			dBm	4
RX Sensitivity	Sen			-32	dBm	4
RX_LOS Assert	LOS A	-45			dBm	
RX_LOS De-assert	LOS D			-33	dBm	
RX_LOS Hysteresis	LOS H	0.5			dB	

Notes:
1. The optical power is launched into SMF.
2. 20-80%.
3. Jitter measurements taken using Agilent OMNIBERT 718 in accordance with GR-253.
4. Measured with PRBS 27 -1at 10-12 BER

VI. Pin Assignment

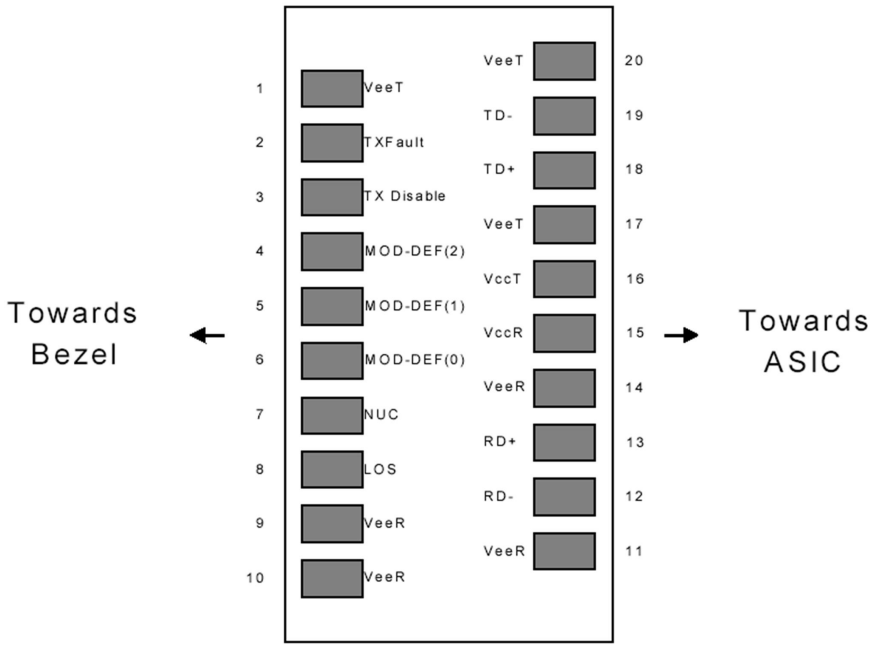


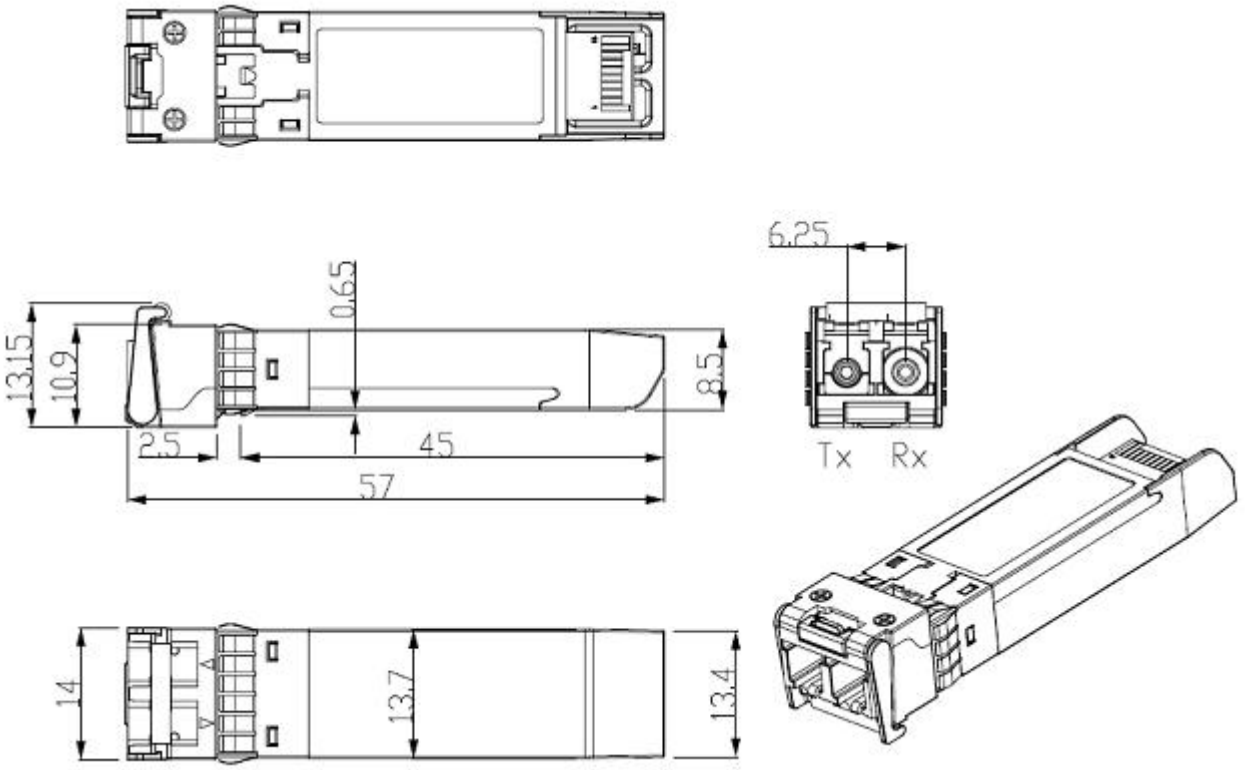
Figure1. Diagram of Host Board Connector Block Pin Numbers and Names

Pin	Name	Function	Plug Seq	Notes
1	VeeT	Transmitter Ground	1	1
2	TX Fault	Transmitter Fault Indication	3	
3	TX Disable	Transmitter Disable	3	2
4	MOD-DEF2	Module Definition	2	3
5	MOD-DEF1	Module Definition 1	3	3
6	MOD-DEF0	Module Definition 0	3	3
7	Rate Select	Not Connected	3	4
8	LOS	Loss of Signal	3	5

9	VeeR	Receiver Ground	1	1
10	VeeR	Receiver Ground	1	1
11	VeeR	Receiver Ground		1
12	RD-	Inv. Received Data Out	3	6
13	RD+	Received Data Out	3	6
14	VeeR	Receiver Ground	3	1
15	VccR	Receiver Power	2	1
16	VccT	Transmitter Power	2	
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	6
19	TD-	Inv. Transmit In	3	6
20	VeeT	Transmitter Ground	1	

Notes:
1.Circuit ground is internally isolated from chassis ground.
2.Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3.Should be pulled up with 4.7k - 10 kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.
4.Rate select is not used
5.LOS is open collector output. Should be pulled up with 4.7k – 10 kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
6.AC Coupled

VII. Mechanical Specifications

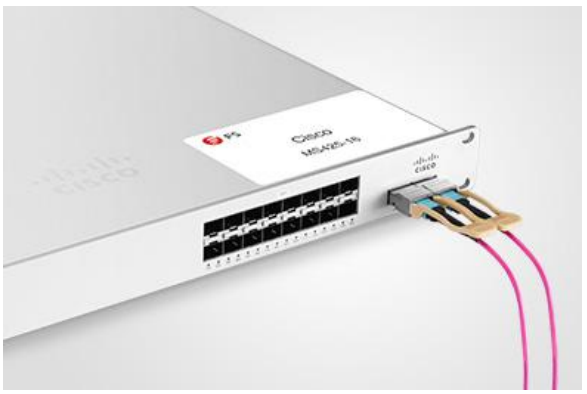


Test Center

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

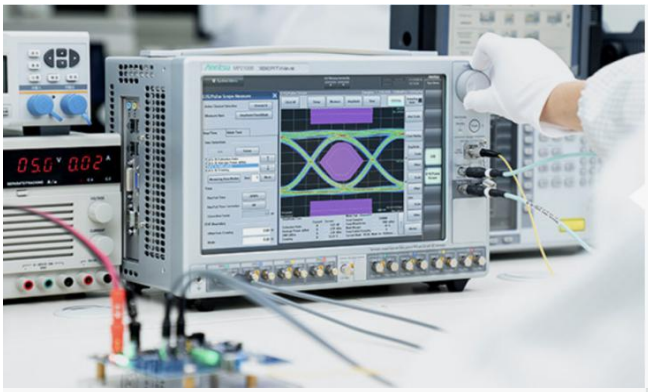
Force⑩tm S60-44T

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

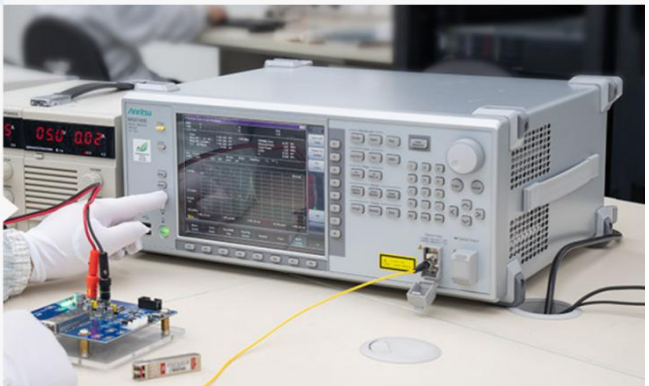
Test the actual transfer data rate and the transmission ability under different protocols with Networks Master Pro.

- 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 No.	Central Wavelength(nm)	Frequency (THZ)
DWDM-SFP1G-EZX	1528.77	196.1
DWDM-SFP1G-EZX	1529.55	196.0
DWDM-SFP1G-EZX	1530.33	195.9
DWDM-SFP1G-EZX	1531.12	195.8
DWDM-SFP1G-EZX	1531.90	195.7
DWDM-SFP1G-EZX	1532.68	195.6
DWDM-SFP1G-EZX	1533.47	195.5
DWDM-SFP1G-EZX	1534.25	195.4
DWDM-SFP1G-EZX	1535.04	195.3
DWDM-SFP1G-EZX	1535.82	195.2
DWDM-SFP1G-EZX	1536.61	195.1
DWDM-SFP1G-EZX	1537.40	195.0
DWDM-SFP1G-EZX	1538.19	194.9
DWDM-SFP1G-EZX	1538.98	194.8
DWDM-SFP1G-EZX	1539.77	194.7
DWDM-SFP1G-EZX	1540.56	194.6
DWDM-SFP1G-EZX	1541.35	194.5
DWDM-SFP1G-EZX	1542.14	194.4
DWDM-SFP1G-EZX	1542.94	194.3
DWDM-SFP1G-EZX	1543.73	194.2
DWDM-SFP1G-EZX	1544.53	194.1
DWDM-SFP1G-EZX	1545.32	194.0
DWDM-SFP1G-EZX	1546.12	193.9
DWDM-SFP1G-EZX	1546.92	193.8
DWDM-SFP1G-EZX	1547.72	193.7

DWDM-SFP1G-EZX	1552.52	193.1
DWDM-SFP1G-EZX	1553.33	193.0
DWDM-SFP1G-EZX	1554.13	192.9
DWDM-SFP1G-EZX	1554.94	192.8
DWDM-SFP1G-EZX	1555.75	192.7
DWDM-SFP1G-EZX	1556.55	192.6
DWDM-SFP1G-EZX	1557.36	192.5
DWDM-SFP1G-EZX	1558.17	192.4
DWDM-SFP1G-EZX	1558.98	192.3
DWDM-SFP1G-EZX	1559.79	192.2
DWDM-SFP1G-EZX	1560.61	192.1
DWDM-SFP1G-EZX	1561.42	192.0
DWDM-SFP1G-EZX	1562.23	191.9
DWDM-SFP1G-EZX	1563.05	191.8
DWDM-SFP1G-EZX	1563.86	191.7

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