4GBASE-SW SFP 850nm 150m DOM Transceiver

SFP4G-SW-85



Application

• Tri-rate 1.0625 / 2.125 / 4.25Gb/s Fiber Channel

Features

- Up to 4.25 Gb/s Bi-directional Data Links
- Hot-Pluggable SFP Footprint LC Optical
 Transceiver
- Digital Diagnostic Monitor Interface Compatible with SFF-8472
- 850nm Oxide VCSEL Laser Transmitter
- Duplex LC Connector
- Single +3.3V Power Supply
- Up to 150m on 50/125µm MMF at 4.25Gb/s
- Up to 70m on 62.5/125µm MMF at 4.25Gb/s
- Operating Temperature Range: 0°C to 70°C
- RoHS Compliant Products

Description

The SFP4G-SW-85 Small Form Pluggable (SFP) transceivers are based on the SFP Multi Source Agreement (MSA). The SFP transceivers are high performance, cost effective modules supporting tri-rate 1.0625 / 2.125 / 4.25Gb/s and support distance up to 150m with MMF.

Specification

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature Range	T _{st}	-40	85	°C
Operating Temperature	T _{OP}	0	70	°C
Input Voltage	T _{cc}	0	5	V

II. Operating Environment

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	V _{cc}	+3.0	+3.6	V
Ambient Operating Temperature	T _{OP}	0	70	°C

III. Electrical Characteristics

Parameter	Symbol	Min.	Тур.	Max.	Unit	Ref.	
Supply Voltage	V _{cc}	3.0		3.6	V		
Supply Current	I _{cc}		180	240	mA		
Transmitter							
Input Differential Impedance	R _{IN}		100		Ω	1	
Single Ended Data Input Swing	V _{IN}	250		1200	mV	2	
Transmit Disable Voltage	V_{DIS}	2		V _{CC}	V	3	
Transmit Enable Voltage	V_{EN}	V_{EE}		V _{EE} + 0.8	V		
	F	leceiver					
Single Ended Data Output Swing	V _{out,pp}	250	350	550	mV	4	
Data Output Rise Time	tr			120	ps	5	
Data Output Fall Time	tf			120	ps	5	
Mask Margin ≤ 2.125 Gb/s			45%				
LOS Fault	VLOS fault	2		VccHOST	V	6	
LOS Normal	VLOS norm	Vee		Vee+0.8	V	6	
Power Supply Rejection	PSR	100			mVpp	7	
Deterministic Jitter Contribution≤2.125Gb/s	RX ΔDJ			51.7	ps	8	
Determinstic Jitter Contribution>2.125Gb/s				23.5	ps	8	
Total Jitter Contribution≤2.125Gb/s	RX ΔTJ			122	ps	9	
Total Jitter Contribution>2.125Gb/s				61	ps	9	

IV. Optical Characteristics

Parameter	Symbol	Min.	Тур.	Max.	Unit	Ref.		
Transmitter								
Output Opt. Pwr: 50 or 62.5MMF	P _{OUT}	-9		-3	dBm	1		
Optical Wavelength	λ	830		860	nm			
Spectral Width	σ			0.85	nm			
Optical Modulation Amplitude@ 4.25 Gb/s	OMA	247			μW	2		
Optical Modulation Amplitude@ 2.125 Gb/s	OMA	196			μW	2		
Optical Modulation Amplitude@ 1.0625 Gb/s	OMA	156			μW	2		
Optical Rise/FallTime	tr/ tf			90	ps	3		
Relative IntensityNoise	R _{IN}			-118	dB/Hz			
Deterministic Jitter Contribution≤2.125Gb/s	ΤΧΔΟͿ			56.5	ps	4		
Deterministic Jitter Contribution>2.125Gb/s	ΤΧΔΟͿ			28.2	ps	4		
Total Jitter Contribution≤2.125 Gb/s	τα χτι			119	ps	5		
Total Jitter Contribution>2.125 Gb/s	τα χτι			56.5	ps	5		
Extinction Ratio @ 1.25Gb/s	ER	9			dB	6		
Mask Margin≤2.125Gb/s			45%					

Parameter	Symbol	Min.	Тур.	Max.	Unit	Ref.	
Receiver							
Receiver Sensitivity=1.0625 Gb/s	R _{XSENS}			-20	dBm	7	
Receiver Sensitivity= 2.125 Gb/s	R _{XSENS}			-18	dBm	7	
Receiver Sensitivity=4.25 Gb/s	R _{XSENS}			-15	dBm	7	
Stressed RX Sens.=1.0625 Gb/s		0.055			mW	8	
Stressed RX Sens.=2.125 Gb/s		0.096			mW	8	
Stressed Rx Sens.=4.25 Gb/s		0.138			mW	8	
Average Receiver Power	R _{XMAX}			0	dBm		
Optical Center Wavelength	λC	770		860	nm		
Optical Return Loss		12			dB		
LOS De-Assert	LOS _D			-20	dBm		
LOS Assert	LOS _A	-30			dBm		
LOS Hysteresis		0.5			dB		

Notes:

1. Class 1 Laser Safety per FDA/CDRH, and EN (IEC) 60825 laser safety standards.

2. Equivalent extinction ratio specification for Fibre Channel. Allows smaller ER at higher average power.

3. Unfiltered, 20-80%. Complies with FC 1x and 2x eye mask when filtered.

4. Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and Δ DJ.

5. If measured with TJ-free data input signal. In actual application, output TJ will be given by:

 $TJ_{OUT} = DJ_{IN} + \Delta DJ + \sqrt{(TJ_{IN} - DJ_{IN})^2 + (\Delta TJ - \Delta DJ)^2}$

6. Applicable for Rate Selectable version only in low bandwidth mode.

7. Specifications are for 50 micro-meter or 62.5 micro-meter fiber.

8. Measured with conformance signals defined in FC-PI-2 Rev. 5.0 specifications

V. Digital Diagnostic Monitor Characteristics

Parameter	Symbol	Min.	Тур.	Max.	Unit	Ref.
	Acc	uracy				
Internally Measured Transceiver Temperature	DDTemperature			3	°C	
Internally Measured Transceiver Supply Voltage	DDVoltage			100	mV	
Measured TX Bias Current	DDBias			10	%	1
Measured TX Output Power	DDTx-Power			2	dB	
Measured RX Received Average Optical Power	DDRx-Power			2	dB	
Dynamic Range for Rated Accuracy						

Internally Measured Transceiver Temperature	DDTemperature	-20	85	°C	
Internally Measured Transceiver Supply Voltage	DDVoltage	3.0	3.6	V	
Measured TX Bias Current	DDBias	0	20	mA	
Measured TX Output Power	DDTx-Power	-9	-2.5	dBm	
Measured RX Received Average Optical Power	DDRx-Power	-20	0	dBm	

Max Reporting Range

Internally Measured Transceiver Temperature	DDTemperature	-40	125	°C	
Internally Measured Transceiver Supply Voltage	DDVoltage	2.8	4.0	V	
Measured TX Bias Current	DDBias	0	20	mA	
Measured TX Output Power	DDTx-Power	-10	-3	dBm	
Measured RX Received Average Optical Power	DDRx-Power	-22	0	dBm	

Block Diagram of Transceiver



Figure 1

VI. Pin Configuration



Figure 2: Pin out of Connector Block on Host Board

VII. Transceiver Pin Descriptions

Pin No.	Symbol	Description	Ref.
1	V _{EE} T	Transmitter Ground(Common with Receiver Ground)	1
2	T _{FAULT}	Transmitter Fault. Supported.	
3	TDIS	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 with in the module.	3
7	Rate Select	Not Connected	
8	LOS	Loss of Signal indication. Logic 0 in dicates normal operation.	4
9	V _{EE} R	Receiver Ground(Common with Transmitter Ground)	1
10	$V_{\text{EE}}R$	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	$V_{\text{EE}}R$	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

VIII. Principle Diagram



Note A: Circuit assumes open emitter output

Note B: Circuit assumes high impedance internal bias @Vcc-1.3V

IX. Mechanical 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



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





公





The information in this document is subject to change without notice. FS has made all efforts to ensure the accuracy of the information, but all information in this document does not constitute any kind of warranty.

Copyright © 2009-2022 FS.COM All Rights Reserved.