



Open Networking Consortium

Open Network Systems Interoperability Test Report

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Enclosed are the results from the Open Network Systems Interoperability Plugfest performed on:

Module or Cable Assembly Under Test (MUT/CUT):

Vendor and Device Type	Siemon SFP+ 10G DAC
Part Number	SFPP30-03

Host Under Test (HUT):

Host System 1 Composition	
Network Operating System	Cumulus
OS Version	3.1
Bare Metal Switch	Edgecore
Part Number	5712
ONIE Version	2014.08

This testing pertains to the Open Network Systems Interoperability Test Plan, which outlines a series of tests performed on a variety of optical transceivers and cables with bare-metal open switches running Network Operating Systems from multiple vendors. The focus of these tests was basic interoperability which aims to validate the operation of open network systems.

As always, we welcome any comments regarding this Test Suite. If you have any questions about the test procedures or results, please feel free to contact me via e-mail at david@iol.unh.edu or by phone at +1-603-862-0090.

Regards,
David Woolf

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In section 2, the following equipment was used:

Test System Hardware	
EEPROM Reader	Avago Aport USB-MDIO/TWI Interface Controller

In section 3, the following equipment was used:

Test System Hardware	
Network Analyzer	Agilent E5071C

In section 4, the following equipment was used:

Test System Hardware	
Wide Bandwidth Oscilloscope	Agilent DCA-X 86100D
Waveform Analyzer	Agilent 86105C
50GHz Waveform Analyzer	Agilent DCA-86108B
Clock Recovery Module	Agilent 83496A
High Performance Serial BERT	Agilent N4903B
Signal Quality Analyzer	Anritsu MP1800A with MU181020B 14Gbps PPG* Modules
De-Emphasis Signal Converter	Agilent N4916B

*Two modules used during testing

In section 6, an Ixia XM12 was used to generate test traffic:

Test System Hardware	
Ethernet Traffic Generator	Ixia XM12
Software Version	IxOS 6.80.110.9 EA
Port Types	10G SFP+, 40G QSFP+

The following table contains possible results and their meanings.

Result	Interpretation
PASS	The Device Under Test (DUT) was observed to exhibit conformant behavior.
PASS W/ Comments	The specified behavior is demonstrated by the DUT, however this result indicates that either changes were made to the standard test procedure or results other than the expected results were observed.
FAIL	The DUT was observed to exhibit non-compliant behavior.
INFO	This Test is designed for informational purposes only. While the results may help ensure the interoperability of the DUT, a PASS/FAIL is not given for this test.
WARN	The DUT was observed to exhibit behavior that is not recommended.
N/A	Not Applicable. This test is not applicable for the DUT.
N/S	Not Supported. This test was not run due to features not implemented on the DUT.
N/T	Not tested. This test was not run.

Summary of Results- Conformance	
Test	Result
Test 1.1: ONIE Compliance Environment	N/A
Test 1.2: Installing and uninstalling a NOS through ONIE via HTTP server	PASS
Test 3.1: Return Loss for 10G Passive Cable	PASS
Test 3.2: Insertion Loss for 10G Passive Cable	PASS

Summary of Results - Interoperability	
Test	Result
Test 2.1: Physical Compatibility with Supporting Devices	PASS
Test 2.2: Host Management of Module or Cable Assembly	PASS
Test 2.3: Diagnostic Optical Monitor Support	PASS
Test 6.1: Establish Baseline Performance Analysis	PASS
Test 6.2: Link Detection on Power Up	PASS
Test 6.3: Packet Error Rate Estimation	PASS
Test 6.4: Packet Loss/Stress Test	PASS

Notes

Conformance Test Results	
Test Information	Test Result
Test 1.1: ONIE Compliance Environment <i>Purpose:</i> To verify that a host can pass a random sampling of ONIE Compliance Environment tests.	N/A
Comments on Test Procedure	
The random sampling of tests from the ONIE Compliance Environment was not used.	
Comments on Test Results	
Additional Comments	
This test is only applicable to Hosts which have not performed ONIE compliance testing previously.	

Test Information	Test Result
Test 1.2: Installing and uninstalling a NOS through ONIE via HTTP server <i>Purpose:</i> To verify that a NOS can be successfully installed through ONIE.	PASS
Comments on Test Procedure	
This test was completed using the standard procedure as written in the Test Plan. The random sampling of tests from the ONIE Compliance Environment was not used.	
Comments on Test Results	
Part A: The DUT was able to install the NOS via ONIE. Part B: The DUT was able to uninstall the NOS via ONIE.	
Additional Comments	

Test Information	Test Result
<p>Test 3.1: Return loss for 10G Passive Cable</p> <p><i>Purpose:</i> To verify that the return loss of the DUT is within the conformance limits provided by SFF-8431 Appendix E, Table 37.</p>	PASS
Comments on Test Procedure	
<p>This test was completed using the standard procedure.</p>	
Comments on Test Results	
<p>The differential return loss observed did not violate the limits governed by SFF-8431 Appendix E.4, Table 37 for 10GBASE-CR passive cables:</p> $SDD_{11}, SDD_{22} \geq \left\{ \begin{array}{ll} 12 - 2\sqrt{f}, & 0.01 \leq f < 4.1 \\ 6.3 - 13 \log_{10} \frac{f}{5.5}, & 4.1 \leq f \leq 11.1 \end{array} \right\} (db)$	
Additional Comments	

Test Information	Test Result
<p>Test 3.2: Insertion Loss for 10G Passive Cable</p> <p><i>Purpose:</i> To verify that the insertion loss of the Cable under test is within the conformance limits provided by IEEE Std. 802.3-2012 Annex , Table 37.</p>	PASS
Comments on Test Procedure	
<p>This test was completed using the standard procedure.</p>	
Comments on Test Results	
<p>The insertion loss of the cable under test does not violate the requirements passive cable assemblies.</p> $3dB \leq SDD_{21}, SDD_{12} \leq 17.04dB, \quad \text{at } 5.15625 \text{ GHz}$	
Additional Comments	

Interoperability Test Results	
Test Information	Test Result
<p>Test 2.1: Physical Compatibility with Supporting Devices</p> <p><i>Purpose:</i> To verify that the mechanical form factor is compatible with devices for interoperability purposes.</p>	PASS
Comments on Test Procedure	
The test was completed with the standard procedure.	
Comments on Test Results	
<p>Part A: The MUT/CUT was able to be inserted into the Host. Part B: This test is not applicable to Cable Assemblies. Part C: The MUT/CUT was able to be removed from the Host.</p>	
Additional Comments	

Test Information	Test Result
<p>Test 2.2: Host Management of Module or Cable Assembly</p> <p><i>Purpose:</i> To verify that the MUT/CUT is manageable via the Host complex.</p>	PASS
Comments on Test Procedure	
The test was completed with the standard procedure.	
Comments on Test Results	
<p>Part B: The EEPROM data of the MUT/CUT was readable. The serial number and vendor information extracted from the EEPROM data matches the serial number and vendor information of the part.</p>	
Additional Comments	

Test Information	Test Result
Test 2.3: Diagnostic Optical Monitor Support <i>Purpose:</i> To verify that the MUT/CUT (active optical cable only) supports diagnostic functions via the Host complex.	PASS
Comments on Test Procedure	
The test was completed with the standard procedure.	
Comments on Test Results	
Part A: The MUT/CUT supports diagnostic monitoring and the diagnostic information from the EEPROM was readable by the NOS.	
Additional Comments	

Test Information	Test Result
<p>Test 6.1: Establish Baseline Performance Analysis</p> <p><i>Purpose:</i> To establish a baseline performance analysis of the HUT.</p>	PASS
Comments on Test Procedure	
This test was completed using a modified procedure. Because of a lack of 40G Golden Modules, the Host was baselined using each 40G MUT/CUT.	
Comments on Test Results	
The baseline performance of the Host was determined to be 90% line rate. All proceeding tests in Group 6 were conducted using this line rate.	
Additional Comments	

Test Information	Test Result
<p>Test 6.2: Detection on Power Up</p> <p><i>Purpose:</i> To determine if the MUT/CUT, HUT and LP establish a link while varying the power up sequence.</p>	PASS
Comments on Test Procedure	
This test was completed using the standard procedure.	
Comments on Test Results	
<p>Part A: The Host and Link Partner were able to establish a valid link with this MUT/CUT while fully powered and operational.</p> <p>Part B: The Host and Link Partner were able to establish a valid link with this MUT/CUT when the Link Partner was powered on after the Host.</p> <p>Part C: The Host and Link Partner were able to establish a valid link with this MUT/CUT when the Host was powered on after the Link Partner.</p>	
Additional Comments	

Test Information	Test Result
<p>Test 6.3: Packet Error Rate Estimation</p> <p><i>Purpose:</i> To determine if a Host can exchange packets with a Module or Cable Assembly such that a bit error rate of 10^{-12} is achieved</p>	PASS
Comments on Test Procedure	
<p>This test was completed using the standard procedure.</p>	
Comments on Test Results	
<p>Part A: All 247,000,000 frames transmitted by TS1 were received by TS2. Part B: All 10,506,539,320 frames transmitted by TS1 were received by TS2.</p>	
Additional Comments	

Test Information	Test Result
<p>Test 6.4: Packet Loss/Stress Test</p> <p><i>Purpose:</i> To verify that no obvious buffer management problems occur when directing a large volume of traffic at the Host and Module/Cable Assembly combination.</p>	PASS
Comments on Test Procedure	
<p>This test was completed using the standard procedure.</p>	
Comments on Test Results	
<p>Parts A-D: All 1,000,000,000 64-byte frames transmitted by TS1 were received by TS2. All 1,000,000,000 1518-byte frames transmitted by TS1 were received by TS2.</p>	
Additional Comments	

Appendix A: EEPROM Data

Siemon SFP/SFP+/SFP28 module
Part Number: SFPP30-03 Serial Number: 15282041925B30
Siemon__15282041925B30__EEPROMdecode_20160722150022.txt

SERIAL_ID Keys:
BR_MAX: 10300
BR_MIN: 10300
BR_NOMINAL: 10300
CABLE_SPEC: 0x1 0x0
CONNECTOR: 33
DATE_CODE: 151012
DIAGNOSTIC_MONITORING_TYPE: 0
ENCODING: 0
ENHANCED_OPTIONS: 0
EXT_IDENTIFIER: 4
IDENTIFIER: 3
LENGTH_50UM: 0
LENGTH_62_5UM: 0
LENGTH_OM3: 0
LENGTH_OM4_OR_CU: 128
LENGTH_SMF: 0
LENGTH_SMF_KM: 0
OPTIONS: 0x0 0x0
RATE_IDENTIFIER: 0
SFF_8472_COMPLIANCE: 0
TRANSCIVER: 0x1 0x0 0x0 0x4 0x41 0x84 0x80 0xd5
TRANSCIVER_EXT: 0
VENDOR_NAME: Siemon
VENDOR_OUI: 0x0 0x1e 0x62
VENDOR_PN: SFPP30-03
VENDOR_REV: F
VENDOR_SN: 15282041925B30
WAVELENGTH: 0

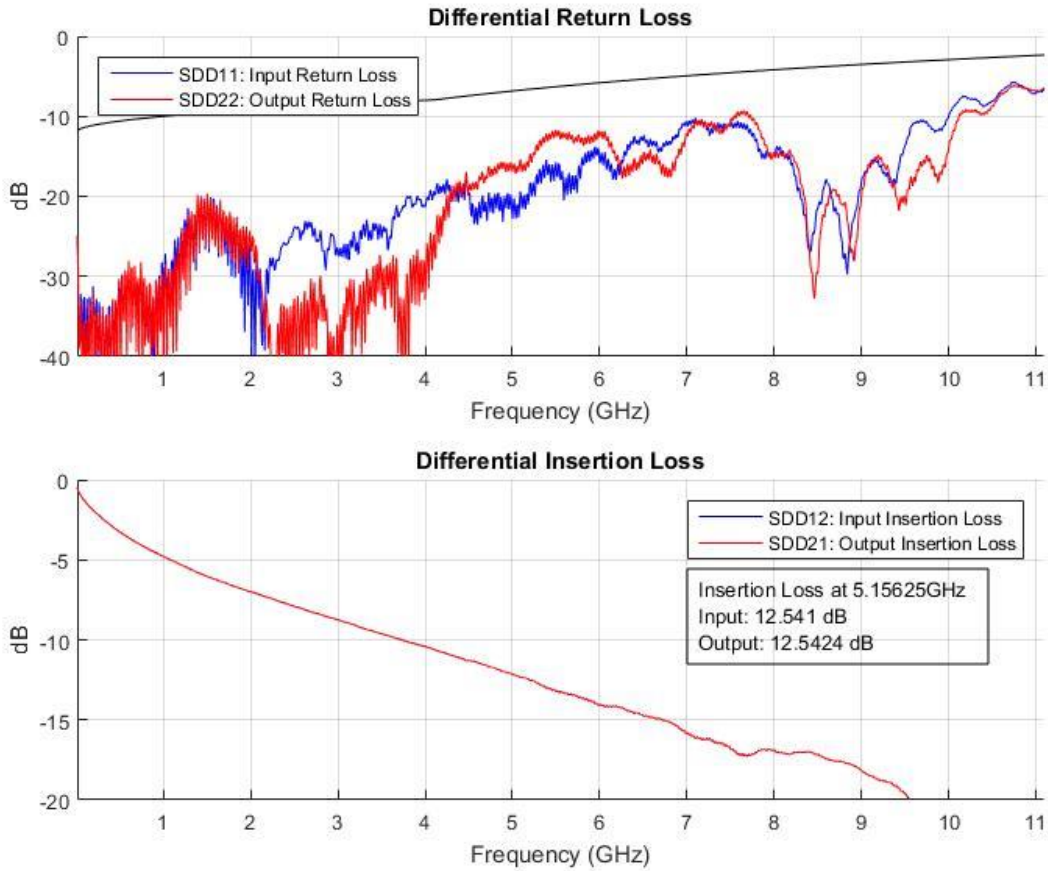
Vendor Specific: 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
0x0 0x0 0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff 0xff
0xff 0xff 0xff

I2C Address A0h, bytes 0-127, in hex
0000x: 03042101 00000441 8480d500 67000000
0010x: 00000300 5369656d 6f6e2020 20202020
0020x: 20202020 00001e62 53465050 33302d30
0030x: 33202020 20202020 46202020 0100008f
0040x: 00000000 31353238 32303431 39323542
0050x: 33302020 31353130 31320000 00000046
0060x: 00000000 00000000 00000000 00000000
0070x: ffffffff ffffffff ffffffff ffffffff

I2C Address A2h, bytes 0-127, in hex
0000x: 00000000 00000000 00000000 00000000
0010x: 00000000 00000000 00000000 00000000

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0020x: 00000000 00000000 00000000 00000000
0030x: 00000000 00000000 00000000 00000000
0040x: 00000000 00000000 00000000 00000000
0050x: 00000000 00000000 00000000 00000000
0060x: 00000000 00000000 00000000 00000000
0070x: 00000000 00000000 00000000 00000000
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Appendix B: Pluggable Module / Cable Electrical Data



Appendix C: Host Electrical Data

N/A