



FBDIMM Compliance Test

Data Sheet

1	Description.....	1
2	General Comments.....	2
3	System Requirements	2
3.1	Hardware and OS.....	2
3.2	M1 Version	2
3.3	Oscilloscope Requirements	2
4	Installation.....	2
5	Instructions	2
6	Included Measurements	3
6.1	Ref Clock Tests	3
6.2	Clean Ref Clock Tests.....	3
6.3	TX and RX PLL.....	4
6.4	TX Output	4
6.5	RX Input.....	4
7	Required Equipment.....	5
8	Revision History.....	5
9	References	5
10	Additional Resources	5

1 Description

The FBDIMM Specification: High Speed Differential PTP Link at 1.5 V (JESD8-18A) Compliance Test for M1 Oscilloscope Tools™ will test timing and voltage parameters from the specification.

For each test section, M1 will provide a results screen containing every parameter tested and its pass/fail status, as well as the condition or value the parameter was tested against and the margin of pass or fail. Upon completion of all tests, M1 will produce a final results window summarizing the result information for every test performed. Results can be notated as needed, saved directly to a text or MS Excel format, and/or directly printed in a readable format.

If any parameter does not meet the specification, M1 will allow the user to cancel testing and bring up the measurement containing the statistic that failed to allow immediate debug and analysis.

2 General Comments

Historically, compliance specifications will contain ambiguous or contradictory statements that require a test developer to make assumptions and interpret what the spec is trying to accomplish. It is frequently the case that solution implementation decisions must be made at a level of specificity that far exceeds that which is specified, creating the possibility that different test implementers will create solutions that are all valid implementations but which all can result in different results. ASA has discovered errors and significant ambiguities in many of the compliance specifications. Where it is felt that an assumption may have a significant bearing on the process, that assumption will be explained in this document.

3 System Requirements

3.1 Hardware and OS

Your hardware and Windows® Operating System (OS) should meet the requirements specified on the [M1 OT website](#).

3.2 M1 Version

You must have **M1 OT™ Standard** or **M1 OT™ Ultimate, v6.05.3** or higher to run this compliance test.

3.3 Oscilloscope Requirements

Please ensure you use an oscilloscope that has adequate technical specifications to perform the measurements required.

4 Installation

After downloading the .zip file containing the compliance test, extract the files in the .zip file to your M1 installation directory. If you are using Windows XP, this will be the **Shared Documents/My M1-OT/TestScripts** directory.

Some compliance tests require special measurements that are not part of M1. If there are any files with a .dll extension in the .zip file, copy those files into the **User_Defined** directory (**Shared Documents/M1 M1-OT/User_Defined**).

5 Instructions

Start M1, and turn on your scope. In M1, make sure all views are closed, then select the **Measurement Tools** menu. Click on **Compliance/TestScript**. Browse to select **FBDIMM.xml**, then click on **Play**. You will be prompted as to what probes to use, and what signals to probe, as the test progresses. The FBDIMM Compliance Test User's Guide is intended to guide the end user through the use of the Compliance Test.

6 Included Measurements

The compliance test will check the following measurements from the **FBDIMM Specification: High Speed Differential PTP Link at 1.5 V, JESD8-18A**, dated March, 2008. The compliance test supports 3.2 Gbps, 4.0 Gbps, and 4.8 Gbps modes of operation for Large, Regular, and Small voltage swings. Voltage levels, rise and fall times, and data timing are tested.

All table numbers refer to the tables in the specification.

6.1 Ref Clock Tests

These tests are performed on the Ref Clock at the operating frequency of the device.

- f_{Refclk} min, max
- V_{max}
- V_{min}
- $V_{\text{Refclk-diff-ih}}$
- $V_{\text{Refclk-diff-il}}$
- V_{Cross} min, max
- $V_{\text{Cross-delta}}$
- $V_{\text{Refclk-cm-acp-p}}$
- $ER_{\text{Refclk-diff-Rise}}$ min, max
- $ER_{\text{Refclk-diff-Fall}}$ min, max
- $T_{\text{Refclk-Dutycycle}}$ min, max
- $V_{\text{RB-diff}}$ min, max
- T_{Stable}
- $T_{\text{REF-SSCp-p}}$
- $T_{\text{REF-JITTER-RMS}}$

6.2 Clean Ref Clock Tests

These tests are performed on the Clean Ref Clock at the operating frequency of the device.

- $f_{\text{CleanRefclk}}$ min, max
- V_{CleanMax}
- V_{CleanMin}
- $V_{\text{CleanRefclk-diff-ih}}$ min, max
- $V_{\text{CleanRefclk-diff-il}}$ min, max
- $V_{\text{CleanCross}}$ min, max
- $V_{\text{CleanCross-delta}}$
- $V_{\text{CleanRefclk-cm-acp-p}}$
- $ER_{\text{CleanRefclk-diff-Rise}}$ min, max
- $ER_{\text{CleanRefclk-diff-Fall}}$ min, max
- $ER_{\text{CleanRefclk-Match}}$
- $T_{\text{CleanRefclk-Dutycycle}}$
- $V_{\text{CleanRB-diff}}$ min, max
- $T_{\text{CleanStable}}$
- $T_{\text{CLEANREFBWLIMIT-RMS-JIT}}$
- $T_{\text{CLEANREF2ns-RMSREL_JITr}}$
- $T_{\text{CLEANREF-SSCp-p}}$

6.3 TX and RX PLL

This test is performed on the TX and RX PLLs at the operating frequency of the device.

- $F_{\text{PLL-BW}_{\text{TX-RX}}}$ min, max

6.4 TX Output

These tests are performed on the TX Output at the operating frequency of the device. Tests may be performed at Large, Regular, and Small voltage swing levels if appropriate. Some values are not specified for all voltage swing levels.

- $V_{\text{TX-DIFF}_{\text{p-p}}}$ min, max
- $V_{\text{TX-CM}}$ min, max
- $V_{\text{TX-DE-3.5-Ratio}}$
- $V_{\text{TX-DE-6.0-Ratio}}$
- $V_{\text{TX-CM-AC}_{\text{p-p}}}$
- $V_{\text{TX-SE}}$ min, max
- $T_{\text{TX-Eye-MIN}}$
- $T_{\text{TX-DJ-DD}}$
- $T_{\text{TX-PULSE}}$
- $T_{\text{TX-RISE}}$ min, max
- $T_{\text{TX-FALL}}$ min, max
- $T_{\text{TX-RFMISMATCH}}$
- $L_{\text{TX-SKEW 1}}$
- $L_{\text{TX-SKEW 2}}$
- BER

6.5 RX Input

These tests are performed on the RX Input at the operating frequency of the device. Tests may be performed at Large, Regular, and Small voltage swing levels if appropriate. Some values are not specified for all voltage swing levels.

- $V_{\text{RX-DIFF}_{\text{p-p}}}$ min, max
- $V_{\text{RX-IDLE-SE}}$
- $V_{\text{RX-IDLE-SE-DC}}$
- $V_{\text{RX-IDLE-DIFF}_{\text{p-p}}}$
- $V_{\text{RX-SE}}$ min, max
- $V_{\text{RX-DIFF-PULSE}}$
- $V_{\text{RX-DIFF-ADJRATIO-HI}}$
- $V_{\text{RX-DIFF-ADJRATIO}}$
- $T_{\text{RX-TJ-MAX}}$
- $T_{\text{RX-DJ-DD}}$
- $T_{\text{RX-PW-ZC}}$
- $T_{\text{RX-PW-ML}}$
- $T_{\text{RX-RISE}}$
- $T_{\text{RX-FALL}}$
- $V_{\text{RX-CM}}$ min, max
- $V_{\text{RX-CM-AC}_{\text{p-p}}}$
- BER

7 Required Equipment

Two single-ended probes and one differential probe are required for conducting this compliance test. Additional equipment, such as compliance test boards, signal generators, etc. may be required to perform the compliance test, as described in the relevant specification. ASA does not supply this equipment.

8 Revision History

Revision	Date	Description
1.1	30 June 2010	Updated to test multiple signals

9 References

Date	Title	Author
March 2008	JEDEC JESD8-18A Standard	JEDEC – http://www.jedec.org

10 Additional Resources

To download the FBDIMM TestScript for use with M1 Oscilloscope Tools, please visit:
www.M1OT.com/fbdimm.htm

For a tutorial video on performing a compliance test with M1 Oscilloscope Tools, please visit:
www.M1OT.com/compliance-test-video.htm

To download the User's Guide for the FBDIMM Compliance Test, please go to:
<http://www.m1ot.com/pdf/fbdimm-users-guide.pdf>

To see what other compliance TestScripts ASA has provided for M1 users, please visit:
www.M1OT.com/m1complianceapps

To learn more about M1 Oscilloscope Tools, please visit:
www.M1OT.com