M1 OSCILLOSCOPE TOOLS™
by ASA Corp.

VESA DisplayPort, Revision 1.1a

Data Sheet

1   Description

The VESA DisplayPort Revision 1.1a 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**, **v4.07** 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

Turn on your scope. If the scope's application does not start up automatically, start the scope application. Start M1, make sure all views are closed, then select the **Measurement Tools** menu. Click on **Compliance/TestScript**. Browse to select the desired TestScript that implements your compliance test, then click on **Play**. You will be prompted as to what probes to use, and what signals to probe, as the test progresses. For more information, please refer to the Displayport Compliance Test User's Guide.

6 Included Measurements

The compliance test will check the following measurements from the VESA DisplayPort Standard, Revision 1.1a, dated January 11, 2008. The compliance tests support 1, 2, or 4 lanes, at 2.7 Gbps (HBR) and/or 1.62 Gbps (RBR) per lane. Voltage levels, rise and fall times, and data timing are tested, along with eye tests as applicable.

All table numbers refer to the tables in the specification.

6.1 Table 3-10: DisplayPort Main Link Transmitter (Main TX) Specifications

- UI_High_Rate min, max
- UI_Low_Rate min, max
- Down_Spread_Amplitude min, max
- Down_Spread_Frequency min, max
- $V_{TX-DIFFp-p-Level1}$ min, max
- $V_{TX-DIFFp-p-Level2}$ min, max
- $V_{TX-DIFFp-p-Level3}$ min, max
- $V_{TX-DIFFp-p-Level4}$ min, max
- $T_{TX-EYE\_CHIP\_High\_Rate}$ min
- $T_{TX-EYE-MEDIAN-to-MAX-JITTER\_CHIP\_High\_Rate}$ max

- $T_{TX-EYE\_CHIP\_Low\_Rate}$ min
- $T_{TX-EYE-MEDIAN-to-MAX-JITTER\_CHIP\_Low\_Rate}$ max
- $T_{TX-RISE\_CHIP}$, $T_{TX-FALL\_CHIP}$ min, max
- $V_{TX-DC-CM}$ min, max
- $V_{TX-AC-CM}$ max
- $L_{TX-SKEW-INTER\_PAIR}$ max
- $L_{TX-SKEW-INTRA\_PAIR}$ max
- $T_{TX-RISE\_FALL\_MISMATCH\_CHIPDIFF}$ max

6.2 Table 3-11: DisplayPort Main Link Receiver (Main RX) Specifications

- UI_High_Rate min, max
- UI_Low_Rate min, max
- Down_Spread_Amplitude min, max
- T_{RX-EYE_CONN} min, HBR and RBR
- T_{RX-EYE_CHIP} min, HBR and RBR

- $T_{RX-EYE-MEDIAN-to-MAX-JITTER\_CHIP}$ max, HBR and RBR
- $V_{RX-DC-CM}$ min, max
- $L_{RX-SKEW-INTER\_PAIR}$ max
- $L_{TX-SKEW-INTRA\_PAIR\_High-Bit-Rate}$ max
- $L_{TX-SKEW-INTRA\_PAIR\_Reduced-Bit-Rate}$ max

6.3 Table 3-13: Differential Noise Budget

- A,p-p – Non-ISI, Total, at TP2 and TP3, HBR and RBR

- f_{SSC} min, max

- SSC_{tol} min, max

- F_{tol} min, max

6.4 Table 3-14: Mask Vertices for High Bit Rate

- Points 1-8

6.5 Table 3-15: Mask Vertices for Reduced Bit Rate

- Points 1-8

6.6 Table 3-16: Sink EYE Vertices for TP3 at High Bit Rate

- Points 1-4

6.7 Table 3-17: Sink EYE Vertices for TP3 at Reduced Bit Rate

- Points 1-4

7 Required Equipment

You will need two differential probes and four single-ended probes.

Additional equipment, such as compliance test boards, signal generators, probes, 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
1.0	15 April 2009	Updated version of test originally released with M1 OT v4
1.1	10 June 2010	Revised to reduce movement of probes, and added graphics to indicate desired probe placement

9 References

Date	Title	Author
11-January-2008	VESA DisplayPort Standard, Version 1, revision 1a	Video Electronics Standards Association – www.vesa.org

10 Additional Resources

To download the DisplayPort Compliance Test User's Guide, please go to:
www.M1OT.com/pdf/DisplayPort-Users-Manual.pdf

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

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

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

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