smiths connectors

Smiths Connectors Sabritec Technical Document
TD#0024

Transmission Testing at 350Mbps over 12.05 Meters of Cable

Per

Digital Visual Interface (DVI) Revision 1.0, 02 April 1999

HYPERTAC IDI INTERCONNECT DEVICES SABRITEC

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1 Scope

This technical document details the tests, methods, and requirements to prove Smiths Connectors Sabritec's 100 Ohm Twinax Cable with 4 Interconnects adhere to the Digital Visual Interface (DVI) Revision 1.0, 02 April 1999 specification for the high performance serial bus.

2 Order of Precedence

In case of a conflict between the text of this document and the applicable referenced documents, the text of this document shall take precedence.

3 Description of Test Articles

Sabritec internal part number, customer part number, quantity to be tested, and a general description of articles to be tested to the requirements of this document are as in Table 1.

Table 1: Connector Part Numbers and Descriptions.

Sabritec Part Number	Customer Part Number	General Description
019911-3003	N/A	Contact, Differential, Socket, 100 OHM
019911-2205	N/A	Contact, Differential, Pin, 100 OHM
540-1153-000	N/A	100 Ohm, 26 AWG, Differential Cable

4 Standard Ambient Test Conditions

All tests and examinations specified by this test procedure will be continued under any combination of conditions within the ranges stated in this paragraph, unless specified otherwise.

Temperature: 21°C to 27°C
Relative Humidity: 20% to 80%
Barometric Pressure: 725 +50/–70 mm Hg

5 References

Test Equipment Specification

Digital Visual Interface (DVI) Revision 1.0 02 April 1999

6 Test Equipment and Facilities

6.1 Test Equipment

Table 2 lists the equipment to be used during the performance of the testing required herein. Equivalent items may be used if the effectiveness and accuracy of the tests are not adversely affected. If a piece of test equipment is found to be out of calibration, all testing shall be suspended until the equipment can be recalibrated, or a calibrated piece of test equipment can be substituted.

Table 2: Test Equipment

Manufacturer	Description and Model	Sabritec S/N	Calibration due date
Tektronix	CSA8000, Communication Signal Analyzer	719	11/18/04
Tektronix	AWG710, Arbitrary Waveform Generator	771	4/23/04

6.2 Facilities

Sabritec may use its own facilities or any commercial laboratory, unless otherwise specified.

7 Calibration and Source Inspection

7.1 Calibration

All test equipment used in the performance of the tests required herein shall be calibrated in accordance with ANSI/NCSL Z540-1-1994. Records of all equipment shall be maintained in accordance with ANSI/NCSL Z540-1-1994 and made available for review. Unless otherwise specified, Sabritec Quality Assurance will verify that all test data and collection methods are accurate and reliable.

8 Performance – Eye Pattern

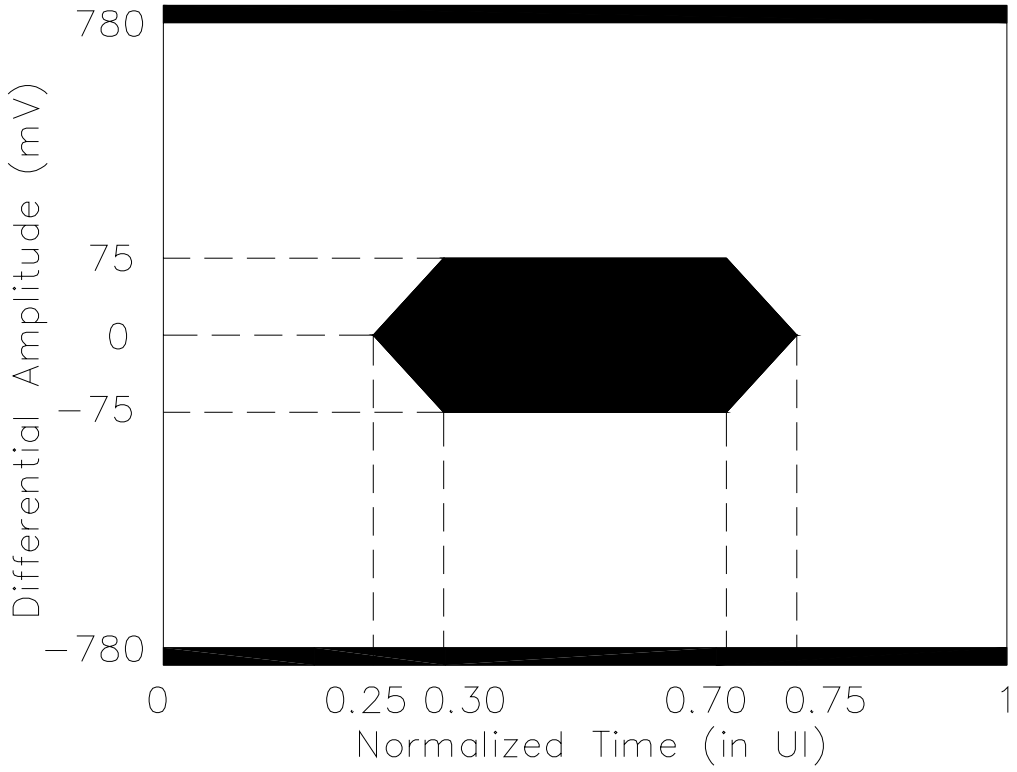
Signal Sampling:
Eye pattern is defined as an oscilloscope display in which a pseudorandom digital data signal from a receiver is repetitively sampled and applied to the vertical input, while the data rate is used to trigger the horizontal sweep. Note: System performance information can be derived by analyzing the display and verifying if the eye pattern “keep out region” or “mask region” has been achieved. An open eye pattern corresponds to minimal signal distortion. Distortion of the signal waveform due to interference and noise appears as closure of the eye pattern.

A UI is a unit interval, and is defined to be one nominal bit period for a given signaling speed. It is equivalent to the shortest nominal time between signal transitions. UI is the reciprocal of Baud (Units of UI are seconds). For the case of 531Mbps, this would equate to (1/531Mbps) = 1.88nS.

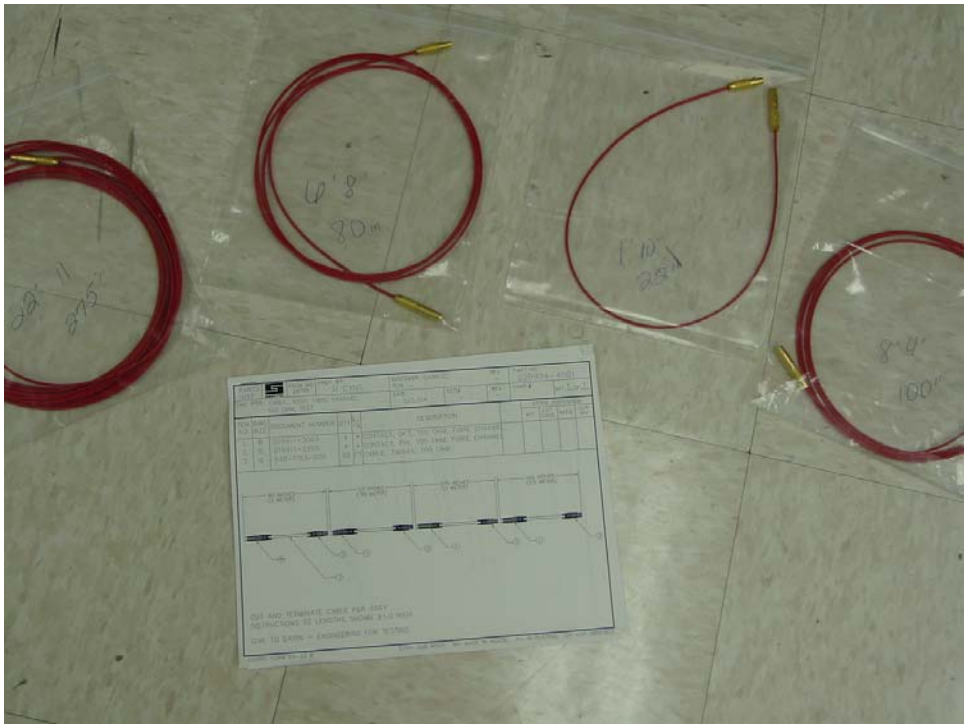
Signal Generation:
The pseudorandom binary signal will be a maximal-length sequence produced by a 23-bit linear feedback shift register (LFSR) with generator polynomial $x^{23} + x^5 + 1$. The output serial stream becomes the input to the device under test (DUT).

Baud Rates:
350 Mbps was the distinct baud rate chosen for performance verification.

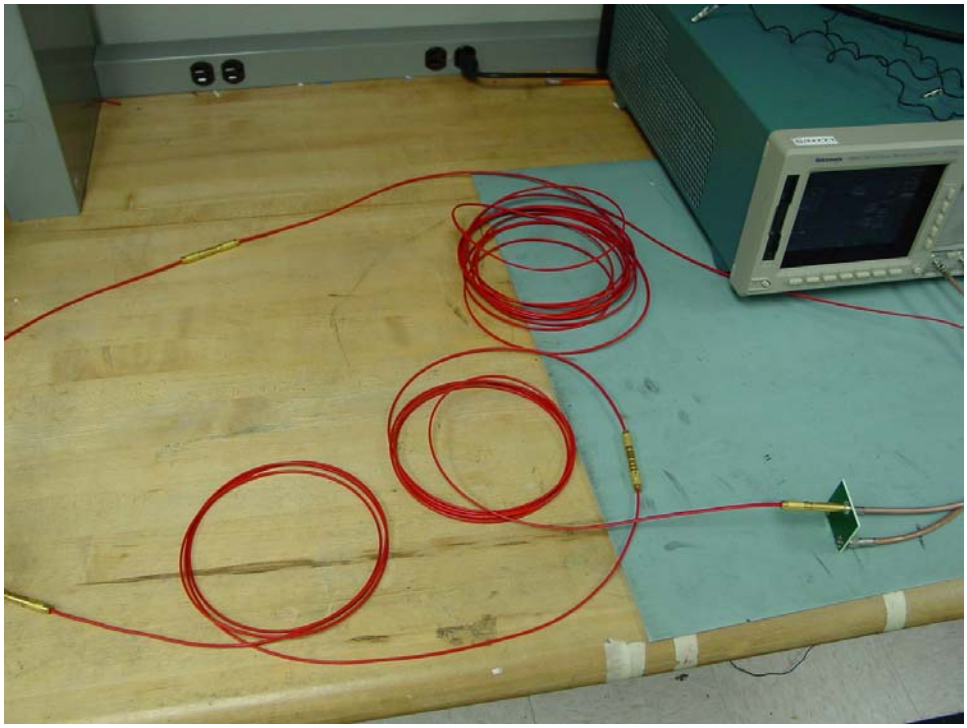
Mask Conformance:
Paragraph 4.4 of Digital Visual Interface (DVI) Revision 1.0, 02 April 1999 describes the mask conformance that must be adhered to. The mask is as shown below:



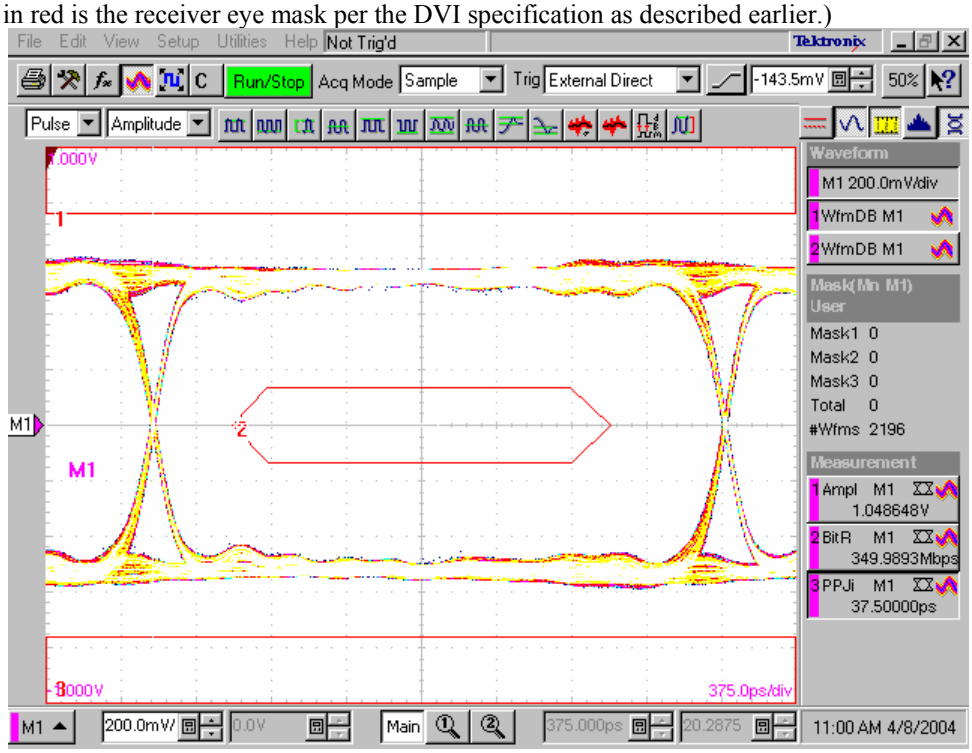
4 Cable Assembles of length 2 meters, 0.55 meters, 7 meters and 2.5 meters were assembled as shown:



All cable assemblies were connected together to form a total cable length of 12.05 meters, with 4 pairs of interconnects as shown:

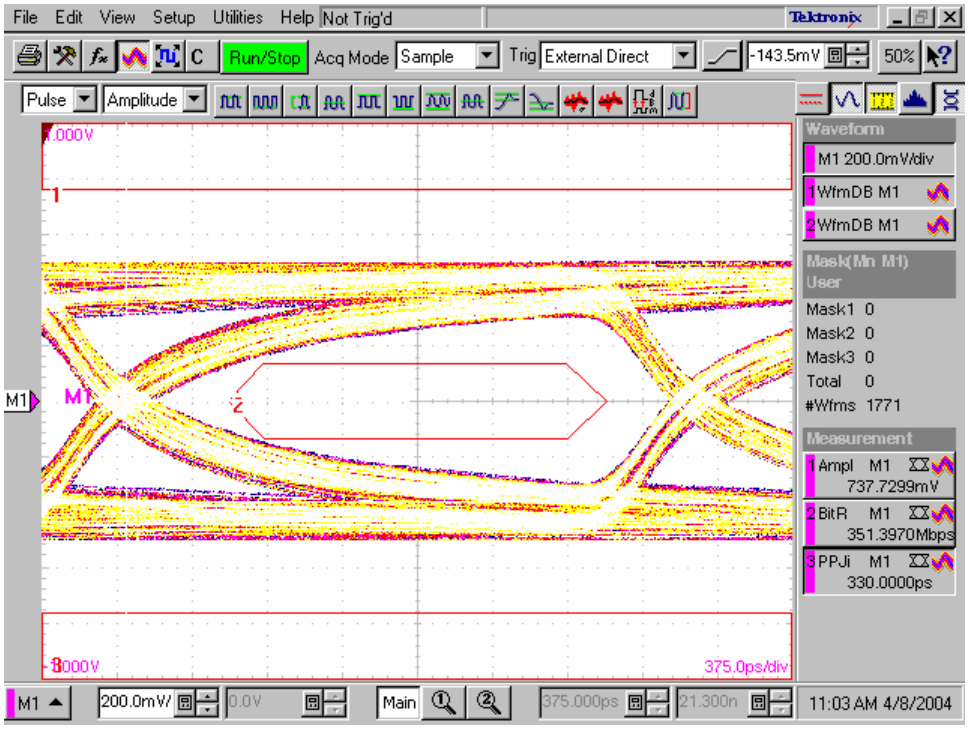


Initially, both test boards were connected together to show overall system performance without the 4 interconnections and 12.05 meters of cable. The test fixture eye pattern at 350Mbps is shown below: (Shown in red is the receiver eye mask per the DVI specification as described earlier.)



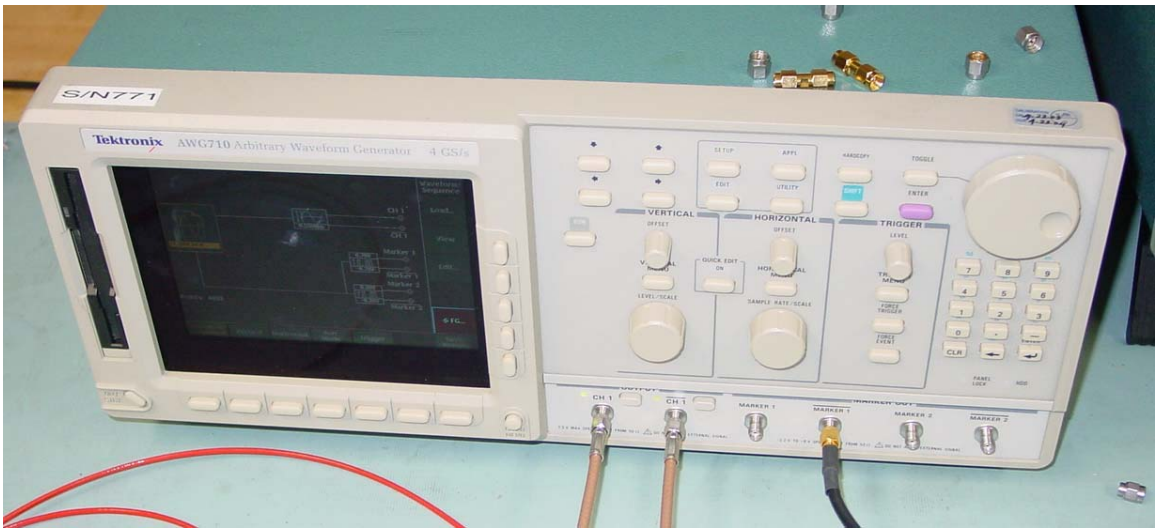
(Test Adaptors only, showing the input waveform to the DUT)

With all cables and interconnections installed, the eye pattern is still valid, and the keep-out regions have been achieved to depict a passing cable assembly:



(Passing Eye Pattern with 12.05 meters of cable and 4 interconnections)

Arbitrary Waveform Generator:



Communications Signal Analyzer: