



Sabritec Technical Document
TD#0023

Throughout Transmission Testing of Modular Block Connectors and Media

Per

1394b IEEE Standard for a High-Performance Serial Bus – Amendment 2

Tested By/Written By: _____

SABRITEC
17550 Gillette Avenue, Irvine, California 92614
(714) 250-1244

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1 Scope

This technical document details the tests, methods, and requirements to prove Sabritec's full duplex modular block connector receptacle, and contact/cable assembly adhere to the IEEE Std 1394b-2002 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
014117-3002	N/A	Receptacle, Common Ground, Modular Block
019511-2015	N/A	100 Ohm, Differential Contact
540-1153-000	N/A	100 Ohm, 26 AWG, Differential Cable, 4 Feet Length

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

IEEE Std 1394b - 2002 1394b IEEE Standard for a High-Performance Serial Bus – Amendment 2

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 $(1/531\text{Mbps}) = 1.88\text{nS}$.

Signal Generation:

The pseudorandom binary signal will be a maximal-length sequence produced by a 7-bit linear feedback shift register (LFSR) with generator polynomial $x^7 + 1$. The output serial stream becomes the input to the device under test (DUT).

Baud Rates:

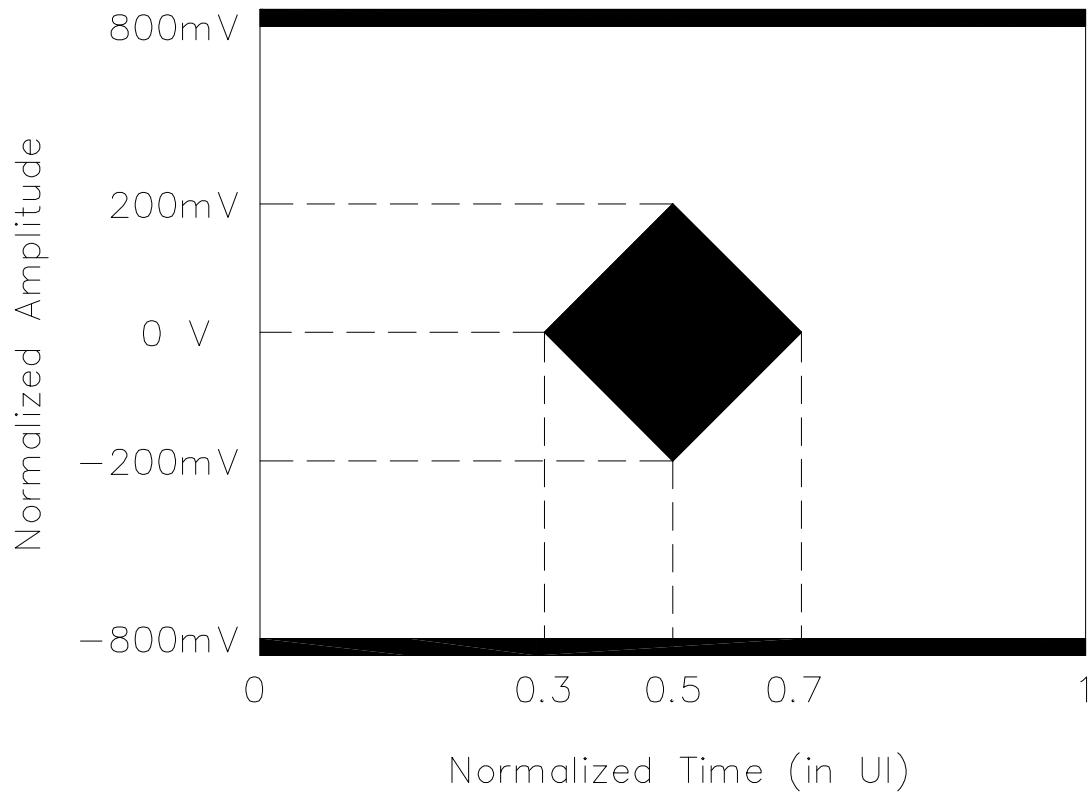
5 Distinct Baud Rates were chosen for performance verification. Baud rates are as follows:

Table 3: Baud Rates

Baud Rates
350 Mbps
1 Gbps
2 Gbps
2.5 Gbps
3 Gbps

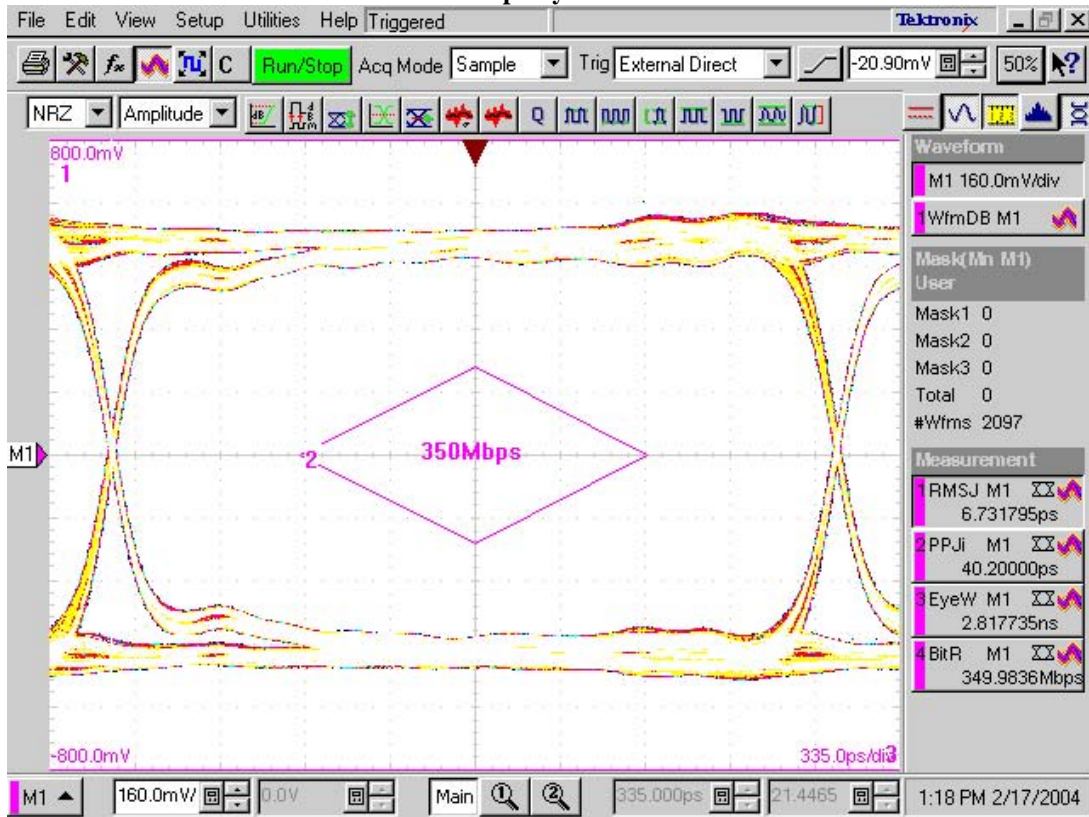
Mask Conformance:

Paragraph 9.3 of 1394b-2002 describes the mask conformance that must be adhered to. The mask is shown below:

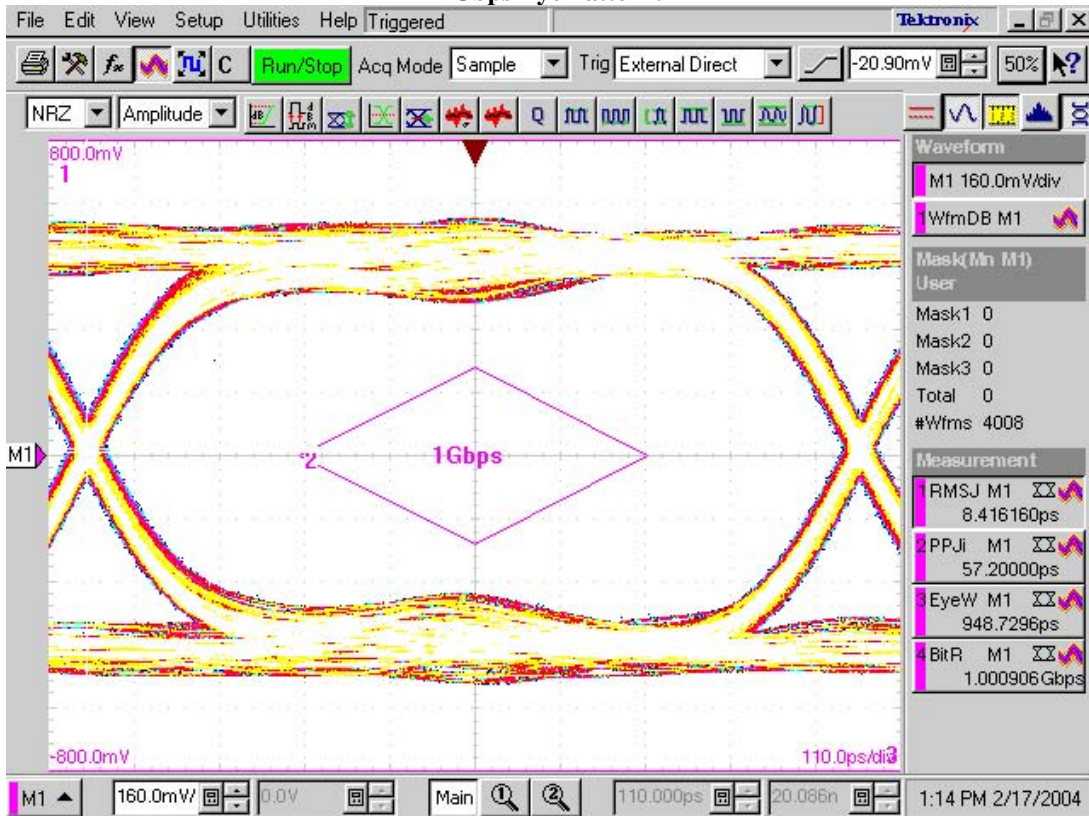


The corresponding eye pattern for each baud rate can be seen in the following pages.

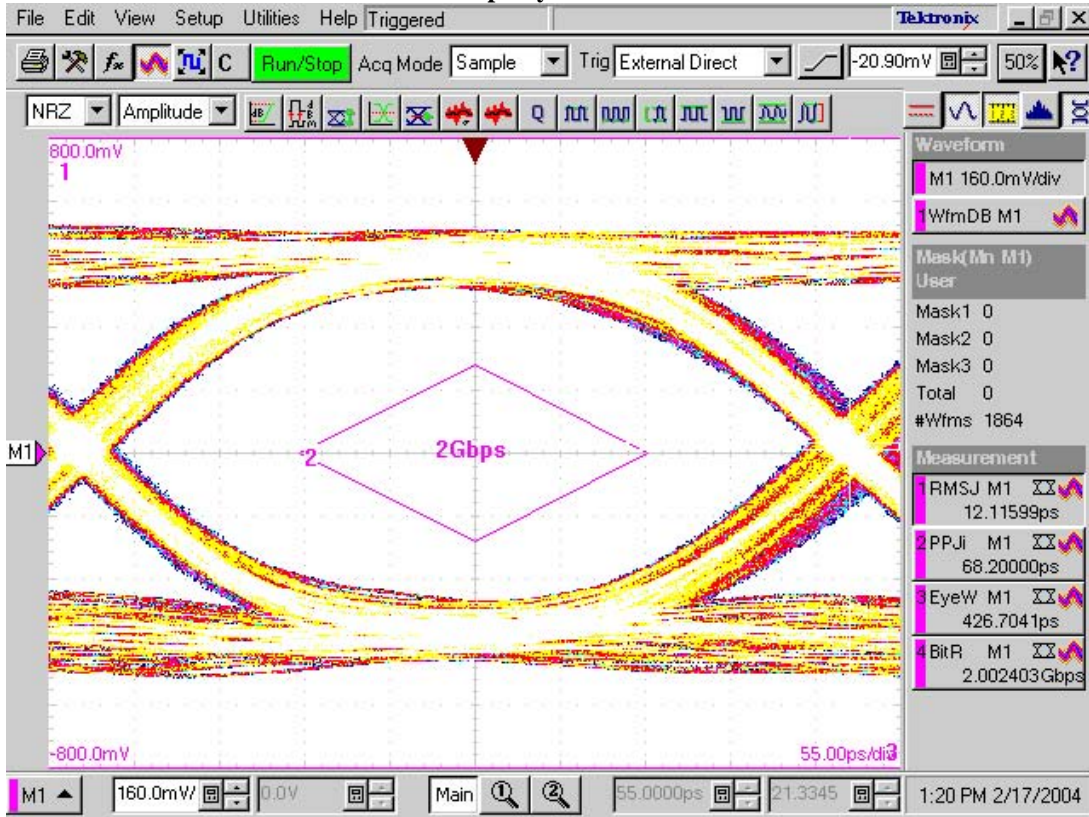
350Mbps Eye Pattern:



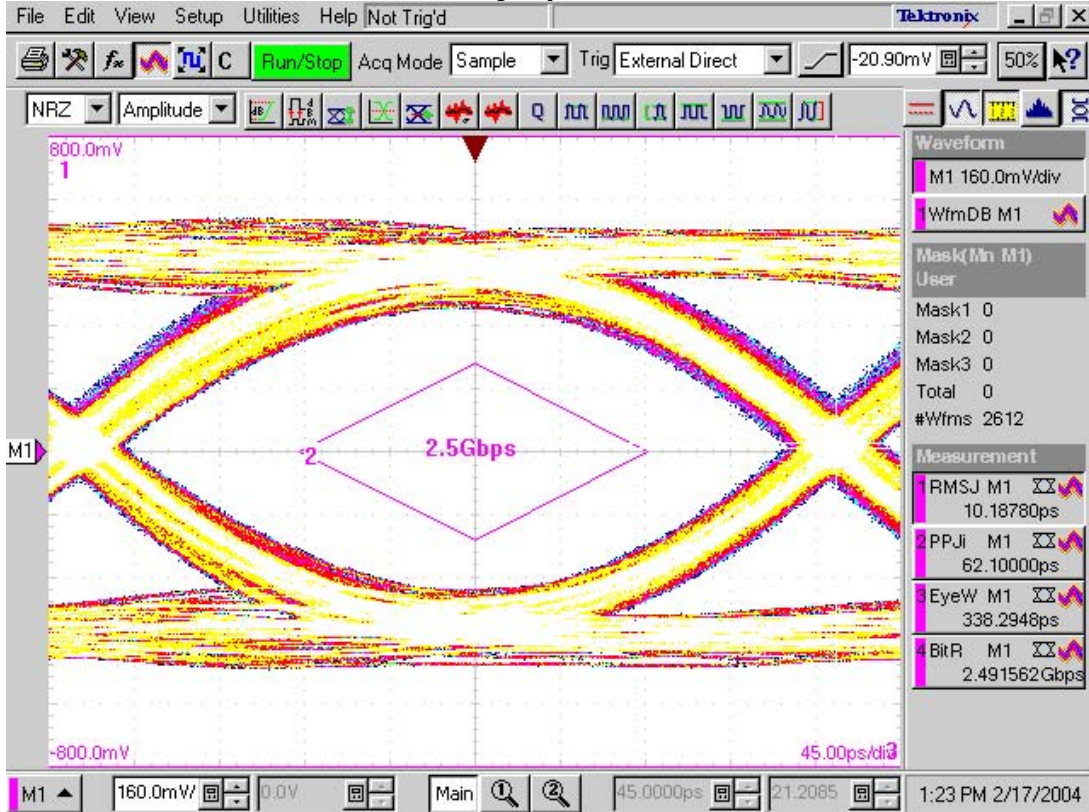
1Gbps Eye Pattern:



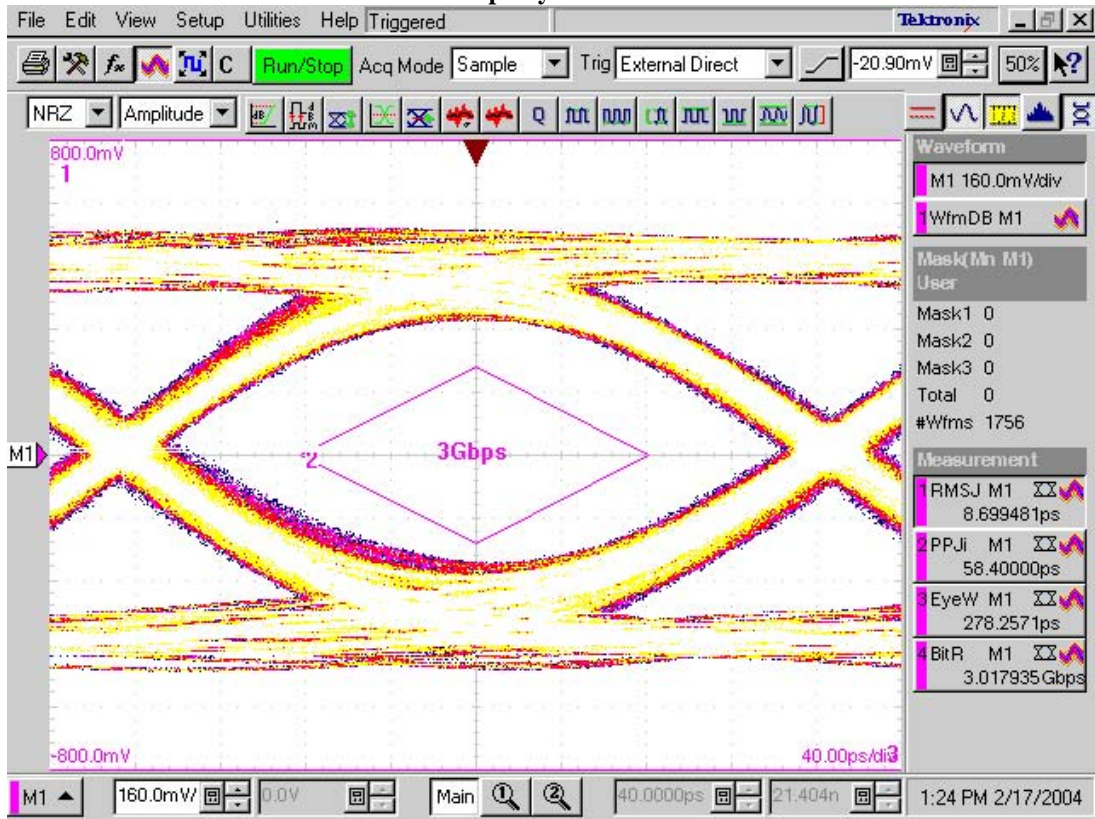
2Gbps Eye Pattern:



2.5Gbps Eye Pattern:

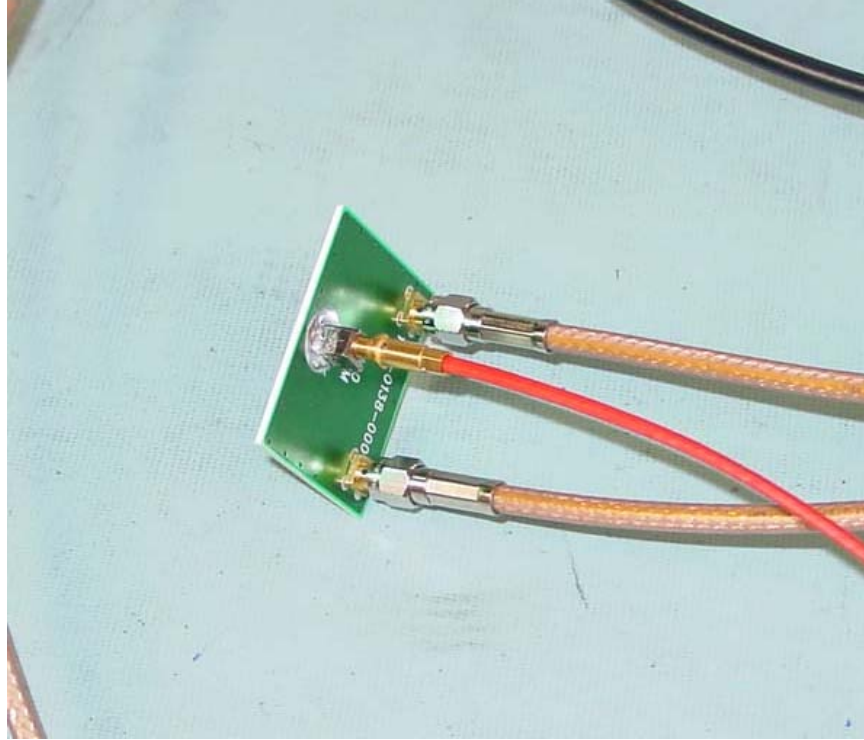


3Gbps Eye Pattern:

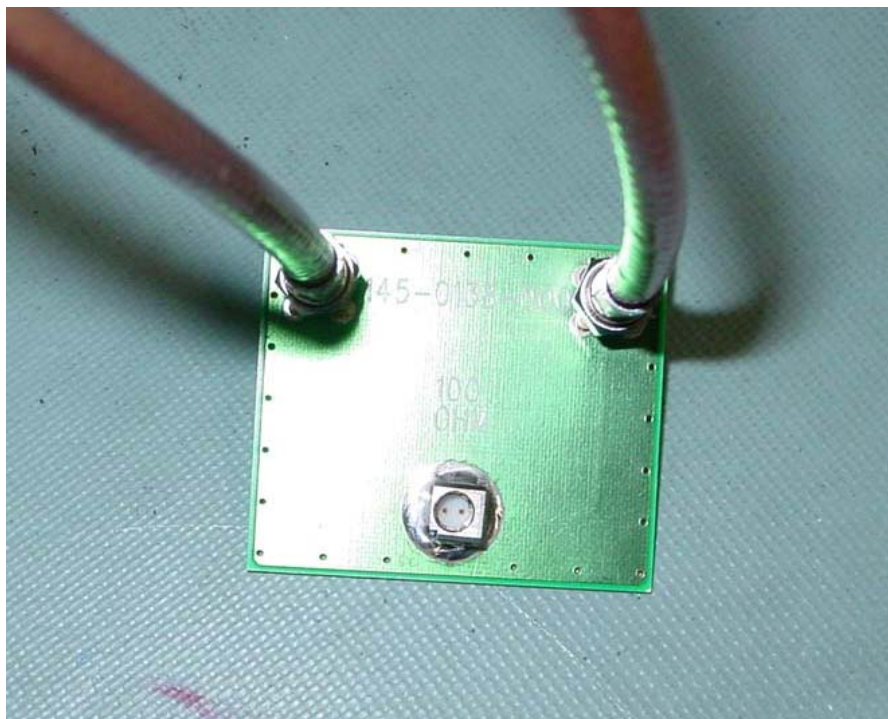


9.0 Setup Apparatus Pictures For Reference:

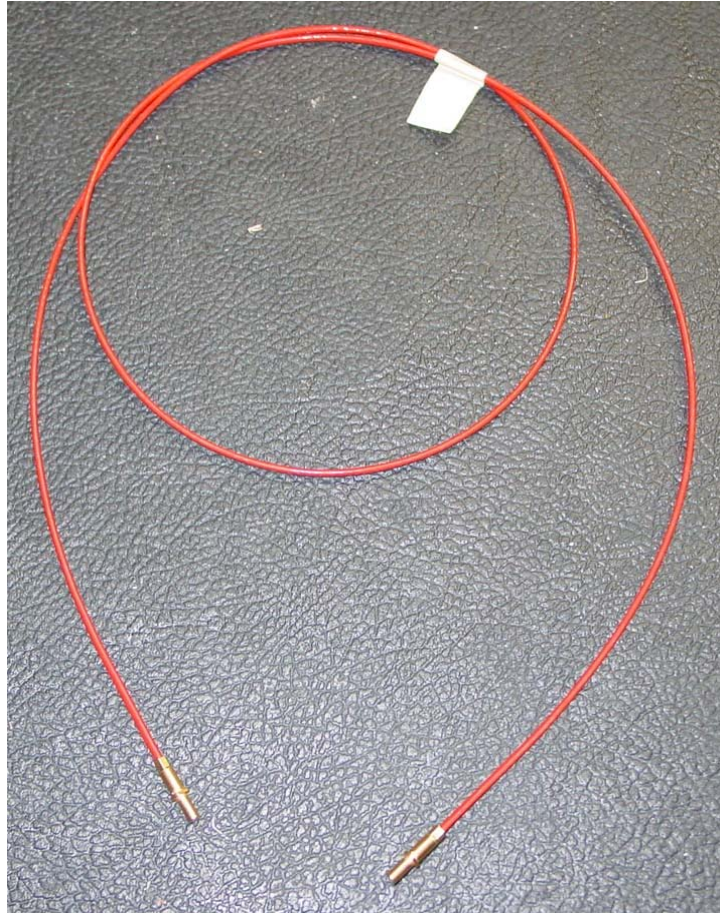
Modular Block Receptacle Mounted to Test PCB, Side View:



Modular Block Receptacle Mounted to Test PCB, Top View:



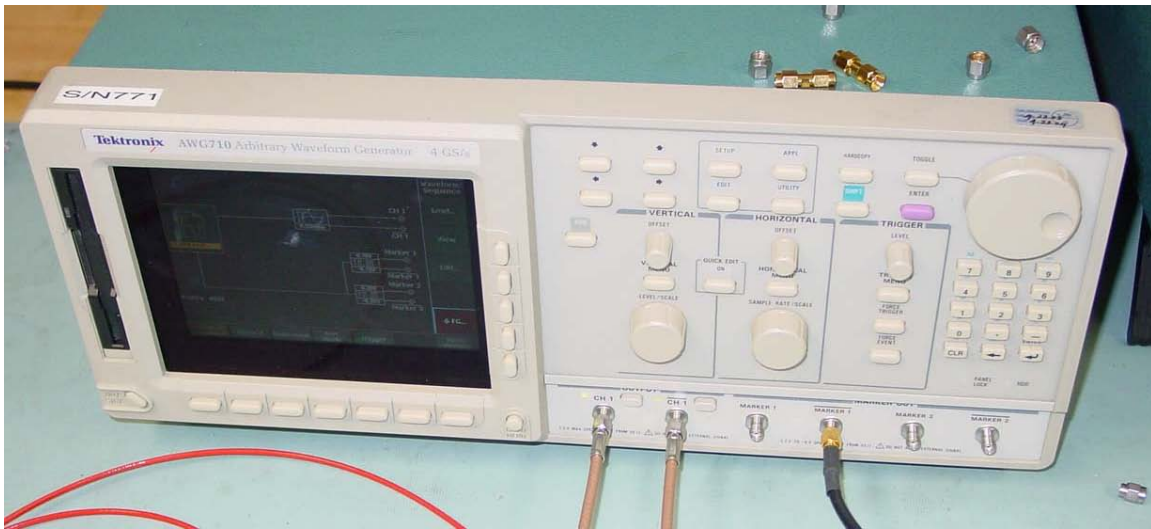
4 Feet of 100 Ohm Differential Cable Assembled with Differential Contacts:



100 Ohm Differential Contact – Close View



Arbitrary Waveform Generator:



Communication Signal Analyzer:

