



AEROSPACE STANDARD

AS5657™

Issued 2007-02
Reaffirmed 2025-04

Test Plan/Procedure for AS5643
IEEE-1394b Interface Requirements for
Military and Aerospace Vehicle Applications

RATIONALE

AS5657 has been reaffirmed to comply with the SAE Five-Year Review policy.

TABLE OF CONTENTS

1.	SCOPE.....	2
1.1	Purpose.....	2
1.2	Application.....	2
1.3	Interpretation.....	2
2.	REFERENCES.....	2
2.1	Applicable Documents	2
2.1.1	SAE Publications.....	2
2.1.2	IEEE Publications.....	2
2.1.3	U.S. Government Publications.....	3
2.1.4	1394 Trade Association Publications.....	3
2.2	Acronyms and Definitions	3
3.	GENERAL VALIDATION CRITERIA.....	3
3.1	Execution of Other Test Specifications.....	3
3.2	Black Box Testing	5
4.	INDIVIDUAL DEVICE VERIFICATION (UUT ONLY)	5
4.1	Test Setup.....	5
4.2	Physical Layer Tests	5
4.2.1	PHY Chip Register Verification.....	5
4.3	Link Layer Test.....	8
4.4	Transaction Layer Test	9
4.5	Bus Management Layer Test.....	9
4.6	Node Operation Verification.....	9
4.6.1	CC Node Operation	9
4.6.2	Remote Nodes	13
FIGURE 1	TEST SEQUENCE.....	4
FIGURE 2	"BLACK BOX" TEST SETUP	5
TABLE 1	RHB REGISTER VALUES.....	6
TABLE 2	MAX_PORT_SPEED REGISTER VALUES	7
TABLE 3	NEGOTIATED_SPEED REGISTER VALUES.....	7
TABLE 4	STANDARD LINK LAYER TESTS.....	8
TABLE 5	STOF PACKET FIELD AND VALUES.....	10
TABLE 6	CC GENERATED MESSAGE FIELDS AND VALUES	11
TABLE 7	REMOTE NODE GENERATED MESSAGE FIELDS AND VALUES	14

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1. SCOPE

This document establishes test plans/procedures for the AS5643 Standard that by itself defines guidelines for the use of IEEE-1394b as a data bus network in military and aerospace vehicles. This test specification defines procedures and criteria for testing device compliance with the AS5643 Standard.

1.1 Purpose

The purpose of this document is to establish test plans/procedures for the AS5643 Standard.

This document is controlled and maintained by the SAE with technical support from subsystem vendors.

1.2 Application

The information herein may be used to assist the test of the subsystems that interface via the vehicle's network.

1.3 Interpretation

The following interpretations shall be placed upon these words, unless stated otherwise, where they are used in this document.

May An allowed action.

Shall A mandatory requirement.

Should A recommended action.

Will A declaration of intent.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AS5643 IEEE-1394b Interface Requirements for Military and Aerospace Vehicle Applications

2.1.2 IEEE Publications

Available from IEEE, 445 Hoes Lane, Piscataway, NJ 08854-1331, Tel: 732-981-0060, www.ieee.org.

IEEE Std 1394-1995 IEEE Standard for a High Performance Serial Bus

IEEE Std 1394a-2000 IEEE Standard for a High Performance Serial Bus, Amendment 1

IEEE Std 1394b-2002 IEEE Standard for a High Performance Serial Bus, High Speed Supplement

2.1.3 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <http://assist.daps.dla.mil/quicksearch/>.

MIL-STD-461E Department of Defense Interface Standard, Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment

MIL-HDBK-454A Department of Defense Handbook, General Guidelines for Airborne Electronic Equipment

MIL-HDBK-5400 Military Handbook, Electronic Equipment, Airborne, General Guidelines

2.1.4 1394 Trade Association Publications

Available from the 1394 Trade Association, 1560 East Southlake Blvd., Suite 242, Southlake, TX 76092, Tel: 817-416-2200, <http://www.1394ta.org>.

1394 Trade Association Document 2002005, Base 1394 Test Suite Definition Version 1.0

2.2 Acronyms and Definitions

This document uses the same acronyms and definitions as the Base specification:

UUT: Unit under Test, meaning a device that is to be tested for conformance to the standard.

3. GENERAL VALIDATION CRITERIA

3.1 Execution of Other Test Specifications

In order to ensure 1394 device interoperability, other organizations have already defined compliance/interoperability specifications or are in the process of doing so. Although these specifications are targeted toward interoperability certification efforts in the consumer electronics market, they also form the basis for basic 1394 device connectivity testing, and therefore are applicable to the testing efforts as defined in this document.

Tests covered by these specifications will not be explicitly specified by this document. Only additional tests required for compliance verification with the AS5643 standard will be explicitly specified.

The following test specifications will be executed fully or in part (when applicable) prior to tests specified in this document:

- AS5643/1 Test Plan or other Physical Layer Test Specifications
- 1394 Trade Association Document 2002005, Base 1394 Test Suite Definition Version 1.0

After successfully passing the specified test program, specific tests shall be performed in order to pass environmental, vibration, and other specific tests that are beyond the scope of this specification.

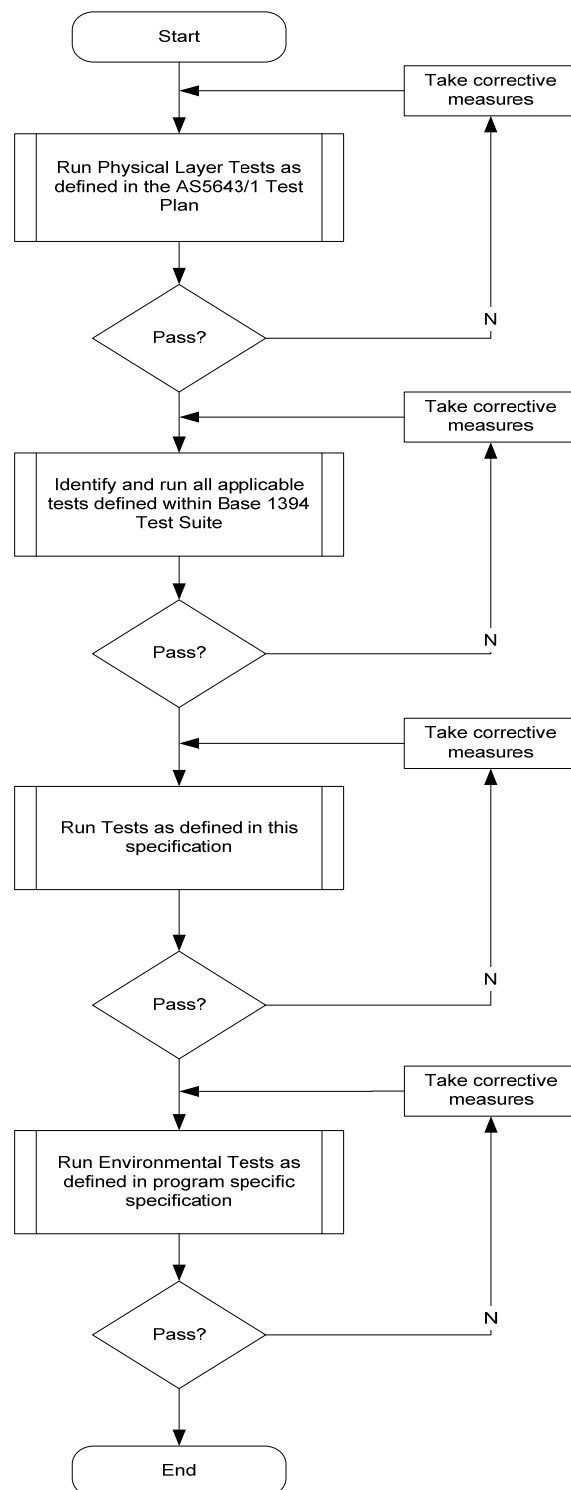


FIGURE 1 - TEST SEQUENCE

3.2 Black Box Testing

For all specified tests, the UUT will be viewed as a “black box” with the 1394 connector being the only access portal to the UUT. “Black Box” also means that the test person has little or no knowledge about the functions, features, and internal operations of the UUT.

4. INDIVIDUAL DEVICE VERIFICATION (UUT ONLY)

The tests specified in this section should verify basic device compliance with standard 1394 test criteria and are intended to ensure basic 1394 interoperability and requirements validation. They should target device validation and characterization on a single device basis, only connected to appropriate Test/Validation Instruments as needed.

This document also requires that the UUT has successfully passed physical layer tests as defined in their respective Physical Layer Test Specifications. This means that the UUT conforms to all wiring, signal integrity, and physical layer transmission characteristics.

4.1 Test Setup

A typical test setup is shown below. Black box testing requires the UUT (completely powered up) to be connected to an adequate test instrument. Unless specified differently, the tests can be performed with commercial 1394b test equipment, i.e., 1394b Bus Analyzers.

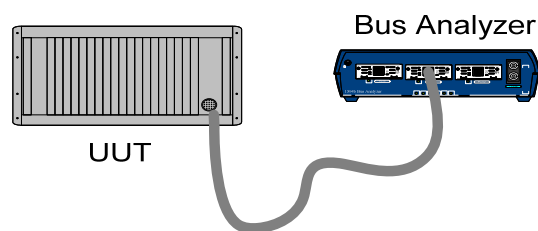


FIGURE 2 - “BLACK BOX” TEST SETUP

The cabling (including wires and connectors) used in this Test Setup must itself conform to applicable Physical Layer Test Plans. It should have been tested by itself.

The UUT's compliance is verified and tested by running test functions on these instruments. Tests can include, but are not limited to:

- PHY Register Read/Writes
- Asynchronous Stream packets verification
- Timing verification

This document does not specify environmental test parameters for the UUT. These parameters (e.g., temperature, vibration, noise, etc.) are specified in the program/device specific definitions. All tests shall be performed in the specified environmental conditions for each UUT.

4.2 Physical Layer Tests

4.2.1 PHY Chip Register Verification

The following tests target PHY register validation. PHY registers define device functionality and therefore device compliance and interoperability on the bus. Only proper PHY register settings guarantee proper device functionality.