



AEROSPACE STANDARD

AS6260™

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Verification Methods for AS5653 Network Controller, Network Terminal,
and Switch Physical Layer

RATIONALE

This documents defines the verification methods that may be applied to verify the Physical Layers of the Network Controller, (NC), Network Terminal (NT), and Switch meet the requirements of AS5653B.

AS6260 has been reaffirmed to comply with the SAE Five-Year Review policy.

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1. SCOPE

This document was prepared by the SAE AS-1A2 Committee to establish techniques for verifying that Network Controllers (NCs), Network Terminals (NTs), switches, cables, and connectors comply with the physical layer requirements specified in AS5653B. Note that this verification document only verifies the specific requirements from AS5653B and does not verify all of the requirements invoked by documents that are referenced by AS5653B. The procuring authority may require further testing to verify the requirements not explicitly defined in AS5653B and in this verification document.

1.1 Purpose

The purpose of this document is to provide methods for verifying that NCs, NTs, switches, cables, and connectors comply with the physical layer requirements of AS5653B. Note that AS5653B makes extensive reference to the various Fibre Channel standards. In the context of the MIL-STD-1760 interfaces, AS5653B is referred to as a “bus.” In the context of Fibre Channel, AS5653B is referred to as a “network.”

1.2 Application

This document is applicable to AS5653B only.

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 +1 724-776-4970 (outside uSA), www.sae.org.

AS5653 High Speed Network for MIL-STD-1760

2.1.2 U.S. Government Documents

Copies of these documents are available online at <http://quicksearch.dla.mil>.

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

MIL-STD-1553B Notice 4 - Digital Time Division Command/Response Multiplex Data Bus (Note: Revision B Notice 4 is specifically required)

MIL-STD-1760E Aircraft/Store Electrical Interconnection System

2.1.3 ANSI Accredited Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

FC-AE-1553	ANSI INCITS TR-42-2007 INCITS Technical Report for Information Technology - Fibre Channel - Avionics Environment - Upper Level Protocol (FC-AE-1553)
FC-FS-2	ANSI INCITS 424-2007 Information Technology - Fibre Channel - Framing and Signaling (FC-FS-2)
FC-LS-2	ANSI INCITS 477-2011 Information Technology - Fibre Channel Link Services (FC-LS-2)
FC-PI	ANSI INCITS 352-2002 Information Technology - Fibre Channel - Physical Interfaces (FC-PI)
MJSQ	T11.2 / Project 1230/ Rev 10 Fibre Channel - Methodologies for Jitter Specification

2.1.4 Fibre Channel Consortium Interoperability Laboratory, University of New Hampshire Publications

FC-PI-2	Clause 9 Electrical Physical Layer Test Suite Version 1.1
FC-PI-5	Clause 5 Bit Error Rate Test Suite Version 1.0
FC-PI-5	Clause 9 Electrical Physical Layer Test Suite Version 2.1

2.2 Usage of References

This standard profiles existing SAE, military, and Fibre Channel standards. Table 1 describes the purpose of each referenced document.

Table 1 - Purpose of referenced documents

Referenced Document	Purpose
AS5653B	This document defines the physical layer and protocol interfaces for the High-Speed Network for MIL-STD-1760.
MIL-STD-1760	This is the parent document defining the aircraft store interface. Referenced by this document for signal assignments, connector details, and contact details.
FC-SW-4	FC-SW-4 defines the switched fabric topology used, the means of assigning addresses, network initialization and Fast Fabric Initialization. AS5653B selects the Fast Fabric Initialization protocol defined in FC-SW-4 Annex D.
FC-PI	FC-PI defines the Fibre Channel baseline physical layer.
FC-AV	Profiled to provide specific means to transfer Audio and Video information.
FC-AE-1553	Profiled to provide a file transfer, command, and control mechanism.
FC-FS-2	Defines the Fibre Channel FC-1 and FC-2 lower layer protocols.
MJSQ	Provides background information about jitter for Fibre Channel physical layers.
FC-PI-2 Clause 9 Electrical Physical Layer Test Suite	Provides guidance for transmitter testing.
FC-PI-5 Clause 9 Electrical Physical Layer Test Suite	Provides guidance for transmitter testing.
FC-PI-5 Clause 5 Bit Error Rate Test Suite Version 1.0	Provides guidance for receiver testing.

2.3 Acronyms and Definitions

BER: Bit Error Rate

AE: Avionics Environment

CJTPAT: Compliant jitter tolerance pattern in a valid Fibre Channel frame

CRPAT: Compliant random data pattern in a valid Fibre Channel frame

CSPAT: Supply noise test sequence in a valid Fibre Channel frame

dB: Decibels

DC: Direct Current

DFC: Down Fibre Channel

DUT: Device Under Test

FC: Fibre Channel

Gbaud: Gigabaud

GHz: Gigahertz

BERT: Bit Error Ratio Tester with jitter generation capabilities for jitter tolerance testing

LINK: The point-to-point connection between two ports

LRU: Line-Replaceable Unit

mA: Milliamps

MBd: Megabaud

Mbits: Megabits

Mb/s: Megabits Per Second

MHz: Megahertz

mV: Millivolts

N/A: Not Applicable

pF: Picofarad

PHY: 1394 Physical Interface Device

ppm: Parts Per Million

ps: Picoseconds

UI: Unit Interval, duration of one bit cell

UFC: Up Fibre Channel