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Standard for Signal and Test Definition

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IEEE Standards Coordinating Committee 20 on Test and Diagnosis for Electronic Systems

Approved 17 June 2010

IEEE-SA Standards Board

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Abstract: This standard provides the means to define and describe signals used in testing. It also provides a set of common basic signals, built upon formal mathematical specifications so that signals can be combined to form complex signals usable across all test platforms.

Keywords: ATE, ATLAS, automatic test equipment, IEEE 1641, signal definitions, test definitions, test requirements, test signals, unit under test, UUT

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IEEE Introduction

This introduction is not part of IEEE Std 1641-2010, IEEE Standard for Signal and Test Definition.

This signal and test definition (STD) standard provides the ability to unambiguously define test signals. It includes a rigorous mathematical and definitive foundation for all of its signal components. Any signal defined using this standard will be the same regardless of the equipment is used to create it. The standard supports the implementation of new technologies by providing users with the ability to describe their own signals by combining existing signals. Thus, any desired signal may be described, and there is no limit on the extensibility of signals supported by this standard.

Signals defined using this standard can be used in a programming environment of the user's choice provided that that environment fulfills the minimum requirements defined in this standard. This universality enables the user to take full advantage of modern program structures and development environments, including graphical programming environments.

This standard was developed by the Test and ATS Description Subcommittee (of the IEEE Standards Coordinating Committee 20 (SCC20) on Test and Diagnosis for Electronic Systems), which has prepared a companion guide, IEEE Std 1641.1™, to explain how to implement signal definitions and test requirements in conformance with STD.

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1. Overview

1.1 Scope

This standard provides the means to define and describe signals used in testing. It provides a set of common basic signal definitions, built upon formal mathematical specifications, so that signals can be combined to form complex signals usable across all test platforms. The standard provides support for structural textual languages and programming language interfaces for interoperability.

1.2 Purpose

This standard provides a common reference for signal definitions, which may be used throughout the life cycle of a unit under test (UUT) or test system. Such a reference will in turn facilitate information transfer, test reuse, and broader application of test information—accessible through commercially available development tools.

1.3 Application

This signal and test definition (STD) standard provides the capability to describe and control signals, while permitting a choice of operating environment, including the choice of carrier language. STD permits signal operations to be embedded in any object-oriented environment and thus to be used by the architecture

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standards of various automatic test systems (ATSs). STD may be used to create truly portable test requirements. It will allow test information to pass more freely between the design, test, and maintenance phases of a project and enable the same information to be used directly across project phases. This more efficient use of information will lead to reduced life-cycle costs.

1.4 Annexes

This standard also contains annexes that describe various elements of the standard in detail. The normative annexes include definitions of the basic signals (in words and with reference to an extensible markup language (XML) format), supporting mathematical definitions for these signals, dynamic model information, interface definition descriptions, and a definition of the requirements of a supporting computer language.

Informative annexes are provided to present examples of signal libraries together with their associated XML definition.

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