

# INTERNATIONAL STANDARD



Information technology – **ITd STANDARD PREVIEW**  
Small computer system interface (SCSI)  
Part 121: Passive interconnect performance (PIP) **(standards.iteh.ai)**

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## INFORMATION TECHNOLOGY – SMALL COMPUTER SYSTEM INTERFACE (SCSI)–

### Part 121: Passive interconnect performance (PIP)

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The list of all currently available parts of the ISO/IEC 14776 series, under the general title *Information technology - Small computer system interface (SCSI)*, can be found on the IEC web site.

This International Standard has been approved by vote of the member bodies and the voting results may be obtained from the address given on the second title page.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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## Introduction

The Parallel Interface Performance standard defines requirements for measuring the electrical performance of bulk cable and interconnect assemblies for use in SPI-x applications and specification of performance limits.

The Parallel Interface Performance standard is divided into the following clauses:

- Clause 1 is the scope;
- Clause 2 enumerates the normative references;
- Clause 3 describes the definitions, symbols, conventions and abbreviations;
- Clause 4 provides a general overview of the concepts;
- Clause 5 contains a summary of bulk cable requirements;
- Clause 6 contains sample preparation, fixtures and setups for bulk cable;
- Clause 7 contains bulk cable test procedures;
- Clause 8 contains a summary of interconnect assembly requirements;
- Clause 9 contains sample preparation, fixtures and setups for interconnect assemblies;
- Clause 10 contains interconnect test requirements;

Annex A, Single ended bulk cable requirements, forms an integral part of this standard.

The following informative annexes are provided:

- Annex B, Periodic structure effects;
- Annex C, Requirements for SCSI signal driver board (SSDB);
- Annex D, Mirage effects in multi-drop subassembly TDR impedance measurement.

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## 1 Scope

In the past only the performance requirements for uniform bulk cable (called "media" in earlier standards) have been specified in SCSI standards. Since bulk cable provides only part of the electrical path in a SCSI bus segment, the performance requirements of the interconnect comprising the path is incomplete if only bulk cable is considered. This document expands the coverage to the complete assembled interconnect including connectors, uniform bulk cable, and non-uniform bulk cable. A syntax and framework is described for all types of passive interconnect. The methodology for performing the electrical measurements required to determine compliance with the performance requirements for bulk cable of several types, various assembled interconnects and printed circuit board designs is included.

Details of the measurement methodology are specified to minimize the difference in measured results from different electrical testing laboratories. Details include calibration, fixturing and sample preparation, equipment, measurement procedure and data output format.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 14776-112, *Information technology – Small computer system interface (SCSI) – Part 112: Parallel interface-2 (SPI-2)*

ISO/IEC 14776-113, *Information technology – Small computer system interface (SCSI) – Part 113: Parallel interface-3 (SPI-3)*

ISO/IEC 14776-115, *Information technology – Small computer system interface (SCSI) – Part 115: Parallel interface-5 (SPI-5) [T10/1525D]*

INCITS 362-2002, *Information technology – Small computer system interface (SCSI) – Parallel Interface-4 (SPI-4)*

## 3 Terms, definitions and abbreviations

### 3.1 Terms and definitions

[ISO/IEC 14776-121:2010](https://standards.iteh.ai/catalog/standards/sist/d63a3825-2226-46d2-a85f-018c09f231b4/iso-iec-14776-121-2010)

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#### 3.1.1 accuracy:

quality of freedom from mistake or error;  
the degree of correctness with which a measured value agrees with the true value

NOTE Not to be confused with precision, see 3.1.74.

#### 3.1.2 admittance:

an  $n$ -terminal network, the complex current flowing to the  $i$ -th terminal divided by the complex voltage applied between the  $j$ -th terminal with respect to the reference point when all other terminals have arbitrary terminations; the inverse of impedance

#### 3.1.3 american wire gauge:

formerly the Brown & Sharpe Gage, the standard gauge for copper, aluminum and other conductors except steel

#### 3.1.4 assembly:

subordinate element of a system that is comprised of two or more components

#### 3.1.5 asserted:

having a signal value associated with a logic 1

#### 3.1.6 attenuation:

a) general term used to denote a decrease in signal magnitude from one point to another; attenuation may be expressed as a scalar ratio of the input magnitude to the output magnitude or in decibels as 20 times the log of that ratio  
b) reciprocal of gain

**3.1.7 backplane:**

printed circuit board that contains the interconnect traces and connectors, into which boards or plug-in units are inserted

**3.1.8 balanced:**

a) state of impedance on a two-wire circuit when the impedance-to-ground of one wire is equal from the impedance-to-ground of the other wire

b) a circuit, in which two branches are electrically alike and symmetrical with respect to a common reference point, usually ground

**3.1.9 buffer:**

in the sense of the IBIS standard, an isolating circuit used to prevent a driven circuit from influencing a driving circuit; a transceiver, see 3.1.98.

**3.1.10 bulk cable:**

cable that is not pure connector terminated

**3.1.11 bus:**

signal line or a set of lines used by an interface system to connect a number of devices and transfer data

**3.1.12 Cable assembly:**

cable that is connector terminated;

NOTE Generally, a cable that has been terminated by a manufacturer and is ready for installation.

**3.1.13 Calibration:**

criteria to validate the measurement

**3.1.14 capacitive coupling:**

type of coupling in which the mechanism is capacitance between the interference source and the signal system; that is, the interference is induced in the signal system by an electric field produced by the interfering source

**3.1.15 circuit:**

interconnection of electrical components

**3.1.16 circuit element:**

basic constituent part of a circuit, exclusive of interconnections; a component

**3.1.17 common-mode:**

instantaneous algebraic average of two signals applied to a balanced circuit, both signals refer to a common reference

**3.1.18 common-mode noise:**

noise voltage that appears equally and in phase from each signal conductor to ground

**3.1.19 component:**

items from which a system, assembly or sub-assembly is assembled; for example, resistors, capacitors, inductors, semiconductors, etc.; a circuit element

**3.1.20 complementary metal oxide semiconductor:**

semiconductor technology in which circuits are composed of paired NMOS and PMOS devices

**3.1.21 complex dielectric constant:**

the complex permittivity of a physical medium in relation to the permittivity of free space

**3.1.22 complex permittivity:**

for isotropic media, the ratio of the complex amplitude of the electric displacement density to the complex amplitude of the electric field strength

**3.1.23 computer-aided engineering:**

application of computers to the engineering process

NOTE The term applies to any computer system or program that manipulates data for the purpose or which assists engineering, design, procurement, maintenance, etc.