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IEEE Standard for a Metric Equipment Practice for Microcomputers— Convection-Cooled With 2.5 mm Connectors

Sponsor

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Abstract: Dimension requirements are presented for subracks, plug-in units, printed boards, and backplanes to be used in conjunction with IEEE Std 1301-1991 and with a 2.5 mm connector as defined in IEC 48B (Central Office) 245. The general arrangement, dimensions, and environmental requirements are covered. This standard may be used with other IEEE Std 1301.x connector implementations in the subrack.

Keywords: backplane, cabinets, connector, interchangeability, metric, microcomputer component dimensions, plug-in unit, printed board, rack, subrack

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Introduction

(This introduction is not a part of IEEE Std 1301.3-1992, IEEE Standard for a Metric Equipment Practice for Microcomputers—Convection-Cooled With 2.5 mm Connectors.)

This document describes a metric equipment practice for use with 2.5 mm pitch connectors in accordance with IEC 48B (Central Office) 245. It is a sublevel standard to IEEE Std 1301-1991, IEEE Standard for a Metric Equipment Practice for Microcomputers—Coordination Document.

This work was performed under the aegis of the P1396 Combus committee whose selection of a 2.5 mm based connection system mandated a new equipment practice and under whose auspices the meetings were held.

Development of this standard would have been considerably more difficult and time-consuming were it not for the superior ground work laid by the Working Group of the "parent" documents, IEEE Std 1301-1991 and IEEE Std 1301.1-1991. These specifications formed a solid base from which to start.

The following is a list of those who were members of the P1301.3 Working Group at the time this document was approved by the Working Group. Any omissions are unintentional and deeply regretted.

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*The P1301.3 Working Group is grateful for the vision and outstanding foundation provided by Hans Karlsson, who unfortunately passed away before the publication of this standard. Under his able leadership, the IEEE 1301 Metric Equipment Practices were conceived, organized, and brought into existence. His dedication, organizational abilities, and friendly persuasive powers were key to this effort and he will be remembered always as the father of the IEEE Metric Equipment Practices.

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IEEE Standard for a Metric Equipment Practice for Microcomputers—Convection-Cooled With 2.5 mm Connectors

1. Overview

1.1 Scope

This is a detail standard for subracks, plug-in-units, printed boards, and backplanes to be used in conjunction with IEEE Std 1301-1991¹ and a 2.5 mm connector in accordance with IEC 48B (Central Office) 245.

1.2 Purpose

This standard is an implementation of IEEE Std 1301-1991. This standard may be used with other IEEE Std 1301.x connector implementations in the same subrack.

1.3 Dimensions

All dimensions in this document are in millimeters in accordance with ISO 1000:1981 and ISO 31-1:1978 unless otherwise specified.

First angle projection has been used throughout this document.

1.4 Coordination dimensions

This standard defines the actual dimensions of a 25 mm metric equipment practice. These actual dimensions are derived from coordination dimensions using the principles of boundary and axis references illustrated in IEEE Std 1301-1991 and described in IEC 917 (1988).

¹ Information on references can be found in clause 2..

Overall dimensions and internal subdivisions are determined by using different increments or mounting pitches ($mp_1 = 25$ mm, $mp_2 = 5$ mm, and $mp_3 = n \times 0.5$ mm). These mounting pitches have been used to derive the key dimensions given in this standard. They are also used when extending this standard with additional dimensions (where such extensions are permitted) and when alternative positions of piece parts are described. (In such cases, it is obvious that the relationships between involved dimensions shall be maintained.)

The subscript, C, has been used in this document to indicate coordination dimensions. For example, in IEEE Std 1301-1991, see H_C , W_C , and D_C for cabinet and rack coordination dimensions in figure 12 and in tables 1, 2, and 3, and H_{2C} , W_{4C} , and D_{10C} subrack coordination dimensions in figure 18 and in tables 4, 6, 7, and 8.

1.5 Environmental requirements

Performance levels and test criteria can be found in P1156.1. This document lists requirements for environmental stresses, such as temperature, humidity, shock, vibration, flammability, ESD, fungus, etc. The majority of the tests therein are based on IEC Publication 68, which is a multipart document covering aspects of environmental testing.

1.6 Conformance with this standard

Conformance with this standard can be claimed provided

- a) The recommended values are used, or
- b) Non-preferred values or options shall be agreed between supplier and user.

2. References

The following publications shall be used in conjunction with this standard. When they are superseded by an approved revision, the revision shall apply:

ANSI/IPC A-600D-1989, Acceptability of Printed Boards.²

ANSI T1.304-1989, American National Standard for Telephone Central Office Equipment-Ambient Temperature and Humidity.

ANSI T1.307-1990, American National Standard for Telecommunications-Fire Resistance Criteria—Part 1: Ignitability Requirements for Equipment Assemblies, and Fire Spread Requirements for Interconnection Wire and Cable Distribution Assemblies.

CFR (Code of Federal Regulations), Title 47: Telecommunications, Part 15J, published by Office of the Federal Register.³

IEC 48B (Central Office) 245, Detail specification for modular two-part connectors for printed boards and backplanes, grid of 2,5 mm (0,098 in) according to IEC 917.⁴

IEC 50, International Electrotechnical Vocabulary.

²ANSI publications are available from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.

³CFR publications are available from the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082, USA.

⁴When published, this document will be designated as IEC 1076-4-100. IEC drafts are available from the IEC Sales Department, Case Postale 131, 3 rue de Varembe, CH-1211, Genve 20, Switzerland/Suisse. IEC drafts are also available in the United States from the IEC Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.

- IEC 68-2-1 (1990), Environmental testing, Part 2: Tests—Tests A: Cold.
- IEC 68-2-2 (1974), Environmental testing, Part 2: Tests—Tests B: Dry heat.
- IEC 68-2-6 (1982), Environmental testing, Part 2: Tests—Tests: Fc and guidance: Vibration (sinusoidal).
- IEC 68-2-11 (1981), Environmental testing, Part 2: Tests—Test Ka: Salt mist.
- IEC 68-2-27 (1987), Environmental testing, Part 2: Tests—Test Ea and guidance: Shock.
- IEC 97 (1991), Grid system for printed circuits.
- IEC 194 (1988), Terms and definitions for printed circuits.
- IEC 348 (1978), Safety requirements for electronic measuring apparatus.
- IEC 512, Electromechanical components for electronic equipment; basic testing procedures and measuring methods.
- IEC 707 (1981), Methods of test for the determination of the flammability of solid electrical insulating materials when exposed to an igniting source.
- IEC 916 (1988), Mechanical structures for electronic equipment. Terminology.
- IEC 917 (1988), Modular order for the development of mechanical structures for electronic equipment practices.
- IEC 917-0 (1989), Modular order for the development of mechanical structures for electronic equipment practices, Part 0: Guide for the users of Publication 917.
- IEC 950 (1991), Safety of information technology equipment including electrical business equipment.
- P1156.1, Environmental Specifications for Computer Modules, Draft No. 4.1, Aug. 25, 1992.⁵
- IEEE Std 1301-1991, IEEE Standard for a Metric Equipment Practice for Microcomputers—Coordination Document.⁶
- IEEE Std 1301.2-1993, IEEE Recommended Practice for the Implementation of a Metric Equipment Practice (IEEE Std 1301).
- ISO 31-1:1978, Quantities and units of space and time.⁷
- ISO 128:1982, Technical drawings—General principles of presentation.
- ISO 1000:1981, SI units and recommendations for use of their multiples and of certain other units.
- ISO 1101:1983, Technical drawings—Geometric tolerancing—Tolerancing characteristics and symbols—Examples of indication and interpretation.
- UL 1459-1987, Telephone Equipment.⁸
- UL 1863-1990, Communication Circuit Accessories.
- UL 1950-1989, Information Technology Equipment Including Electrical Business Equipment.

⁵This IEEE authorized standards project was not approved by the IEEE Standards Board at the time this standard went to press. For information about obtaining drafts, contact the IEEE Computer Society, 1730 Massachusetts Ave., NW, Washington, DC 20036-1903, USA.

⁶IEEE publications are available from the Institute of Electrical and Electronics Engineers, Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA.

⁷ISO publications are available from the ISO Central Secretariat, Case Postale 56, 1 rue de Varem, CH-1211, Genve 20, Switzerland/Suisse. ISO publications are also available in the United States from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.

⁸UL publications are available from Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096, USA.

3. Word usage, definitions, and abbreviations

3.1 Special word usage

3.1.1 may

A key word indicating flexibility of choice with no implied preference. The phrase *is optional* is used interchangeably with the key word *may*.

3.1.2 shall

A key word indicating a mandatory requirement. Designers shall implement such mandatory requirements to ensure mechanical interchangeability and to claim conformance with the specification. The phrase *is required* is used interchangeably with the key word *shall*.

3.1.3 should

A key word indicating flexibility of choice with a strongly preferred implementation. The phrase *is recommended* and the word *preferred* are used interchangeably with the key word *should*.

3.2 Definitions

3.2.1 aperture dimension: The usable height, width, or depth between features.

3.2.2 coordination dimension: A reference dimension used to coordinate mechanical interfaces. This is not a manufacturing dimension with a tolerance,

3.2.3 mounting pitch (mp): The interval of distance between parts or assemblies in a given space.

3.2.4 *n*: Multiplier having integer values of 1, 2, 3 ..., *n*

3.2.5 reference plane: A theoretical plane, having neither thickness nor tolerance, used to separate space. See 4.1 in IEEE Std 1301-1991.

3.2.6 system unit (SU): The equipment reference increment mounting pitch, 1 SU = 25.0 mm, for height, width, and depth.

3.3 Abbreviations

The following abbreviations are used in this document:

D	depth nomenclature
EMI	electromagnetic interference
H	height nomenclature
I/O	input/output
mm	millimeter
mp	mounting pitch
PB	printed board
SU	system unit
W	width nomenclature