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Electromagnetic compatibility (EMC) –

Part 4-20: Testing and measurement techniques – Emission and immunity testing in transverse electromagnetic (TEM) waveguides

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-20: Testing and measurement techniques – Emission and immunity testing in transverse electromagnetic (TEM) waveguides

FOREWORD

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International Standard IEC 61000-4-20 has been prepared by CISPR subcommittee A: Radio interference measurements and statistical methods, in cooperation with subcommittee 77B: High-frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

This standard forms Part 4-20 of IEC 61000. It has the status of a basic EMC publication in accordance with IEC Guide 107.

This consolidated version of IEC 61000-4-20 consists of the first edition (2003) [documents CIS/A/419/FDIS and CIS/A/435/RVD] and its amendment 1 (2006) [documents 77B/520/FDIS and 77B/528/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 1.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

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

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

Withdrawn

INTRODUCTION

IEC 61000 is published in separate parts according to the following structure:

Part 1: General

General considerations (introduction, fundamental principles)
Definitions, terminology

Part 2: Environment

Description of the environment
Classification of the environment
Compatibility levels

Part 3: Limits

Emission limits
Immunity limits (in so far as they do not fall under the responsibility of the product committees)

Part 4: Testing and measurement techniques

Measurement techniques
Testing techniques

Part 5: Installation and mitigation guidelines

Installation guidelines
Mitigation methods and devices

Part 6: Generic Standards

Part 9: Miscellaneous

Each part is further subdivided into several parts, published either as International Standards, Technical Specifications or Technical Reports, some of which have already been published as sections. Others will be published with the part number followed by a dash and a second number identifying the subdivision (example: 61000-6-1).

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-20: Testing and measurement techniques – Emission and immunity testing in transverse electromagnetic (TEM) waveguides

1 Scope and object

This part of IEC 61000 relates to emission and immunity test methods for electrical and electronic equipment using various types of transverse electromagnetic (TEM) waveguides. This includes open (for example, striplines and EMP simulators) and closed (for example, TEM cells) structures, which can be further classified as one-, two-, or multi-port TEM waveguides. The frequency range depends on the specific testing requirements and the specific TEM waveguide type.

The object of this standard is to describe

- TEM waveguide characteristics, including typical frequency ranges and EUT-size limitations;
- TEM waveguide validation methods for EMC measurements;
- the EUT (i.e. EUT cabinet and cabling) definition;
- test set-ups, procedures, and requirements for radiated emission testing in TEM waveguides and
- test set-ups, procedures, and requirements for radiated immunity testing in TEM waveguides.

NOTE Test methods are defined in this standard for measuring the effects of electromagnetic radiation on equipment and the electromagnetic emissions from equipment concerned. The simulation and measurement of electromagnetic radiation is not adequately exact for quantitative determination of effects for all end-use installations. The test methods defined are structured for a primary objective of establishing adequate repeatability of results at various test facilities for qualitative analysis of effects.

This standard does not intend to specify the tests to be applied to any particular apparatus or system(s). The main intention of this standard is to provide a general basic reference for all interested product committees of the IEC. For radiated emissions testing, product committees should select emission limits and test methods in consultation with CISPR. For radiated immunity testing, product committees remain responsible for the appropriate choice of immunity tests and immunity test limits to be applied to equipment within their scope. This standard describes test methods that are separate from those of IEC 61000-4-3. These other distinct test methods may be used when so specified by product committees, in consultation with CISPR and TC 77.

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.

IEC 60050(161), *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 60068-1, *Environmental testing – Part 1: General and guidance.*

IEC 61000-2-11, *Electromagnetic compatibility (EMC) – Part 2-11: Environment – Classification of HEMP environments.* Basic EMC publication

IEC 61000-4-23, *Electromagnetic compatibility (EMC) – Part 4-23: Testing and measurement techniques – Test methods for protective devices for HEMP and other radiated disturbances.* Basic EMC publication

IEC/TR 61000-4-32, *Electromagnetic compatibility (EMC) – Part 4-32: Testing and measurement techniques – HEMP simulator compendium*

IEC/TR 61000-5-3, *Electromagnetic compatibility (EMC) – Part 5-3: Installation and mitigation guidelines – HEMP protection concepts.* Basic EMC publication

CISPR 16-1-1, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

CISPR 16-1-4, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Ancillary equipment – Radiated disturbances*

CISPR 16-2-3, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements*

CISPR 16-2-4, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-4: Methods of measurement of disturbances and immunity – Immunity measurements*

CISPR 22, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*