

**Specification for radio disturbance and immunity  
measuring apparatus and methods –**

**Part 1-3:**

**Radio disturbance and immunity measuring  
apparatus – Ancillary equipment –  
Disturbance power**

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INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION  
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

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**SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY  
MEASURING APPARATUS AND METHODS –**

**Part 1-3: Radio disturbance and immunity measuring apparatus –  
Ancillary equipment – Disturbance power**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard CISPR 16-1-3 has been prepared by CISPR subcommittee A: Radio interference measurements and statistical methods.

This first edition of CISPR 16-1-3, together with CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-4 and CISPR 16-1-5, cancels and replaces the second edition of CISPR 16-1, published in 1999, amendment 1 (2002) and amendment 2 (2003). It contains the relevant clauses of CISPR 16-1 without technical changes.

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

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

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

Withdawn

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## INTRODUCTION

CISPR 16-1, CISPR 16-2, CISPR 16-3 and CISPR 16-4 have been reorganised into 14 parts, to accommodate growth and easier maintenance. The new parts have also been renumbered. See the list given below.

| Old CISPR 16 publications |   | New CISPR 16 publications |  |
|---------------------------|---|---------------------------|--|
| CISPR 16-1                | Radio disturbance and immunity measuring apparatus  | →                         | CISPR 16-1-1 Measuring apparatus   |
|                           |   | →                         | CISPR 16-1-2 Ancillary equipment – Conducted disturbances  |
|                           |   | →                         | CISPR 16-1-3 Ancillary equipment – Disturbance power   |
|                           |   | →                         | CISPR 16-1-4 Ancillary equipment – Radiated disturbances   |
|                           |   | →                         | CISPR 16-1-5 Antenna calibration test sites for 30 MHz to 1 000 MHz                                      |
| CISPR 16-2                | Methods of measurement of disturbances and immunity | →                         | CISPR 16-2-1 Conducted disturbance measurements  |
|                           |   | →                         | CISPR 16-2-2 Measurement of disturbance power  |
|                           |   | →                         | CISPR 16-2-3 Radiated disturbance measurements   |
|                           |   | →                         | CISPR 16-2-4 Immunity measurements   |
| CISPR 16-3                | Reports and recommendations of CISPR                | →                         | CISPR 16-3 CISPR technical reports   |
|                           |   | →                         | CISPR 16-4-1 Uncertainties in standardised EMC tests   |
|                           |   | →                         | CISPR 16-4-2 Measurement instrumentation uncertainty   |
|                           |   | →                         | CISPR 16-4-3 Statistical considerations in the determination of EMC compliance of mass-produced products |
| CISPR 16-4                | Uncertainty in EMC measurements                     | →                         | CISPR 16-4-4 Statistics of complaints and a model for the calculation of limits                          |

More specific information on the relation between the 'old' CISPR 16-1 and the present 'new' CISPR 16-1-3 is given in the table after this introduction (TABLE RECAPITULATING CROSS REFERENCES).

Measurement instrumentation specifications are given in five new parts of CISPR 16-1, while the methods of measurement are covered now in four new parts of CISPR 16-2. Various reports with further information and background on CISPR and radio disturbances in general are given in CISPR 16-3. CISPR 16-4 contains information related to uncertainties, statistics and limit modelling.

CISPR 16-1 consists of the following parts, under the general title *Specification for radio disturbance and immunity measuring apparatus and methods – Radio disturbance and immunity measuring apparatus*:

- Part 1-1: Measuring apparatus,
- Part 1-2: Ancillary equipment – Conducted disturbances,
- Part 1-3: Ancillary equipment – Disturbance power,
- Part 1-4: Ancillary equipment – Radiated disturbances,
- Part 1-5: Antenna calibration test sites for 30 MHz to 1 000 MHz.

## TABLE RECAPITULATING CROSS-REFERENCES

Second edition of CISPR 16-1  
Clauses, subclausesFirst edition of CISPR 16-1-3  
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35.3  
5.3.1  
5.3.2  
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Annexes

Annexes

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40, 41, 42A.1, A.2  
B.1, B.2, B.3

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## SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY MEASURING APPARATUS AND METHODS –

### Part 1-3: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Disturbance power

#### 1 Scope

This part of CISPR 16 is designated a basic standard, which specifies the characteristics and calibration of the absorbing clamp for the measurement of radio disturbance power in the frequency range 30 MHz to 1 GHz.

#### 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.

CISPR 14-1:2000, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission*

CISPR 16-1-1: 2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*  
(<https://standards.iteh.ai>)

CISPR 16-2-1:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-1: Methods of measurement of disturbances and immunity – Conducted disturbance measurements*

CISPR 16-2-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-2: Methods of measurement of disturbances and immunity – Measurement of disturbance power*

CISPR 16-3:2003, *Specification for radio disturbance and Immunity measuring apparatus and methods – Part 3: CISPR technical reports*

CISPR 16-4-1:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-1: Uncertainties, statistics and limit modelling – Uncertainties in standardized EMC tests*

CISPR 16-4-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Measurement instrumentation uncertainties*

IEC 60050(161):1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*, including its Amendments 1 (1997) and 2 (1998)

*International Vocabulary of Basic and General Terms in Metrology*, International Organization for Standardization, Geneva, 2nd edition, 1993

### 3 Definitions

None of the definitions of CISPR 16-1:1999 apply to this new part of CISPR 16. For further definitions, see IEC 60050(161).

## 4 Absorbing clamp for use in the frequency range 30 MHz to 1 000 MHz

### 4.1 General

Absorbing clamps are suitable for the measurement of disturbance from some types of equipment depending on construction and size. The precise measuring procedure and its applicability is to be specified for each category of equipment. If the EUT itself (without connecting leads) approaches a 1/4 of a wavelength of the measuring frequency, direct cabinet radiation may occur.

The disturbance capability of an appliance with a mains lead being the only external lead may be taken as the power it could supply to its mains lead acting as a radiating antenna. This power is nearly equal to that supplied by the appliance to a suitable absorbing device placed around the lead at the position where the absorbed power is maximum. The absorbing device is known as the absorbing clamp or the ferrite clamp.

Equipment having external leads other than a mains lead can radiate disturbing energy from such leads, shielded or unshielded, in the same manner as radiation from the mains lead. Absorbing clamp measurements can be done on these leads also.

Radiation from leads at frequencies above 300 MHz, up to 1 000 MHz, may be measured with a suitable absorbing clamp. Such measurements could be of considerable use. However, it should be noted that substantial amount of radiation could emanate directly from the equipment.

### 4.2 Construction

The absorbing clamp shall consist of three parts as follows:

- a) a broadband RF current transformer;
- b) a broadband RF power absorber and impedance stabilizer for the lead under measurement;
- c) an absorbing sleeve or assembly of ferrite rings to reduce RF current on the surface of the coaxial cable from the current transformer to the measuring receiver.

Annex A describes the construction of some examples of absorbing clamps.

NOTE The transformer and the absorber described in a) and b) above respectively are maintained in fixed relative positions as close together as convenient. They may be constructed of split rings to avoid the necessity of disconnecting a fitted plug from the lead, but care should be taken to keep the air gap small.

### 4.3 Characteristics

The use of the absorbing clamp relies on a calibrating factor obtained by a specific calibration procedure, as described in annex B and figure B.1. The absorbing clamp shall have a characteristic response of output power versus input power from the calibration signal generator,  $P_0$ , that shows no pronounced resonance at any frequency.