AS CISPR 16.1.1:2020

Australian STANDARD®

Specification for radio disturbance and immunity measuring apparatus and methods

Part 1.1: Radio disturbance and immunity measuring apparatus — Measuring apparatus (CISPR 16-1-1:2019 (ED 5.0) MOD)

STANDARDS Australia

AS CISPR 16.1.1:2020

This Australian Standard® was prepared by TE-003, Electromagnetic Compatibility. It was approved on behalf of the Council of Standards Australia on 8 June 2020.

This Standard was published on 17 July 2020.

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This Standard was issued in draft form for comment as DR AS CISPR 16.1.1:2020.

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ISBN 978 1 76072 938 7

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Specification for radio disturbance and immunity measuring apparatus and methods

Part 1.1: Radio disturbance and immunity measuring apparatus — Measuring apparatus (CISPR 16-1-1:2019 (ED 5.0) MOD)

Originated in Australia as part of AS 1052.1—1976.
Previous edition revised and redesignated AS CISPR 16.1.1:2017.
Sixth edition 2020.

Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee TE-003, Electromagnetic Compatibility, to supersede AS CISPR 16.1.1:2017, *Specification for radio disturbance and immunity measuring apparatus and methods, Part 1.1: Radio disturbance and immunity measuring apparatus—Measuring apparatus.*

The objective of this document is to specify the characteristics and performance of equipment for the measurement of radio disturbance in the frequency range 9 kHz to 18 GHz. In addition, requirements are provided for specialized equipment for discontinuous disturbance measurements.

The specifications in this document apply to electromagnetic interference (EMI) receivers and spectrum analyzers. The calibration requirements for measuring receivers are detailed in AnnexJ.

This document is an adoption with national modifications, and has been reproduced from CISPR 16-1-1:2019, *Specification for radio disturbance and immunity measuring apparatus and methods, Part 1-1: Radio disturbance and immunity measuring apparatus — Measuring apparatus*. The modifications are additional requirements and are set out in Appendix ZZ, which has been added at the end of the source text.

Appendix ZZ lists the variations to the normative references list for the application of this documents in Australia and New Zealand.

This document is structured as follows:

(a) Preface.

(b) CISPR 16-1-1:2019 (unedited from the contents page to the final clause of the source document).

(c) Appendix ZZ—Australian/New Zealand variations to the source document.

As this document has been reproduced from an International Standard, the following applies:

(i) In the source text “This part of CISPR 16” should read “this document”.

(ii) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

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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 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus

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 16-1-1 has been prepared by CISPR subcommittee A: Radio-interference measurements and statistical methods.

This fifth edition cancels and replaces the fourth edition published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Reorganization of the document structure to remove common elements of receiver performance from Clauses 4, 5, 6, and 7 and create a new clause that applies across all of these clauses. Key common parameters include:

1) Input impedance
2) CW amplitude accuracy
3) Limitations of intermodulation effects
4) Limitation of receiver noise and internally generated spurious signals

b) Rewording of Subclause B.1.1 for the purpose of correcting existing errors

c) Amendments to Subclause 7.5.2 to modify the definition of the test signal to be used for calibrating and verifying the required RMS-average detector response to pulses of the receiver. This section will include a note requiring that the amplitude of the pulsed signal be verified prior to the calibration, and will include several verification methods.

d) Amendments to Subclause 6.5.2 to modify the definition of the test signal to be used for calibrating and verifying the required average detector response to pulses. The purpose of this proposed change is the alignment of the test signal type with that of the newly proposed signal used to verify the RMS-average detector, allowing the use of a pulsed RF signal. This section will include a note requiring that the amplitude of the pulsed signal be verified prior to the calibration and will include several verification methods.

e) Implementation and use of Gaussian filters

f) Amendments to Clause 9 on discontinuous disturbance analyzers (DDAs) to allow the use of measuring receivers with built-in DDAs, to clarify which signal is used for click time parameter determination and to allow the use of FFT-based measuring instruments with internal DDAs.

g) Amendments to Subclauses 4.2, 5.2, 6.2 and 7.2 to remove the mention of a symmetric input for measuring receivers.

h) Deletion of Subclause 4.8.1 “Screening Effectiveness”.

i) add a frequency accuracy specification to the proposed reorganized clause mentioned in a) above.

j) Amend Subclause 6.5.3 to adjust the allowable tolerance for the variation with repetition frequency for the linear average detector.

k) Add interpretation information to Clause K.4 based on CISPR-A-1188-INF.

l) Indicate that the 31,6 Hz pulse repetition frequency for the RMS-Average test requirement for Bands C and D in Table 15 is optional. For the RMS-Average overload requirement in Table 13, change the minimum pulse repetition frequency to 100 Hz and the associated Peak to RMS-Average ratio to 30,6 dB.

m) Improve the phrasing used for the tolerance statements in Subclauses 4.4.1, 5.5, 6.5.2, 6.5.3, 6.5.4 and 7.5.2.

n) Remove a note from Clause E1.

o) Add a reference for FFT-based discontinuous disturbance analyzers

It has the status of a basic EMC publication in accordance with IEC Guide 107, *Electromagnetic compatibility – Guide to the drafting of electromagnetic compatibility publications*.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
CIS/A/1290/FDIS	CIS/A/1295/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

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

A list of all parts in the CISPR 16 series, published under the general title *Specification for radio disturbance and immunity measuring apparatus and methods*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The CISPR 16 series, published under the general title *Specification for radio disturbance and immunity measuring apparatus and methods,* is comprised of the following sets of documents:

- CISPR 16-1 – six parts covering measurement instrumentation specifications;
- CISPR 16-2 – five parts covering methods of measurement;
- CISPR TR 16-3 – a single publication containing various technical reports (TRs) with further information and background on CISPR and radio disturbances in general;
- CISPR 16-4 – five parts covering 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: Coupling devices for conducted disturbance measurements

– Part 1-3: Ancillary equipment – Disturbance power

– Part 1-4: Antennas and test sites for radiated disturbance measurements

– Part 1-5: Antenna calibration sites and reference test sites for 5 MHz to 18 GHz

– Part 1-6: EMC antenna calibration

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning the measuring receiver with RMS-average detector (patent no DE 10126830) given in Clause 7.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

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ISO (www.iso.org/patents) and IEC (http://patents.iec.ch) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.

SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY MEASURING APPARATUS AND METHODS –

Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus

1 Scope

This part of CISPR 16 specifies the characteristics and performance of equipment for the measurement of radio disturbance in the frequency range 9 kHz to 18 GHz. In addition, requirements are provided for specialized equipment for discontinuous disturbance measurements.

NOTE In accordance with IEC Guide 107, CISPR 16-1-1 is a basic electromagnetic compatibility (EMC) standard for use by product committees of the IEC. As stated in Guide 107, product committees are responsible for determining the applicability of a basic EMC standard. CISPR and its subcommittee are prepared to co-operate with product committees in the evaluation of the value of particular EMC tests for specific products.

The specifications in this document apply to electromagnetic interference (EMI) receivers and spectrum analyzers. The term “measuring receiver” used in this document refers to both EMI receivers and spectrum analyzers (see also 3.7). The calibration requirements for measuring receivers are detailed in Annex J.

Further guidance on the use of spectrum analyzers can be found in Annex B of any one of the following documents: CISPR 16-2-1:2014, CISPR 16-2-2:2010, or CISPR 16-2-3:2016.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 11:2015, *Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement*
CISPR 11:2015/AMD1:2016
CISPR 11:2015/AMD2:2019

CISPR 14-1:2016, *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission*

CISPR 16-2-1:2014, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements*
CISPR 16-2-1:2014/AMD1:2017

CISPR 16-2-2:2010, *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 16-2-3:2016, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements*