Australian/New Zealand Standard™

Specification for radio disturbance and immunity measuring apparatus and methods

Part 1.4: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Radiated disturbances

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee TE-003, Electromagnetic Interference. It was approved on behalf of the Council of Standards Australia on 12 June 2009 and on behalf of the Council of Standards New Zealand on 26 June 2009.
This Standard was published on 21 August 2009.

The following are represented on Committee TE-003:

Association of Consulting Engineers Australia
Australian Broadcasting Corporation
Australian Chamber of Commerce and Industry
Australian Communications and Media Authority
Australian Industry Group
Australian Information Industry Association
Australian Subscription Television and Radio Association
Consumer Electronics Suppliers Association
Department of Defence (Australia)
Electrical Compliance Testing Association
Energy Networks Association
Engineers Australia
Free TV Australia
Ministry of Economic Development (New Zealand)
National Measurement Institute
SingTel Optus Pty Limited
Society of Automotive Engineers- Australasia
Telstra Corporation Limited
University of Western Australia
Wireless Institute Australia

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 09025.

Australian/New Zealand Standard™

Specification for radio disturbance and immunity measuring apparatus and methods

Part 1.4: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Radiated disturbances

Originated as AS/NZS CISPR 16.1.4:2004.
Second edition 2009.

Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 9217 0

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE-003, Electromagnetic Interference to supersede AS/NZS CISPR 16.1.4:2004, as one of a series of Standards intended to facilitate control of electromagnetic interference and the compatibility of electrical and electronic equipment.

The objective of this Standard is to provide the characteristics and performance of equipment for the measurement of radiated disturbances in the frequency range 9 kHz to 18 GHz.

This Standard is identical with, and has been reproduced from, CISPR 16-1-4, Ed. 2.1 (2008), *Specification for radio disturbance and immunity measuring apparatus and methods, Part 1.4: Radio disturbance and immunity measuring apparatus— Ancillary equipment—Radiated disturbances.* Edition 1.1 is a consolidated version based on the first edition (2003) and its amendment 1 (2004).

This Standard is Part 1.4 of AS/NZS CISPR 16.1, *Specification for radio disturbance and immunity measuring apparatus and methods*, which consists of the following:

Part 1.1: Radio disturbance and immunity measuring apparatus—Measuring apparatus

Part 1.2: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Conducted disturbances

Part 1.3: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Disturbance power

Part 1.4: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Radiated disturbances (this Standard)

Part 1.5: Radio disturbance and immunity measuring apparatus—Antenna calibration test sites for 30 MHz to 1000 MHz

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text ‘this part of CISPR 16’ should read ‘this part of AS/NZS CISPR 16’.

(c) A full point should be substituted for a comma when referring to a decimal marker.

The terms ‘normative’ and ‘informative’ are used to define the application of the Annex to which it applies. A normative annex is an integral part of a Standard, whereas an informative Annex is only for information and guidance.

CONTENTS

Page

INTRODUCTION

In this amendment, the use of a balanced dipole antenna (the CISPR tuned dipole) as a physical reference for radiated emission measurements in the frequency range between 30 MHz and 300 MHz is deleted. It is replaced by the requirement that in this frequency range the quantity to be measured is the electric field strength that can be determined using different types of antennas, provided that the antenna factor and the associated uncertainty are known.

This fundamental change of measurand in the frequency range between 30 MHz and 300 MHz was subject to thorough investigations and discussion within CISPR A, and brings it into line with the measurand that already applies in the rest of the frequency range 9 kHz to 1 GHz, and indeed above 1 GHz. The decision for this change has been supported by the results of a questionnaire. More details on the rationale for the decision to introduce the ‘electric field’ measurand instead of the CISPR reference dipoles can be found in the CISPR Maintenance Cycle Report CISPR/A/541/MCR.

CISPR/A/541/MCR explains that the need for a CISPR reference dipole no longer exists, due to improvements in the calibration of antennas used for EMC compliance testing and the increased implementation of quality systems in test and calibration laboratories in accordance with ISO 17025. Moreover, Clause 4 of CISPR 16-1-4 covers the frequency range 9 kHz to 1 GHz, yet a reference antenna is only specified in the range 30 MHz to 300 MHz, which seems to make this frequency range an exception to the general rule.

In other words, most measurements of physical quantities are made with an instrument that is traceable to national standards. There is no need for measurement of electric field strength in the frequency range 30 MHz to 300 MHz to deviate from this, especially when application of such a physical reference antenna may give a greater uncertainty to the intended measurand than a regular calibrated broadband antenna. Moreover, these days, the CISPR reference dipole is rarely used in practice because it is impractical from a operational point of view (time consuming). The new measurand is the field strength as defined by the limit level in dBµV/m and as required by the method of measurement. If various operators follow the same measurement method, involving calibrated antennas, a high degree of reproducibility is ensured.

A consequence of using the tuned dipole antenna as a reference is that the antenna uncertainties in CISPR 16-4-2 require the field strength measured by a broadband antenna to be referred to the field strength that would have been measured had a tuned dipole been used. The ramifications would be dependent on the difference in radiation patterns and mutual coupling of a dipole compared to a broadband antenna (including height dependence of antenna factor). This practice can actually result in larger EMC measurement uncertainties than if the field strength were derived from the traceably calibrated broadband antenna. The relating of the behaviour of the commonly used broadband antenna to the extremely rarely used tuned dipole in the notes to the uncertainty budget in CISPR 16-4-2, requires specialist knowledge to understand.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard

Specification for radio disturbance and immunity measuring apparatus and methods, Part 1.4: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Radiated disturbances

1 Scope

This part of CISPR 16 is designated a basic standard, which specifies the characteristics and performance of equipment for the measurement of radiated disturbances in the frequency range 9 kHz to 18 GHz.

Specifications for ancillary apparatus are included for: antennas and test sites, TEM cells, and reverberating chambers.

The requirements of this publication must be complied with at all frequencies and for all levels of radiated disturbances within the CISPR indicating range of the measuring equipment.

Methods of measurement are covered in Part 2-3, and further information on radio disturbance is given in Part 3 of CISPR 16. Uncertainties, statistics and limit modelling are covered in Part 4 of CISPR 16.

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.

References to International Standards that are struck through in this clause are replaced by references to identical Australian or Australian/New Zealand Standards that are listed immediately thereafter and identified by shading.

~~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*~~

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

AS/NZS 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 16-3, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 3: CISPR technical reports*~~