

Australian/New Zealand Standard™

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

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

AS/NZS CISPR 16.1.2:2004

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 13 October 2004 and on behalf of the Council of Standards New Zealand on 1 October 2004.

This Standard was published on 17 November 2004.

The following are represented on Committee TE-003:

Australian Broadcasting Authority
Australian Broadcasting Corporation
Australian Chamber of Commerce and Industry
Australian Communications Authority
Australian Electrical and Electronic Manufacturers Association
Australian Information Industry Association
Commercial Television Australia
Consumer Electronics Suppliers Association
Department of Defence (Australia)
Electrical Compliance Testing Association
Engineers Australia
Ministry of Economic Development (New Zealand)
SingTel Optus
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 Standards may also be withdrawn.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 International or Standards New Zealand at the address shown on the back cover.

Australian/New Zealand Standard™

Specification for radio disturbance and immunity measuring apparatus and methods

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

Originated as part of AS 1052.1—1976.
Revised and redesignated in part as AS/NZS CISPR 16.1.2:2004.
Second edition November 2004.

COPYRIGHT

© Standards Australia/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Jointly published by Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE-003, Electromagnetic Interference to supersede AS/NZS CISPR 16.1.2:2004.

This Standard is identical with, and has been reproduced from, CISPR 16-1-2, Ed.1.1 (2004) (2004) *Specification for radio disturbance and immunity measuring apparatus and methods—Part 1.2: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Conducted disturbances*. Edition 1.1 is a consolidated version based on the first edition (2003) and its Amendment 1 (2004).

The objective of this Standard is to provide the electrotechnology (Electromagnetic Interference) industry with a set of measuring and testing procedures published as a series of CISPR 16 Specification for radio disturbance and immunity.

This Standard is Part 1.2 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 (this Standard)

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

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

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

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

- (a) Its number appears on the cover and title page while the international standard number appears only on the cover.
- (b) In the source text ‘this International Standard’ should read ‘this Australian/New Zealand Standard’.
- (c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian/New Zealand Standard</i>	
CISPR		AS/NZS CISPR	
16	Specification for radio disturbance and immunity measuring apparatus and methods	16	Specification for radio disturbance and immunity measuring apparatus and methods
16-1-1	Part 1-1: Radio disturbance and immunity measuring apparatus—Measuring apparatus	16.1.1	Part 1.1: Radio disturbance and immunity measuring apparatus—Measuring apparatus

16-2-1	Part 2-1: Methods of measurement of immunity and disturbance— Conducted disturbance measurements	16.2.1	Part 2.1: Methods of measurement of immunity and disturbance— Conducted disturbance measurements
16-3	Part 3: CISPR technical reports	16.3	Part 3: CISPR technical reports
16-4-1	Part 4-1: Uncertainties, statistics and limit modelling—Uncertainties in standardized EMC tests	16.4.1	Part 4.1: Uncertainties, statistics and limit modelling—Uncertainties in standardized EMC tests
16-4-2	Part 4-2: Uncertainties, statistics and limit modelling—Measurement instrumentation uncertainty	16.4.2	Part 4.2: Uncertainties, statistics and limit modelling—Measurement instrumentation uncertainty

CONTENTS

	<i>Page</i>
1 Scope	1
2 Normative references	1
3 Definitions	2
4 Artificial mains networks	3
4.1 Network impedance	3
4.2 50 Ω /50 μ H + 5 Ω artificial mains V-network (for use in the frequency range 9 kHz to 150 kHz)	3
4.3 50 Ω /50 μ H artificial mains V-network (for use in the frequency range 0,15 MHz to 30 MHz)	4
4.4 50 Ω /5 μ H + 1 Ω artificial mains V-network (for use in the frequency range 150 kHz to 100 MHz)	4
4.5 150 Ω artificial mains V-network (for use in the frequency range 150 kHz to 30 MHz)	8
4.6 150 Ω artificial mains delta-network (for use in the frequency range 150 kHz to 30 MHz)	8
4.6.1 Balance of the 150 Ω artificial mains delta-network	8
4.7 Isolation	9
4.8 Current carrying capacity and series voltage drop	9
4.9 Modified reference earth connection	9
4.10 Calibration of the voltage division factor of artificial mains V-networks	10
5 Current and voltage probes	10
5.1 Current probes	10
5.1.1 Construction	11
5.1.2 Characteristics	11
5.2 Voltage probe	11
5.2.1 High impedance voltage probe	11
5.2.2 Capacitive voltage probe	12
6 Coupling units for conducted current immunity measurement	15
6.1 Characteristics	15
6.1.1 Impedance	15
6.1.2 Insertion loss	15
7 Coupling devices for measuring signal lines	16
7.1 Requirements for asymmetric artificial networks (AANs or Y-networks)	16
7.2 Requirements for artificial networks for coaxial and other screened cables	19
8 The artificial hand and series RC element	19
8.1 Introduction	19
8.2 Construction of the artificial hand and RC element	19
8.3 The use of the artificial hand	20
Annex A (normative) Artificial mains networks (clause 4)	24
Annex B (informative) Construction, frequency range, and calibration of current probes (clause 5)	33
Annex C (informative) Construction of the coupling units for current injection for the frequency range 0,15 MHz to 30 MHz (clause 6)	43

	<i>Page</i>
Annex D (informative) Principle of operation and examples of coupling units for conducted current immunity measurements (clause 6)	49
Annex E (normative) Example and measurement of the parameters of the asymmetric artificial network (AAN)	53
Annex F (normative) Example and measurement of the parameters of the AN for coaxial and other screened cables	58
Annex G (informative) Construction and evaluation of capacitive voltage probe (subclause 5.2.2)	60

NOTES

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Specification for radio disturbance and immunity measuring apparatus
and methods****Part 1.2: Radio disturbance and immunity measuring apparatus—
Ancillary equipment—Conducted 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 radio disturbance voltages and currents in the frequency range 9 kHz to 1 GHz.

Specifications for ancillary apparatus are included for: artificial mains networks, current and voltage probes and coupling units for current injection on cables.

The requirements of this publication shall be complied with at all frequencies and for all levels of radio disturbance voltages and currents within the CISPR indicating range of the measuring equipment.

Methods of measurement are covered in Part 2, and further information on radio disturbance is given in Part 3 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.

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*

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

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*