

Australian/New Zealand Standard™

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

**Part 1.2: Radio disturbance and
immunity measuring apparatus—
Coupling devices for conducted
disturbance measurements**



AS/NZS CISPR 16.1.2:2015

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Specification for radio disturbance and immunity measuring apparatus and methods

Part 1.2: Radio disturbance and immunity measuring apparatus— Coupling devices for conducted disturbance measurements

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE-003, Electromagnetic Compatibility, to supersede AS/NZS CISPR 16.1.2:2012.

The objective of this Standard is to specify the characteristics and performance of equipment for the measurement of disturbance voltages and currents.

This Standard is identical with, and has been reproduced from CISPR 16-1-2, Ed 2.0 (2014), *Specification for radio disturbance and immunity measuring apparatus and methods*, Part 1-2: *Radio disturbance and immunity measuring apparatus—Coupling devices for conducted disturbance measurements*.

The principal differences between this and the previous edition are the inclusion of the CDNE (coupling decoupling network for emission measurements) for measurements of disturbance voltage and moving requirements from CISPR 22 for the AAN (asymmetric artificial network) into this standard.

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

- (a) In the source text ‘this part of CISPR 16’ should read ‘this Australian/New Zealand Standard’.
- (b) 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: 2010	Part 1-1: Radio disturbance and immunity measuring apparatus—Measuring apparatus	16.1.1: 2012	Part 1.1: Radio disturbance and immunity measuring apparatus—Measuring apparatus
16-2-1: 2014	Part 2-1: Methods of measurement of disturbances and immunity—Conducted disturbance measurements	16.2.1: 2015	Part 2.1: Methods of measurement of disturbances and immunity—Conducted disturbance measurements
16-4-2: 2011	Part 4-2: Uncertainties, statistics and limit modelling—Measurement instrumentation uncertainty	16.4.2: 2013	Part 4.2: Uncertainties, statistics and limit modelling—Measurement instrumentation uncertainty
IEC		AS	
60050	International Electrotechnical Vocabulary (series)	1852	International Electrotechnical vocabulary (series)
		AS/NZS	
61000	Electromagnetic compatibility (EMC)	61000	Electromagnetic compatibility (EMC)
61000-4-6: 2008	Part 4-6: Testing and measurement techniques—Immunity to conducted disturbances, induced by radio frequency fields	61000.4.6: 2013	Part 4.6: Testing and measurement techniques—Immunity to conducted disturbances, induced by radio frequency fields

Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annexes to which they apply. A 'normative' annex is an integral part of a Standard, whereas an 'informative' annex is only for information and guidance.

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AUSTRALIAN/NEW ZEALAND STANDARD

Specification for radio disturbance and immunity measuring apparatus and methods**Part 1.2:****Radio disturbance and immunity measuring apparatus—Coupling devices for conducted disturbance measurements****1 Scope**

This part of the CISPR 16 series 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.

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

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

It is intended that the requirements of this publication are fulfilled 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 the CISPR 16-2 series, and further information on radio disturbance is given in CISPR 16-3, while uncertainties, statistics and limit modelling are covered in the CISPR 16-4 series.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CISPR 16-1-1:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

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

CISPR 16-4-2:2011, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Measurement instrumentation uncertainty*

IEC 60050 (all parts), *International Electrotechnical Vocabulary* (available at <<http://www.electropedia.org>>)

IEC 61000-4-6:2008, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050, as well as the following apply.

3.1.1

ancillary equipment

transducers connected to a measuring receiver or (test) signal generator and used in the disturbance signal transfer between the EUT and the measuring or test equipment

Note 1 to entry: Examples of transducers are current and voltage probes and artificial networks.

3.1.2

associated equipment

AE

apparatus that is not part of the system under test but is required for the functioning of the EUT

3.1.3

asymmetric voltage

radio-frequency disturbance voltage appearing between the electrical mid-point of the mains terminals and ground, sometimes called the common mode voltage

Note 1 to entry: If V_a is the vector voltage between one of the mains terminals and ground, and V_b is the vector voltage between the other mains terminal and ground, the asymmetric voltage is half the vector sum of V_a and V_b , i.e. $(V_a + V_b)/2$.

3.1.4

symmetric voltage

radio-frequency disturbance voltage appearing between the two wires in a two-wire circuit, such as a single-phase mains supply, sometimes called the differential mode voltage

Note 1 to entry: The symmetric voltage is the vector difference $(V_a - V_b)$.

3.1.5

unsymmetric voltage

amplitude of the vector voltage, V_a or V_b defined in 3.1.3 and 3.1.4

Note 1 to entry: The unsymmetric voltage is the voltage measured by the use of an artificial mains V-network.

Note 2 to entry: See notes in 3.1.3 and 3.1.4 for details on V_a and V_b .

3.1.6

artificial mains network

AMN

network that provides a defined impedance to the EUT at radio frequencies, couples the disturbance voltage to the measuring receiver, and decouples the test circuit from the supply mains

Note 1 to entry: There are two basic types of this network, the V-network (V-AMN) which couple the unsymmetric voltages, and the delta-network (Δ -AMN), which couple the symmetric and the unsymmetric voltages separately.

Note 2 to entry: The terms line impedance stabilization network (LISN) and V-AMN are used interchangeably.

3.1.7**asymmetric artificial network****AAN**

network used to measure (or inject) asymmetric (common mode) voltages on unshielded symmetric signal (e.g. telecommunication) lines while rejecting the symmetric (differential mode) signal

Note 1 to entry: The term “Y-network” is a synonym for AAN.

3.1.8**auxiliary equipment****AuxEq**

peripheral equipment that is part of the system under test

3.1.9**coupling/decoupling network****CDN**

artificial network for the measurement or injection of signals on one circuit while preventing signals from being measured or injected on another circuit

3.1.10**CDNE-*X***

coupling/decoupling network for emission measurement in the frequency range 30 MHz to 300 MHz; where the “*X*” suffix can be “M2” for unscreened two-wire mains, DC or control ports, “M3” for unscreened three-wire mains, DC or control ports, and “S_{*x*}” for screened cable with *x* internal wires

Note 1 to entry: See Annex J for further details on the CDNE-*X*.

3.1.11**equipment under test****EUT**

equipment (devices, appliances and systems) subjected to EMC (emission) compliance tests

3.1.12**impedance measurement adaptor****IMA**

metallic vertical plane, 0,1 m by 0,1 m, bonded to the reference ground plane, which contains connection ports for a network analyzer and a CDNE

3.1.13**longitudinal conversion loss****LCL**

in a one- or two-port network, a measure of the degree of unwanted transverse (symmetric mode) signal produced at the terminals of the network due to the presence of a longitudinal (asymmetric mode) signal on the connecting leads

Note 1 to entry: LCL is a ratio expressed in dB.

[SOURCE: ITU-T Recommendation O.9 [8] ¹⁾]

1) Numbers in square brackets refer to the Bibliography.