

Australian/New Zealand Standard™

**Electromagnetic compatibility of
multimedia equipment—Emission
requirements**



AS/NZS CISPR 32:2013

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 22 May 2013 and on behalf of the Council of Standards New Zealand on 23 April 2013.
This Standard was published on 20 June 2013.

The following are represented on Committee TE-003:

Australian Broadcasting Corporation
Australian Communications and Media Authority
Australian Industry Group
Australian Information Industry Association
Consumer Electronics Suppliers Association
Consumers Federation of Australia
Curtin University of Technology
Department of Defence, Australia
Electrical Compliance Testing Association
Energy Networks Association
Engineers Australia
Lighting Council New Zealand
Lighting Council of Australia
Ministry of Economic Development, New Zealand
National Measurement Institute
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 Standards may also be withdrawn.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.saiglobal.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

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.

Australian/New Zealand Standard™

**Electromagnetic compatibility of
multimedia equipment—Emission
requirements**

First published as AS/NZS CISPR 32:2013.

COPYRIGHT

© Standards Australia Limited/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, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, Private Bag 2439, Wellington 6140.

ISBN 978 1 74342 476 6

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE-003, Electromagnetic Interference.

The objective of this Standard is to establish requirements which provide an adequate level of protection of the radio spectrum, allowing radio services to operate as intended in the frequency range 9 kHz to 400 GHz and to specify procedures to ensure the reproducibility of measurement and the repeatability of results.

This Standard is identical with, and has been reproduced from CISPR 32, Ed. 1.0 (2012), *Electromagnetic compatibility of multimedia equipment—Emission requirements*, and its corrigenda of March 2012 and August 2012, which have been incorporated into the source text.

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
16-1-2	Part 1-2: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Conducted disturbances	16.1.2	Part 1.2: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Conducted disturbances
16-1-4	Part 1-4: Radio disturbance and immunity measuring apparatus—Antennas and test sites for radiated disturbance measurements	16.1.4	Part 1.4: Radio disturbance and immunity measuring apparatus—Ancillary equipment—Radiated disturbances
16-2-1	Part 2-1: Methods of measurement of disturbances and immunity—Conducted disturbance measurements	16.2.1	Part 2.1: Methods of measurement of disturbances and immunity—Conducted disturbance measurements
16-2-3	Part 2-3: Methods of measurement of disturbances and immunity—Radiated disturbance measurements	16.2.3	Part 2.3: Methods of measurement of disturbances and immunity—Radiated disturbance measurements
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—Uncertainty in EMC measurements
CISPR/TR			
16-4-3	Part 4-3: Uncertainties, statistics and limit modelling—Statistical considerations in the determination of EMC compliance of mass-produced products	16.4.3	Part 4.3: Uncertainties, statistics and limit modelling—Statistical considerations in the determination of EMC compliance of mass-produced products

IEC		AS/NZS	
61000	Electromagnetic compatibility (EMC)	61000	Electromagnetic compatibility (EMC) -
61000-4-6	Part 4-6: Testing and measurement techniques—Immunity to conducted disturbances, induced by radio-frequency fields	61000.4.6	Part 4.6: Testing and measurement techniques—Immunity to conducted disturbances, induced by radio-frequency fields
ISO/IEC		AS ISO/IEC	
17025	General requirements for the competence of testing and calibration laboratories	17025	General requirements for the competence of testing and calibration laboratories

Only international 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 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.

CONTENTS

1	Scope	7
2	Normative references	7
3	Terms, definitions and abbreviations	8
3.1	Terms and definitions	8
3.2	Abbreviations	12
4	Classification of equipment	14
5	Requirements	14
6	Measurements	14
6.1	General	14
6.2	Host systems and modular EUT	15
6.3	Measurement procedure	16
7	Equipment documentation	16
8	Applicability	16
9	Test report	17
10	Compliance with this publication	18
11	Measurement uncertainty	18
	Annex A (normative) Requirements	19
	Annex B (normative) Exercising the EUT during measurement and test signal specifications	27
	Annex C (normative) Measurement procedures, instrumentation and supporting information	32
	Annex D (normative) Arrangement of EUT, local AE and associated cabling	46
	Annex E (informative) Prescan measurements	61
	Annex F (informative) Test report contents summary	62
	Annex G (informative) Support information for the measurement procedures defined in C.4.1.1	63
	Bibliography	79
	Figure 1 – Examples of ports	11
	Figure 2 – Example of a host system with different types of modules	15
	Figure A.1 – Graphical representation of the limits for the AC mains power port defined in Table A.9	19
	Figure C.1 – Measurement distance	33
	Figure C.2 – Boundary of EUT, Local AE and associated cabling	34
	Figure C.3 – Decision tree for using different detectors with quasi peak and average limits	35
	Figure C.4 – Decision tree for using different detectors with peak and average limits	36
	Figure C.5 – Decision tree for using different detectors with a quasi-peak limit	36
	Figure C.6 – Calibration fixture	43
	Figure C.7 – Circuit arrangement for measurement of emission voltages at TV/FM broadcast receiver tuner ports	44
	Figure C.8 – Circuit arrangement for the measurement of the wanted signal and emission voltage at the RF modulator output port of an EUT	45

Figure D.1 – Example measurement arrangement for table-top EUT (Conducted and radiated emission) (Top view)	52
Figure D.2 – Example measurement arrangement for table-top EUT (Conducted emission measurement – alternative 1).....	53
Figure D.3 – Example measurement arrangement for table-top EUT (Conducted emission measurement – alternative 2).....	54
Figure D.4 – Example measurement arrangement for table-top EUT measuring in accordance with C.4.1.6.4.....	55
Figure D.5 – Example measurement arrangement for table-top EUT (Conducted emission measurement – alternative 2, showing AAN position)	56
Figure D.6 – Example measurement arrangement for floor standing EUT (Conducted emission measurement).....	57
Figure D.7 – Example measurement arrangement for combinations of EUT (Conducted emission measurement).....	58
Figure D.8 – Example measurement arrangement for table-top EUT (Radiated emission measurement).....	58
Figure D.9 – Example measurement arrangement for floor standing EUT (Radiated emission measurement).....	59
Figure D.10 – Example measurement arrangement for combinations of EUT (Radiated emission measurement).....	60
Figure G.1 – Example AAN for use with unscreened single balanced pairs	63
Figure G.2 – Example AAN with high LCL for use with either one or two unscreened balanced pairs	64
Figure G.3 – Example AAN with high LCL for use with one, two, three, or four unscreened balanced pairs	65
Figure G.4 – Example AAN, including a 50 Ω source matching network at the voltage measuring port, for use with two unscreened balanced pairs.....	66
Figure G.5 – Example AAN for use with two unscreened balanced pairs	67
Figure G.6 – Example AAN, including a 50 Ω source matching network at the voltage measuring port, for use with four unscreened balanced pairs	68
Figure G.7 – Example AAN for use with four unscreened balanced pairs	69
Figure G.8 – Example AAN for use with coaxial cables, employing an internal common mode choke created by bifilar winding an insulated centre-conductor wire and an insulated screen-conductor wire on a common magnetic core (for example, a ferrite toroid).....	70
Figure G.9 – Example AAN for use with coaxial cables, employing an internal common mode choke created by miniature coaxial cable (miniature semi-rigid solid copper screen or miniature double-braided screen coaxial cable) wound on ferrite toroids	70
Figure G.10 – Example AAN for use with multi-conductor screened cables, employing an internal common mode choke created by bifilar winding multiple insulated signal wires and an insulated screen-conductor wire on a common magnetic core (for example, a ferrite toroid).....	71
Figure G.11 – Example AAN for use with multi-conductor screened cables, employing an internal common mode choke created by winding a multi-conductor screened cable on ferrite toroids	72
Figure G.12 – Basic circuit for considering the limits with defined common mode impedance of 150 Ω	75
Figure G.13 – Basic circuit for the measurement with unknown common mode impedance	75
Figure G.14 – Impedance layout of the components in the method described in C.4.1.6.3.....	76

Figure G.15 – Basic measurement setup to measure combined impedance of the 150 Ω and ferrites	78
Table 1 – Required highest frequency for radiated measurement	17
Table A.1 – Radiated emissions, basic standards and the limitation of the use of particular methods	20
Table A.2 – Requirements for radiated emissions at frequencies up to 1 GHz for Class A equipment.....	21
Table A.3 – Requirements for radiated emissions at frequencies above 1 GHz for Class A equipment.....	21
Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for Class B equipment	21
Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for Class B equipment.....	22
Table A.6 – Requirements for radiated emissions from FM receivers	22
Table A.7 – Conducted emissions, basic standards and the limitation of the use of particular methods	23
Table A.8 – Requirements for conducted emissions from the AC mains power ports of Class A equipment.....	23
Table A.9 – Requirements for conducted emissions from the AC mains power ports of Class B equipment.....	24
Table A.10 – Requirements for asymmetric mode conducted emissions from Class A equipment.....	24
Table A.11 – Requirements for asymmetric mode conducted emissions from Class B equipment.....	25
Table A.12 – Requirements for conducted differential voltage emissions from Class B equipment.....	26
Table B.1 – Methods of exercising displays and video ports.....	28
Table B.2 – Display and video parameters	28
Table B.3 – Methods used to exercise ports.....	29
Table B.4 – Examples of digital broadcast signal specifications	30
Table C.1 – Analogue/digital data port emission procedure selection	38
Table C.2 – LCL values	39
Table C.3 – 5 m OATS/SAC NSA figures	45
Table D.1 – Arrangement spacing, distances and tolerances	48
Table F.1 – Summary of information to include in a test report.....	62
Table G.1 – Summary of advantages and disadvantages of the procedures described in C.4.1.6.....	73

AUSTRALIAN/NEW ZEALAND STANDARD

Electromagnetic compatibility of multimedia equipment—Emission requirements**1 Scope**

NOTE Blue coloured text within this document indicates text aligned with CISPR 35.

This International Standard applies to multimedia equipment (MME) as defined in 3.1.23 and having a rated r.m.s. AC or DC supply voltage not exceeding 600 V.

Equipment within the scope of CISPR 13 or CISPR 22 is within the scope of this publication.

MME intended primarily for professional use is within the scope of this publication.

The radiated emission requirements in this standard are not intended to be applicable to the intentional transmissions from a radio transmitter as defined by the ITU, nor to any spurious emissions related to these intentional transmissions.

Equipment, for which emission requirements in the frequency range covered by this publication are explicitly formulated in other CISPR publications (except CISPR 13 and CISPR 22), are excluded from the scope of this publication.

This document does not contain requirements for in-situ assessment. Such testing is outside the scope of this publication and may not be used to demonstrate compliance with it.

This publication covers two classes of MME (Class A and Class B). The MME classes are specified in Clause 4.

The objectives of this publication are:

- 1) to establish requirements which provide an adequate level of protection of the radio spectrum, allowing radio services to operate as intended in the frequency range 9 kHz to 400 GHz;
- 2) to specify procedures to ensure the reproducibility of measurement and the repeatability of results.

2 Normative references

The following reference documents are indispensable for the application of this publication. 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*
Amendment 1 (2010)

CISPR 16-1-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Conducted disturbances*
Amendment 1 (2004)
Amendment 2 (2006)