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Australian Standard[®]

**Radio equipment and systems—
Short range devices**

**Part 2: Technical characteristics
and test methods for radio
equipment to be used in the 25 MHz
to 25 GHz frequency range with
power levels ranging up to 1 W**

[Based on IETS 300 220:1993, Radio Equipment and Systems—
Short range devices: Technical characteristics and test methods for
radio equipment to be used in the 25 MHz to 1000 MHz frequency
range with power levels ranging up to 500 mW]



STANDARDS AUSTRALIA



This Australian Standard was prepared by Committee RC/3, Radiocommunications Equipment—Low Power. It was approved on behalf of the Council of Standards Australia on 5 December 1994 and published on 5 February 1995.

The following interests are represented on Committee RC/3:

Australian Electrical and Electronic Manufacturers Association
Australian Federation of Consumer Organisations
Consumer Electronics Suppliers Association
Department of Communications and the Arts
Ministry of Commerce, NZ
Model Aeronautical Association of Australia
National Association of Testing Authorities Australia
Spectrum Management Agency

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This Standard was issued in draft form for comment as DR 93245.

Australian Standard[®]

**Radio equipment and systems—
Short range devices**

**Part 2: Technical characteristics
and test methods for radio
equipment to be used in the 25 MHz
to 25 GHz frequency range with
power levels ranging up to 1 W**

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee RC/3 on Radiocommunications Equipment—Low Power. It is one of a series of Standards intended to provide specification for spectrum management and minimum radio equipment performance.

This Standard is the result of a consensus among Australian and New Zealand representatives on the Joint Committee to produce it as an Australian Standard.

It has been reproduced from European Telecommunication Standard IETS 300 220:1993, *Radio Equipment and Systems—Short range devices: Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW*, drawn up by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute.

Where the text of IETS 300 220 has been varied technically to accommodate different or additional requirements for Australia, it is indicated by double vertical lines in the left-hand margin against the clause affected. Australian variations to IETS 300 220 are given in Appendix ZZ at the end of this publication.

This Standard differs from IETS 300 220:1993 in that some test signals and spectral conditions are varied to reflect local conditions and usage. Any limit derived from the measurement of radiated signals is expressed in equivalent isotropic radiated power.

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

As this Standard is reproduced from a European Standard the following applies:

- (a) The Standard number does not appear on every page of text and its identity is shown only on the cover.
- (b) In the source text, 'this Interim European Telecommunications Standard' should read 'this Australian Standard'.

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

<i>Reference to International Standard or Other Publication</i>	<i>Australian/New Zealand Standard</i>
CCITT Recommendation G.57: Basic parameters for the measurement of error performance at bit rates below the primary rate	—
CEPT Recommendation T/R 20-03: Low power telecommand and telemetry equipment operating on collective frequencies in the ISM frequency bands	—
CEPT Recommendation T/R 20-04: Low power narrow band telecommand and telemetry equipment for use outside the ISM frequency bands	—
CEPT Recommendation T/R 01-04: Use of Low Power Devices (LPD) using integral antennas and operating in harmonized frequency bands	—

CEPT	Recommendation T/R 71-03: Procedures for type testing and approval for radio equipment intended for non- public systems	—
CISPR	Publication 16: Specifications for radio interference measuring apparatus and measurement methods	AS/NZS 1052 CISPR specification for radio interference measuring apparatus and measurement methods
ETR	028 Radio Equipment and Systems; Uncertainties in the measurement of mobile radio equipment characteristics	—

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CONTENTS

	<i>Page</i>
Foreword	viii
Introduction	ix
1 Scope	1
2 Normative references	1
3 Definitions, symbols and abbreviations	2
3.1 Definitions	2
3.2 Symbols	2
3.3 Abbreviations	3
4 General	3
4.1 Presentation of equipment for testing purposes	3
4.1.1 Choice of model for type testing	3
4.1.2 Definitions of alignment range and switching range	4
4.1.3 Definition of the categories of the alignment range (AR1 and AR2) ...	4
4.1.4 Choice of frequencies	4
4.1.5 Testing of single frequency equipment of category AR1	4
4.1.6 Testing of single frequency equipment of category AR2	4
4.1.7 Testing of two frequency equipment of category AR1	5
4.1.8 Testing of two frequency equipment of category AR2	5
4.1.9 Testing of multi-frequency equipment (more than two frequencies) of category AR1	5
4.1.10 Testing of multi-frequency equipment (more than two frequencies) of category AR2 (switching range less than alignment range)	5
4.1.11 Testing of multi-frequency equipment (more than two frequencies) of category AR2 (switching range equals the alignment range)	6
4.1.12 Testing of equipment without a permanent external 50 ohm antenna connector	6
4.1.12.1 Equipment with a permanent internal 50 ohm RF connector	6
4.1.12.2 Equipment with a temporary 50 ohm RF connector ..	6
4.2 Mechanical and electrical design	6
4.2.1 General	6
4.2.2 Controls	6
4.2.3 Transmitter shut-off facility	7
4.2.4 Marking (equipment identification)	7
4.2.5 Receiver mute or squelch	7
4.3 Declarations by the applicant	7
4.4 Auxiliary test equipment	7
4.5 Interpretation of the measurement results	7
5 Test conditions, power sources and ambient temperatures	7
5.1 Normal and extreme test conditions	7
5.2 External test power source	8
5.3 Normal test conditions	8
5.3.1 Normal temperature and humidity	8
5.3.2 Normal test power source	8

			<i>Page</i>
	5.3.2.1	Mains voltage	8
	5.3.2.2	Regulated lead-acid battery power sources	8
	5.3.2.3	Other power sources	9
5.4	Extreme test conditions		9
	5.4.1	Extreme temperatures	9
	5.4.1.1	Procedure for tests at extreme temperatures	9
	5.4.1.2	Extreme temperature ranges	10
	5.4.2	Extreme test source voltages	10
	5.4.2.1	Mains voltage	10
	5.4.2.2	Regulated lead-acid battery power sources	10
	5.4.2.3	Power sources using other types of batteries	10
	5.4.2.4	Other power sources	10
6	General conditions		11
	6.1	Normal test signals and test modulation	11
	6.1.1	Normal test signals for analogue speech	11
	6.1.2	Normal test signals for data	11
	6.2	Artificial antenna	11
	6.3	Test fixture	11
	6.4	Test sites and general arrangements for radiated measurement	12
	6.5	Modes of operation of the transmitter	12
	6.6	Measuring receiver	12
7	Methods of measurement and limits for transmitter parameters		13
	7.1	Frequency error	13
	7.1.1	Definition	13
	7.1.2	Method of measurement	13
	7.1.3	Limits	14
	7.2	Carrier power (conducted)	14
	7.2.1	Definition	14
	7.2.2	Method of measurement	14
	7.2.3	Limits	15
	7.3	Effective radiated power (radiated)	15
	7.3.1	Definition	15
	7.3.2	Methods of measurement	15
	7.3.3	Limits	16
	7.4	Response of the transmitter to modulation frequencies	17
	7.4.1	Frequency deviation	17
	7.4.1.1	Definition	17
	7.4.1.2	Analogue signals within the audio bandwidth	17
	7.4.1.3	Analogue signals above the audio bandwidth	18
	7.4.2	Modulation depth	19
	7.4.2.1	Definition	19
	7.4.2.2	Analogue signals within the audio bandwidth	20
	7.4.2.3	Analogue signals above the audio bandwidth	20
	7.5	Adjacent channel power	21
	7.5.1	Definition	21
	7.5.2	Method of measurement	22
	7.5.2.1	Method of measurement using a power measuring receiver	22
	7.5.3	Limits	23
	7.6	Range of modulation bandwidth for wide band equipment (> 25 kHz)	23
	7.6.1	Definition	23
	7.6.2	Method of measurement	23
	7.6.3	Limits	24
	7.7	Spurious emissions	24

	<i>Page</i>	
7.7.1	Definition	24
7.7.2	Method of measuring the power level in a specified load, subclause 7.7.1 a.i)	24
7.7.3	Method of measuring the effective radiated power, subclause 7.7.1 a.ii)	25
7.7.4	Method of measuring the effective radiated power, subclause 7.7.1 b)	26
7.7.5	Limits	26
8	Methods of measurement and limits for receiver parameters	26
8.1	Spurious radiation	26
8.1.1	Definition	26
8.1.2	Method of measuring the power level in a specified load, subclause 8.1.1 a.i)	27
8.1.3	Method of measuring the effective radiated power, subclause 8.1.1 a.ii)	27
8.1.4	Method of measuring the effective radiated power, subclause 8.1.1 b)	28
8.1.5	Limits	28
9	Measurement uncertainty	28
	Annex A (informative): Defined applications using I-ETS 300	29
A.1	Application: Low power devices	29
A.1.1	General	29
A.1.2	Definition	29
A.1.3	Technical parameters	29
	Annex B (normative): Radiated measurement	30
B.1	Test sites and general arrangements for measurements involving the use of radiated fields	30
B.1.1	Outdoor test site	30
B.1.1.1	Test support for body worn equipment	31
B.1.1.2	Standard position	31
B.1.2	Test antenna	31
B.1.3	Substitution antenna	32
B.1.4	Optional additional indoor site	32
B.2	Guidance on the use of radiation test sites	33
B.2.1	Measuring distance	33
B.2.2	Test antenna	33
B.2.3	Substitution antenna	33
B.2.4	Artificial antenna	34
B.2.5	Auxiliary cables	34
B.3	Further optional alternative indoor test site using an anechoic chamber	34
B.3.1	Example of the construction of a shielded anechoic chamber	34
B.3.2	Influence of parasitic reflections in anechoic chambers	35
B.3.3	Calibration of the shielded RF anechoic chamber	35
	Annex C (normative):	37
	Specifications for adjacent channel power measurement arrangements	37
C.1	Power measuring receiver specification	37

	<i>Page</i>
C.1.1 IF filter	37
C.1.2 Variable attenuator	38
C.1.3 rms value indicator	38
C.1.4 Oscillator and amplifier	39
Annex D (informative):	40
Graphic representation of the selection of equipment and frequencies for testing of single and multi-frequency equipment	40
Annex E (normative): Correction factor for pulsed systems	42
E.1 Introduction	42
E.2 Method of measurement	42
E.3 Limit	42
Annex F (normative): Technical performance of the spectrum analyser	43
Appendix ZZ (normative): Variations for Australia	44

FOREWORD

This Interim European Telecommunication Standard (I-ETS) has been prepared by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI) and having passed through ETSI standards approval procedure, is now published.

This is a general standard based upon CEPT Recommendations T/R 20-03 [1] and T/R 20-04 [2].

All types of modulation for radio devices, except Code Division Multiple Access (CDMA), are covered by this I-ETS.

For regulatory purposes the equipment is divided into four main classes based on frequency range and maximum output power (see table 1), and further divided into classes based on the use inside or outside the Industrial Scientific and Medical (ISM) bands and on the use of the antenna (see table 2).

Table 1

Class	Frequency range MHz	Power level (conducted or radiated) maximum (mW)
I	25 to 1 000	10
II	300 to 1 000	25
III	25 to 300	100
IV	300 to 1 000	500

Table 2

Sub-class	Frequency band	Antenna type/connector
a	I.S.M.	Integral
b	Non-I.S.M.	Integral
c	I.S.M.	External socket
d	Non-I.S.M.	External socket

The CEPT recommendation T/R 01-04 [6] covering Low Power Devices (LPD) is supported by class I.a., from the above tables, see Annex A, Clause A.1.

For non-harmonised parameters, national administrations may impose conditions on the type of modulation, channel/frequency separations, maximum transmitter output power/effective radiated power, equipment marking and the inclusion of an automatic transmitter shut-off facility as a condition of the issue of an individual or general licence, or, as a condition of use under licence exemption. The extreme temperature ranges are fixed and are given in subclause 5.4.1.2.

This I-ETS does not cover requirements for radiated emissions below 25 MHz.

Additional standards or specifications may be required for equipment such as that intended for connection to the Public Switched Telephone Network (PSTN).

INTRODUCTION

This I-ETS is intended to specify the minimum performance and the methods of measurement for short range devices as specified in the scope.

When ETSI publishes a standard covering a specific application for short range devices, it will supersede this general standard.

Interference from other services and systems has not been taken into account in this I-ETS.

Included are methods of measurement for equipments fitted with antenna sockets and/or integral antenna. Equipment designed for use with an integral antenna may be supplied with a temporary external/internal or permanent internal 50 ohm connector for the purpose of testing, providing, the characteristics being measured are not expected to be affected.

The performance of the equipment submitted for type testing should be representative of the performance of the corresponding production model. In order to avoid any ambiguity in that assessment, this I-ETS contains instructions for the presentation of equipment for type testing purposes (see subclause 4.1), conditions of testing (see Clause 5).

This I-ETS was drafted on the assumption that:

"Type test measurements, performed in an accredited test laboratory, shall be accepted by the various National Regulatory Authorities in order to grant type approval, provided the National regulatory requirements are met. In addition national administrations may accept a "certificate of conformity" based on the type test report".

This is in compliance with CEPT Recommendation T/R 71-03 [7].

Clauses 1 and 3 provide a general description on the types of equipment covered by this I-ETS and the definitions and abbreviations used. Clause 4 provides a guide as to the number of samples required in order that type tests may be carried out, and any markings on the equipment which the applicant should provide.

Clauses 7 and 8 provide the limits of the parameters which are required to be tested. These limits have been chosen to minimise harmful interference to other equipment and services. It also provides details on how the equipment should be tested and the conditions which should be applied.

Clause 9 gives the maximum measurement uncertainty values.

Annex A provides information on specific applications covered by this I-ETS.

Annex B provides specifications concerning radiated measurements.

Annex C contains specifications for adjacent channel power measurement arrangements.

Annex D is a graphic representation of subclause 4.1, referring to the presentation of equipment for testing purposes.

Annex E provides information on the correction curve to be used for pulsed systems.

Annex F provides information on the spectrum analyser specification.

X

NOTES

AUSTRALIAN STANDARD

Radio equipment and systems—Short range devices

Part 2:

Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 25 GHz frequency range with power levels ranging up to 1 W

1 Scope

This I-ETS covers the minimum characteristics considered necessary in order to make the best use of the available frequencies.

It does not necessarily include all the characteristics which may be required by a user, nor does it necessarily represent the optimum performance achievable.

It applies to short range devices:

- with an antenna connection and/or with an integral antenna;
- for alarms, telecommand, telemetry, etc., applications;
- with or without speech;
- operating on radio frequencies between 25 MHz and 1 000 MHz, with power levels up to 500 mW, radiated or terminated.

This I-ETS covers fixed stations, mobile stations and portable stations. It applies also to Low Power Devices (LPD), as defined in the CEPT Recommendation T/R 01-04 [6]. In this I-ETS basic requirements are given for the different frequency bands, channel separation etc., where appropriate.

2 Normative references

This I-ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this I-ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- | | |
|-----|--|
| [1] | CEPT Recommendation T/R 20-03: "Low power telecommand and telemetry equipment operating on collective frequencies in the ISM frequency bands". |
| [2] | CEPT Recommendation T/R 20-04: "Low power narrow band telecommand and telemetry equipment for use outside the ISM frequency bands". |
| [3] | CCITT Recommendation O.153: "Basic parameters for the measurement of error performance at bit rates below the primary rate". |
| [4] | CISPR Publication 16: "Specifications for radio interference measuring apparatus and measurement methods". |
| [5] | ETR 028: "Radio Equipment and Systems; Uncertainties in the measurement of mobile radio equipment characteristics". |
| [6] | CEPT Recommendation T/R 01-04: "Use of Low Power Devices (LPD) using integral antennas and operating in harmonised frequency bands". |
| [7] | CEPT Recommendation T/R 71-03: "Procedures for type testing and approval for radio equipment intended for non public systems". |