ETSI EN 300 296-2 V1.4.1 (2013-08)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

Reference
REN/ERM-TGDMR-303

Keywords
analogue, mobile, PMR, radio, regulation, speech

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Sous-Préfecture de Grasse (06) N° 7803/88

Contents

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Foreword

This Harmonized European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been produced by ETSI in response to the mandate M/284 from the European Commission issued under Council Directive 98/34/EC [i.2] as amended by Directive 98/48/EC [i.5].

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [i.1].

See article 5.1 of Directive 1999/5/EC [i.1] for information on presumption of conformity and Harmonized Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

The requirements relevant to Directive 1999/5/EC [i.1] are summarized in annex A.

The present document is part 2 of a multi-part deliverable covering the Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech, as identified below:

Part 1: "Technical characteristics and methods of measurement";

Part 2: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".

National transposition dates	
Date of adoption of this EN:	13 August 2013
Date of latest announcement of this EN (doa):	30 November 2013
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2014
Date of withdrawal of any conflicting National Standard (dow):	31 May 2015

Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the R&TTE Directive [i.1]. The modular structure is shown in EG 201 399 [i.3].

1 Scope

The present document covers the minimum characteristics considered necessary in order to avoid harmful interference and to make acceptable use of the available frequencies.

The present document applies to equipment with integral antennas, used in angle modulation systems in the land mobile service, operating on radio frequencies between 30 MHz and 1 000 MHz, with channel separations of 12,5 kHz, 20 kHz and 25 kHz, and is intended primarily for analogue speech.

In the present document different requirements are given for the different radio frequency bands, channel separations, environmental conditions and types of equipment, where appropriate.

The present document is complementary to EN 300 086 [i.4], which covers radio equipment with an internal or external RF connector, for use in the land mobile service.

The present document may apply to PMR446 equipment as defined in CEPT/ERC/DEC(98)25 [i.6]. Note that PMR446 equipment has a requirement to incorporate a receiver and may have requirements for 180 s maximum transmission time and VOX.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

[1] ETSI EN 300 296-1 (V1.4.1) (08-2013): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Part 1: Technical characteristics and methods of measurement".

[2] ETSI TR 100 028 (V1.4.1) (12-2001) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications equipment and the mutual recognition of their conformity (R&TTE Directive).

[i.2] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.

[i.3] ETSI EG 201 399 (V2.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of Harmonized Standards for application under the R&TTE Directive".

[i.4] ETSI EN 300 086: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment with an internal or external RF connector intended primarily for analogue speech".

[i.5] Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

[i.6] CEPT/ERC/DEC(98)25: "The Harmonised frequency band designated for analogue PMR446".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in Directive 1999/5/EC [i.1] and EN 300 296-1 [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 296-1 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 296-1 [1] apply.

4 Technical specifications

4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be determined by the environmental class of the equipment. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the required operational environmental profile.

4.2 Transmitter requirements

4.2.1 Frequency error

4.2.1.1 Definition

The frequency error is defined in EN 300 296-1 [1], clause 7.1.1.

4.2.1.2 Limit

The frequency error shall not exceed the limits in EN 300 296-1 [1], table 1, clause 7.1.3.

4.2.1.3 Methods of measurement

The measurement as specified in EN 300 296-1 [1], clause 7.1.2, shall be carried out.

4.2.2 Effective radiated power

4.2.2.1 Definition

The effective radiated power is defined in EN 300 296-1 [1], clause 7.2.1.

4.2.2.2 Limit

The effective radiated power shall not exceed the limits in EN 300 296-1 [1], clause 7.2.3.

4.2.2.3 Methods of measurement

The measurement as specified in EN 300 296-1 [1], clause 7.2.2, shall be carried out.

4.2.3 Maximum permissible frequency deviation

4.2.3.1 Definition

The maximum permissible frequency deviation is defined in EN 300 296-1 [1], clause 7.3.1.

4.2.3.2 Limit

The maximum permissible frequency deviation shall not exceed the limits in EN 300 296-1 [1], clause 7.3.3.

4.2.3.3 Methods of measurement

The measurement as specified in EN 300 296-1 [1], clause 7.3.2, shall be carried out.

4.2.4 Adjacent and alternate channel power

4.2.4.1 Definition

The adjacent and alternate channel power is defined in EN 300 296-1 [1], clause 7.4.1.

4.2.4.2 Limit

The adjacent and alternate channel power shall not exceed the limits in EN 300 296-1 [1], clause 7.4.3.

4.2.4.3 Methods of measurement

The measurement as specified in EN 300 296-1 [1], clause 7.4.2, shall be carried out.

4.2.5 Radiated unwanted emissions in the spurious domain

4.2.5.1 Definition

The spurious emissions are defined in EN 300 296-1 [1], clause 7.5.1.

4.2.5.2 Limit

The spurious emissions shall not exceed the limits in EN 300 296-1 [1], clause 7.5.3.

4.2.5.3 Methods of measurement

The measurement as specified in EN 300 296-1 [1], clause 7.5.2, shall be carried out.

4.2.6 Voice operated transmission

4.2.6.1 Definition

The VOX is defined in EN 300 296-1 [1], clause 7.6.1.

4.2.6.2 Limit

The VOX limits are given in EN 300 296-1 [1], clause 7.6.3.

4.2.6.3 Methods of measurement

The measurement as specified in EN 300 296-1 [1], clause 7.6.2, shall be carried out.

4.2.7 Maximum transmission time

4.2.7.1 Definition

The maximum transmission time is defined in EN 300 296-1 [1], clause 7.7.1.

4.2.7.2 Limit

The maximum transmission time limits are given in EN 300 296-1 [1], clause 7.7.3.

4.2.7.3 Methods of measurement

The measurement as specified in EN 300 296-1 [1], clause 7.7.2, shall be carried out.

4.3 Receiver requirements

4.3.1 Average usable sensitivity (field strength, speech)

4.3.1.1 Definition

The average useable sensitivity (speech, field strength) is defined in EN 300 296-1 [1], clause 8.1.1.

4.3.1.2 Limit

The average useable sensitivity (speech, field strength) shall not exceed the limits in EN 300 296-1 [1], clause 8.1.3.

4.3.1.3 Method of measurement

The measurement as specified in EN 300 296-1 [1], clause 8.1.2, shall be carried out.

4.3.2 Co-channel rejection

4.3.2.1 Definition

The co-channel rejection is defined in EN 300 296-1 [1], clause 8.3.1.

4.3.2.2 Limit

The co-channel rejection shall not exceed the limits in EN 300 296-1 [1], clause 8.3.3.

4.3.2.3 Method of measurement

The measurement as specified in EN 300 296-1 [1], clause 8.3.2, shall be carried out.

4.3.3 Adjacent channel selectivity

4.3.3.1 Definition

The adjacent channel selectivity is defined in EN 300 296-1 [1], clause 8.4.1.

4.3.3.2 Limit

The adjacent channel selectivity shall not exceed the limits in EN 300 296-1 [1], clause 8.4.3.

4.3.3.3 Method of measurement

The measurement as specified in EN 300 296-1 [1], clause 8.4.2, shall be carried out.

4.3.4 Spurious response rejection

4.3.4.1 Definition

The spurious response rejection is defined in EN 300 296-1 [1], clause 8.5.1.

4.3.4.2 Limit

The spurious response rejection shall not exceed the limits in EN 300 296-1 [1], clause 8.5.3.

4.3.4.3 Method of measurement

The measurement as specified in EN 300 296-1 [1], clause 8.5.2, shall be carried out.

4.3.5 Intermodulation response rejection

4.3.5.1 Definition

The intermodulation response rejection is defined in EN 300 296-1 [1], clause 8.6.1.

4.3.5.2 Limit

The intermodulation response rejection shall not exceed the limits in EN 300 296-1 [1], clause 8.6.3.

4.3.5.3 Method of measurement

The measurement as specified in EN 300 296-1 [1], clause 8.6.2, shall be carried out.

4.3.6 Blocking or desensitization

4.3.6.1 Definition

The blocking or desensitization is defined in EN 300 296-1 [1], clause 8.7.1.

4.3.6.2 Limit

The blocking or desensitization shall not exceed the limits in EN 300 296-1 [1], clause 8.7.3.

4.3.6.3 Method of measurement

The measurement as specified in EN 300 296-1 [1], clause 8.7.2, shall be carried out.

4.3.7 Spurious radiations

4.3.7.1 Definition

The spurious radiations are defined in EN 300 296-1 [1], clause .8.2.1.

4.3.7.2 Limit

The spurious radiations shall not exceed the limits in EN 300 296-1 [1], clause 8.2.3.

4.3.7.3 Method of measurement

The measurement as specified in EN 300 296-1 [1], clause 8.2.2, shall be carried out.

5 Testing for compliance with technical requirements

5.1 Environmental conditions for testing

5.1.1 Normal and extreme test-conditions

Measurements shall be made under normal test conditions, and also, where stated, under extreme test conditions.

The test conditions and procedures shall be as specified in EN 300 296-1 [1], clauses 5.1, 5.3 and 5.4.

5.1.2 Test power source

The test power source shall meet the requirements of EN 300 296-1 [1], clause 5.2.

5.1.3 Choice of samples for test suites

Measurement shall be performed, according to the present document, on samples of equipment defined in EN 300 296-1 [1], clause 4.1.

5.2 Interpretation of the measurement results

The interpretation of the results recorded in a test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit shall be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be included in the test report;
- the value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures given in clause 9, table 9, in EN 300 296-1 [1].

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [2] and shall correspond to an expansion factor (coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

The particular expansion factor used for the evaluation of the measurement uncertainty shall be stated.

The absolute measurement uncertainties are given in clause 9 in EN 300 296-1 [1].

5.3 Essential radio test suites

Essential test suites are referred to in annex III of R&TTE Directive [i.1].

5.3.1 Frequency error

The measurement as specified in EN 300 296-1 [1], clause 7.1.2, shall be carried out.

5.3.2 Effective radiated power

The measurement as specified in EN 300 296-1 [1], clause 7.2.2, shall be carried out.

5.3.3 Maximum frequency deviation

The measurement as specified in EN 300 296-1 [1], clause 7.3.2, shall be carried out.

5.3.4 Adjacent and alternate channel power

The measurement as specified in EN 300 296-1 [1], clause 7.4.2, shall be carried out.

5.3.5 Radiated unwanted emission in the spurious domain

The measurement as specified in EN 300 296-1 [1], clause 7.5.2, shall be carried out.

5.3.6 Spurious radiations

The measurement as specified in EN 300 296-1 [1], clause 8.2.2, shall be carried out.

5.3.7 Average usable sensitivity (speech, field strength)

The measurement as specified in EN 300 296-1 [1], clause 8.1.2, shall be carried out.

5.3.8 Adjacent channel selectivity

The measurement as specified in EN 300 296-1 [1], clause 8.4.2, shall be carried out.

5.3.9 Intermodulation response rejection

The measurement as specified in EN 300 296-1 [1], clause 8.6.2, shall be carried out.

5.3.10 Blocking or desensitization

The measurement as specified in EN 300 296-1 [1], clause 8.7.2, shall be carried out.

5.4 Other test specifications

The following radio test suites shall be used to assess the performance of equipment.

5.4.1 Voice operated transmission

The measurement as specified in EN 300 296-1 [1], clause 7.6.2, shall be carried out.

5.4.2 Maximum transmission time

The measurement as specified in EN 300 296-1 [1], clause 7.7.2, shall be carried out.

Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT)

The HS Requirements and conformance Test specifications Table (HS-RTT) in table A.1 serves a number of purposes, as follows:

- it provides a statement of all the requirements in words and by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it provides a statement of all the test procedures corresponding to those requirements by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it qualifies each requirement to be either:
  - Unconditional: meaning that the requirement applies in all circumstances; or
  - Conditional: meaning that the requirement is dependent on the manufacturer having chosen to support optional functionality defined within the schedule;
- in the case of Conditional requirements, it associates the requirement with the particular optional service or functionality;
- it qualifies each test procedure to be either:
  - Essential: meaning that it is included with the Essential Radio Test Suite and therefore the requirement shall be demonstrated to be met in accordance with the referenced procedures;
  - Other: meaning that the test procedure is illustrative but other means of demonstrating compliance with the requirement are permitted.

Table A.1: HS Requirements and conformance Test specifications Table (HS-RTT)

Harmonized Standard EN 300 296-2 The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive [i.1]						
Requirement			**Requirement Conditionality**		**Test Specification**	
No	**Description**	**Reference: Clause No**	**U/C**	**Condition**	**E/O**	**Reference: Clause No**
1	Transmitter frequency error	4.2.1	U		E	5.3.1
2	Transmitter effective radiated power	4.2.2	U		E	5.3.2
3	Transmitter maximum frequency deviation	4.2.3	U		E	5.3.3
4	Transmitter adjacent and alternate channels power	4.2.4	U		E	5.3.4
5	Transmitter radiated unwanted emissions in the spurious domain	4.2.5	U		E	5.3.5
6	Receiver spurious radiations	4.3.7	U		E	5.3.6
7	Receiver average useable sensitivity	4.3.1	U		E	5.3.7

Harmonized Standard EN 300 296-2 The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive [i.1]						
Requirement			**Requirement Conditionality**		**Test Specification**	
No	**Description**	**Reference: Clause No**	**U/C**	**Condition**	**E/O**	**Reference: Clause No**
8	Receiver adjacent channel selectivity	4.3.3	U		E	5.3.8
9	Receiver inter-modulation response	4.3.5	U		E	5.3.9
10	Receiver blocking or desensitization	4.3.6	U		E	5.3.10
11	Voice operated transmission	4.2.6	C	Applied only to PMR446 equipment [i.6] not having a PTT control.	O	5.4.1
12	180 second transmission time	4.2.7	C	Applied only to PMR446 equipment [i.6] either not having a PTT control or having PTT functionality capable of being latched 'on'.	O	5.4.2

Key to columns:

Requirement:

No A unique identifier for one row of the table which may be used to identify a requirement or its test specification.

Description A textual reference to the requirement.

Clause Number Identification of clause(s) defining the requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

U/C Indicates whether the requirement is to be *unconditionally* applicable (U) or is *conditional* upon the manufacturers claimed functionality of the equipment (C).

Condition Explains the conditions when the requirement shall or shall not be applicable for a technical requirement which is classified "conditional".

Test Specification:

E/O Indicates whether the test specification forms part of the Essential Radio Test Suite (E) or whether it is one of the Other Test Suite (O).

NOTE: All tests whether "E" or "O" are relevant to the requirements. Rows designated "E" collectively make up the Essential Radio Test Suite; those designated "O" make up the Other Test Suite; for those designated "X" there is no test specified corresponding to the requirement . The completion of all tests classified "E" as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Compliance with requirements associated with tests classified "O" or "X" is a necessary condition for presumption of conformity, although conformance with the requirement may be claimed by an equivalent test or by manufacturer's assertion supported by appropriate entries in the technical construction file.

Clause Number Identification of clause(s) defining the test specification in the present document unless another document is referenced explicitly. Where no test is specified (that is, where the previous field is "X") this field remains blank.

Annex B (informative): Bibliography

- Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).
- Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC.
- Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).
- Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

History

Document history				
Edition 1	December 1994	Publication as ETS 300 296		
Amendment 1	March 1997	Amendment 1 to 1st Edition of ETS 300 296		
V1.1.1	March 2001	Publication		
V1.2.1	February 2009	Publication		
V1.3.1	July 2010	Publication		
V1.4.1	July 2012	One-step Approval Procedure (Withdrawn)	OAP 20121115:	2012-07-18 to 2012-11-15
V1.4.1	July 2012	Public Enquiry	PE 20121117:	2012-07-20 to 2012-11-19
V1.4.1	June 2013	Vote	V 20130813:	2013-06-14 to 2013-08-13
V1.4.1	August 2013	Publication		