SLOVENSKI STANDARD
SIST EN 302 217-4-2 V1.1.3:2005

01-maj-2005

Fiksni radijski sistemi - Karakteristike in zahteve za opremo in antene tipa toļ ka-toļ ka - 4-2. del: Harmonizirani EN, ki zajema bistvene zahteve ļ lena 3.2 direktive R&TTE za antene

Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 4-2: Harmonized EN covering essential requirements of Article 3.2 of R&TTE Directive for antennas

Ta slovenski standard je istoveten z: **EN 302 217-4-2 Version 1.1.3**

ICS:

33.060.30	Radiorelejni in fiksni satelitski komunikacijski sistemi	Radio relay and fixed satellite communications systems
33.120.40	Antene	Aerials

SIST EN 302 217-4-2 V1.1.3:2005 **en**

ETSI EN 302 217-4-2 V1.1.3 (2004-12)

Candidate Harmonized European Standard (Telecommunications series)

Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 4-2: Harmonized EN covering essential requirements of Article 3.2 of R&TTE Directive for antennas

Reference
DEN/TM-04131-4-2

Keywords
antenna, DFRS, DRRS, FWA, point-to-point,
radio, regulation, transmission

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Candidate Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Transmission and Multiplexing (TM).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC [1] of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity ("the R&TTE Directive").

The present document is part 4-2, of a multi-part deliverable covering the Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas, as identified below:

Part 1: "Overview and system-independent common characteristics";

Part 2-1: "System-dependent requirements for digital systems operating in frequency bands where frequency co-ordination is applied";

Part 2-2: "Harmonized EN covering essential requirements of Article 3.2 of R&TTE Directive for digital systems operating in frequency bands where frequency co-ordination is applied";

Part 3: "Harmonized EN covering essential requirements of Article 3.2 of R&TTE Directive for equipment operating in frequency bands where no frequency co-ordination is applied";

Part 4-1: "System-dependent requirements for antennas";

Part 4-2: "Harmonized EN covering essential requirements of Article 3.2 of R&TTE Directive for antennas".

The present document, with EN 302 217-2-2 (see bibliography) and EN 302 217-3 (see bibliography) intend to replace and supersede the harmonized EN 301 751 (see bibliography) for all P-P equipment and antennas.

National transposition dates	
Date of adoption of this EN:	19 November 2004
Date of latest announcement of this EN (doa):	28 February 2005
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2005
Date of withdrawal of any conflicting National Standard (dow):	28 February 2007

Introduction

The present document is part of a set of standards designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [1]. Each standard is a module in the structure. The modular structure is shown in figure 1.

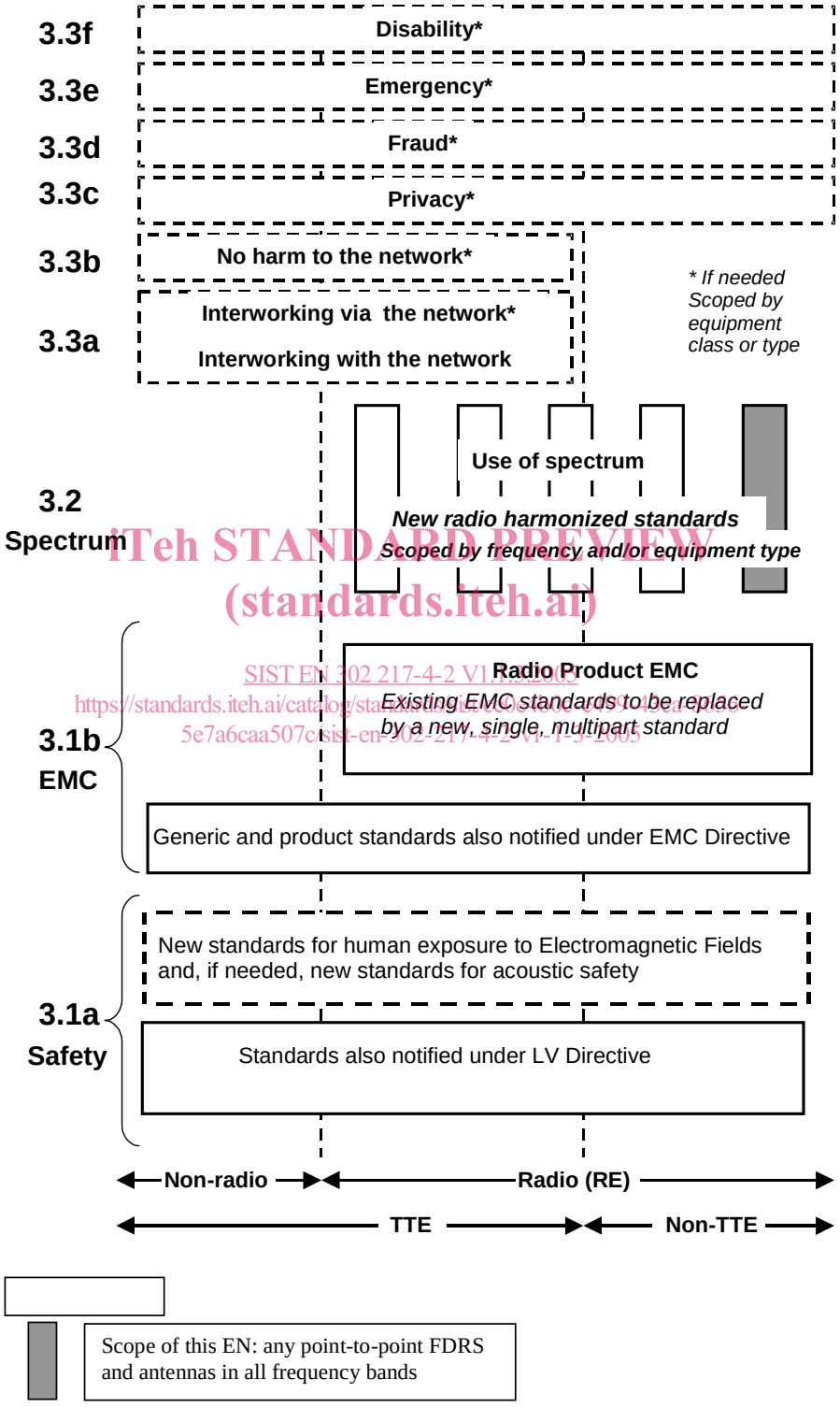


Figure 1: Modular structure for the various standards used under the R&TTE Directive

The left hand edge of figure 1 shows the different clauses of article 3 of the R&TTE Directive [1].

For article 3.3 various horizontal boxes are shown. Dotted lines indicate that at the time of publication of the present document essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum by radio equipment. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.1b the diagram shows EN 301 489 (see bibliography), the multi-part product EMC standard for radio used under the EMC Directive 89/336/EEC (see bibliography).

NOTE: For Fixed Radio Systems, EN 301 489-1 and EN 301 489-4 (see bibliography) are relevant.

For article 3.1a, figure 1 shows the existing safety standards currently used under the LV Directive 73/23/EEC (see bibliography) and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

The bottom of figure 1 shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular item of equipment may be radio equipment, telecommunications terminal equipment or both. A radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement under the R&TTE Directive [1] is adopted by the Commission and if the equipment in question is covered by the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the R&TTE Directive [1] may be covered in a set of standards.

The modularity principle has been taken because:

- It minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions. It is not practicable to produce a single standard for each possible combination of functions that may occur in equipment.

- It provides scope for standards to be added:

  - under article 3.2 when new frequency bands are agreed; or
  - under article 3.3 should the Commission take the necessary decisions

  without requiring alteration of standards that are already published.

- It clarifies, simplifies and promotes the usage of Harmonized Standards as the relevant means of conformity assessment.

1 Scope

The present document is intended to cover the provisions of Directive 1999/5/EC (R&TTE Directive) [1] regarding article 3.2, which states that "[…] *radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference*".

The present document with EN 302 217-2-2 (see bibliography) and EN 302 217-3 (see bibliography) intend to replace and supersede, after a suitable transition period, the harmonized EN 301 751 (see bibliography) for all P-P equipment and antennas.

Those documents introduces, for systems (equipment and antennas) already covered by EN 301 751 (see bibliography), equal, technically equivalent or less stringent requirements. Therefore, from a strictly technical point of view, it is expected that antennas, covered in the present document and already conforming to the previous EN 301 751 (see bibliography), would not need a new test report for re-assessment of essential requirements according this new EN 302 217 series (see notes); however, legal implications with respect to the declaration of conformity have not been considered, not being in the scope of the present document.

NOTE 1: Few antenna types of the lower classes, covered by EN 301 751, based on EN 300 631 and EN 300 833 (see these references in the bibliography), have not been carried over into the present document because no longer considered appropriate, from the system point of view, with the increasing demand of spectrum in ETSI Countries, and therefore no more suitable for essential requirements under article 3.2 of the R&TTE Directive [1] within the European Union. Nevertheless, recognizing that ETSI ENs have worldwide relevance, they are still found into EN 302 217-4-1 (see bibliography).

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of article 3 of the R&TTE Directive will apply to equipment within the scope of the present document.

NOTE 2: A list of such ENs is included on the web site http://www.newapproach.org.

In order to technically cover different market and network requirements, with an appropriate balance of performance to cost and effective and appropriate use of the radio spectrum, the present document, together with EN 302 217-2-2 (see bibliography), offers a number of system types and antennas alternatives, for selection by administrations, operators and manufacturers dependent on the desired use of the radio spectrum and network/market requirements; those options include:

- channel separation alternatives (as provided by the relevant CEPT Recommendation);
- spectral efficiency class alternatives (different complexity of modulation formats provided in radio equipment standards);
- antenna directivity class alternatives (for different network density requirement).

The present document is considered applicable to fixed radio systems products with integral antennas, for which all the technical requirements included in the present document, in EN 302 217-2-2 (see bibliography) and in EN 302 217-3 (see bibliography) apply; the present document applies, as well, to separate antenna products, to which only the relevant technical requirements apply. For more background information on the equipment and antenna paramaeters relevant to Article 3.2 of the R&TTE Directive see EG 201 399 (see bibliography) and TR 101 156 (see bibliography).

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version 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: With regard to ETSI ENs, the third digit of the version number is not considered essential for dated reference purposes because the ETSI Technical Working Procedures reserve this digit for editorially changed versions, thereby not affecting the technical parameters within versions with the same two initials digits. Here is reported the third digit of the latest version available at the time of the publication of the present document.

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

[2] ETSI EN 301 126-3-1 (V1.1.2): "Fixed Radio Systems; Conformance testing; Part 3-1: Point-to-Point antennas; Definitions, general requirements and test procedures".

[3] ETSI EN 302 217-1 (V1.1.2): "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 1: Overview and system-independent common characteristics".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 302 217-1 [3] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 302 217-1 [3] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 302 217-1 [3] apply.

4 Technical requirements specifications

In the following clauses, electrical characteristics are given as function of specific classification of the antennas according to the principles referred to in EN 302 217-4-1 (see bibliography).

The antenna supplier shall state, for each antenna type, the frequency band of operation and antenna gain at least at the frequency band edges and at mid-band. An antenna, which employs a radome, shall meet the requirements of the present document with the radome in place. The antenna system shall radiate a linear (single or dual) polarized wave. In bands where frequency co-ordination is applied, single polarized antennas shall meet cross-polar RPE and XPD requirements also.

NOTE: In bands where frequency co-ordination is not applied, cross-polar RPE and XPD are not considered as essential requirements for R&TTE Directive [1] conformance, even if the antenna is actually dual polarized. Values given in the present document should be considered for reference purposes only. For definition of co-ordination in frequency bands, refer to definitions in EN 302 217-1 [3].

4.1 Environmental profile

The technical requirements of the present document apply with respect to the environmental profile for operation of the antenna or the equipment-antenna assembly (in case of systems with integral antenna), which shall be declared by the supplier. The antenna shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile. For testing the compliance to technical requirements refer also to EN 301 126-3-1 [2] and clause 5 in the present document.

4.2 Radiation Pattern Envelope (RPE)

The present document defines only RPE which characteristics are considered suitable, within the European Community, and relevant to essential requirements under article 3.2 of the R&TTE Directive [1]; however, it is recognized that ETSI ENs have worldwide relevance and therefore, in other countries, there might be applications and low density radio networks that justify a different trade-off in terms of performance, size and cost. Therefore in EN 302 217-4-1 (see bibliography) other Class 1 antenna RPE are standardized for such purpose.

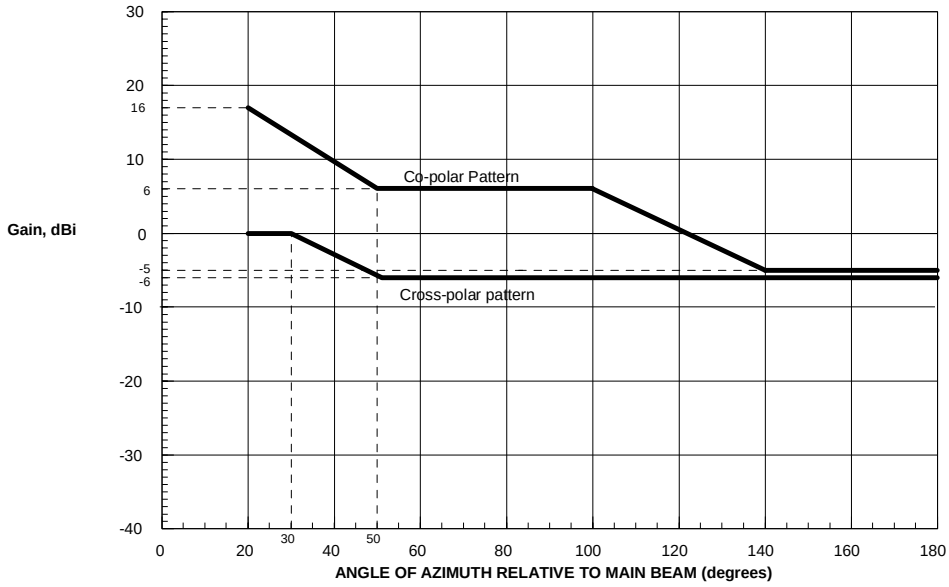
Not all classes of antennas defined in EN 302 217-4-1 (see bibliography) are presently represented by specific RPEs in the present document; missing RPEs are intended for future inclusion whenever the market might possibly require them. Table 1 provides for each frequency range an overview of the currently standardized antenna classes.

Table 1: Summary of RPE classes represented in the present document

Frequency range (GHz)	Antenna Radiation Pattern Envelope (RPE) class
1 to 3	1A, 1B, 1C, 2, 3
3 to 14	2, 3, 4
14 to 20	2, 3
20 to 24	2, 3
24 to 30	2, 3
30 to 47	2, 3A, 3B, 3C
47 to 60	2, 3A, 3B

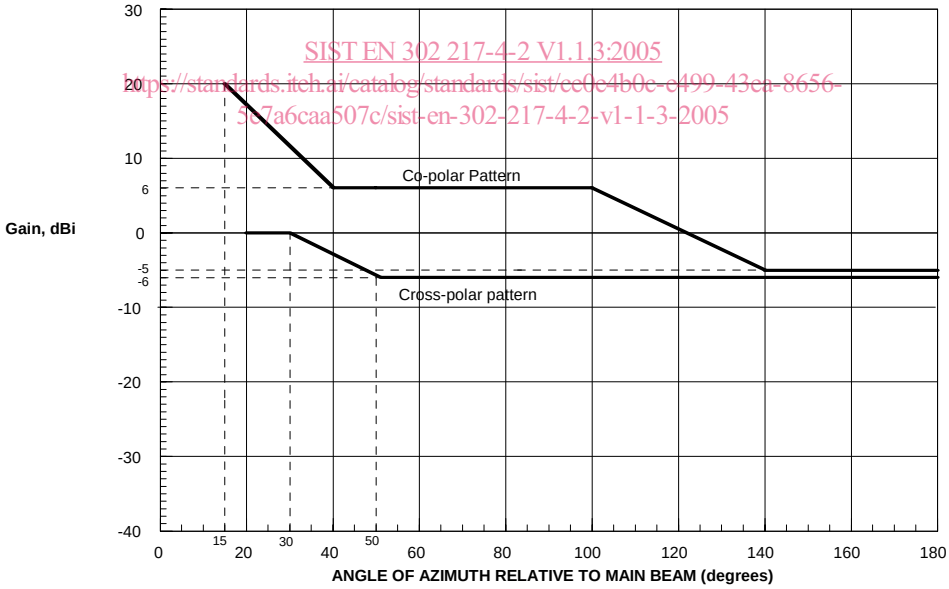
4.2.1 Frequency range 0: 1 GHz to 3 GHz

The choice of antenna depends on the application planned for this band, requirements of the operators and the responsible administration. Figures 2 to 7 give the RPEs for antenna classes 1, 2 and 3.



Angle (°)	Co-polar (dBi)	Angle (°)	Cross-polar (dBi)
20	16	20	0
50	6	30	0
100	6	50	-6
140	-5	180	-6
180	-5		

Figure 2: Class 1A antenna RPE (1 GHz to 3 GHz)



Angle (°)	Co-polar (dBi)	Angle (°)	Cross-polar (dBi)
15	20	20	0
40	6	30	0
100	6	50	-6
140	-5	180	-6
180	-5		

Figure 3: Class 1B antenna RPE (1 GHz to 3 GHz)