



SLOVENSKI STANDARD
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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

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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**

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Foreword

This 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 (as amended) 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").

Technical Specifications relevant to Directive 1999/5/EC are given in annex A.

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".**

National transposition dates

Date of adoption of this EN:	5 October 2007
Date of latest announcement of this EN (doa):	31 January 2008
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 July 2008
Date of withdrawal of any conflicting National Standard (dow):	31 July 2009

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 [1]. The modular structure is described in EG 201 399 (see bibliography) and shown in figure 1.

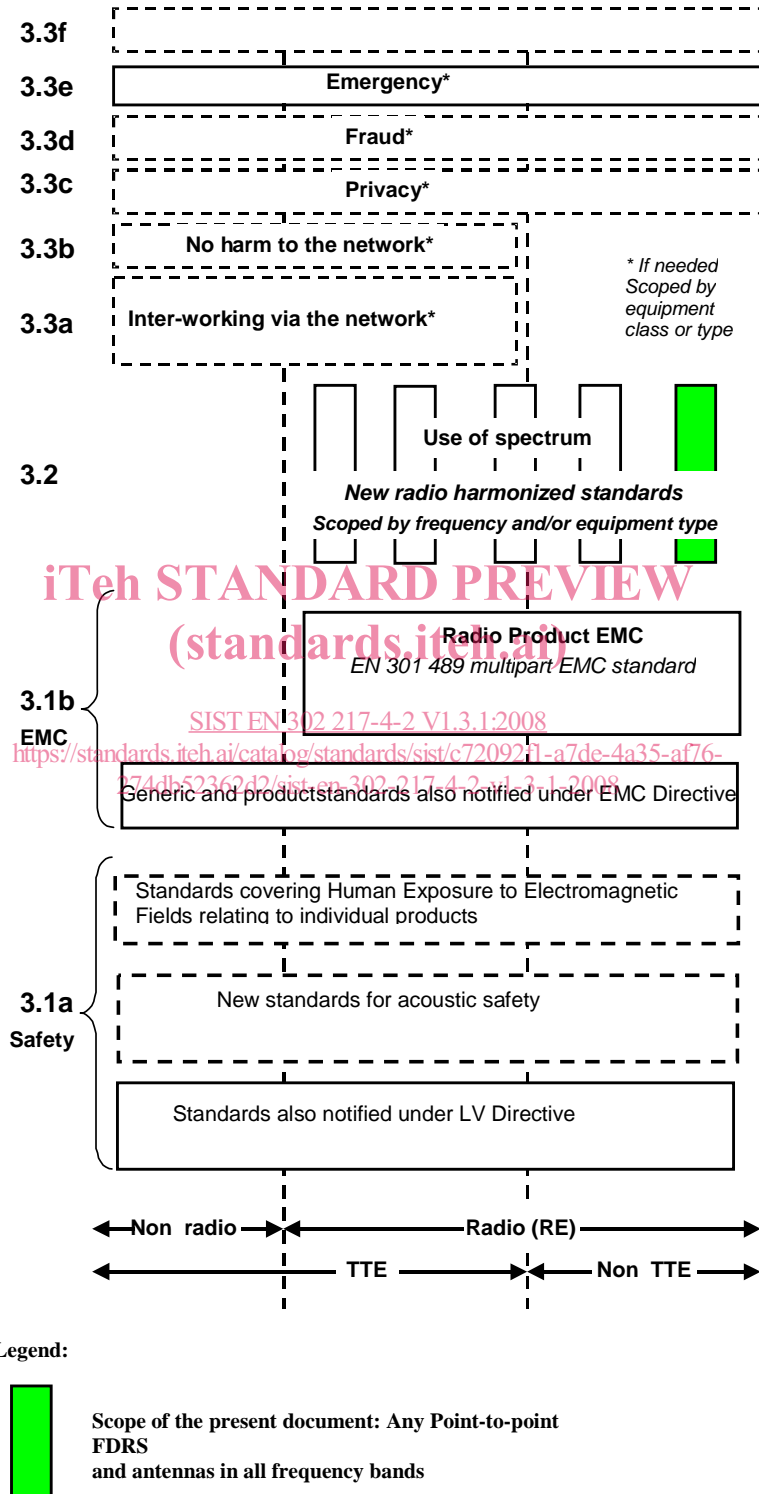


Figure 1: Modular structure for the various standards used under the R&TTE Directive

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 is applicable only to antenna types that are intended for use with the systems falling within the scope of documents EN 302 217-2-2 (see bibliography) and EN 302 217-3 (see bibliography).

Those documents introduces requirements, for systems (equipment and antennas) that were formerly covered by EN 301 751 (see bibliography) and that are 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) or previous versions of the present harmonized standard, 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, have not been carried over since the first version of 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 parameters relevant to Article 3.2 of the R&TTE Directive see EG 201 399 (see bibliography) and TR 101 506 (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: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

- [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 (V1.2.1): "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 1: Overview and system-independent common characteristics".

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3 Definitions, symbols and abbreviations

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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 required environmental profile for operation of the antenna or the equipment-antenna assembly (in case of systems with integral antenna) 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.

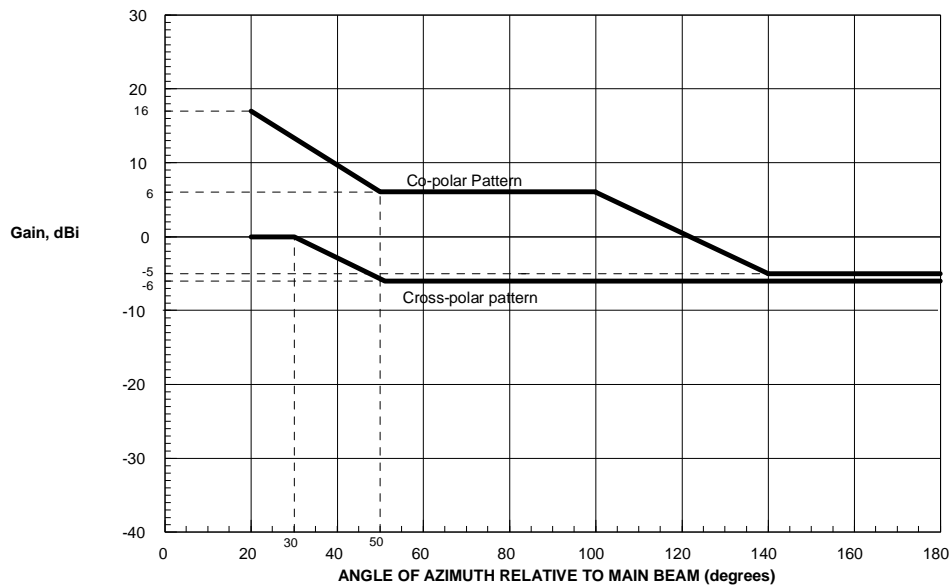
Not all classes of antennas defined in EN 302 217-4-1 (see bibliography) are presently represented by specific RPEs in the present document; missing RPEs are intended for future inclusion whenever the market might possibly require them. Table 1 provides for each frequency range an overview of the currently 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, 4
20 to 24	2, 3, 4
24 to 30	2, 3, 4
30 to 47	2, 3A, 3B, 3C, 4
47 to 66	2, 3A, 3B
71 to 86	No class defined

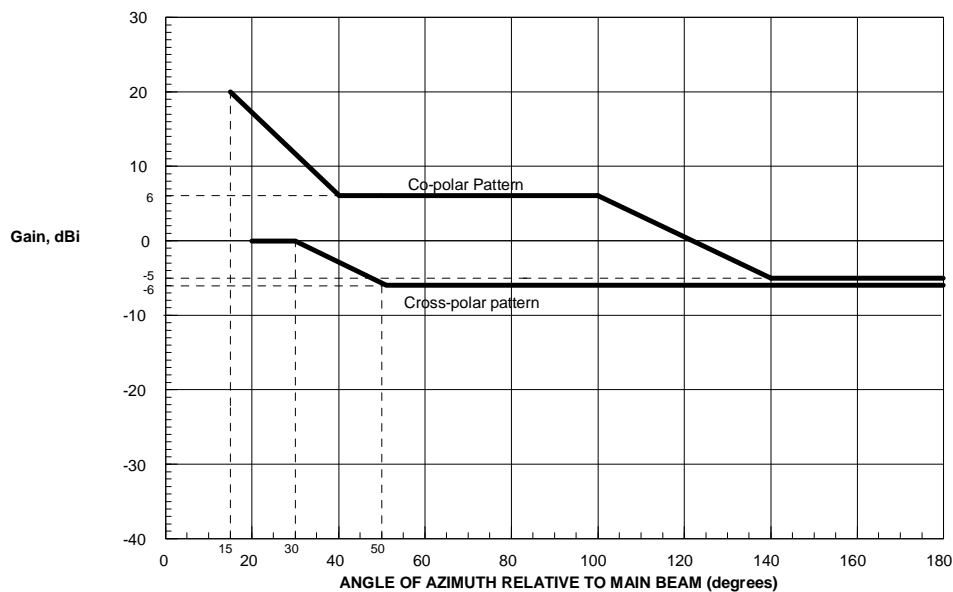
4.2.1 Frequency range 0: 1 GHz to 3 GHz

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.



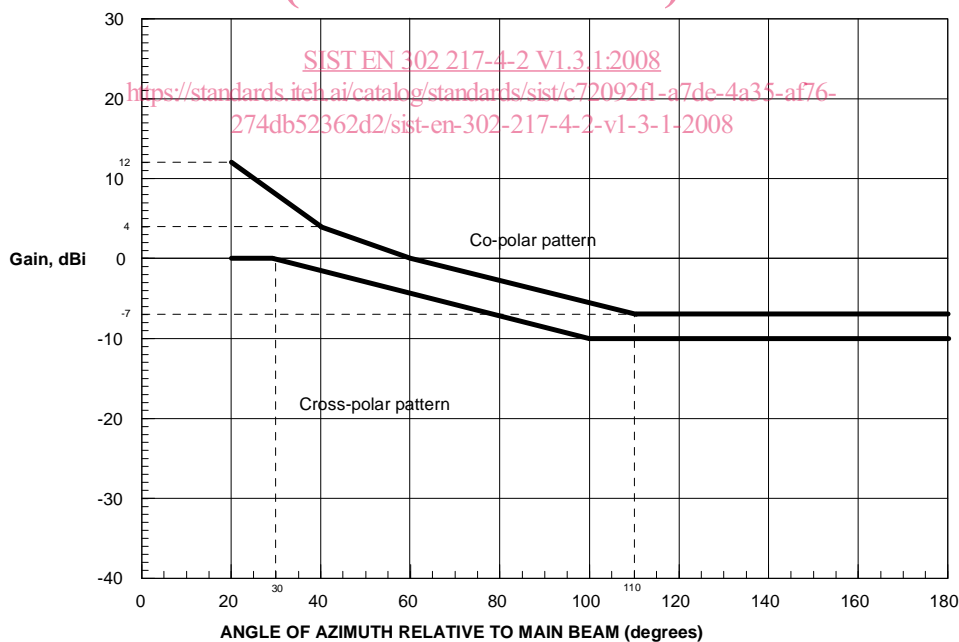
Angle (°)	Co-polar (dBi)	Angle (°)	Cross-polar (dBi)
20	16	20	0
50	6	30	0
100	6	50	-6
140	-5	180	-6
180	-5		

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)
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Azimuth angle (°)	Co-polar (dBi)	Azimuth angle (°)	Cross-polar (dBi)
20	12	20	0
40	4	30	0
110	-7	100	-10
180	-7	180	-10

Figure 4: Class 1C antenna RPE (1 GHz to 3 GHz, azimuth plane)