

SLOVENSKI STANDARD

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Fiksni radijski sistemi - Karakteristike in zahteve za opremo in antene tipa tol'ka - 3. del: Oprema, ki deluje v frekvenčnih pasovih, kjer se lahko uporablja usklajena in neusklajena oprema - Harmonizirani EN, ki zajema bistvene zahteve iz člena 3.2 direktive R&TTE

Fixed Radio Systems - Characteristics and requirements for point-to-point equipment and antennas - Part 3: Equipment operating in frequency bands where both frequency coordinated or uncoordinated deployment might be applied - Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

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ETSI EN 302 217-3 V1.3.1 (2009-07)

Harmonized European Standard (Telecommunications series)

**Fixed Radio Systems;
Characteristics and requirements for
point-to-point equipment and antennas;
Part 3: Equipment operating in frequency bands where
both frequency coordinated or
uncoordinated deployment might be applied;
Harmonized EN covering the essential requirements
of article 3.2 of the R&TTE Directive**

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Contents

Intellectual Property Rights	7
Foreword.....	7
Introduction	8
1 Scope	9
2 References	10
2.1 Normative references	10
2.2 Informative references	11
3 Definitions, symbols and abbreviations	12
3.1 Definitions	12
3.2 Symbols	12
3.3 Abbreviations	12
4 Technical requirements specifications	12
4.1 Environmental profile	13
4.2 RF-channel selection	13
4.2.1 RF-channel selection procedure	13
4.2.2 Interference avoidance requirements	13
4.2.2.1 Interference avoidance limit	13
4.2.3 Frequency agile automatic channel selection	14
4.3 Transmitter requirements	14
4.3.1 Transmitter power	14
4.3.1.1 Transmitter power	14
4.3.1.2 Equivalent Isotropically Radiated Power (EIRP)	14
4.3.1.3 Output Power Tolerance	14
4.3.2 Radio Frequency (RF) spectrum mask	14
4.3.3 Spurious emissions	15
4.3.4 Radio frequency tolerance	15
4.3.5 Antenna directional requirements	15
4.3.5.1 Radiation Pattern Envelope (Off-axis EIRP density)	15
4.3.5.2 Antenna gain	15
4.3.5.3 Antenna Cross-Polar Discrimination (XPD)	16
4.4 Receiver requirements	16
4.4.1 Spurious emissions	16
5 Testing for compliance with technical requirements	16
5.1 Environmental conditions for testing	16
5.2 RF-channel selection	17
5.3 Essential radio test suites for the transmitter	17
5.3.1 Transmitter power	18
5.3.1.1 Transmitter power	18
5.3.1.2 Equivalent Isotropically Radiated Power (EIRP) and EIRP density mask	18
5.3.1.3 Output power tolerance	18
5.3.2 RF spectrum mask	18
5.3.3 Spurious emissions - external	18
5.3.4 Radio frequency tolerance	18
5.3.5 Antenna and system directional requirements	19
5.3.5.1 Radiation pattern envelope (Off-axis EIRP density)	19
5.3.5.2 Antenna gain	19
5.3.5.3 Antenna Cross-Polar Discrimination (XPD)	19
5.4 Essential radio test suites for the receiver	19
5.4.1 Spurious emissions	20
Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT).....	21

Annex B (normative):	Wide radio-frequency band covering units and multirate equipment specification and tests	23
B.1	Wide radio-frequency band covering units	23
B.2	Multirate/multiformat equipment	25
Annex C (informative):	The EN title in the official languages	26
Annex D (informative):	Bibliography	27
Annex UA (normative):	Frequency band around 58 GHz	28
UA.0	Introduction	28
UA.1	Digital systems	28
UA.1.1	Frequency bands and channel arrangements	28
UA.1.1.1	Frequency band	28
UA.1.1.2	Radio channel arrangements	28
UA.1.1.3	Transmission capacity	28
UA.1.2	Transmitter	29
UA.1.2.1	Transmitter power	29
UA.1.2.2	Equivalent Isotropically Radiated Power (EIRP)	29
UA.1.2.3	Output power tolerance	29
UA.1.2.4	RF spectrum masks	29
UA.1.2.4.1	Limits	29
UA.1.2.4.2	Spectrum analyser settings	30
UA.1.2.5	Spurious emissions-external	30
UA.1.2.6	Radio frequency tolerance	30
UA.1.2.7	RF-channel selection parameters	30
UA.1.3	Receiver	30
UA.2	Analogue systems	31
UA.2.1	Frequency bands and channel arrangements	31
UA.2.1.1	Frequency bands	31
UA.2.1.2	Radio channel arrangements	31
UA.2.1.3	Transmission capacity	31
UA.2.2	Transmitter	31
UA.2.2.1	Transmitter power	31
UA.2.2.2	Equivalent Isotropically Radiated Power (EIRP)	31
UA.2.2.3	Output power tolerance	31
UA.2.2.4	RF spectrum masks	31
UA.2.2.5	Spurious emissions - external	31
UA.2.2.6	RF frequency tolerance	31
UA.2.3	Receiver requirements	32
UA.2.3.1	Spurious emissions	32
Annex UB (normative):	Frequency band 64 GHz to 66 GHz	33
UB.0	Introduction	33
UB.1	Frequency bands and channel arrangements	33
UB.1.1	Frequency band	33
UB.1.2	Radio channel arrangements	34
UB.1.3	Spectral efficiency	34
UB.2	Transmitter	35
UB.2.1	Transmitter power and Equivalent Isotropically Radiated Power (EIRP)	35
UB.2.2	Output power tolerance	36
UB.2.3	EIRP density masks	37
UB.2.3.1	Limits	37
UB.2.3.2	Emissions outside the 64 GHz to 66 GHz range	38
UB.2.3.3	Spectrum analyser settings	38
UB.2.4	Spurious emissions	38
UB.2.5	Radio frequency tolerance	38

UB.2.6	RF-channel selection parameters.....	38
UB.2.7	Antenna gain	38
UB.3	Receiver.....	38
Annex UBa (normative): Frequency band 57 GHz to 66 GHz for point-to-point fixed wireless systems		39
UBa.0	Introduction	39
UBa.1	Frequency bands and channel arrangements	39
UBa.1.1	Frequency band	39
UBa.1.2	Radio channel arrangements and nominal bandwidth	40
UBa.1.3	Spectral efficiency.....	40
UBa.2	Transmitter	41
UBa.2.1	Transmitter power, antenna gain and Equivalent Isotropically Radiated Power (EIRP).....	41
UBa.2.2	Output power tolerance	42
UBa.2.3	RF spectrum masks	43
UBa.2.3.1	Limits.....	43
UBa.2.3.2	Emissions outside the 57 GHz to 66 GHz range.....	44
UBa.2.4	Spurious emissions	45
UBa.2.5	Radio frequency tolerance.....	45
UBa.2.6	Antenna gain	45
UBa.3	Receiver.....	45
Annex UC (normative): Frequency bands 71 GHz to 76 GHz and 81 GHz to 86 GHz		46
UC.0	Introduction	46
UC.1	Frequency bands and channel arrangements	46
UC.1.1	Frequency band	46
UC.1.2	Radio channel arrangements.....	46
UC.1.3	Spectral occupancy and transmission capacity.....	47
UC.2	Transmitter	47
UC.2.1	Transmitter power and Equivalent Isotropic Radiated Power (EIRP).....	47
UC.2.2	Output power tolerance	48
UC.2.3	Output power density masks	49
UC.2.3.1	Limits.....	49
UC.2.3.2	Emissions outside the 71 GHz to 76 GHz and 81 GHz to 86 GHz ranges.....	50
UC.2.3.2.1	General requirement.....	50
UC.2.3.2.2	Requirement for emissions above 86 GHz band edge.....	50
UC.2.3.2.3	Conformance statement.....	51
UC.2.3.3	Spectrum analyser settings.....	51
UC.2.4	Spurious emissions-external.....	51
UC.2.5	Radio frequency tolerance.....	51
UC.2.6	RF-channel selection parameters.....	51
UC.2.7	Antenna gain	51
UC.3	Receiver.....	51
Annex UD (informative): Rationale for the interference limit formula		52
UD.1	Analysis of the quality value for the channel selection procedure	52
UD.1.1	Error-performance and availability requirements for Class A equipment.....	52
UD.1.1.1	Example in the 58 GHz band.....	52
UD.1.2	Theoretical background.....	52
UD.1.3	Typical co-channel interference situation when channel rejection threshold is used	53
UD.2	Protection capability of the RF-channel selection procedure.....	54
UD.3	Frequency agility criteria.....	55

Annex UE (informative):	Capacity and Receiver characteristics in the bands 64 GHz to 66 GHz, 71 GHz to 76 GHz and 81 GHz to 86 GHz.....	56
UE.1	Band 64 GHz to 66 GHz	56
UE.1.1	BER as a function of receiver input signal level (RSL)	56
UE.1.2	Co-channel and adjacent channel interference sensitivity	57
UE.1.3	CW spurious interference	57
UE.2	Bands 71 GHz to 76 GHz and 81 GHz to 86 GHz	57
UE.2.1	Capacity.....	57
UE.2.2	BER as a function of receiver input signal level (RSL)	58
UE.2.3	Co-channel and adjacent channel interference sensitivity	59
UE.2.4	CW spurious interference	59
History		60

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Foreword

This Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [i.19] (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").

Summary of Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A.

The present document is part 3 of a multi-part deliverable covering Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas. Full details of the entire series can be found in part 1 [8].

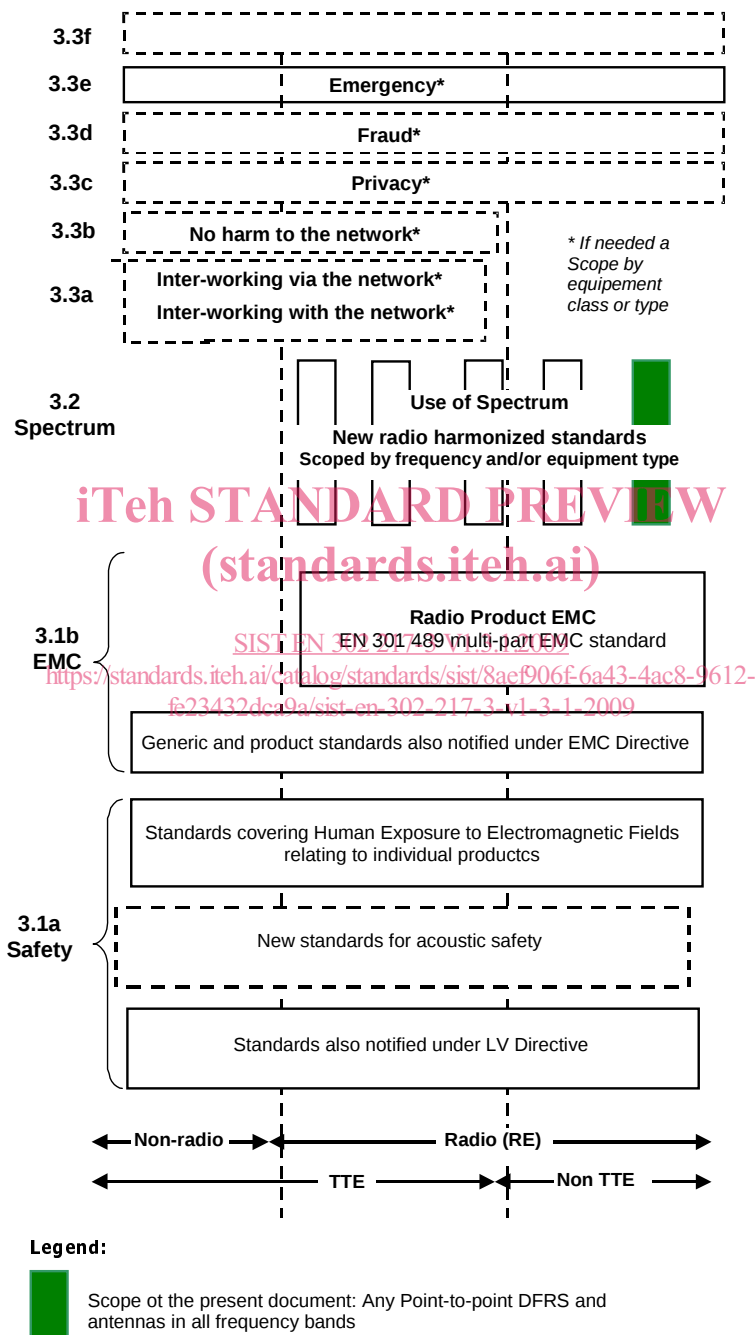
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Introduction

The EN 302 217 series has been produced in order to rationalize a large number of previous ETSI ENs dealing with equipment and antennas for Point-to-Point (P-P) Fixed Service applications. For more details, see Foreword in the EN 302 217-1 [8].

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 [i.2] figure 1 shows how the present document fits within that structure.



NOTE: For article 3.1b the diagram shows EN 301 489, the multi-part product EMC standard for radio used under the EMC Directive 89/336/EEC [i.1]. For Fixed Radio Systems EN, EN 301 489-1 [i.4] and EN 301 489-4 [i.5] are relevant.

Figure 1: Present document relationship with the modular structure of standards used under the R&TTE Directive

1 Scope

The present document specifies the essential requirements for point-to-point Digital Fixed Radio Systems (DFRS) operating in higher frequency bands, which propagation characteristics might be suitable for different frequency planning (see note 1). This would imply that, besides conventional link-by-link coordinated deployment, administrations may apply either no co-ordination at all (i.e. the band usage is free and the user is responsible for detecting a suitable interference-free operating frequency) or simplified co-ordination procedures based on the knowledge of existing links (e.g. through a public national data base) so that the impact of a possible new link could be evaluated on the basis of budgetary considerations of typical equipment receiver performances (which will not be considered related to essential requirements of article 3.2 of R&TTED [1]).

NOTE 1: For example, the frequency bands 58 GHz is proposed to be used by various technologies for uncoordinated use of the band. Besides the RF-channel selection procedure, specified in clause 4.2 to avoid unacceptable interference situations, this band, and those above up to ~63 GHz, also benefits from the high and stable atmospheric attenuation which suppresses efficiently distant interferers (about 10 dB/km to 15 dB/km at sea level), refer to ITU-R Recommendation P.676 [i.13].

The present document is intended to cover the provisions of Directive 1999/5/EC [1] (R&TTE Directive) 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".

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 [1] 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 302 217-4-2 [9], offers 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);
- implemented procedure for free radio channel selection;
- antenna directivity class alternatives (for different network density requirement).

The present document is mainly intended to cover fixed radio equipment without integral antennas. However, it also applies to fixed radio systems products with integral antennas, for which all the technical requirements included in the present document and in EN 302 217-4-2 [9] apply. For more background information on the equipment and antenna parameters here identified as relevant to article 3.2 of R&TTE Directive [1] see EG 201 399 [i.2] and TR 101 506 [i.8].

For the purposes of the present document two equipment Classes are specified depending on the network requirements:

- Class A: Digital equipment which apply the automatic RF-channel selection procedure (see clause 4.2) for interference avoidance and error performance enhancement.
- Class B: Equipment without automatic RF-channel selection procedure.

2 References

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.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
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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 indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

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 initial digits. Here is reported the third digit of the latest version available at the time of 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] CEPT/ERC/Recommendation 74-01 (2005): "Unwanted emissions in the spurious domain".
- [3] CEPT/ERC/Recommendation 05-02 (2005): "Use of the 64,0 - 66,0 GHz frequency band for Fixed Service".
- [4] CEPT/ERC/Recommendation 09-01 (2009): "Use of the 57 - 64 GHz frequency band for point-to-point fixed wireless systems".
- [5] CEPT/ERC/Recommendation 05-07 (2009): "Radio frequency channel arrangements for Fixed Service systems operating in the bands 71,0 - 76,0 GHz and 81,0 - 86,0 GHz".
- [6] ETSI EN 301 126-1 (V1.1.2): "Fixed Radio Systems; Conformance testing; Part 1: Point-to-Point equipment - Definitions, general requirements and test procedures".
- [7] ETSI EN 301 126-3-1 (V1.1.1): "Fixed Radio Systems; Conformance testing; Part 3-1: Point-to-Point antennas; Definitions, general requirements and test procedures".
- [8] 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".
- [9] ETSI EN 302 217-4-2 (V1.4.1): "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 4-2: Antennas; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".

- [10] IEEE 1802.3 (2001): "IEEE Conformance Test Methodology for IEEE Standards for Local and Metropolitan Area Networks-Specific Requirements - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications".
- [11] IEEE 802.3 (2002): "Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) access method and physical layer specifications".
- [12] ITU-R Recommendation SM.1539-1: "Variation of the boundary between the out-of-band and spurious domains required for the application of Recommendations ITU-R SM.1541 and ITU-R SM.329".
- [13] ITU-T Recommendation O.151 and Corrigendum 1 (2002): "Error performance measuring equipment operating at the primary rate and above".
- [14] ITU-T Recommendation O.181 (2002): "Equipment to assess error performance on STM-N interfaces".
- [15] ITU-T Recommendation O.191 (2000): "Equipment to measure the cell transfer performance of ATM connections".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [i.1] 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).
- [i.2] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of candidate Harmonized Standards for application under the R&TTE Directive".
<https://standards.ietf.org/catalog/standards/sist/8ac906f-6a43-4ac8-9612-623432da9c18/en-302-217-3-v1-3-1-2009>
- [i.3] ETSI EN 301 390 (V1.2.1): "Fixed Radio Systems; Point-to-point and Multipoint Systems; Spurious emissions and receiver immunity limits at equipment/antenna port of Digital Fixed Radio Systems".
- [i.4] ETSI EN 301 489-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements".
- [i.5] ETSI EN 301 489-4: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 4: Specific conditions for fixed radio links and ancillary equipment and services".
- [i.6] ETSI EN 302 217-2-1: "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2-1: System-dependent requirements for digital systems operating in frequency bands where frequency co-ordination is applied".
- [i.7] ETSI EN 302 217-2-2: "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; 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".
- [i.8] ETSI TR 101 506: "Fixed Radio Systems; Generic definitions, terminology and applicability of essential requirements under the article 3.2 of 1999/05/EC Directive to Fixed Radio Systems".
- [i.9] ITU-R Recommendation F.1101: "Characteristics of digital fixed wireless systems below about 17 GHz".
- [i.10] ITU-R Recommendation F.1191: "Bandwidths and unwanted emissions of digital fixed service systems".

- [i.11] ITU-R Recommendation F.1497: "Radio-frequency channel arrangements for fixed wireless systems operating in the band 55.78-59 GHz".
- [i.12] Void.
- [i.13] ITU-R Recommendation P.676: "Attenuation by atmospheric gases".
- [i.14] ITU-R Recommendation SM.329-10: "Unwanted emissions in the spurious domain".
- [i.15] ITU-R Recommendation SM.1541-2: "Unwanted emissions in the out-of-band domain".
- [i.16] ITU Radio Regulations (2008).
- [i.17] CEPT/ERC/Recommendation 12-09 (2004), withdrawn (2009): "Radio frequency channel arrangement for Fixed Service systems operating in the band 57,0 - 59,0 GHz which do not require frequency planning".
- [i.18] ETSI TR 100 028: "ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [i.19] 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.

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 [8] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 302 217-1 [8] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 302 217-1 [8] apply.

4 Technical requirements specifications

Guidance and description of the phenomena relevant to "essential requirements" under article 3.2 is given in EG 201 399 [i.2]; specific applications and descriptions for DFRS is given in TR 101 506 [i.8].

In the following clauses, limits are required to be met at specific reference points of the system block diagram. Reference points and the system block diagram are those set out in figure 1 of EN 302 217-1 [8].

In the case of wide radio-frequency bands covering units and multirate/multiformat equipment, these specifications shall be met at any frequency and at any rate/format. However the tests, required for generating a test report and/or declaration of conformity, in order to fulfil any conformity assessment procedure with respect to the R&TTE Directive [1], shall be carried-out in accordance with the principles set out in annex B.

Testing methods and conditions for assessing all requirements are specified in clause 5, where each clause directly refers to corresponding clause in this clause.

4.1 Environmental profile

The required environmental profile for operation of the equipment shall be declared by the supplier. 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.

For testing the compliance with technical requirements see also EN 301 126-1 [6] and clause 5 of the present document.

NOTE: With the generic term of environmental profile, it is here intended any variation of the "external" conditions (e.g. climatic and external primary/secondary power supply sources feeding the equipment to be assessed) that might affect the system parameter relevant to the "essential requirements" of article 3.2 of the R&TTE Directive [1].

4.2 RF-channel selection

RF-channel selection procedure is mandatory for Class A equipment only.

4.2.1 RF-channel selection procedure

The purpose of the RF-channel selection procedure is to detect and protect existing transmissions in order to avoid unacceptable interference situations.

At both transmission sites, radio-relay terminals shall measure during installation, the interference levels of both receive and transmit channels (see note). Only in the instance when an unoccupied channel is identified and selected as the transmission channel shall the transmit power be switched on. The interference avoidance requirements for the receiver to detect occupied channels are specified in clause 4.2.2.

The principle of protecting existing transmission shall be respected also during the antenna alignment procedure.

NOTE: If the national regulatory rules allow to change the frequency of the link during its operation, it may be considered, in order to decrease the possibility of undetected interference, to apply the RF channel selection procedure whenever appropriate (e.g. when restoring a link after a failure or by suitable automatic timed routine in conjunction with frequency agility as in clause 4.2.3).

4.2.2 Interference avoidance requirements

4.2.2.1 Interference avoidance limit

The radio relay terminal shall consider the radio channel occupied when the level of the interference is above the following limit:

- $P_i > C \text{ dBm} + 10 \log (BW/10 \text{ MHz})$.

Where:

- BW is the noise bandwidth of the receiver expressed in MHz;
- P_i is the interference power expressed in dBm measured within the receiver noise bandwidth (BW);

The value C is dependent on frequency band and is given in the relevant annexes UA to UC.

For the rationale of the interference limit formula see informative annex UD.

For test purpose this requirement shall be fulfilled at reference point C within the intended band of transmission:

- with a signal similar to the transmitted one;
- with a CW signal at any frequency within this band.

The value of the intended band of transmission shall be declared by the supplier.