

# ETSI EN 302 066-2 V1.1.1 (2005-09)

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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Short Range Devices (SRD);  
Ground- and Wall- Probing Radar applications;  
Part 2: Harmonized EN under article 3.2  
of the R&TTE Directive**

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Reference

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Keywords

radar, radio, regulation, SRD, testing, UWB

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## Foreword

This Candidate Harmonized European Standard (Telecommunications series) 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 a mandate from the European Commission issued under Council Directive 98/34/EC [6] (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 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") [1].

The document responds to the EC mandate M/329 for Harmonized Standards covering Ultra-WideBand applications [5].

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

The present document is part 2 of a multi-part deliverable covering the Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ground- and Wall- Probing Radar applications, as identified below:

Part 1: "Technical characteristics and test methods";

**Part 2: "Harmonized EN under article 3.2 of the R&TTE Directive".**

<b>National transposition dates</b>	
Date of adoption of this EN:	26 August 2005
Date of latest announcement of this EN (doa):	30 November 2005
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2006
Date of withdrawal of any conflicting National Standard (dow):	31 May 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.

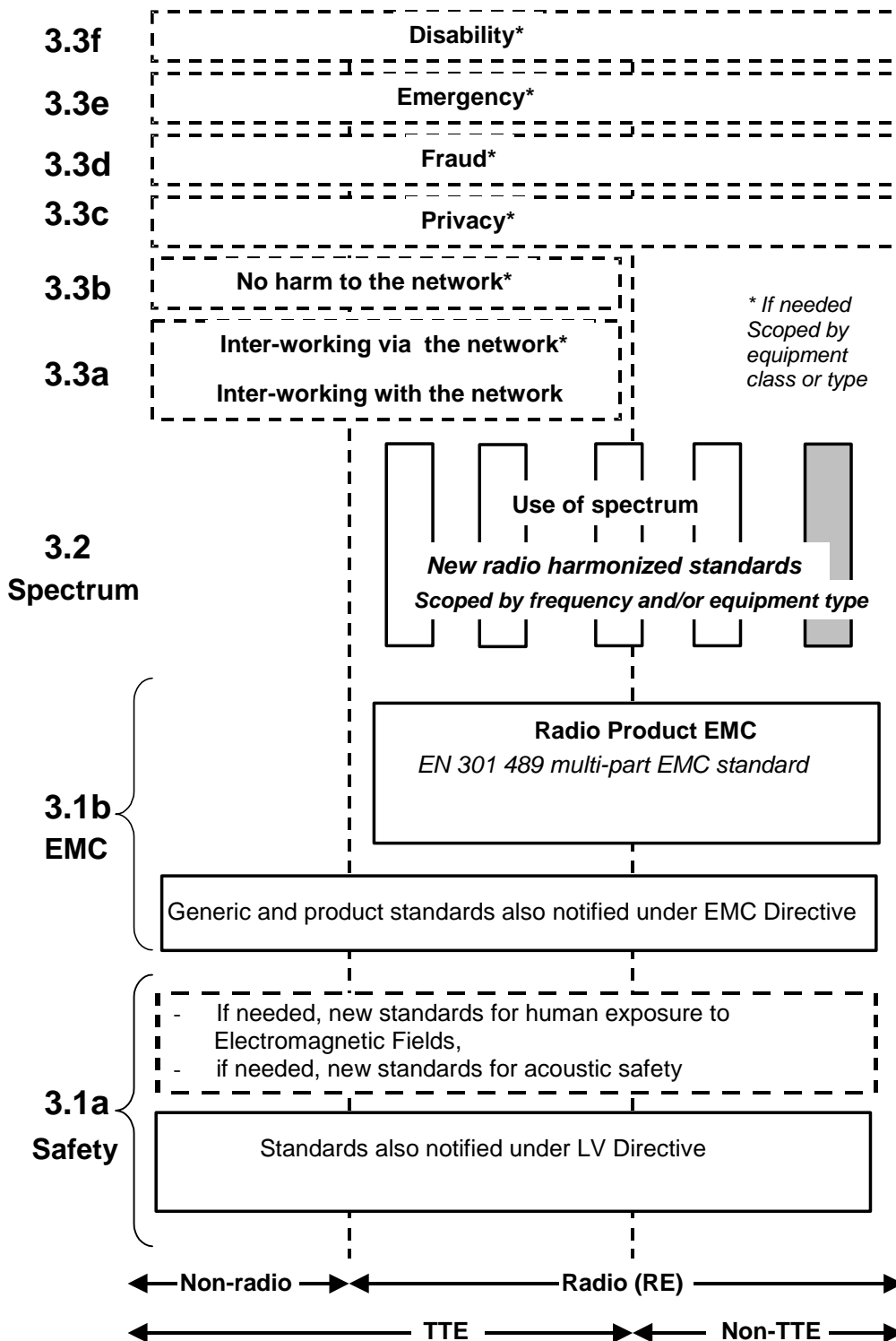


Figure 1: Modular structure for the various standards used under the R&TTE Directive [1]

The left hand edge of the 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, the multi-part product EMC standard for radio used under the EMC Directive [2].

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive [3] and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

The bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. Particular 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 an 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 decisionswithout 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.

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# 1 Scope

The present document specifies the requirements for Ground- and Wall- Probing Radar applications operating in all or part of the frequency band from 30 MHz to 12,4 GHz.

Ground Probing Radars (GPR) and Wall Probing Radars (WPR) are used in survey and detection applications.

The scope is limited to radars operated as short range devices (because of their usage and design), in which the system is in close proximity to the materials being investigated. It does not include radars operated from aircraft or spacecraft.

The radar applications in the present document are not intended for communications purposes. Their intended usage excludes radiation into the free space and means shall be taken to keep it to a minimum.

NOTE 1: Equipment using the frequencies typically below 100 MHz may use higher output power for geophysical applications and therefore, may not fulfil the emission requirements set out in the present document.

NOTE 2: Equipment covered by the present document is used by competent professional personnel.

The present document applies to:

- Ground Probing Radars (GPR) operating over approximately one decade in the frequency range 30 MHz to 12,4 GHz radiating directly downwards into the ground. Any horizontal radiation from this equipment is caused by leakage and is considered as undesired emission.
- Wall Probing Radars (WPR) operating in the frequency range 30 MHz to 12,4 GHz radiating directly into a "wall". The "wall" is a building material structure, the side of a bridge, the wall of a mine or another physical structure that absorbs a significant part of the signal transmitted by the radar.
- Equipment fitted with integral antennas and without antenna connector.
- Equipment which uses different imaging heads (antennas) with an antenna connector, to allow operation at different frequencies.

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

The present document contains the technical characteristics and test methods for Ground- and Wall- Probing Radar applications.

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

The document responds to the EC mandate M/329 for Harmonized Standards covering Ultra-WideBand (UWB) applications [5].

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## 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>.

- [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] 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).
- [3] 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).
- [4] ETSI EN 302 066-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ground- and Wall- Probing Radar applications; Part 1: Technical characteristics and test methods".
- [5] EC Mandate M/329, Standardisation Mandate forwarded to CEN/CENELEC/ETSI in the field of Information Technology and Telecommunications: "Harmonized standards covering Ultrawide band (UWB) applications".

NOTE: See <http://europa.eu.int/comm/enterprise/rte/harstand.htm>.

- [6] 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.

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [1], EN 302 066-1 [4] and the following apply:

**environmental profile:** range of environmental conditions under which equipment within the scope of the present document is required to comply with the provisions of the present document

### 3.2 Symbols

For the purposes of the present document, the symbols defined in EN 302 066-1 [4] apply.

### 3.3 Abbreviations

For the purposes of the present document, the abbreviations defined in EN 302 066-1 [4] apply.



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## 4 Technical requirements specifications

### 4.1 Environmental conditions

#### 4.1.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the provider. The equipment 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.

#### 4.1.2 Power supply

All the characteristics and essential requirements applying to the equipment shall be fulfilled within the range of all declared operational conditions of the power supply.

Power supply may be e.g. an external battery or a stabilized power supply.

### 4.2 Conformance requirements

#### 4.2.1 Frequency band of operation

The frequency band of operation shall not exceed the limits specified in clause 8.1.3 of EN 302 066-1 [4].

#### 4.2.2 Emissions

The undesired emissions shall not exceed the limits specified in clause 8.2.3 of EN 302 066-1 [4].

#### 4.2.3 Deactivation mechanism requirements

The deactivation mechanism requirements are defined in EN 302 066-1 [4], annex B.

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## 5 Testing for compliance with technical requirements

### 5.1 Environmental conditions for testing

Tests defined in the present document shall be carried out at representative points within the boundary limits of the declared operational environmental profile.

Where technical performance varies subject to environmental conditions, tests shall be carried out under a sufficient variety of environmental conditions (within the boundary limits of the declared operational environmental profile) to give confidence of compliance for the affected technical requirements.

### 5.2 Essential radio test suites

#### 5.2.1 Frequency band of operation

The test defined in clause 8.1.2 of EN 302 066-1 [4] shall be carried out.

## 5.2.2 Emissions

The test defined in clause 8.2.2 of EN 302 066-1 [4] shall be carried out.

## 5.3 Interpretation of results and measurement uncertainty

Clause 4.5 of EN 302 066-1 [4] shall apply.

## Annex A (normative): The EN Requirements Table (EN-RT)

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the EN-RT proforma in this annex so that it can be used for its intended purposes and may further publish the completed EN-RT.

The EN Requirements Table (EN-RT) serves a number of purposes, as follows:

- it provides a tabular summary of all the requirements;
- it shows the status of each EN-R, whether it is essential to implement in all circumstances (Mandatory), or whether the requirement is dependent on the provider having chosen to support a particular optional service or functionality (Optional). In particular it enables the EN-Rs associated with a particular optional service or functionality to be grouped and identified;
- when completed in respect of a particular equipment it provides a means to undertake the static assessment of conformity with the EN.

**Table A.1: EN Requirements Table (EN-RT)**

EN Reference		EN 302 066-2		Comment
No.	Reference	EN-R (see note 1)	Status	
<b>Transmitter and Receiver</b>				
1	4.2.1	Frequency range of operation	M (see note 2)	
2	4.2.2	Emissions	M (see note 2)	
<b>Design</b>				
3	4.2.3	Deactivation mechanism requirements	M (see note 1)	
NOTE 1: These EN-Rs are justified under article 3.2 of the R&TTE Directive [1].				
NOTE 2: Mandatory for a transmitter.				

### Key to columns:

<b>No.</b>	Table entry number;
<b>Reference</b>	Clause reference number of conformance requirement within the present document;
<b>EN-R</b>	Title of conformance requirement within the present document;
<b>Status</b>	Status of the entry as follows:
M	Mandatory, shall be implemented under all circumstances.
<b>Comments</b>	To be completed as required.

## Annex B (informative): The EN title in the official languages

Language	EN title
Czech	Elektromagnetická kompatibilita a rádiové spektrum (ERM) – Zařízení krátkého dosahu (SRD) – Aplikace radarového sondování země a zdi – Část 2: Harmonizovaná EN podle článku 3.2 Směrnice R&TTE
Danish	Elektromagnetisk kompatibilitet og spektrumanliggender (ERM) – Apparater med kort rækkevidde (SRD) – Radarsystemer til jord og murværk – Del 2: Harmoniseret EN, der dækker de væsentlige krav i R&TTE direktivets artikel 3.2
Dutch	Elektromagnetische compatibiliteit en radiospectrumaangelegenheden (ERM); Kort bereik apparatuur (SRD); Radartoepassingen voor bodem en wand-sondering; Deel 2: Geharmoniseerde EN onder artikel 3.2 van de R&TTE Directive
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ground- and Wall- Probing Radar applications; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive
Estonian	Elektromagnetilise ühilduvuse ja raadiospektri küsimused (ERM); Lähitoimeseadmed; Pinnase ja seinä sondeerimisradarid; Osa 2: Harmoneeritud EN R&TTE direktiivi artikli 3.2 alusel
Finnish	Sähkömagneettinen yhteensopivuus ja radiospektriasiat (ERM); Lyhyen kantaman laitteet; Maa- ja pintatutkasovellukset; Osa 2: R&TTE-direktiivin artiklaan 3.2 perustuva yhdenmukaistettu standardi
French	Télécommunications - CEM et spectre radioélectrique (ERM) Appareils à courte portée (SRD) - Applications terrestres et radars d'inspection et sondage de murs - Partie 2 : EN harmonisée couvrant les exigences essentielles de l'article 3.2 de la Directive R&TTE
German	Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM); Funkanlagen geringer Reichweite; Boden- und Wandradaranwendungen; Teil 2: Harmonisierte Europäische Norm gemäß Artikel 3.2 der R&TTE- Richtlinie
Greek	Ηλεκτρομαγνητική Συμβατότητα και Θέματα Ραδιοφάσματος (ERM); Συσκευές μικρής εμβέλειας (SRD) – Εφαρμογές ραντάρ ανίχνευσης εδάφους και ραντάρ ανίχνευσης τοίχων – Μέρος 2: Εναρμονισμένο EN για την κάλυψη του Άρθρου 3.2 της Οδηγίας R&TTE
Hungarian	Elektromágneses összeférhetőségi és rádióspektrumügyek (ERM). Kis hatótávolságú eszközök (SRD). Talaj- és falvizsgáló radaralkalmazások. 2. rész: Az R&TTE-irányelv 3.2. cikkelye alá tartozó, harmonizált európai szabvány
Icelandic	
Italian	Compatibilità elettromagnetica e problematiche di Spettro Radio (ERM); Dispositivi a breve portata (SRD); Applicazioni radar per le indagini del sottosuolo e per le indagini verticali; Parte 2: Norma armonizzata relativa ai requisiti essenziali dell'articolo 3.2 della direttiva R & TTE
Latvian	
Lithuanian	Elektromagnetinio suderinamumo ir radijo dažnių spektro dalykai. Trumpojo nuotolio įtaisai. Žemės ir sienų zondavimo radarų taikymas. 2 dalis. Darnusis Europos standartas pagal 1999/5/EC* direktyvos 3.2 straipsnį
Maltese	Kompatibilità elettromanjetika u materji relatati ma' spettru radjofoniku (ERM); Apparati ta' Medda Qasira (SRD); Applikazzjonijiet għal Radar dirett lejn l-Art u lejn Strutturi solidi; Parti 2: EN armonizzata taħt l-artiklu 3.2 tad-Direttiva R&TTE
Norwegian	Elektromagnetisk kompatibilitet og radiospektrumspørsmål (ERM); Kortdistanseutstyr (SRD); Radaranvendelser for utforsking av grunn og vegger; Del 2: Harmonisert EN under artikkel 3.2 i R&TTE-direktivet
Polish	Kompatybilność Elektromagnetyczna i Zagadnienia Widma Radiowego (ERM) - Urządzenia bliskiego zasięgu (SRD); Zastosowania radaru do próbkowania gruntu i ścian - Część 2: Zharmonizowana EN zgodna z wymaganiami artykułu 3.2 dyrektywy R&TTE
Portuguese	
Slovak	Elektromagnetická kompatibilita a závislosti rádiového spektra (ERM). Zariadenia s krátkym dosahom (SRD). Aplikácie radarového sondovania zeme a stien. Časť 2: Harmonizovaná EN podľa článku 3.2 smernice R&TTE
Slovenian	Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) – Naprave kratkega dosega (SRD) – Radarji za sondiranje tal in zidov – 2. del: Harmonizirani EN v skladu s členom 3.2 direktive R&TTE
Spanish	Cuestiones de Compatibilidad Electromagnética y Espectro Radioeléctrico (ERM). Dispositivos de corto alcance (SDR). Aplicaciones de radar penetrante de tierra y pared. Parte 2: EN Armonizada que cubre los requisitos esenciales bajo el artículo 3.2 de la Directiva RTTE
Swedish	Elektromagnetisk kompatibilitet och radiospektrumfrågor (ERM); Kortdistansutrustningar (SRD); Del 2: Harmoniserad EN enligt artikel 3.2 i R&TTE-direktivet

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## History

<b>Document history</b>			
V1.1.1	November 2004	Public Enquiry	PE 20050325: 2004-11-24 to 2005-03-25
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