

Final draft **ETSI EN 302 208-2** V1.1.1 (2004-07)

Candidate Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Radio Frequency Identification Equipment operating in the
band 865 MHz to 868 MHz with power levels up to 2 W;
Part 2: Harmonized EN under article 3.2
of the R&TTE Directive**



Reference

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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 Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the Vote phase of the ETSI standards Two-step Approval Procedure.

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 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 2 of a multi-part deliverable covering Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W as identified below:

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

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

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

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. Each standard is a module in the structure. The modular structure is shown in figure 1.

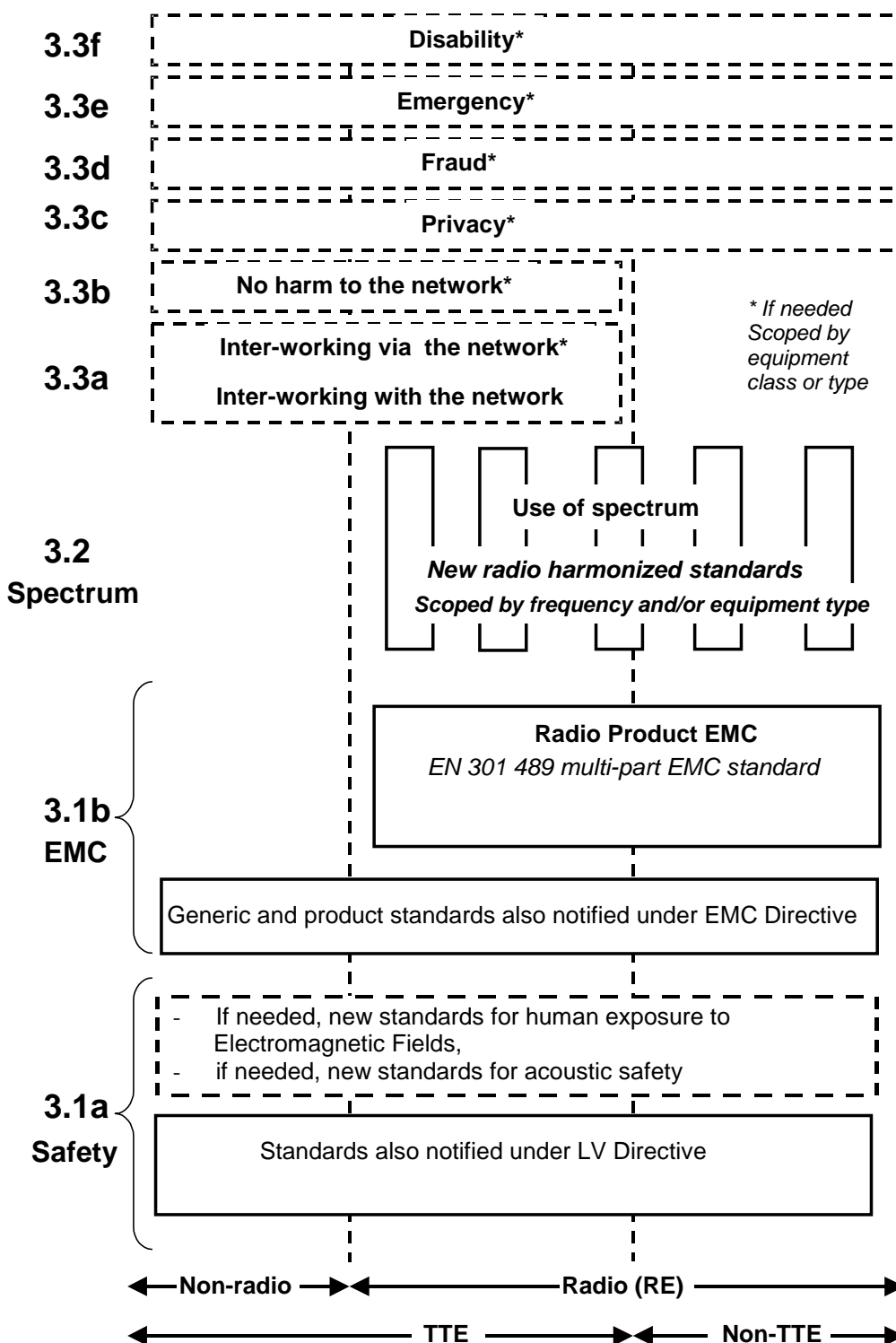


Figure 1: Modular structure for the various standards used under the R&TTE Directive

The left hand edge of 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 [8].

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive [7] 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. A 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 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 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 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 covers the minimum characteristics considered necessary in order to make the best use of the available frequencies. It does not necessarily include all the characteristics that may be required by a user, nor does it necessarily represent the optimum performance achievable.

Radio frequency identification equipment covered within the present document are considered by definition short-range devices. The power limits for frequency bands will be found in the current version of CEPT/ERC/Recommendation 70-03 [2] (or national regulations).

The present document applies to RFID interrogators used in conjunction with their RFID transponders (tags). The interrogators operate within 200 kHz sub-bands using a modulated carrier. The tags respond with a modulated signal. Interrogators may be used with either integral or external antennas.

ElectroMagnetic Compatibility (EMC) requirements are covered by EN 301 489-1 [3] and EN 301 489-3 [6].

The types of equipment covered by the present document are as follows:

- fixed interrogators;
- hand portable interrogators;
- batteryless tags;
- battery assisted tags;
- battery powered tags.

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.

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

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] CEPT/ERC Recommendation 70-03: "Relating to the use of Short Range Devices (SRD)".

- [3] 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".
- [4] ETSI TR 100 028 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [5] ETSI EN 302 208-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W Part 1: Technical requirements and methods of measurement".
- [6] ETSI EN 301 489-3: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz".
- [7] 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).
- [8] 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 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] and EN 302 208-1 [5] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 302 208-1 [5] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 302 208-1 [5] apply.

4 Technical requirements specifications

4.1 Interrogators

4.1.1 General performance criteria

The provider shall declare that interrogators operate in accordance with the general requirements defined in EN 302 208-1 [5], clause 4.1.

4.2 Transmitter requirements

4.2.1 Frequency error

The frequency error, as defined in EN 302 208-1 [5], clause 8.1.1 shall not exceed the limits in EN 302 208-1 [5], clause 8.1.3.

4.2.2 Frequency stability under low voltage conditions

The frequency stability under low voltage conditions as defined in EN 302 208-1 [5], clause 8.2.1 shall comply with the conditions given in EN 302 208-1 [5], clause 8.2.3.

4.2.3 Effective radiated power

The effective radiated power, as defined in EN 302 208-1 [5], clause 8.3.1 shall not exceed the limits in EN 302 208-1 [5], clause 8.3.3.

4.2.4 Transmitter antenna beamwidth

The transmitter antenna beamwidth shall comply with the limits in EN 302 208-1 [5], clause 8.3.3.

4.2.5 Transmitter spectrum mask

The transmitter spectrum mask, as defined in EN 302 208-1 [5], clause 8.4.1 shall not exceed the limits in EN 302 208-1 [5], clause 8.4.3.

4.2.6 Spurious emissions

The spurious emissions, as defined in EN 302 208-1 [5], clause 8.5.1 shall not exceed the limits in EN 302 208-1 [5], clause 8.5.3.

4.2.7 Transmission times

Transmission times, as defined in EN 302 208-1 [5], clause 8.6.1 shall comply with the conditions in EN 302 208-1 [5], clause 8.6.3.

4.3 Receiver requirements

4.3.1 Receiver threshold in listen mode

The receiver threshold in the listen mode, as defined in EN 302 208-1 [5], clause 9.1.1 shall comply with the limits in EN 302 208-1 [5], clause 9.1.3.

4.3.2 Listen time

The listen time of an interrogator, as defined in EN 302 208-1 [5], clause 9.2 shall comply with the limits in EN 302 208-1 [5], clause 9.2.

4.3.3 Blocking or desensitisation in listen mode

The blocking level of the receiver of an interrogator in the listen mode as defined in EN 302 208-1 [5], clause 9.3.1 shall comply with the limit in EN 302 208-1 [5], clause 9.3.3.

4.3.4 Spurious emissions

Spurious emissions from the receiver of an interrogator, as defined in EN 302 208-1 [5], clause 9.6.1 shall not exceed the limits in EN 302 208-1 [5], clause 9.6.3.

4.4 Tag requirements

4.4.1 Emissions outside sub-band edges

Tag emissions outside the sub-band edges, as defined in EN 302 208-1 [5], clause 10.1 shall not exceed the limits in EN 302 208-1 [5], clause 10.3.

5 Testing for compliance with technical requirements

5.1 Essential radio test suites

5.1.1 Environmental conditions for testing

5.1.1.1 Normal and extreme test conditions

Tests shall be made under normal test conditions, and also where stated, under extreme test conditions. The test procedures shall be as specified in EN 302 208-1 [5], clauses 5.3 and 5.4.

5.1.1.2 Test power sources

The test power sources shall meet the requirements of EN 302 208-1 [5], clause 5.2.

5.1.2 Choice of samples for test suite

Measurement shall be performed according to the present document on samples of equipment defined in EN 302 208-1 [5], clauses 4.2 and 4.3.

5.1.3 Transmitter test suites

5.1.3.1 Frequency error

The test specified in EN 302 208-1 [5], clause 8.1 shall be carried out.

5.1.3.2 Frequency stability under low voltage conditions

The test specified in EN 302 208-1 [5], clause 8.2 shall be carried out.

5.1.3.3 Effective radiated power

The test specified in EN 302 208-1 [5], clause 8.3 shall be carried out.

5.1.3.4 Transmitter antenna beamwidth

The test specified in EN 302 208-1 [5], clause 8.3 shall be carried out.

5.1.3.5 Transmitter spectrum mask

The test specified in EN 302 208-1 [5], clause 8.4 shall be carried out.

5.1.3.6 Spurious emissions

The test specified in EN 302 208-1 [5], clause 8.5 shall be carried out.

5.1.3.7 Transmission times

The test specified in EN 302 208-1 [5], clause 8.6 shall be carried out

5.1.4 Receiver test suites

5.1.4.1 Receiver threshold in listen mode

The test specified in EN 302 208-1 [5], clause 9.1 shall be carried out.

5.1.4.2 Listen time

The provider shall declare that the interrogator complies with the requirements of EN 302 208-1 [5], clause 9.2.

5.1.4.3 Blocking or desensitisation in listen mode

The test specified in EN 302 208-1 [5], clause 9.3 shall be carried out.

5.1.4.4 Spurious emissions

The test specified in EN 302 208-1 [5], clause 9.6 shall be carried out.

5.1.5 Tag test suites

5.1.5.1 Emissions outside sub-band edges

The test specified in EN 302 208-1 [5], clause 10 shall be carried out.

6 Interpretation of the measurement results

The interpretation of the results recorded in the appropriate 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 separately included in the test report;
- the value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures in the table 1.

Table 1: Measurement uncertainty

Parameter	Uncertainty
RF frequency	$\pm 1 \times 10^{-7}$
RF power, conducted	$\pm 0,75$ dB
Radiated RF power, valid up to 12,75 GHz	± 6 dB
Maximum frequency deviation for FM	± 5 %
Two-signal measurements	± 4 %
Time	± 5 %
Temperature	± 1 K
Humidity	± 5 %

For the test methods, according to the present document the uncertainty figures shall be calculated according to the methods described in the TR 100 028 [4] 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 cases where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Table 1 is based on such expansion factors.

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

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 supplier 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 302 208-2			Comment
No.	Reference	EN-R (see note)	Status		
1	4.1.1	General performance criteria	M		
2	4.2.1	Frequency error	M		
3	4.2.2	Frequency stability under low voltage conditions	M		
4	4.2.3	Effective radiated power	M		
5	4.2.4	Transmitter antenna beamwidth	M		
6	4.2.5	Transmission spectrum mask	M		
7	4.2.6	Transmitter spurious emissions	M		
8	4.2.7	Transmission times	M		
9	4.3.1	Receiver threshold in "listen" mode	M		
10	4.3.2	Listen Time	M		
11	4.3.3	Receiver blocking or desensitisation in listen mode	M		
12	4.3.4	Receiver spurious emissions	M		
13	4.4.1	Tag emissions outside sub-band edges	M		

NOTE: These EN-Rs are justified under article 3.2 of the R&TTE Directive.

Key to columns:

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

Annex B (informative): Bibliography

- Council Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

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

Language	EN title
Czech	
Danish	Elektromagnetisk kompatibilitet og radiospektrum anliggender (ERM); Radioudstyr for identifications formål (RFID) in frekvensområdet 865 MHz til 868 MHz med en udgangseffekt up til 2W; Del 2. Harmoniseret EN, der dækker de væsentligste krav i R&TTE Direktivet artikel 3.2.
Dutch	
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive
Estonian	
Finnish	Sähkömagneettinen yhteensopivuus ja radiospektriasiat (ERM); Radiotaajuiset etätunnustuslaitteet, jotka toimivat taajuusalueella 865 MHz - 868 MHz ja joiden tehotaso on enintään 2 W; Osa 2: Harmonisoitu standardi (EN) R&TTE direktiivin art. 3.2 olennaisten vaatimusten toteuttamiseksi
French	
German	Elektromagnetische Verträglichkeit und Funkspektrumsangelegenheiten (ERM); Funkanlagen fuer Identifizierungszwecke (RFID) im Frequenzband von 865 MHz bis 868 MHz mit einer Ausgangsleistung bis zu 2 W; Teil 2: Harmonisierte Norm mit den wesentlichen Anforderungen gemaess Artikel 3.2 der R&TTE- Richtlinie
Greek	
Hungarian	
Icelandic	
Italian	Compatibilità elettromagnetica e questioni relative allo spettro delle radiofrequenze (ERM); Apparecchiature a Radio Frequenza per la Identificazione (RFID) operantinella banda di frequenza 865-868 MHz, con potenza fino a 2W; Parte 2 : Norma Armonizzata Europea per i requisiti essenziali dell'articolo 3.2 della Direttiva R&TTE
Latvian	
Lithuanian	
Maltese	
Polish	Kompatybilność Elektromagnetyczna i Zagadnienia Widma Radiowego (ERM) - Radiowe urządzenia identyfikujące pracujące w pasmie częstotliwości od 865 MHz do 868 MHz z poziomami mocy do 2 W - Część 2: Zharmonizowana EN zgodna z artykułem 3.2 dyrektywy R&TTE
Portuguese	
Slovak	
Slovenian	
Spanish	Compatibilidad Electromagnética y Asuntos del Espectro de Radio (ERM); Equipos de Identificación de Frecuencias de Radio operando en la banda de 865 MHz a 868 MHz con niveles de potencia hasta 2 W; Parte 2: EN Armonizado bajo el artículo 3.2 de la Directiva RTTE
Swedish	Elektromagnetisk kompatibilitet och radiospektrumfrågor (ERM); Utrustning för identifiering med radiofrekvens arbetande i bandet 865 MHz till 868 MHz med effektnivåer upp till 2 W; Del 2: Harmoniserad EN enligt artikel 3.2 i R&TTE-direktivet

History

Document history				
V1.1.1	December 2003	Public Enquiry	PE 20040416:	2003-12-17 to 2004-04-16
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