

Draft **ETSI EN 302 208-2** V1.1.1 (2003-12)

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: Harmonised EN under article 3.2 of the R&TTE Directive**



Reference

DEN/ERM-TG34-001-2

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Contents

Intellectual Property Rights	5
Foreword.....	5
Introduction	5
1 Scope	8
2 References	8
3 Definitions, symbols and abbreviations	9
3.1 Definitions	9
3.2 Symbols.....	9
3.3 Abbreviations	9
4 Technical requirements specifications	9
4.1 Interrogators	9
4.1.1 General performance criteria	9
4.2 Transmitter requirements	9
4.2.1 Frequency error.....	9
4.2.2 Frequency stability under low voltage conditions	9
4.2.3 Effective radiated power	10
4.2.4 Transmitter spectrum mask.....	10
4.2.5 Spurious emissions	10
4.2.6 Transmission times	10
4.3 Receiver requirements.....	10
4.3.1 Receiver threshold in listen mode.....	10
4.3.2 Listen time	10
4.3.3 Adjacent sub-band selectivity in listen mode.....	10
4.3.4 Blocking or desensitisation in listen mode	10
4.3.5 Spurious emissions	10
4.4 Tag requirements.....	10
4.4.1 Emissions outside sub-band edges.....	10
5 Testing for compliance with technical requirements.....	11
5.1 Essential radio test suites.....	11
5.1.1 Environmental conditions for testing	11
5.1.1.1 Normal and extreme test conditions.....	11
5.1.1.2 Test power sources.....	11
5.1.2 Choice of samples for test suite	11
5.1.3 Transmitter test suites	11
5.1.3.1 Frequency error	11
5.1.3.2 Frequency stability under low voltage conditions.....	11
5.1.3.3 Effective radiated power	11
5.1.3.4 Transmitter spectrum mask	11
5.1.3.5 Spurious emissions.....	11
5.1.3.6 Transmission times.....	11
5.1.4 Receiver test suites.....	11
5.1.4.1 Receiver threshold in listen mode	11
5.1.4.2 Listen time.....	12
5.1.4.3 Adjacent sub-band selectivity in listen mode.....	12
5.1.4.4 Blocking or desensitisation in listen mode.....	12
5.1.4.5 Spurious emissions.....	12
5.1.5 Tag test suites	12
5.1.5.1 Emissions outside sub-band edges	12
6 Interpretation of the measurement results	12
Annex A (normative): The EN Requirements Table (EN-RT)	13

Annex B (informative):	The EN title in the official languages	14
Annex C (informative):	Bibliography	15
History		16

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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), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure.

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 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):	6 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.

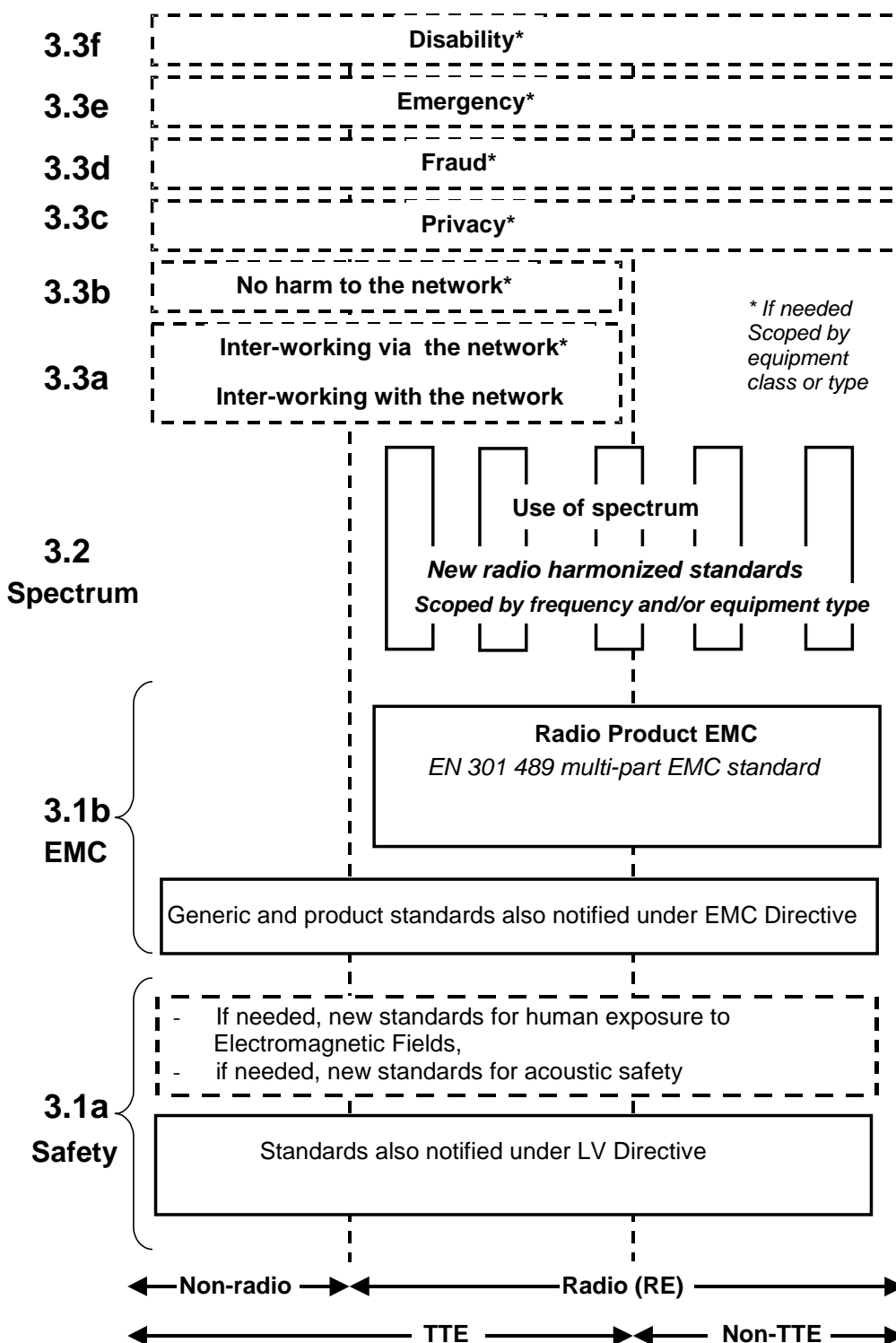


Figure 1: Modular structure for the various standards used under the R&TTE Directive

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.

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive 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 [3 [7].

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.
- [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] Void.
- [6] 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".
- [7] 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".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions in the R&TTE Directive [1] and EN 302 208-1 [6] apply.

3.2 Symbols

For the purposes of the present document, the terms and definitions in EN 302 208-1 [6] apply.

3.3 Abbreviations

For the purposes of the present document, the terms and definitions in EN 302 208-1 [6] 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 [6], clause 4.1.

4.2 Transmitter requirements

4.2.1 Frequency error

The frequency error, as defined in EN 302 208-1 [6], clause 8.1.1 shall not exceed the limits in EN 302 208-1 [6], 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 [6], clause 8.2.1 shall comply with the conditions given in EN 302 208-1 [6], clause 8.2.3.

4.2.3 Effective radiated power

The effective radiated power, as defined in EN 302 208-1 [6], clause 8.3.1 shall not exceed the limits in EN 302 208-1 [6], clause 8.3.3.

4.2.4 Transmitter spectrum mask

The transmitter spectrum mask, as defined in EN 302 208-1 [6], clause 8.4.1 shall not exceed the limits in EN 302 208-1 [6], clause 8.4.3.

4.2.5 Spurious emissions

The spurious emissions, as defined in EN 302 208-1 [6], clause 8.5.1 shall not exceed the limits in EN 302 208-1 [6], clause 8.5.3.

4.2.6 Transmission times

Transmission times, as defined in EN 302 208-1 [6], clause 8.6.1 shall comply with the conditions in EN 302 208-1 [6], 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 [6], clause 9.1.1 shall comply with the limits in EN 302 208-1 [6], clause 9.1.3.

4.3.2 Listen time

The listen time of an interrogator, as defined in EN 302 208-1 [6], clause 9.2 shall comply with the limits in EN 302 208-1 [6], clause 9.2.

4.3.3 Adjacent sub-band selectivity in listen mode

The adjacent sub-band selectivity of the receiver of an interrogator in the listen mode, as defined in EN 302 208-1 [6], clause 9.3.1 shall comply with the limit in EN 302 208-1 [6], clause 9.3.3.

4.4.4 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 [6], clause 9.4.1 shall comply with the limit in EN 302 208-1 [6], clause 9.4.3.

4.3.5 Spurious emissions

Spurious emissions from the receiver of an interrogator, as defined in EN 302 208-1 [6], clause 9.7.1 shall not exceed the limits in EN 302 208-1 [6], clause 9.7.3.

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 [6], clause 10.1 shall not exceed the limits in EN 302 208-1 [6], 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 [6], 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 [6], 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 [6], 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 [6], 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 [6], clause 8.2 shall be carried out

5.1.3.3 Effective radiated power

The test specified in EN 302 208-1 [6], clause 8.3 shall be carried out.

5.1.3.4 Transmitter spectrum mask

The test specified in EN 302 208-1 [6], clause 8.4 shall be carried out.

5.1.3.5 Spurious emissions

The test specified in EN 302 208-1 [6], clause 8.5 shall be carried out.

5.1.3.6 Transmission times

The test specified in EN 302 208-1 [6], 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 [6], 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 [6], clause 9.2

5.1.4.3 Adjacent sub-band selectivity in listen mode

The test specified in EN 302 208-1 [6], clause 9.3 shall be carried out.

5.1.4.4 Blocking or desensitisation in listen mode

The test specified in EN 302 208-1 [6], clause 9.4 shall be carried out.

5.1.4.5 Spurious emissions

The test specified in EN 302 208-1 [6], clause 9.7 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 [6], 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	Transmission spectrum mask	M			
6	4.2.5	Transmitter spurious emissions	M			
7	4.3.1	Receiver threshold in "listen" mode	M			
8	4.3.2	Listen Time	M			
9	4.3.3	Receiver adjacent sub-band selectivity in listen mode	M			
10	4.3.4	Receiver blocking or desensitisation in listen mode	M			
11	4.3.5	Receiver spurious emissions	M			
12	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): The EN title in the official languages

Language	EN title
Czech	
Danish	
Dutch	
English	
Estonian	
Finnish	
French	
German	
Greek	
Hungarian	
Icelandic	
Italian	
Latvian	
Lithuanian	
Maltese	
Polish	
Portuguese	
Slovak	
Slovenian	
Spanish	
Swedish	

Annex C (informative): Bibliography

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

History

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