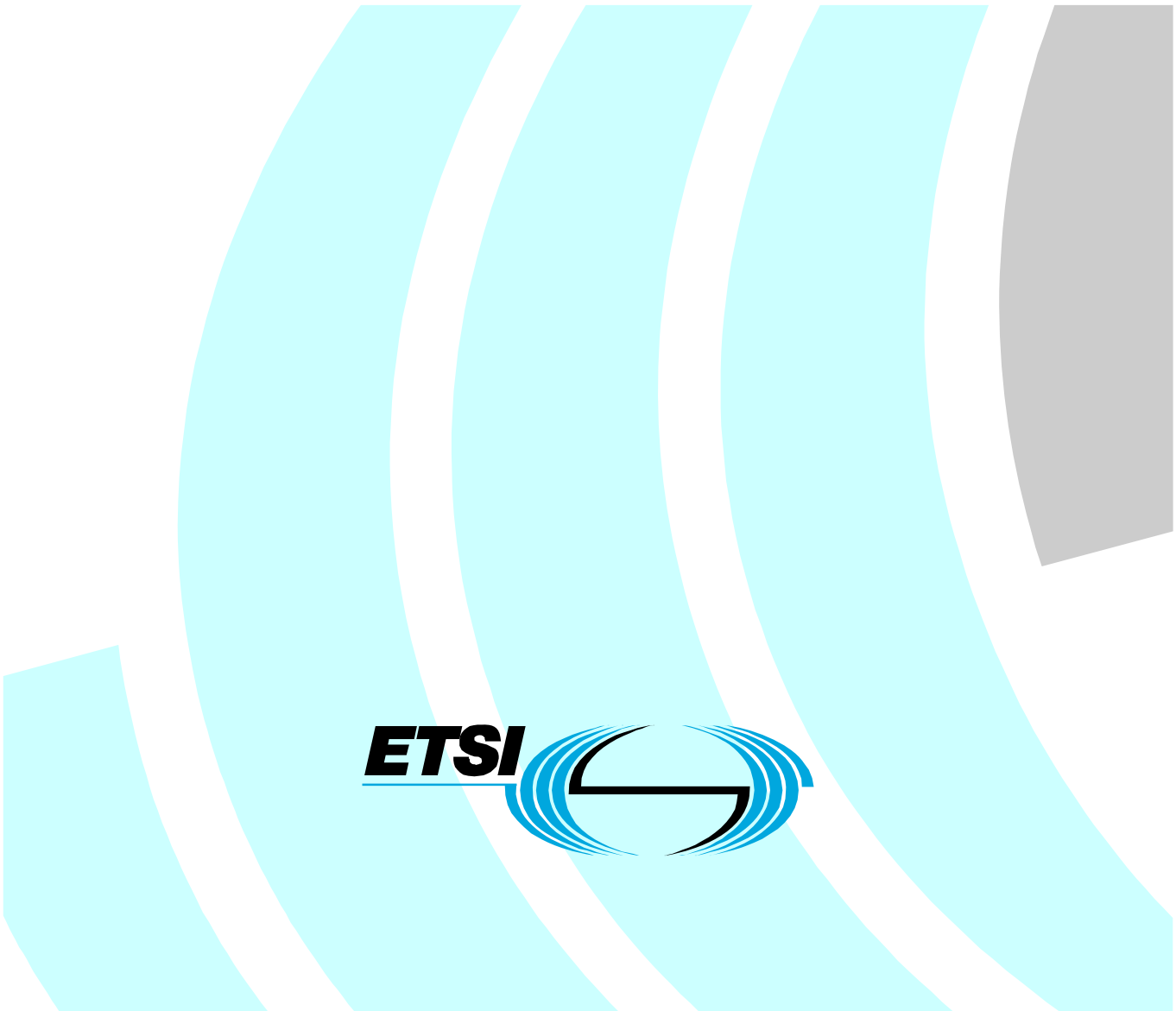
Draft ETSI EN 302 208-2 V1.2.1 (2007-07)

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 covering essential requirements of Article 3.2 of the R&TTE Directive



Reference
REN/ERM-TG34-004-2

Keywords
ID, radio, regulation, short range, terrestrial

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Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

This 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 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 (see bibliography) 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 covering essential requirements of 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 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 (see bibliography). The modular structure is shown in EG 201 399 (see bibliography).

1 Scope

The present document applies to RFID interrogators and tags operating together as a system. The interrogators transmit in four specified channels of 200 kHz each using a modulated carrier. The tags preferably respond with a modulated signal in the adjacent low power channels. Interrogators may be used with either integral or external antennas.

The present document applies to RFID interrogators used in conjunction with their RFID transponders (tags). The interrogators operate in the dense interrogator mode in 200 kHz channels using a modulated carrier. The tags respond in the adjacent channels with a modulated signal. Interrogators may be used with either integral or external antennas.

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

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

These radio equipment types are capable of operating in all or any part of the frequency band as specified below.

Table 1: Frequencies of operation

Equipment	Operating frequencies
Interrogator Transmit channel 4	865,6 MHz to 865,8 MHz
Interrogator Transmit channel 7	866,2 MHz to 866,4 MHz
Interrogator Transmit channel 10	866,8 MHz to 867,0 MHz
Interrogator Transmit channel 13	867,4 MHz to 867,6 MHz
Interrogator Receive	865,0 MHz to 868,0 MHz
Tag Transmit	865,0 MHz to 868,0 MHz

The present document is intended to cover the provisions of Directive 1999/5/EC (see bibliography) (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 (see bibliography) may 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.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

[1] ETSI EN 302 208-1 (V1.2.1): "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".

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 (see bibliography) and EN 302 208-1 [1] apply.

3.2 Symbols

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

3.3 Abbreviations

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

4 Technical requirements specifications

4.1 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 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 declared operational environmental profile.

4.1.1 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 [1], clauses 4.2.3.

4.2 Transmitter conformance requirements

4.2.1 Frequency error

This requirement applies only to interrogators.

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

4.2.2 Frequency stability under low voltage conditions

This requirement applies only to battery- powered interrogators.

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

4.2.3 Effective radiated power

This requirement applies only to interrogators.

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

4.2.4 Transmitter antenna beamwidth

This requirement applies only to antennas of interrogators.

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

4.2.5 Transmitter spectrum mask

This requirement applies only to interrogators.

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

4.2.6 Transmitter spurious emissions

This requirement applies only to interrogators.

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

4.2.7 Transmission times

This requirement applies only to interrogators.

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

4.3 Receiver conformance requirements

4.3.1 Receiver spurious radiations

This requirement applies only to interrogators.

Spurious radiations from the receiver of an interrogator, as defined in EN 302 208-1 [1], clause 9.4.1 shall not exceed the limits in EN 302 208-1 [1], clause 9.4.3.

4.4 Tag conformance requirements

4.4.1 Tag emissions

This requirement applies only to tags.

Tag emissions in the adjacent channels and outside the adjacent channel edges, as defined in EN 302 208-1 [1], clause 10.1 shall not exceed the limits in EN 302 208-1 [1], clause 10.3.

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.

5.1.1 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 [1], clauses 5.3 and 5.4.

5.1.2 Test power sources

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

5.2 Interpretation of the measurement results

The interpretation of the results recorded in a test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit will 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 included in the test report;
- the recorded value of the measurement uncertainty shall be, for each measurement, equal to or lower than the values in clause 7, table 3 of EN 302 208-1 [1].

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with the principles contained within TR 100 028 (see bibliography) 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 the case where the distributions characterising the actual measurement uncertainties are normal (Gaussian)).

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

5.3 Essential transmitter test suites

5.3.1 Frequency error

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

5.3.2 Frequency stability under low voltage conditions

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

5.3.3 Effective radiated power

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

5.3.4 Transmitter antenna beamwidth

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

5.3.5 Transmitter spectrum mask

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

5.3.6 Transmitter spurious emissions

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

5.3.7 Transmission times

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

5.4 Essential receiver test suites

5.4.1 Receiver spurious radiations

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

5.5 Essential tag test suites

5.5.1 Tag emissions

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

Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT)

The HS Requirements and conformance Test specifications Table (HS-RTT) in table A.1 serves a number of purposes, as follows:

- it provides a statement of all the essential requirements in words and by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it provides a statement of all the test procedures corresponding to those essential requirements by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it qualifies each requirement to be either:
  - Unconditional: meaning that the requirement applies in all circumstances; or
  - Conditional: meaning that the requirement is dependant on the manufacturer having chosen to support optional functionality defined within the schedule;
- in the case of Conditional requirements, it associates the requirement with the particular optional service or functionality;
- it qualifies each test procedure to be either:
  - Essential: meaning that it is included with the Essential Radio Test Suite and therefore the requirement shall be demonstrated to be met in accordance with the referenced procedures;
  - Other: meaning that the test procedure is illustrative but other means of demonstrating compliance with the requirement are permitted.

Table A.1: HS Requirements and conformance Test specifications Table (HS-RTT)

Harmonized Standard EN 302 208-2 The following essential requirements and test specifications are relevant to the presumption of conformity under Article 3.2 of the R&TTE Directive						
Essential Requirement			**Requirement Conditionality**		**Test Specification**	
No	**Description**	**Reference: Clause No**	**U/C**	**Condition**	**E/O**	**Reference: Clause No**
1	Frequency error	4.2.1	C	Applies to interrogators	E	5.3.1
2	Frequency stability under low voltage conditions	4.2.2	C	Applies to battery powered interrogators	E	5.3.2
3	Effective radiated power	4.2.3	C	Applies to interrogators	E	5.3.3
4	Transmitter antenna beamwidth	4.2.4	C	Applies to antennas of antennas	E	5.3.4
5	Transmission spectrum mask	4.2.5	C	Applies to interrogators	E	5.3.5
6	Transmitter spurious emissions	4.2.6	C	Applies to interrogators	E	5.3.6
7	Transmission times	4.2.7	C	Applies to interrogators	E	5.3.7
8	Receiver spurious emissions	4.3.1	C	Applies to interrogators	E	5.4.1
9	Tag emissions	4.4.1	C	Applies to tags	E	5.5.1

Key to columns:

Essential Requirement:

No A unique identifier for one row of the table which may be used to identify a requirement or its test specification.

Description A textual reference to the requirement.

Clause Number Identification of clause(s) defining the requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

U/C Indicates whether the requirement is to be *unconditionally* applicable (U) or is *conditional* upon the manufacturers claimed functionality of the equipment (C).

Condition Explains the conditions when the requirement shall or shall not be applicable for a technical requirement which is classified "conditional".

Test Specification:

E/O Indicates whether the test specification forms part of the Essential Radio Test Suite (E) or whether it is one of the Other Test Suite (O).

NOTE: All tests whether "E" or "O" are relevant to the requirements. Rows designated "E" collectively make up the Essential Radio Test Suite; those designated "O" make up the Other Test Suite; for those designated "X" there is no test specified corresponding to the requirement . The completion of all tests classified "E" as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Compliance with requirements associated with tests classified "O" or "X" is a necessary condition for presumption of conformity, although conformance with the requirement may be claimed by an equivalent test or by manufacturer's assertion supported by appropriate entries in the technical construction file.

Clause Number Identification of clause(s) defining the test specification in the present document unless another document is referenced explicitly. Where no test is specified (that is, where the previous field is "X") this field remains blank.

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

Language	EN title
Bulgarian	
Czech	
Danish	
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 covering essential requirements of Article 3.2 of the R&TTE Directive
Estonian	
Finnish	
French	
German	
Greek	
Hungarian	
Icelandic	
Italian	
Latvian	
Lithuanian	
Maltese	
Norwegian	
Polish	
Portuguese	
Romanian	
Slovak	
Slovenian	
Spanish	
Swedish	

Annex C (informative): Bibliography

- 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).
- ETSI EG 201 399 (V2.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of candidate Harmonized Standards for application under the R&TTE Directive".
- ETSI TR 100 028 (V.1.4.1) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- Commission Decision on harmonisation of the radio spectrum for Radio Frequency IDentification (RFID) devices operating in the Ultra High Frequency (UHF) band; Brussels, (2006/804/EG), 25th of Nov. 2006, Official Journal of the European Union, L 329/64.
- 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).
- 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).
- ITU-R Recommendation SM.329-10 (2003): "Unwanted emissions in the spurious domain".

History

Document history		
V1.1.1	September 2004	Publication
V1.2.1	July 2007	Public Enquiry PE 20071116: 2007-07-18 to 2007-11-16