ETSI EN 302 208-2 V1.2.1 (2008-04)

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

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

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 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 [5] (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 [3] 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 [3] 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".

The present document includes improvements to the previous version of the standard that take advantage of technical developments within the RFID industry. In particular this includes the ability for multiple interrogators to transmit simultaneously on the same channel. This provides significant improvements in spectrum efficiency and system performance. As a consequence "listen before talk" is no longer a requirement.

National transposition dates	
Date of adoption of this EN:	21 March 2008
Date of latest announcement of this EN (doa):	30 June 2008
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 December 2008
Date of withdrawal of any conflicting National Standard (dow):	31 December 2009

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. The modular structure is shown in EG 201 399 [4].

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 [3] (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 [3] 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

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:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

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.

[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".

[2] 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".

2.2 Informative references

[3] 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).

[4] 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".

[5] 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 the R&TTE Directive [3] 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], clause 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 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 included in the test report;

- the recorded value of the measurement uncertainty, for each measurement, shall comply with 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 [2] 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 characterizing 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.