



**Electromagnetic compatibility and
Radio spectrum Matters (ERM);
Network Based Short Range Devices (SRD);
Radio equipment to be used in the 870 MHz to 876 MHz
frequency range with power levels ranging up to 500 mW;
Part 2: Harmonized EN covering the essential requirements
of article 3.2 of the R&TTE Directive**

Reference

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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
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Foreword

This Harmonized European Standard (EN) 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 mandates M/284 and M/441 issued from the European Commission under Directive 98/34/EC [i.2] as amended by Directive 98/48/EC [i.3].

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [i.1].

See article 5.1 of Directive 1999/5/EC [i.1] for information on presumption of conformity and Harmonized Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

The requirements relevant to Directive 1999/5/EC [i.1] are summarized in annex A.

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

National transposition dates	
Date of adoption of this EN:	17 October 2014
Date of latest announcement of this EN (doa):	31 January 2015
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 July 2015
Date of withdrawal of any conflicting National Standard (dow):	31 July 2016

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**may not**", "**need**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

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 Radio Equipment Directive [i.1]. The modular structure is shown in EG 201 399 [i.4].

1 Scope

The present document applies to the following following radio equipment types:

- 1) Network Based SRDs which are SRDs intended to operate in association with other SRDs to form network topologies supporting the intended application.
- 2) Network Relay Points which are specific Network Based SRDs supporting interconnection of a network of SRDs with an external network or service.

These radio equipment types are capable of operating in all or any part of the frequency bands given in table 1.

Table 1: Frequency bands designated to Network Based Short Range Devices

Network Based SRD frequency bands	
Transmit	870,00 MHz to 875,6 MHz
Receive	870,00 MHz to 875,6 MHz

The present document is intended to cover the provisions of Directive 1999/5/EC [i.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 [i.1] 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 specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) 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.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] ETSI EN 303 204-1 (V1.1.1) (10-2014): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Network Based Short Range Devices (SRD); Radio equipment to be used in the 870 MHz to 876 MHz frequency range with power levels ranging up to 500 mW; Part 1: Technical characteristics and test methods".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.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).

- [i.2] 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.
- [i.3] Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.
- [i.4] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of Harmonized Standards for application under the R&TTE 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 [i.1] and EN 303 204-1 [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 303 204-1 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 303 204-1 [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.

4.2 Conformance requirements

4.2.1 Transmitter requirements

4.2.1.1 Frequency Tolerance

The frequency tolerance requirement is as defined in EN 303 204-1 [1], clause 7.2.1.

4.2.1.1.1 Limits

The limits for frequency tolerance defined in EN 303 204-1 [1], clause 7.2.3 shall not be exceeded.

4.2.1.1.2 Conformance

The conformance test suite for the frequency tolerance requirement is defined in clause 5.3.1.1 of the present document.

4.2.1.2 Average power (conducted)

The average power requirement is as defined in EN 303 204-1 [1], clause 7.3.1.

4.2.1.2.1 Limits

The limits for average power defined in EN 303 204-1 [1], clause 7.3.3 shall not be exceeded.

4.2.1.2.2 Conformance

The conformance test suite for the average power requirement is defined in clause 5.3.1.2 of the present document.

4.2.1.3 Effective radiated power

The effective radiated power requirement is as defined in EN 303 204-1 [1], clause 7.4.1.

4.2.1.3.1 Limits

The limits for effective radiated power defined in EN 303 204-1 [1], clause 7.4.3 shall not be exceeded.

4.2.1.3.2 Conformance

The conformance test suite for the effective radiated power requirement is defined in clause 5.3.1.3 of the present document.

4.2.1.4 Transient power

The transient power requirement is as defined in EN 303 204-1 [1], clause 7.5.1.

4.2.1.4.1 Limits

The limits for transient power defined in EN 303 204-1 [1], clause 7.5.3 shall not be exceeded.

4.2.1.4.2 Conformance

The conformance test suite for the transient power requirement is defined in clause 5.3.1.5 of the present document.

4.2.1.5 Occupied bandwidth

The occupied bandwidth requirement is as defined in EN 303 204-1 [1], clause 7.6.1.

4.2.1.5.1 Limits

The limits for occupied bandwidth defined in EN 303 204-1 [1], clause 7.6.3 shall not be exceeded.

4.2.1.5.2 Conformance

The conformance test suite for the occupied bandwidth requirement is defined in clause 5.3.1.5 of the present document.

4.2.1.6 Unwanted emissions in the out-of-band domain

The unwanted emissions in the out-of-band domain requirement is defined in EN 303 204-1 [1], clause 7.7.1.

4.2.1.6.1 Limits

The limits for unwanted emissions in the out-of-band domain defined in EN 303 204-1 [1], clause 7.7.3 shall not be exceeded.

4.2.1.6.2 Conformance

The conformance test suite for the unwanted emissions in the spurious domain requirement is defined in clause 5.3.1.6 of the present document.

4.2.1.7 Unwanted emissions in the spurious domain

The unwanted emissions in the spurious domain requirement is defined in EN 303 204-1 [1], clause 7.8.1.

4.2.1.7.1 Limits

The limits for unwanted emissions in the spurious domain defined in EN 303 204-1 [1], clause 7.8.3 shall not be exceeded.

4.2.1.7.2 Conformance

The conformance test suite for the unwanted emissions in the spurious domain requirement is defined in clause 5.3.1.7 of the present document.

4.2.1.8 Frequency stability under low-voltage conditions

The frequency stability under low-voltage conditions requirement is defined in EN 303 204-1 [1], clause 7.9.1.

4.2.1.8.1 Limits

The limits for Frequency stability under low-voltage conditions defined in EN 303 204-1 [1], clause 7.9.3 shall not be exceeded.

4.2.1.8.2 Conformance

The conformance test suite for the frequency stability under low-voltage conditions requirement is defined in clause 5.3.1.8 of the present document.

4.2.1.9 Duty cycle

The duty cycle requirement is as defined in EN 303 204-1 [1], clauses 7.10.2 and 7.10.3.

4.2.1.9.1 Limits

The limits for duty cycle defined in EN 303 204-1 [1], clause 7.10.4 shall not be exceeded.

4.2.1.9.2 Conformance

Conformance with the duty cycle requirement is defined in clause 5.3.1.9 of the present document.

4.2.1.10 Automatic/Adaptive Power Control

The automatic/adaptive power control requirement is as defined in EN 303 204-1 [1], clause 7.11.1.

4.2.1.10.1 Limits

The limits for automatic/adaptive power control defined in EN 303 204-1 [1], clause 7.11.3 shall not be exceeded.

4.2.1.10.2 Conformance

The conformance test suite for the automatic/adaptive power control requirement is defined in clause 5.3.1.10 of the present document.

4.2.2 Receiver requirements

4.2.2.1 Receiver sensitivity

The receiver sensitivity requirement is as defined in EN 303 204-1 [1], clause 8.2.1.

4.2.2.1.1 Limits

The limits for receiver sensitivity defined in EN 303 204-1 [1], clause 8.2.3 shall not be exceeded.

4.2.2.1.2 Conformance

The conformance test suite for the receiver sensitivity requirement is defined in clause 5.3.2.1 of the present document.

4.2.2.2 Clear channel assessment threshold

The clear channel assessment threshold requirement is as defined in EN 303 204-1 [1], clause 8.3.1.

4.2.2.2.1 Limits

The limits for clear channel assessment threshold defined in EN 303 204-1 [1], clause 8.3.3 shall not be exceeded.

4.2.2.2.2 Conformance

The conformance test suite for the clear channel assessment threshold requirement is defined in clause 5.3.2.2 of the present document.

4.2.2.3 Blocking

The blocking requirement is as defined in EN 303 204-1 [1], clause 8.4.1.

4.2.2.3.1 Limits

The limits for blocking defined in EN 303 204-1 [1], clause 8.4.3 shall not be exceeded.

4.2.2.3.2 Conformance

The conformance test suite for the blocking requirement is defined in clause 5.3.2.3 of the present document.

4.2.2.4 Receiver spurious radiations

The receiver spurious radiations requirement is as defined in EN 303 204-1 [1], clause 8.5.1.

4.2.2.4.1 Limits

The limits for receiver spurious radiations defined in EN 303 204-1 [1], clause 8.5.3 shall not be exceeded.

4.2.2.4.2 Conformance

The conformance test suite for the receiver spurious radiations requirement is defined in clause 5.3.2.4 of the present document.

4.2.3 Polite spectrum access

4.2.3.1 Listen before talk

The listen before talk requirement is as defined in EN 303 204-1 [1], clause 9.2.1.

4.2.3.1.1 Limits

The limits for listen before talk requirement defined in EN 303 204-1 [1], clause 9.2.3 shall not be exceeded.

4.2.3.1.2 Conformance

The conformance test suite for the listen before talk requirement is defined in clause 5.3.1.11 of the present document.

4.2.3.2 Short control signalling transmissions

The short control signalling transmissions requirement is as defined in EN 303 204-1 [1], clause 9.3.1.

4.2.3.2.1 Limits

The limits for short control signalling transmissions defined in EN 303 204-1 [1], clause 9.3.3 shall not be exceeded.

4.2.3.2.2 Conformance

The conformance test suite for the listen before talk requirement is defined in clause 5.4.3.1 of the present document.

4.2.3.3 Channel adaptivity

The channel adaptivity requirement is as defined in EN 303 204-1 [1], clause 9.4.1.

4.2.3.3.1 Limits

The limits for channel adaptivity defined in EN 303 204-1 [1], clause 9.4.3 shall not be exceeded.

4.2.3.3.2 Conformance

The conformance test suite for the channel adaptivity requirement is defined in clause 5.3.1.12 of the present document.

4.2.3.4 Coordination of network relay points

The coordination of network relay point requirement is as defined in EN 303 204-1 [1], clause 9.5.1.

4.2.3.4.1 Limits

The limits for polite spectrum access defined in EN 303 204-1 [1], clause 9.2.3 shall not be exceeded.

4.2.3.4.2 Conformance

The conformance test suite for the listen before talk requirement is defined in clause 5.4.3.2 of the present document.

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 Presentation for testing

Measurement shall be performed, according to the present document, on equipment presented for testing as defined in EN 303 204-1 [1], clause 4.

5.1.2 Test conditions

Test conditions shall be as defined in EN 303 204-1 [1], clauses 5 and 6.

5.2 Interpretation of the measurement results

The interpretation of the results recorded in the test report for the measurements described in the present document shall be as given in EN 303 204-1 [1], clause 10.

5.3 Essential radio test suites

5.3.1 Transmitter test suites

5.3.1.1 Frequency tolerance

The test specified in EN 303 204-1 [1], clause 7.2.2 shall be carried out.

5.3.1.2 Average power (conducted)

The test specified in EN 303 204-1 [1], clause 7.3.2 shall be carried out.

5.3.1.3 Effective radiated power

The test specified in EN 303 204-1 [1], clause 7.4.2 shall be carried out.

5.3.1.4 Transient power

The test specified in EN 303 204-1 [1], clause 7.5.2 shall be carried out.

5.3.1.5 Occupied bandwidth

The test specified in EN 303 204-1 [1], clause 7.6.2 shall be carried out.

5.3.1.6 Unwanted emissions in the out-of-band domain

The test specified in EN 303 204-1 [1], clause 7.7.2 shall be carried out.

5.3.1.7 Unwanted emissions in the spurious domain

The test specified in EN 303 204-1 [1], clause 7.8.2 shall be carried out.

5.3.1.8 Frequency stability under low-voltage conditions

The test specified in EN 303 204-1 [1], clause 7.9.2 shall be carried out.

5.3.1.9 Duty cycle

The test specified in EN 303 204-1 [1], clauses 7.10.2 and 7.10.3 shall be carried out.

5.3.1.10 Automatic / Adaptive Power Control

The test as specified in EN 303 204-1 [1], clause 7.11.2 shall be carried out.

5.3.1.11 Listen before talk

The test specified in EN 303 204-1 [1], clause 9.2.2 shall be carried out.

5.3.1.12 Channel adaptivity

The test specified in EN 303 204-1 [1], clause 9.4.2 shall be carried out.

5.3.2 Receiver test suites

5.3.2.1 Receiver sensitivity

The test specified in EN 303 204-1 [1], clause 8.2.2 shall be carried out.

5.3.2.2 Clear channel assessment threshold

The test specified in EN 303 204-1 [1], clause 8.3.2 shall be carried out.

5.3.2.3 Blocking

The test specified in EN 303 204-1 [1], clause 8.4.2 shall be carried out.

5.3.2.4 Receiver spurious radiation

The test specified in EN 303 204-1 [1], clause 8.5.2 shall be carried out.

5.4 Other test suites

5.4.1 Transmitter test suites

Void.

5.4.2 Receiver test suites

Void

5.4.3 Polite spectrum access test suites

5.4.3.1 Short control signalling transmissions

The test specified in EN 303 204-1 [1], clause 9.3.2 shall be carried out.

5.4.3.2 Coordination of network relay points

The test specified in EN 303 204-1 [1], clause 9.5.2 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 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 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 dependent 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 303 204-2						
The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive [i.1]						
Requirement			Requirement Conditionality		Test Specification	
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No
1	Frequency tolerance	4.2.1.1	C	Applies to transmitters capable of generating an unmodulated carrier	E	5.3.1.1
2	Average power (conducted)	4.2.1.2	C	Applies to transmitters with an external antenna connector	E	5.3.1.2
3	Effective radiated power	4.2.1.3	C	Applies to transmitters with integral or external dedicated antenna	E	5.3.1.3
4	Transient power	4.2.1.4	U		E	5.3.1.4
5	Occupied bandwidth	4.2.1.5	U		E	5.3.1.5
6	Unwanted emissions in the out-of-band domain	4.2.1.6	U		E	5.3.1.6
7	Unwanted emissions in the spurious domain	4.2.1.7	U		E	5.3.1.7
8	Frequency stability under low-voltage conditions	4.2.1.8	C	Applies to battery-operated transmitters	E	5.3.1.8
9	Duty cycle	4.2.1.9	U		E	5.3.1.9
10	Automatic/Adaptive Power Control	4.2.1.10	U		E	5.3.1.10
11	Listen before talk	4.2.3.1	C	Applies to network relay point operation	E	5.3.1.11

Harmonized Standard EN 303 204-2						
The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive [i.1]						
Requirement			Requirement Conditionality		Test Specification	
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No
12	Channel adaptivity	4.2.3.3	C	Applies to network relay point operation	E	5.3.1.12
13	Receiver sensitivity	4.2.2.1	C	Applies to receivers with CCA	E	5.3.2.1
14	Clear channel assessment threshold	4.2.2.2	C	Applies to receivers with CCA	E	5.3.2.2
15	Short control signalling transmissions	4.2.2.3	C	Applies to equipment declaring use of short control signalling transmissions	O	5.4.3.1
16	Coordination of network relay points	4.2.3.4	C	Applies to equipment declaring coordination of network relay points	O	5.4.3.2

Key to columns:**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 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): Bibliography

- Commission Decision 2006/771/EC on harmonization of the radio spectrum for use by short-range devices as amended by subsequent Commission Decisions.
- CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".
- ETSI EN 300 220-1 (V2.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW; Part 1: Technical characteristics and test methods".
- ETSI TR 100 028 (Parts 1 and 2): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- 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).
- ETSI EN 301 489: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".
- 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).

History

Document history		
V1.1.0	June 2014	EN Approval Procedure AP 20141017: 2014-06-19 to 2014-10-17
V1.1.1	October 2014	Publication