

**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 2: Harmonized EN covering essential requirements
under article 3.2 of the R&TTE Directive**

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Contents

Intellectual Property Rights	5
Foreword.....	5
Introduction	5
1 Scope	6
2 References	7
2.1 Normative references	7
2.2 Informative references.....	7
3 Definitions, symbols and abbreviations	8
3.1 Definitions	8
3.2 Symbols.....	8
3.3 Abbreviations	8
4 Technical requirements specifications	8
4.1 Environmental profile.....	8
4.2 Conformance requirements	9
4.2.1 Transmitter requirements.....	9
4.2.1.1 Frequency error and frequency drift.....	9
4.2.1.2 Average power (conducted)	9
4.2.1.3 Effective radiated power	9
4.2.1.4 Types of spread spectrum modulation.....	9
4.2.1.4.1 Frequency Hopping Spread Spectrum devices (FHSS)	9
4.2.1.4.2 Direct sequence or other spread spectrum than FHSS.....	9
4.2.1.5 Transient Power	9
4.2.1.6 Adjacent channel power	10
4.2.1.7 Modulation bandwidth	10
4.2.1.8 Unwanted emissions in the spurious domain	10
4.2.1.9 Frequency stability under low-voltage conditions	10
4.2.1.10 Duty cycle	10
4.2.1.11 Listen Before Talk (LBT)	10
4.2.1.11.1 Minimum transmitter off-time	10
4.2.1.11.2 Minimum listening time	10
4.2.1.11.3 Maximum dead time	10
4.2.1.11.4 Maximum transmitter on-time	11
4.2.1.11.5 Time-out-timer	11
4.3 Receiver requirements	11
4.3.1 Receiver categories	11
4.3.2 Receiver sensitivity.....	11
4.3.3 Receiver LBT threshold.....	11
4.3.4 Adjacent channel selectivity	12
4.3.5 Blocking.....	12
4.3.6 Spurious response rejection	12
4.3.7 Spurious radiations	12
5 Testing for compliance with technical requirements.....	12
5.1 Description testing for compliance with technical requirements.....	12
5.1.1 Environmental conditions for testing	12
5.1.1.1 Normal and extreme test-conditions.....	12
5.1.1.2 Test power source	12
5.1.2 Choice of samples for test suites.....	12
5.1.3 Transmitter test suites	13
5.1.3.1 Frequency error and drift	13
5.1.3.2 Average power (conducted)	13
5.1.3.3 Effective radiated power	13
5.1.3.4 Transient power.....	13
5.1.3.5 Adjacent channel power	13

5.1.3.6	Modulation bandwidth	13
5.1.3.7	Unwanted emissions in the spurious domain	13
5.1.3.8	Frequency stability under low-voltage conditions	14
5.1.4	Receiver test suites.....	14
5.1.4.1	Receiver sensitivity	14
5.1.4.2	Receiver LBT threshold	14
5.1.4.3	Adjacent channel selectivity.....	14
5.1.4.4	Blocking.....	14
5.1.4.5	Spurious response rejection.....	14
5.1.4.6	Receiver spurious radiation.....	14
5.2	Interpretation of measurement results	14
Annex A (normative):	HS Requirements and conformance Test specifications Table (HS-RTT).....	15
Annex B (informative):	The EN title in the official languages	18
Annex C (informative):	Bibliography.....	19
History		20

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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 Vote phase of the ETSI standards Two-step Approval Procedure.

The present document includes improvements to the previous version of the standard that take advantage of technical developments within the SRD industry. It also serves the purpose of providing the requirements and associated measurement methods to improve the intra- SRD co-existence and promote efficient spectrum use.

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [i.2] (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") [i.1].

Technical specifications relevant to Directive 1999/5/EC [i.1] are given in annex A.

The present document is part 2 of a multi-part deliverable covering the 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, as identified below:

Part 1: "Technical characteristics and test methods";

Part 2: "Harmonized EN covering essential requirements 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):	36 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 [i.1]. The modular structure is shown in EG 201 399 [i.5].

1 Scope

The present document applies to the following Short Range Device major equipment types:

- 1) Non-specific Short Range Devices.
- 2) Alarms, identification systems, radio-determination, telecommand, telemetry, etc.
- 3) Radio Frequency Identification (RFID).
- 4) Detection, movement and alert applications.

These radio equipment types are capable of operating in the frequency bands within the 25 MHz to 1 000 MHz range as specified in table 1:

- either with a Radio Frequency (RF) output connection and dedicated antenna or with an integral antenna;
- for all types of modulation;
- with or without speech.

Table 1 shows a list of the frequency bands as designated to Short Range Devices by some European Commission Decisions [i.3] and [i.4] and the CEPT/ERC/REC 70-03 [i.6] as known at the date of publication of the present document.

NOTE 1: It should be noted that table 1 represents the most widely implemented position within the European Union and the CEPT countries, but it should not be assumed that all designated bands are available in all countries.

Table 1: Frequency bands commonly designated to Short Range Devices within 25 MHz to 1 000 MHz

	Frequency Bands/Frequencies	Applications
Transmit and Receive	26,995 MHz, 27,045 MHz, 27,095 MHz, 27,145 MHz, 27,195 MHz, 34,995 MHz to 35,225 MHz, 40,665 MHz, 40,675 MHz, 40,685 MHz, 40,695 MHz	Model control
Transmit and Receive	26,957 MHz to 27,283 MHz	Non-specific use
Transmit and Receive	40,660 MHz to 40,700 MHz	Non-specific use
Transmit and Receive	138,200 MHz to 138,450 MHz	Non-specific use
Transmit and Receive	169,400 MHz to 169,475 MHz	Tracking, tracing and data acquisition and meter reading
Transmit and Receive	169,475 MHz to 169,4875 MHz	Social alarms
Transmit and Receive	169,5875 MHz to 169,6000 MHz	Social alarms
Transmit and Receive	433,050 MHz to 434,790 MHz	Non-specific use
Transmit and Receive	863,000 MHz to 870,000 MHz	Non-specific use
Transmit and Receive	864,800 MHz to 865,000 MHz	Wireless audio applications
Transmit and Receive	868,000 MHz to 868,600 MHz	Non-specific use
Transmit and Receive	868,600 MHz to 868,700 MHz	Alarms
Transmit and Receive	868,700 MHz to 869,200 MHz	Non-specific use
Transmit and Receive	869,200 MHz to 869,250 MHz	Social alarms
Transmit and Receive	869,250 MHz to 869,300 MHz	Alarms (0,1 % duty cycle)
Transmit and Receive	869,300 MHz to 869,400 MHz	Alarms (1 % duty cycle)
Transmit and Receive	869,400 MHz to 869,650 MHz	Non-specific use
Transmit and Receive	869,650 MHz to 869,700 MHz	Alarms

NOTE 2: In addition, it should be noted that other frequency bands may be available in a country within the frequency range 25 MHz to 1 000 MHz for SRD covered by the present document. See European Commission Decisions on Short Range Devices [i.3] and [i.4] and CEPT/ERC/REC 70-03 [i.6] as implemented through National Radio Interfaces (NRI) or additional NRI as relevant.

NOTE 3: On non-harmonized parameters, national administrations may impose certain conditions such as the type of modulation, frequency, channel/frequency separations, maximum transmitter radiated power, duty cycle, and the inclusion of an automatic transmitter shut-off facility, as a condition for the issue of Individual Rights for use of spectrum or General Authorization, or as a condition for use under "licence exemption" as it is in most cases for Short Range Devices.

The present document covers fixed stations, mobile stations and portable stations.

The present document is intended to cover the provisions of article 3.2 of Directive 1999/5/EC [i.1] (R&TTE Directive). The present document does not apply to radio equipment for which a specific Harmonized EN applies as such Harmonized EN may specify additional EN requirements relevant to the presumption of conformity under article 3.2 of the R&TTE Directive [i.1].

NOTE 4: 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>.

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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 300 220-1 (V2.3.1): "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".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [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] Commission Decision 2006/771/EC on harmonization of the radio spectrum for use by short-range devices as amended by subsequent Commission Decisions.
- [i.4] Commission Decision 2005/928/EC on the harmonization of the 169,4-169,8125 MHz frequency band in the Community as amended by Commission Decision of 13 August 2008.
- [i.5] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of candidate Harmonized Standards for application under the R&TTE Directive".
- [i.6] CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".

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 300 220-1 [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 220-1 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 220-1 [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 error and frequency drift

One of the following shall be met:

- 1) if the equipment can produce an unmodulated carrier then the frequency error or frequency drift, as defined in EN 300 220-1 [1], clause 7.1.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.1.3, table 4a for systems with channel spacing of less than or equal to 25 kHz or table 4b for all other systems; or
- 2) if the equipment is not able to produce an unmodulated carrier then either:
 - a) the adjacent channel power as defined in EN 300 220-1 [1], clause 7.6.1 for narrowband and channelized equipment shall not exceed the limits in EN 300 220-1 [1], clause 7.6.3 under extreme conditions; or
 - b) the modulation bandwidth as defined in EN 300 220-1 [1], clause 7.7.1 for all other equipment shall not exceed the limit in clause 7.7.4 under extreme conditions.

This requirement applies to all transmitters.

4.2.1.2 Average power (conducted)

The average power, as defined in EN 300 220-1 [1], clause 7.2.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.2.3, table 5.

4.2.1.3 Effective radiated power

The effective radiated power, as defined in EN 300 220-1 [1], clause 7.3.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.2.3, table 5.

This requirement applies to transmitters with an integral antenna or transmitters supplied with a dedicated antenna.

4.2.1.4 Types of spread spectrum modulation

4.2.1.4.1 Frequency Hopping Spread Spectrum devices (FHSS)

Frequency hopping spread spectrum devices, as defined in EN 300 220-1 [1], clause 7.4.1.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.4.1.3 indent a) to i) and table 6.

The frequency hopping performance specified in EN 300 220-1 [1], clause 7.4.1.2 shall be declared by the provider.

This applies to all transmitters which employ FHSS.

4.2.1.4.2 Direct sequence or other spread spectrum than FHSS

Direct sequence or other spread spectrum than FHSS devices, as defined in EN 300 220-1 [1], clause 7.4.2.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.4.2.2 table 7.

Direct sequence or other spread spectrum than FHSS specified in EN 300 220-1 [1], clause 7.4.2.2 shall be declared by the provider.

This applies to all transmitters which employ DSSS and other spread spectrum than FHSS.

4.2.1.5 Transient Power

The transient power, as defined in EN 300 220-1 [1], clause 7.5.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.5.3.

This requirement applies to all transmitters.

4.2.1.6 Adjacent channel power

The adjacent channel power, as defined in EN 300 220-1 [1], clause 7.6.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.6.3.

This requirement applies to transmitters of narrowband systems.

4.2.1.7 Modulation bandwidth

The modulation bandwidth, as defined in EN 300 220-1 [1], clause 7.7.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.7.3.

This requirement applies to equipment not covered by EN 300 220-1 [1], clause 7.6.

4.2.1.8 Unwanted emissions in the spurious domain

The spurious emissions, as defined in EN 300 220-1 [1], clause 7.8.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.8.3, table 11.

This requirement applies to all transmitters.

4.2.1.9 Frequency stability under low-voltage conditions

The frequency stability under low-voltage conditions, as defined in EN 300 220-1 [1], clause 7.9.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.9.3.

This requirement applies to all battery-operated transmitters.

4.2.1.10 Duty cycle

The duty cycle, as defined in EN 300 220-1 [1], clause 7.10.1, shall not exceed the limits in EN 300 220-1 [1], clause 7.10.3.

The duty cycle shall be declared by the provider.

This requirement applies to all transmitters excluding those with a listen before talk facility with AFA or equivalent mitigation method and FHSS devices with LBT.

4.2.1.11 Listen Before Talk (LBT)

4.2.1.11.1 Minimum transmitter off-time

The minimum transmitter off-time, as defined in EN 300 220-1 [1], clause 9.2.1.1, shall not be less than the limits in EN 300 220-1 [1], clause 9.2.1.2.

The minimum transmitter off-time shall be declared by the provider.

This requirement applies to all transmitters using LBT.

4.2.1.11.2 Minimum listening time

The minimum listening time, as defined in EN 300 220-1 [1], clause 9.2.2.1 shall not be less than the limits in EN 300 220-1 [1], clause 9.2.2.2.

The minimum listening time shall be declared by the provider.

This requirement applies to all transmitters using LBT.

4.2.1.11.3 Maximum dead time

The maximum dead time, as defined in EN 300 220-1 [1], clause 9.2.3.1 shall not exceed the limit in EN 300 220-1 [1], clause 9.2.3.2.