



**Short Range Devices (SRD) operating  
in the frequency range 25 MHz to 1 000 MHz;  
Part 3-1: Harmonised Standard covering the essential  
requirements of article 3.2 of the Directive 2014/53/EU;  
Low duty cycle high reliability equipment, Social Alarms  
Equipment operating on designated frequencies  
(869,200 MHz to 869,250 MHz)**

---

Reference

DEN/ERM-TG28-530

---

Keywords

alarm, harmonised standard, radio, reliability,  
SRD

**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**

The present document can be downloaded from:  
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (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  
<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:  
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

---

**Copyright Notification**

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2016.  
All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.  
**3GPP™** and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.  
**GSM®** and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	6
Foreword.....	6
Modal verbs terminology.....	6
Introduction .....	6
1 Scope .....	8
2 References .....	8
2.1 Normative references .....	8
2.2 Informative 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 Environmental profile.....	9
4.2 Technical requirements for transmit mode.....	9
4.2.1 Applicability .....	9
4.2.2 Operating Frequency and Channel.....	10
4.2.2.1 Description.....	10
4.2.2.2 Limits .....	10
4.2.2.3 Conformance.....	10
4.2.3 Effective Radiated Power .....	10
4.2.3.1 Description .....	10
4.2.3.2 Limits .....	10
4.2.3.3 Conformance.....	10
4.2.4 Duty Cycle .....	10
4.2.4.1 Description .....	10
4.2.4.2 Limits .....	10
4.2.4.3 Conformance.....	11
4.2.5 Adjacent Channel Power .....	11
4.2.5.1 Description and Applicability .....	11
4.2.5.2 Limits .....	11
4.2.5.3 Conformance.....	11
4.2.6 Transmitter Frequency Error.....	11
4.2.6.1 Description and Applicability .....	11
4.2.6.2 Limits .....	11
4.2.6.3 Conformance.....	11
4.2.7 Transmitter Transient Power.....	11
4.2.7.1 Description .....	11
4.2.7.2 Limits .....	11
4.2.7.3 Conformance.....	11
4.2.8 Tx Behaviour under Low Voltage Conditions.....	12
4.2.8.1 Description and Applicability .....	12
4.2.8.2 Limits .....	12
4.2.8.3 Conformance.....	12
4.3 Technical requirements for all EUT .....	12
4.3.1 Applicability .....	12
4.3.2 Spurious Emissions.....	12
4.3.2.1 Description .....	12
4.3.2.2 Limits .....	12
4.3.2.3 Conformance.....	12
4.4 Receiver Parameters .....	12
4.4.1 Applicability .....	12
4.4.2 Blocking.....	12
4.4.2.1 Description .....	12

4.4.2.2	Limits .....	13
4.4.2.3	Conformance .....	13
5	Technical Requirements for Uni-Directional Communication .....	13
5.1	Mode A Applicability and Conformance Requirements .....	13
5.2	Communication method .....	13
5.3	Transmitter Parameters.....	13
5.4	Receiver Parameters .....	13
5.4.1	Applicability .....	13
5.4.2	Adjacent Channel Selectivity.....	13
5.4.2.1	Description .....	13
5.4.2.2	Limits .....	13
5.4.2.3	Conformance.....	13
5.4.3	Blocking.....	13
5.4.3.1	Description .....	13
5.4.3.2	Limits .....	14
5.4.3.3	Conformance.....	14
5.4.4	Adjacent Channel Saturation .....	14
5.4.4.1	Description .....	14
5.4.4.2	Limits .....	14
5.4.4.3	Conformance.....	14
5.4.5	Spurious Response Rejection.....	14
5.4.5.1	Description .....	14
5.4.5.2	Limits .....	14
5.4.5.3	Conformance.....	14
5.4.6	Behaviour at high wanted signal level .....	14
5.4.6.1	Description .....	14
5.4.6.2	Limits .....	14
5.4.6.3	Conformance.....	14
6	Bi-Directional Communication - Single Frequency.....	14
6.1	Mode B1 Applicability and Conformance Requirements.....	14
6.2	Bi-directional Communication .....	15
6.2.1	Applicability .....	15
6.2.2	Acknowledgement .....	15
6.2.2.1	Description .....	15
6.2.2.2	Limits .....	15
6.2.2.3	Conformance.....	15
6.3	Transmitter Parameters.....	15
6.4	Receiver Parameters .....	15
6.4.1	Applicability .....	15
6.4.2	Adjacent Channel Selectivity.....	15
6.4.2.1	Description .....	15
6.4.2.2	Limits .....	15
6.4.2.3	Conformance.....	15
6.4.3	Blocking.....	16
6.4.3.1	Description .....	16
6.4.3.2	Limits .....	16
6.4.3.3	Conformance.....	16
6.4.4	Adjacent Channel Saturation .....	16
6.4.4.1	Description .....	16
6.4.4.2	Limits .....	16
6.4.4.3	Conformance.....	16
6.4.5	Spurious Response Rejection.....	16
6.4.5.1	Description .....	16
6.4.5.2	Limits .....	16
6.4.5.3	Conformance.....	16
6.4.6	Behaviour at high wanted signal level .....	17
6.4.6.1	Description .....	17
6.4.6.2	Limits .....	17
6.4.6.3	Conformance.....	17
7	Testing for compliance with technical requirements.....	17

7.1	General .....	17
7.2	Presentation of equipment for testing purposes .....	17
7.3	Wanted performance criteria .....	17
7.3.1	Receiver response .....	17
<b>Annex A (normative):</b>	<b>Relationship between the present document and the essential requirements of Directive 2014/53/EU .....</b>	<b>19</b>
<b>Annex B (informative):</b>	<b>Selection of technical parameters .....</b>	<b>21</b>
B.1	Introduction .....	21
B.2	Receiver sensitivity .....	21
B.3	Other receiver parameters .....	21
B.4	Listen before talk .....	21
<b>Annex C (informative):</b>	<b>Bibliography .....</b>	<b>22</b>
History .....		23

---

## 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 (<https://ipr.etsi.org>).

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 draft Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.4] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.2].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive and associated EFTA regulations.

The present document is part 3-1 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

<b>Proposed national transposition dates</b>	
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

---

## Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**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 equipment within the scope of the Radio Equipment Directive (RED) [i.2].

The equipment to which the present document applies fall within the low duty cycle high reliability devices category.

NOTE 1: The low duty cycle/high reliability devices category is defined in Commission Decision 2013/752/EU [i.3] as:

*"Category of short-range devices" means a group of short- range devices that use spectrum with similar technical spectrum access mechanisms or based on common usage scenarios.*

and

*The low duty cycle/high reliability device category covers radio devices that rely on low overall spectrum utilisation and low duty cycle spectrum access rules to ensure highly reliable spectrum access and transmissions in shared bands. Typical uses include alarm systems that use radio communication for indicating an alert condition at a distant location and social alarms systems that allow reliable communication for a person in distress.*

It is recognized that the radio communications link alone does not determine the overall operation of a system, but that a functioning radio communications link is an essential foundation upon which a system may be built.

The present document sets out various means and features by which the performance of a radio communications link may be improved. These include:

- 1) Spectrum Access Rules - with the aim of reducing the probability of collisions between transmissions from different equipment.
- 2) Receiver Parameters - with the aim of reducing the probability of interference from equipment on other frequencies.
- 3) Bi-Directional Communications - with the aim of reducing the time and number of transmissions required to achieve a given level of confidence in successful communication.

Application of these features, separately or in combination, does not necessarily ensure successful radio communication. In addition, there are other features that may be considered, such as listen before talk or error correction, that may improve overall performance.

Clauses 1 and 3 provide a general description on the types of equipment covered by the present document and the definitions and abbreviations used.

Clause 4 specifies technical requirements to be met by all equipment.

Clause 5 specifies technical requirements for receivers in equipment with uni-directional communications.

Clause 6 specifies technical requirements for equipment with bi-directional communications.

Clause 7 specifies the methods for testing for compliance with the technical requirements.

Annex A summarizes the requirements relevant to the RE-Directive [i.2].

# 1 Scope

The present document applies to social alarm devices operating on designated frequencies.

Designated frequencies are those frequency bands identified in Commission Decision 2013/752/EU [i.3] as having a usage available only to social alarms.

Social alarms are defined in Commission Decision 2013/752/EU [i.3] as:

*"Social alarm devices" are radio communications systems that allow reliable communication for a person in distress in a confined area to initiate a call for assistance. Typical uses of social alarm are to assist elderly or disabled people.*

These radio equipment types are capable of operating, for transmission or reception, in all or part of the frequency bands given in table 1.

**Table 1: Frequency bands**

Frequency band
869,200 MHz to 869,250 MHz

The present document contains requirements to demonstrate that radio equipment both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

## 2 References

### 2.1 Normative 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 <https://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.

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

- [1] ETSI EN 300 220-1 (V3.1.0) (05-2016): "Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 1: Technical characteristics and methods of measurement".

### 2.2 Informative 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.

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

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] ETSI EG 203 336: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".
- [i.2] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC. (RE-Directive).



- [i.3] Commission Decision 2013/752/EU amending Decision 2006/771/EC on harmonisation of the radio spectrum for use by short-range devices and repealing Decision 2005/928.
- [i.4] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in the RE-Directive [i.2] and ETSI EN 300 220-1 [1] apply, unless otherwise ascribed herein.

**low duty cycle/high reliability:** category of device used in Commission Decision 2013/752/EU [i.3]

NOTE: Note (15) in the Commission Decision states: "*The low duty cycle/high reliability device category covers radio devices that rely on low overall spectrum utilisation and low duty cycle spectrum access rules to ensure highly reliable spectrum access and transmissions in shared bands. Typical uses include alarm systems that use radio communication for indicating an alert condition at a distant location and social alarms systems that allow reliable communication for a person in distress.*"

### 3.2 Symbols

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

### 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI EN 300 220-1 [1] apply, unless otherwise ascribed herein.

MI	Message Initiator
MR	Message Responder

## 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.

Normal and extreme test conditions are described in ETSI EN 300 220-1 [1], clauses 4.3.3 and 4.3.4.

### 4.2 Technical requirements for transmit mode

#### 4.2.1 Applicability

The requirements in clause 4.2 apply to all EUT when operating in transmit mode, except where stated.

**Table 2: Technical Requirements**

Band no.	Frequency Band	Maximum radiated power, e.r.p.	Operating channel width (OCW)
1	869,200 MHz to 869,250 MHz	10 mW	25 kHz

## 4.2.2 Operating Frequency and Channel

### 4.2.2.1 Description

The nominal operating frequency is the centre of a channel of width OCW.

### 4.2.2.2 Limits

The OCW shall be equal to the operating channel width listed in table 2. The channels shall lie on a raster formed by the operating channel width and the edges of the bands.

### 4.2.2.3 Conformance

There is no conformance test specified for this requirement.

The provider shall details of the operating frequency.

NOTE 1: More than one operating frequency on one or more channels may be declared.

NOTE 2: If the frequency error measurements in clause 4.2.6 cannot be performed, an alternative is to perform the adjacent channel power measurements in clause 4.2.5 under extreme test conditions.

## 4.2.3 Effective Radiated Power

### 4.2.3.1 Description

The effective radiated power (e.r.p.) is the power radiated in the direction of the maximum field strength under specified conditions of measurements for any condition of modulation. For equipment with a permanent or temporary antenna connection it may be taken as the power delivered from that connector.

### 4.2.3.2 Limits

The effective radiated power shall not be greater than the value shown in table 2.

### 4.2.3.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.2.2.

Compliance shall be established under normal and extreme conditions for conducted measurements and under normal conditions for radiated measurements.

## 4.2.4 Duty Cycle

### 4.2.4.1 Description

The present document applies to equipment operating with low duty cycle. Equipment may be triggered manually, by internal timing or by external stimulus. Depending on the method of triggering the timing may be predictable or random.

### 4.2.4.2 Limits

**Table 3: Duty Cycle**

Band no.	Duty Cycle		
	Frequency Band	Max Duty cycle DC	Observation Period $T_{obs}$
1	869,200 MHz to 869,250 MHz	0,1 %	1 hr

The observation bandwidth  $F_{obs}$  is the operational frequency band.

#### 4.2.4.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.4.2.

Compliance shall be established under normal conditions.

### 4.2.5 Adjacent Channel Power

#### 4.2.5.1 Description and Applicability

Adjacent channel power is power incidental to proper operation of a transmitter falling into the neighbouring channels.

If the frequency error measurements in clause 4.2.6 cannot be performed, the alternative is to perform the adjacent channel power measurements in this clause under extreme test conditions.

#### 4.2.5.2 Limits

The power in the adjacent channels shall not exceed the reference limits defined in ETSI EN 300 220-1 [1], clause 5.11.2.

#### 4.2.5.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.11.3.

Compliance shall be established under normal conditions and also under extreme conditions if the conformance tests for Tx Frequency Error (clause 4.2.6) are not carried out.

### 4.2.6 Transmitter Frequency Error

#### 4.2.6.1 Description and Applicability

Frequency error is the difference, under normal and extreme conditions, between the measured unmodulated carrier frequency and the nominal operating frequency.

Frequency error is normally measured with an unmodulated carrier. If the equipment is not capable of producing an unmodulated carrier, then this requirement does not apply. Instead the adjacent channel power (clause 4.2.5) requirements shall be met under extreme test conditions.

#### 4.2.6.2 Limits

The frequency error shall not exceed:

$$\pm 10 \% \text{ of OCW}$$

#### 4.2.6.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.7.2.

Compliance shall be established under normal and extreme conditions.

### 4.2.7 Transmitter Transient Power

#### 4.2.7.1 Description

For the purpose of the present document, the description in ETSI EN 300 220-1 [1], clause 5.10.1 applies.

#### 4.2.7.2 Limits

The EUT shall comply with reference limits defined in ETSI EN 300 220-1 [1], clause 5.10.2.

#### 4.2.7.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.10.3.

Compliance shall be established under normal conditions.

## 4.2.8 Tx Behaviour under Low Voltage Conditions

### 4.2.8.1 Description and Applicability

This requirement applies only to transmitters in battery operated equipment.

For the purpose of the present document, the description in ETSI EN 300 220-1 [1], clause 5.12.1 applies.

### 4.2.8.2 Limits

The equipment shall comply with the reference limits in ETSI EN 300 220-1 [1], clause 5.12.2.

### 4.2.8.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.12.3.

Compliance shall be established under normal conditions.

## 4.3 Technical requirements for all EUT

### 4.3.1 Applicability

The requirements in clause 4.3 apply to all EUT.

### 4.3.2 Spurious Emissions

#### 4.3.2.1 Description

Spurious emissions are unwanted emissions in the spurious domain radiated by the equipment or its antenna.

For transmitters, the spurious domain is all frequencies apart from the channel on which the transmitter is intended to operate and its adjacent and alternate adjacent channels.

For receivers, the spurious domain is all frequencies.

#### 4.3.2.2 Limits

The EUT shall comply with reference limits defined in ETSI EN 300 220-1 [1], clause 5.9.2.

#### 4.3.2.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.9.3.

Compliance shall be established under normal conditions.

## 4.4 Receiver Parameters

### 4.4.1 Applicability

The requirements in clause 4.4 apply to all receiving equipment that is part of a MI.

### 4.4.2 Blocking

#### 4.4.2.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.19.1 applies.

#### 4.4.2.2 Limits

The EUT shall comply with the reference limits for Rx Category 2 in ETSI EN 300 220-1 [1], clause 5.19.3.

#### 4.4.2.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.19.6.

Compliance shall be established under normal conditions.

---

## 5 Technical Requirements for Uni-Directional Communication

### 5.1 Mode A Applicability and Conformance Requirements

Clause 5 applies to equipment in systems using uni-directional communication.

NOTE 1: This clause forms a technical solution known as Mode A.

For Mode A, equipment shall meet the requirements of clause 4, plus the additional requirements of this clause 5.

NOTE 2: For some parameters, conformance with clause 5 will demonstrate conformance with clause 4.

### 5.2 Communication method

No additional requirements.

### 5.3 Transmitter Parameters

No additional requirements.

### 5.4 Receiver Parameters

#### 5.4.1 Applicability

The requirements in clause 5.4 shall apply to all receiving equipment that is part of a MR.

#### 5.4.2 Adjacent Channel Selectivity

##### 5.4.2.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.16.1 applies.

##### 5.4.2.2 Limits

The EUT shall comply with the reference limits for Rx Category 1 in ETSI EN 300 220-1 [1], clause 5.16.2

##### 5.4.2.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.16.3.

Compliance shall be established under normal conditions.

#### 5.4.3 Blocking

##### 5.4.3.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.19.1 applies.

#### 5.4.3.2 Limits

The EUT shall comply with the reference limits for Rx Category 1 in ETSI EN 300 220-1 [1], clause 5.19.5

#### 5.4.3.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.19.6.

Compliance shall be established under normal conditions.

### 5.4.4 Adjacent Channel Saturation

#### 5.4.4.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.17.1 applies.

#### 5.4.4.2 Limits

The EUT shall comply with the reference limits for Rx Category 1 in ETSI EN 300 220-1 [1], clause 5.17.2.

#### 5.4.4.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.17.3.

Compliance shall be established under normal conditions.

### 5.4.5 Spurious Response Rejection

#### 5.4.5.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.18.1 applies.

#### 5.4.5.2 Limits

The EUT shall comply with the reference limits for Rx Category 1 in ETSI EN 300 220-1 [1], clause 5.18.2.

#### 5.4.5.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.18.3.

Compliance shall be established under normal conditions.

### 5.4.6 Behaviour at high wanted signal level

#### 5.4.6.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.20.1 applies.

#### 5.4.6.2 Limits

The EUT shall comply with the reference limits for Rx Category 1 in ETSI EN 300 220-1 [1], clause 5.20.2.

#### 5.4.6.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.20.3.

Compliance shall be established under normal conditions.

---

## 6 Bi-Directional Communication - Single Frequency

### 6.1 Mode B1 Applicability and Conformance Requirements

Clause 6 applies to equipment in systems using bi-directional communication on a single frequency.

NOTE 1: This clause forms an alternative technical solution to Mode A known as Mode B1.

For Mode B1, equipment shall meet the requirements of clause 4, plus the additional requirements of clause 6.

NOTE 2: For some parameters, conformance with clause 6 will demonstrate conformance with clause 4.

For the purposes of this section, the EUT will consist of two or more parts. The provider shall identify one part as the Message Initiator (MI) and one part as the Message Responder (MR). If only one part is being tested the other part may be replaced by a simulator if necessary.

## 6.2 Bi-directional Communication

### 6.2.1 Applicability

The requirements of clause 6.2 apply to the MI and the MR when working in conjunction.

### 6.2.2 Acknowledgement

#### 6.2.2.1 Description

An acknowledgement (ACK) is a short message sent in the return direction to signal that a forward going message has been received successfully.

#### 6.2.2.2 Limits

The EUT shall be able to demonstrate an acknowledgment (ACK) of message transfer, with a latency of no more than 5 seconds.

#### 6.2.2.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.23.2.

## 6.3 Transmitter Parameters

No additional requirements.

## 6.4 Receiver Parameters

### 6.4.1 Applicability

The requirements of clause 6.4 apply to all receiving equipment that is part of a MR.

### 6.4.2 Adjacent Channel Selectivity

#### 6.4.2.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.16.1 applies.

#### 6.4.2.2 Limits

The adjacent channel selectivity shall be equal to or greater than the limit in table 4.

**Table 4: Adjacent channel selectivity**

Requirement	Limits
Minimum Adjacent Channel Selectivity	$\geq -65$ dBm

#### 6.4.2.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.16.3.

Compliance shall be established under normal conditions.

### 6.4.3 Blocking

#### 6.4.3.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.19.1 applies.

#### 6.4.3.2 Limits

The EUT shall comply with the reference limits for Rx Category 1.5 in ETSI EN 300 220-1 [1], clause 5.19.4.

#### 6.4.3.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.19.6.

Compliance shall be established under normal conditions.

### 6.4.4 Adjacent Channel Saturation

#### 6.4.4.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.17.1 applies.

#### 6.4.4.2 Limits

The receiver saturation at the adjacent channel shall be equal or greater than limit given in table 5.

**Table 5: Receiver saturation at adjacent channel**

Requirement	Limits
Adjacent channel saturation	$\geq -35$ dBm

#### 6.4.4.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.17.3.

Compliance shall be established under normal conditions.

### 6.4.5 Spurious Response Rejection

#### 6.4.5.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.18.1 applies.

#### 6.4.5.2 Limits

The spurious response rejection of the equipment shall be equal to or greater than the limit in table 6.

**Table 6: Spurious response rejection**

Requirement	Limits
Spurious response rejection	$\geq -54$ dBm
NOTE: For spurious response tests separated from the wanted signal by less than 0,1 % of the Operating Frequency, the limits are relaxed by 25 dB.	

#### 6.4.5.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.18.3.

Compliance shall be established under normal conditions.



## 6.4.6 Behaviour at high wanted signal level

### 6.4.6.1 Description

The description in ETSI EN 300 220-1 [1], clause 5.20.1 applies.

### 6.4.6.2 Limits

The wanted performance criterion shall be met with a wanted signal at a level of -15 dBm.

### 6.4.6.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.20.3.

Compliance shall be established under normal conditions.

# 7 Testing for compliance with technical requirements

## 7.1 General

The provisions of ETSI EN 300 220-1 [1], clause 4, shall apply except as varied herein.

## 7.2 Presentation of equipment for testing purposes

The following information shall be stated by the provider in order to assist carrying out the test suites and/or to declare compliance to technical requirements (e.g. technical requirements for which no conformance test is included in the present document).

**Table 7: Declarations to be made by the Provider**

Parameter	Notes
Operating Frequency	One or more operating frequencies
Channel Width, OCW	For each operating frequency
Duty Cycle (operational)	An assessment of maximum DC in normal use
Normal operating voltage	
Minimum operating voltage	Applies to battery operated EUT
Mode A or B1 operation	Whether compliance with Mode A or B1
Environmental Profile	
Test modes	Transmitter test signals the EUT is capable of generating
Antenna type and connection	Whether the EUT has a 50 Ohm antenna port or an integral or dedicated antenna
Antenna gain	Gain in dB, relative to a dipole, where the antenna is not provided as part of the EUT
Declaration of conformity of test sample	Where EUT is provided with a temporary antenna connection
Maximum Duty Cycle (testing)	The maximum permitted DC of the EUT when undergoing testing

## 7.3 Wanted performance criteria

### 7.3.1 Receiver response

For the purpose of the performance tests involving a receiver, the wanted performance criterion is that the receiver shall produce an appropriate output as indicated below:

- after demodulation, a data signal with a bit error ratio of  $10^{-3}$  without correction; or
- after demodulation, a message acceptance ratio of 90 %;
- an appropriate false alarm rate or sensing criteria as declared by the provider.

Where the indicated performance cannot be achieved, the performance criterion used to determine the performance of the receiver shall be declared and published by the provider.

The receiver measurements should be conducted with any Forward Error Correction (FEC) or Automatic Repeat reQuest (ARQ) function disabled. If it is not practical to disable such error correction, a suitable note shall be made in the test report, together with any alternative test method used.

## Annex A (normative): Relationship between the present document and the essential requirements of Directive 2014/53/EU

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.4] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.2].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive and associated EFTA regulations.

**Table A.1: Relationship between the present document and the essential requirements of Directive 2014/53/EU**

<b>Harmonised Standard ETSI EN 300 220-3-1</b>				
The following requirements are relevant to the presumption of conformity under the article 3.2 of Directive 2014/53/EU [i.2]				
<b>Requirement</b>			<b>Requirement Conditionality</b>	
<b>No</b>	<b>Description</b>	<b>Reference: Clause No</b>	<b>U/C</b>	<b>Condition</b>
1	Operating Frequency	4.2.2	U	
2	Tx Effective Radiated Power	4.2.3	U	
3	Tx Duty Cycle	4.2.4	U	
4	Tx Adjacent Channel Power	4.2.5	U	
5	Tx Adjacent Channel Power at extreme test conditions	4.2.5	C	Where Frequency Error test (clause 4.2.6) not carried out
6	Tx Frequency Error	4.2.6	C	For equipment capable of generating an unmodulated carrier
7	Tx Transient Power	4.2.7	U	
8	Unwanted Emissions in the Spurious Domain	4.3.2	U	
9	Tx behaviour under Low Voltage Conditions	4.2.8	C	Applies to transmitters in battery operated equipment
10	Rx Adjacent Channel Selectivity	5.4.2	C	Applies to Mode A MR equipment
11	Rx Adjacent Channel Selectivity	6.4.2	C	Applies to Mode B1 MR equipment
12	Rx Blocking	4.4.2	C	Applies to MI equipment
13	Rx Blocking	5.4.3	C	Applies to Mode A MR equipment
14	Rx Blocking	6.4.3	C	Applies to Mode B1 MR equipment
15	Rx Adjacent Channel Saturation	5.4.4	C	Applies to Mode A MR equipment
16	Rx Adjacent Channel Saturation	6.4.4	C	Applies to Mode B1 MR equipment
17	Rx Spurious Response Rejection	5.4.5	C	Applies to Mode A MR equipment
18	Rx Spurious Response Rejection	6.4.5	C	Applies to Mode B1 MR equipment
19	Rx Behaviour at high wanted signal level	5.4.6	C	Applies to Mode A MR equipment
20	Rx Behaviour at high wanted signal level	6.4.6	C	Applies to Mode B1 MR equipment
21	Acknowledgement	6.2.2	C	Applies to Mode B1 equipment

### Key to columns:

#### Requirement:

<b>No</b>	A unique identifier for one row of the table which may be used to identify a requirement.
<b>Description</b>	A textual reference to the requirement.
<b>Clause Number</b>	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 shall 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".

Presumption of conformity stays valid only as long as a reference to the present document is maintained in the list published in the Official Journal of the European Union. Users of the present document should consult frequently the latest list published in the Official Journal of the European Union.

Other Union legislation may be applicable to the product(s) falling within the scope of the present document.

---

## Annex B (informative): Selection of technical parameters

### B.1 Introduction

ETSI EG 203 336 [i.1] lists candidate technical parameters to be included in a Harmonised Standard aimed at providing a presumption of conformity of radio equipment with the essential requirements in articles 3.1(b) and 3.2 of the Radio Equipment Directive 2014/53/EU [i.2].

Essential requirements are high level objectives described in European Directives. The purpose of the Harmonised Standard is to translate those high level objectives into detailed technical specifications.

This annex provides information regarding selected parameters that may be in or not in the present document.

---

### B.2 Receiver sensitivity

Receiver sensitivity is not specified in the present document in order to allow providers the freedom to tailor equipment to specific circumstances.

For instance, equipment covered by the present document may have to operate in the presence of elevated background electromagnetic noise or in proximity to other transmitters. In such circumstances, specifying a high level of sensitivity may be counter productive to the aim of achieving reliable communications.

Providers should be aware of the situations in which equipment is likely to be used. In particular, it should be noted that frequency bands covered in the present document may be adjacent to bands used by mobile telephones. Other equipment operating in adjacent bands may have out of band emissions falling into bands covered by the present document. In such cases there is a possibility of in-band interference that may affect operation.

---

### B.3 Other receiver parameters

Because sensitivity is not specified, it follows that co-channel rejection is not specified.

Many receiver requirements fall under the general heading of linearity and these are covered in the present document by requirements on blocking performance.

Intermodulation performance is not specified as it is not considered a major failure mechanism. The risk of failure due to second order intermodulation products is considered low because the blocking specification leads to the ability to handle strong out of band signals. The risk of failure due to third order intermodulation products is considered low when equipment is used in bands where low duty cycle is required.

---

### B.4 Listen before talk

Listen before talk is a common spectrum sharing mechanism. It is important for high duty cycle use and/or in high occupancy spectrum. For the purposes of the present document it is considered optional for low duty cycle use in low occupancy spectrum, therefore no requirements have been specified.

Nevertheless, providers are reminded that listen before talk is likely to bring benefits to the equipment using it as well as to other equipment and therefore its use is recommended.

---

## Annex C (informative): Bibliography

- 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".
- EN 50134-5: "Alarm systems - Social alarm systems - Part 5: Interconnections and communications".
- ANSI C63.5 (2006): "American National Standard for Calibration of Antennas Used for Radiated Emission Measurements in Electro Magnetic Interference".
- ITU-R Radio Regulations.
- ETSI TR 103 056: "Electromagnetic compatibility and Radio spectrum Matters (ERM); System Reference Document; Short Range Devices (SRD); Technical characteristics for SRD equipment for social alarm and alarm applications".
- ETSI TS 103 051 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Expanded measurement uncertainty for the measurement of radiated electromagnetic fields".
- ETSI TS 103 052 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiated measurement methods and general arrangements for test sites up to 100 GHz".
- CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".

---

## History

<b>Document history</b>			
V2.1.0	May 2016	EN Approval Procedure	AP 20160801: 2016-05-03 to 2016-08-01