

# ETSI EN 300 220-3-2 V1.1.1 (2017-02)



**Short Range Devices (SRD) operating  
in the frequency range 25 MHz to 1 000 MHz;  
Part 3-2: Harmonised Standard covering the essential  
requirements of article 3.2 of Directive 2014/53/EU;  
Wireless alarms operating in designated LDC/HR  
frequency bands 868,60 MHz to 868,70 MHz,  
869,25 MHz to 869,40 MHz, 869,65 MHz to 869,70 MHz**

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Reference

DEN/ERM-TG28-528

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Keywords

harmonised standard, radio, SRD, testing

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## Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

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.1].

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 3-2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

For non EU countries the present document may be used for regulatory (Type Approval) purposes.

<b>National transposition dates</b>	
Date of adoption of this EN:	27 January 2017
Date of latest announcement of this EN (doa):	30 April 2017
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 October 2017
Date of withdrawal of any conflicting National Standard (dow):	31 October 2018

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## 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.

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## Introduction

The present document is part 3-2 of a multi-part deliverable covering wireless alarm Short Range Devices (SRD) operating in the designated LDC/HR frequency range 868,60 MHz to 868,70 MHz, 869,25 MHz to 869,40 MHz, 869,65 MHz to 869,70 MHz.

The present document is structured as follows:

Clause 2 provides references.

Clause 3 provides definitions of terms and abbreviations used.

Clause 4 provides technical requirements.

Annex A (informative): provides relationship between the present document and essential requirements of Directive 2014/53/EU [i.1].

Annex B (normative): EU designated frequency bands for wireless alarm equipment.

Annex C (informative): Application form for testing.

Annex D (informative): Selection of parameters.

Annex E (informative): Change History.

# 1 Scope

The present document specifies technical characteristics and methods of measurements for LDC/HR wireless alarm equipment types:

- LDC/HR category is defined by the EU Commission Decision 2013/752/EU [i.2] as:

*"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".*

The present document covers equipment intended for fixed, mobile or nomadic use, e.g.:

- stand-alone radio equipment;
- plug-in radio devices intended for use with or within a variety of host systems;
- plug-in radio devices intended for use within combined equipment.

These radio equipment types are capable of operating in the LDC/HR designated frequency bands given in table 1.

**Table 1: Wireless alarm LDC/HR designated frequency bands**

	Frequency band
Transmit and Receive	868,600 to 868,700 MHz
Transmit and Receive	869,250 to 869,400 MHz
Transmit and Receive	869,650 to 869,700 MHz

The present document covers the essential requirements of article 3.2 of Directive 2014/53/EU [i.1] under the conditions identified in annex A.

## 2 References

### 2.1 Normative references

References are specific, identified by date of publication and/or edition number or version number. Only the cited version 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 (V3.1.1) (02-2017): "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] 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.
- [i.2] Commission Decision 2013/752/EU on harmonisation of the radio spectrum for use by short-range devices as amended by subsequent Commission Decisions.
- [i.3] 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.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.
- [i.5] Commission Decision 2000/299/EU on harmonisation of the radio spectrum for use by short-range devices as amended by subsequent Commission Decisions.

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## 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.1] and ETSI EN 300 220-1 [1] apply.

### 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.

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## 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 manufacturer. The equipment shall comply with all the technical requirements of the present document which are identified as applicable in annex A at all times when operating within the boundary limits of the declared operational environmental profile. Normal and extreme tests conditions are defined in ETSI EN 300 220-1 [1], clauses 4.3.3 and 4.3.4.



## 4.2 All equipment conformance requirements

### 4.2.0 Compliance

When an operational frequency band is selected from table B.1 from annex B for the equipment under test, the equipment shall comply with all parameters, exclusions and notes from the row in table B.1 unless a different National Radio Interface applies.

#### 4.2.1 Operating frequency

##### 4.2.1.0 Applicability

Clause 4.2.1 applies to all equipment.

##### 4.2.1.1 Description

For the purpose of the present document, the description in ETSI EN 300 220-1 [1], clause 5.1.1 applies.

##### 4.2.1.2 Limits

The manufacturer may declare either one or more operating frequencies and operating channels.

Operating channel(s) shall be entirely within operational frequency bands allowed by annex B.

##### 4.2.1.3 Conformance

The conformance for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.1.2.

### 4.2.2 Unwanted emissions in the spurious domain

#### 4.2.2.0 Applicability

Clause 4.2.2 applies to all equipment.

#### 4.2.2.1 Description

For the purpose of the present document, the description in ETSI EN 300 220-1 [1], clauses 5.9.1.1 and 5.9.1.2 apply.

#### 4.2.2.2 Limits

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

#### 4.2.2.3 Conformance

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

Conformance shall be established under normal test conditions.

## 4.3 Transmitters conformance requirements

### 4.3.1 Effective Radiated Power

#### 4.3.1.0 Applicability

Clause 4.3.1 applies to all transmitters.

#### 4.3.1.1 Description

For the purpose of the document, the description in ETSI EN 300 220-1 [1], clause 5.2.1 applies.

#### 4.3.1.2 Limits

The effective radiated power shall not be greater than the value allowed in table B.1 from annex B for the chosen operational frequency band(s). The signal shall be located within the operational frequency band.

#### 4.3.1.3 Conformance

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

Conformance shall be established under normal and extreme test conditions.

### 4.3.2 Duty Cycle

#### 4.3.2.0 Applicability

Clause 4.3.2 applies to all transmitters.

#### 4.3.2.1 Description

For the purpose of the present document, the description in ETSI EN 300 220-1 [1], clause 5.4.1 applies.

#### 4.3.2.2 Limits

The Duty Cycle at the operating frequency shall not be greater than values in annex B for the chosen operational frequency band.

#### 4.3.2.3 Conformance

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

### 4.3.3 Maximum Occupied Bandwidth

#### 4.3.3.0 Applicability

Clause 4.3.3 applies to all transmitters.

#### 4.3.3.1 Description

For the purpose of the present document, the description in ETSI EN 300 220-1 [1], clause 5.6.1 applies.

#### 4.3.3.2 Limits

The EUT shall comply with reference limits defined in ETSI EN 300 220-1 [1], clause 5.6.2.

#### 4.3.3.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.6.3.

Conformance shall be established under normal and extreme test conditions.

## 4.3.4 TX Out Of Band Emissions

### 4.3.4.0 Applicability

Clause 4.3.5 applies to all transmitters with OCW > 25 kHz.

### 4.3.4.1 Description

For the purpose of the present document, the description in ETSI EN 300 220-1 [1], clause 5.8.1 applies.

### 4.3.4.2 Limits

The EUT shall comply with reference limits defined in ETSI EN 300 220-1 [1], clause 5.8.2.

### 4.3.4.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.8.3.

Conformance shall be established under normal and extreme test conditions.

## 4.3.5 Transient power

### 4.3.5.0 Applicability

Clause 4.3.5 applies to all transmitters.

### 4.3.5.1 Description

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

### 4.3.5.2 Limits

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

### 4.3.5.3 Conformance

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

Conformance shall be established under normal test conditions.

## 4.3.6 Adjacent Channel Power

### 4.3.6.0 Applicability

Clause 4.3.6 applies to all transmitters with OCW  $\leq$  25 kHz.

### 4.3.6.1 Description

For the purpose of the present document, the description in ETSI EN 300 220-1 [1], clause 5.11.1 applies.

### 4.3.6.2 Limits

Where the Operating Channel is less than or equal to 25 kHz, the power in the adjacent channels shall not exceed the reference limits defined in ETSI EN 300 220-1 [1], clause 5.11.2.

### 4.3.6.3 Conformance

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

Conformance shall be established under normal and extreme test conditions.

## 4.3.7 TX behaviour under Low Voltage Conditions

### 4.3.7.0 Applicability

Clause 4.3.7 applies to battery powered transmitters.

### 4.3.7.1 Description

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

### 4.3.7.2 Limits

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

### 4.3.7.3 Conformance

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

Conformance shall be established under normal test conditions.

## 4.4 Receivers conformance requirements

### 4.4.1 Blocking

#### 4.4.1.0 Applicability

Clause 4.4.1 applies to all receivers.

#### 4.4.1.1 Description

For the purpose of the present document, the description in ETSI EN 300 220-1 [1], clause 5.18.1 applies.

#### 4.4.1.2 Limits

The blocking level shall be better or equal to category 2 reference limits level defined in ETSI EN 300 220-1 [1], clause 5.18.3.

#### 4.4.1.3 Conformance

The conformance tests for this requirement shall be as defined in ETSI EN 300 220-1 [1], clause 5.18.6.

Conformance shall be established under normal test conditions.

## Annex A (informative): 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.1].

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**

Harmonised Standard ETSI EN 300 220-3-2				
Requirement			Requirement Conditionality	
No	Description	Reference: Clause No	U/C	Condition
1	Operating frequency	4.2.1	U	
2	Unwanted emissions in the spurious domain	4.2.2	U	
3	TX Transmitter effective radiated power	4.3.1	U	
4	TX Duty cycle	4.3.2	U	
5	TX Occupied bandwidth	4.3.3	U	
6	TX out of band emissions	4.3.4	C	Applies to EUT with OCW > 25 kHz
7	TX Transient	4.3.5	U	
8	TX Adjacent channel power	4.3.6	C	Applies to EUT with OCW ≤ 25 kHz
9	TX behaviour under low voltage conditions	4.3.7	C	Applies to battery powered EUT
10	RX Blocking	4.4.1	U	

### Key to columns:

#### Requirement:

**No** A unique identifier for one row of the table which may be used to identify a requirement.

**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 unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).

**Condition** Explains the conditions when the requirement is or is not 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 (normative): EU LDC/HR designated frequency bands for wireless alarm equipment

According to Article 8 (2) of Directive 2014/53/EU [i.1], the European Commission has adopted implementing acts establishing the equivalence between notified national radio interfaces and assigning a radio equipment class. So called Class 1 equipment is equipment that can be placed on the market and be put into service without restrictions. The Commission, in consultation with Member States, publishes an indicative and non-exhaustive list of equipment falling within the scope of Class 1. Table B.1 summarizes the relevant parameters in the band 25 MHz to 1 000 MHz from the latest list of class 1 equipment (December 2014). This table is in line with the harmonised frequency bands and technical parameters for short-range devices from EC Decision 2013/752/EU [i.2].

**Table B.1: EU LDC/HR designated frequency bands for wireless alarm**

Frequency Band		Maximum radiated power, e.r.p.	Channel access and occupation rules	OCW	Band number from EC Decision 2013/752/EU [i.2]	Class 1 sub-class number according Commission Decision 2000/299/EU [i.5]
<b>A</b>	868,600 MHz to 868,700 MHz	10 mW e.r.p.	$\leq 1$ % duty cycle	100 kHz or 25 kHz	49	32
<b>B</b>	869,250 MHz to 869,300 MHz	10 mW e.r.p.	$\leq 0,1$ % duty cycle	25 kHz	52	33
<b>C</b>	869,300 MHz to 869,400 MHz	10 mW e.r.p.	$\leq 1$ % duty cycle	25 kHz	53	72
<b>D</b>	869,650 MHz to 869,700 MHz	25 mW e.r.p.	$\leq 10$ % duty cycle	25 kHz	55	34

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## Annex C (informative): Application form for testing

### C.1 Description

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the application form in this annex so that it can be used for its intended purposes and may further publish the completed application form.

The form contained in this annex may be used by the manufacturer to comply with the requirement contained in clause 4 to provide the necessary information about the equipment to the test laboratory prior to the testing. It contains product information as well as other information which might be required to define which configurations are to be tested, which tests are to be performed as well the test conditions.

This application form should form an integral part of the test report.

---

### C.2 Information as required by ETSI EN 300 220-3-2

In accordance with ETSI EN 300 220-3-2, clause 4, the following information is provided by the manufacturer:

- a) **The name of the manufacturer or his trademark:**

.....

- b) **The type equipment designation:**

.....

- c) **The Application(s) of the equipment:**

.....

.....

- d) **The operating frequency(ies):**

.....

.....

- e) **The operational frequency band(s):**

.....

- f) **The operating channel(s) width(s):**

.....

.....

The operating channel is less than or equal to 25 kHz ?

- g) **Maximum radio-frequency power transmitted in the frequency band in which the radio equipment operates:**

.....

- h) **What is the spectrum access mechanism of the equipment?**

Duty cycle

- i) **Is the equipment battery powered?**

Yes  No

j) **Is the equipment frequency agile?**

Yes  No



---

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

### D.1 Introduction

ETSI EG 203 336 [i.3] 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.1].

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.

---

### D.2 Receiver sensitivity

Receiver sensitivity is not specified in the present document in order to allow manufacturers 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.

Manufacturers should be aware of the situations in which equipment is likely to be used. In particular, it should be noted that the band 869,40 MHz to 869,65 MHz may be used by SRDs up to 500 mW. 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.

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### D.3 Other receiver parameters

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

Adjacent channel selectivity is not specified in the present document because only applicable to category 1 receivers.

Receiver saturation is not specified in the present document because only applicable to category 1 receivers.

Spurious response rejection is not specified in the present document because only applicable to category 1 receivers.

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 in order to simplify testing. 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. Manufacturers should assess the risk of intermodulation products when operating adjacent to high occupancy bands.

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## Annex E (informative): Change History

Version	Information about changes
1.1.1	First published version covering Directive 2014/53/EU [i.1]. Major change is: <ul style="list-style-type: none"><li data-bbox="355 421 1374 477">• New multi-part structure of ETSI EN 300 220 which is described in ETSI EN 300 220-1 [1], clause "Foreword".</li></ul>

## History

<b>Document history</b>		
V1.1.0	May 2016	EN Approval Procedure AP 20160801: 2016-05-03 to 2016-08-01
V1.1.1	November 2016	Vote V 20170127: 2016-11-28 to 2017-01-27
V1.1.1	February 2017	Publication