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**5 GHz WAS/RLAN;**
**Harmonised Standard for access to radio spectrum**

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REN/BRAN-230016

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# Foreword

This draft Harmonised European Standard (EN) has been produced by ETSI Technical Committee Broadband Radio Access Networks (BRAN), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI Standardisation Request deliverable Approval Procedure.



The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.2] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU [i.1] 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.

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.

| **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): | 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

5 GHz Wireless Access Systems (WAS) including RLAN equipment are used in wireless local area networks which provide high speed data communications in between devices connected to the wireless infrastructure. The present document also addresses ad-hoc networking where devices communicate directly with each other, without the use of a wireless infrastructure.

The spectrum usage conditions for equipment within the scope of the present document are set out as follows:

- ECC Decision (04)08 [i.6], Commission Implementing Decision (EU) 2022/179 [i.7] amended by Commission Implementing Decision (EU) 2022/2307 [i.8] for sub-band 1, sub-band 2 and sub-band 3 as shown in table 1.
- The operation in sub-band 4 as shown in table B.1 is subject to national frequency usage conditions. Hence, it should be verified whether national frequency usage conditions permit operations in this sub-band in accordance with the present document.

NOTE: An example for national frequency usage conditions is given in UK Interface Requirements IR 2030 [i.12].

# 1 Scope

The present document specifies technical characteristics and methods of measurement for Wireless Access Systems (WAS) including Radio Local Area Network (RLAN) equipment operating in the 5 GHz RLAN band.

The present document specifies spectrum access requirements to facilitate spectrum sharing with other equipment.

Radio equipment capable of operating in all or parts of the service frequency bands given in table 1 is within the scope of the present document.

**Table 1: Service frequency bands**

| | Sub-band 1 | Sub-band 2 | Sub-band 3 |
|---|---|---|---|
| Transmit | 5 150 MHz to 5 250 MHz | 5 250 MHz to 5 350 MHz | 5 470 MHz to 5 725 MHz |
| Receive | 5 150 MHz to 5 250 MHz | 5 250 MHz to 5 350 MHz | 5 470 MHz to 5 725 MHz |

Provisions for radio equipment capable of operating in all or parts of the 5 725 MHz to 5 850 MHz frequency band (sub-band 4 as given in table B.1) are contained in annex B. However, operation in sub-band 4 is subject to national frequency usage conditions. The present document also contains provisions for equipment operating on channels whose nominal channel bandwidth falls partly in sub-band 3 and partly in sub-band 4.

NOTE 1: The technical requirements for equipment operating in the service frequency bands identified in table 1 are contained in the main part of the present document (see clause 4) while the technical requirements for equipment operating in the service frequency band identified in table B.1 are contained in annex B.

NOTE 2: The relationship between the present document and essential requirements of article 3.2 of Directive 2014/53/EU [i.1] is given in annex A.



# 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/.

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

[1] ETSI TS 136 141 (V17.10.0) (07-2023): "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing (3GPP TS 36.141 version 17.10.0 Release 17)".

[2] IEEE 802.11™-2020: "IEEE Standard for Information Technology - Telecommunications and Information Exchange between Systems - Local and Metropolitan Area Networks - Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

## 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.

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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 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.3] ETSI EG 203 367 (V1.1.1) (06-2016): "Guide to the application of harmonised standards covering articles 3.1b and 3.2 of the Directive 2014/53/EU (RED) to multi-radio and combined radio and non-radio equipment".

[i.4] ETSI TR 100 028-1 (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1".

[i.5] ETSI TR 100 028-2 (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2".

[i.6] ECC/DEC/(04)08: "On the harmonised use of the 5 GHz frequency bands for Wireless Access Systems including Radio Local Area Networks (WAS/RLAN)" (approved 9 July 2004, latest amended 1 July 2022).

[i.7] Commission Implementing Decision (EU) 2022/179 of 8 February 2022 on the harmonised use of radio spectrum in the 5 GHz frequency band for the implementation of Wireless Access Systems including Radio Local Area Networks and repealing Decision 2005/513/EC.

[i.8] Commission Implementing Decision (EU) 2022/2307 of 23 November 2022 amending Implementing Decision (EU) 2022/179 as regards designating and making available the 5 150–5 250 MHz, 5 250–5 350 MHz and 5 470–5 725 MHz frequency bands in accordance with the technical conditions set out in the Annex.

[i.9] ETSI TR 102 273-2 (V1.2.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties; Part 2: Anechoic chamber".

[i.10] ETSI TR 102 273-3 (V1.2.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties; Part 3: Anechoic chamber with a ground plane".

[i.11] ETSI TR 102 273-4 (V1.2.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties; Part 4: Open area test site".

[i.12] IR 2030: "UK Interface Requirements 2030; Licence Exempt Short Range Devices".

[i.13] ERC Recommendation 74-01: "Unwanted emissions in the spurious domain" (approved 1998, corrected 23 May 2022).

[i.14] ECC Report 330: "To enable WAS/RLAN use on a national basis in the band 5725-5850 MHz but also ensure the protection of RTTT/Smart Tachograph and radars (including Fast Frequency Hopping) taking into account free circulation of WAS/RLAN" (approved 8 October 2021).

[i.15] ECO Report 06: "Country Determination Capability; National use of the 5725‑5850 MHz frequency band by WAS/RLAN devices with maximum power higher than 25 mW and up to 200 mW e.i.r.p. in CEPT countries" (approved 9 June 2022).

# 3 Definition of terms, symbols and abbreviations

## 3.1 Terms

For the purposes of the present document, the terms given in Directive 2014/53/EU [i.1] and the following apply:

**5 GHz DFS band:** total frequency range within the 5 GHz RLAN band in which DFS is required

NOTE: The 5 GHz DFS band is defined in clause 4.2.6.1.2.

**5 GHz RLAN band:** service frequency bands for WAS/RLAN equipment within the scope of the present document

**ad-hoc mode:** operating mode in which an RLAN device establishes a temporary wireless connection with other RLAN devices without a controlling network infrastructure

**antenna array:** two or more antennas connected to a single device and operating simultaneously

**antenna assembly:** combination of the antenna (integral or dedicated), its coaxial cable and if applicable, its antenna connector and associated switching components

NOTE 1: This term (antenna assembly) refers to an antenna connected to one transmit chain.

NOTE 2: The gain of an antenna assembly G in dBi does not include the additional gain that may result out of beamforming.

**available channel:** usable channel where the radar detection mechanism did not detect radar signals or where radar detection is not required

NOTE: Usable channels whose nominal channel bandwidth falls completely within sub-band 1 can be considered as available channels without further testing.

**backoff procedure:** procedure that facilitates the sharing of the medium by randomizing the transmission attempts from multiple devices competing for access to an operating channel

**beamforming gain:** additional (antenna) gain realized by using beamforming techniques in smart antenna systems

NOTE: Beamforming gain as used in the present document does not include the gain of the antenna assembly.

**burst:** period during which radio waves are intentionally transmitted, preceded and succeeded by periods during which no intentional transmission is made

**channel:** continuous part of the radio-frequency spectrum used for transmission and reception by RLAN devices and identified by a nominal centre frequency and a nominal channel bandwidth

NOTE: An RLAN device is permitted to operate (transmit/receive) in one or more adjacent or non-adjacent channels simultaneously.

EXAMPLE: For the purpose of the present document, an IEEE 802.11™-2020 [2] device operating in 40 MHz may be considered as operating in two adjacent channels simultaneously.

**channel access engine:** mechanism that determines when a transmission attempt is permitted

**channel plan:** list of channels with their nominal centre frequencies and, for each of the centre frequencies, the nominal channel bandwidth(s)