Spectrum Management and Telecommunications

Radio Standards Specification

Radio Local Area Network (RLAN) Devices in the 5925-7125 MHz Band

Canada

Preface

Radio Standards Specification RSS-248, issue 1, *Radio Local Area Network (RLAN) Devices in the 5925-7125 MHz Band*, sets out the certification requirements for licence-exempt low-power RLAN devices operating indoors in the frequency band 5925-7125 MHz .

Inquiries may be submitted by one of the following methods:

1. Online using the General Inquiry form (in the form, select the Directorate of Regulatory Standards radio button and specify "RSS-248" in the General Inquiry field)

2. By mail to the following address:

   Innovation, Science and Economic Development Canada
   Engineering, Planning and Standards Branch
   Attention: Regulatory Standards Directorate
   235 Queen Street
   Ottawa ON K1A 0H5
   Canada

3. By email to ic.consultationradiostandards-consultationnormesradio.ic@canada.ca

Comments and suggestions for improving this standard may be submitted online using the Standard Change Request form or by mail or email to the above addresses.

All spectrum and telecommunications related documents are available on ISED's Spectrum Management and Telecommunications website.

Issued under the authority of
the Minister of Innovation, Science and Industry

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Director General
Engineering, Planning and Standards Branch

Contents

1. Scope

This Radio Standard Specification (RSS) sets out the certification requirements for licence-exempt low-power Radio Local Area Network (RLAN) devices operating indoors in the frequency band 5925-7125 MHz (the 6 GHz band).

RLAN devices with occupied bandwidths that fall into other frequency bands (e.g. 2.4 GHz) shall comply with requirements for each respective band specified in the applicable RSS standard(s).

2. General requirements and references

This section sets out the general requirements and references related to this RSS.

2.1. Coming into force

This document will be in force as of the date of its publication on Innovation, Science and Economic Development Canada's (ISED) website.

2.2. Certification requirements

The RLAN devices covered by this standard are classified as Category I equipment. Either a technical acceptance certificate (TAC) issued by the Certification and Engineering Bureau (CEB) of ISED or a certificate issued by a recognized certification body (CB) is required.

2.3. Licensing requirements

The RLAN devices covered by this standard are exempt from licensing requirements pursuant to section 15 of the *Radiocommunication Regulations*.

2.4. RSS-Gen compliance

Equipment being certified under this standard shall also comply with the general requirements set out in RSS-Gen, *General Requirements for Compliance of Radio Apparatus*.

2.5. Related documents

ISED documents are available on the Published documents page of the Spectrum management and telecommunications web page.

Accepted Knowledge Database (KDB) publications are listed on ISED's Certification and Engineering Bureau website.

The following documents should be consulted in conjunction with this RSS:

SMSE-006-21 *Decision on the Technical and Policy Framework for License-Exempt Use in the 6 GHz Band*

3. Definitions

Access Point: a transceiver that operates as:
- a bridge in a peer-to-peer connection; or
- a connector between the wired and wireless segments of the network; or
- a relay between wireless network segments.

Client Device: a device whose transmissions are under the control of an indoor access point or an indoor subordinate device. Client devices shall not be capable of initiating a network.

Contention-Based Protocol: a protocol allowing multiple users to share the same radio spectrum by defining events that must occur when two or more transmitters attempt to simultaneously access the same radio resource and establishing rules for a reasonable cooperation between transmitters. *Listen Before Talk* is an example of a contention-based protocol.

Indoor Access Point: an access point operating in locations completely enclosed by walls and a ceiling. Indoor access points are not battery powered, have a permanent antenna, have a direct connection to the internet, and do not have a weatherized enclosure.

Indoor Subordinate Device: a device operating under control of an indoor access point. Indoor subordinate devices are not battery powered, have a permanent antenna, do not have a direct connection to the internet, and do not have a weatherized enclosure. Indoor subordinate devices may connect to indoor access points or other indoor subordinate devices within a single building or structure. Indoor subordinate devices shall not be used to connect RLAN devices between separate structures and buildings.

RLAN Device: an indoor access point, an indoor subordinate device or a client device.

4.   Technical and operational requirements for RLAN devices

This section provides the technical and operational requirements for RLAN devices.

4.1. Measurement method

Unless otherwise specified, the measurements shall be performed in accordance with the requirements of RSS-Gen.

4.2. Frequency band

The RLAN devices covered under this standard shall operate in the 5925-7125 MHz frequency band.

4.3. Types of modulation

The RLAN devices shall employ digital modulation.

4.4. Occupied bandwidth

The occupied bandwidth shall not exceed 320 MHz.

4.5. Frequency stability

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the 5925-7125 MHz frequency band when tested at the temperature and supply voltage variations specified in RSS-Gen.

4.6. Transmitter power limits

This section specifies the transmitter power limits.

4.6.1. Measurement requirements

The power of the RLAN device fundamental emissions shall be measured in terms of average value. Measurements shall employ either a resolution bandwidth of 1 MHz or the occupied bandwidth of the RLAN device, whichever is less. A narrower resolution bandwidth may be used in power spectral density measurements, provided that the measured power is integrated over the full reference bandwidth.

4.6.2. Power limits for RLAN devices other than client devices

The following limits shall apply to the RLAN devices other than client devices:
   a. the maximum e.i.r.p. spectral density shall not exceed 5 dBm/MHz; and
   b. the maximum e.i.r.p. shall not exceed 30 dBm/occupied bandwidth.

4.6.3. Power limits for client devices

The following limits shall apply to client devices:
   a. the maximum e.i.r.p. spectral density shall not exceed –1 dBm/MHz; and
   b. the maximum e.i.r.p. shall not exceed 24 dBm/occupied bandwidth.

4.7. Unwanted emissions

This section specifies the unwanted emissions limits.

4.7.1. Measurement requirements

The power of the RLAN device unwanted emissions shall be measured in terms of average value. Measurements shall employ a resolution bandwidth of 1 MHz. A narrower resolution bandwidth may be used, provided that the measured power is integrated over 1 MHz. Measurements of the unwanted emissions shall be performed and reported using the lowest and highest channels that the RLAN device supports.

For purposes of this section, the channel bandwidth is identical to the occupied bandwidth, whereas the channel edge refers to the outermost frequency points that define the channel bandwidth.

If the transmission is in bursts, the provisions of RSS-Gen for pulsed operation shall apply.

4.7.2. Unwanted emissions limits

The following unwanted emissions limits shall apply:
   a. any emissions outside of the 5925-7125 MHz band shall not exceed –27 dBm/MHz e.i.r.p.; and
   b. e.i.r.p. spectral density of unwanted emissions falling into the 5925-7125 MHz band shall be attenuated (in dB) below the reference power spectral density by:
      i.   20 dB at 1 MHz away from the channel edge; and
      ii.   a linearly interpolated value between 20 dB and 28 dB at frequencies between 1 MHz outside of channel edge and one (1) channel bandwidth from the operating channel centre, respectively; and
      iii. 28 dB at one (1) channel bandwidth away from the operating channel centre; and
      iv.   a linearly interpolated value between 28 dB and 40 dB at frequencies between one (1) channel bandwidth from the channel centre and one- and one-half (1.5) times the channel bandwidth away from the operating channel centre, respectively; and
      v.   40 dB at one- and one-half (1.5) times the channel bandwidth away from the channel centre; and
      vi.   a minimum of 40 dB at frequencies that are further away than one and one-half (1.5) times the channel bandwidth from the channel centre;
   c. notwithstanding (a) and (b) above, the RLAN devices are required to comply with the provisions of RSS-Gen with respect to emissions falling within restricted frequency bands; and
   d. any emissions below 1000 MHz shall meet the general field strength limits specified in RSS-Gen; and

e. the RLAN devices designed to be connected to the public utility AC power network shall comply with the AC power-line conducted emissions limits specified in RSS-Gen.

4.8. Contention-based protocol

This section specifies the requirements for contention-based protocol.

4.8.1. Measurement requirements

ISED requires using the FCC KDB Procedure 987594 D02 for demonstrating compliance with the contention-based protocol requirements set out in this section.

4.8.2. Minimum detection threshold power

The RLAN devices shall utilize a contention-based protocol to detect the presence of any emissions on the channel that the RLAN device intends to occupy. The RLAN device must detect within its entire occupied bandwidth a radio frequency power of –62 dBm or lower. The minimum detection threshold power is the received power averaged over a 1 microsecond reference to a 0 dBi antenna.

If an emission is detected, the RLAN device shall vacate the occupied channel and shall not transmit on this channel until the detected radio frequency power is equal to or greater than the -62 dBm threshold.

4.9. Operational requirements

The RLAN devices shall not be used for control of or communications with unmanned aircraft systems.

For the RLAN devices other than client devices, the following requirements shall apply:

a. Operation shall be limited to indoor use only; and
b. Operation on oil platforms, cars, trains, boats, and aircraft shall be prohibited except for operation in the 5925-6425 MHz band in large aircraft while flying above 10,000 ft.

4.10.   User manual requirements

RLAN devices, other than client devices, shall bear statements acknowledging both of the following restrictions in a conspicuous location on the RLAN device and in the user manual:

a. Operation shall be limited to indoor use only; and
b. Operation on oil platforms, cars, trains, boats, and aircraft shall be prohibited except for large aircraft while flying above 10,000 ft.

4.11. Additional requirements

All of the following requirements shall apply to RLAN devices:

a. Devices shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signalling information or the use of repetitive codes where required by the technology.

b. Devices must contain security features to protect against modification of software by unauthorized parties. Manufacturers must implement security features in any RLAN device operating in the 6 GHz band, so that third parties are not able to reprogram the RLAN device to operate outside the parameters for which the RLAN device was certified. The software must prevent the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the RLAN device. Manufacturers may use various means, including the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment certification.

c. Manufacturers must take steps to ensure that the contention-based protocol cannot be disabled by the operator of the RLAN device.