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Spectrum Management and Telecommunications

Radio Standards Specification

Licensed Wireless Microphones

Preface

Radio Standards Specification RSS-123, issue 5, Licensed *Wireless Microphones*, replaces RSS-123, issue 4, *Licensed Wireless Microphones*, dated August 2019.

The following are the main changes:

1. added requirements for operation of WMAS in frequency bands specified in table 2
2. added definition for terms used in this standard in section 4
3. updated the reference for ETSI EN 300 422-1 in section 3.5
4. updated the unwanted emissions requirements for wireless microphones in section 5.3
5. made editorial changes and clarifications, as appropriate

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1. Online using the [General Inquiry](#) form (in the form, select the Directorate of Regulatory Standards radio button and specify “RSS-123” in the General Inquiry field)

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1. Scope

This Radio Standards Specification (RSS) sets out the requirements for the certification of licensed wireless microphones, which includes wireless multichannel audio systems (WMAS), operating in the frequency bands listed in table 1 and table 2, respectively.

2. Purpose and application

This RSS applies to wireless microphones, which includes wireless multichannel audio systems. It also applies to FM transmitters when authorized under certain conditions described in the Client Procedures Circular CPC-2-1-11, [Licensing Procedure for Licensed Wireless Microphones](#).

This standard does not apply to radio apparatus intended for general public broadcasting services, which are subject to [Broadcasting Equipment Technical Standards](#) and [Broadcasting Procedures and Rules](#).

3. General requirements and references

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

3.1 Coming into force and transition period

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

However, a transition period of six months from the publication date is provided. During this transition period, applications for certification under either RSS-123 issue 5 or issue 4, will be accepted. After this period, only applications for the certification of equipment under RSS-123, issue 5, will be accepted, and equipment manufactured, imported, distributed, leased, offered for sale, or sold in Canada shall comply with this present issue.

A copy of RSS-123, issue 4, is available upon request by emailing consultationradiostandards-consultationnormesradio@ised-isde.gc.ca.

3.2 Certification requirements

Equipment subject to this standard is classified as Category I and shall be certified. Either a technical acceptance certificate issued by the [Certification and Engineering Bureau](#) of ISED or a certificate issued by a recognized [certification body](#) is required.

3.3 Licensing requirements

Equipment covered by this standard is subject to licensing requirements pursuant to subsection 4(1) of the [Radiocommunication Act](#).

3.4 RSS-Gen compliance

Equipment being certified under this standard shall comply with the general requirements set out in RSS-Gen, [General Requirements for Compliance of Radio Apparatus](#).

3.5 Normative references

This standard refers to the following publication:

- ETSI EN 300 422-1, *Wireless Microphones; Audio PMSE up to 3 GHz; Part 1: Audio PMSE Equipment up to 3 GHz; Harmonised Standard for access to radio spectrum*

The ETSI standard edition adopted by ISED is posted on the [Normative Test Standards and Acceptable Alternate Procedures](#) web page.

ETSI – European Telecommunications Standards Institute

3.6 Related documents

The following document should be consulted:

- CPC-2-1-11, [Licensing Procedure for Licensed Wireless Microphones](#)

4. Definitions

The following terms are used in this document:

Channel bandwidth: The equipment’s operating bandwidth specified by the manufacturer that contains the information transmitted.

Channel frequency: The frequency at the center of the channel bandwidth.

Wireless microphone: A radio apparatus that combines a microphone with a radio transmitter. For the purpose of this standard, the term “wireless microphone” also includes cue and control communications, audio return feeds such as in-ear monitoring and synchronization of video camera signals.

Wireless multichannel audio system (WMAS): A wireless microphone, utilizing digital broadband transmission techniques, capable of combining multiple wireless microphone signals onto one radio-frequency channel.

5. Transmitter requirements

This section specifies the requirements applicable to radio transmitters subject to this standard.

5.1 Modulation

WMAS shall employ digital modulation.

Wireless microphones other than WMAS may employ any type of modulation. However, the following conditions shall apply:

- when employing amplitude modulation (AM), the modulation index shall not exceed 100%
- when employing frequency modulation (FM), the frequency deviation shall not exceed ± 75 kHz

5.2 Transmitter power, frequency bands, authorized bandwidths and frequency stability limits

Wireless microphones other than WMAS shall meet the conducted power or effective radiated power (e.r.p.), authorized bandwidth and frequency stability limits for the frequency bands specified in table 1. The conducted power or e.r.p. shall be measured in terms of average value.

Table 1: Specifications for wireless microphones other than WMAS

Frequency band (MHz)	Conducted power (W)	e.r.p. (W)	Authorized bandwidth (kHz)	Frequency stability (\pm ppm)
26.10-26.48	—	1	200	50
88-107.5	—	1	200	50
150-174	0.05	—	54	50
450-451	—	1	200	50
455-456	—	1	200	50
941.5-952	1	—	200	20
953-959.85	1	—	200	20
6930-6955	1	—	600	10
7100-7125	1	—	600	10

WMAS shall meet the conducted power, authorized bandwidth and frequency stability limits for the frequency bands specified in table 2. The conducted power shall be measured in terms of average value.

Table 2: Specifications for WMAS

Frequency band (MHz)	Conducted Power (W)	Authorized bandwidth (MHz)	Frequency stability (\pm ppm)
941.5-952	1	10.5	20
953-959.85	1	6.85	20
6930-6955	1	20	10
7100-7125	1	20	10

In addition, the frequency stability of wireless microphones shall be sufficient to ensure that the occupied bandwidth stays within its frequency band of operation when tested to the temperature and supply voltage variations specified in [RSS-Gen](#).

WMAS shall have a mode of operation in which it is capable of transmitting at least three audio channels per megahertz.

5.3 Unwanted emissions

Wireless microphones shall comply with the following emission limits:

- a. For wireless microphones other than WMAS operating in the frequency bands 26.1-26.48 MHz, 88-107.5 MHz, 450-451 MHz and 455-456 MHz, the power of unwanted emissions at any frequency outside the authorized bandwidth shall not exceed -13 dBm. The power of unwanted emissions shall be measured using a detector with a measurement bandwidth specified in [RSS-Gen](#).
- b. For wireless microphones other than WMAS operating in frequency band 150-174 MHz, the power of unwanted emissions shall:
 - i. be attenuated by at least 25 dB below the transmitter output power, P (in dBW), on any frequency removed from the channel frequency by more than 50% up to and including 100% of the authorized bandwidth
 - ii. be attenuated by at least 35 dB below the transmitter output power, P (in dBW), on any frequency removed from the channel frequency by more than 100% up to and including 250% of the authorized bandwidth and
 - iii. not exceed -25 dBm on any frequency removed from the channel frequency by more than 250% of the authorized bandwidth

The power of unwanted emissions shall be measured with a resolution bandwidth of 1% of the authorized bandwidth for limit in 5.3(b(i) and 5.3(b(ii) and of 30 kHz for limit in 5.3(b(iii).

- c. For wireless microphones other than WMAS using analog modulation operating in the 941.5-952 MHz, 953-959.85 MHz, 6930-6955 MHz and 7100-7125 MHz bands, emissions within the band from $2.5 \times B$ below to $2.5 \times B$ above the channel frequency, where B is the channel bandwidth, shall comply with the emission mask specified in figure 1 of section 4.2.4.2.2 of ETSI EN 300 422-1.
- d. For wireless microphones other than WMAS using digital modulation operating in the 941.5-952 MHz, 953-959.85 MHz, 6930-6955 MHz and 7100-7125 MHz bands, emissions within the band from $2.5 \times B$ below to $2.5 \times B$ above the channel frequency, where B is the channel bandwidth, shall comply with the emission mask specified in figure 2 of section 4.2.4.2.2 of ETSI EN 300 422-1.
- e. For WMAS, emissions within the band from $2.5 \times B$ below to $2.5 \times B$ above the channel frequency, where B is the channel bandwidth, shall comply with the emission mask specified in figure 3 of section 4.2.4.2.2 of ETSI EN 300 422-1.
- f. For all wireless microphones, the emissions outside of the emission masks specified in 5.3(c, 5.3(d and 5.3(e shall comply with the limits specified in section 4.2.4.1.2 of ETSI EN 300 422-1.

6. Labelling and user manual requirements

In addition to the labelling requirements outlined in RSS-Gen, FM transmitters operating in the 88-107.5 MHz frequency band shall include a statement in the user manual or on a label with the following text:

“This device requires a license prior to operation and must only be operated on licensed channels.”