



Industry  
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RSS-123  
Issue 2  
February 2011

Spectrum Management and Telecommunications

Radio Standards Specification

# Licensed Low-Power Radio Apparatus

## Preface

Radio Standards Specification RSS-123, Issue 2, *Licensed Low-Power Radio Apparatus*, replaces Issue 1, Revision 2 of RSS-123 (titled *Low Power Licensed Radiocommunication Devices*), dated November 6, 1999.

This document will be in force as of the publication date of Notice SMSE-003-11 in the *Canada Gazette*, Part I. Upon publication, the public has 120 days to submit comments. Comments received will be taken into account in the preparation of the next version of the document.

Listed below are the changes:

1. **Title Page:** The title of this RSS has been changed from *Low Power Licensed Radiocommunication Devices* to *Licensed Low-Power Radio Apparatus*. Throughout the document, the term “radiocommunication equipment” has been replaced with “radio apparatus.”
2. **General:** This RSS has been reformatted and the material common to RSS-Gen, *General Requirements and Information for the Certification of Radio Apparatus*, has been removed. Editorial changes have been performed and sections have been renumbered accordingly.
3. **Section 2.2:** The related documents section has been updated.
4. **Section 2.3:** A description of different types of radio apparatus has been updated.
5. **Section 4.1:** The measurement method has been clarified.
6. **Section 5.1 Frequency Band Allocations:** The 698-806 MHz frequency band has been removed (see SAB-001-10). Specifications for power and frequency stability limits have been modified for devices in certain frequency bands.
7. **Section 5.5.1:** The emission mask for unwanted emissions has been updated for low-power auxiliary equipment.

Issued under the authority of  
the Minister of Industry

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## Contents

<b>1.</b>	<b>Scope</b> .....	<b>1</b>
<b>2.</b>	<b>General Information</b> .....	<b>1</b>
	2.1 Licensing Requirements .....	1
	2.2 Related Documents .....	1
	2.3 Types of Radio Apparatus .....	2
<b>3.</b>	<b>General Requirements</b> .....	<b>2</b>
	3.1 RSS-Gen Compliance .....	2
<b>4.</b>	<b>Measurement Method</b> .....	<b>2</b>
	4.1 Frequency Deviation .....	2
	4.2 Transmitter Output Power .....	3
<b>5.</b>	<b>Transmitter and Receiver Standard Specifications</b> .....	<b>3</b>
	5.1 Frequency Band Allocations .....	3
	5.2 Modulation .....	4
	5.3 Occupied Bandwidth .....	5
	5.4 Transmitter Frequency Stability .....	5
	5.5 Transmitter Unwanted Emissions .....	5
	5.6 Receiver Spurious Emissions .....	6

## 1. Scope

This Radio Standards Specification (RSS) sets out the requirements for certification of licensed low-power radio apparatus operating in the frequency bands listed in tables 1 and 2, such as low-power auxiliary equipment and wireless cameras (both defined in Section 2.3).

## 2. General Information

Radio apparatus certified under this standard is classified as Category I equipment. A technical acceptance certificate (TAC), issued by the Certification and Engineering Bureau of Industry Canada, or a certificate, issued by a recognized Certification Body (CB), is required.

### 2.1 Licensing Requirements

Radio apparatus covered by this RSS is subject to licensing pursuant to subsection 4(1) of the *Radiocommunication Act*.

Inquiries concerning licensing requirements should be directed to Industry Canada's regional and district offices located in the geographical areas where the equipment is intended to be used (see Radiocommunication Information Circular RIC-66, *Addresses and Telephone Numbers of Regional and District Offices of Industry Canada*).

### 2.2 Related Documents

All Spectrum Management and Telecommunications publications are available on the following website: <http://www.ic.gc.ca/spectrum>, under *Official Publications*.

In addition to the related documents specified in RSS-Gen, *General Requirements and Information for the Certification of Radio Apparatus*, the following documents should be consulted:

RIC-66	<i>Addresses and Telephone Numbers of Regional and District Offices of Industry Canada</i>
SAB-001-10	<i>Low-power Licensed Radiocommunication Devices, Including Wireless Microphones, in the Band 698-806 MHz</i>
CPC-2-1-11	<i>Low-power Licensed Radiocommunication Devices</i>

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CPC - Client Procedures Circular

RIC – Radiocommunication Information Circular

SAB - Spectrum Advisory Bulletin

## 2.3 Types of Radio Apparatus

RSS-123 does not apply to radio apparatus intended for general public broadcasting services. Such equipment is regulated by the Department's broadcasting equipment procedures and standards. For the purposes of this standard, the following terms are defined below:

**Low-power auxiliary equipment** consists of wireless microphones, cue and control communications, and synchronization of video camera signals. FM transmitters may also be included in that category, but are restricted and may only be authorized under certain conditions described in Client Procedures Circular CPC-2-1-11.

**Wireless camera** equipment may be authorized under certain conditions described in Client Procedures Circular CPC-2-1-11.

## 3. General Requirements

### 3.1 RSS-Gen Compliance

RSS-123 shall be used in conjunction with RSS-Gen for general specifications and information relevant to the radio apparatus for which this standard applies.

## 4. Measurement Method

### 4.1 Frequency Deviation

In conjunction with the measurement method described in RSS-Gen for the measurement of the output power, the transmitter shall be operated at the manufacturer's rated power and modulated with signals as follows:

- (i) if the audio input signal is voice and the transmitter employs FM, modulate the transmitter with a 2.5 kHz tone at a level 16 dB higher than that required to produce a frequency deviation of 75 kHz, or 50% of the manufacturer's rated deviation, whichever is less; and
- (ii) for transmitters not employing FM, a signal representative (i.e. typical) of those encountered in a real system operation should be used. However, if the transmission is not continuous, this must be so indicated in the test report.

## **4.2 Transmitter Output Power**

### **4.2.1 Low-Power Auxiliary Equipment**

#### **4.2.1.1 Television Broadcasting Bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, 614-698 MHz and 150-174 MHz)**

The transmit power shall be measured in average value ( $P_{\text{MEAN}}$ ) as a conducted emission over any period of continuous transmission.

#### **4.2.1.2 Other Bands (26.10-26.48 MHz, 88-107.5 MHz, 450-451 MHz and 455-456 MHz)**

The transmit power shall be measured in average value ( $P_{\text{MEAN}}$ ) as a radiated emission over any period of continuous transmission.

### **4.2.2 Wireless Cameras**

The transmit power shall be measured in average value ( $P_{\text{MEAN}}$ ) as a radiated emission over any period of continuous transmission for wireless cameras employing FM or a digital modulation.

For any National Television System Committee (NTSC) equipment, measurement shall be carried out as a radiated emission in terms of the peak envelope transmitter power ( $P_{\text{PEAK}}$ ) over a period of continuous transmission. The aural (audio) carrier shall be unmodulated and the visual carrier shall be modulated with normal blanking level synchronizing signals.

## **5. Transmitter and Receiver Standard Specifications**

### **5.1 Frequency Band Allocations**

The bands 26.10-26.48 MHz, 88-107.5 MHz, 150-174 MHz, 450-451 MHz and 455-456 MHz shown in Table 1 are only for wireless microphones (one-way voice communication). These bands are not for data or two-way voice communication. Furthermore, the bands 450-451 MHz and 455-456 MHz are only for auxiliary-to-broadcast use. All the other bands in Table 1 may be used for low-power auxiliary equipment, one- or two-way communication. The bands listed in Table 2 may be used for wireless cameras.

**Table 1: Low-Power Auxiliary Equipment Limits**

<b>Frequency Bands (MHz)</b>	<b>Transmit Power</b>	<b>Authorized Bandwidth</b>	<b>Frequency Stability, Parts/million</b>
26.10-26.48 450-451 455-456	1 W <sup>1</sup>	200 kHz	± 50 ppm
88-107.5 <sup>2</sup>	1 W <sup>1</sup>	Wireless microphones and FM transmitters only: 200 kHz	± 50 ppm
54-72 76-88 174-216	50 mW	200 kHz	± 50 ppm
150-174	50 mW	Wireless microphones only: 54 kHz	± 50 ppm
470-608 614-698	250 mW	200 kHz	± 50 ppm
<p><sup>1</sup> The transmit power limits established in Table 1 for bands 26.10-26.48 MHz, 450-451 MHz, 455-456 MHz and 88-107.5 MHz are effective radiated power (ERP) limits as opposed to the limits for other frequency bands, which are conducted emission limits.</p> <p><sup>2</sup> In the FM broadcasting band, FM transmitters using carrier frequencies 88.1 MHz to 107.5 MHz (spaced 200 kHz apart) may be authorized under certain conditions described in Client Procedures Circular CPC-2-1-11.</p>			

**Table 2: Wireless Camera Limits**

<b>Frequency Bands (MHz)</b>	<b>Effective Radiated Power (Watts)</b>	<b>Authorized Bandwidth</b>	<b>Frequency Stability, Parts/million</b>
54-72 76-88 174-216 470-608 614-698	1 W	6 MHz	± 30 ppm

## 5.2 Modulation

The devices may employ any type of modulation. The type of modulation used shall be reported in the test report.

Low-power auxiliary equipment operating in the bands allocated for TV broadcasting and frequency modulation (FM) radio broadcasting (54-72 MHz, 76-88 MHz, 88-107.5 MHz, 174-216 MHz, 470-608 MHz and 614-698 MHz) using FM may employ a frequency deviation up to a maximum of  $\pm 75$  kHz.

For low-power auxiliary equipment employing amplitude modulation (AM), the modulation shall not exceed 100% on positive or negative peaks.

### **5.3 Occupied Bandwidth**

The occupied bandwidth as defined in RSS-Gen shall not exceed the authorized bandwidth specified in tables 1 and 2.

### **5.4 Transmitter Frequency Stability**

The frequency stability of low-power licensed radio apparatus shall comply with the limits specified in tables 1 and 2 when tested under the frequency stability testing condition specified in RSS-Gen.

### **5.5 Transmitter Unwanted Emissions**

#### **5.5.1 Low-Power Auxiliary Equipment**

The power of unwanted emissions (measured with a resolution bandwidth of 1% of the authorized bandwidth) shall be attenuated below the mean output power,  $P_{\text{MEAN}}$  in dBW, of the transmitter as follows:

- (i) at least 25 dB on any frequency removed from the operating frequency by more than 50% up to and including 100% of the authorized bandwidth; and
- (ii) at least 35 dB on any frequency removed from the operating frequency by more than 100% up to and including 250% of the authorized bandwidth.

The power of unwanted emissions (measured with a resolution bandwidth of 30 kHz) shall be attenuated below the mean output power,  $P_{\text{MEAN}}$  in dBW, of the transmitter as follows:

- (i) at least  $55 + 10\log_{10}(P_{\text{MEAN}}$  in watts) dB: on any frequency removed from the operating frequency by more than 250% of the authorized bandwidth.

#### **5.5.2 Wireless Cameras**

For NTSC equipment, the power spectral density of intermodulation products at  $-4.5$  MHz and  $+9.0$  MHz with respect to the visual carrier shall not exceed  $-36$  dBW/4 kHz. Elsewhere, the power spectral density outside of the channel bandwidth shall not exceed  $-46$  dBW/4 kHz.

For FM and digital modulation, the power spectral density outside of the channel bandwidth shall not exceed  $-46$  dBW/4 kHz.

## **5.6 Receiver Spurious Emissions**

The receiver spurious emissions shall comply with the limits specified in RSS-Gen.

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