Spectrum Management and Telecommunications

Radio Standards Specification

Licensed Low-Power Radio Apparatus
Preface


This document will be in force as of the publication date of Notice SMSE-007-15 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) The requirements of low-power radiocommunication apparatus (i.e. low-power auxiliary equipment and wireless cameras) operating in the television broadcasting bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-698 MHz), have been moved to RSS-210.
(2) The scope of this standard has been updated accordingly with the change mentioned in (1).
(3) Sections for RSS-Gen Compliance, Radio Frequency Exposure and Certification of Radio Apparatus have been included in this standard.
(4) For amplitude modulation (AM), a measurement procedure for transmitter power, authorized bandwidth, frequency stability and modulation depth has been included.
(5) For frequency modulation (FM), a measurement procedure for transmitter power, authorized bandwidth, frequency stability has been included. The measurement procedure for frequency modulation has been included.
(6) The numbering and order of sections have changed.
(7) Minor editorial changes have been made.

Issued under the authority of
the Minister of Industry

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1. **Scope**


2. **General**

2.1 **Purpose and Application**

Low-power apparatus equipment includes 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, *Licensed Low-power 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.

2.2 **RSS-Gen Compliance**

In addition to RSS-123, the requirements in RSS-Gen, *General Requirements for Compliance of Radio Apparatus*, shall be met.

2.3 **Radio Frequency Exposure**

The requirements in RSS-102, *Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)*, must be met.

2.4 **Certification of Radio Apparatus**

The application for equipment certification shall be submitted in accordance with Industry Canada’s Radio Standards Procedure RSP-100, *Certification of Radio Apparatus*. RSP-100 shall be used in conjunction with RSS-Gen and other Radio Standards Specifications (RSSs) specifically applicable to the type of radio apparatus for which certification is being sought.

2.5 **Reference Publications**


The following documents shall be consulted as per the applicable version(s) specified in RSS-Gen, *General Requirements for Compliance of Radio Apparatus*. 

1
2.6 Licensing Requirements

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

Enquiries 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).

3. Measurement Method

3.1 VHF (Band 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.

3.2 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.
3.3 Additional Measurement Method Requirements

In addition to the measurement requirements of sections 3.1 and 3.2, the following measurement requirements shall apply if the modulation scheme addressed herein is used.

3.3.1 Amplitude Modulation (AM)

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:

A test signal at an audio frequency of 1250 Hz shall be applied to the transmitter. Its level shall first be adjusted to obtain a modulation depth of 60%. The test signal’s level shall then be adjusted to 20 dB above the level required to obtain a modulation depth of 60%.

3.3.2 Frequency Modulation (FM)

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:

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.

3.3.3 Other Modulation Schemes

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:

For transmitters not employing either AM or 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. Transmitter and Receiver Standard Specifications

4.1 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 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. Additionally, the band 150-174 MHz may be used for low-power announcement service (LPAS) stations.
Table 1: Low-Power Auxiliary Equipment Limits

<table>
<thead>
<tr>
<th>Frequency Bands (MHz)</th>
<th>Transmit Power $P_{\text{MEAN}}$</th>
<th>Authorized Bandwidth</th>
<th>Frequency Stability, Parts/million</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.10-26.48</td>
<td>1 W (ERP)</td>
<td>200 kHz</td>
<td>± 50 ppm</td>
<td>One-way voice communication</td>
</tr>
<tr>
<td>88-107.5*</td>
<td>1 W(ERP)</td>
<td>200 kHz</td>
<td>± 50 ppm</td>
<td>One-way voice communication or low-power announcement services (LPAS) stations</td>
</tr>
<tr>
<td>150-174</td>
<td>50 mW (conducted)</td>
<td>54 kHz</td>
<td>± 50 ppm</td>
<td>One-way voice communication</td>
</tr>
<tr>
<td>450-451</td>
<td>1 W (ERP)</td>
<td>200 kHz</td>
<td>± 50 ppm</td>
<td>Only one-way voice communication for auxiliary-to-broadcast use</td>
</tr>
<tr>
<td>455-456</td>
<td>1 W (ERP)</td>
<td>200 kHz</td>
<td>± 50 ppm</td>
<td>Only one-way voice communication for auxiliary-to-broadcast use</td>
</tr>
</tbody>
</table>

* 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.

4.2 Occupied Bandwidth

The occupied bandwidth as defined in RSS-Gen shall not exceed the authorized bandwidth specified above in Table 1.

4.3 Transmitter Frequency Stability

The frequency stability of low-power auxiliary equipment shall comply with the limits specified in Table 1 when tested under the frequency stability testing condition specified in RSS-Gen.

4.4 Transmitter Unwanted Emissions

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

4.5 Receiver Spurious Emissions

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

4.6 Modulation

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

4.6.1 Amplitude Modulation (AM)

In addition to the requirements of Section 3.3.1, the following measurement procedure shall be followed:

The frequency of the test signal shall then be varied between 50 Hz and 10 kHz and the modulation depth measured. The modulation depth shall be measured using any appropriate measurement equipment capable of measuring amplitude modulation depth, i.e. modulation analyzer, spectrum analyzer, etc.

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

4.6.2 Frequency Modulation (FM)

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:

A test signal at an audio frequency of 1 kHz shall be applied to the transmitter. Its level shall first be adjusted to obtain a frequency deviation of ±45 kHz. The test signal’s level shall then be adjusted to 20 dB above the level required to obtain a frequency deviation of ±45 kHz. The frequency of the test signal shall then be varied between 50 Hz and 15 kHz. If ±45 kHz is unobtainable, then the maximum deviation shall be used. The maximum deviation shall be
measured using any appropriate measurement equipment capable of measuring frequency deviation (i.e. modulation analyzer, spectrum analyzer, etc.).

Low-power auxiliary equipment operating in the bands allocated for frequency modulation (FM) radio broadcasting (88-107.5 MHz) that uses FM may employ a frequency deviation up to a maximum of ±75 kHz.