General Requirements for Compliance of Radio Apparatus — Limits and Methods of Measurement
Industry Canada Radio Standard Specifications (RSSs) describe the various technical requirements and processes to be followed when demonstrating compliance of radio apparatus that is used for radiocommunication other than broadcasting.

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

List of Changes:

(1) This new issue 4 of RSS-Gen has been entirely modified. There are numerous changes to the content including the numbering of each section. Consequently not all changes may be captured in this list of changes.

(2) The title of the standard has changed from General Requirements and Information for the Certification of Radio Apparatus to General Requirements for Compliance of Radio Apparatus – Limits and Methods of Measurement

(3) Section 3: Normative Reference Publications have been added.

(4) Section 4: Requirement for a waiver has been added.

(5) Section 5: The section on receiver requirements has been revised as per Regulatory Standards Notice; NOTICE 2012-DRS0126

(6) Section 9: Requirements for licence-Exempt radio apparatus are now all included in one section of RSS-Gen which is in addition to the specific requirements in a RSS-200 series standard.

(7) Section 8 Glossary of terms has been removed. Terms and definitions can be found in the normative references and related publications.

(8) Sections 2.4, 3, 5 of issue 3 have been moved to RSP-100 issue 10.
Enquires concerning regulatory radio standards may be directed to the following address:

Industry Canada
Engineering, Planning and Standards Branch
Attention: Regulatory Standards
300 Slater Street
Ottawa, Ontario K1A 0C8

E-mail: res.nmr@ic.gc.ca


Issued under the authority of
The Minister of Industry

Marc Dupuis
Director General
Engineering, Planning and Standards Branch
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1. **Scope**

The Minister of Industry, through the *Department of Industry Act*, the *Radiocommunication Act*, the *Radiocommunication Regulations*, is responsible for establishing technical standards and developing national policies, procedures and standards to ensure effective management of the radio frequency spectrum.

Radio Standards Specification-Gen (RSS-Gen), Issue 4, *General Requirements for Compliance of Radio Apparatus — Limits and Methods of Measurement* (formerly titled *General Requirements and Information for the Certification of Radiocommunication Equipment*), sets out the general requirements for radio apparatus that is used for radiocommunication other than broadcasting. This document must be used in conjunction with other Radio Standards Specifications (RSSs) for compliance with Industry Canada requirements.

2. **Purpose and Application**

This Radio Standards Specification (RSS-Gen) sets out the general requirements applicable to radio apparatus used for radiocommunication other than broadcasting.¹

RSS-Gen must be used in conjunction with the RSS containing the technical requirements applicable to the type of radio apparatus being tested. Except where otherwise specified in the applicable RSS and/or in a Regulatory Standards Notice, radio apparatus shall comply with the specifications and methods prescribed in RSS-Gen.

Enquiries regarding outdated or obsolete documents referenced in an RSS standard should be addressed by e-mail at the following address: res.nmr@ic.gc.ca

2.1 **Radio Frequency Exposure (RSS-102)**

In addition to RSS-Gen, the requirements in Radio Standards Specification RSS-102, *Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)*, shall be met.

2.2 **Radiocommunication Antenna Systems**

Radio equipment that may require the use of an external antenna system, a supporting structure and/or when installing or modifying an antenna system shall reference the process outlined in Client Procedures Circular, CPC-2-0-03, *Radiocommunication and Broadcasting Antenna Systems*.

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¹ The term “broadcasting” refers to any radiocommunication in which the transmissions are intended for direct reception by the general public.
2.3 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*, which sets out the requirements for 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 sought.

2.3.1 Certification Body (CB)

A Certification Body (CB)\(^2\) is an independent domestic or foreign organization that is authorized by the Government of Canada to certify radio equipment to certain Canadian regulatory requirements. CBs are recognized under the terms of mutual recognition agreements/arrangements.\(^3\)

2.4 Categories of Radio Equipment

Radio apparatus are classified into two categories, Category I equipment and Category II equipment.

(i) Category I Equipment

Category I equipment, which is comprised of radio apparatus for which a technical acceptance certificate (TAC) is required, pursuant to subsections 4(2) of the *Radiocommunication Act* and 21(1) of the *Radiocommunication Regulations*. A TAC may be issued by the Certification and Engineering Bureau of Industry Canada (the Bureau) or a certificate may be issued by a recognized Certification Body (CB).

(ii) Category II Equipment

Category II equipment\(^4\) is comprised of radio apparatus for which standards have been prescribed, but for which a TAC is not required. Category II equipment is certification-exempt. Therefore, a TAC from Industry Canada or a certificate from a CB is not required, pursuant to subsection 4(3) of the *Radiocommunication Act*. The manufacturer, importer and/or distributor shall ensure compliance with all applicable procedures and standards for Category II equipment are met.

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\(^2\) A certification body (CB) is designated under an international agreement, convention or treaty to which Canada is party and that is recognized by Canada under that agreement, convention or treaty as competent to certify equipment and issue a certificate, to the effect that the equipment complies with the applicable standards.

\(^3\) Agreements/arrangements are signed by International Trade Canada and are available on their website, http://www.international.gc.ca, under *Trade Negotiations and Agreements*.

\(^4\) See *Radiocommunication Regulations* (SOR/96-484), December 11, 2011.
2.5 Exclusions

2.5.1 Broadcasting Equipment

Radio Standard Specifications do not apply to radio apparatus intended for general public broadcasting services. Furthermore RSSs do not apply to broadcasting equipment, including broadcasting receivers and broadcast satellite receivers. Such equipment is regulated by the Department’s Radio Standards Procedure (RSP-100) and broadcasting equipment standards (BETS).

2.5.2 Interference-Causing Equipment

Interference-causing equipment, which refers to any equipment other than radio apparatus that is capable of causing interference to radiocommunication, is covered by the Department’s Interference-Causing Equipment Standards (ICES).

2.5.3 Radio Apparatus Containing Digital Circuits (ICES-003)

Any radio apparatus that is specifically subject to an Industry Canada Radio Standard Specification (RSS) requirement and contains information technology equipment (ITE device) is not subject to the Interference Causing Equipment Standard, ICES-003 — Information Technology Equipment (ITE) — Limits and methods of measurement standard, provided that the ITE is used only to enable operation of the radio apparatus and that the ITE does not control additional functions or capabilities.

2.6 Determination of Interference

The following applies to all radiocommunication equipment, whether or not the equipment complies with applicable standards and whether or not applicable standards exist for the equipment.

Where the Department determines that a model or several models of equipment cause or are likely to cause interference to radiocommunication or suffer from or are likely to suffer from adverse effects of electromagnetic energy, the Department shall give notice of the determination to persons who are likely to be affected thereby. No person shall manufacture, import, distribute, lease, offer for sale, sell, install or use equipment in respect of which a notice has been given.

Where the Department determines that a unit of equipment causes or suffers from interference or adverse effects of electromagnetic energy, the Department shall order the person(s) in possession or control of the equipment to cease or modify operation of the equipment until such time as it can be operated without causing or being affected by such interference or such adverse effects.
2.7 Related Documents


- CPC-2-0-03 *Radiocommunication and Broadcasting Antenna Systems*
- ICES-003 *Information Technology Equipment (ITE) — Limits and methods of measurement*
- RIC-66 *Addresses and Telephone Numbers of Regional and District Offices of Industry Canada*
- RSP-100 *Certification of Radio Apparatus*
- RSSs *Radio Standards Specifications (RSS)*
- TRC-43 *Designation of Emissions (Including Necessary Bandwidth and Classification), Class of Station and Nature of Service*
3. **Normative Reference Publications**

This regulatory standard (RSS-Gen) refers to the following publication, and where such reference is made, it shall be to the edition listed below. Where there may be discrepancies between the requirements as stated in RSS-Gen or the applicable RSS and the relevant text of the publications referenced in this section, the text in RSS-Gen and/or the applicable RSS shall take precedence.

Methods of measurement not covered by an Industry Canada radio standard specification (RSS) and/or a reference publication may be considered by the Department. Please consult the radio standards group to determine the acceptability of any alternative method of measurement. Send an e-mail to the following address: res.nmr@ic.gc.ca

**(a) Reference Publication for Methods of Measurement**

ANSI C63.4-2014, *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*

ANSI C63.4-2009, *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*

**(b) Reference Publication for Licence-Exempt Radio Apparatus**


**(c) Reference Publication for Licensed Radio Apparatus**

The ASC C63 committee is currently developing ANSI C63.26 for licensed transmitters. Please continue to use the applicable RSS and for any additional enquiries regarding the method of measurement, send an e-mail to the following address: res.nmr@ic.gc.ca

**Note:** Upon the release of ANSI C63.26 *American National Standard for Testing Licensed Transmitters* in 2014, this standard will be considered as a normative method of measurement for licensed transmitters.

A copy of these standards can be purchased online at: [http://www.ieee.org](http://www.ieee.org)

3.1 **Radio Standards Procedure RSP-100, Certification of Radio Apparatus**

Radio Standards Procedure RSP-100, *Certification of Radio Apparatus*, which sets out the requirements for certification of radio apparatus, shall be used in conjunction with RSS-Gen. Compliance with the requirements in RSP-100 is mandatory to obtain equipment certification. See also section 2.3 of this standard.
4. **Application for a Waiver**

A waiver or an exemption to an RSS would only be considered in cases where an applicant has no reasonable alternative or where unique or unusual factual circumstances exist that would serve in the best interest of the consumer or public to exempt the requirements of an RSS.

In order for the Department to proceed with such a request, the applicant must provide the following required information:

1. The original submission for equipment certification with all associated correspondences;
2. A detailed rationale as to why the equipment does not comply with the RSS requirements and why the equipment was rejected or not considered;
3. The technical and operational specifications of the radio apparatus or system, including any additional information that may help in the evaluation; and
4. A detailed rationale of technical feasibility as to why an exemption would benefit consumers and the public.

5. A detailed description as to the nature of the proposal, including the geographic service boundaries;
6. The make, model and frequency range of the radio equipment being used, including how the interoperability works between the US and Canada and outlining what minimum specifications are required;
7. The model/s (statistical analysis, formulas, IEEE papers, etc.) and variables used to calculate spectrum requirements;
8. A complete technical description of the proposed equipment, including the method of transmitter identification, augmented by block diagrams and system coverage maps;
9. A complete description of the operation of the technology chosen, including rationalization for the power levels, antenna types and antenna patterns;
10. The total number of data users, the total number of active users and the total number of mobile and base stations required.
11. For Data Rates and Structure, applicants are asked to provide the following information:

   a. The manufacturer specified raw data rate and throughput;
   b. Which information is carried from mobile-to-base and base-to-mobile;
   c. The time required to transmit and receive information from a mobile or portable data unit;
   d. A diagram of a sample packet, including overhead information as well as total and individual packet byte size; and
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e. The type of modulation technique used to modulate the carrier and the bandwidth required for each channel.

Please send the required information to Industry Canada’s Regulatory Standards office by e-mail at the following address: res.nmr@ic.gc.ca or by postal mail at:

Industry Canada
Regulatory Standards
Engineering, Planning and Standards Branch
Attention: Manager of Regulatory Standards
Industry Canada
365 Laurier Avenue West
Ottawa, Ontario
K1A 0C8 Canada
5 Receivers

Receiver emission limits are detailed in Section 7 of this standard.

5.1 Scanner Receivers

Scanner receivers (analog and digital) require equipment certification and are covered under their own specific RSS.

5.2 Stand-Alone Receivers Operating in the Band 30-960 MHz

A stand-alone receiver is defined as any receiver that is not permanently combined together with a transmitter in a single case (a transceiver), in which it functions as the receiver component of the transceiver.

Stand-alone receivers that operate in the band 30 to 960 MHz shall comply with the limits for receiver spurious emissions set out in RSS-Gen. Testing is required, and the manufacturer, importer or distributor shall ensure that the results are compiled into a test report, to be made available to Industry Canada upon request. Equipment certification is not required for these receivers; however, labelling is required.


5.3 Receivers Excluded From Industry Canada Requirements

Only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz as well as scanner receivers are subject to Industry Canada requirements, as described above. All other receivers are excluded from any Industry Canada certification, testing, labelling and reporting requirements.

However, all receivers in all frequency bands shall comply with the limits set forth in RSS-Gen although no testing, reporting and/or certification may apply.

6. Technical Requirements

Compliance with RSS-Gen and the limits set out in the applicable RSS shall be demonstrated using the methods of measurement described in the publication referenced in Section 3. Where there may be discrepancies between the requirements as stated in RSS-Gen or the applicable RSS and the relevant text of the publications referenced in this section, the text in RSS-Gen and/or the applicable RSS shall take precedence.
6.1 Test Site Facilities

Test site facilities performing measurements on radio apparatus shall be registered with Industry Canada. A test site registration number will be provided that identifies the specific test site facility where testing will take place. The renewal of the test site facilities shall be every 3 years.

For below 1GHz the test site shall comply with the requirements in ANSI C63.4-2009 or ANSI C63.4-2014. Above 1 GHz the test site shall comply with the requirements in CISPR 16-1-4 up to 18 GHz or ANSI C63.4-2014 up to 18 GHz.

The following information shall be submitted to Industry Canada to register or renew an accredited test site facility

A letter providing the following information:
   a) physical location (postal address) of the test site;
   b) Control number or asset number of the test site;
   c) Photos of the test site (inside and out) for which registration/renewal is sought;
   d) Copy of the scope of accreditation indicating ANSI C63.4-2009 or ANSI C63.4-2014 issued by a recognized accreditation body.

There is no fee or form associated with test site registration. Submissions may be filed electronically. The web site address is: [http://www.ic.gc.ca/eic/site/ceb-bhst.nsf/eng/h_tt00016.html](http://www.ic.gc.ca/eic/site/ceb-bhst.nsf/eng/h_tt00016.html)

6.2 Test Report

A test report shall be compiled, listing a record of the tests as well as how their results demonstrate compliance with the technical requirements in RSS-Gen and the applicable RSS. The test report shall indicate the date(s) on which the tests were completed. The test report including the date of testing shall not be dated more than one year old.

The test report shall clearly state which reference publication from Section 3 was used for methods of measurement, including the test methods referenced in the applicable RSS. The test report contents shall be in accordance with Annex A of this standard, the reference publication used from Section 3, including the requirements in Section 6.1 and the applicable RSS.

In the test report the applicant for equipment certification shall include the test site facility registration number and demonstrate that the specific test site used to test a particular model has been accredited to ANSI C63.4-2009 or ANSI C63.4-2014 or a later edition by including the current scope of accreditation in the test report for each model, indicating that the ANSI C63.4 standard is included on the scope and has been accredited by a recognized accreditation body.5

5 A recognized Accreditation Body is an organization that has been recognized under the International Laboratory Accreditation Cooperation (ILAC). ILAC’s members, including contact details, are available on the web at: [https://www.ilac.org](https://www.ilac.org)
6.3  **External Controls**

The device shall not have any external controls accessible to the user that enable it to be adjusted, selected or programmed to operate in violation of the regulatory requirements, including RSS-Gen and the applicable RSSs. Furthermore, information on internal adjustments, reconfiguration or programmability of the device must not be available to the general public.

6.4  **Near Field Measurement Method below 30 MHz**

For measurements below 30 MHz, the field strength may be measured in its near field (i.e. the measurement distance less than wavelength/(2\(\pi\))). The measured field strength shall be extrapolated to the distance specified, using the formula that the field strength varies as the inverse distance square (40 dB per decade of distance). It is also permissible to take measurements at a minimum of two distances on at least one radial to determine the proper extrapolation formula instead of using 40 dB.

Below 1.705 MHz, the magnetic or H-field shall be used in taking the measurement, and the measuring receiver is to be equipped with a loop antenna (rod antennas are not permitted). The permissible limits are given in microamperes/m. The measuring receiver can be calibrated to read in microvolts/m where E/H = 377 is used in the conversion.

6.5  **Measurement Distance above 30 MHz**

At frequencies at or above 30 MHz, exploratory measurements may be performed at a distance other than what is specified in the normative reference publication from Section 3 of this standard. Measurements shall not be taken in the near field, except where it can be shown that near field measurements are appropriate due to the characteristics of the device or where it can be demonstrated that the signal levels needed to be measured at the distance employed in order to be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters, unless it can be demonstrated that measurements at a distance of 30 meters or less are not practical. When performing measurements at a distance other than that which has been specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear distance for field strength measurements).

Final measurements shall be performed in accordance with the normative reference publication from Section 3 of this standard and the applicable RSS.
6.6 Occupied Bandwidth

In circumstances when the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately three times RBW. The video bandwidth shall be set to 3 times the resolution bandwidth.
  **Note:** Video averaging is not permitted.
- A sampling detector shall be used when available. A peak or, peak hold, may produce a wider bandwidth than the actual bandwidth.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is then recorded.

The span between the two recorded frequencies is the 99% occupied bandwidth.

6.7 Transmitter Antenna for Licensed Radio Apparatus

The applicant for equipment certification as per RSP-100, *Procedure for Certification of Radio Apparatus*, must provide a list of all antenna types that may be used with the transmitter, indicating the maximum permissible antenna gain (in dBi).

Testing shall be performed using the highest gain antenna with the transmitter output power set at the maximum level. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device’s antenna shall be stated, based on a measurement or on data from the antenna manufacturer. The RF power, output power setting and spurious emission measurements including the antenna type used shall be stated in the test report.
7. **Receiver Limits**

Compliance with the limits set out in RSS-Gen, as well as in the applicable RSS for the device, shall be demonstrated using the method of measurement that is described in Section 3.

7.1 **Receiver Emission Limits**

Receivers, as defined in Section 5, are required to comply with the limits of spurious emissions as set out in this section. Receiver emission measurements are to be performed as per the normative test method referenced in Section 3.

For emissions below 1000 MHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth. Above 1000 MHz, measurements shall be performed using an average detector with a minimum resolution bandwidth of 1 MHz.
7.1.2 Receiver Radiated Limits

Radiated emission measurements shall be performed with the receiver antenna connected to the receiver antenna terminals. The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

Spurious emissions from receivers shall not exceed the radiated limits shown in Table 2 below:

Table 2: Receiver Radiated Limits

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Field Strength (microvolts/m at 3 metres)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-88</td>
<td>100</td>
</tr>
<tr>
<td>88-216</td>
<td>150</td>
</tr>
<tr>
<td>216-960</td>
<td>200</td>
</tr>
<tr>
<td>Above 960</td>
<td>500</td>
</tr>
</tbody>
</table>

* Measurements for compliance with limits in the above table may be performed at distances other than 3 metres, in accordance with Section 6.5

7.1.3 Receiver Conducted Limits

If the receiver has a detachable antenna of known impedance, an antenna-conducted spurious emissions measurement is permitted as an alternative to radiated measurement. However, the radiated method of Section 7.1.2 is recommended.6

The antenna-conducted test shall be performed with the antenna disconnected and with the receiver antenna terminals connected to a measuring instrument having equal impedance to that specified for the antenna.

The receiver spurious emissions measured at the antenna terminals by the antenna-conducted method shall then comply with the following limits:

Receiver spurious emissions at any discrete frequency shall not exceed 2 nanowatts in the band 30-1000 MHz, nor 5 nanowatts above 1000 MHz.

6 Audit testing performed by the Department to confirm compliance will use the radiated method of measuring receiver spurious emissions. If the radiated limits are exceeded or, as a result of an interference complaint, it is determined that the device’s spurious emissions cause harmful interference to other authorized users of the spectrum, the Department may require that the party responsible for compliance take corrective action. Therefore, it is recommended that the radiated method be employed.
8. **Licence-Exempt Radio Apparatus**

Licence-exempt devices (a.k.a. Unlicensed Wireless Devices) shall be measured using the method of measurement described in the publications referenced in Section 3 that are applicable to licence-exempt devices. Typically technical requirements for licence-exempt radio apparatus are included in the 200 and 300 series of RSS standards.

8.1 **Measurement Bandwidths and Detector Functions**

Unless otherwise specified, for all frequencies equal to or less than 1000 MHz, the emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a CISPR quasi-peak detector function. The measurement bandwidth to be used with the CISPR detector function depends on frequency and is specified in RSS-Gen. As an alternative to CISPR quasi-peak measurements, compliance with the limits can be demonstrated using a peak detector function, properly adjusted for factors such as pulse desensitization as required, with an equal or greater bandwidth relative to the applicable CISPR quasi-peak bandwidth.

If an average measurement is specified for wanted emissions, an average meter having a bandwidth equal to or greater than the emission bandwidth shall be used.

Unless otherwise specified, for all frequencies greater than 1000 MHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using an average detector function having a minimum resolution bandwidth of 1 MHz.

If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for factors, such as pulse desensitization, to ensure that the peak emission is less than 20 dB above the average limit.
8.2 External Amplifiers

Except as set out below, the marketing of RF power amplifiers for use with licence-exempt radio apparatus is prohibited.

External RF power amplifiers may be marketed separately for use with devices certified under RSS-210, Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the Bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz) or for use with devices in the band 5725-5825 MHz certified under Annex 9 (Local Area Network Devices), under the following conditions:

(i) The RF power amplifier shall be certified with the device with which it is intended to be used, such that the amplifier-device combination does not exceed any of the limits specified for the device alone; and

(ii) The RF power amplifier shall be marketed only for use with the device with which it has been certified.

8.3 Transmitter Antenna for Licence-Exempt Radio Apparatus

The applicant for equipment certification as per RSP-100, Procedure for Certification of Radio Apparatus, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum e.i.r.p. (equivalent isotropically radiated power) limits specified in the applicable standard (RSS) for the licence-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level7. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device’s antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

8.4 User Manual Notice for Licence-Exempt Radio Apparatus

User manuals for licence-exempt radio apparatus shall contain the following text, or display an equivalent notice in a conspicuous location either in the user manual or on the device, or both:

This device complies with Industry Canada licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

7 Compliance is required under all operational combinations of transmitter output power and antenna gain.
8.5 Measurement of License-Exempt Devices On-Site (in-situ)

In the case of licence-exempt equipment for which measurements are required to be performed at the end user’s or manufacturer’s location the method of measurement in ANSI C63.10 shall be used.

8.6 Operating Frequency Range of Devices in Master/Slave Networks

Slave devices operating in a master/slave network may be certified if they have the capability of operating outside of the licence-exempt frequency bands permitted for the device by the applicable RSS, provided that they operate only in their permitted licence-exempt frequency bands under the control of a master device. Master devices marketed within Canada must only be capable of operating in licence-exempt frequency bands permitted for the device by applicable Industry Canada standards. Slave devices that can also act as master devices must meet the requirements of a master device. A master device is a device that can operate in a mode in which it is able to transmit without first receiving an enabling signal, and in which it is able to select a channel and initiate a network by sending enabling signals to other devices. A network always has at least one device operating in master mode. A slave device is a device operating in a mode in which the transmissions of the device are under control of the master device. A device in slave mode is not able to initiate a network.

Master devices that use location awareness technology such as GPS or can be connected to a GPS device or using remote technology such as a secure data base to auto configure a certified device for the correct frequency and power levels without user interaction are also authorized to use based upon acceptance by Industry Canada. Such configurations must be capable of ‘locking’ in the correct frequencies, power levels without user override.

8.7 Radio Frequency Identification (RFID) Devices

Active RFID tags that operate from their own source of power and actively transmit identification data when interrogated by an RFID reader device must comply with RSS-210.

Passive RFID tags that do not have their own source of power, but that send identification data by passively returning energy received from an RFID reader’s interrogating signal, may operate without approval from Industry Canada.
8.8 AC Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz, shall not exceed the limits in Table 3.

Unless the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 3 below. The more stringent limit applies at the frequency range boundaries.

The conducted emissions shall be measured in accordance with the reference publication in Section 3.

Table 3: AC Power Line Conducted Emissions Limits

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Conducted limit (dBµV)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quasi-Peak</td>
</tr>
<tr>
<td>0.15–0.5</td>
<td>66 to 56*</td>
</tr>
<tr>
<td>0.5–5</td>
<td>56</td>
</tr>
<tr>
<td>5–30</td>
<td>60</td>
</tr>
</tbody>
</table>

* Decreases with the logarithm of the frequency.
8.9 Transmitter Emission Limits for Licence-Exempt Radio Apparatus

Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 4 or Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter’s fundamental emission.

Table 4: General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Above 30 MHz

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Field Strength (microvolt/m at 3 metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-88</td>
<td>100</td>
</tr>
<tr>
<td>88-216</td>
<td>150</td>
</tr>
<tr>
<td>216-960</td>
<td>200</td>
</tr>
<tr>
<td>Above 960</td>
<td>500</td>
</tr>
</tbody>
</table>

Note: Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.

Table 5: General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Below 30 MHz

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Field Strength (microvolts/m)</th>
<th>Magnetic H-Field (microamperes/m)</th>
<th>Measurement Distance (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-490 kHz</td>
<td>2,400/F (F in kHz)</td>
<td>2,400/377F (F in kHz)</td>
<td>300</td>
</tr>
<tr>
<td>490-1,705 kHz</td>
<td>24,000/F (F in kHz)</td>
<td>24,000/377F (F in kHz)</td>
<td>30</td>
</tr>
<tr>
<td>1.705-30 MHz</td>
<td>30</td>
<td>N/A</td>
<td>30</td>
</tr>
</tbody>
</table>

Note: The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average detector.

8.10 Restricted Frequency Bands

Restricted bands, identified in Table 1, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following restrictions apply:

(a) Fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of Table 1 except for apparatus complying under RSS-287;
(b) Unwanted emissions that fall into restricted bands of Table 1 shall comply with the limits specified in RSS-Gen; and

(c) Unwanted emissions that do not fall within restricted frequency bands shall either comply with the limits specified in the applicable RSS or with those specified in RSS-Gen.
General Requirements for Compliance of Radio Apparatus – Limits and Methods of Measurement

**Table 1: Restricted Frequency Bands**

<table>
<thead>
<tr>
<th>MHz</th>
<th>MHz</th>
<th>MHz</th>
<th>GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.090-0.110</td>
<td>240-285</td>
<td>22.01-23.12</td>
<td>9.0-9.2</td>
</tr>
<tr>
<td>2.1735-2.1905</td>
<td>322-335.4</td>
<td>23.6-24.0</td>
<td>9.3-9.5</td>
</tr>
<tr>
<td>3.020-3.026</td>
<td>399.9-410</td>
<td>31.2-31.8</td>
<td>10.6-12.7</td>
</tr>
<tr>
<td>4.125-4.128</td>
<td>608-614</td>
<td>36.43-36.5</td>
<td>13.25-13.4</td>
</tr>
<tr>
<td>4.17725-4.17775</td>
<td>960-1427</td>
<td>Above 38.6</td>
<td>14.47-14.5</td>
</tr>
<tr>
<td>4.20725-4.20775</td>
<td>1435-1626.5</td>
<td></td>
<td>15.35-16.2</td>
</tr>
<tr>
<td>5.677-5.683</td>
<td>1645.5-1646.5</td>
<td></td>
<td>17.7-21.4</td>
</tr>
<tr>
<td>6.215-6.218</td>
<td>1660-1710</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.26775-6.26825</td>
<td>1718.8-1722.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.31175-6.31225</td>
<td>2200-2300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.291-8.294</td>
<td>2310-2390</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.362-8.366</td>
<td>2655-2900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.37625-8.38675</td>
<td>3260-3267</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.41425-8.41475</td>
<td>3332-3339</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.29-12.293</td>
<td>3345.8-3358</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.51975-12.52025</td>
<td>3500-4400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.57675-12.57725</td>
<td>4500-5150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.36-13.41</td>
<td>5350-5460</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.42-16.423</td>
<td>7250-7750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.69475-16.69525</td>
<td>8025-8500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.80425-16.80475</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.5-25.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.5-38.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>73-74.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>74.8-75.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>108-138</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>156.52475-156.52525</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>156.7-156.9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Certain frequency bands listed in Table 1 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200– and 300– series of RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.
ANNEX A - Test Report Contents
(Normative)

The following list is from ASC C63 and has been amended. The test report shall contain at a minimum the following:

a) Title (identifying the model and testing to which RSS).

b) A date (e.g. January 1st, 1901).

c) The name and postal address of the test facility and the location (postal address) where the tests were actually carried out.

d) The name and postal address of the customer and/or owner of the EUT.

e) The name(s), function(s), and signature(s) or equivalent identification of person(s) responsible for the test report.

f) Unique identification of the test report (such as a test report number).

g) A table of contents, and on every page an apparent identification, so that a page can be recognized as a part of the test report. In addition, a clear identification of the end of the test report shall be included.

h) A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units (system) for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

i) A summary of all the tests listed in the RSS and/or referenced test method as applicable for a specific EUT, with a notation of whether the EUT passed or not.
   (i) the rated transmitter power;
   (ii) the type of modulation with a brief description giving any information useful for the understanding of the device, such as (but not limited to) the bit rate and symbol rate;
   (iii) all frequency band(s) of operation;
   (iv) the occupied bandwidth(s), channel bandwidth(s) and the emission designator(s);
   (v) if the device is pulsed, a graphical representation depicting a typical encoded pulse train showing pulse widths and amplitudes in the time domain, the method of power calculation and the type of detector used during testing shall be reported;
   (vi) the frequency stability and supporting information;
   (vii) a list of all antennas, including relevant information such as (but not limited to) the antenna type and the antenna gain, intended for use and to be tested with the device.
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j) Photographs of the EUT and any manufacturer supplied accessories to be used with the EUT under normal operating conditions that are relevant for the purpose of performing the testing of the EUT.

k) Any tune-up or adjustment procedures that were employed during the testing of the EUT. Identification and description of any operating software/firmware for both the normal operating mode and special test modes for compliance testing.

l) A statement to the effect that the results relate only to the items tested.

m) The measurement uncertainty of the instrumentation.

n) The following information for each test provision deemed applicable:
   (i) All requirements to which the device is tested.
   (ii) Operating conditions for the device under test (including firmware, specific software settings, and input/output signal levels to the EUT).
   (iii) Modifications made to the device (if any).
   (iv) The results of the test in the form of tables, spectrum analyzer plots, charts, sample calculations, and so on, as appropriate for each test procedure.
   (v) The test equipment used identified by type, manufacturer, serial number, or other identification and the date on which the next calibration or service check is due.
   (vi) Description of the firmware or software used to operate EUT for testing purposes.
   (vii) A description and a block diagram of the test setup.
   (viii) Photographs of the test setup where this is relevant for the repeatability of the test results.
   (ix) The name of the person(s) who has performed the testing.
o) Except where otherwise specified, measurements shall be performed for each frequency band of operation for which the radio apparatus is to be certified, with the device operating at the frequencies in each band of operation shown in the Table T1 below. The frequencies selected for measurements shall be reported in the test report.

### Table T1: Frequency Range of Operation

<table>
<thead>
<tr>
<th>Frequency Range over which the device operates</th>
<th>Number of Measurement Frequencies Required</th>
<th>Location of Measurement Frequency in Band of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MHz or less</td>
<td>1</td>
<td>Centre</td>
</tr>
<tr>
<td>1 MHz to 10 MHz</td>
<td>2</td>
<td>1 near high end, 1 near low end</td>
</tr>
<tr>
<td>Greater than 10 MHz</td>
<td>3</td>
<td>1 near high end, 1 near centre and 1 near low end</td>
</tr>
</tbody>
</table>

p) Include additional requirements as required from applicable RSS.