Equipment Operating in the Frequency Bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz
Preface


Changes are listed below:

1) Add the frequency bands 617-652 MHz and 663-698 MHz and the related requirements to the standard.

2) Add a provision for a transition period regarding RSS-130 Issue 1.

3) Change equipment’s effective isotropic radiated power (e.i.r.p.) to effective radiated power (e.r.p.).

4) Clarify that the equipment’s unwanted emission limit shall be met at the highest and lowest frequency of the frequency block range that contains the equipment operating frequencies.

5) Clarify that equipment’s measurement shall be performed only with the carrier frequency set at the lowest frequency and highest frequency in each frequency bands.

6) Add guidance on determining the occupied bandwidth when measuring frequency stability limits for equipment able to transmit numerous channels simultaneously.

7) Remove measurement section on multiple antennas since the measurement method is defined in ANSI C63.26, *American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Service* (referenced in RSS-Gen, *General Requirements for Compliance of Radio Apparatus*).

Issued under the authority of the Minister of Innovation, Science and Economic Development.

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1. **Scope**

This Radio Standard Specification (RSS) sets out certification requirements for all equipment operating in the frequency bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz.

2. **Transition Period**

This document will be in force upon publication on Innovation, Science and Economic Development Canada’s (ISED’s) website. However, a transition period of six (6) months following its publication will be provided, within which certification under RSS-130, Issue 1, or Issue 2, will be accepted. After this period, only applications for certification of equipment under RSS-130, Issue 2, will be accepted. A copy of RSS-130, issue 1, may be requested by email.

3. **General Information and Requirements**

3.1 **Certification**

Equipment covered by this standard is classified as Category I equipment and requires 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).

3.2 **Licensing**

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

3.3 **RSS-Gen compliance**

RSS-130 shall be used in conjunction with RSS-Gen, *General Requirements for Compliance of Radio Apparatus*, for general specifications and information relevant to the equipment covered by this standard.

3.4 **Related documents**

All Spectrum Management and Telecommunications publications are available online under the *Official Publications*

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

SRSP-518  *Technical Requirements for [Mobile Broadband Radio Services] Equipment Operating in the Bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz*

SRSP – Standard Radio System Plan
3.5 Definitions

*Mobile equipment* is equipment that is designed for use while in motion as well as during halts at unspecified points in which the radiating antenna is at least 20 cm apart from the human body.

*Portable equipment* is equipment with an embedded radiating antenna having direct contact with or within 20 cm of the human body.

*Fixed subscriber equipment* is fixed equipment that provides connectivity between the user’s equipment and base station equipment. Fixed subscriber equipment is used at a fixed point and is not operational while in motion.

*Equipment operating frequency range* is the range of frequencies that the equipment is designed to operate.

*Frequency block range* is the range of each group of frequency block(s) that contains the equipment’s operating frequency range.

*Frequency band* is the frequency range assigned for the service to be provided by the equipment (e.g. 617-652 MHz, 663-698 MHz, etc.)

4. Transmitter Standard Specifications

4.1 General

Measurement shall be performed with the equipment’s carrier frequency set at the highest settable frequency and at the lowest settable frequency permitted by the design of the equipment in each frequency block range.

4.2 Types of modulation

Equipment certified under this standard shall employ digital modulation.

4.3 Frequency block

The frequency bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz are divided into small frequency blocks as per SRSP-518. Equipment shall operate according to the frequency plan given in the SRSP.

4.4 Interoperability requirement

[Mobile and portable stations in the bands 617-652 MHz and 663-698 MHz must be capable of operating on all frequencies in these bands using the same air interfaces that the equipment utilizes on any frequencies in the band.]
4.5 Transmitter frequency stability

For equipment which is capable of transmitting numerous channels simultaneously for different applications (e.g. LTE and narrowband – internet of things (IoT)), the occupied bandwidth shall be the bandwidth representing the sum of the occupied bandwidths of these channels.

The frequency stability shall be sufficient to ensure that the occupied bandwidth remains within each frequency blocks range when tested at the temperature and supply voltage variations specified in RSS-Gen.

4.6 Transmitter output power and equivalent radiated power (e.r.p.)

4.6.1 General

The transmitter output power shall be measured in terms of average power. In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

4.6.2 Frequency band 617-652 MHz and 663-698 MHz

The e.r.p. shall not exceed 3 watts for mobile equipment, fixed subscriber equipment and portable equipment.

For base and fixed equipment other than fixed subscriber equipment, refer to SRSP-518 for the equivalent isotropic radiated power (e.i.r.p.) limits.

4.6.3 Frequency band 698-756 MHz and 777-787 MHz

The e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

For base and fixed equipment other than fixed subscriber equipment, refer to SRSP-518 for the e.i.r.p. limits.

4.7 Transmitter unwanted emissions

4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment’s frequency block range, a resolution bandwidth of 30 kHz may be employed.

4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in Section 4.7.1 above, equipment operating in the frequency bands 746-
756 MHz and 777-787 MHz shall also comply with the following restrictions:

(a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

(i) \[76 + 10 \log_{10} p(\text{watts}), \text{dB}, \text{for base and fixed equipment, and} \]
(ii) \[65 + 10 \log_{10} p(\text{watts}), \text{dB}, \text{for mobile and portable equipment.}\]

(b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.
Radio Standards Specification

Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz
Preface


Listed below are the changes:

1. Remove the section on receiver spurious emission as it is covered in RSS-Gen.
2. Add the definition for mobile equipment and portable equipment.
3. Change mobile equipment’s effective isotropic radiated power (e.i.r.p.) to effective radiated power (e.r.p.).
4. Add requirements for portable equipment.

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1. **Scope**

This Radio Standards Specification (RSS) sets out the requirements for certification of transmitters for cellular telephone systems in the bands 824-849 MHz and 869-894 MHz.

2. **Transition Period**

This document will be in force as of its publication on Innovation, Science and Economic Development Canada’s (ISED) website. However, a transition period of six (6) months following its publication will be provided, within which compliance with RSS-132, issue 3 or issue 4, will be accepted. After this period, only applications for certification of equipment that complies with the requirements in RSS-132, issue 4, will be accepted. A copy of RSS-132, issue 3, may be requested by email.

3. **General Requirements and Information**

Equipment certified under this standard is classified as Category I equipment and a technical acceptance certificate (TAC), issued by the Certification and Engineering Bureau of ISED, or a certificate issued by a Certification Body (CB) is required.

3.1 **Licensing requirements**

The equipment covered by this standard is subject to licensing, pursuant to subsection 4(1) of the Radiocommunication Act.

3.2 **RSS-Gen compliance**

RSS-132 shall be used in conjunction with RSS-Gen, General Requirements and Information for the Certification of Radio Apparatus, for general specifications and information relevant to the equipment for which this standard applies.

3.3 **Related documents**

All Spectrum Management and Telecommunications publications are available online under Official Publications.

The following departmental document should be consulted in conjunction with this RSS:

SRSP-503  *Technical Requirements for Cellular Radiotelephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz*

SRSP – Standard Radio System Plan

3.4 **Definitions**

*Mobile equipment* is equipment that is designed for use in motion as well as during halts at unspecified points in which the radiating antenna is at least 20 cm away from the human body.

*Portable equipment* is equipment with an embedded radiating antenna having contact directly with or within
Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz

20 cm of the human body.

4. **General Standard Specifications**

4.1 **External controls**

Section 6.4 of RSS-Gen only applies to mobile equipment and portable equipment, and not to base station equipment that is intended to be under the control of a service provider.

4.2 **Mobile equipment identifier (MEID) or International mobile equipment identity (IMEI)**

The 56-bit MEID developed in 3GPP2 (3rd Generation Partnership Project 2) and the IMEI developed in 3GPP (3rd Generation Partnership Project) will be accepted by ISED as complying with the requirements of this section.

a. Each mobile transmitter in service shall have a unique MEID or IMEI.

b. The MEID or IMEI host component shall be permanently attached to a main circuit board of the mobile transmitter and the unit’s operating software must not be alterable. The MEID or IMEI must be isolated from fraudulent contact and tampering. If the MEID or IMEI host component does not contain other information, that component must not be removable, and its electrical connections must not be accessible. If the MEID or IMEI host component contains other information, the MEID or IMEI must be encoded using one or more of the following techniques:

(i) multiplication or division by a polynomial;
(ii) cyclic coding;
(iii) the spreading of MEID or IMEI bits over various non-sequential memory locations.

c. The MEID or IMEI must be factory set and not alterable, transferable, removable or otherwise able to be manipulated. Cellular mobile equipment must be designed such that any attempt to remove, tamper with, or change the MEID or IMEI chip, its logic system, or firmware originally programmed by the manufacturer will render the mobile transmitter inoperative.

5. **Transmitter Specifications**

5.1 **Frequency sub-bands**

The frequency bands 824-849 MHz and 869-894 MHz are divided into sub-bands as described in SRSP-503. These sub-bands are:

- 824-835 MHz, 835-845 MHz, 845-846.5 MHz, and 846.5-849 MHz for mobile transmit; and
- 869-880 MHz, 880-890 MHz, 890-891.5 MHz, and 891.5-894 MHz for base transmit.

5.2 **Types of modulation**

Equipment certified under this standard shall use digital modulation.
5.3 Frequency stability

The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile and portable equipment and ±1.5 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the occupied bandwidth stays within each of the sub-bands (see Section 5.1) when tested to the temperature and supply voltage variations specified in RSS-Gen.

5.4 Transmitter output power and equivalent radiated power (e.r.p.)

The transmitter output power shall be measured in terms of average power. The e.r.p shall not exceed 7 watts for mobile equipment and 5 watts for portable equipment. Refer to SRSP-503 for base station equivalent isotropic radiated power limits.

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

5.5 Transmitter unwanted emissions

Equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.