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# **Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz**

## Preface

Radio Standards Specification 132, Issue 2, *Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz*, replaces RSS-132, Issue 1 (Provisional) dated August 2002.

RSS-132, Issue 2, must be used in conjunction with RSS-Gen, *General Requirements and Information for the Certification of Radiocommunication Equipment*, for general specifications and information relevant to the equipment for which this Standard applies.

This document will be in force as of the publication date of *Canada Gazette* notice SMSE-011-05, after which the public has 90 days to make comments. Comments received will be considered and a new issue or a revised version of this issue may be developed.

Listed below are the main changes:

1. General reformatting, editorial changes and updating were carried out to reflect current practices. Material common to most RSSs was moved to RSS-Gen.
2. The “Transmitter Unwanted Emissions” section (Section 4.5) was updated to include a new unwanted emission mask after the first 1.0 MHz from frequency block edge for equipment with emission bandwidth greater than 4 MHz.
3. A new alternative unwanted emission mask (Section 4.5) was added for base station equipment with emission bandwidth greater than 4 MHz based on the 1.5 MHz separation from the frequency block edge. The new mask is equivalent to current Universal Mobile Telecommunication System (UMTS) base station specifications.
4. The spurious emission limit (using the radiated measurement method) for receivers at frequencies above 1610 MHz has been abolished. The 960-1610 MHz limit is now applicable to all receiver spurious emissions at frequencies above 960 MHz as per RSS-Gen.

Issued under the authority of  
the Minister of Industry

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## 1. Scope

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

Standards for AMPS, TDMA and CDMA cellular equipment in the 800 MHz band are provided in RSS-118, RSS-128 and RSS-129, respectively.

## 2. General Information

Cellular equipment is classified as Category I equipment, and a technical acceptance certificate (TAC), issued by the Certification and Engineering Bureau of Industry Canada, or a certificate issued by a Certification Body (CB) is required.

### 2.1 Licensing Requirements

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

### 2.2 Related Documents

In addition to related documents specified in RSS-Gen, the following Industry Canada documents should be consulted:

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

RSS-210     *Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment*

## 3. General Standard Specifications

### 3.1 External Controls

Section 5.3 of RSS-Gen only applies to mobile station equipment, and not to base station equipment that is intended to be under the control of a service provider.

### 3.2 Electronic Serial Numbers (ESN)

The electronic serial number (ESN) is a 32-bit number which uniquely identifies a cellular mobile station to any cellular system. (**Note:** Other ESN schemes may be considered by Industry Canada).

- a. Each mobile transmitter in service must have a unique ESN.

- b. The ESN host component must be permanently attached to a main circuit board of the mobile transmitter and the integrity of the unit's operating software must not be alterable. The ESN must be isolated from fraudulent contact and tampering. If the ESN host component does not contain other information, that component must not be removable, and its electrical connections must not be accessible. If the ESN host component contains other information, it must be encoded using one or more of the following techniques:
- multiplication or division by a polynomial;
  - cyclic coding;
  - the spreading of ESN bits over various non-sequential memory locations.
- c. The ESN 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 ESN chip, its logic system, or firmware originally programmed by the manufacturer will render the mobile transmitter inoperative.

### **3.3 Cordless-mode Cellular Base Stations (CCBS)**

Cordless-mode cellular base stations (CCBS) are permitted. The CCBS is intended to form a cordless telephone system in conjunction with a cellular handset or handsets. The communication between the handsets and the CCBS will use the service provider's cellular frequency band. Such a cordless system is intended for short range and/or in-building usage. When the CCBS is certified (according to the requirements of this RSS), operation is permitted under the cellular service provider's licence.

The CCBS shall also comply with this RSS as well as with the standard CS-03 and be certified under both the radio certification procedure outlined in RSP-100 and the terminal attachment program procedure of DC-01.

The CCBS and the handset shall incorporate a security code of a minimum of 8 bits or equivalent to prevent unintentional line seizure, dialling or ringing. While a description of the implementation of the code is required, the implementation need not be tested. If more details are required, please see the Section 2.4, "Cordless Telephones (General Conditions)", in RSS-210.

The RF output power shall not exceed a level that is required for reliable communication.

The applicant for certification shall provide a letter from one of the appropriate cellular service providers (i.e. Mobility Canada, Roger Wireless, TELUS Mobility) stating that the CCBS authorization protocol has been tested and found to work satisfactorily.

An authorization protocol shall be put in place to allow the operation of the CCBS, based on the following principles:

- a. The CCBS shall be controlled by the network of the cellular service provider in order to receive permission to operate. The controlling mechanism may be provided by wireline or wireless facilities. The operation of a CCBS must only be on frequencies within the frequency sub-band assigned for use to the cellular service provider (and not just the cell site frequencies) and must operate only within the radio service coverage of the network by which the CCBS is controlled.

- b. Upon reception of permission to operate from the network and under no other circumstances, a CCBS will enable its transmitter to permit communication with any associated certified handset, and provide service, using the frequency spectrum and operating parameters specified and/or permitted by the cellular service provider.
- c. Until authorized for service by the network, neither the CCBS nor the handset shall be able to transmit in their cordless mode.

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

### **4.1 Channelling Arrangements**

Equipment certified under this Standard may employ any channelling arrangement that which is deemed suitable by the service provider, however, such a channelling arrangement shall meet all relevant conditions specified in SRSP-503.

### **4.2 Types of Modulation**

Equipment certified under this Standard shall use digital modulation; however supervisory and other control function signals may use any type of modulation technique. The type of modulation used shall be reported.

### **4.3 Frequency Stability**

The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations and  $\pm 1.5$  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 emission bandwidth stays within the authorized frequency block, when tested to the temperature and supply voltage variations specified in RSS-Gen.

### **4.4 Transmitter Output Power**

The transmitter output power shall not exceed the limits given in SRSP-503.

### **4.5 Transmitter Unwanted Emissions**

#### **4.5.1 Out-of-block Emissions**

Mobile and base station equipment with emission bandwidth less than or equal to 4 MHz shall comply with 4.5.1.1. Mobile station equipment with emission bandwidth greater than 4 MHz shall comply with 4.5.1.2. Base station equipment with emission bandwidth greater than 4 MHz shall comply with either 4.5.1.2 or 4.5.1.3.

4.5.1.1 In the first 1.0 MHz band immediately outside and adjacent to the licensee’s frequency block, the power of emissions per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least  $43 + 10 \log_{10}(P)$ , dB. After the first 1.0 MHz, the power of emissions shall be attenuated below the transmitter output power by at least  $43 + 10 \log_{10}(P)$ , dB, in any 100 kHz bandwidth.

4.5.1.2 In the first 1.0 MHz band immediately outside and adjacent to the licensee’s frequency block, the power of emissions per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least  $43 + 10 \log_{10}(P)$ , dB. After the first 1.0 MHz, the power of emissions shall be attenuated below the transmitter output power by at least  $43 + 10 \log_{10}(P)$ , dB, in any 1 MHz bandwidth.

4.5.1.3 Base station equipment with emission bandwidth greater than 4 MHz may, in lieu of 4.5.1.2, comply with the following:

In the first 1.5 MHz immediately outside and adjacent to the licensee’s frequency block, the power of emissions at offset dF shall be less than the maximum level specified in Table 1.

**Table 1: Spectrum Emission Mask of Base Station**

| <b>dF = separation between edge of licensee’s block and measurement band</b> | <b>Maximum Level (dBm)</b> | <b>Measurement Bandwidth (kHz)</b> |
|--|----------------------------|------------------------------------|
| 0-0.2 MHz  | -14                        | 30                                 |
| 0.2-1.0 MHz  | $-(14 + 15(dF-0.2))$       | 30                                 |
| 1.0-1.5 MHz  | -26                        | 30                                 |

After the first 1.5 MHz, the power of emissions shall be attenuated below the transmitter output power by at least  $43 + 10 \log_{10}(P)$ , dB, in any MHz of bandwidth.

**4.5.2 Additional Out-of-block Suppression**

Since unwanted emissions are not necessary for the purpose of communication, Industry Canada may require service providers to take corrective action should it be found that out-of-block emissions cause harmful interference to other users. SRSP-503 should be consulted, as it contains special requirements with respect to certain band edges, for coexistence with adjacent band services.

**4.6 Receiver Spurious Emissions**

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