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RSS-133

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Spectrum Management and Telecommunications

Radio Standards Specification

# **Personal Communications Service Equipment Operating in the Bands 1850- 1915 MHz and 1930-1995 MHz**

## Preface

Radio Standards Specification RSS-133, issue 7, *Personal Communications Service Equipment Operating in the Bands 1850-1915 MHz and 1930-1995 MHz*, replaces RSS-133, issue 6, amendment 1, *2 GHz Personal Communications Services*, dated January 18, 2018.

The following are the main changes:

1. added maximum transmitter power requirements for fixed station, base station and subscriber equipment in [table 2](#)
2. added total radiated power requirements for active antenna system (AAS) equipment in table 2 and for unwanted emissions in [section 5.6](#)
3. added definitions to clarify the terms used
4. removed the section on receiver spurious emission, as it is a requirement found in [RSS-Gen](#)
5. removed requirements for mobile equipment identifier (MEID) and international mobile equipment identity (IMEI) as they are no longer required
6. modernized to reflect the current Radio Standards Specification structure
7. made editorial changes and clarifications, as appropriate

Inquiries may be submitted by one of the following methods:

1. Online using the [General Inquiry](#) form (in the form, select the Directorate of Regulatory Standards radio button and specify “RSS-133” in the General Inquiry field)

2. By mail to the following address:

Innovation, Science and Economic Development Canada  
Engineering, Planning and Standards Branch  
Attention: Regulatory Standards Directorate  
235 Queen St  
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3. By email to [consultationradiostandards-consultationnormesradio@ised-isde.gc.ca](mailto:consultationradiostandards-consultationnormesradio@ised-isde.gc.ca)

Additional information and guidance is available on the Innovation, Science and Economic Development Canada (ISED) web pages [Common Questions and Answers](#) and [General Notices](#)

Comments and suggestions for improving this standard may be submitted online using the [Standard Change Request](#) form, or by mail or email to the above addresses.

All ISED publications related to spectrum management and telecommunications are available on the [Spectrum management and telecommunications](#) website.

Issued under the authority of  
the Minister of Innovation, Science and Industry

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Director General  
Engineering, Planning and Standards Branch

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## 1. Scope

This Radio Standards Specification (RSS) sets out the certification requirements for Personal Communications Service (PCS) equipment operating in the bands 1850-1915 MHz and 1930-1995 MHz.

## 2. Purpose and application

This RSS applies to base station, fixed station and subscriber equipment operating in the bands 1850-1915 MHz and 1930-1995 MHz.

## 3. General requirements and references

This section sets out the general requirements and references related to this RSS.

### 3.1 Coming into force and transition period

This document will be in force as of the date of its publication on Innovation, Science and Economic Development Canada's (ISED) website.

However, a transition period of six months from the publication date is provided. During this transition period, applications for certification under either RSS-133, issue 7, or issue 6, amendment 1, will be accepted. After this period, only applications for the certification of equipment under RSS-133, issue 7, will be accepted, and equipment manufactured, imported, distributed, leased, offered for sale, or sold in Canada shall comply with this present issue.

A copy of RSS-133, issue 6, amendment 1, is available upon request by emailing [consultationradiostandards-consultationnormesradio@ised-isde.gc.ca](mailto:consultationradiostandards-consultationnormesradio@ised-isde.gc.ca).

### 3.2 Certification requirements

Equipment covered by this standard is classified as Category I equipment and shall be certified. Either a technical acceptance certificate (TAC) issued by ISED's Certification and Engineering Bureau or a certificate issued by a recognized [certification body](#) (CB) is required.

### 3.3 Licensing requirements

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

### 3.4 RSS-Gen compliance

Equipment being certified under this standard shall comply with the general requirements set out in RSS-Gen, [General Requirements for Compliance of Radio Apparatus](#).

### 3.5 Related documents

All ISED publications related to spectrum management and telecommunications are available on the [Spectrum management and telecommunications](#) website. In addition to related documents specified in RSS-Gen, refer to the following documents as needed:

- SRSP-510, [Technical Requirements for Personal Communications Services \(PCS\) in the Bands 1850-1915 MHz and 1930-1995 MHz](#)

#### Acronyms

SRSP: Standard Radio System Plan

## 4. Definitions

The following terms are used in this document:

#### **Active antenna system (AAS)**

An antenna system where the amplitude and/or phase between antenna elements is dynamically adjusted, resulting in an antenna pattern that varies in response to short-term changes in the radio environment. An AAS may be integrated into a fixed station or base station. An antenna system used for long-term beam shaping, such as fixed electrical down tilt, is not considered an AAS.

#### **Active antenna system (AAS) base station equipment**

Base station equipment using an AAS.

#### **Base station equipment**

Equipment that provides network connectivity to, as well as management and control of, the subscriber equipment.

#### **Channel bandwidth**

The equipment's operating bandwidth specified by the manufacturer that contains the information transmitted.

#### **Channel frequency**

The frequency at the center of the channel bandwidth.

**Fixed station equipment**

Radio station equipment authorized to operate at a fixed point.

**Fixed subscriber equipment**

Subscriber equipment that is used at a fixed location, by the nature of its design. Fixed station, portable, mobile, and nomadic equipment are not considered fixed subscriber equipment.

**Frequency block**

A portion of spectrum within a frequency band that can typically be assigned to operators.

**Frequency block group**

A continuous frequency range of one or multiple contiguous frequency blocks that contain the equipment's channel bandwidth specified by the manufacturer.

**Non-active antenna system (non-AAS)**

An antenna system that does not meet the definition of an AAS.

**Non-AAS base station equipment**

Base station equipment with a non-AAS.

**Subscriber equipment**

Equipment that provides connectivity between the user and the base station equipment. It includes, but is not limited to, mobile, portable, nomadic and fixed subscriber equipment.

**Total radiated power (TRP)**

The integral of the power transmitted by all radiating elements in different directions over the entire radiation sphere.

**5. Transmitter requirements**

This section sets out the requirements applicable to radio transmitters.

**5.1 Measurement methods**

Unless otherwise specified, all measurements shall be performed in accordance with the requirements of RSS-Gen.

Alternate measurement procedures or standards are listed on ISED's [Normative Test Standards and Acceptable Alternate Procedures](#) website and may be used to demonstrate compliance with the TRP limits.

The equipment shall comply with the specified requirements while performing measurements for all operating channel bandwidths specified by the manufacturer.

If the transmitter is designed for a multi-carrier operation, the tests shall be carried out using both the maximum and minimum number of carriers intended for the equipment.

## 5.2 Band plan

The bands 1850-1915 MHz and 1930-1995 MHz are divided into 11 paired frequency blocks as shown in table 1. Frequency blocks may be aggregated to form a frequency block group. SRSP-510, [Technical Requirements for Personal Communications Services \(PCS\) in the Bands 1850-1915 MHz and 1930-1995 MHz](#), contains the detailed band plan.

**Table 1: Paired frequency blocks in the 1850-1915 MHz and 1930-1995 MHz bands**

Block	Lower sub-band (MHz)	Upper sub-band (MHz)	Total spectrum (MHz)
A	1850-1865	1930-1945	30
D	1865-1870	1945-1950	10
B1	1870-1875	1950-1955	10
B2	1875-1880	1955-1960	10
B3	1880-1885	1960-1965	10
E	1885-1890	1965-1970	10
F	1890-1895	1970-1975	10
C1	1895-1900	1975-1980	10
C2	1900-1905	1980-1985	10
C3	1905-1910	1985-1990	10
G	1910-1915	1990-1995	10

## 5.3 Types of modulation

The modulation used shall be digital.



#### 5.4 Frequency stability

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested to the temperature and supply voltage variations specified in RSS-Gen.

#### 5.5 Transmitter output power

The maximum power spectral density of the equipment, measured in terms of average values, shall comply with the limits specified in table 2. These limits are either specified in terms of equivalent isotropically radiated power (e.i.r.p.) or TRP for the purpose of certification and may not apply to all deployment scenarios. Consult SRSP-510 for more deployment details in the bands 1850-1915 MHz and 1930-1995 MHz.

AAS equipment with eight antenna elements or less can demonstrate compliance with the e.i.r.p limit specified for non-AAS equipment in table 2, instead of the TRP limit.

**Table 2: Maximum power spectral density of equipment**

Equipment type	Maximum power spectral density
Non-AAS fixed station and base station	3280 W/MHz e.i.r.p
AAS fixed station and base station	46 dBm/MHz TRP
Subscriber equipment	2 W /channel bandwidth e.i.r.p

In addition, the peak-to-average power ratio (PAPR) of the equipment 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.

#### 5.6 Unwanted emission limits

Unwanted emissions shall be measured in terms of average values while the transmitter is operating at the manufacturer's rated power and modulated as specified in RSS-Gen.

Equipment shall meet the unwanted emission limits, specified in table 3, outside each frequency block group. For each channel bandwidth supported by the equipment under test, the unwanted emissions shall be measured and reported for two channel frequencies: one located as close as possible to the low end and one located as close as possible to the high end of the equipment's operating frequency range.

For the unwanted emission limits, in the 1 MHz bands immediately outside and adjacent to the frequency block group, the power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth (OBW). Beyond these 1 MHz bands, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth may be used, provided that the

measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% of the OBW, as applicable.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors), where applicable, of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in the table 3.

**Table 3: Unwanted emission limits for all equipment**

<b>Offset frequency from the edge of the frequency block group (MHz)</b>	<b>Unwanted emission limit</b>
$\leq 1$	-13 dBm/(1% of OBW)
$> 1$	-13 dBm/MHz