Innovation, Science and Economic Development Canada
Innovation, Sciences et Développement économique Canada

RSS-139
Issue 4
February 8, 2022
Draft 1

Spectrum Management and Telecommunications

Radio Standards Specification

Advanced Wireless Services (AWS) Equipment Operating in the Bands 1710-1780 MHz and 2110-2200 MHz

Aussi disponible en français - CNR-139

Canada

Preface

Radio Standards Specification RSS-139, Issue 4, *Advanced Wireless Services (AWS) Equipment Operating in the Bands 1710-1780 MHz and 2110-2200 MHz,* replaces RSS-139, Issue 3, *Advanced Wireless Services (AWS) Equipment Operating in the Bands 1710-1780 MHz and 2110-2180 MHz,* dated July 16, 2015.

The main changes are listed below:

1. Added the frequency range 2180-2200 MHz to the standard. As such, title is updated accordingly.

2. Added definitions to clarify terms used within the standard.

3. Removed the Mobile Equipment Identifier and International Mobile Equipment Identity requirements as they are no longer required.

4. Incorporated some requirements previously contained in SRSP-513 and SRSP-519.

5. Modernized to reflect the current Radio Standard Specification structure.

6. 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-139" 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 Street
   Ottawa ON K1A 0H5
   Canada

3. By email to consultationradiostandards-consultationnormesradio@ised-isde.gc.ca

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 spectrum and telecommunications related documents are available on ISED's Spectrum Management and Telecommunications website.

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

_____

Martin Proulx
Director General
Engineering, Planning and Standards Branch

Contents

1. Scope

This Radio Standards Specification (RSS) sets out the requirements for the certification of transmitters used in radiocommunication systems to provide Advanced Wireless Services (AWS) in the bands 1710-1780 MHz and 2110-2200 MHz.

2. Purpose and application

This RSS applies to base station, fixed and subscriber equipment operating in the bands 1710-1780 MHz and 2110-2180 MHz, with the frequency blocks specified in section 5.2. and ATC base station equipment operating in the band 2180-2200 MHz (AWS-4).

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 (6) months from the publication date will be provided. During this transition period, applications for certification under either RSS-139 issue 3 or issue 4 will be accepted. After this period, only applications for the certification of equipment under RSS-139 issue 4 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-139, issue 3, is available upon request by email.

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 the Certification and Engineering Bureau (CEB) of ISED or a certificate issued by a recognized certification body (CB) is required.

Ancillary terrestrial component (ATC) equipment operating in the band 2000-2020 MHz, as well as mobile satellite service equipment shall be certified under RSS-170, *Mobile Earth Stations and Ancillary Terrestrial Component Equipment Operating in the Mobile-Satellite Service Bands*.

3.3 Licensing Requirements

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

3.4 RSS-Gen compliance

Equipment being certified under this standard shall also comply with the general requirements set out in RSS-Gen, *General Requirements for Compliance of Radio Apparatus*.

3.5 Related Documents

ISED documents are available on the Published documents page of the Spectrum management and telecommunications web page.

The following ISED documents should be consulted:

SRSP-513 *Technical Requirements for Advanced Wireless Services (AWS) in the Bands 1710-1780 MHz and 2110-2180 MHz*

SRSP-519 *Technical Requirements for the Ancillary Terrestrial Component (ATC) of Mobile-Satellite Service (MSS) Systems Operating in the Bands 2000–2020 MHz and 2180–2200 MHz*

_____
SRSP – Standard Radio System Plan

4. Definitions

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. AAS may be integrated in a fixed or base station. Antenna systems used for long-term beam shaping such as fixed electrical down tilt are not considered an AAS.

Active Antenna System (AAS) base station: A base station equipment with AAS.

Fixed subscriber equipment: A fixed equipment that provides connectivity between the user's equipment and base station equipment. Fixed subscriber equipment is used at a fixed location and is not operational while in motion. It is not considered fixed point-to-point equipment.

Frequency block: A block of frequency in the bands 1710-1780 MHz and 2110-2200 MHz, as defined in Tables 1 and 2 of section 5.2, below.

Frequency block group: A continuous frequency range of multiple frequency blocks that contains the equipment's channel bandwidth.

Non-active antenna system (non-AAS): An antenna system that does not meet the definition of AAS.

Non-AAS base station: A base station with a non-AAS.

Subscriber equipment: An equipment that is either mobile or portable.

Total Radiated Power (TRP): The integral of the power transmitted by an antenna, in different directions over the entire radiation sphere.

5. Transmitter requirements

This section sets out the requirements applicable to radio transmitters subject to this standard.

5.1 Measurement methods

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

The equipment measurement shall be performed for all operating channel bandwidths. In addition, for the unwanted emissions, the carrier frequency shall be set at both the highest and lowest channels in which the equipment is designed to operate.

For subscriber equipment, a narrower resolution bandwidth may be used, provided that the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1% of the occupied bandwidth, as applicable).

5.2 Band plan

The bands 1710-1780 MHz and 2110-2180 MHz are divided into eleven paired blocks as shown in **Error! Reference source not found.**. SRSP-513 contains the detailed band plan.

Table 1: Frequency blocks in the bands 1710-1780 MHz / 2110-2180 MHz

Block	Block size	Lower sub-band	Upper sub-band
Block A	20 MHz	1710-1720 MHz	2110-2120 MHz
Block B	20 MHz	1720-1730 MHz	2120-2130 MHz
Block C	10 MHz	1730-1735 MHz	2130-2135 MHz
Block D	10 MHz	1735-1740 MHz	2135-2140 MHz
Block E	10 MHz	1740-1745 MHz	2140-2145 MHz
Block F	20 MHz	1745-1755 MHz	2145-2155 MHz
Block G	10 MHz	1755-1760 MHz	2155-2160 MHz
Block H	10 MHz	1760-1765 MHz	2160-2165 MHz
Block I	10 MHz	1765-1770 MHz	2165-2170 MHz
Block J1	10 MHz	1770-1775 MHz	2170-2175 MHz
Block J2	10 MHz	1775-1780 MHz	2175-2180 MHz

The band 2180-2200 MHz is divided into two downlink-only blocks, as shown in **Error! Reference source not found.**. SRSP-519 contains the detailed band plan. In this RSS, AWS-4 is also referred to as ATC band 2180-2200 MHz

Table 2: Frequency blocks in the bands 2180-2200 MHz

Block	Block size	Frequency range
Block C	10 MHz	2180-2190 MHz
Block D	10 MHz	2190-2200 MHz

The blocks listed in Table 1 and Table 2 can be aggregated to form a larger channel.

5.3 Types of modulation

Devices may employ any type of modulation technique. The type of modulation shall be documented in the test report.

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 output power of the equipment measured in terms of average values shall comply with the limits specified below.

Table 3: Maximum power of equipment

Frequency band	Equipment type	Maximum power
1710-1780 MHz	Fixed and base station	30 dBm e.i.r.p./channel bandwidth
	Subscriber equipment and fixed subscriber equipment	30 dBm e.i.r.p./channel bandwidth
2110-2180 MHz[1]	Non-AAS: Fixed and base station	65 dBm e.i.r.p./MHz
	AAS: Fixed and base station	46 dBm TRP/MHz
	Subscriber equipment and fixed subscriber equipment	30 dBm e.i.r.p./channel bandwidth
2180-2200 MHz[2]	Non-AAS: Base station	65 dBm e.i.r.p./MHz
	AAS: Base station	46 dBm TRP/MHz

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 that corresponds to the highest PAPR during periods of continuous transmission.

5.6 Unwanted emission limits

Unwanted emissions shall be measured in terms of average value.

Equipment shall have the TRP or conducted power (all antenna connectors), of unwanted emissions outside the frequency block or frequency block group not exceeding the limits shown in Table 4

Table 4: Unwanted emission limits

Offset from the edge of the frequency block or frequency block group	Unwanted emission limits
≤1 MHz	-13 dBm/(1% of B)
> 1 MHz	-13 dBm/MHz

Where B is the frequency block or frequency block group.

[1] The limits specified in this RSS are for the purpose of certification and may not apply to all deployment scenarios, consult SRSP-513 for more details

[2] The limits specified in this RSS are for the purpose of certification and may not apply to all deployment scenarios, consult SRSP-519 for more details

For equipment operating in the band 2180-2200 MHz, additional filtering may apply (consult SRSP-519).

5.7 Additional requirements for subscriber equipment

Subscriber equipment shall employ transmitter power control to limit power. The applicant shall include, with the application for certification, a declaration of compliance with this requirement, which shall also include a description of how it is met. This declaration may be either separate or attached to the test report (e.g. an appendix to the test report).

Subscriber equipment and fixed subscriber equipment operating in the band 1755-1780 MHz shall operate only when under the control of a base station. The applicant shall include, with the application for certification, a declaration of compliance with this requirement, which shall also include a description of how this control requirement is met. This declaration may be either separate or attached to the test report (e.g. an appendix to the test report).

Subscriber equipment that transmits in the band 1755-1780 MHz and receives in the band 2155-2180 MHz shall be certified only if it is capable of operating on all frequencies in the bands 1710-1780 MHz and 2110-2180 MHz.