Innovation, Science and Economic Development Canada
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Spectrum Management and Telecommunications

Radio Standards Specification

Flexible Use Broadband Equipment Operating in the Band 3450-3650 MHz

Draft 1

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Canada

Preface

Radio Standards Specification (RSS) 192, issue 4, *Flexible Use Broadband Equipment Operating in the Band 3450-3650 MHz* replaces issue 3 of RSS-192, *Fixed Wireless Access Equipment Operating in the Band 3450-3650 MHz*, dated January 2008.

Listed below are the main changes:

1. Updated requirements to accommodate flexible use broadband equipment as per Innovation, Science and Economic Development's *Decision on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Decisions on Changes to the 3800 MHz Band*.
2. Added definitions related to flexible use broadband equipment
3. Updated the transmitter output power limits and the unwanted emission masks for base stations and subscriber equipment

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

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Draft

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1. Scope

This Radio Standard Specification (RSS) sets out certification requirements for flexible use broadband equipment used in fixed and/or mobile services operating in the frequency band 3450-3650 MHz.

2. Transition period

This document will be in force upon 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 certification under RSS-192, issue 4, or issue 3 will be accepted. After this period, only applications for certification of equipment under RSS-192, issue 4, will be accepted and equipment manufactured, imported, distributed, leased, offered for sale, or sold in Canada, shall comply with this issue.

A copy of RSS-192, issue 3, may be requested by email.

3. Certification

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

4. Licensing requirements

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

5. RSS-Gen compliance

RSS-192 shall be used in conjunction with RSS-Gen, *General Requirement for Compliance of Radio Apparatus*, for general specifications and information relevant to the equipment to which this standard applies

6. Related documents

ISED documents are available on the Official publications section of the Spectrum Management and Telecommunications website.

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

SRSP-520: *Technical Requirements for Flexible Use Broadband Systems in the Band 3450-3650 MHz*

SRSP – Standard Radio System Plan

7. Definitions

Active antenna system (AAS) refers an antenna that is integrated as part of the radio equipment and has the capability to continuously vary its antenna pattern by adjusting the amplitude and/or phase between elements.

AAS base station equipment is a base station equipment with AAS integrated.

Antenna means a radiating unit/component which contains all radiating elements

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

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

Channel frequency is the frequency at the center of the channel bandwidth.

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

Frequency block is defined as a 10 MHz block of frequency in the band 3450-3650 MHz (see SRSP-520).

Frequency block group is a continuous frequency range of multiple block(s) of 10 MHz that contains the equipment's channel bandwidth. For equipment with channel bandwidth smaller than 10 MHz, the frequency block group is the frequency range of a 10 MHz block.

Frequency block range is the range of all frequency blocks that contains the equipment operating frequency range.

Non-active antenna system (Non-AAS) is an antenna system that does not meet the definition of AAS.

Non-AAS base station equipment is a base station equipment with connector(s), which are connected to one or more separately supplied passive antenna elements or arrays to radiate radio waves.

Point-to-point (P-P) equipment is equipment with directional antenna and is used between two fixed locations installed to provide service such as backhaul.

Point-to-multipoint (P-MP) hub equipment is fixed equipment to provide communication with multiple user equipment installed at fixed locations.

Total radiated power (TRP) is defined as the integral of the power transmitted by an AAS, in different directions over the entire radiation sphere.

$$TRP \overset{\text{def}}{\equiv} \frac{1}{4\pi}\int_0^{2\pi}\int_0^{\pi} P(\theta,\varphi)\sin(\theta)d\theta d\varphi$$

Where

P(θ,φ): power radiated by an antenna array system in direction (θ, φ).

$$P(\theta,\varphi) = P_{Tx}g(\theta,\varphi)$$

Where,
P_{TX} : conducted power (watts) input to the array system;
g(θ, φ) : array systems directional gain along (θ,φ) direction.

8. Transmitter standard specifications

The provisions of this section are specific to the transmitter specifications.

8.1 Measurement method

Measurements shall be performed in accordance with the requirements of RSS-Gen. However, for TRP measurements, the standards listed on ISED's Certification and Engineering Bureau website shall be consulted.

The equipment measurement shall be performed for all operating channel bandwidth specified by the manufacturer.

8.2 Frequency plan

The band 3450-3650 MHz is divided into 10 MHz blocks as per SRSP-520. Blocks can be aggregated to form a channel larger than 10 MHz.

8.3 Occupied bandwidth

The occupied bandwidth shall not exceed the equipment's channel bandwidth, which is declared by the manufacturer.

8.4 Types of modulation

The modulation used shall be digital.

8.5 Frequency stability

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

8.6 Transmitter output power

The maximum average output power of the equipment shall comply with the limits specified in table 1.

Table 1: Maximum power of equipment

Equipment type	Maximum average power
Non-AAS: base station, fixed P-P station, P-MP hub station	68 dBm e.i.r.p./ 5 MHz
AAS: base station, P-MP hub station	47 dBm TRP/ 5 MHz
Fixed subscriber equipment	39 dBm e.i.r.p./channel bandwidth
Subscriber equipment other than fixed subscriber equipment: AAS Non-AAS	 28 dBm TRP/channel bandwidth 23 dBm e.i.r.p./ 10 MHz

8.7 Transmitter unwanted emissions

Unwanted emissions shall be measured when 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 below, outside each frequency block group. However, the unwanted emissions shall only need to be measured and reported for the two channels: one located at the bottom and one at the top of the operating frequency block range. In doing so, the equipment must be set such that the middle of the occupied bandwidth is respectively as close to the bottom or the top edge of the frequency block range as the equipment design permits.

Set the channel frequency f_L to the lowest frequency of the frequency block range. Record f_L and the RF spectrum. Repeat the test using the highest channel frequency f_H of the frequency block range.

8.7.1 Unwanted emission limits for base station, P-P and P-MP equipment

The unwanted emissions of base station, P-P and P-MP equipment, in any 5 MHz bandwidth, outside the frequency block group shall comply with the limits shown in table 2.

Table 2: Unwanted emission limits for base station, P-P and P-MP equipment

Unwanted emission limits	
Non-AAS	AAS
-34 dBm e.i.r.p./ 5 MHz	-43 dBm TRP/ 5MHz

8.7.2 Unwanted emission limits for subscriber equipment

Subscriber equipment shall have the [TRP] or conducted power, where applicable, of unwanted emission outside the frequency block group not exceed the followings, where B is the equipment channel bandwidth in MHz:

(i) -13 dBm/MHz within 0 to B from the frequency block group edges; and
(ii) -25 dBm/MHz in the frequency ranges greater than B from the frequency block group edges.

8.7.3 Out-of-frequency band unwanted emission limits

Notwithstanding the above limits in 8.7.1 and 8.7.2, the [TRP] or conducted power, where applicable, of unwanted emissions for all equipment shall not exceed:

(i) -13 dBm/MHz at frequencies below 3450 MHz or above 3650 MHz;
(ii) -25 dBm/MHz at frequencies below 3440 MHz or above 3660 MHz; and
(iii) -40 dBm/MHz at frequencies below 3430 MHz and above 3670 MHz