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Spectrum Management and Telecommunications

Radio Standards Specification

# Point-to-Multipoint Broadband Equipment Operating in the Band 512-608 MHz for Rural Remote Broadband Systems (RRBS) (TV Channels 21 to 36)

**Note**: a moratorium on new applications for licensing RRBS is in place (see *Consultation on Repurposing the 600 MHz Band*)

Aussi disponible en français – CNR-196

Canada

## Preface

Radio Standards Specification 196 (RSS-196), issue 2, *Point-to-Multipoint Broadband Equipment Operating in the Band 512-608 MHz for Rural Remote Broadband Systems (RRBS) (TV Channels 21 to 36)*, replaces RSS-196, issue 1, *Point-to-Multipoint Broadband Equipment Operating in the Bands 512-608 and 614-698 MHz for Rural Remote Broadband Systems (RRBS) (TV Channels 21 to 51)* dated March 2010.

Changes are listed below:

- Remove the band 614-698 MHz as per the policy decision in the document SLPB-004-15, *Decision on Repurposing the 600 MHz Band)*.
- Remove the section on receiver spurious emission as it is covered in RSS-Gen, *General Requirements for Compliance of Radio Apparatus*.
- Refer to RSS-Gen instead of RSS-210, *Licence-Exempt Radio Apparatus: Category I Equipment*, for the general field strength limit.

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

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Martin Proulx
Director General
Engineering, Planning and Standards Branch

# Contents

# 1. Scope

This Radio Standard Specification (RSS) sets out certification requirements for equipment employed in Rural Remote Broadband Systems (RRBS) to provide point-to-multipoint fixed wireless access broadband radiocommunication in the band 512-608 MHz (TV channels 21 to 36).

# 2. Transition period

This document will be in force upon its publication on Innovation, Science and Economic Development Canada's (ISED) website. Effective immediately, no application for certification of equipment operating in the band 614-698 MHz is accepted as per Innovation, Science and Economic Development (ISED)'s decision in the SPLB-004-15, *Decision on Repurposing the 600 MHz Band* document.

A copy of RSS-196, issue 1, may be requested by email.

# 3. General requirements and information

## 3.1 Certification

Equipment covered by this standard is classified as Category I equipment and requires a technical acceptance certificate (TAC) issued by ISED's Certification and Engineering Bureau or a certificate issued by a recognized certification body (CB).

## 3.2 Licensing requirements

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

## 3.3 RSS-Gen compliance

RSS-196 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

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

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

IEEE Std. 1631: *IEEE Recommended Practice for Measurement of 8-VSB Digital Television Transmission Mask Compliance for the USA*

SRSP-300.512: *Technical Requirements for Remote Rural Broadband Systems (RRBS) Operating in the Bands 512-608 MHz (TV Channels 21 to 36)*

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IEEE Std – The Institute of Electrical and Electronics Engineers Standard
SRSP – Standard Radio System Plan

### 3.5 Definition

**Nominal channel bandwidth,** for the purpose of this document, is defined as follows:

- For equipment having an occupied bandwidth less than or equal to 6 MHz, the nominal channel bandwidth is 6 MHz, the channel being a 6 MHz block as specified in the radio frequency channel arrangement in SRSP-300.512.

- For equipment having an occupied bandwidth greater than 6 MHz, up to a maximum of 12 MHz, the nominal channel bandwidth is 12 MHz, the channel being formed by two contiguous 6 MHz blocks as specified in the radio frequency channel arrangement in SRSP-300.512.

## 4. Transmitter specifications

### 4.1 Frequency plan

The radio frequency channel arrangements are defined in SRSP-300.512.

### 4.2 Type of modulation

Equipment certified under this standard shall use digital modulation.

### 4.3 Nominal channel bandwidth and occupied bandwidth

Equipment having an occupied bandwidth of less than or equal to 6 MHz shall comply with the standard specified for a 6 MHz nominal channel bandwidth, i.e. the occupied bandwidth shall be contained in the 6 MHz nominal channel bandwidth as defined in section 3.5 and the specifications shall meet all requirements applicable to 6 MHz channel bandwidth equipment.

The maximum permissible nominal channel bandwidth is 12 MHz.

The occupied bandwidth shall be greater than or equal to 500 kHz and shall not exceed the nominal channel bandwidth.

### 4.4 Frequency stability

The carrier frequency shall not depart from the reference frequency in excess of ±10 ppm.

### 4.5 Transmitter output power

The average transmitter output power for the subscriber equipment shall not exceed 1 watt in a 6 MHz bandwidth and the average transmitter power spectral density shall not exceed -7 dBW/100 kHz.

The average transmitter output power for the base station equipment shall not exceed 125 watts in a 6 MHz bandwidth and the average transmitter power spectral density shall not exceed 14 dBW/100 kHz.

The equivalent isotropically radiated power (e.i.r.p.) limits for the subscriber and base stations are specified in SRSP-300.512.

### 4.6 Transmitter unwanted emissions

The transmitter unwanted emissions shall be measured using an average detector and a resolution bandwidth equal to the measurement bandwidth specified in table 1. A lower resolution bandwidth may be employed near the channel edge, provided the power is integrated over a 100 kHz bandwidth. Any suitable method of measurement can be used provided that it is fully described in the test report. ISED's Certification and Engineering Bureau shall be consulted to determine the acceptability of the method. The IEEE 1631 document can be used for guidance while measuring this emission mask.

The power of unwanted emissions in the measurement bandwidth shall be attenuated below the average transmitted power in a 6 MHz bandwidth, P (dBW), by the limits specified in table 1 below, or shall comply with the field strength limits indicated in RSS-Gen table 5, General field strength limits at frequencies above 30 MHz, where applicable.

Δf (MHz) is the frequency separation from the edge of the nominal channel used by the equipment to the centre of the measurement bandwidth. Figure 1 shows the unwanted emissions limits for a 100 kHz measurement bandwidth with Δf less than 18 MHz.

**Table 1: Unwanted emission limits**

| **Frequency separation, Δf (MHz)** | **Out-of-channel attenuation (dB) or field strength** | **Measurement bandwidth** |
|---|---|---|
| $0.05 \leq \Delta f \leq 6$ | $44.9 + 1.1*(\Delta f)^{1.6}$ | 100 kHz |
| $6 \leq \Delta f \leq 12$ | $37.8 + 4.4*\Delta f$ | |
| $12 \leq \Delta f \leq 18$ | $70.2 + 1.7*\Delta f$ | |
| Δf > 18 and within 54-72 MHz, 76-88 MHz, 174-216 MHz and 470-608 MHz | 100.8 | |
| Outside the above cases | Base station equipment:<br><br>$43 + 10*\log_{10}(p)$<br>Where p is the transmitter power in a 6 MHz bandwidth expressed in watts<br><br>Subscriber equipment:<br><br>As per RSS-Gen, table 5, General field strength limits at frequencies above 30 MHz | 100 kHz for $f_m \leq 1$ GHz<br>1 MHz for $f_m > 1$ GHz<br><br>120 kHz for $f_m \leq 1$ GHz<br>1 MHz for $f_m > 1$ GHz<br><br>Where $f_m$ is the measurement frequency |

**Note:** As per SRSP-300.512, subscriber equipment certified with this emission mask shall employ only vertical polarization for the transmit antenna, while any polarization can be used for reception. The vertically polarized antenna needs to meet the requirements specified in SRSP-300.512.

Base station equipment certified with this emission mask can employ any type of signal polarization, provided that the RRBS siting restrictions, specified in SRSP-300.512, are observed.

**Figure 1 Unwanted Emissions Limits with Δf < 18 MHz**