Innovation, Science and Economic Development Canada
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Spectrum Management and Telecommunications

Radio Standards Specification

Broadband Radio Service (BRS) Equipment Operating in the Band 2500-2690 MHz

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Canada

Preface

Radio Standards Specification RSS-199, *Broadband Radio Service (BRS) Equipment Operating in the Band 2500–2690 MHz*, issue 5, replaces RSS-199, *Broadband Radio Service (BRS) Equipment Operating in the Band 2500–2690 MHz*, issue 4, dated July 2023.

Listed below are the main changes:

1. added alternative band plan for TDD equipment operating in the band 2500-2690 MHz
2. 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-199" 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, Ontario K1A 0H5
   Canada

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

Additional information and guidance are available on the Innovation, Science and Economic Development Canada (ISED) webpages 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 spectrum and telecommunications related documents are available on ISED's Spectrum Management and Telecommunications website.

Issued under the authority of the
Minister of Industry

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Wen Kwan
Director General
Engineering, Planning and Standards Branch

Contents

1. Scope

This Radio Standards Specification (RSS) sets out the certification requirements for equipment used in broadband radio services (BRS) operating in the frequency band 2500-2690 MHz.

2. Purpose and application

This RSS applies to base station, fixed service equipment and subscriber equipment operating in the band 2500-2690 MHz.

3. General requirements and references

This section specifies the general requirements and references related to this standard.

3.1 Coming into force and transition period

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

However, a transition period of six months from the publication date is provided. During this period, applications for certification under either issue 5 or issue 4 of RSS-199 will be accepted. After this period, only applications for the certification of equipment under issue 5 of RSS-199 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-199, issue 4, is available upon request by emailing consultationradiostandards-consultationnormesradio@ised-isde.gc.ca.

3.2 Certification requirements

Equipment subject to this standard is classified as Category I 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.

3.3 Licensing requirements

Equipment subject to this standard requires a licence pursuant to subsection 4(1) of the *Radiocommunication Act*.

3.4 RSS-Gen compliance

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

3.5 Related documents

The following document should be consulted:

- SRSP-517, *Technical Requirements for Broadband Radio Service (BRS) in the Band 2500-2690 MHz*

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SRSP – Standard Radio System Plan

4. Definitions

RSS-Gen contains a generic list of definitions for commonly used terms. The following terms have been specifically defined for this standard:

AAS base station equipment
Base station equipment with an active antenna system (AAS).

Fixed service equipment
Equipment authorized to operate at a fixed point that enables communication between terrestrial stations. It can be used for point-to-point (P-P) or point-to-multipoint (P-MP) services.

Fixed subscriber equipment
Subscriber equipment that is used at a fixed location, by the nature of its design. This does not include fixed service equipment.

Mobile subscriber equipment
Subscriber equipment designed to be used while in motion or during halts at unspecified points.

NOTE As such, it includes portable equipment.

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

Non-AAS base station equipment
Base station equipment with a non-AAS.

5. Transmitter requirements

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

5.1 Measurement method

Unless otherwise specified in this standard, all measurements shall be performed in accordance with the requirements in RSS-Gen. However, applicable alternative measurement procedures listed on the Normative Test Standards and Acceptable Alternate Procedures web page may also be used to demonstrate compliance.

The equipment shall comply with the specified requirements for all 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

This section specifies the band plans applicable to this standard. Frequency blocks can be aggregated to form a frequency block group. SRSP-517 contains the detailed band plan.

5.2.1 Paired and Unpaired band plan

The band 2500-2690 MHz is divided into 7 paired blocks and 2 unpaired blocks as shown in table 1 and 2.

Table 1: Paired frequency blocks in the band 2500-2690 MHz

Block	Uplink frequencies (MHz)	Block	Downlink frequencies (MHz)	Total spectrum (MHz)
A	2500-2510	A’	2620-2630	10+10
B	2510-2520	B’	2630-2640	10+10
C	2520-2530	C’	2640-2650	10+10
D	2530-2540	D’	2650-2660	10+10
E	2540-2550	E’	2660-2670	10+10
F	2550-2560	F’	2670-2680	10+10
G	2560-2570	G’	2680-2690	10+10

Table 2: Unpaired frequency blocks in the band 2500-2690 MHz

Block	Frequencies (MHz)	Total spectrum (MHz)
H	2570-2595	25
I	2595-2620	25

5.2.2 Unpaired only band plan

Alternatively, the 2500-2690 MHz band is divided into 38 unpaired blocks of 5 MHz as shown in table 3. Only equipment employing time division duplexing (TDD) technology shall be permitted to use this band plan option.

Table 3: Unpaired frequency blocks in the band 2500-2690 MHz

Block	Frequencies (MHz)	Total spectrum (MHz)		Block	Frequencies (MHz)	Total spectrum (MHz)
A1	2500-2505	5		K2	2595-2600	5
A2	2505-2510	5		L1	2600-2605	5
B1	2510-2515	5		L2	2605-2610	5
B2	2515-2520	5		M1	2610-2615	5
C1	2520-2525	5		M2	2615-2620	5
C2	2525-2530	5		N1	2620-2625	5
D1	2530-2535	5		N2	2625-2630	5
D2	2535-2540	5		P1	2630-2635	5
E1	2540-2545	5		P2	2635-2640	5
E2	2545-2550	5		Q1	2640-2645	5
F1	2550-2555	5		Q2	2645-2650	5
F2	2555-2560	5		R1	2650-2655	5
G1	2560-2565	5		R2	2655-2660	5
G2	2565-2570	5		S1	2660-2665	5
H1	2570-2575	5		S2	2665-2670	5
H2	2575-2580	5		T1	2670-2675	5
J1	2580-2585	5		T2	2675-2680	5
J2	2585-2590	5		U1	2680-2685	5
K1	2590-2595	5		U2	2685-2690	5

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 power

The maximum power spectral density of the equipment, measured in terms of average values, shall comply with the limits specified below. These limits are either specified in terms of equivalent isotropically radiated power (e.i.r.p.) or total radiated power (TRP) for the purpose of certification and may not apply to all deployment scenarios. Consult SRSP-517 for more deployment details in the band 2500-2690 MHz.

Mobile subscriber equipment shall not exceed an e.i.r.p of 2W per channel bandwidth.

Fixed subscriber equipment shall not exceed the following:

i. conducted power of 2W per channel bandwidth for all ports
ii. e.i.r.p of 40 W per channel bandwidth

Fixed service equipment and base station equipment shall not exceed the limits specified in Table 4. 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 4, instead of the TRP limit.

Table 4: Maximum power spectral density of fixed service equipment and base station in the band 2500-2690 MHz

Equipment type	Maximum power spectral density
Non-AAS fixed service and base station equipment	1640 W /MHz e.i.r.p
AAS fixed service and base station equipment	43 dBm /MHz TRP

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 and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

5.6 Unwanted emissions

Unwanted emissions shall be measured in terms of average values 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 or 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 operating frequency range.

For the unwanted emission limits, in the 1 MHz bands immediately outside and adjacent to the frequency block or frequency block group, the power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth (OBW) for fixed service equipment, base stations, and fixed subscriber equipment, and 2% of the OBW for mobile subscriber equipment. Beyond these 1 MHz bands, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full applicable measurement bandwidth.

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 specified in tables 5 or 6, as applicable.

Table 5: Unwanted emission limits for fixed service equipment, base station and fixed subscriber equipment

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

Table 6: Unwanted emission limits for mobile subscriber equipment

Offset from the edge of the frequency block or frequency block group (MHz)	**Unwanted emission limit**
0-1	-10 dBm/(2% of OBW)
1-5	-10 dBm/MHz
5-X*	-13 dBm/MHz
≥ X	-25 dBm/MHz

* X is 6 MHz or the equipment occupied bandwidth, whichever is greater

In addition to complying with the limits in table 5, mobile subscriber equipment shall not exceed -13 dBm/MHz on all frequencies between 2490.5 and 2496 MHz, and -25 dBm/MHz at or below 2490.5 MHz.