

**REGULATIONS ON THE USE OF UNLICENSED FREQUENCY SPECTRUM
FOR THE DELIVERY OF TELECOMMUNICATION SERVICES**

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PREAMBLE

The Regulatory Board of Rwanda Utilities Regulatory Authority;

Pursuant to Law n° 44/2001 of 30 November 2001 governing telecommunications, especially in Articles 10, 32 and 33

Pursuant to Law No. 09/2013 of 01/03/2013 establishing the Rwanda Utilities Regulatory Authority, especially in Article 2;

Pursuant to the Presidential Order n° 04/01 of 15/03/2004 determining specific duties of the Regulatory Board in telecommunication matters, especially in Article 7;

Pursuant to the Ministerial order n° 3/dc/04 of 07/06/2004 on telecommunications networks and Services not requiring a telecommunications license, especially in Articles 8 and 9;

Pursuant to the Ministerial Decree n° 03 /RURA/2005 determining fees for radiocommunications licenses, especially in it article 8;

Considering ITU Resolution 229 (Revised by the WRC-12) “Use of the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz by the mobile service for the implementation of wireless access systems including radio local area networks”;

Considering the ITU Recommendation M.1450-4 “Characteristics of broadband radio local area networks”;

And after considerations and deliberations in its meeting of __ / __ /2013;

Hereby issues the following Regulations;

CHAPTER ONE: GENERAL PROVISIONS

Article One: Purpose of these Regulations

These regulations govern the use of unlicensed frequency spectrum for the deployment of telecommunication services.

The frequency bands considered under this regulation are 2.4GHz and 5 GHz.

Article 2: Definitions of Terms

For the purpose of these regulations, the following terms shall have the following meanings:

ARIB:	Association of Radio Industries and Businesses
Channelization:	Bandwidth of each channel and number of channels that can be contained in the RF bandwidth allocation
Channel Indexing:	The frequency difference between adjacent channel center frequencies
DAA:	Detect And Avoid
dB:	DeciBell
DFS:	Dynamic frequency selection
e.i.r.p.:	Equivalent isotropically radiated power
ETSI:	European Telecommunications Standards Institute
Frequency band:	Nominal operating spectrum of operation
GHz:	Giga Hertz
HiSWANa:	High speed wireless access network – type a
IEEE:	Institute of Electrical and Electronics Engineers
ITU:	International Telecommunication Union
KHz:	Kilo Hertz
LAN:	Local area network
LBT:	Listen before talk
MU:	Medium Utilisation
mW:	Milli Watt
OFDM:	Orthogonal frequency division multiplexing
RLAN:	Radio local area network
TPC:	Transmit power control
W:	Watt
WLAN:	Wireless Local Area Network
WRC-12:	World Radio Conference of 2012

Article 3 : Scope of application

These regulations shall apply to the use of unlicensed frequency spectrum for the deployment of telecommunication services in the Republic of Rwanda.

Article 4: Objectives

These regulations shall have the following objectives:

- a) To ensure that the unlicensed spectrum is utilized in compliance with technical parameters set by these regulations;
- b) To avoid interference between users by placing appropriate limits on parameters such as network standards, radiated power levels and frequencies of operation.

CHAPTER II: REQUIREMENTS TO DEPLOY TELECOMMUNICATION SERVICES IN THE UNLICENSED SPECTRUM

Article 5: Operating conditions

A licensed telecommunication Company wishing to deploy a network and service for the public using an unlicensed band must, two (02) months prior to the deployment of the network, make a declaration to the Regulatory Board according to the procedures set in the Ministerial Decree N° 3/DC/04 of 07/06/2004.

Operation in the unlicensed band is on the basis that no interference is caused to licensed radiocommunication users and no protection from interference is offered to the unlicensed users.

Article 6: Networks not subject to declaration

The following use of spectrum is exempted from acquiring a license or an authorization:

- WLANs used where supply to the public is not involved;
- Wireless networks in airport lounges, hotels, shopping centres and Internet cafes where the service is provided in a single place.

Article 7: Technical requirements for the use of WLAN devices

The utilization of WLAN using the unlicensed frequency bands in 2.4GHz and 5GHz bands shall comply with the technical requirements specified in the Appendix of these regulations in order to avoid destructive interference between users.

Article 8: Spectrum fees

Frequencies used within the specifications set in these regulations are not subject to frequency fee and individual frequency coordination.

Article 9: Backhaul frequencies

Any operator wishing to deploy a backhaul link using the unlicensed frequency shall comply with the Power level and the Standard set in the Appendix of these regulations.

Article 10: Enforcement Action

If the Authority determines that unlicensed frequency spectrum user has failed to comply with any term or condition of these regulations, the Authority shall send a written warning to the concerned operator including a deadline for correction.

After receipt of the warning from the Regulatory Authority, if the user does not cure the non-compliance, the Regulatory Authority may proceed for further sanctions which may consist of suspending such right until he/she complies with these regulations.

CHAPTER III: TRANSITIONAL AND FINAL PROVISIONS

Article 11: Transitional period

Any existing activity related to the use of unlicensed frequency spectrum conducted by any natural or legal person, must comply with these Regulations within three (3) months of the effective date of these regulations;

Any other person who commences the use of unlicensed frequency spectrum after the effective date of these regulations shall comply with these Regulations prior to commencing operations.

Article 12: Interpretations of these regulations

Upon request, the Authority shall provide an interpretation of these Regulations to assist the user of the unlicensed frequency spectrum in ensuring its compliance with these regulations.

Article 13: Repealing provision

All prior provisions contrary to these regulations are hereby repealed.

Article 14: Commencement

These regulations shall come into force on the date of their signature.

Kigali, on / / 2013

Eng. Coletha .U. RUHAMYA
CHAIRPERSON OF THE REGULATORY BOARD

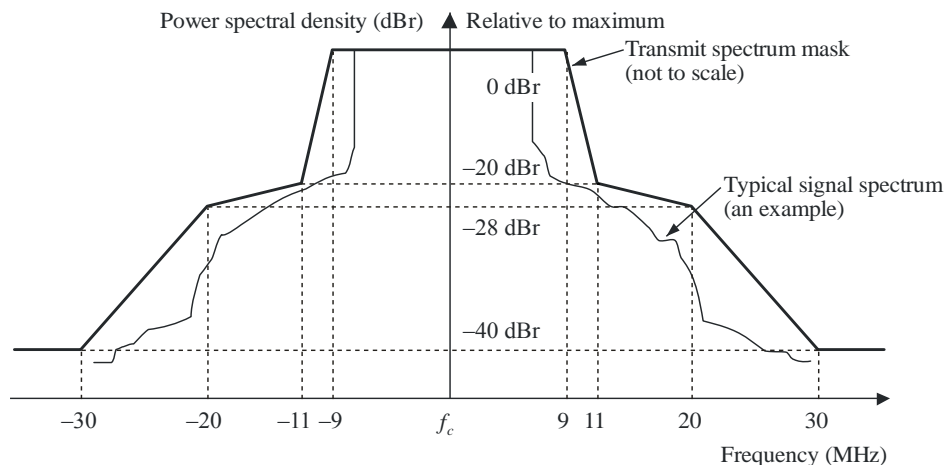
APPENDIX: Technical requirements

General band designation	Specific frequency band (MHz)	Transmitter output power (e.i.r.p)	Standard characteristics	Interference mitigation	Spectrum mask (Bandwidth)	Channel indexing
2.4 GHz	2400 – 2483 MHz	100 mW	IEEE Std 802.11-2012 (Clause 17, commonly known as 802.11b)	LBT	802.11b mask (Fig. 3)	5 MHz
			IEEE Std 802.11-2012 (Clause 19, commonly known as 802.11g)	LBT	OFDM mask (Fig. 1)	5 MHz
			IEEE Std 802.11-2012 (Clause 20, commonly known as 802.11n)	LBT/DFS/TPC	OFDM mask (Fig. 2A and 2B)	5 MHz
			ETSI EN 300 328	DAA/LBT, DAA/non-LBT, MU	Not specified	Not specified
5GHz	5150 – 5250 MHz	200 mW 10 mW/MHz	IEEE Std 802.11-2012 (Clause 18, commonly known as 802.11a)	LBT/DFS/TPC	OFDM mask (Fig. 1) OFDM mask (Fig. 2A and 2B)	5 MHz and 20 MHz
	5250 – 5350 MHz	200 mW 10 mW/MHz	IEEE Std 802.11-2012 (Clause 18, Annex D and Annex E, commonly known as 802.11j)			
	5470 – 5725 MHz	1 000 mW 50 mW/MHz	IEEE Std 802.11-2012 (Clause 20, commonly known as 802.11n)			
	5725 – 5825 MHz	1 000 mW 50.1 mW/MHz	IEEE P802.11ac ETSI EN 301 893 (Only for 5150 – 5350 MHz & 5470 - 5725 MHz) ARIB HiSWANa (Only for 5150 – 5250 MHz)			

Note:

- Pursuant to ITU Resolution 229 (WRC-12), operation in the 5 150-5 250 MHz band is limited to indoor use
- The maximum allowable channel width is 20 MHz

FIGURE 1
OFDM transmit spectrum mask for 802.11a, 11g, 11j, HIPERLAN2
and HiSWANa systems



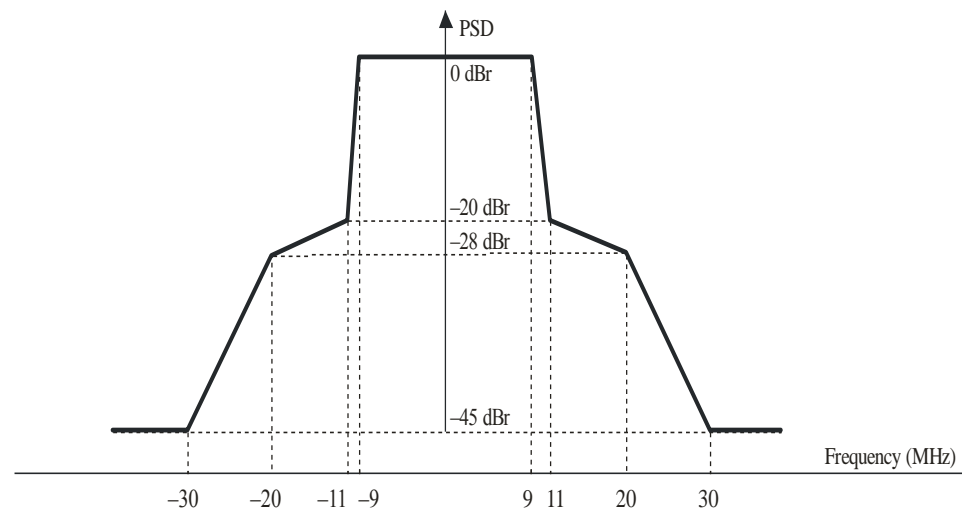
Note 1 – The outer heavy line is the spectrum mask for 802.11a, 11g, 11j, HIPERLAN2 and HiSWANa and the inner thin line is the envelope spectrum of OFDM signals with 52 subcarriers.

Note 2 – The measurements shall be made using a 100 kHz resolution bandwidth and a 30 kHz video bandwidth.

Note 3 – In the case of the 10 MHz channel spacing in 802.11j, the frequency scale shall be half.

M.1450-01

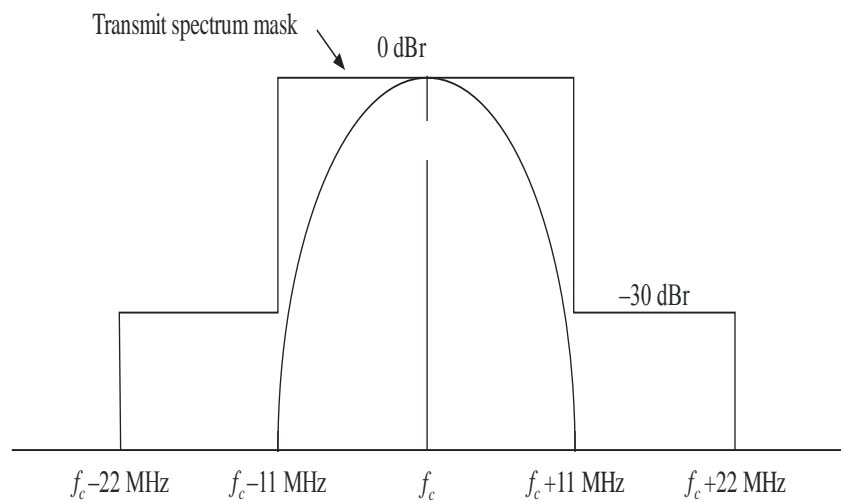
FIGURE 2a
Transmit spectral mask for 20 MHz 802.11n transmission in 2.4 GHz band



Note 1 – Maximum of -45 dBr and -53 dBm/MHz at 30 MHz frequency offset and above.

M.1450-02

Figure 3: Transmit spectrum mask for 802.11b



1450-04

FIGURE 2b

Transmit spectral mask for a 20 MHz 802.11n transmission in 5 GHz band and transmit spectral mask for 802.11ac

