Guidelines for the Operation of Industrial, Scientific and Medical (ISM) Frequency Bands for Radiocommunication Services in Bhutan

BHUTAN INFOCOMM AND MEDIA AUTHORITY

ROYAL GOVERNMENT OF BHUTAN

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1. Introduction

The industrial, scientific, and medical band (ISM band) refers to a group of radio frequency bands that are internationally reserved for scientific, medical and industrial requirements. The ISM bands are generally open frequency bands, which may vary according to different ITU regions.

The ISM bands have been used internationally on a non-interference and non-protection basis and certain limits on its emission power are determined by the regulators in order to minimize interference to other radio communication services. It is essential that the ISM frequencies users in Bhutan should also adhere to the prescribed technical parameters, conditions and limits while operating any SRDs at ISM frequencies.

Therefore, the Authority has formulated these Guidelines in order to prevent and minimise the radio communication interferences to other licensed users caused by ISM band operation. The Guidelines is also to enable the effective usage of ISM frequencies in Bhutan.

2. Effective Date

These guidelines shall come into force on the …Day....Month of the.....Year corresponding to the ....Day of...Month of….Year.

3. Purpose

These guidelines are aimed at providing clear instructions on the necessary compliance of technical parameters to use any Short Range Devices (SRDs) and other electronic devices used in ISM frequency band in Bhutan. These guidelines shall be an addendum to the Part B of National Radio Rules and shall have equal legal enforcement rights with National Radio Rules.

4. Scope of Application

These guidelines shall apply to all the users who use the ISM frequencies only for radio communication services within the kingdom of Bhutan. And it shall be read in conjunction with the National Radio Rules.

5. Definitions

In addition to the following terms, or unless the context requires otherwise, the words and terms used in these guidelines shall have the same meaning as assigned in the Act and National Radio Rules.

Act means the Bhutan Information, Communications and Media Act, 2006;

Authority means the Bhutan InfoComm and Media Authority;

Equipment means an apparatus capable to transmit and/or receive *radio waves* for the purpose of intentional radio communication application;

Industrial, Scientific and Medical (ISM) means equipment or appliances designed to generate and use locally radio frequency energy for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of telecommunications;

Interference means the effect of unwanted signal due to one or a combination of emissions, radiations, or inductions upon reception in a radio communication system, manifested by any performance degradation, misinterpretation, or loss of information, which could be extracted in the absence of such unwanted signal;

Indoor usage means the use of radio communication services, which are used inside a closed space;

License means an authorization that is issued to a person to establish, to own, to install and to deploy assigned frequency, operate a radio communication station under the specified terms and conditions;

Outdoor usage means the use of radio communication services, which are used for backhaul services outside a closed space;

Person means any individual, partnership, company, unincorporated organization, Government, Governmental agency, trustee, executor, administrator or other legal representative;

Radiocommunication means telecommunication by means of radio waves;

Radiocommunication service means a service involving the transmission, emission and or a reception of radio waves for specific telecommunication purposes;

Radio waves means Electromagnetic waves of frequencies arbitrarily lower than 3000 GHz, propagated in space without artificial guide;

Station means one or more transmitters or receivers or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radio communication service. Station is different from device, as it may include additional parameters such as geographical coordinates of the site, altitude of site above sea level, altitude of center antenna above ground level etc;

Spectrum utilization fee means annual fees payable to the Authority for usage of frequency (ies);

Telecommunication means any transmission, emission or reception of signs, signals, writings, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems (ITU Constitution);

6. ISM Frequency band

6.1 Derived from the ITU Radio Regulations Article 1, the **Table 1** shows the frequency band identified for the ISM in Bhutan;

Table 1: Frequency band for ISM in Bhutan

Sl. No	Frequency Range		Bandwidth
	From	To	
1.	6765.00KHz	6795.00KHz	30KHz
2.	13.5530MHz	13.5670MHz	140KHz
3.	26.9570MHz	27.4050MHz	448KHz
4.	40.66MHz	40.70MHz	40KHz
5.	433.05MHz	434.79MHz	1.74MHz
6.	2.4GHz	2.5GHz	100MHz
7.	5725MHz	5875MHz	150MHz
8.	24GHz	24.250GHz	250MHz
9.	61.00GHz	61.50GHz	500MHz
10.	122GHz	123GHz	1000MHz
11.	244GHz	246GHz	2000MHz

6.2 The ITU Region 2 (Americas) ISM band in 915MHz (902–928 MHz) shall not be considered as ISM band in Bhutan for SRDs as it will interfere with the GSM 900 network.

7. Operating Conditions

7.1 These provisions and conditions shall govern the operation of SRDs in ISM bands in Bhutan and wherever the conditions are not provided, the provisions of National Radio Rules 2017 shall guide the operation.

7.2 Any person intending to operate radio communication services in the ISM bands shall not require any radio spectrum license from the Authority and shall not be required to pay annual spectrum utilization fee.

7.3 Radiocommunication equipment and services operating in the ISM bands shall not cause interference to other radio communication system while tolerating any interference from the use of licensed services.

7.4 The use of SRDs in ISM bands shall be classified based on the nature of usage as indoor and outdoor.

7.5 Any ISM equipment for broadband wireless access services, in particular the backhaul links shall apply for technical clearance from the Authority before importing equipment.

7.6 The Authority shall have the right to reject the technical clearance approval request in the event the technical specifications of the equipment is not in compliance of the Authority's prescribed standards.

7.7 The use of any SRDs including the SRD in ISM band shall comply with the required technical parameters and limits prescribed by the Authority.

7.8 Any SRD user shall use only the certified devices or type approved equipment to minimize the possible interference.

7.9 Any equipment currently used in ISM band by any person shall comply with these guidelines within six months from the effective date of these guidelines.

8. Technical Standards for compliance by SRDs in ISM band

8.1 Any person using the SRDs in ISM band shall comply with the following technical parameter limits mentioned in Table 2.

8.2 The technical parameters are subject to change as per the technological and regulatory development.

Table 2: Technical parameter limits for SRDs in ISM operation

Sl. No	Frequency Range		Bandwidth	Maximum Field Strength or RF Power output
	From	To		
1.	6765.00KHz	6795.00KHz	30KHz	≤ 42dBμA/m at 10m
2.	13.5530MHz	13.5670MHz	140KHz	≤ 42dBμA/m at 10m
3.	26.9570MHz	27.4050MHz	448KHz	≤ 42 dBμA/m at 10 m e.r.p 10mW
4.	40.66MHz	40.70MHz	40KHz	≤10mW or 10dBm
5.	433.05MHz	434.79MHz	1.74MHz	≤ 10mW or 10dBm
6.	2.4GHz	2.5GHz	100MHz	≤ 10mW or 10dBm And ≤100mW or 20dBm for wideband data transmission system
7.	5725MHz	5875MHz	150MHz	≤ 25mWor 14dBm
8.	24GHz	24.250GHz	250MHz	≤ 100mWor 20dBm
9.	61.00GHz	61.50GHz	500MHz	≤ 100mWor 20dBm
10.	122GHz	123GHz	1000MHz	≤ 10mWor 10dBm
11.	244GHz	246GHz	2000MHz	≤ 100mWor 20dBm

9. Enforcement and Penalties

9.1 A person shall be guilty of an offence if he or she operates the radio communication equipment in the ISM band without complying with the required technical parameters prescribed by the Authority.

9.2 Any person failing to comply with the terms and conditions of these guidelines shall be liable for the penalties as per the Act and the National Radio Rules.