



BHUTAN INFOCOMM AND MEDIA AUTHORITY

2.6GHz FREQUENCY BAND PLAN FOR USE BY WIRELESS BROADBAND ACCESS AND MMDS SERVICES IN BHUTAN

Foreword

The 2.6GHz frequency band is often called the “IMT-2000 expansion band” and allocated for the terrestrial mobile communications services in all the three International Telecommunication Union (ITU) regions (*Bhutan falls in ITU region 3*). Apart from mobile cellular services, the band is also widely deployed for fixed Wireless Broadband Access (WBA) services including the Multi-channel Multi-point distribution system (MMDS) and other fixed services.

Currently in Bhutan the fixed broadband Internet and Cable Television (CaTV) signals are distributed through co-axial cable and optic fiber. It is economically and technically more efficient to deploy wireless distribution systems to ensure the reach and coverage in the sparsely populated areas. In order to derive the maximum economic benefits and facilitate the users to roll out WBA and MMDS services through fair and transparent allocation, the Authority formulated 2.6GHz frequency band plan.

Therefore, in accordance with the Bhutan Information, Communications and Media Act 2006 and the National Radio Rules 2011, the “**2.6GHz Frequency Band Plan for use by Wireless Broadband Access and MMDS Services**” is hereby adopted by the 25th Management Committee (GNHC) of the Authority during its meeting on 15th September, 2016.

This band plan shall be an addendum to the schedule 2, Part IV of the National Radio Rules 2011.



Director General
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1. Legal basis

This frequency band plan is prepared in accordance with the following legal provisions:

- a) Subsection 25(a) of the Bhutan Information, Communications and Media (BICM) Act 2006, provides for the Authority to plan, supervise, regulate and manage the use of radio frequency spectrum.
- b) Section 81(1) of the Act also empowers the Authority to prepare Frequency Band Plan in respect of any part of radio frequency spectrum.
- c) The subsection 1.2(a) of the chapter III of the National Radio Rules states that the Authority shall, by written instrument prepare frequency band plans each relating to one or more frequency bands.

2. Public Consultation

The Authority has shared the 2.6GHz frequency band plan consultation paper to the relevant stakeholders, industries and the beneficiaries on 9th August 2016. In addition, a stakeholder meeting was also held on 26th August 2016.

The band plan is formulated after incorporating the comments and feedback from the stakeholders.

3. 2.6GHz frequency and its range

The 2.6GHz frequency is the part of S-band Frequency band and it ranges from the lower limit frequency of 2500MHz to upper limit frequency of 2690MHz. It consists of 190MHz Radio frequency band.

4. 2.6GHz Frequency Band plan

The Authority adopted the 2.6GHz frequency band plan shown below for deploying WBA and MMDS services in Bhutan.

2500	2545					2580						2610						2640	2645	2690
FDD Uplink	G 1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	G 2	FDD Downlink		
45	5	90 (MMDS) and TDD														5	45			

Bandwidth in MHz

G1 and G2 are 5MHz Guard bands, which separate the MMDS from FDD Uplink and Downlink frequency.



A, B C O are the contiguous MMDS channels containing 6MHz each. The 6MHz each are in compliance to the ITU-R Recommendation F.755.2

This arrangement consists of paired 2x45MHz for FDD uplink and downlink separated by 100MHz of continuous spectrum in the center, which could be allocated for TDD services. The center 100MHz band also includes 5MHz guard band at both sides leaving 90MHz, which is further divided into contiguous blocks of 6MHz each for carrying the MMDS signals. The guard band will serve the purpose of mitigating interference from adjacent FDD bands and its services.

5. Reservation of Band for Future Use

Considering the need to reserve the radio frequency for future use in case of new service provider, the 2x10MHz of frequency in FDD allocation and 3 channels of MMDS allocation will be reserved.

6. Service allocations for 2.6GHz frequency band in Bhutan

The 2x45MHz frequency will be allocated for cellular services and 90 MHz for Broadband Wireless Access services and the MMDS services. The services may include point-to-point fixed wireless broadband services and the point to multipoint wireless broadband services.

7. Assignment Method

For MMDS services, the assignment of the frequency will be Dzongkhag wise so that same channel could be licensed in another Dzongkhag.

However for the FDD cellular services allocation, the minimum channel size of 5MHz to the maximum of 15MHz will be allocated to the cellular mobile operators for nationwide usage.

The Spectrum Utilization Fees (SUF) will be charged as per the provisions of National Radio Regulation.

8. Power Radiation Limit for the Services deploying 2.6GHz

All BWA equipment operating in 2.6GHz frequency band must adhere to the following minimum technical standards;

- a) Maximum eirp–20W or 43dBm

