National Information & Communications Technology Authority

2.6 GHz BAND PLAN

NICTA 2021

1 DOCUMENT REVISION DETAILS

Revision	Date	Who	Details
1	25/01/2021	Anda. S	First Draft
2			
3			
4			
5			
6			
7			
8			
9			
10			

TABLE OF CONTENTS **PAGE**

1.0 DISCLAIMER

Due to the continuous developments in Radiocommunication technologies and enhancement in related applications, the PNG spectrum plan covering the Primary and Secondary Service Allocations may change with the outcome of each World Radio Conference (WRC).

This document is based on the recommendations of WRC-19, for ITU Region 3. This document must be read with all relevant references quoted to understand various sub-band plans and channeling arrangements. The National Information and Communication Technology Authority (NICTA) of Papua New Guinea hereby expressly disclaims any and all liability connected with or arising from any sole use of or reliance on the contents of this document alone for any purpose whatsoever.

Introduction

With the mobile broadband exploding development and data traffic dramatic growth, the 2.6GHz is well recognized as one of the essential bands to harness the future development.

The band, 2500-2690 MHz was globally identified for IMT at WRC-2000 in accordance with the Footnote 5.384A[1]. ITU-R Working Party 5D as the responsible group of IMT spectrum and standardization in ITU-R has initiated the update of frequency arrangements of bands identified for IMT by modifying the Recommendation ITU-R M.1036-4[2] .

The band 2500-2690MHz is globally recognized as the “3G extension band,” which plays a key role in satisfying the demand for greater capacity for mobile broadband and for launching next-generation networks such as Long-Term Evolution (LTE).

The band 2500-2690 MHz is being used or is planned to be used for mobile broadband wireless access including IMT technologies in a number of Asia Pacific countries, and thus the frequency arrangements in the band need to be developed as a matter of urgency for Region 3 in order to maximize additional benefit from harmonized use of the band.

Scope

The 2.6 GHz Band Plan covers the use of the 2 500-2 690MHz band. The objective is to plan the band and do arrangements and future plan of 2 500-2 690 MHz in PNG including technical conditions and license conditions and based on such identification to develop possible harmonized frequency arrangement on 2 500-2 690 MHz for IMT.

Vocabulary of terms

IMT International Mobile Telecommunications

WRC World Radiocommunication Conference

ITU-R International Telecommunication Union – Radiocommunication Sector

BWA Broadband Wireless Access

FDD Frequency Division Duplex

TDD Time Division Duplex

Spectrum Plan

The Band 2.6 GHz

- Was used for MMDS services in PNG but has ceased and now considered for IMT as per ITU Recommendation M.1036-6
- Was identified for IMT services by WRC-2000 and is primed to be used to cater for the ever increasing demand for mobile spectrum
- Makes available a substantial amount of spectrum (190 MHz) to meet the growing demand for aggregated bandwidth and high data rates

Service Allocation

The 2.6 GHz spectrum band is the Ideal complement to the 700 MHz and 800 MHz spectrum bands, known as the 'digital dividend' frequencies. Together these bands can help provide the most cost-effective nationwide coverage of mobile broadband services across both rural and urban areas.

The ITU has identified 2500-2690 MHz as a global band for IMT. The definition of a common IMT band across all three ITU regions raises the prospect of equipment manufacturers being able to produce network infrastructure and equipment that can be deployed across the world. Thus, able to generate global economies of scale and ultimately make mobile broadband accessible to everyone, everywhere.

FREQUENCY BAND ARRANGEMENT FOR PNG

- ITU Option 3 will be used for frequency band planning for the 2.6 GHz band in PNG with full TDD implementation on the band.
- LTE Band 41 TDD is implemented

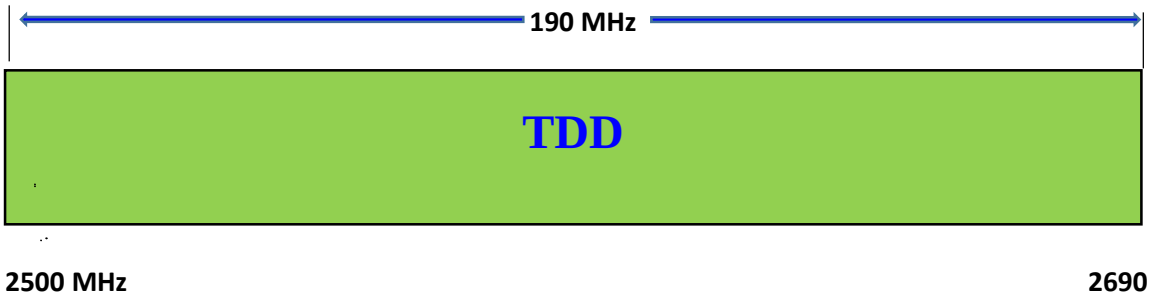


Figure 1: 2.6 GHz Frequency Arrangement for PNG

- Allows for 4G and 5G services in the Band
- Allows for high capacity services in densely populated locations
- Greater economies of scale, leading to more choice for consumers and lower prices.

References

Recommendation ITU-R M.1036-6 – “Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications (IMT) in the bands identified for IMT in the Radio Regulations (RR)”;

APPENDIX 1

Recommended harmonized frequency arrangement for implementation of IMT in the band 2500-2690MHz for APT member countries.

Paired arrangements					Un-paired arrangements (e.g. for TDD) (MHz)
Mobile station transmitter (MHz)	**Centre gap (MHz)**	**Base station transmitter (MHz)**	**Duplex separation (MHz)**	**Centre gap usage**	
2 500-2 570	50	2 620-2 690	120	TDD	2 570-2 620 TDD

- Channel bandwidth could be 5MHz, 9MHz and 10MHz.
- APT members consider using emission masks based on Recommendations ITU-R M.1580-4 for base station and ITU-R M.1581-4 for mobile station.

APPENDIX 2

ITU-R Recommendation

ITU-R has harmonized the 2500-2690MHz frequency arrangement in Recommendation ITU-R M.1036-6.

The frequency arrangements table is shown as below:

Table 1 Frequency arrangements in the band 2 500-2 690 MHz (not including the satellite component)

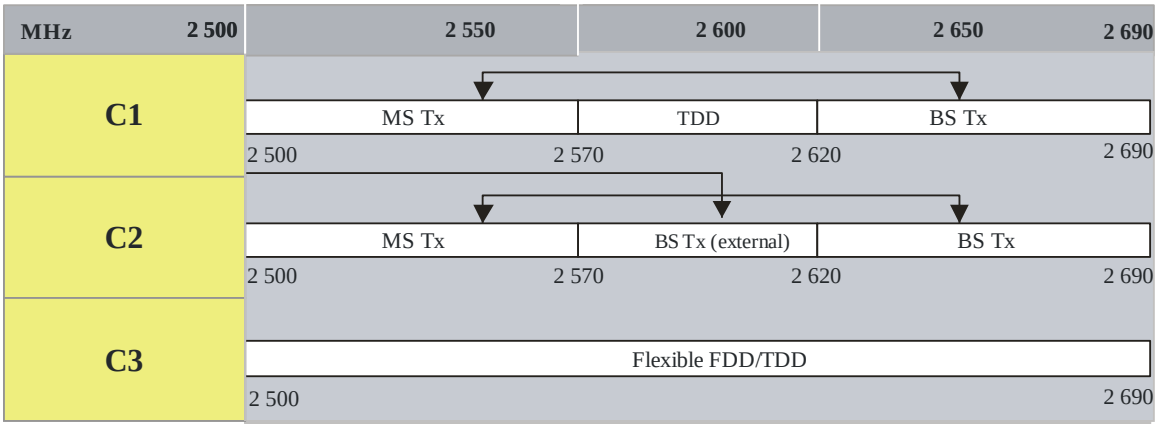
Frequency arrangements	Paired arrangements					Un-paired arrangements (e.g. for TDD) (MHz)
	Mobile station transmitter (MHz)	**Centre gap (MHz)**	**Base station transmitter (MHz)**	**Duplex separation (MHz)**	**Centre gap usage**	
C1	2 500-2 570	50	2 620-2 690	120	TDD	2 570-2 620 TDD
C2	2 500-2 570	50	2 620-2 690	120	FDD	2 570-2 620 FDD DL external
C3	Flexible FDD/TDD					

Notes to Table 1:

NOTE 1 – In C1, in order to facilitate deployment of FDD equipment, any guardbands required to ensure adjacent band compatibility at the 2 570 MHz and 2 620 MHz boundaries will be decided on a national basis and will be taken within the band 2 570-2 620 MHz and should be kept to the minimum necessary, based on Report ITU-R M.2045.

NOTE 2 – In C3, administrations can use the band solely for FDD or TDD or some combination of TDD and FDD. Administrations can use any FDD duplex spacing or FDD duplex direction. However, when administrations choose to deploy mixed FDD/TDD channels with a fixed duplex separation for FDD, the duplex separation and duplex direction as shown in C1 are preferred.

FIGURE 1
(See notes to Table 1)



M.1036-06

Other relevant ITU-R Recommendations:

Recommendation ITU-R M.1457-10 – "Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)"

Recommendation ITU-R M.1580-4 – "Generic unwanted emission characteristics of base stations using the terrestrial radio interfaces of IMT-2000";

Recommendation ITU-R M.1581-4 – "Generic unwanted emission characteristics of mobile stations using the terrestrial radio interfaces of IMT-2000";

Recommendation ITU-R M.1801-1 – "Radio interface standards for broadband wireless access systems, including mobile and nomadic applications, in the mobile service operating below 6 GHz";

Recommendation ITU-R M.2012 – "Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications Advanced (IMT-Advanced)";

APPENDIX 3

APT Regional View and implementations

The APT member state Regional View is summarized as follows;

Option1:

- The arrangement 2500-2570 MHz and 2620-2690 MHz is allocated for the FDD usage and 2570-2620 MHz is for the TDD usage
- Channel raster of 5MHz or 40MHz for the center gap of TDD, 5MHz and ~20MHz for FDD are used.

Option2:

- full TDD arrangement

The band plan options are shown as follows: