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**APT REPORT ON**

**INFORMATION OF MOBILE OPERATORS’ FREQUENCIES, TECHNOLOGIES AND LICENSE DURATIONS IN ASIA PACIFIC COUNTRIES**

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# Introduction

APT Wireless Forum[[1]](#footnote-1) (AWF) has started to develop the APT Frequency Information System (AFIS) based on the APT Recommendation “The APT Spectrum Database- Guidelines for Constructing and Maintaining the APT Frequency Information system(AFIS)” which was approved in 2006. The sharing of information on frequency allocation and spectrum usages will be beneficial to reach harmonization on spectrum usages among APT member countries. However, especially for IMT mobile usage, information on operators’ frequencies, technologies and license duration of each country is essential to achieve global/regional roaming with the purpose of improving economies of scale and is also very useful in considering migration path of IMT technologies in view of the situation in other countries.

In this regard, at the 7th meeting of AWF, it was agreed to develop an APT Report on information of mobile operators’ frequencies, technologies and license durations in Asia Pacific countries and also to develop a Questionnaire on information in relation to all terrestrial mobile operators, which was completed during the meeting. The first edition of the APT Report was adopted in the 9th meeting of AWF in September 2010. This APT Report was further updated to reflect the latest state of additional frequency bands released for terrestrial mobile cellular networks in some APT countries.

This APT report is a compilation of responses to the Questionnaire and would provide useful information to APT members and could be used for AFIS depending on the scope.

# Questionnaire and Responses

## Questionnaire

Questionnaire sent out to each of the APT Member Administration is shown below.

***Question 1*:** What frequency band(s) is/are used for mobile technology (e.g. GSM, CDMA, IMT-2000, BWA) in your country/region?

***Question 2:*** Which operator is using the frequency band(s) mentioned in Question 1 with what kind of technology mentioned in Question 1? Please provide operator name, detailed frequency band(s), used technology and license duration.

## APT Member countries that submitted responses to APT during the development of this Report

The following member countries provided their responses to the Questionnaire.

1. Afghanistan**,** Islamic Republic of (as of January 2010)
2. Australia (as of March 2015)
3. Bangladesh (as of March 2015)
4. Bhutan (as of September 2014)
5. Brunei Darussalam (as of August 2014)
6. Cambodia (as of January 2010)
7. China, People’s Republic of (as of August 2014)
8. Hong Kong, China (as of March 2015)
9. India, Republic of (as of January 2010)
10. Indonesia, Republic of (as of February 2016)
11. Iran, Islamic Republic of (as of March 2015)
12. Japan (as of March 2015)
13. Korea, Republic of (as of September 2014)
14. Lao, People's Democratic Republic (as of March 2015)
15. Macao, China (as of January 2010)
16. Malaysia (as of March 2015)
17. Micronesia, The Federated States of (as of January 2010)
18. Mongolia (as of September 2016)
19. Myanmar, The Union of (as of January 2010)
20. Nepal (as of March 2015)
21. New Zealand (as of September 2014)
22. Palau (as of January 2010)
23. Papua New Guinea (as of March 2015)
24. Philippines (as of March 2015)
25. Thailand (as of September 2016)
26. Vietnam, Socialist Republic of (as of September 2014)

## Responses to Question 1

| **Technology** | **Frequency Band (MHz)** | |
| --- | --- | --- |
| Afghanistan (Islamic Republic of) | | |
| CDMA800 | | 826.110 – 834.735 / 871.110 – 879.735 |
| P-GSM900 | | 890.200 – 915.000 / 935.200 – 959.800 |
| E-GSM900 | | 880.200 – 884.200 / 925.200 – 929.200 |
| GSM1800 | | 1710.200 – 1748.400 / 1805.200 – 1843.400 |
| BWA | | 2400 – 2500 / 3400 – 3600 |
| IMT 2000 | | 1885 – 2025 / 2110 – 2200 |

|  |  |
| --- | --- |
| Australia | |
| LTE700 | 703-748 / 758-803 |
| LTE850 | 825-845 / 870-890 |
| UMTS (HSPA+) 850 | 825 – 845 / 870 – 890 |
| GSM900 | 890 – 915 / 935 – 960 |
| UMTS (HSPA+) 900 | 900 – 915 / 945 – 960 |
| GSM-R1800 | 1710 – 1785 / 1805 –1880 |
| LTE1800 | 1710 – 1785 / 1805 – 1880 |
| UMTS(HSPA+) 2100 | 1920 – 1980 / 2110 – 2170 |
| TD-LTE | 2302 – 2400 |
| LTE2500/2600 | 2500-2570 / 2620-2690 |
| LTE3500 /WiMAX | 3400-3600 |

|  |  |
| --- | --- |
| Bangladesh | |
| CDMA800 | 825 – 845 / 870 – 890 |
| E-GSM | 880 – 890 / 925 – 935 |
| GSM900 | 890 – 915 / 935 – 960 |
| GSM1800 | 1710 – 1785 / 1805 – 1880 |
| WCDMA2100 | 1920 – 1980 / 2110 – 2170 |
| BWA systems (Mobile WiMAX) | 2300 – 2400 (TDD) |
| BWA systems (Mobile WiMAX) | 2500 – 2690 (TDD) |

| **Technology** | **Frequency Band (MHz)** |
| --- | --- |
| Bhutan | |
| GSM 900 | 880-915 / 925 – 960 |
| WCDMA 850 | 824 – 835 / 869 – 880 |
| GSM 1800/LTE 1800 | 1710 – 1785 / 1805 –1880 |
| WCDMA 2100 | 1920 – 1980 / 2110 – 2170 |
| WiMAX | 3400 - 3500 / 3500 – 3600 |

|  |  |
| --- | --- |
| Brunei Darussalam | |
| GSM900 | 900 - 915 / 945 – 960 |
| LTE1800 | 1710-1785 / 1805 – 1880 |
| UMTS (WCDMA) 2100 | 1920 – 1980 / 2110 – 2170 |

|  |  |
| --- | --- |
| Cambodia | |
| CDMA450 | 453 – 457.5 / 463 – 467.5 |
| CDMA800 | 824 – 829.4 / 869 – 874.4 |
| EGSM900 | 880 – 915 / 925 – 960 |
| GSM1800 | 1710 – 1785 / 1805 – 1880 |
| UMTS(WCDMA)2100 | 1920 – 1980/2110 – 2170 |

|  |  |
| --- | --- |
| China (People’s Republic of) | |
| CDMA800 | 825 – 835 / 870 – 880 |
| GSM900 | 889 – 915 / 934 – 960 |
| GSM1800 | 1710 – 1755 / 1805 – 1850 |
| IMT | 1755-1785 / 1850-1880 |
| CDMA2000 | 1920 – 1935/2110 – 2125 |
| IMT | 1935-1940 / 2125-2130 |
| UMTS(WCDMA) | 1940 – 1955/2130 – 2145 |
| IMT | 1955 –1980 / 2145-2170 |
| TD-LTE | 1880 –1900 TDD |
| IMT | 1900 – 1920 TDD |
| TD-SCDMA | 2010 – 2025 TDD |
| TD-LTE | 2300 – 2400 TDD |
| TD-LTE | 2500 – 2690 TDD |

|  |  |
| --- | --- |
| Hong Kong, China | |
| CDMA2000 | 825 – 832.5 / 870 – 877.5 |
| UMTS850 | 832.5 – 837.5 / 877.5 – 882.5 |
| GSM900 / UMTS | 885 – 915 / 930 – 960 |
| GSM1800 / LTE | 1710.5 – 1784.9 / 1805.5 – 1879.9 |
| UMTS | 1920.3 – 1979.7 / 2110.3 – 2169.7 |
| LTE | 2500 – 2570 / 2620 – 2690 |
| UMTS TDD | 1904.9 – 1919.9 (TDD) |
| UMTS TDD | 2019.7 – 2024.7 (TDD) |
| TD-LTE | 2300 – 2390 (TDD) |

| **Technology** | **Frequency Band (MHz)** |
| --- | --- |
| India (Republic of) | |
| CDMA800 | 824 – 844 / 869 – 889 |
| GSM900 | 890 – 915 / 935 – 960 |
| GSM1800 | 1710 – 1785 / 1805 – 1880 |

|  |  |
| --- | --- |
| Indonesia (Republic of) | |
| CDMA450 | 450 – 457.5 / 460 – 467.5 |
| CDMA800 / LTE | 824 – 835 / 869 – 880 |
| eGSM / UMTS / LTE | 880 – 890 / 925 – 935 |
| GSM900 / UMTS 900 / LTE | 890 – 915 / 935 – 960 |
| GSM1800 / LTE | 1710 – 1785 / 1805 – 1880 |
| UMTS(WCDMA)2100 | 1920 – 1970 / 2110 – 2160 |
| CDMA1900 | 1903.125 – 1910 / 1983.125 – 1990 |
| LTE | 2330 – 2360 (TDD) |
| BWA(TDD) | 2360 – 2390 |

|  |  |
| --- | --- |
| Iran (Islamic Republic of) | |
| UMTS 900 MHz | 880 – 890 / 925 – 935 |
| GSM 900 MHz | 890-915 / 935-960 |
| GSM 1800 MHz | 1710-1714 / 1805-1809  1725-1740 / 1820-1840  1770-1785 / 1865-1880 |
| UMTS 1800 MHz | 1725-1740 / 1820-1840  1740-1750/ 1835-1845  1765-1785 / 1860-1880 |
| DECT 1800 MHz | 1880-1900 |
| UMTS 2100 MHz | 1935-1975 / 2125-2170 |
| LTE 2500 MHz | 2550-2570 / 2670-2690 FDD  2570-2620 TDD |
| BWA systems | 3422-3474.5 / 3479-3500 TDD  3522-3564.5 / 3569-3600 TDD |

|  |  |
| --- | --- |
| Japan | |
| LTE | 718 – 748 / 773 – 803 |
| UMTS (WCDMA)800 / CDMA800 / LTE | 815 – 845 / 860 – 890 |
| UMTS (WCDMA)900 / LTE | 900 – 915 / 945 – 960 |
| UMTS (WCDMA)1500 / LTE | 1427.9 – 1462.9 / 1475.9 – 1510.9 |
| UMTS (WCDMA)1700 / LTE | 1749.9 – 1784.9 / 1844.9 – 1879.9 |
| UMTS (WCDMA)2100  / CDMA 2000 / LTE | 1920 – 1980 / 2110 – 2170 |
| PHS | 1884.5 – 1915.7 (TDD) |
| BWA systems (WiMAX, AXGP, WiMAX2+) | 2545 – 2575 (TDD)  2595 – 2645 (TDD) |
| LTE | 3480 – 3600 (TDD) |

| **Technology** | **Frequency Band (MHz)** | |
| --- | --- | --- |
| Korea (Republic of) | | |
| CDMA800 | | 824 – 829 / 869 – 874 |
| CDMA | | 1770 – 1780 / 1860 – 1870 |
| UMTS(WCDMA)2100 | | 1940 – 1960 / 2130 – 2150  1960 – 1980 / 2150 – 2170 |
| Mobile WiMAX (WiBro) | | 2300 – 2327  2330 – 2360 |
| LTE | | 829 – 839 / 874 – 884  1715 – 1725 / 1810 – 1820  1730 – 1735 / 1820 – 1830  1930 – 1940 / 2120 - 2130  904.3 – 914.3 / 949.3 – 959.3  1735 – 1740 / 1830 - 1840  1745 – 1755 / 1840 - 1850  839 – 849 / 884 - 894  1920 – 1930 / 2110 -2120  2520 – 2540 / 2640 - 2660 |
| TBD | | 819 – 824 / 864 - 869 |

|  |  |
| --- | --- |
| Lao PDR | |
| CDMA 450 | 452.5-457.475 / 462.5-467.475 |
| eGSM 900 | 880 - 890 / 925 – 935 |
| GSM 900 | 890 – 915 / 935 – 960 |
| GSM 1800 | 1710 -1785 / 1805 – 1880 |
| IMT 2000 | 1920 – 1980 / 2110 – 2170 |

|  |  |
| --- | --- |
| Macao (China) | |
| CDMA800 | 825 – 845/870 – 890 |
| GSM900 | 890 – 915 / 935 – 960 |
| GSM1800 | 1710 – 1785 / 1805 – 1880 |
| UMTS(WCDMA)2100 | 1920 – 1980 / 2110 – 2170 |

|  |  |  |
| --- | --- | --- |
| Malaysia | |  |
| CDMA450 | 452.0 – 456.475 / 462.0 – 466.475 |
| IMT | 825 – 835 / 870 – 880 |
| GSM900/IMT | 880 – 915 / 925 – 960 |
| GSM1800/IMT | 1710 – 1785/ 1805 – 1880 |
| UMTS(WCDMA)2100 | 1920 – 1980/ 2110 – 2170  1915 – 1920 (TDD)  2010 – 2025 (TDD) |
| BWA(WiMAX) | 2300 – 2400 (TDD) |
| IMT | 2500 – 2570 / 2620 – 2690  2575 – 2615 (TDD) |

| **Technology** | **Frequency Band (MHz)** | |
| --- | --- | --- |
| Micronesia (The Federated States of) | | |
| GSM900 | | 890 – 902 / 935 – 947 |

|  |  |
| --- | --- |
| Mongolia | |
| CDMA450 | 450 – 460 / 460 – 470 |
| CDMA800 | 824 – 849 / 869 – 894 |
| CDMA1800 | 1850 – 1865 / 1930 – 1945  1880 – 1885 / 1960 – 1965 |
| GSM900 | 890 – 915 / 935 – 960 |
| GSM1800 | 1710 – 1785 / 1805 – 1880 |
| 3G/WCDMA | 1920 – 2170 |
| LTE | 1710 – 1785 / 1805 – 1880 |

|  |  |
| --- | --- |
| Myanmar (The Union of) | |
| CDMA450 | 453 – 457/465 – 468 |
| CDMA800 / TDMA800(DAMPS) | 825 – 845 / 870 – 890 |
| GSM900 | 890 – 915/ 935 – 960 |
| DECT | 1800 – 1900/1800 – 1900 |
| WCDMA | 1920 – 1980/2110 – 2170 |

|  |  |
| --- | --- |
| Nepal (Federal Democratic Republic of ) | |
| CDMA800 | 824 – 834 / 869 – 879 (2x10) |
| GSM 900 | 880 – 915 / 925 – 960 (2x35) |
| GSM 1800 | 1710 – 1785 / 1805 – 1880 (2x75) |
| IMT-2000 (3G/WCDMA) | 1920 – 1980 / 2110 – 2170 (2x60) |
| IMT-Advanced | 2300 – 2400 (100) |
| IMT-Advanced | 2500 – 2690 (190) |
| IMT- Advanced/BWA/WiMAX | 3300 (specific range yet remained to be decided) |
| IMT-Advanced/LTE | 700 (APT band plan will be adopted.) |

|  |  |
| --- | --- |
| New Zealand | |
| LTE | 703 – 748 / 758 – 803 |
| UMTS850 | 825 – 840 / 870 – 885 |
| GSM900 / UMTS900 | 890 – 915/ 935 – 960 |
| GSM1800 / LTE | 1710 – 1785/ 1805 – 1880 |
| UMTS(WCDMA)2100 | 1920 – 1980/ 2110 – 2170 |
| BWA | 2300 – 2395 |
| LTE or BWA | 2500 – 2575 / 2620 – 2690 |
| BWA | 2575 – 2620 |
| BWA | 3410 – 3487 / 3510 –3587 |

|  |  |
| --- | --- |
| Palau | |
| GSM900 | 890 – 915/ 935 – 960 |
| GSM1800 | 1710 – 1715/ 1805 – 1810 |

|  |  |
| --- | --- |
| Papua New Guinea | |
| EGSM | 880 – 889.80 / 925 – 934.80 |
| PGSM | 890 – 914.80 / 935 – 959.80 |
| GSM1800 | 1700 – 1720 / 1805 – 1820 |
| CDMA | 824 – 835 / 869 – 880 |
| LTE700 | 698-806 |
| BWA (WiMAX) | 2330 – 2360 |
| BWA (WiMAX) | 3400 – 3500 |

|  |  |
| --- | --- |
| Philippines | |
| CDMA 450 | 450 – 470 |
| UMTS (WCDMA) 800 | 825 – 845 / 870 - 890 |
| EGSM | 880 – 890 / 925 – 935 |
| GSM 900 | 890 – 915 / 935 – 960 |
| GSM 1800 | 1710 – 1785 / 1805 – 1880 |
| UMTS (WCDMA) 2100 | 1920 – 1980 / 2110 – 2170 |
| CDMA | 1900 – 1910 / 1980 – 1990 |
| WIMAX | 2300 – 2400 (TDD)  2500 – 2690 (TDD)  3400 – 3600 (FDD)  10150 – 10650 (FDD) |

|  |  |
| --- | --- |
| Thailand | |
| CDMA2000 1X | 479 – 483.5 / 489 – 493.5 |
| CDMA2000 1X EV-DO/HSPA | 824 – 839 / 869 – 884 |
| AMPS800/HSPA | 839 – 849 / 884 – 894 |
| GSM900/HSPA | 897.5 – 915 / 942.5 – 960 |
| GSM1800 | 1710 – 1785 / 1805 – 1880 |
| IMT | 1920 – 1980 / 2110 – 2170  2010 – 2025 |
| BWA | 2300 – 2400  2500 – 2690 |

|  |  |
| --- | --- |
| Viet Nam (Socialist Republic of) | |
| CDMA 450 | 453.08 – 457.37 / 463.08 – 467.37 |
| CDMA 2000 1X EV-DO/HSPA | 824 – 835 / 869 – 880 |
| eGSM900 | 880 – 890 / 925 – 935 |
| GSM900 | 890 – 915 / 935 – 960 |
| GSM1800 | 1710 – 1785 / 1805 –1880 |
| IMT 2000 | 1920 – 1980 / 2110 – 2170 |

## Responses to Question 2

1. **Afghanistan, Islamic Republic of**

| **Operator** | **Frequency Band (MHz)** | | **Technology** | **License duration** |
| --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** |
| AWCC | 829.200 - 898.000 | 935.200 - 943.000 | P-GSM 900 | Period:15 years  10 July 2003 –  9 July 2018 |
| 1730.200-1736.000 | 1825.200-1831.000 | GSM 1800 |
| TDCA | 898.400 - 906.200 | 934.000 - 951.200 | P-GSM 900 | Period:15 years  09 Jan 2003 –­  08 Jan 2018 |
| 1742.600-1748.400 | 1837.600-1843.400 | GSM 1800 |
| MTN | 906.000 - 910.600 | 951.600 - 955.600 | P-GSM 900 | Period:15 years  12 Oct 2005 –  11 Oct 2020 |
| 1710.200-1719.800 | 1805.200-1814.800 | GSM 1800 |
| ETTISALAT | 911.000 - 915.000 | 956.000 - 959.800 | P-GSM 900 | Period:15 years  30 May 2006 –  29 May 2021 |
| 880.200 - 884.200 | 925.200 - 929.200 | E-GSM 900 |
| 1720.200-1729.800 | 1815.200-1824.800 | GSM 1800 |
| AFGHAN TELECOM | 826.110 - 829.800 | 871.110 - 874.800 | CDMA 800 | Period:15 years  19 April 2006 –  18 April 2021 |
| WASEL TELECOM | 831.045 - 834.735 | 876.045 - 879.735 | CDMA 800 | Period:15 years  18 May 2006 –  17 May 2021 |

Note: Afghanistan Telecommunications Regulatory Authority (ATRA) has not awarded any license for BWA and IMT-2000 since January 2010 in Afghanistan.

1. **Australia**

| **Operator** | **Frequency Band(MHz)** | | **Technology**  **(Note)** | **License duration** | **Comments** |
| --- | --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** |
| Telstra Corporation Limited | 713-733 | 768-788 | LTE700 | Period:15 years  Expiration:  31 Dec 2029 | Australia-wide |
| 830-845 | 875-890 | UMTS  (HSPA+)  800 | Period:15 years  Expiration:  17 June 2028 | Australia wide |
| 890-898.4 | 935-943.4 | GSM 900 | Issued on an annual basis until completion of 803-960 MHz review (previously 5 years) | Australia wide |
| 1710-1730 | 1805-1825 | LTE1800 | Period:15 years  Expiration:  17 June 2028 | Regional and  City areas |
| 1935- 1940  1960-1970 | 2125-2130  2150-2160 | UMTS  (HSPA+)  2100 | Period:15 years  Expiration:  11 Oct. 2017 | Major cities |
| 1970-1975  1940-1950 | 2160-2165  2130-2140 | UMTS  (HSPA+)  2100 | Combination 15 year spectrum licence  expiring:  11 Oct. 2017 and 5 year apparatus licence | Regional |
| 2302-2337, 2368-2400 | | TD-LTE | 24 July 2030 | Remote Areas |
| 2510-2550 | 2630-2670 | LTE2500/ 2600 | Period:15 years  Expiration:  30 Sep 2029 | Australia-wide |
| 3425-3442.5, 3475-3492.5 | | TD-LTE | 13 Dec 2015 |  |
| Vodafone Hutchison Australia Pty Ltd | 825-835 | 870-880 | UMTS  (HSPA+)  850/  LTE850 | Period:15 years  Expiration:  17 June 2028 | Regional, Remote and City Areas. |
| 906.7-915.1 | 951.7-960.1 | GSM 900 / UMTS  (HSPA+)  900 | Issued on an annual basis until completion of 803-960 MHz review (previously 5 years) | Australia wide |
| 1725-1755 | 1820-1845 | LTE 1800 | Period:15 years  Expiration:  17 June 2028 | Major cities |
| 1710-1725 | 1805-1820 | LTE1800 | Period:15 years  Expiration:  17 June 2028 | Regional Areas |
| 1920-1935 | 2110-2125 | UMTS  (HSPA+)  2100 | Period:15 years  Expiration:  11 Oct.2017 | Major cities |
| 1970-1980 | 2160-2170 | UMTS  (HSPA+)  2100 | Period:15 years  Expiration:  11 Oct.2017 | Major cities and regional |
| Singtel Optus Pty Ltd | 703-713 | 758-768 | LTE700 | Period:15 years  Expiration:  31 Dec 2029 | Australia-wide |
| 898.4-906.8 | 943.4-951.8 | GSM 900 / UMTS  (HSPA+)  900 | Issued on an annual basis until completion of 803-960 MHz review (previously 5 years) | Australia wide |
| 1755-1770 | 1850-1865 | LTE 1800 | Period:15 years  Expiration:  17 June 2028 | Major cities |
| 1940-1960 | 2130-2150 | UMTS  (HSPA+)  2100 | Period:15 years  Expiration:  11 Oct.2017 | Major cities |
| 1970-1965 | 2140-2155 | UMTS  (HSPA+)  2100 | Combination 15 year spectrum licence  expiring:  11 Oct. 2017 and 5 year apparatus licence | Regional areas |
| 2302-2400 | | TD-LTE | Period:15 years  Expiration:  24 July 2030 | Major cities, some regional locations |
| 2550-2570 | 2670-2690 | LTE2500/ 2600 | Period:15 years  Expiration:  30 Sep 2029 | Australia-wide |
| 3425-3492.5, 3542.5-3575 | | TD-LTE | Period:15 years  Expiration:  13 Dec 2015 | Major cities, Regional Western Australia |
| Rail Corporation New South Wales | 1770-1785 | 1865-1880 | GSM-R 1800 | Period:15 years  Expiration:  17 June 2028 | Sydney |
| Public Transport Authority of Western Australia | 1770-1785 | 1865-1880 | – | Period:15 years  Expiration:  17 June 2028 | Perth |
| Department for Transport Energy and Infrastructure | 1775-1785 | 1870-1880 | – | Period:15 years  Expiration:  17 June 2028 | Adelaide |
| QR Network Pty Ltd | 1770-1785 | 1865-1880 | GSM-R 1800 | Period:15 years  Expiration:  17 June 2028 | Brisbane |
| Victorian Rail Track | 1770-1785 | 1865-1880 | GSM-R 1800 | Period:15 years  Expiration:  17 June 2028 | Melbourne |
| NBN Co | 2302-2400 | | TD-LTE | Period:15 years  Expiration:  24 July 2030 | Regional and remote areas |
| 3400-3575 | | TD-LTE | Combination 15 year spectrum licence  expiring:  13 Dec 2015 and 5 year apparatus licence | Various amounts of spectrum in different metro, regional and remote areas |

Note: All bands in the table are available on a technology flexible basis in Australia.

The technology column in this case indicates the most likely/major technology deployed at the present time (however, the type of service deployed and the technology used is at the discretion of the licensee).

1. **Bangladesh**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operator** | **Frequency Band (MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| Pacific Bangladesh Telecom Ltd | 825.00 – 835.00 | 870.00-880.00 | CDMA2000 1X | 2011-2026 |
| Airtel Bangladesh Ltd | 885.00 – 890.00 | 930 – 935 | E-GSM, EDGE | 2005-2020 |
| 1720.00-1730.00 | 1815.00 –1825.00 | GSM, EDGE |
| 1945 – 1950 | 2135 – 2140 | 3G | 2013-2028 |
| Tele Talk Bangladesh Ltd | 890.00 – 895.20 | 935.00 – 940.20 | GSM, EDGE | 2004 - 2019 |
| 1710.00 -1720.00 | 1805.00 –1815.00 | GSM, EDGE |
| 1960 – 1970 | 2150-2160 | 3G | 2012 - 2026 |
| Banglalink Digital Communications Ltd | 895.20 - 900.20 | 940.20 – 945.20 | GSM, EDGE | 2011 - 2026 |
| 1752.00-1762.00 | 1847.00 –1857.00 | GSM, EDGE |
| 1955 – 1960 | 2145 – 2150 | 3G | 2013 - 2028 |
| ROBI AXIATA BD Ltd | 900.20-907.60 | 945.20 – 952.60 | GSM, EDGE | 2011 - 2026 |
| 1730.0 -1737.40 | 1825.0 – 1832.40 | GSM, EDGE |
| 1950 – 1955 | 2140 – 2145 | 3G | 2013 - 2028 |
| Grameen Phone Ltd | 907.60 – 915.00 | 952.60 – 960 1737.40 – 1752.00/1832.40 – 1847.00 MHz | GSM, EDGE | 2011 - 2026 |
| 1737.40 -1752.00 | 1832.40 –1847.00 1737.40 – 1752.00/1832.40 – 1847.00 MHz | GSM,EDGE |
| 1935 – 1945 | 2125 – 2135 | 3G | 2013 - 2028 |

1. **Bhutan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| Bhutan Telecom | 824 - 829 | 869 - 874 | WCDMA850 | 15 years |
| 890 - 900 | 935 - 945 | GSM900 |
| 1920 - 1940 | 2110 - 2130 | WCDMA2100 |
| 1730 - 1740 | 1825 - 1835 | LTE1800 |
| 1720 - 1730 | 1815 - 1825 | GSM1800 |
| Tashi InfoComm | 900 - 910 | 945 - 955 | GSM900 | 15 years |
| 824 - 834 | 860 - 879 | WCDMA850 |

1. **Brunei Darussalam**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| DataStream Technology Sdn Bhd | 900 - 915 | 945 – 960 | GSM 900 | Valid until 30 April 2028 |
| 1765 - 1785 | 1860 – 1880 | LTE1800 | Valid until 30 April 2028 |
| 1940 - 1960 | 2130 – 2150 | UMTS(WCDMA)2100 | Valid until 30 April 2028 |
| Progresif Celullar Sdn Bhd | 1920 - 1940 | 2110 – 2130 | UMTS(WCDMA)2100 | Valid until 31 Dec 2029 |

1. **Cambodia**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| M FONE | 453.0 – 457.5 | 463.0 – 467.5 | CDMA 450 | Note |
| 888.0 – 890.0 | 933.0 – 935.0 | EGSM 900 | Note |
| 1750 – 1770 | 1845 – 1865 | GSM 1800 | Expiration:2032 |
| 1975 – 1980 | 2165 – 2170 | UMTS(WCDMA) | Expiration:2036 |
| GT-Tell | 824.0 – 829.4 | 869.0 - 874.4 | CDMA 800 | Expiration:2037 |
| SOTELCO | 880.0 – 888.0 | 925.0 – 933.0 | EGSM 900 | Expiration:2042 |
| 1745 – 1750 | 1840 – 1845 | GSM 1800 | Expiration:2042 |
| CamGSM | 890.0 – 899.3 | 935.0 – 944.3 | GSM 900 | Expiration:2021 |
| 1770 – 1785 | 1865 – 1880 | GSM 1800 | Note |
| 1960 – 1975 | 2150 – 2165 | UMTS(WCDMA) | Note |
| VIETTEL | 899.3 – 905.7 | 944.3 – 950.7 | GSM 900 | Note |
| 1710 – 1720 | 1805 – 1815 | GSM 1800 | Expiration:2036 |
| 1940 – 1950 | 2130 – 2140 | UMTS(WCDMA) | Expiration:2039 |
| TMIC | 905.7 – 915.0 | 950.7 – 960.0 | GSM 900 | Expiration:2027 |
| 1740 – 1745 | 1835 – 1840 | GSM 1800 | Note |
| 1920 – 1930 | 2110 – 2120 | UMTS(WCDMA) | Expiration:2038 |
| LATELZ | 1720 – 1730 | 1815 – 1825 | GSM 1800 | Note |
| APPIFONE | 1730 – 1740 | 1825 – 1835 | GSM 1800 | Note |
| 1930 – 1940 | 2120 – 2130 | UMTS(WCDMA) | Expiration:2038 |
| CADCOMMS | 1950 – 1960 | 2140 – 2150 | UMTS(WCDMA) | Expiration:2036 |

Note: Expiration date is around 2020 to 2040.

1. **China, People’s Republic of**

| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** |
| China Telecom | 825~835 | 870~880 | CDMA 800(3G) | Expiration:  2018.12.31 |
| 1920~1935 | 2110~2125 | CDMA2000 | Expiration:  2018.12.31 |
| 2635-2655 (TDD) | | TD-LTE | Expiration:  2023.12.31 |
| China Mobile | 889 – 909 | 934 – 954 | GSM900 | Expiration  2014.12.31 |
| 1710~1735 | 1805~1830 | GSM1800 | Expiration  2014.12.31 |
| 1880 – 1900(TDD) | | TD-LTE | Expiration:  2023.12.31 |
| 2010~2025(TDD) | | TD-SCDMA | Expiration:  2018.12.31 |
| 2320 – 2370 (TDD) | | TD-LTE | Expiration:  2023.12.31 |
| 2575-2635 (TDD) | | TD-LTE | Expiration:  2023.12.31 |
| China Unicom | 909~915 | 954~960 | GSM900 | Expiration  2015.4.30 |
| 1735~1755 | 1830~1850 | GSM1800 | Expiration  2015.4.30 |
| 1940~1955 | 2130~2145 | WCDMA | Expiration:  2018.12.31 |
| 2300-2320 (TDD) | | TD-LTE | Expiration:  2023.12.31 |
| 2555-2575 (TDD) | | TD-LTE | Expiration:  2023.12.31 |

1. **Hong Kong, China**

| **Operator** | **Frequency Band (MHz)** | | | **Technology** | **Licence duration** |
| --- | --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** | |
| Hong Kong Telecom | 825 – 832.5 | 870 – 877.5 | | CDMA2000 | Expiration : 2023 |
| 890 – 897.5 | 935 – 942.5 | | GSM900 / UMTS | Expiration : 2021 |
| 904.1 – 904.9 | 949.1 – 949.9 | | GSM900 | Expiration : 2021 |
| 1713.7 – 1716.9 | 1808.7 – 1811.9 | | GSM1800 | Expiration : 2021 |
| 1718.5 – 1740.1 | 1813.5 – 1835.1 | | GSM1800 / LTE | Expiration : 2021 |
| 1770.1 – 1781.7 | 1865.1 – 1876.7 | | GSM1800 / LTE | Expiration : 2021 |
| 1920.3 – 1949.9 | 2110.3 – 2139.9 | | UMTS | Expiration : 2016 |
| 2535 – 2540 | 2655 – 2660 | | LTE | Expiration : 2028 |
| 2540 – 2555 | 2660 – 2675 | | LTE | Expiration : 2024 |
| 1904.9 – 1909.9 | | | UMTS TDD | Expiration : 2016 |
| 1914.9 – 1919.9 | | | UMTS TDD | Expiration : 2016 |
| Hutchison | 885 – 890 | 930 – 935 | | UMTS | Expiration : 2026 |
| 897.5 – 902.3 | 942.5 – 947.3 | | UMTS | Expiration : 2020 |
| 903.1 - 904 | 948.1 – 949 | | GSM900 | Expiration : 2020 |
| 904.9 – 907.5 | 949.9 – 952.5 | | GSM900 | Expiration : 2020 |
| 1710.5 – 1712.1 | 1805.5 – 1807.1 | | GSM1800 | Expiration : 2021 |
| 1760.1 – 1770.1 | 1855.1 – 1865.1 | | GSM1800 / LTE | Expiration : 2021 |
| 1964.9 – 1979.7 | 2154.9 – 2169.7 | | UMTS | Expiration : 2016 |
| 2019.7 – 2024.7 | | | UMTS TDD | Expiration : 2016 |
| 2360 – 2390 | | | TD-LTE | Expiration : 2027 |
| China Mobile | 1750.1 – 1760.1 | | 1845.1 – 1855.1 | GSM1800 / LTE | Expiration : 2021 |
| 1781.7 – 1784.9 | | 1876.7 – 1879.9 | GSM1800 | Expiration : 2021 |
| 2530 – 2535 | | 2650 – 2655 | LTE | Expiration : 2028 |
| 2555 – 2570 | | 2675 – 2690 | LTE | Expiration : 2024 |
| 2330 – 2360 | | | TD-LTE | Expiration : 2027 |
| SmarTone | 832.5 – 837.5 | | 877.5 – 882.5 | UMTS850 | Expiration : 2026 |
| 902.3 – 903.1 | | 947.3 – 948.1 | GSM900 | Expiration : 2021 |
| 907.5 – 915 | | 952.5 – 960 | GSM900 | Expiration : 2021 |
| 1712.1 – 1713.7 | | 1807.1 – 1808.7 | GSM1800 | Expiration : 2021 |
| 1716.9 – 1718.5 | | 1811.9 – 1813.5 | GSM1800 | Expiration : 2021 |
| 1740.1 – 1750.1 | | 1835.1 – 1845.1 | LTE | Expiration : 2021 |
| 1950.1 – 1964.9 | | 2140.1 – 2154.9 | UMTS | Expiration : 2016 |
| 2520 – 2530 | | 2640 – 2650 | LTE | Expiration : 2028 |
| 1909.9 – 1914.9 | | | UMTS TDD | Expiration : 2016 |
| Genius Brand | 2500 – 2515 | | 2620 – 2635 | LTE | Expiration : 2024 |
| 2515 – 2520 | | 2635 – 2640 | LTE | Expiration : 2028 |

Note: All licences have a period of validity of 15 years.

1. **India, Republic of**

| **Operator** | **Frequency Band (MHz)** | | | **License Duration** |
| --- | --- | --- | --- | --- |
| **GSM 900** | **GSM 1800** | **CDMA 800** |
| Aircel Ltd | Y | Y |  | 20 years from the date of license |
| Allianz |  | Y |  |
| Bharti | Y | Y |  |
| BSNL | Y | Y | Y |
| Datacom |  | Y |  |
| Dishnet Wireless | Y | Y |  |
| Etisalat DB |  | Y |  |
| HFCL Infocom |  | Y | Y |
| Idea | Y | Y |  |
| Loop | Y | Y |  |
| MTNL | Y | Y | Y |
| Reliance Infocomm |  | Y | Y |
| Reliance Telecom | Y | Y | Y |
| S. Tel |  | Y |  |
| Sistema Shyam |  |  | Y |
| Spice | Y | Y |  |
| Tata Teleservices |  | Y | Y |
| Unitech |  | Y |  |
| Vodafone | Y | Y |  |

Note: In India, licenses are awarded to mobile operators on service area basis. Please contact Telecom Regulatory Authority of India (TRAI)/Department of Telecommunication (DOT) for detailed information on mobile operator name, assigned frequency band and used technology in a specific service area.

1. **Indonesia, Republic of**

| **Operator** | **Frequency Band(MHz)** | | | **Technology** | **License duration** | **Coverage** |
| --- | --- | --- | --- | --- | --- | --- |
| **Uplink** | | **Downlink** |
| PT Sampoerna Telekomunikasi Indonesia | 450 – 457.5 | | 460 – 467.5 | CDMA450 | 5 years for each apparatus license 1) | Nation Wide |
| PT Telekomunikasi Indonesia, Tbk. | 2360 – 2390 | | | BWA (TDD) | 2009 – 2019 2) | Sub Nation |
| PT Smartfren Telecom, Tbk. | 824 – 835 | | 869 – 880 | CDMA800  / LTE | 2010 –  2020 2) | Nation Wide |
| PT Indosat, Tbk. | 887.5 – 890 | | 932.5– 935 | e-GSM900 / UMTS / LTE | 2010 –  2020 2) | Nation Wide |
| 890 – 900 | | 935 – 945 | GSM900 / UMTS / LTE | 2010 –  2020 2) |
| 1742.5 – 1762.5 | | 1837.5 – 1857.5 | GSM1800 / LTE |
| 1945 – 1950 | | 2135 – 2140 | UMTS  (WCDMA)  2100 | 2009 – 2019 2) |
| 1950 – 1955 | | 2140 – 2145 | UMTS  (WCDMA)  2100 | 2006 – 2016 2) |
| PT Telekomunikasi Selular | 880-887.5 | | 925-932.5 | eGSM900 / UMTS / LTE | 2010 –  2020 2) | Nation Wide |
| 900 – 907.5 | | 945 – 952.5 | GSM900 / UMTS / LTE |
| 1762.5 – 1785 | | 1857.5 – 1880 | GSM1800 / LTE |
| 1930 – 1935 | | 2120 – 2125 | UMTS  (WCDMA)  2100 | 2013 – 2023 2) |
| 1935 – 1940 | | 2125 - 2130 | UMTS  (WCDMA)  2100 | 2009 – 2019 2) |
| 1940 – 1945 | | 2130 - 2135 | UMTS  (WCDMA)  2100 | 2006 – 2016 2) |
| PT XL Axiata, Tbk. | | 907.5 – 915 | 952.5 – 960 | GSM900 / UMTS / LTE | 2010 –  2020 2) | Nation Wide |
| 1710 – 1732.5 | 1805 – 1827.5 | GSM1800 / LTE |
| 1955 - 1960 | 2145 - 2150 | UMTS  (WCDMA)  2100 | 2011 – 2021 2) |
| 1960 - 1965 | 2150 - 2155 | UMTS  (WCDMA)  2100 | 2006 – 2016 2) |
| 1965 - 1970 | 2155 - 2160 | UMTS  (WCDMA)  2100 | 2010 – 2020 2) |
| PT Hutchison 3 Indonesia 3) | | 1732.5 – 1742.5 | 1827.5 – 1837.5 | GSM1800 / LTE | 2010 –  2020 2) | Nation Wide |
| 1920 - 1925 | 2110 - 2115 | UMTS  (WCDMA)  2100 | 2006 – 2016 2) |
| 1925 - 1930 | 2115 - 2120 | 2011 – 2021 2) |
| PT Smart Telecom 4) | | 1903.125 - 1910 | 1983.125 – 1990 | CDMA1900 | 2008 – 2016 | Nation Wide |
| 2330 - 2360 | | LTE (TDD) | 2014 – 2018 2) |
| PT First Media | | 2360 – 2375 | | BWA (TDD) | 2009 – 2019 2) | Sub Nation |
| PT Internux | | 2375 – 2390 | | BWA (TDD) | 2009 – 2019 2) | Sub Nation |
| PT Indosat Mega Media | | 2375 – 2390 | | BWA (TDD) | 2009 – 2019 2) | Sub Nation |
| PT Jasnita Telekomindo | | 2375 – 2390 | | BWA (TDD) | 2009 – 2019 2) | Sub Nation |
| PT Berca Hardayaperkasa | | 2360 – 2390 | | BWA (TDD) | 2009 – 2019 2) | Sub Nation |

Note 1) : License is granted by apparatus-based licensed and can be extended for the next 5 years.

Note 2) : License is granted by bandwidth-based licensed and can be extended for the next 10 years.

Note 3) : Before March 2013, PT Hutchison 3 Indonesia was known as PT Hutchison CP Telecommunications.

Note 4) : PT Smart Telecom is in the process of frequency migration from frequency pair of 1903.125 – 1910 MHz and 1983.125 – 1990 MHz to 2330 – 2360 MHz (TDD).

1. **Iran (Islamic Republic of)**

| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** |
| Ritel | 880-890 | 925-935 | UMTS | 15 years |
| 1740-1750 | 1835-1845 | UMTS |
| 1950-1965 | 2140-2155 | UMTS |
| MTN | 890.1-896.1 | 935.1-941.1 | GSM | 15 years  WiMax: 6 years |
| 890.1-897.9 | 935.1-942.9 | GSM |
| 1765-1785 | 1860-1880 | GSM/UMTS |
| 1935-1950 | 2125-2140 | UMTS |
| 2500-2515 | 2620-2635 | 3G & LTE |
| 3479-3500 | 3569-3600 | WiMax |
| TCI | 896.3-914.9 | 941.3-959.9 | GSM | 15 years |
| 898.1-902.7 | 943.1-947.7 | GSM |
| 906.7-914.7 | 951.7-959.9 | GSM |
| 902.7-906.7 | 947.7-951.7 | GSM |
| 1725.1-1739.9 | 1820.1-1834.9 | GSM/UMTS |
| 1880-1900 (TDD) | | WLL DECT |
| MTCE | 902.7-906.7 | 947.7-951.7 | GSM | 15 years  WiMax: 6 years |
| 3422-3443 | 3522-3543 | WiMax |
| Kish Telecom | 902.7-906.7 | 947.7-951.7 | GSM | 10 years |
| Irafon | 1710.1-1713.1 | 1805.2-1806.8 | PSTN | 10 years |
| Koh noor | 1710.1-1713.1 | 1805.1-1808.1 | GSM as USO | 10 years |
| Datak | 3422-3443 | 3522-3543 | WiMax | 6 years |
| Rayaneh Danesh | 3422-3443 | 3522-3543 | WiMax | 6 years |
| Mobin Net | 3443.5-3474.5 | 3543.5-3564.5 | WiMax | 6 years |

1. **Japan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| NTT DOCOMO, INC. | 728-738 | 783-793 | LTE | Period:5 years  (Note) |
| 830-845 | 875-890 | WCDMA / LTE |
| 1447.9-1462.9 | 1495.9-1510.9 | LTE |
| 1764.9-1784.9 | 1859.9-1879.9 | WCDMA / LTE |
| 1940-1960 | 2130-2150 | WCDMA / LTE |
| 3480-3520(TDD) | | LTE |
| KDDI CORPORATION | 718-728 | 773-783 | LTE |
| 815-830 | 860-875 | CDMA2000 / LTE |
| 1437.9-1447.9 | 1485.9-1495.9 | LTE |
| 1920-1940 | 2110-2130 | CDMA2000 / LTE |
| 3520-3560(TDD) | | LTE |
| SOFTBANK MOBILE Corp. | 900-915 | 945-960 | WCDMA / LTE |
| 1427.9-1437.9 | 1475.9-1485.9 | WCDMA |
| 1960-1980 | 2150-2170 | WCDMA / LTE |
| 3560-3600(TDD) | | LTE |
| Ymobile Corp. | 738-748 | 793-803 | LTE |
| 1749.9-1764.9 | 1844.9-1859.9 | WCDMA / LTE |
| Ymobile Corp. | 1884.5-1915.7(TDD) | | PHS |
| Wireless City Planning Inc. | 2545-2575(TDD) | | AXGP(Advanced  eXtended Global Platform) |
| UQ Communications Inc. | 2595-2645(TDD) | | WiMAX / WiMAX2+ |

Note: License is granted to Base Station each. Expiration date of license for each station is different.

1. **Korea, Republic of**

| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** |
| SK Telecom | 824-829 | 869-874 | CDMA 800 | 2011.7.1 -  2021.6.30 |
| 829-839 | 874-884 | LTE | 2011.7.1 -  2021.6.30 |
| 1715-1725 | 1810-1820 | LTE | 2011.12.6 -  2021.12.5 |
| 1730-1735 | 1820-1830 | LTE | 2013.9.26 –  2021.12.5 |
| 1930-1940 | 2120-2130 | LTE | 2010.5.25 -  2016.12.3 |
| 1940-1960 | 2130-2150 | UMTS(WCDMA) 2100 or LTE | 2001.12.4 -  2016.12.3 |
| 2300-2327(TDD) | | Mobile WiMAX  (WiBro) | 2012.3.30 -  2019.3.29 |
| KT | 819-824 | 864-869 | - | 2012.7.1 -  2022.6.30 |
| 904.3-914.3 | 949.3-959.3 | LTE | 2011.7.1 -  2021.6.30 |
| 1735-1740 | 1830-1840 | LTE | 2013.9.11 -  2021.6.30 |
| 1745-1755 | 1840-1850 | LTE | 2011.7.1 -  2021.6.30 |
| 1960-1980 | 2150-2170 | UMTS(WCDMA) 2100 or LTE | 2001.12.4 -  2016.12.3 |
| 2330-2360(TDD) | | Mobile WiMAX  (WiBro) | 2012.3.30 -  2019.3.29 |
| LG Uplus | 839-849 | 884-894 | LTE | 2011.7.1 -  2021.6.30 |
| 1770-1780 | 1860-1870 | CDMA | 2011.7.1 -  2021.6.30 |
| 1920-1930 | 2110-2120 | LTE | 2011.12.6 -  2021.12.5 |
| 2520-2540 | 2640-2660 | LTE | 2011.12.4 -  2021.12.3 |

1. **Lao, PDR**

| **Operator** | **Frequency Band (MHz)** | | **Technology** | **License Duration** |
| --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** |
| LTC | 452.5-457.475 | 462.5-467.475 | CDMA 450 | 1 year \* |
| 880.2-884.8 | 925.2-929.8 | eGSM 900 | 1 year \* |
| 909-915 | 954-960 | GSM 900 | 1 year \* |
| 1755-1770 | 1850-1865 | GSM 1800 | 1 year \* |
| 1935-1950 | 2125-2140 | IMT 2000 | 1 year \* |
| ETL | 890.2-896.2 | 935.2-941.2 | GSM 900 | 1 year \* |
| 1740-1755 | 1835-1850 | GSM 1800 | 1 year \* |
| 1960-1970 | 2150-2160 | IMT 2000 | 1 year \* |
| Star Telecom | 896.4-902.4 | 941.4-947.4 | GSM 900 | 1 year \* |
| 1710-1725 | 1805-1820 | GSM 1800 | 1 year \* |
| 1930-1935 &  1950-1960 | 2120-2125 &  2140-2150 | IMT 2000 | 1 year \* |
| Beeline | 885.2-887.4 | 930.2-932.4 | eGSM 900 | 1 year \* |
| 902.6-908.6 | 947.6-853.6 | GSM 900 | 1 year \* |
| 1725-1740 | 1820-1835 | GSM 1800 | 1 year \* |
| 1920-1930 | 2110-2120 | IMT 2000 | 1 year \* |
| Sky Telecom | 1770-1785 | 1865-1880 | LTE | 1 year \* |
| 1970 – 1980 | 2160-2170 | IMT 2000 | 1 year \* |

Note \*: to renew every year subject to the master agreement with Government.

1. **Macao, China**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operator** | **Frequency Band (MHz)** | | **Technology** | **License Duration**  **(Note 1)** |
| **Uplink** | **Downlink** |
| China Telecom (Macau) Company Limited | 825.485-826.735 | 870.485-871.735 | CDMA800 | Period:8 years  June 2007-June 2015 |
| 832.865-834.115 | 877.865-879.115 |
| Smartone - Mobile Communications (Macau), Limited | 891.5-899.1 | 936.5-944.1 | GSM900 | Period:8+2 years (Note 2)  July 2002-July 2012 |
| 1723.9-1734.1 | 1818.9-1829.1 | GSM1800 |
| Macau Telecommunications Company Limited | 899.3-906.9 | 944.3-951.9 | GSM900 | Period:8+2 years (Note 2)  July 2002-July 2012 |
| 1734.9-1750.1 | 1829.9-1845.1 | GSM1800 |
| 1970.1-1975.1 | 2160.1-2165.1 | UMTS  (WCDMA)  2100 | Period:8 years  June 2007-June 2015 |
| Hutchison Telephone (Macau) Company Limited | 907.3-914.9 | 952.3-959.9 | GSM900 | Period:8+2 years (Note 2)  July 2002-July 2012 |
| 1769.7-1784.9 | 1864.7-1879.9 | GSM1800 |
| 1950.1-1955.1 | 2140.1-2145.1 | UMTS  (WCDMA)  2100 | Period:8 years  June 2007-June 2015 |

Note 1: Licensing arrangement may be made at an appropriate time before the expiration of the license.

Note 2: According to the 3G licensing conditions, if the 3G licensee possesses a 2G license, the 2G license will be renewed for a period of no more than two years. Therefore, the 2G licenses of Macau Telecommunications Company Limited (CTM), Hutchison and Smartone have been renewed and the license durations have been extended to year 2012.

1. **Malaysia**

| **Operator** | **Frequency Band(MHz)** | | | | **Technology** | **License duration** |
| --- | --- | --- | --- | --- | --- | --- |
| **Uplink** | | **Downlink** | |
| Telekom Malaysia | 452.0-456.475 | | 462.0- 466.475 | | CDMA450 | Annual basis\* |
| 825-835 | | 870-880 | | IMT | Annual basis\* |
| Maxis | 880-886 | | 925-931 | | GSM 900/  IMT | Annual basis\* |
| 905-915 | | 950-960 | | GSM 900/IMT | Annual basis\* |
| 1710-1735 | | 1805-1830 | | GSM 1800/IMT | Annual basis\* |
| 1935-1950 | | 2125-2140 | | UMTS(WCDMA)2100/IMT-2000 | Until 2018 |
| 2015-2020(TDD) | | | |
| 2510-2520 | | 2630-2640 | | IMT | Annual basis\* |
| Celcom | 888 - 890 | | 933-935 | | GSM 900 | Annual basis\* |
| 890 - 905 | | 935-950 | | GSM 900/IMT | Annual basis\* |
| 1735-1760 | | 1830-1855 | | GSM 1800/IMT | Annual basis\* |
| 1950-1965 | | 2140-2155 | | UMTS(WCDMA)2100/IMT-2000 | Until 2018 |
| 2020-2025(TDD) | | | |
| 2530-2540 | | 2650-2660 | | IMT | Annual basis\* |
| DiGi | 886-888 | | 931-933 | | GSM 900 | Annual basis\* |
| 1760-1785 | | 1855-1880 | | GSM 1800/IMT | Annual basis\* |
| 1965-1980 | | 2155-2170 | | UMTS(WCDMA)2100/IMT-2000 | Until 2018 |
| 2010-2015(TDD) | | | |
| 2560-2570 | | 2680-2690 | | IMT | Annual basis\* |
| U Mobile | 1920-1935 | | 2110-2125 | | UMTS(WCDMA)2100/IMT-2000 | Until 2027 |
| 1915-1920(TDD) | | | |
| 2520-2530 | | 2640-2650 | | IMT | Annual basis\* |
| Asiaspace Broadband | 2300-2330 (TDD)  (West Malaysia) | | | | BWA (WiMAX) | Annual basis\* |
| Redtone | 2300-2330 (TDD)  (East Malaysia) | | | | BWA (WiMAX) | Annual basis\* |
| 2500-2510 | | | 2620-2630 | IMT | Annual basis\* |
| YTL Communications | 2330-2360 (TDD) | | | | BWA (WiMAX) | Annual basis\* |
| 2595-2615 (TDD) | | | | IMT | Annual basis\* |
| Packet One | 2360-2390 (TDD) | | | | BWA (WiMAX) | Annual basis\* |
| 2575-2595 (TDD) | | | | IMT | Annual basis\* |
| Altel Communications | 2540-2560 | 2660-2680 | | | IMT | Annual basis\* |
|  |  |  |  |  |  |  |

Note \*: Approval is given on annual basis based on Apparatus Assignment.

1. **Micronesia, The Federated States of**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| FSM Telecom Corporation | 890-902 | 935-947 | GSM900 | Conditional  (Note) |

Note 1: FSM Telecom Corporation is a public Corporation and the only service provider (monopoly) in the FSM. While they are not issued a license, the Department of Transportation, Communication and Infrastructure has issued a Frequency Authorization for use of the frequencies for the mobile service. The authorization is conditional for 5 years duration which has expired pending adoption of the radiocommunication regulations for the FSM.

Note 2: While FSM Telecom Corporation has originally requested to also operate in the 1800 MHz band, the service has not taken off. Because of this, the 1800MHz band has been filed, but never used.

1. **Mongolia**

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| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| Mobicom | 890.0-902.5 | 935.0-947.5 | GSM 900 | 1995-2031 |
| 1740-1755 | 1835-1850 | GSM 1800 | 2001-2031 |
| 1920-1930 | 2110-2120 | 3G/WCDMA | 2008-2018 |
| 1970-1980 | 2160-2170 |
| 2010-2015 (TDD) | |
| 2020-2025 (TDD) | |
| 1735-1745 | 1830-1840 | LTE | 2016-2031 |
| Skytel | 824.0-831.0 | 869.0-876.0 | CDMA 800 | 1999-2029 |
| 835-845 | 880-890 | 3G/WCDMA | - |
| 1945-1955 | 2135-2145 | 2008-2018 |
| 2015-2020 (TDD) | |
| 1760-1770 | 1855-1865 | LTE | 2016-2031 |
| Unitel | 902.6-914.8 | 947.6-959.8 | GSM 900 | 2005-2025 |
| 1710-1725 | 1805-1820 | GSM 1800 | 2009-2025 |
| 1930-1945 | 2120-2135 | 3G/WCDMA | 2008-2018 |
| 1725-1735 | 1820-1830 | LTE | 2016-2031 |
| G-Mobile | 453.0-457.5 | 463.0-467.5 | CDMA 450 | 2006-2021 |
| 1885-1890 (TDD) | | 3G/WCDMA | 2008-2018 |
| 1960-1970 | 2150-2160 |
| 1770-1780 | 1865-1875 | LTE | 2016-2031 |

1. **Myanmar, The Union of**

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| --- | --- | --- | --- | --- |
| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| MPT | 453-457 | 465-468 | CDMA 450 | 5 Years |
| 825-835 | 870-880 | CDMA | 5 Years |
| 835-845 | 880-890 | DAMPS | 5 Years |
| 890-915 | 935-960 | GSM | 5 Years |
| 1800-1900 | 1800-1900 | DECT | 5 Years |
| 1920-1980 | 2110-2170 | WCDMA | 5 Years |

Note 1: Currently, all telecommunications services including mobile services are being provided by government operator MPT. There is no legal background requiring MPT to get a license for provision of services. In such a situation, a formal and systematic licensing regime has not been established yet. Of the various services, MPT applied for and has been awarded a license for GSM mobile service ONLY. So currently GSM Mobile service license is the only license granted by Posts and Telecommunications Department (PTD). PTD is now preparing a formal licensing regime and MPT will soon require to get licenses for other types of services (WCDMA, CDMA450 etc.,).

Note 2: GSM license period is five years. GSM license has been renewed according to its expiration in July 2010. For other services, radio frequency allocation validity period is five years.

1. **Nepal**

| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** |
| Nepal Doorsanchar Company Limited (Nepal Telecom) | 827 – 835 | 872 – 880 | CDMA 2000-1x EV-DO | Refer Note below. |
| 890 – 899.6 | 935 – 944.6 | GSM 900 |
| 1710 – 1725 | 1805 – 1820 | GSM 1800 |
| 1970 – 1980 | 2160 – 2170 | WCDMA(3G) |
| 2300 – 2330 | | WiMAX |
| United Telecom Limited | 824 – 827 | 869 – 872 | CDMA 2000-1x EV-DO |
| Ncell Private Limited | 902.6 – 910.6 | 947.6 – 955.6 | GSM 900 |
| 1732 – 1743 | 1827 – 1838 | GSM 1800 |
| 1960 – 1970 | 2150 – 2160 | 3G/WCDMA |
| STM Telecom Sanchar Pvt. Ltd. | 887.6 – 890 | 932.6 – 935 | GSM 900 |
| Nepal Satellite Telecom Pvt. Ltd. | 910.6 – 915 | 955.6 – 960 | GSM 900 |
| 1744 – 1753 | 1839 – 1848 | GSM 1800 |
| Smart Telecom Pvt. Ltd. | 885 – 887  899.6 – 902.6 | 930 – 932  944.6 – 947.6 | GSM 900  GSM 900 |
| 1753 – 1765 | 1848 - 1860 | GSM 1800 |

Note 1: No separate frequency license is awarded to the operators. The frequencies were assigned to the operators as a part of the Service License to provide the telecommunication services (Mobile, Limited Mobility).

Note 2: The bandwidths were assigned to the operators based on the number of subscribers and other additional criteria in the past whereas the New Frequency Policy, 2012 has adopted the principle of auction for frequency assignment. However, yet frequency remains to be assigned based on auction process.

Note 3: Operators have to pay frequency fee to the Government as per the frequency policy and decision of the Radio Frequency Policy Determination Committee (RFPDC).

Note 4: The bandwidth assigned to the operators can be revoked if frequency fee is not paid within the stipulated time.

1. **New Zealand**

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| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| Vodafone New Zealand Ltd | 723-738 | 778-793 | LTE | Period: 18 years  Expiration: 2031  (Note 1) |
| 900-915 | 945-960 | GSM 900 / UMTS 900 | Period: 20 years  Expiration: 2031 |
| 1760-1785 | 1855-1880 | GSM 1800 /LTE | Period: 20 years  Expiration: 2021 |
| 1920-1945 | 2110-2135 | UMTS 2100 | Period: 20 years  Expiration: 2021 |
| 2555-2575 | 2675-2690 | LTE or BWA | Period: 20 years  Expiration: 2030 (Note 2) |
| 3424-3452 | 3524-3552 | BWA | Period: 20 years  Expiration: 2022 |
| Spark NZ (formerly known as Telecom NZ Ltd) | 703-723 | 758-778 | LTE | Period: 18 years  Expiration: 2031  (Note 1) |
| 825-840 | 870 – 885 | UMTS850 | Period: 20 years  Expiration: 2031 |
| 1735-1760 | 1830-1855 | LTE | Period: 20 years  Expiration: 2021 |
| 1950 -1965 | 2140-2155 | UMTS 2100 | Period: 20 years  Expiration: 2021 |
| 2520-2540 | 2640-2660 | LTE or BWA | Period: 20 years  Expiration: 2030 (Note 2) |
| 3459-3466 | 3559-3566 | BWA | Period: 20 years  Expiration: 2022 |
| Two Degrees Mobile Ltd | 738-748 | 793-803 | LTE | Period: 18 years  Expiration: 2031  (Note 1) |
| 890-900 | 935-945 | GSM 900 / UMTS 900 | Period: 20 years  Expiration:2031 |
| 1710-1735 | 1805-1830 | GSM 1800 / LTE | Period: 20 years  Expiration: 2021 |
| 1965-1980 | 2155-2170 | UMTS 2100 | Period: 20 years  Expiration: 2021 |
| Managed Spectrum Park (Note 3) | 2575-2620 (TDD) | | BWA | Period: 20 years  Expiration: 2030 |
| 3410-3424 | 3510-3524 | BWA | Period: 20 years  Expiration: 2022 |
| Craig Wireless | 2300-2335 (TDD) | | BWA | Period: 20 years  Expiration: 2030 (Note 2) |
| Woosh Wireless | 2335-2370 (TDD) | | BWA | Period: 20 years  Expiration: 2030 (Note 2) |
| Reserved (Note 4) | 2370-2395 (TDD) | | Planned for BWA | Period: 20 years  Expiration: 2030 |
| Cayman | 2500-2520 | 2620-2640 | LTE or BWA | Period: 20 years  Expiration: 2030 (Note 2) |
| Blue Reach | 2540-2555 | 2646-2675 | LTE or BWA | Period: 20 years  Expiration: 2030 (Note 2) |
| Wired Company | 3452-3459 | 3552-3559 | BWA | Period: 20 years  Expiration: 2022 |
| Kordia | 3466-3487 | 3566-3587 | BWA | Period: 20 years  Expiration: 2022 |

Note 1: An early licence expiry date of 2020 would apply if implementation requirements are not met.

Note 2: An early licence expiry date of 2016 would apply if implementation requirements are not met.

Note 3: Managed Spectrum Park is facilitated by a nationwide spectrum access open to local and regional BWA services subject to self-managed coordination or sharing.

Note 4: This spectrum is currently reserved by the New Zealand government for possible reallocation and it is planned for BWA

1. **Palau**

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| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| Palau National Communications Corporation | 890-915 | 935-960 | GSM 900 | Not subject to license |
| Palau Mobile Corporation | 1710-1715 | 1805-1810 | GSM 1800 | 5 years |

1. **Papua New Guinea**

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| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| **Uplink** | **Downlink** |
| Digicel | 718 - 733 | 773 -788 | 4G (LTE)-Yet to be deployed | Period:10 years  Expiration:2024 |
| 880 – 894 | 925 – 939 | GSM 900 | Period:10 years  Expiration:2017 |
| 894 - 899 | 939 - 944 | 3G(WCDMA) | Period:10 years  Expiration: 2017 |
| 1710 – 1720 | 1805 – 1816 | GSM1800 | Period:10 years  Expiration: 2017 |
| 1721 - 1740 | 1816 - 1835 | 4G (LTE) | Period:10 years  Expiration: 2017 |
| Bemobile | 903 – 908 | 948 – 953 | 3G (WCDMA) | Period:10 years  Expiration: 2017 |
| 908 - 915 | 953 - 960 | GSM 900 | Period:10 years  Expiration: 2017 |
| Telikom PNG | 733 - 748 | 788 - 803 | 4G (LTE)- Yet to be deployed | Period:10 years  Expiration:2024 |
| 824 – 835 | 869 – 880 | CDMA 800 | Period:10 years  Expiration: 2017 |
| 1760 - 1785 | 1855 - 1880 | 4G (LTE) – yet to be deployed | Period:10 years  Expiration:2024 |
| 2330 – 2360 | | BWA (Wimax) | Period:10 years  Expiration: 2019 |
| 3400 – 3500 | | BWA (Wimax) | Period:10 years  Expiration: 2019 |
| PNG Government  (Note) |

Note: Permit only as of January 2010. The full extent of the amount of spectrum needed was not known as of January 2010. The permit is renewable annually.

1. **Philippines**

| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** |
| TEXTRON CORP .  GLOBE | 450-460 | 460-470 | CDMA 450 | Renewable for a maximum period of three years. |
| SMART | 825-835 | 870-880 | UMTS (WCDMA) 800 |
| EXTELCOM | 835-845 | 880-890 | UMTS (WCDMA) 800 |
| EXTELCOM | 880-890 | 925-935 | EGSM |
| GLOBE | 890-897.5  905-915 | 935-942.5  950-960 | GSM 900 |
| SMART | 897.5-905 | 942.5-950 | GSM 900 |
| BELLTEL | 1710-1720 | 1805-1815 | GSM 1800 |
| EXTELCOM | 1720-1725 | 1815-1820 | GSM 1800 |
| SMART | 1725-1732.5  1735-1740  1745-1750  1780-1782.5 | 1820-1827.5  1830-1835  1840-1845  1875-1877.5 | GSM 1800 |
| DIGITEL | 1760-1775  1782.5-1785 | 1855-1870  1877.5-1880 | GSM 1800 |
| GLOBE | 1732.5-1735  1740-1745  1775-1780 | 1827.5-1830  1835-1840  1870-1875 | GSM 1800 |
| BAYANTEL | 1750-1760 | 1845-1855 | GSM 1800 |
| SMART | 1920-1935 | 2110-2125 | UMTS (WCDMA) 2100 |
| DIGITEL | 1935-1945 | 2125-2135 | UMTS (WCDMA) 2100 |
| GLOBE | 1945-1955 | 2135-2145 | UMTS (WCDMA) 2100 |
| BAYANTEL | 1900.625-1903.125 | 1980.625-1983.125 | CDMA 2000 |
| MULTIMEDIA TELEPHONY INC./BROADBAND PHILS. | 1903.125-1904.375  1905.625-1906.875 | 1983.125-1904.375  1985.625-1986.875 | CDMA 2000 |
| DIGITEL | 1906.875-1909.375 | 1986.875-1989.375 | CDMA 2000 |
| eTELCO | 2300-2330 | TDD | WIMAX |
| PRIMEWORLD/SMART | 2332.5-2362.5 | TDD | WIMAX |
| EXTELCOM | 2365-2395 | TDD | WIMAX |
| INNOVE/GLOBE | 2500-2515 | TDD | WIMAX |
| BAYANTEL | 2515-2520 | TDD | WIMAX |
| DIGITEL | 2520-2535 | TDD | WIMAX |
| eTELCO | 2535-2550 | TDD | WIMAX |
| WI-TRIBE (LBNI) | 2555-2595 | TDD | WIMAX |
| BELLTEL | 2629-2669 | TDD | WIMAX |
| SMART BROADBAND | 2670-2690 | TDD | WIMAX |
| TNRI TELECOMS | 10154-10182 | 10504-10532 | WIMAX |

1. **Thailand**

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| **Operator** | **Frequency Band (MHz)** | | **Technology** | **License**  **Duration** |
| **Uplink** | **Downlink** |
| TOT | 1965-1980 | 2155-2170 | HSPA | August 2025 |
| CAT  (RealMove – MVNO) | 824-839 | 869-884 | HSPA | August 2025 |
| DTAC | 839-849 | 884-894 | HSPA | September 2018 |
| 1740-1765.3 | 1835-1860.3 | GSM/LTE | September 2018 |
| DTN | 1920-1935 | 2110-2125 | HSPA/LTE | December 2027 |
| AWN | 895-905 | 940-950 | GSM/HSPA/LTE | June 2031 |
| 1725-1740 | 1820-1835 | LTE | September 2033 |
| 1950-1965 | 2140-2155 | HSPA/LTE | December 2027 |
| TrueMoveH Universal Communication (TUC) | **905-915** | 950-960 | GSM/LTE | June 2031 |
| 1710-1725 | 1805-1820 | GSM/LTE | September 2033 |
| 1935-1950 | 2125-2140 | HSPA/LTE | December 2027 |

1. **Vietnam, Socialist Republic of**

| **Operator** | **Frequency Band(MHz)** | | **Technology** | **License duration** |
| --- | --- | --- | --- | --- |
| **Uplink** | **Downlink** |
| Viettel (1) | 453.08 – 457.37 | 465.08 – 467.37 | CDMA 450 | Period:15 years  Expiration:2019 |
| SPT | 824 – 835 | 869 – 880 | CDMA2000 1X EV-DO/HSPA | Period:15 years  Expiration:2016 |
| HTC | 880 - 890 | 925 – 935 | eGSM900 | Period:15 years  Expiration:2023 |
| GPC – VNPT | 890.1 – 898.5 | 935.1 – 943.5 | GSM900 | Period:15 years  Expiration:2018 |
| 1710 – 1730 | 1805 – 1825 | GSM1800 | Period:15 years  Expiration:2022 |
| 1965 – 1980 | 2155 – 2170 | IMT 2000 | Period:15 years  Expiration:2024 |
| Viettel | 898.5 – 906.7 | 943.5 – 951.7 | GSM900 | Period:15 years  Expiration:2018 |
| 1750 – 1770 | 1845 – 1865 | GSM1800 | Period:15 years  Expiration:2018 |
| 1935 – 1950 | 2125 – 2140 | IMT 2000 | Period:15 years  Expiration:2024 |
| VMS | 906.7 – 914.9 | 951.7 – 959.9 | GSM900 | Period:15 years  Expiration:2015 |
| 1730 – 1750 | 1825 – 1845 | GSM1800 | Period:15 years  Expiration:2015 |
| 1920 – 1935 | 2110 – 2125 | IMT 2000 | Period:15 years  Expiration:2024 |
| GTel Mobile | 1770 – 1785 | 1865 – 1880 | GSM1800 | Period:15 years  Expiration:2023 |
| Viettel (1) & HTC | 1950 – 1965 | 2140 – 2155 | IMT 2000 | Period:15 years  Expiration:2024 |

Note 1: EVN Telecom was merged with Viettel from 1/1/2012

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1. AWF is now renamed as APT Wireless Group (AWG) [↑](#footnote-ref-1)