

# Maxis Broadband Sdn Bhd

## Public Consultation Paper

### WIRELESS LOCAL AREA NETWORK (WLAN) IN THE 6GHz FREQUENCY BAND

7 October 2021

For queries, please contact:

Lam Leong Kien  
lklam@maxis.com.my  
Regulatory Department  
Maxis Broadband Sdn Bhd

## **PC Paper: Wireless Local Area Network (WLAN) in the 6 GHz Frequency Band**

---

Maxis Broadband Sdn Bhd (Maxis) welcomes this opportunity to submit comments to MCMC's Public consultation on Wireless Local Area Network (WLAN) in the 6 GHz frequency band published on 12 August 2021.

### **Executive Summary**

In our submission, we respond to MCMC's six questions where we:

- a. Support the MCMC's proposal to make available for license exempt Wi-Fi use in the 6 GHz band while maintaining technology neutral use.
- b. Propose a balanced approach where 500 MHz block (5925 MHz to 6425 MHz band) is allocated for Wi-Fi with low power indoor use like ECC Decision (20)01.
- c. Propose Wi-Fi use with very low power outdoor use like ECC Decision (20)01 to ensure coexistence between incumbent satellite and fixed microwave links.
- d. Propose the use of Automatic Frequency Coordination in careful way without incurring cost to the service provider if needed to ensure coexistence with incumbent services.
- e. Propose remaining 700 MHz block (6425-7125 MHz band) to be considered at WRC-23 for IMT allocation. This is in view that cellular usage in Malaysia is very high and there is need for new bands to cater for this continued growth.

## PC Paper: Wireless Local Area Network (WLAN) in the 6 GHz Frequency Band

---

Question	Response
<p><b>Question 1</b></p> <p>MCMC seeks your views and comments on the demand for spectrum for Wi-Fi in the 6GHz frequency band.</p>	<p>As a converged network provider, we have been leveraging on Wi-Fi solutions to meet our subscriber needs. We also observe that the introduction of Wi-Fi 6 technology has significantly improved the performance of Wi-Fi allowing it to keep up with advancements in the fixed broadband connection speeds e.g. beyond 500Mbps packages.</p> <p>Considering these demands, we see the need to accelerate the adoption of new Wi-Fi technology, i.e. WiFi-6 to increase its capacity and performance.</p> <p>Wi-Fi 6 technology also can make use of additional frequency in 6GHz range beside common Wi-Fi operating band on 2.4GHz or 2.4GHz/5GHz by legacy Wi-Fi5 devices.</p> <p>It is also important to note that Wi-Fi for in-building coverage will help in situations where cellular signals are unable to reach deep indoor area, particularly for Multi Dwelling Units or apartments. As such, the use of Wi-Fi technology can play an important role to complement cellular wireless networks.</p> <p>Any additional spectrum band will help to further improve the performance of Wi-Fi or any wireless technology especially in dense and congested location. In this regard, we are of the view that, spectrum shall be allocated in such a way that could bring the greatest economic value.</p>
<p><b>Question 2</b></p> <p>MCMC seeks your views and comments on the emerging</p>	<p>Different regions are considering various amounts and range of spectrum at the World Radiocommunication Conference 2023 (WRC-23) in the 6 GHz band for different uses. Under WRC-23 Agenda Item 1.2, there is a</p>

## PC Paper: Wireless Local Area Network (WLAN) in the 6 GHz Frequency Band

Question	Response
<p>technologies utilising the 6GHz frequency band.</p>	<p>potential for 6GHz band IMT identification in the following frequency ranges:</p> <ul style="list-style-type: none"> <li>• 5925-7025 MHz (Region 1)</li> <li>• 7025-7125 MHz (global, i.e. including APT)</li> </ul> <p>Considering that agenda item 1.2 only covers frequency band 7025-7125 MHz for Region 3 countries to which Malaysia belongs to, it may be possible for Malaysia to add its country name to one or more footnotes to allow modification of the Table of Frequency Allocations in the ITU Radio Regulations during the WRC-23 in relation to the frequency bands considered under agenda item 1.2. With this option Malaysia may consider registering its intention to identify IMT in the band 5925-7025 MHz or part thereof subject to approval of WRC-23.</p> <p>We also understand that China's IMT-2020 Promotion Group has started the 6GHz IMT field test in H1 2021, and Russia's Radio Research and Development Institute (NIIR) will start the 6 GHz IMT field test in H2 2021. Commercial products are expected to be released before WRC-23 according to our vendor.</p> <p>Besides, 3GPP Work item for "Introduction of 6GHz NR licensed bands" (RP-202114) has also started, covering 6425-7125 MHz and 5925-7125 MHz.</p> <p>We are in the view that the 6 GHz mid-band frequency range is able to provide a good balancing point between coverage and capacity for 5G connectivity. 6 GHz has the potential to serve as future 5G capacity layer or more advanced technology evolution e.g. 5.5G/6G, hence reducing the need for network densification (i.e. reduced cost per bit) and empowering more affordable the 5G connectivity to the nation.</p> <p>GSMA report "Vision 2030 Insights for Mid-band Spectrum Needs" states that in densely populated cities need, on</p>

## PC Paper: Wireless Local Area Network (WLAN) in the 6 GHz Frequency Band

Question	Response
	<p>average, a total of 2GHz of mid-band spectrum to guarantee the IMT-2020 requirements for 5G. The report further gives the example that with a deficit of 800-1000 MHz spectrum assigned for IMT-2020, total cost of networks would be 3-5x higher over a ten-year period, The higher cost per bit also means that consumers will not be able to enjoy 5G connectivity at a lower price.</p>
<p><b>Question 3</b></p> <p>MCMC seeks your views and comments on the frequency range within the 6GHz frequency band that could be considered for Wi-Fi under the Class Assignment in Malaysia. Should MCMC consider allowing Wi-Fi to operate in the entire 1200 MHz (5925 MHz to 7125 MHz frequency band) or only in the 500 MHz (5925 MHz to 6425 MHz frequency band)?</p>	<p>We support the use of the 6GHz frequency band for Wi-Fi under Class Assignment. With this, the use of Wi-Fi on an unlicensed basis will ensure its efficient use by all interested parties in particular the public without requiring separate licensing.</p> <p>We do not recommend assigning the full 1200MHz (5925 MHz to 7125 MHz frequency band) to Wi-Fi use. Wi-Fi technology usage is typically applicable if fibre fixed broadband coverage is available (indoor environment). In rural areas, whereby fibre is not economically viable, users will not be able to enjoy the benefits brought by additional spectrum. On the other hand, if 6 GHz frequency is being used for IMT-2020 technology, it will benefit both indoor and outdoor users, as well as both cities and rural area for both enhanced mobile broadband and fixed wireless access (FWA) services.</p> <p>Considering the relevance of Wi-Fi, we propose for MCMC to consider allowing Wi-Fi to operate with maximum 500 MHz in the 5925-6425 MHz frequency band while maintaining technology neutral use of this band. For example, MCMC to allow the use of other unlicensed technologies (e.g., 5G NR-U, LAA) to also operate in this band along Wi-Fi technology.</p>

## PC Paper: Wireless Local Area Network (WLAN) in the 6 GHz Frequency Band

Question	Response
	<p>We further propose that MCMC reserves the balance 6425-7125 MHz band for licensed IMT-2020 technology, upon alignment after the WRC-23.</p>
<p><b>Question 4</b></p> <p>MCMC seeks your views and comments on:</p> <ol style="list-style-type: none"> <li>i. the coexistence between Wi-Fi and incumbent services (i.e. fixed service and fixed-satellite service); and</li> <li>ii. the potential interference mitigation between these services.</li> </ol>	<p>The use of Wi-Fi in the 6GHz band may have the potential to cause frequency interference to fixed and fixed satellite services (FSS) operating in this band.</p> <p>ECC Decision (20)01 states that co-existence between Wi-Fi operating in the 5945-6425 MHz band and fixed service systems would be technically feasible under some technical conditions, whereby, the key parameters are:</p> <ul style="list-style-type: none"> <li>• Low power indoor (LPI) use, maximum EIRP of +23dBm, limited to only indoor use;</li> <li>• Very low power (VLP) portable use, maximum EIRP of +14dBm, which may operate in both indoor and outdoor.</li> </ul> <p>Considering that the FSS is using the 6GHz band for up-link transmit, the potential for frequency interference expected to the FSS earth station to be minimal. However, high density uses of Wi-Fi especially in outdoor in parts of the 6GHz band overlapping with the FSS system may cause aggregate interference to the Satellite receiver hence impacting FSS uplink band. We observe that the FSS uplink in Malaysia operate in 5925-6725 MHz frequency band. Therefore, aggregate frequency interference originating from Wi-Fi transmitters operating in the FSS uplink band may cause the space satellite stations receiving in this frequency band to be overloaded and cause unacceptable disruption.</p> <p>We also observe that the US FCC has decided to adopt restriction on unlicensed standard-power access point in the 6GHz unlicensed band to prevent them from pointing toward the satellite (space station) receivers. Pointing</p>

## PC Paper: Wireless Local Area Network (WLAN) in the 6 GHz Frequency Band

Question	Response
	<p>restrictions which limit outdoor devices to antenna elevation angles less than 30 degrees for devices transmitting more than +21 dBm EIRP to protect satellite operations in the band is required by US FCC.</p> <p>ECC Report 302 also recommended “taking steps such as limiting the use to indoor only deployment and/or introducing an EIRP limit, would help further ensuring long term protection of FSS space stations from aggregate interference from WAS/RLAN devices in the band 5925-6425MHz.”</p> <p>Some other studies e.g., the report prepared by RKF Engineering Solutions (see note below), confirms that with appropriate interference mitigation techniques, introduction of Wi-Fi in the 6 GHz band will have minimal impact on existing radio operations.</p> <p>Note: <a href="https://s3.amazonaws.com/rkfengineering-web/6USC+Report+Release+-+24Jan2018.pdf">https://s3.amazonaws.com/rkfengineering-web/6USC+Report+Release+-+24Jan2018.pdf</a></p>
<p><b>Question 5</b></p> <p>MCMC seeks your views and comments on the potential technical and operational conditions to be imposed if the 6GHz frequency band is introduced for Wi-Fi under the Class Assignment. Should part of the frequency band be limited to indoor operation? Should standard power devices operating under the Automatic Frequency Coordination (AFC) system be adopted in Malaysia?</p>	<p>US FCC, for example, mandates AFC in the 5925-6425 MHz and 6525-6875 MHz bands that allow outdoor operation of Wi-Fi 6E based on the prevalence and characteristics of incumbent licensed services that operate in the sub-bands in particular, operation of fixed microwave service.</p> <p>In Malaysia, we note that fixed microwave services may operate within the 5925-6425 MHz, 6430-7110 MHz and 7111-7425 MHz bands. We seek MCMC to review this information on the prevalence of fixed microwave links and other incumbent services within the 5925-7125 MHz band to assess available sub-bands that could be designated to operate standard power devices under the Automatic Frequency Coordination (AFC) system to be adopted.</p>

## PC Paper: Wireless Local Area Network (WLAN) in the 6 GHz Frequency Band

---

Question	Response
	<p>We however propose that at the minimum the entire 5925-6425 MHz band to be allowed for Wi-Fi indoor operation using low power while very low power can used for outdoor use to protect incumbent services. Such power levels can be per ECC Decision 20(01) as commented in our response under Question 4 above.</p>
<p><b>Question 6</b></p> <p>What other key issues need to be considered in introducing Wi-Fi in the 6GHz frequency range?</p>	<p>AFC system to protect 6GHz fixed microwave links may have to be developed with database to be made available by MCMC. It also appears that Automatic Frequency Coordination (AFC) standard is yet to be developed.</p> <p>Due to above, AFC adoption must also be carefully considered, e.g. it should not incur additional cost to service providers.</p> <p>Harmonization within region will benefit the overall ecosystem development.</p> <p>Border frequency coordination need to be considered as well.</p>