Creation of a Class Licence for Regulating the Use of and Trade in 6 GHz Devices for Wireless Local Area Network
and
Variation to the Class Licence for Provision of Public Wireless Local Area Network Services

Consultation Paper

26 November 2021

INTRODUCTION

Wireless Local Area Network ("WLAN") (also known as Radio Local Area Network ("RLAN") or Wireless Access System ("WAS")) devices (commonly known as Wi-Fi devices) have been widely deployed in the 2400 – 2483.5 MHz band (the "2.4 GHz band"), as well as the 5150 – 5350 MHz, 5470 – 5725 MHz and 5725 – 5850 MHz bands (collectively referred to as the "5 GHz band") for applications in home Internet routers, personal computers, smartphones, wearable devices, etc., and provision of public WLAN services in Hong Kong. With the advent of technology, there are emerging new WLAN devices operating in the 5925 – 7125 MHz band (the "6 GHz band") which support faster data rates and lower latency, and hence higher performance. While the use of the 2.4 GHz and 5 GHz bands for WLAN devices conforming to the requirements of the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) Order (Cap. 106Z) ("the Exemption Order")[1] is exempted from licensing, use of the 6 GHz band for WLAN devices in Hong Kong is currently not allowed.

2. In line with worldwide development, the Communications Authority ("CA") is mindful to release part of the 6 GHz band in 5925 – 6425 MHz ("the designated 6 GHz band") for use of the new WLAN devices. In this regard, with a view to regulating the use/possession of and trade in WLAN devices operating in the designated 6 GHz band ("6 GHz Devices"), the CA proposes to create a class licence (hereinafter referred to as the "WLAN Device Class Licence") pursuant to section 7B(2) of the Telecommunications Ordinance (Cap. 106) ("TO"). The CA also proposes, pursuant to sections 7C(1) and 7C(2) of the TO, to vary the existing Class Licence for Provision of Public Wireless Local Area Network Services

[1] https://www.elegislation.gov.hk/hk/cap106Z

(hereinafter referred to as the "PWLAN Service Class Licence") to allow the provision of public WLAN services in the designated 6 GHz band as well. This paper seeks to consult the public and the industry on the CA's proposals.

3. For the avoidance of doubt, the CA's views expressed in this paper on the subject matter are for the purpose of discussion and consultation only. Nothing in this paper represents or constitutes a decision made by the CA. The consultation contemplated by this paper is without prejudice to the exercise of powers by the CA under the TO.

BACKGROUND

Statutory Provisions and Regulatory Framework of Class Licence

Creation of Class Licence

4. Under section 8(1) of the TO, save under and in accordance with a licence granted by the Chief Executive in Council or with the appropriate licence granted or created by the CA, no person shall in Hong Kong or on board any ship, aircraft or space object that is registered or licensed in Hong Kong –

(a) establish or maintain any means of telecommunications; or

(aa) offer in the course of business a telecommunications service; or

(b) possess or use any apparatus for radiocommunications or any apparatus of any kind that generates and emits radio waves notwithstanding that the apparatus is not intended for radiocommunications; or

(c) deal in the course of trade or business in apparatus or material for radiocommunications or in any component part of any such apparatus or in apparatus of any kind that generates and emits radio waves whether or not the apparatus is intended, or capable of being used, for radiocommunications; or

(d) demonstrate, with a view to sale in the course of trade or business, any apparatus or material for radiocommunications.

5. Under sections 7B(1) and 7B(2) of the TO, the CA may create a class licence for telecommunications networks, systems, installations or

services, with the class licence giving a person the right to carry on the activities specified therein that are prohibited under section 8(1) of the TO except under a licence, subject to the conditions of the class licence. Before creating a class licence, pursuant to section 7B(3) of the TO, the CA shall (a) by notice in the Gazette invite members of the public who are interested to make representations by a date not less than 21 days after the notice is published and as specified in the notice; and (b) consider the representations received by the date.

6. Class licensing is commonly used by telecommunications regulators to license the establishment or maintenance, offer, possession or use, dealing, or demonstration of telecommunications networks, systems, installations or services as appropriate under a common set of conditions. A class licence sets out the conditions under which any person is permitted to carry on specified activities relating to the telecommunications networks, systems, installations or services. It is not issued to an individual user and does not involve licence fees, and there is minimal licence administration by the regulators. The class licensing approach has been used in Hong Kong since 2002 to regulate specified activities in relation to telecommunications networks, systems, installations or services, and a number of class licences have been created to regulate, among others, in-building telecommunications systems, 27 MHz citizens band radio stations, 433 MHz short-range devices, 60 GHz radiocommunications devices, 79 GHz automotive radar, resale of public telecommunications services, etc.

Variation of Class Licence

7. Pursuant to section 7C(1) of the TO, the CA may vary the conditions of a class licence by notice in the Gazette. Pursuant to section 7C(2) of the TO, the CA may in varying a class licence –

(a) specify further telecommunications networks, systems, installations or services that a person may supply under the licence;

(b) vary or revoke the type of telecommunications network, system, installation or service that a person may supply under the licence;

(c) add conditions to the licence; and

(d) vary or revoke conditions in the licence.

8. Pursuant to section 7C(4) of the TO, before varying a class licence, the CA shall by notice in the Gazette –

(a) state that it proposes to vary the class licence specified in the notice;

(b) state the subject matter of the variations to the class licence;

(c) set out where a member of the public may purchase a copy of the class licence and the proposed variations;

(d) invite members of the public who are interested to make representations by a date set out in the notice; and

(e) give an address to which a member of the public may send representations about the proposed variation.

Current Regulation of WLAN in Hong Kong

9. Wi-Fi technology[2] has been widely adopted worldwide and deployed in various kinds of info-communications equipment and devices like personal computers, Internet routers, tablets, smartphones, and other electronic gadgets. Wi-Fi devices are conventionally operating in the 2.4 GHz and 5 GHz bands based on the IEEE 802.11 series of standards. Wi-Fi devices conforming to IEEE 802.11n, 802.11ac and 802.11ax standards are also known as Wi-Fi 4, Wi-Fi 5 and Wi-Fi 6 devices respectively.

10. In Hong Kong, use of the 2.4 GHz and 5 GHz bands by WLAN devices ("2.4/5 GHz Devices") is covered by the Exemption Order that specified the relevant criteria of exemption including, among others, the applicable power limits[3] and compliance with the relevant technical specification (i.e. HKCA 1039[4] for 2.4/5 GHz Devices). Such 2.4/5GHz

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[2] Wi-Fi technology has been advocated by the Wi-Fi Alliance which is an industry organisation established to drive global adoption of WLAN standards to ensure equipment interoperability and spectrum advocacy through industry-wide collaboration.

[3] The output power of WLAN devices operating in the 2400 – 2483.5 MHz, 5150 – 5350 MHz, 5470 – 5725 MHz and 5725 – 5850 MHz bands are limited to 4 W, 200 mW, 1 W and 4 W peak equivalent isotropically radiated power respectively.

[4] Entitled "Performance Specification for Radiocommunications Apparatus Operating in the 2.4 GHz or 5 GHz Band and Employing Frequency Hopping or Digital Modulation" https://www.ofca.gov.hk/filemanager/ofca/en/content_401/hkca1039.pdf

Devices are sharing the relevant bands with other radiocommunications apparatus [5] covered under the Exemption Order for operation in an uncoordinated and unprotected manner, and they shall not cause interference to other legitimate telecommunications services.

11. Similar to other radiocommunications apparatus covered under the Exemption Order, certification of 2.4/5 GHz Devices to demonstrate compliance with the HKCA 1039 specification is on a voluntary basis. For devices having been certified against HKCA 1039, they may be affixed a label prescribed by the CA ("the CA Label") on a voluntary basis. Notwithstanding that 2.4/5 GHz Devices can be used or marketed in Hong Kong without prior certification or affixing with the CA Label, it is incumbent on manufacturers, suppliers or dealers to ensure that their 2.4/5 GHz Devices comply with the HKCA 1039 specification. From time to time, the Office of the Communications Authority ("OFCA") conducts enforcement actions against any sale and use of non-compliant devices of the Exemption Order, among others. During the past 10 years, 128 non-compliant devices[6] were seized. Under the TO, possession or use of radiocommunications equipment not meeting technical specifications will be subject to a maximum fine of HK$50,000 and imprisonment for two years.

12. The Exemption Order does not cover the use of 2.4/5 GHz Devices for provision of public telecommunications services. Public WLAN services are covered by the PWLAN Service Class Licence created by the former Telecommunications Authority ("TA") in 2003[7] which authorises the provision of public WLAN services in locations which are not unleased Government land and public streets. As at September 2021, over 230 service providers have registered under the PWLAN Service Class Licence with public WLAN installations at more than 14,000 locations[8]. On the other hand, facilities-based network operators[9] are also authorised to provide public WLAN services in the 2.4 GHz and 5 GHz bands under their Unified Carrier

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[5] Including Bluetooth devices operating in the 2.4 GHz band.

[6] These include wireless cameras, wireless microphones, etc.

[7] The Service Class Licence covered the 2.4 GHz, 5150 – 5350 MHz and 5725 – 5850 MHz bands initially and was varied by the then TA for inclusion of the 5470 – 5725 MHz band in 2007.

[8] https://www.ofca.gov.hk/en/news_info/data_statistics/internet/wifi/index.html

[9] Namely 21 ViaNet Group Limited, China Mobile Hong Kong Company Limited, HGC Global Communications Limited, HKBN Enterprise Solutions Limited, HKBN Enterprise Solutions HK Limited, Hong Kong Broadband Network Limited, SmarTone Mobile Communications Limited, PCCW-HKT Telephone Limited and Hong Kong Telecommunications (HKT) Limited.

Licences ("UCL"), and there is no restriction on the locations for provision of public WLAN services by these UCL holders.

New WLAN Devices in the 6 GHz Band

13. In recent years, a new generation of Wi-Fi devices which operate in the 6 GHz band based on the IEEE 802.11ax standard, commonly known as Wi-Fi 6E devices, was emerging in the market. With the additional spectrum in the 6 GHz band, in conjunction with the use of the 2.4 GHz and 5 GHz bands, Wi-Fi 6E could provide more capacity for innovative applications like augmented reality, virtual reality and Internet of Things. Wi-Fi 6E devices, including home Internet routers, dongles, smartphones and notebook computers, are gradually available in the market of some economies.

Potential Use of the 6 GHz Band for Mobile Services

14. Apart from supporting WLAN, part of the 6 GHz band in the range of 6425 – 7125 MHz is being considered by the International Telecommunication Union ("ITU"), in addition to other frequency bands, for the development of International Mobile Telecommunications ("IMT"). The coming World Radiocommunication Conference of ITU to be held in 2023 ("WRC-23") will deliberate on the identification of the 6425 – 7025 MHz band (for Region 1, i.e. Europe and Africa) and the 7025 – 7125 MHz band (for all regions, i.e. global) for IMT, including the fifth generation mobile ("5G") services. The Third Generation Partnership Project ("3GPP")[10] is also conducting a study on using the 6 GHz band, or parts thereof, for licensed 5G services[11] in response to the interest of some regulatory bodies and the industry. The targeted completion date of the study is around mid-2022.

Developments in Overseas Economies

15. Despite that part of the 6 GHz band is concurrently under study by ITU as one of the new candidate frequency bands for supporting IMT, some economies have decided to release the whole or part of 6 GHz band for WLAN use. In particular, economies like the United States ("US"), Canada and South Korea designate the whole 6 GHz band (i.e. the entire range of 5925 – 7125 MHz) for supporting the new generation of WLAN devices,

[10] 3GPP is dedicated to the development of technical standards on cellular telecommunications network technologies.

[11] https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=RP-202844

while other economies like Europe, United Kingdom ("UK"), Australia and New Zealand tend to designate the lower part of the 6 GHz band (typically in the range of 5945 – 6425 MHz) for WLAN use. While different administrations may impose varied technical control on the radiocommunications aspect of the new WLAN devices, they are all inclined to adopt a light-handed, licence-exempt approach for regulating the use of WLAN devices. A summary of the concerned developments in these economies is given at **Appendix 1**.

CONSIDERATIONS IN USING THE 6 GHz BAND FOR WLAN

16. Having regard to the technology and market developments for WLAN devices operating in the 6 GHz band and the potential allocation of the upper part of the frequency band for advanced mobile services including 5G services on an international / regional level, it is noted that the designated 6 GHz band (i.e. the 5925 – 6425 MHz band) is not a candidate band for 5G services. As such, the CA considers that this band may be released for use of WLAN devices including Wi-Fi 6E devices to better serve the needs of the general public in regard to short-range, high capacity communications, in line with the corresponding development in other developed economies surveyed in **Appendix 1**. In setting out a proposal for using the designated 6 GHz band for WLAN applications, the CA has also given regard to a number of considerations in paragraphs 17 to 23.

Technical Feedback from the Industry

17. In October 2020, OFCA presented a paper entitled "Advent of Radio Local Area Network Devices Operating in the 6 GHz Band"[12] in the Radio Spectrum and Technical Standards Advisory Committee ("SSAC")[13] and consulted SSAC Members on the proposed use of the designated 6 GHz band for WLAN devices in Hong Kong. SSAC Members noted that such low power devices should not cause interference to the existing fixed-satellite service ("FSS") (Earth-to-space) operating in the designated 6 GHz band and generally support[14] the release of the band for use of WLAN devices in an

[12] https://www.ofca.gov.hk/filemanager/ofca/en/content_751/SSAC_Paper_5_2020.pdf

[13] SSAC is an advisory committee established under OFCA to advise the Director-General of Communications on the planning of the use of radio frequency spectrum and the maintenance of technical standards, among others. Its members include representatives of various licensees, major government spectrum users, amateur radio society, industry associations and engineering institutions.

[14] One SSAC Member was of the view that the designated 6 GHz band was allocated to FSS on a primary

uncoordinated and unprotected manner in Hong Kong.

Control of Non-Compliant Devices

18. Pending the WRC-23 decision, the 6425 – 7125 MHz band, or parts thereof, may potentially be deployed for 5G services in Hong Kong in the future. WLAN devices from overseas market (such as the US) which could operate in the 6425 – 7125 MHz band, if illegally imported and used in Hong Kong, would cause in-band interference to the future 5G services. In this connection, Hong Kong has encountered similar interference problem due to the use of illegal DECT 6.0 cordless phones[15] that users brought from overseas had caused interference to the public mobile services[16] and OFCA has spent tremendous efforts to keep the situation under control. Although the US imposed requirements for the relevant access points of WLAN devices to be under control of an automated frequency coordination ("AFC") system or a contention-based protocol so as to ensure protection to fixed services and facilitate sharing of spectrum among different devices/services, the effectiveness of such technical provisions to protect the future 5G services outside the US, particularly in Hong Kong, is still uncertain.

19. In view of the above potential problem, the CA considers that appropriate measures should be in place to prohibit the sale of non-compliant devices in Hong Kong, and to provide an easy means to enable the general public to distinguish compliant devices allowable for use in Hong Kong from those non-compliant devices, in particular those capable of operating in the 6425 – 7125 MHz band that might be allocated for providing mobile service in Hong Kong. The measures may include more stringent certification and labelling requirements to be imposed on the sale of Wi-Fi 6E devices in Hong Kong as compared with the conventional WLAN products working in the 2.4 GHz and 5 GHz bands.

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basis and that WLAN devices sharing the same band should not impose additional constraints/restriction to the deployment of FSS in Hong Kong.

[15] DECT is a European standard for digital cordless phone which operates in the 1880 – 1900 MHz band, and such use of DECT phones is covered under the Exemption Order in Hong Kong. The US and Canada have adopted a variant of DECT, known as DECT 6.0 cordless phones, which operate in the 1920 – 1930 MHz band that overlap in frequency with the 1920.3 – 1935.1 MHz band as designated for public mobile services in Hong Kong.

[16] DECT 6.0 cordless phones as illegally imported and used in Hong Kong have caused harmful interference to the public mobile services operating in the same band. Other economies in Europe also reported similar interference problems. The CA had issued publicity materials appealing to the public not to use illegal DECT 6.0 cordless phones (see the poster at https://www.ofca.gov.hk/filemanager/ofca/Publicity/en/upload/3/3.pdf).

20. At present, there is no mandatory requirement for certification and labelling of conventional WLAN devices to ensure their compliance with the relevant HKCA specification. These devices generally fall under the following two categories –

(a) access points ("APs"), including fixed Internet routers, portable Internet routers (commonly known as "pocket Wi-Fi" or "Wi-Fi eggs"), bridges, repeaters, extenders, etc. which control the operations, including the use of frequency channels, of other WLAN devices connected to them; and

(b) client devices, including Wi-Fi dongles, smartphones, tablets, laptop computers, smart home appliances, etc. which normally work under the control of an AP but may have the capability of communicating with one another directly.

21. Among these devices, APs have higher output power than client devices in general and they control the use of frequency channels for communication with client devices for accessing the Internet. In other words, non-compliant APs, i.e. those can operate in the 6425 – 7125 MHz band, would be the prime threats in respect of in-band interference to the future 5G services of Hong Kong. It is therefore considered that APs rather than client devices shall be subject to tighter regulatory control, i.e. compulsory certification and labelling requirements.

Usage on Unmanned Aircraft Systems

22. At present, many unmanned aircraft systems ("UASs") (such as drones) use the 2.4 GHz and 5 GHz bands for remote control and relaying video pictures to ground conforming to the technical requirements of the Exemption Order. If UASs should also use the designated 6 GHz band in future for remote control and an UAS was flying at high altitude having direct line of sight to transmitting dish antennas of a satellite earth station, the UAS might receive high level co-channel interference signals that would cause harmful interference to it and break the radiocommunications for remote control. As an out-of-control UAS at high altitude might pose risk of causing casualties and property damages to the public, use of the designated 6 GHz band by UASs should not be allowed in Hong Kong. It is noted that overseas economies like the European Union ("EU") and US have prohibited UASs to use the 6 GHz band.

Effective Licensing Regime

23. An effective licensing regime is needed in order to authorise the use of and trade in 6 GHz Devices by the public in a convenient and cost-effective manner. Based on the current usage of Wi-Fi devices in general, vast quantity of 6 GHz Devices may be procured and used by individual citizens and businesses in Hong Kong. It will be impractical for the CA to grant a licence to an individual user of 6 GHz Device as it would create undue administrative burden on both the applicants and the CA as the licensing authority. As such, a light-handed licensing regime such as class licence is more appropriate for regulating the use of 6 GHz Devices. As with any other radiocommunications apparatus used in Hong Kong, OFCA will conduct enforcement actions against any sales and use of unauthorised WLAN devices from time to time, including those non-compliant devices operating in the 6 GHz band, or parts thereof.

THE PROPOSAL

Part A – Creation of the Device Class Licence

24. Taking into account the above considerations given in paragraphs 16 to 23 above, **the CA proposes to create a new WLAN Device Class Licence under section 7B(2) of the TO to regulate the use of WLAN devices operating in the designated 6 GHz band.** The draft WLAN Device Class Licence is given at **Appendix 2**.

Frequency Band

25. As mentioned in paragraph 16 above, **the CA proposes to make available the 5925 – 6425 MHz band for WLAN use in Hong Kong**. Compared with the 663.5 MHz spectrum now provided in the existing 2.4 GHz and 5 GHz licence-exempted bands for WLAN use, the additional 500 MHz of spectrum in the 5925 – 6425 MHz band represents a significant increase (about 75%) in the supply of spectrum for supporting the development of WLAN applications. As for the 6425 – 7125 MHz band, the CA will consider the use of this band, or parts thereof, for 5G services in Hong Kong subject to the outcome of WRC-23 and other considerations including co-existence with the incumbent services and frequency coordination with the neighbouring regions.

Power Limits

26. Having regard to the technical standards and specifications being adopted or developed for Wi-Fi 6E devices on an international or regional level, the **CA proposes to set out the power limits for WLAN use which are maximum equivalent isotropically radiated power of 24 dBm (250 mW) for indoor use; and 14 dBm (25 mW) for outdoor use.** Such power limits are compatible with that of developed economies like Australia, the EU, New Zealand, and the UK, among others, which also open the designated 6 GHz band or parts thereof for WLAN use. With such arrangement, end-users in Hong Kong could benefit from more potential choices of 6 GHz Devices.

HKCA Specification for 6 GHz Devices

27. The CA proposes that 6 GHz Devices shall comply with a new performance specification HKCA 1081, with a draft specification given at **Appendix 3**. HKCA 1081 will specify an operating frequency range of 5925 – 6425 MHz, the power limits, and draw reference to the European harmonised standard EN 303 687 for other technical requirements such as spurious emissions and the test methods.

Certification Requirement

28. In view of the considerations given in paragraphs 18 to 21 above, **the CA proposes to impose the compulsory certification requirement on APs** covered by the WLAN Device Class Licence with a view to ensuring that such devices to be used in Hong Kong should comply with the relevant specification (i.e. HKCA 1081), in particular that they do not operate in the 6425 – 7125 MHz band which may be used for 5G services in Hong Kong in the future. It is the responsibility of manufacturers, suppliers or dealers to seek for certification of their concerned APs before they are launched in the Hong Kong market.

29. It should be emphasised that the compulsory certification requirement does not apply to client devices, thus reducing the burden of the industry. As most smartphones, tablets and etc. may be in-built with 6 GHz Device for WLAN use, certification of such client devices remains voluntary following the same current practice for the 2.4/5 GHz Devices and it is incumbent on manufacturers, suppliers or dealers to ensure that their client devices of 6 GHz Devices comply with HKCA 1081.

Labelling Requirement

30. In order to enable consumers to have an easy means of differentiating compliant APs from non-compliant APs, **the CA proposes to impose the compulsory labelling requirement on the sale, including demonstration in the course of sale, of APs**. That is, traders must ensure that their APs on sale have been certified and affixed with the CA Label. As in the past, OFCA would undertake enforcement actions against the sale of non-compliant APs, among others.

31. Upon the creation of the WLAN Device Class Licence, OFCA would conduct education campaigns to provide information to the general public for better understanding of the WLAN Device Class Licence, and to procure and use only those compliant APs of 6 GHz Devices affixed with the CA Label.

Trading of 6 GHz Devices

32. In view of the fact that 6 GHz Devices are mainly consumer products such as Wi-Fi routers, dongles, notebook computers and smartphones embedded with Wi-Fi modules, they will be widely available for sale in the local market. **The CA proposes that the WLAN Device Class Licence should cover various trading activities,** including the related sale and demonstration activities, which would otherwise be subject to individual licensing requirements under the radio dealers licensing regime[17].

The WLAN Device Class Licence

33. According to the proposed WLAN Device Class Licence given at **Appendix 2**, a person is authorised to establish, maintain, possess, use, deal in the course of trade or business in or demonstrate, with a view to sale in the course of trade or business, 6 GHz Devices, without the need to apply for an individual licence. The major licence conditions and technical requirements set out in the proposed WLAN Device Class Licence are summarised below –

(a) the proposed WLAN Device Class Licence does not authorise provision of any public telecommunications service with the use of 6 GHz Devices (see paragraphs 34 – 36 below on the provision

[17] Sales outlets of mobile phones and 2.4/5 GHz Devices are not required to hold a Radio Dealers Licence (Unrestricted) as the trading of these radiocommunications apparatus are exempted from the licensing obligations under the Exemption Order.

of public WLAN services in the designated 6 GHz band);

(b) use of 6 GHz Devices on board UAS is prohibited;

(c) 6 GHz Devices shall share use of the same frequency band with other legitimate devices and applications in an uncoordinated and unprotected manner. In other words, users shall not be protected from harmful interference and shall use the frequency band in such a way as not to cause any harmful interference with other lawful telecommunications service or apparatus;

(d) 6 GHz Devices falling under the category of AP shall be of a type approved by the CA, i.e. such devices are subject to compulsory certification requirement;

(e) traders, when selling 6 GHz Devices falling under the category of AP or demonstrating such devices in the course of sale, shall ensure that such devices have been properly certified and affixed with the CA Label, i.e. the sale of 6 GHz Devices falling under the category of AP is subject to compulsory labelling requirement[18]; and

(f) 6 GHz Devices shall operate in the frequency band 5925 – 6425 MHz and comply with the proposed new specification HKCA 1081 (see draft at **Appendix 3**).

Part B – Variation to the Existing PWLAN Service Class Licence

The Varied PWLAN Service Class Licence

34. Along with the creation of the proposed new WLAN Device Class Licence, **the CA also proposes to vary the existing PWLAN Service Class Licence to add the designated 6 GHz band as a consequential change to authorise the provision of public WLAN services using the designated 6 GHz band**.

[18] The compulsory labelling requirement does not apply to the use of 6 GHz Devices (APs or client devices) by the end-users for which labelling (after certification) remains voluntary, i.e. the same as the current practice for 2.4/5 GHz Devices.

35. The proposed varied PWLAN Service Class Licence (with the proposed amendments highlighted) is at **Appendix 4**. It authorises a person to provide public WLAN services in locations which are not unleased Government land and public streets by making use of the radiocommunications apparatus as stipulated in the Schedule 1 to the varied PWLAN Service Class Licence, without the need to obtain an individual licence. The major changes in the proposed varied PWLAN Service Class Licence are set out below –

(a) radiocommunications apparatus operating in the 5925 – 6425 MHz band may be used for provision of public WLAN services, and the output and spurious emission levels of such apparatus are specified in Schedule 1 to the varied PWLAN Service Class Licence;

(b) radiocommunications apparatus in the 5925 – 6425 MHz band used for provision of public WLAN services are subject to compulsory certification requirement, i.e. type approval;

(c) the licensee shall register its Business Registration Certificate number or equivalent with the CA before the commencement of provision of the public WLAN services; and

(d) some references in Schedule 1 have been updated.

Use of the Designated 6 GHz Band by UCL Licensees

36. After the variation of the PWLAN Service Class Licence, the UCL licensees concerned may apply to the CA to amend their UCLs to authorise them to use the designated 6 GHz band for the provision of public WLAN services in Hong Kong.

INVITATION OF VIEWS AND COMMENTS

37. The CA invites views and comments on the creation of the WLAN Device Class Licence, the variation to the existing PWLAN Service Class Licence and the terms and conditions therein, as proposed in this consultation paper. After considering the views and comments received, the CA will finalise the regulatory framework for 6 GHz Devices and the two class licences.

38. Any person wishing to respond to the public consultation should do so on or before 24 December 2021. The CA may publish all or part of the views and comments received, and disclose the identity of the source in such manner as the CA sees fit. Any part of the submissions considered commercially confidential should be clearly marked. The CA would take such markings into account in making the decision as to whether or not to disclose such information. Submissions should be sent to –

Office of the Communications Authority
29/F Wu Chung House
213 Queen's Road East
Wanchai, Hong Kong

Attention: Senior Telecommunications Engineer
(Spectrum Planning) 1
Fax: 2803 5112
Email: spenq@ofca.gov.hk

An electronic copy of the submission should be provided by email to the address indicated above.

Office of the Communications Authority
26 November 2021

Appendix 1

Summary of Developments in Overseas Economies on Introduction of WLAN Devices operating in the 6 GHz Band

The United States

In April 2020, the Federal Communications Commission ("FCC") of the US adopted rules in the Code of Federal Regulations, Title 47, Part 15 Subpart E ("FCC Part 15E") releasing the entire 6 GHz band for licence-exempted use by unlicensed national information infrastructure devices, including WLAN devices. According to FCC Part 15E, standard power access points and the associated client devices allowed for both indoor and outdoor use can operate at maximum equivalent isotropically radiated power ("EIRP") of 36 dBm (4 W) and 30 dBm (1 W) respectively, but operations of standard power access points shall be under control of an AFC system[19]. Low power access points and the associated client devices restricted for indoor use only can operate with maximum EIRP of 30 dBm (1 W) and 24 dBm (250 mW) respectively without the need of AFC control. On the other hand, client-to-client (or peer-to-peer) communications among client devices in the 6 GHz band without an access point is currently not permitted in the US[20]. Use of the 6 GHz band on UAS is also prohibited in the US[21].

South Korea

2. In June 2020, the Ministry of Science and ICT of South Korea released the entire 6 GHz band for licence-exempted WLAN use. More specifically, low power devices with maximum EIRP of 24 dBm (250 mW) could operate indoors across the entire 6 GHz band, and very low power devices with maximum EIRP of 14 dBm (25 mW) could operate outdoors in

[19] Standard power access points shall access an AFC system for assignment of permissible operating frequencies and power to avoid causing interference to incumbent services sharing the spectrum in the US.

[20] In January 2021, FCC released a public notice seeking comments from the public on whether direct client-to-client (or peer-to-peer) communications among 6 GHz devices would be permitted. FCC had not followed up the matter to propose any new rules or rules changes however.

[21] With reference to FCC document number 2020-11236, unlicensed devices operating in the 6 GHz band, whether standard power or low power devices, are prohibited from operating on UAS because these systems would pose potential harmful interference concerns to incumbent services with the added complication of operating at significant height.

the 5925 – 6425 MHz band. By 2022, all licence-exempted devices could use the entire 6 GHz band outdoors incorporating a form of database-driven spectrum sharing mechanism, similar to the AFC system of the US.

Canada

3. In May 2021, the Innovation, Science and Economic Development Canada ("ISED") of Canada decided, after conducting a consultation from November 2020 to January 2021, to release the entire 6 GHz band for licence-exempted WLAN use, among others. ISED will align the use of the entire 6 GHz band in Canada with that adopted by the FCC in the US to the maximum extent possible, including the devices classes for WLAN use, the relevant power levels and adoption of an AFC system, among others.

Europe

4. In Europe, the Electronic Communications Committee ("ECC") of the European Conference of Postal and Telecommunications Administrations ("CEPT") published an ECC decision[22] in November 2020 requiring CEPT administrations to designate the 5945 – 6425 MHz band[23], preferably by 20 May 2021, for use by WAS/RLAN equipment on a non-exclusive, non-interference and non-protected basis. The ECC decision also requires CEPT administrations to exempt WAS/RLAN equipment from individual licensing. In June 2021, the European Commission ("EC") published an implementing decision[24] requiring member countries of the EU to designate the 5945 – 6425 MHz band for implementation of WAS/RLAN on a non-exclusive, non-interference and non-protected basis by 1 December 2021. Both ECC decision and EC implementing decision mentioned above cover the following two types of devices –

(a) low power indoor devices with maximum EIRP of 23 dBm (200 mW) restricted to indoor use; and

[22] ECC Decision (20)01 available at https://docdb.cept.org/download/1448

[23] According to the IEEE 802.11ax channel plan, the lower 20 MHz spectrum (i.e. 5925 – 5945 MHz) is a guard band. Taking into account the operations of urban rail intelligent transport systems in parts of the 5905 – 5935 MHz band in some EU countries, EU decided to adopt only the 5945 – 6425 MHz band for WAS/RLAN in Europe.

[24] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2021:232:FULL&from=EN

(b) very low power portable devices with maximum EIRP of 14 dBm (25 mW) for indoor and outdoor use.

In addition, use of the aforesaid devices on board UAS is not allowed[25].

5. For certification purpose and to facilitate product launch of 6 GHz Devices on the EU market, the European Telecommunications Standards Institute is developing the European harmonised standard EN 303 687[26] covering WAS/RLAN equipment operating in the 5945 – 6425 MHz band which can be used to demonstrate compliance with the essential requirements of EU's Radio Equipment Directive[27].

The United Kingdom

6. In the UK, the Office of the Communications ("Ofcom") issued a decision[28] in July 2020 making available the 5925 – 6425 MHz band for Wi-Fi and other licence-exempted technologies with maximum EIRP of 24 dBm (250 mW) for indoor use; and 14 dBm (25 mW) for outdoor use. Ofcom will continue to review the optimal use of the 6425 – 7125 MHz band, including the use for 5G services.

Australia

7. In April 2021, the Australian Communications and Media Authority ("ACMA") of Australia published a consultation paper proposing, among others, the allocation of the 5925 – 6425 MHz band for WLAN use with maximum EIRP of 24 dBm (250 mW) for indoor use; and 14 dBm (25 mW) for all locations, while the use of the 6425 – 7125 MHz band would be decided later pending the WRC-23 decision in respect of the identification of the aforesaid band for 5G services. Nevertheless, ACMA sought views for releasing the 6425 – 7125 MHz band for WLAN use before the WRC-23

[25] With reference to CEPT Report 75, UAS or drones, operating in the 5945 – 6425 MHz band should not be permitted as there is a likelihood of UAS coming into the main beam of a fixed service antenna which may cause interference to fixed services.

[26] A publicly available draft and the final version of EN 303 687 are scheduled to be published on 10 March 2022 and 22 November 2022 respectively. The latest stable draft (available to ETSI members only) was published on 24 June 2021.

[27] A piece of WAS/RLAN equipment in compliance with EN 303 687 is considered to meet the essential requirement of the Radio Equipment Directive (2014/53/EU) in respect of the effective and efficient use of radio spectrum in order to avoid harmful interference.

[28] https://www.ofcom.org.uk/consultations-and-statements/category-2/improving-spectrum-access-for-wi-fi

decision. The consultation ended in May 2021 and a decision is yet to be made by the ACMA.

New Zealand

8. In June 2021, the Radio Spectrum Management ("RSM") of New Zealand conducted a consultation proposing, among others, the allocation of the 5925 – 6425 MHz band for WLAN use with maximum EIRP of 24 dBm (250 mW) for indoor use; and 14 dBm (25 mW) for all locations. Regarding the use of the 6425 – 7125 MHz band, it would be decided later pending the WRC-23 decision. RSM also sought views on the potential use of the 6425 – 7125 MHz band for new applications including WLAN and 5G services. The consultation ended in June 2021 and a decision is yet to be made by the RSM.

Appendix 2

[DRAFT]

TELECOMMUNICATIONS ORDINANCE
(Chapter 106)

CLASS LICENCE

6 GHz DEVICE

The Communications Authority, in exercise of the powers conferred on it by sections 7(5) and 7B(2) of the Telecommunications Ordinance (Chapter 106), issues this Licence on this [xx] day of [MM, YYYY].

1. Interpretation

1.1 In this Licence –

"6 GHz Device" means a radio station as described in the Schedule to this Licence;

"Access Point" means a 6 GHz Device (portable or non-portable) which controls the operations, including the use of frequency channels, of other wireless devices connected to it;

"Authority" means the Communications Authority established by section 3 of the Communications Authority Ordinance (Chapter 616);

"Client Device" means a 6 GHz Device which normally works under the control of an Access Point and may have the capability of communicating with one another directly without involving an Access Point, i.e. peer-to-peer communications;

"Licensee" means a person licensed under Condition 2 of this Licence;

"Ordinance" means Telecommunications Ordinance (Chapter 106); and

"Telecommunication Convention" means any Constitution and Convention of the International Telecommunication Union and the Radio Regulations annexed thereto, which have from time to time or at

any time been acceded to by or applied to Hong Kong.

1.2 Any word or expression used in this Licence shall, unless otherwise provided, have the same meaning as it has in the Ordinance or regulations made under the Ordinance.

1.3 For the purposes of interpreting this Licence, headings and titles shall be disregarded.

2. Grant of Licence

2.1 Subject to the terms and conditions of this Licence, a person is licensed to establish, maintain, possess, use, deal in the course of trade or business in and demonstrate, with a view to sale in the course of trade or business, the 6 GHz Device.

2.2 Notwithstanding Condition 2.1, this Licence does not authorise the use of 6 GHz Device on board unmanned aircraft systems.

3. General

3.1 This Licence shall not be construed as granting an exclusive right to the Licensee.

3.2 This Licence replaces any licence or any exemption from licensing for the establishment, maintenance, possession and use of, dealing in the course of trade or business in and demonstration, with a view to sale in the course of trade or business, of the 6 GHz Device, however described, which the Authority may have granted to the Licensee.

3.3 This Licence shall remain in full force unless expressly revoked by the Authority.

4. Compliance Generally

4.1 The Licensee shall comply with the Ordinance, regulations made under the Ordinance, licence conditions or any other instruments which may be issued by the Authority under the Ordinance and such guidelines or codes of practices which may be issued by the Authority as in its opinion are suitable for the purpose of providing practical guidance on

any particular aspect of any conditions of this Licence.

4.2 The Licensee shall observe and comply with all provisions of the Telecommunication Convention relevant to the 6 GHz Device.

4.3 The Licensee shall not use the 6 GHz Device to provide a public telecommunications service, except under and in accordance with a licence granted by the Authority.

5. Interference

5.1 Where the Licensee establishes, operates, maintains or uses the 6 GHz Device, the Licensee shall take reasonable measures to do so in such a way as not to cause any direct or indirect harmful interference with any lawful telecommunications service or any telecommunications apparatus licensed or authorised under the Ordinance.

5.2 The Authority may give such reasonable directions as it thinks fit to prevent any direct or indirect harmful interference referred to in Condition 5.1. The Licensee shall comply with the directions.

5.3 The Licensee shall make the 6 GHz Device available for inspection and testing, if so required, by any person authorised for the purpose by the Authority.

5.4 The Licensee should be aware that the frequencies allocated to the 6 GHz Device are shared with other applications in an uncoordinated manner and not protected from harmful interference caused by other telecommunications installations or radio equipment operating in accordance with the provisions of the Ordinance, or regulations or orders made under the Ordinance.

6. Certification and Labelling

6.1 The 6 GHz Device, if falling under the category of Access Point, shall be of a type approved by the Authority.

6.2 The Licensee, when dealing in the course of trade or business in and demonstrate, with a view to sale in the course of trade or business, the 6 GHz Device which falls under the category of Access Point, shall ensure that such device is affixed with a label prescribed by the

Authority.

7. Technical Criteria

7.1 The Licensee shall ensure that any 6 GHz Device that it establishes, maintains, operates, uses, deals in the course of trade or business in, and demonstrates, with a view to sale in the course of trade or business, shall at all times fully comply with the technical criteria and technical specification specified in the Schedule.

SCHEDULE

6 GHz Device

A 6 GHz Device under this Licence refers to a radio station for Wireless Local Area Network, including Access Point and Client Device. The 6 GHz Device shall comply with the technical criteria below and the technical specification HKCA 1081[1] issued by the Authority pursuant to section 32D of the Ordinance.

Technical Criteria

Frequency band: 5.925 – 6.425 GHz

Maximum power:

(i) 24 dBm mean equivalent isotropically radiated power, for indoor use

(ii) 14 dBm mean equivalent isotropically radiated power, for outdoor use

[1] Entitled "Performance Specification for Radiocommunications Apparatus Operating in the 6 GHz Band for Wireless Local Area Network".

Appendix 3

[DRAFT]

HKCA 1081
ISSUE 1
[MM YEAR]

PERFORMANCE SPECIFICATION

FOR RADIOCOMMUNICATIONS APPARATUS

OPERATING IN THE 6 GHz BAND FOR

WIRELESS LOCAL AREA NETWORK

通訊事務管理局
COMMUNICATIONS
AUTHORITY

FOREWORD

1. This specification is prescribed under section 32D of the Telecommunications Ordinance (Cap 106) ("the Ordinance") to set out the technical and evaluation requirements for radiocommunications apparatus operating in the 6 GHz band for wireless local area network. Radiocommunications apparatus falling into the scope of this specification shall meet the stipulated requirements.

2. Under the Ordinance, the possession or use of any radiocommunications apparatus or any apparatus emitting radio frequency energy must be covered by an appropriate licence issued by the Communications Authority (CA) with the exception of those specifically exempted from licensing under the Ordinance, such as those covered by the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) Order (Cap 106Z).

3. At present, the Office of the Communications Authority (OFCA) operates a **H**ong **K**ong **T**elecommunications Equipment **E**valuation and **C**ertification (HKTEC) Scheme. Details of the HKTEC Scheme can be found in the information note OFCA I 421. Suppliers or manufacturers of the radiocommunications apparatus shall apply for certification of their apparatus against this specification in accordance with the HKTEC Scheme. The application procedures for certification of radiocommunications apparatus can be found in the information note OFCA I 401. A prescribed label shall/may be affixed to the certified equipment. Details of the labelling arrangement can be found in the Standardisation Guide HKCA 3211.

4. The CA may amend any part of this specification as and when it deems necessary.

5. In case of doubt about the interpretation of this specification, the methods of carrying out the test and the validity of statements made by the equipment manufacturers or suppliers about the equipment, the decision of the CA shall be final.

6. The HKCA specifications and information notes issued by the CA can be downloaded from OFCA's website at http://www.ofca.gov.hk. Enquiries about this specification may be directed to:

Senior Telecommunications Engineer
Standards Section
Office of the Communications Authority
29/F Wu Chung House
213 Queen's Road East
Wanchai
Hong Kong

Fax : +852 2838 5004
Email : standards@ofca.gov.hk

AMENDMENT HISTORY

Item	Issue No.	Paragraph	Descriptions
1.	Issue 1 [MM YEAR]	All	First release

CONTENTS

1. SCOPE OF SPECIFICATION

This specification defines the minimum performance requirements for radiocommunications apparatus operating in the 6 GHz band for wireless local area network (hereafter referred to as the "apparatus").

2. ELECTRICAL SAFETY REQUIREMENTS

The apparatus shall comply with the electrical safety requirements set out in HKCA 2001 "Compliance Test Specification - Safety and Electrical Protection Requirements for Subscriber Telecommunications Equipment" issued by the Communications Authority.

3. TECHNICAL REQUIREMENTS

3.1 The apparatus shall operate in the 5.925 – 6.425 GHz frequency range.

3.2 The maximum output power of the apparatus shall not exceed the limits indicated below:

Location of Use	Output Power (EIRP)
Indoor	24 dBm
Outdoor	14 dBm

3.3 The apparatus shall meet the technical requirements specified in the standard EN 303 687 "6 GHz RLAN; Harmonised Standard for access to radio spectrum"[1] published by the European Telecommunications Standards Institute ("ETSI").

4. EVALUATION REQUIREMENTS

Compliance of the apparatus with the technical requirements shall be evaluated in accordance with the procedures specified in the standard given in clause 3.3 above.

5. REFERENCE

ETSI EN 303 687 "6 GHz RLAN; Harmonised Standard for access to radio spectrum"

- END -

[1] According to the power level specified in 3.2 above, the RF output power limit of 23 dBm EIRP and the power spectral density limit of 10 dBm/MHz EIRP as specified in clauses 4.3.2 and 4.3.3 of EN 303 687 are allowed to be increased by 1 dB to 24 dBm EIRP and 11 dBm/MHz EIRP respectively.

Appendix 4

[DRAFT]

TELECOMMUNICATIONS ORDINANCE
(Chapter 106)

CLASS LICENCE

PROVISION OF PUBLIC WIRELESS LOCAL AREA NETWORK SERVICES

The ~~Telecommunications~~Communications Authority, in exercise of the powers conferred on him by sections 7B(6) and 7C(1) of the Telecommunications Ordinance (~~Cap~~Chapter 106), publishes this Licence on this ~~9th~~[xx] day of ~~February 2007~~[MM, YYYY].

1. Interpretation

1.1 In this Licence –

"Authority" means the ~~Telecommunications~~Communications Authority[1] ~~appointed under section 5 of the Ordinance~~ established by section 3 of the Communications Authority Ordinance (Chapter 616);

"Licensee" means a person licensed under Condition 2.1 of this Licence;

"Ordinance" means the Telecommunications Ordinance (~~Cap~~Chapter 106); and

"radiocommunications apparatus" means the radiocommunications apparatus falling within the description of Schedule 1 to this Licence.

1.2 Any word or expression used in this Licence shall, unless otherwise provided, have the same meaning as it has in the Ordinance or regulations made under the Ordinance.

[1] ~~Pursuant to Section 27 of the Communications Authority Ordinance, the "Telecommunications Authority" referred to in this Class Licence shall be construed as the "Communications Authority".~~

1.3 For the purposes of interpreting this Licence, headings and titles shall be disregarded.

2. Grant of Licence

2.1 Subject to the terms and conditions of this Licence, a person is licensed to establish, maintain, use or possess radiocommunications apparatus specified in Schedule 1 to provide a public telecommunications service more particularly described as follows:

(a) a service that provides communications between two or more points within the radio coverage of the same set of radiocommunications apparatus being established, maintained, used or possessed by that person; or

(b) a service that provides access to or resale of a public telecommunications service provided by a person duly licensed under a public telecommunications network or services licence.

3. General

3.1 This Licence shall not be construed as granting an exclusive right to the Licensee.

3.2 This Licence replaces any licence or any exemption from licensing, however described, which the Authority may have granted to the Licensee.

3.3 This Licence shall remain in full force unless expressly revoked by the Authority.

4. Compliance Generally

4.1 The Licensee shall comply with the Ordinance, regulations made under the Ordinance, licence conditions or any other instruments which may be issued by the Authority under the Ordinance and such guidelines or Codes of Practices which may be issued by the Authority as in his opinion are suitable for the purpose of providing practical guidance on any particular aspect of any conditions of the Licence.

5. Registration

5.1 Subject to Condition 5.4, the Licensee shall register the following information with the Authority before the commencement of the provision of the public telecommunications service:

(a) the name and contact details of the Licensee;
(b) the Business Registration Certificate number or equivalent of the Licensee;
(c) the location in which the radiocommunications apparatus is established or maintained; and
(d) the frequency band(s) employed by the radiocommunications apparatus for the provision of service.

5.2 The Licensee shall update the information provided under Condition 5.1 before changes to the registered details are put into effect.

5.3 The Licensee shall notify the Authority within one month of his ceasing to provide public telecommunications services under the Class Licence.

5.4 Where the Licensee has been providing a public telecommunications service within the description of Condition 2.1 before the commencement of this Licence, he shall register the information referred to in Condition 5.1 within one month of the commencement of this Licence.

6. Provision of Satisfactory Service

6.1 The Licensee shall at all times and from time to time during the subsistence of this Licence operate, maintain and provide the public telecommunications service under Condition 2.1 in a manner satisfactory to the Authority.

7. Interference and Obstruction

7.1 The Licensee shall take reasonable measures to install, establish, operate and maintain the radiocommunications apparatus in such a way as not to cause any direct or indirect harmful interference with or physical obstruction to any lawful telecommunications service, or the installation, maintenance, operation, adjustment, repair, alteration, removal or replacement of the facilities of any lawful

telecommunications or utility service provider.

7.2 The Authority may give such reasonable directions as he thinks fit to avoid any direct or indirect harmful interference or physical obstruction referred to in Condition 7.1. The Licensee shall comply with the directions.

7.3 The Licensee should be aware that the bands allocated to the radiocommunications apparatus are shared with other applications in an uncoordinated manner and therefore not protected from harmful interference caused by other telecommunications installations or radio equipment operating in accordance with the provisions of the Ordinance, or regulations or orders made under the Ordinance.

8. Installations and Radio Path not to Cross Public Street or Unleased Government Land

8.1 No wire shall be laid or maintained by the Licensee across any public street or unleased Government land.

8.2 The licensee shall not offer or provide any public telecommunications service under Condition 2.1 to a person who is separated from the radiocommunications apparatus established, maintained, used or possessed by the Licensee by unleased Government land or public street.

9. Requirement to Furnish Information to the Authority

9.1 The Licensee shall furnish to the Authority, in such manner and at such times as the Authority may request in writing, such information related to the business, including financial information, accounts and other records as the Authority may reasonably require in order to perform his functions under the Ordinance and this Licence and to ensure the Licensee's compliance with the conditions of this Licence and the Ordinance.

9.2 Where the Authority proposes to disclose information obtained and the Authority considers that the disclosure would result in the release of information concerning the business or commercial or financial affairs of the Licensee which disclosure would or could reasonably be expected to adversely affect the Licensee's lawful business or commercial or

financial affairs, the Authority will give the Licensee a reasonable opportunity to make representations on the proposed disclosure before the Authority makes a final decision whether to disclose the information.

10. Metering Accuracy

10.1 The Licensee shall take all reasonable steps to ensure that any metering equipment used in connection with the service operated under this Licence is accurate and reliable.

10.2 Upon written request of the Authority, the Licensee shall conduct tests on metering equipment to assess its accuracy, reliability and conformity to the technical standards, if any, specified by the Authority. The Licensee shall submit the test result to the Authority within 14 days after the date of the test or such other longer period as the Authority may determine.

11. Publication of Tariffs

11.1 The Licensee shall publish and charge no more than the tariffs for the service operated under this Licence. Publication may be effected by electronic means or by providing a copy to any person who may request it. The tariffs shall include the relevant terms and conditions for the provision of the service.

SCHEDULE 1

Radiocommunications Apparatus

Radiocommunications apparatus under this Licence refers to a radiocommunications apparatus which complies with the standards and / or certification requirements as may be prescribed by the Authority pursuant to sections 32D and / or 32E of the Ordinance and conforms to the technical criteria specified below:

(i) Interpretation

"digital modulation" (數碼調制) means the process by which the characteristics of a carrier wave (that is to say, an electromagnetic wave used to carry an information signal) are varied among a set of predetermined discrete values in accordance with a digital modulating function as specified in document ANSI C63.17~~ 1998~~ published by the American National Standards Institute;

"effective radiated power" or "e.r.p." (有效輻射功率), "equivalent isotropically radiated power" or "e.i.r.p." (等效全向輻射功率) and "spurious emission" (雜散發射) have the meanings assigned to them respectively by Article 1 of Chapter 1 of the Radio Regulations published by the General Secretariat of the International Telecommunication Union~~, edition of 2001~~, as revised from time to time;

"frequency hopping spread spectrum modulation" (頻率跳變擴譜調制) means a modulation system which hops to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies; and

"modulation" (調制) has the meaning ~~assigned to it in "Terms and Definitions" of~~defined in the Recommendation ~~ITU-R V.662~~ITU-T K.83 approved by the International Telecommunication Union, as revised from time to time.

(ii) Technical Criteria

The radiocommunications apparatus shall operate within a frequency band shown in column 1 of the following table and shall generate an output level and spurious emission level as set out opposite to that frequency band in columns 2 and 3 -

Column 1 **Frequency Band**	Column 2 **Output Level**	Column 3 **Spurious Emission Level**
2400 – 2483.5 MHz	(a) peak e.i.r.p. not to exceed 4 W for frequency hopping spread spectrum modulation or digital modulation systems; or (b) aggregate e.r.p. not to exceed 100 mW for any modulation	e.r.p. not to exceed 10 μW outside the frequency band in which the fundamental frequencies are located
5150 – 5350 MHz [1]	e.i.r.p. not to exceed 200 mW using only digital modulation	e.r.p. not to exceed 10 μW
5470 – 5725 MHz [2]	e.i.r.p. not to exceed 1 W	e.r.p. not to exceed 10 μW
5725 – 5850 MHz	(a) peak e.i.r.p. not to exceed 4 W for frequency hopping spread spectrum modulation or digital modulation systems; or (b) aggregate e.r.p. not to exceed 100 mW for any modulation	e.r.p. not to exceed 10 μW outside the frequency band in which the fundamental frequencies are located
5925 – 6425 MHz [3]	(a) e.i.r.p. not to exceed 250 mW for indoor operations (b) e.i.r.p. not to exceed 25 mW for outdoor operations	in compliance with the specification HKCA 1081

Note: [1] Use of the band 5150 – 5350 MHz is restricted to indoor operations until the requirements of the International Telecommunication Union as

applicable to the band are available, by which time the use of the band shall be in compliance with the requirements as laid down by the International Telecommunication Union.

[2] Use of the band 5470 – 5725 MHz shall comply with the technical requirements in Recommendation ITU-R M.1652 “Dynamic frequency selection (DFS) in wireless access systems including radio local area networks for the purpose of protecting the radiodetermination service in the 5 GHz band” approved by the International Telecommunication Union as revised from time to time.

[3] Radiocommunications apparatus operating in the 5925 – 6425 MHz band shall comply with the specification HKCA 1081 entitled “Performance Specification for Radiocommunications Apparatus Operating in the 6 GHz Band for Wireless Local Area Network” issued by the Authority and shall also be of a type approved by the Authority.