

Statement of the Communications Authority

Variation to the Class Licence for Short Range Device to Regulate the Use of and Trade in Ultra-Wideband Radiocommunications Devices under Section 7C of the Telecommunications Ordinance (Chapter 106)

3 August 2018

INTRODUCTION

On 6 April 2018, the Communications Authority (“CA”) published a consultation paper entitled “Variation to the Class Licence for Short Range Device to Regulate the Use of and Trade in Ultra-Wideband Radiocommunications Devices under Section 7C of the Telecommunications Ordinance (Chapter 106)” (the “Consultation Paper”)¹. The CA proposed in the Consultation Paper to vary the Class Licence for Short Range Device (hereinafter referred to as the “Class Licence”) to expand its scope to cover short-range devices (“SRD”) employing Ultra-Wideband technology (“UWB devices”) in addition to SRD operating in the 433 – 434.79 MHz band (“433 MHz devices”) currently covered, in light of the anticipated broad availability of UWB-enabled consumer products in Hong Kong in the near future. The CA invited interested parties to give views and comments on its proposal. A Gazette notice was published on the same day announcing the issue of the Consultation Paper. Four submissions², from Company X (the company has requested to keep its identity confidential), the Wi-Fi Alliance, Asia Satellite Telecommunications Company Limited (“AsiaSat”) and APT Satellite Company Limited (“APT Satellite”) respectively, were received by the close of the consultation period on 4 May 2018.

RELEVANT STATUTORY PROVISIONS

2. Pursuant to section 7C(1) of the Telecommunications Ordinance (“TO”) (Cap. 106), 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 –

¹ See http://www.coms-auth.hk/filemanager/en/content_711/cp20180406_e.pdf

² The submission is available at:
http://www.coms-auth.hk/en/policies_regulations/consultations/completed/index_id_446.html

- (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.

SUBMISSIONS RECEIVED AND CA'S RESPONSES

Submissions Received

3. Company X supports the CA's proposal.
4. The Wi-Fi Alliance submits that the 5.925 – 7.125 GHz band ("the 6 GHz band"), which overlaps in frequency with the proposed UWB operating band of 6 – 8.5 GHz, is being considered internationally for the deployment of Wireless Local Area Networks ("WLAN"). It urges the CA to ensure that in allowing the use of UWB devices in the 6 – 8.5 GHz band, the use of the 6 GHz band for other licence-exempted or class-licensed services such as WLAN should not be compromised in the future. AsiaSat expresses similar concern that UWB operations in the 6 – 8.5 GHz band should not impose any constraints on the deployment of fixed-satellite service ("FSS") uplinks in the 6 – 7.075 GHz band.
5. AsiaSat and APT Satellite allege that UWB transmissions in the 4.5 – 4.8 GHz band would risk causing in-band interference to FSS downlink earth stations. In addition, APT Satellite also expresses concern on adjacent band interference from UWB transmissions in the 4.2 – 4.8 GHz band to FSS downlink earth stations in the 3.4 – 4.2 GHz band. AsiaSat further proposes that UWB operations in the 4.5 – 4.8 GHz band should not be allowed.
6. AsiaSat submits that the 4.2 – 4.4 GHz band is allocated to the aeronautical radionavigation service in Hong Kong and considers that UWB devices operating in this band should not be allowed as it would impact aircraft safety.

CA's Response

7. As stated in paragraph 20(b) of the Consultation Paper, the use of UWB devices under the varied Class Licence is on a non-interference and non-protected basis, i.e. users of UWB devices will not be protected from harmful interference and they shall use the UWB devices in such a way that no harmful interference should be caused to any other legitimate telecommunications service or apparatus. As such, the claims of the Wi-Fi Alliance and AsiaSat in respect of the use of UWB devices in the 6 – 8.5 GHz band constraining the respective deployments of WLAN in the 6 GHz band (if it is allowed by the CA in future) and FSS uplinks in the 6 – 7.075 GHz band should not be a concern.

8. Regarding the comments of AsiaSat and APT Satellite about the potential interference to FSS downlink earth station due to UWB operations as mentioned in paragraph 5 above, the CA notes that these satellite operators raised the same issues during the consultation on UWB conducted by the former Telecommunications Authority (“former TA”) in 2009. As explained in the Consultation Paper, after considering the results of all relevant tests conducted, the former TA concluded via its statement in March 2010 that UWB devices implementing mitigation techniques should be allowed to operate in the whole 3.4 – 4.8 GHz band at the proposed power limit of -41.3 dBm/MHz EIRP under a class licensing regime. Against this background, the CA considers that AsiaSat’s proposal of excluding the 4.5 – 4.8 GHz band from the permitted UWB operating bands is not justified.

9. The CA notes that the use of UWB devices on board aircraft is allowed in Europe, but disallowed in the United States and in Mainland China. However, the use of UWB devices operating in the frequency band of 4.2 – 4.4 GHz on ground is generally allowed. Similar to mobile phones and other licence-exempted radiocommunications devices (such as Bluetooth devices in the 2.4 GHz band), although there is no express requirement of the CA which forbids their use on board aircraft, passengers should always follow flight crews’ instructions to use or not to use such devices on board aircraft in order to avoid interference with the aviation electronic systems. The same arrangement should apply for the use of UWB devices on board aircraft, as appropriate. The CA therefore considers that AsiaSat’s proposal of excluding the 4.2 – 4.4 GHz band from the permitted UWB operating bands due to potential interference to the aeronautical radionavigation service is not justified.

10. Details of the submissions and the responses of the CA are at **Annex**.

THE CA'S DECISION

11. Having considered all submissions received and in anticipation of broad availability of UWB-enabled consumer products in the near future, the CA considers that the proposed variation to the Class Licence would be beneficial to both the industry and general consumers in facilitating the use and trading of UWB devices (in addition to 433 MHz devices) in Hong Kong while other services such as satellite services would not be adversely affected. On the basis of the above considerations, the CA decides to vary the Class Licence as set out in Appendix 1 of the Consultation Paper with effect from the date of this statement.

12. To implement the CA's decision, the Office of the Communications Authority ("OFCA") publishes the varied Class Licence in the Gazette in accordance with section 7C(1) of the TO and adopts the specification HKCA 1080 today. For public access, the class licence is available on the CA's website (<http://www.coms-auth.hk/en/licensing/telecommunications/class/index.html>) and the specification HKCA 1080 is available on OFCA's website (http://www.ofca.gov.hk/en/industry_focus/telecommunications/standards/hkca/radio_equipment_specifications/index.html).

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Details of the Submissions and the CA's Responses

Industry Views	CA's Consideration and Responses
<p>Company X supports the proposed variation to the Class Licence for Short Range Device ("the Class Licence").</p>	<p>Noted.</p>
<p>Wi-Fi Alliance points out that the 5.925 – 7.125 GHz band ("the 6 GHz band") is being considered internationally for the deployment of Wireless Local Area Networks ("WLAN"). It urges the CA to ensure that allowing the use of UWB devices in the 6 – 8.5 GHz band should not compromise the use of the 6 GHz band for other licence-exempted or class-licensed services, e.g. WLAN.</p>	<p>The proposed use of UWB devices under the varied Class Licence is on a non-interference and non-protected basis, i.e. users of UWB devices will not be protected from harmful interference and they shall use the UWB devices in such a way that no harmful interference should be caused to any other legitimate telecommunications service or apparatus. The use of UWB devices therefore should not constrain the deployments of other lawful services operating in the band, including WLAN in the 6 GHz band (if it would be allowed by the CA in future). OFCA will keep in view the international development relating to the use of the 6 GHz band for new applications such as WLAN and take necessary actions to facilitate such use as appropriate.</p>
<p>AsiaSat is currently operating a satellite with payload in the planned fixed-satellite service ("FSS") band of 4.5 – 4.8 GHz band (downlink). It considers that UWB operations in the 4.2 – 4.8 GHz band at the proposed mean power spectral density ("PSD") limit of -41.3 dBm/MHz equivalent isotropically radiated power ("EIRP"), even with mitigation techniques such as low duty cycle ("LDC") implemented, would produce interference exceeding the level tolerable by FSS as specified in Recommendation ITU-R S.1432. As such, UWB devices would pose significant risk of causing interference to FSS. AsiaSat proposes that the 4.5 – 4.8 GHz band be excluded from the permitted UWB operating bands.</p>	<p>During the consultation in 2009, AsiaSat raised the same concern that interference from UWB transmissions to FSS in the 3.4 – 4.2 GHz band exceeded the tolerable level specified in Recommendation ITU-R S.1432. The former Telecommunications Authority ("former TA") considered that, in practice, FSS systems should be able to tolerate interference level in excess of the level specified in the said ITU-R recommendation. In fact, the results of the field tests conducted by the satellite operators at that time revealed that FSS downlink earth stations in the 3.4 – 4.2 GHz band would not be affected by UWB devices operating at the PSD level of -41.3 dBm/MHz and at a distance of 10 m or more away from the satellite receiving antennas. Having considered these test results, the former TA concluded that UWB devices implementing mitigation techniques should be allowed to operate in the whole 3.4 – 4.8 GHz band at the PSD level of -41.3 dBm/MHz EIRP under a class licensing regime. Against this background, it is not justifiable that the 4.5 – 4.8 GHz band be excluded from the UWB operating bands as proposed by AsiaSat.</p>

Industry Views	CA's Consideration and Responses
<p>AsiaSat points out that LDC is not able to provide adequate protection to FSS as the determining factor for FSS performance degradation is the peak emission level of UWB transmissions instead of the average emission level. If UWB operation in the 4.2 – 4.8 GHz band is allowed, the mean PSD limit should be significantly reduced.</p>	<p>As regards UWB devices implementing LDC, according to the European harmonised standards under reference in the specification HKCA 1080, the mean PSD is measured using an average detector with maximum hold and is the highest value found over all frequencies and times and operating modes. The mean PSD refers to the maximum power level measured using an average detector but not the power level averaged over the whole transmitter ON and OFF period. The maximum hold setting ensures that the highest power level (during transmitter ON period) is captured. It is not agreeable that the mean PSD is not a determining factor affecting FSS performance. It is also considered that the mean PSD limit of -41.3 dBm/MHz EIRP for UWB devices implementing mitigation technique, which had been set by the former TA after the consultation in 2009, should be appropriate.</p> <p>In fact, the European harmonised standards under reference in HKCA 1080 specify limits on peak power (in 50 MHz bandwidth) also, which is measured using peak detector with maximum hold. Compliance with these peak power limits is also required under HKCA 1080.</p>
<p>AsiaSat points out that the 4.2 – 4.4 GHz band is allocated to the aeronautical radionavigation service in Hong Kong. UWB devices operating in this band would have significant impact on aircraft safety. It also raises concern on the difficulty of ensuring that UWB devices on board aircraft are switched off during take-off or landing of aircraft. AsiaSat proposes that the 4.2 – 4.4 GHz band be excluded from the permitted UWB operating bands.</p>	<p>In Europe, use of UWB devices operating in the 4.2 – 4.4 GHz band on board aircraft is allowed. In the United States and the Mainland China, use of UWB devices on board aircraft, irrespective of the operating bands, is not allowed at all. Yet, use of UWB devices operating in the 4.2 – 4.4 GHz band on ground is generally allowed.</p> <p>Similar to mobile phones and other licence-exempted radiocommunications devices (such as Bluetooth devices in the 2.4 GHz band), although there is no express requirement of the CA forbidding their use on board aircraft, passengers should always follow flight crews' instructions to use or not to use such devices on board aircraft in order to avoid interference with the aviation electronic systems. The same arrangement should apply for the use of UWB devices on board aircraft, as appropriate.</p> <p>In view of the above considerations, it is not justifiable that the 4.2 – 4.4 GHz band be excluded from the UWB operating bands.</p>

Industry Views	CA's Consideration and Responses
<p>AsiaSat considers that UWB devices should neither claim protection from nor cause harmful interference to FSS uplink in the 6 – 7.075 GHz band. UWB operations also should not impose any constraints to the deployment and operation of current and future FSS uplink earth stations operating in this band.</p>	<p>As mentioned above, under the proposed varied Class Licence, UWB devices shall be operated on a non-interference and non-protected basis. The use of UWB devices therefore should not constrain the deployments of FSS uplinks in the 6 – 7.075 GHz band.</p>
<p>APT Satellite points out that under the Plan for FSS in the frequency bands 4.5 – 4.8 GHz (downlink) and 6.725 – 7.025 GHz (uplink) specified in Appendix 30B of the Radio Regulations (“RR”), Hong Kong has an allotment at the orbital position 57.5°E. UWB devices in the 4.5 – 4.8 GHz band at the proposed mean PSD limit of -41.3 dBm/MHz EIRP would cause in-band harmful interference to this allotment. APT Satellite has also submitted satellite network filing to ITU for using the above-mentioned frequency bands at another orbital position in accordance with the provisions of Appendix 30B of RR. Protection of this satellite network against in-band harmful interference from UWB devices also requires the CA's attention.</p> <p>APT Satellite says that the proposed UWB operating band 4.2 – 4.8 GHz is adjacent to the 3.4 – 4.2 GHz being used for FSS downlink where there are critical telemetry signals close to 4.2 GHz. Out-of-band emissions from UWB devices would cause harmful interference to FSS but the CA has not specified the out-of-band emission mask for UWB devices.</p>	<p>During the consultation in 2009, APT Satellite raised the same concern about the potential interference from UWB devices operating at mean PSD of -41.3 dBm/MHz EIRP to FSS downlinks in the 3.4 – 4.2 GHz band. As explained above, having considered the results of tests conducted by the satellite operators at that time in respect of the alleged interference from UWB devices to FSS downlinks, the former TA concluded that UWB devices implementing mitigation techniques should be allowed to operate in the whole 3.4 – 4.8 GHz band at the PSD level of -41.3 dBm/MHz EIRP under a class licensing regime.</p> <p>In addition to the above-said PSD limit, UWB devices shall also comply with other technical requirements specified in the European harmonised standards and FCC rules under reference in the specification HKCA 1080, including out-of-band or spurious emission limits. In other words, HKCA 1080 has control on out-of-band or spurious emissions of UWB devices.</p> <p>The proposed use of the 4.2 – 4.8 GHz band for UWB is in line with the former TA's decision as well as the widely recognised European harmonised standards and FCC rules and should not pose risk of interference to FSS downlinks in the 3.4 – 4.2 GHz and 4.5 – 4.8 GHz bands.</p>