

**RADIO SPECTRUM AND TECHNICAL STANDARDS
ADVISORY COMMITTEE**

**Proposed New Performance Specifications for
New Radio (NR) Base Station and
Active Antenna System (AAS) Base Station**

Purpose

This paper proposes the adoption of the following new HKCA specifications:

HKCA 1082 Issue 1	Performance Specification for New Radio (NR) Base Station
HKCA 1083 Issue 1	Performance Specification for Active Antenna System (AAS) Base Station

Background

2. With the assignments of the spectrum in the 3.3 GHz, 3.5 GHz, 4.9 GHz and 26/28 GHz bands¹ to mobile network operators, the fifth generation mobile (5G) services have been commercially launched in Hong Kong since April 2020. The NR base stations are now certified using several type acceptance criteria including TAC 005², TAC 007³ and TAC 011⁴, which draw reference to the relevant specifications published by the 3rd Generation Partnership Project (“3GPP”) as follows for selected test items to ensure efficient use of radio spectrum and to avoid harmful interference –

- (a) TAC 005 - “Type Acceptance Criteria for 5G New Radio Base

¹ 3.3 GHz band refers to 3300 – 3400 MHz band
3.5 GHz band refers to 3400 – 3600 MHz band
4.9 GHz band refers to 4800 – 4960 MHz band
26/28 GHz band refer to 24.25 – 28.35 GHz band

² TAC 005 “Type Acceptance Criteria for 5G New Radio Base Station Equipment Operating in the 24.25-28.35 GHz Band” is available at https://www.ofca.gov.hk/filemanager/ofca/en/content_791/tac005.pdf.

³ TAC 007 “Type Acceptance Criteria for 5G New Radio Base Station Equipment Operating Below 6 GHz Band” is available at https://www.ofca.gov.hk/filemanager/ofca/en/content_791/tac007.pdf.

⁴ TAC 011 “Type Acceptance Criteria for Active Antenna System (AAS) Base Station Equipment Operating Below 6 GHz” is available at https://www.ofca.gov.hk/filemanager/ofca/en/content_791/tac011.pdf.

Station Equipment Operating in the 24.25-28.35 GHz Band” draws reference to 3GPP TS 38.141-2;

- (b) TAC 007 - “Type Acceptance Criteria for 5G New Radio Base Station Equipment Operating Below 6 GHz Band” draws reference to 3GPP TS 38.141-1 and 3GPP TS 38.141-2; and
- (c) TAC 011 - “Type Acceptance Criteria for Active Antenna System (AAS) Base Station Equipment Operating Below 6 GHz” draws reference to 3GPP TS 37.145-1 and 3GPP TS 37.145-2.

3. Recently, the European Telecommunications Standards Institute (“ETSI”) has expanded the set of harmonised standards⁵ ETSI EN 301 908 to cover the requirements of NR base station with the publication of the following harmonised standards –

- (a) ETSI EN 301 908-1 V15.2.1 covering the common requirements of NR base station;
- (b) ETSI EN 301 908-24 V15.1.1⁶ covering NR base station operating in specified frequency bands; and
- (c) ETSI EN 301 908-23 V15.1.1⁵ covering AAS base station supporting single-RAT⁷ UTRA FDD⁸, single-RAT E-UTRA⁹ and Multi-Standard Radio (“MSR”) (UTRA FDD, E-UTRA, NR) and operating in specified frequency bands.

4. ETSI EN 301 908-24 V15.1.1 covers all frequency bands used for provision of mobile services in Hong Kong, except for the paired band 825 – 837.5 MHz / 870 – 882.5 MHz (“850 MHz band”) and the 4.9 GHz band as these bands are not allocated to mobile services in EU countries. These two bands are covered by 3GPP TS 38.141-1 and 3GPP TS 38.141-2 under reference in TAC 005 and TAC 007. Similarly, ETSI EN 301 908-23 V15.1.1 covers all

⁵ Compliance with the relevant harmonised standards gives presumption of conformity to the essential requirements of the European Union (“EU”), i.e. efficient use of radio spectrum and avoidance of harmful interference, which are required before the concerned radio equipment can be marketed and used in EU countries.

⁶ ETSI EN 301 908-24 V15.1.1 has been developed with reference to 3GPP TS 38.141-1 and 3GPP TS 38.141-2 whereas ETSI EN 301 908-23 has been developed with reference to 3GPP TS 37.145-1 and 3GPP TS 37.145-2. However, these harmonised standards cover only operating frequency bands which have been allocated to mobile services in EU countries, and selected test items which are necessary to meet the essential requirements of EU, i.e. efficient use of radio spectrum and avoidance of harmful interference. On the other hand, the 3GPP specifications, developed by industry players from all over the world, have wider coverage of test items and operating frequency bands.

⁷ RAT: Radio Access Technology

⁸ UTRA FDD: Universal Terrestrial Radio Access Frequency Division Duplex

⁹ E-UTRA: Evolved Universal Terrestrial Radio Access

frequency bands used for provision of mobile services in Hong Kong which can be used in AAS base stations, except for the 850 MHz band. The 850 MHz band is covered by 3GPP TS 37.145-1 and 3GPP TS 37.145-2 under reference in TAC 011. As such, it is advisable that reference should be drawn to these relevant 3GPP specifications in the proposed new specifications HKCA 1082 and HKCA 1083 to cater for the 850 MHz and 4.9 GHz bands.

5. In TAC 007 and TAC 011, there is an additional requirement on unwanted emissions of not exceeding -52 dBm/MHz in the 3700 – 4200 MHz band, mainly aiming to protect satellite master antenna television (“SMATV”) systems operating in this band from potential interference of NR base stations and AAS base stations. This is an additional requirement on top of the requirements specified in 3GPP TS 38.141-1 and 3GPP TS 38.141-2, and 3GPP TS 37.145-1 and 3GPP TS 37.145-2 for NR base station operating in the 3.5 GHz and 4.9 GHz bands. It is advisable that this requirement should also be included in the proposed new specifications HKCA 1082 and HKCA 1083.

Proposed New Specifications HKCA 1082 and HKCA 1083

6. Having considered the frequency bands and technical requirements, new specifications HKCA 1082 and HKCA 1083 are proposed to include both the relevant ETSI and 3GPP standards to allow certification of NR base station and AAS base station respectively for all relevant frequency bands for provision of mobile services in Hong Kong. The proposed new HKCA specifications will also replace TAC 005, TAC 007 and TAC 011.

7. Salient points of the proposed new specifications HKCA 1082 and HKCA 1083 are given below –

For HKCA 1082

- (a) the scope covers single-RAT NR base station and embraces both TAC 005 and TAC 007;
- (b) all applicable frequency bands in Hong Kong are covered;
- (c) reference is drawn to ETSI EN 301 908-1 and ETSI EN 301 908-24, as well as 3GPP TS 38.141-1 and 3GPP TS 38.141-2;

For HKCA 1083

- (d) the scope covers AAS base station supporting single-RAT UTRA FDD, single-RAT E-UTRA, and MSR (UTRA FDD, E-UTRA, NR) and embraces TAC 011;
- (e) all applicable frequency bands in Hong Kong are covered;

- (f) reference is drawn to ETSI EN 301 908-1 and ETSI EN 301 908-23, as well as 3GPP TS 37.145-1 and 3GPP TS 37.145-2; and

For both HKCA 1082 and HKCA 1083

- (g) the requirement on unwanted emissions of not exceeding -52 dBm/MHz in the 3700 – 4200 MHz band to protect SMATV systems operating in this band is included.

The proposed new specifications HKCA 1082 and HKCA 1083 are given at **Annex 1** and **Annex 2** respectively.

Certification Requirement

8. Base station equipment for mobile services is classified under the Compulsory Certification Scheme of the Hong Kong Telecommunications Equipment Evaluation and Certification Scheme. Such equipment must be certified before it can be used in Hong Kong.

WTO Notification

9. As the proposed new specifications HKCA 1082 and HKCA 1083 are based on open standards, notification to the World Trade Organisation (“WTO”) is not required.

Recommendation

10. It is recommended that the proposed new specifications HKCA 1082 and HKCA 1083 be submitted to the Communications Authority for adoption.

Advice Sought

11. Members are invited to offer comments on the recommendation above.

Office of the Communications Authority
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