



**Federal Communications Commission  
Office of Engineering and Technology  
Laboratory Division**

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**HEARING AID COMPATIBILITY**

**Frequently Asked Questions**

**Q1.** What is a manufacturer's responsibility for testing of HAC compliance of over-the-top (OTT) – voice services operating over IP, installed on a wireless handset by the manufacturer, service provider, or end-user.

**A1.**

OTT is an IP based application that supports voice calling supported by an application included by the manufacturer with the handset. Common examples are Google Duo and Apple Face time. In these cases, a typical call box does not support calling capability to the handset under test and require a special test setup arrangement.

Considering the following five conditions for voice services (including OTT or any other voice service):

- a. Pre-installed (installed and delivered) by the manufacturer.
- b. Pre-installed (installed and delivered) by the manufacturer for the operating system manufacturer's software partner.
- c. Installed and delivered by the manufacturer at the direction of the service provider.
- d. Service provider installed (post-installed by the service provider after delivery from the manufacturer).
- e. Installed by the end-user after purchase.

For items (a) through (c), it is the responsibility of the manufacturer to test the handset that is reported to the FCC Wireless Telecommunications Bureau (WTB) as HAC compliant.

For item (d), the service provider cannot market or report this as HAC compliant (Section 20.19). Optionally, the service provider can arrange for the manufacturer (grantee) to apply for a Class II Permissive Change to add the service provider's model.

For item (e), testing is not required.

**Q2.** For the OTT voice applications installed by the service provider (post-installed by the service provider after delivery from the manufacturer), is the service provider required to arrange for the manufacturer to file a Class II Permissive Change, including a HAC test report, if the service provider added OTT voice service to a handset model, even if subscribers are not required to use it?

**A2.** Section 20.19 requires that if a handset is marketed, sold, and reported as HAC compliant by a service provider, and that handset contains alternative voice services that meet the definition of Section 20.19(a)(1)(i), then all delivered voice services need to have been tested to demonstrate compliance. There is no provision in the rules that permits a service provider to continue to claim that the handset is HAC compliant only for certain voice services and not for others that qualify under Section 20.19(a)(1)(i). The service provider and the manufacturer must cooperate to update the application filing under a Class II Permissive Change application.

**Q3.** What is the meaning of “voice services or voice applications,” and the “specific applications which support voice calling,” video, and other communications applications, in terms of those that are not ordinarily used with a device placed next to the ear and devices that are designed to be held to the ear?

**A3.** The meaning of “all voice services or voice applications” applies to both: (a) voice applications that are used in delivery of a digital mobile service as defined in Section 20.19(a)(1)(i); and (b) handsets as defined in FCC 10-145 item 20, Handsets Covered by the Rule. See Fourth Report and Order (FCC 15-155, Released: November 20, 2015), paras. 40-41).

In most cases the features of a product’s design are intuitively obvious when providing an audio output not customarily intended to be held next to the ear versus a design for audio output to be held next to the ear. HAC testing is applicable for any device that has a feature designed to be held to the ear.

**Q4.** KDB Publication 285076 D01 Appendix B shows example air interfaces table column “Name of Voice Service”. Is it necessary to identify the non-VoIP modes that need to be listed as well?

**A4.** No, only voice services that are not defined in ANSI C63.19-2011 need to be identified in this column. For all other services identified in ANSI C63.19-2011, use a single \* symbol. Specific listing is not needed because legacy circuit-switched voice services are bound to the air interface in ANSI C63.19-2011 which are identified in the Air Interface column. IP transporter voice services are independent of the air interface, only bound to the IP layer, and therefore the service needs to be identified by name.

**Q5.** Are OTT IP voice services (e.g., Skype, Google Hangouts, etc.) a VD for Voice and Data type air interface for 3G data services (e.g., EDGE, HSPA, EVDO)?

**A5.** Yes, these are voice services, because EDGE, HSPA, and EVDO are IP packet transporters and as such they can transport IP voice services.

**Q6.** Does HSPA circuit-switched (CS) voice services over HSPA (CSoHS) need to be tested?

**A6.** Yes, if the handset has the capability to support VoHSPA or CSoHS, it needs to be tested to demonstrate compliance.

**Q7.** What is Wi-Fi calling, is it considered an OTT IP service and what is the reference level that should be used for compliance testing referenced in Appendix B of KDB Publication 285076 D01 and in KDB Publication 285076 D02?

**A7.** Wi-Fi calling (or cellular-provider Wi-Fi calling) -for the purpose of this publications is not considered an OTT service. It is an advanced calling or roaming feature provided by the licensed mobile-service provider (carrier) originating and terminating calls over their network infrastructure using Wi-Fi as the service drop connection instead of using the licensed service bands. *Wi-Fi calling is not just any voice service operating over Wi-Fi; it is a feature of the mobile service provider’s network, for providing the carrier’s voice service in areas where there is Wi-Fi coverage (such as in a home).*

Wi-Fi calling is not defined by ANSI C63.19 and therefore testing shall use a reference level of –20 dBm0 as noted by “\*\*” in reporting per Appendix B of KDB Publication 285076 D01. If ASC C63®-EMC provides an

update of the ANSI C63.19 standard and this is adopted by the FCC or another entity provides a new value accepted by OET through a PAG procedure , then testing can be performed using that reference level and appropriately noted in the table. Reference levels approved by the FCC on a case-by-case basis should be noted with “\*\*\*\*” in the table.

Note that for Wi-Fi calling, the M-rating is primarily influenced by the air interface, while T-Coil (T-rating) is primarily influenced by the codec and basic phone magnetic-background noise .

**Q8.** What are the steps to get approval to use the Pre-Approval Guidance (PAG) Reuse procedures for VOIP OTT T-coil testing?

**A8.** When 388624 D02 Pre-Approval Guidance List requires a PAG for specific HAC air interfaces, reuse is permitted in accordance with the following guidance.

Requesting reuse must follow the procedures in accordance with 388624 D01 Pre-Approval Guidance section II D

An initial PAG is required to certify handsets that support voice protocols which currently do not have a specified reference input level in C63.19-2011 (section 7.4.2.1) and/or for which the handset cannot be tested for compliance using the customary laboratory Call Boxes (examples are provided below for reference). Furthermore, the initial PAG that requests reuse must:

1. Describe or illustrate the setup of call setup. Include all special software, auxiliary devices, and phones
2. Define the method that permitted establishing the call, selecting the various codecs, data rates and calibrating the reference levels in with respect to -20 dBm0 (i.e. -23.14 below full scale ).
3. State that there has been an investigation for the worst-case codecs and bit rate tested and how the codecs were selected.
4. Clearly specify the text and diagrams that will be re-used.

#### **Examples:**

#### **OTT (PAG)**

OTT is an IP-based application that supports voice calling supported by the data connection as provided by the handset manufacturer. Currently the most common examples are Google Duo and Apple Face time. In these cases, the typical call box cannot be used to test calling capability to the handset under test.

To apply the PAG reuse procedures, it is necessary to insert an additional section that:

- Describes or provide diagrams for the setup of call setup. In this case one must include the ancillary equipment (in block diagram form) that established a call to the handset EUT, and equipment for injecting the reference and test tones.
- Defines how the method that permitted establishing the call, selecting the various codecs, data rates and determining the reference levels in terms of -20 dBm0 (i.e. -23.14 below saturation). For example, Duo uses an ancillary handset using special software from Google to make a connection, select codecs and bit rates, and the reference level.
- States that there has been an investigation for the worst-case codecs and bit rate tested and how the codecs were selected. Details about which codecs were investigated and the results obtained do not need to be included. As typically required for wireless interfaces.

**Q9.** Are there any interim procedures for testing VoLTE/OTT calls over 5G Sub 6 bands since current call boxes do not support simulated 5G calls or internet connections.

**A9.** Currently, laboratories are having difficulty in establishing a voice connection for testing T-Coil over 5G Sub 6 air interfaces. The problem is the inability to establish 5G sub 6 VoLTE or OTT voice calls over 5G NR F1 air interfaces using the current call boxes. Below is an interim PAG procedure to address this issue:

1. This procedure is only applicable for 5G Sub 6 calls that use the same protocol, Codec(s) and reference level as VoLTE over LTE (i.e. -16 dBm0) or OTT calls (such as Duo or AppleTalk).
2. For LTE, establish the ABM1S65G value by using the ABM1LTE magnetic intensity for an LTE call in the same band as the 5G sub6 band under test.
3. For OTT, establish the ABM1S65G value by using an IP connection for magnetic intensity for a call in the same band as the 5G sub6 band under test.
4. Also note the actual ABM2LTE/OTT value.
5. Establish an ABM2S65G value, using a 5G manufacture test mode over 5 G Sub 6 channels for the same band under test.
6. Document in the test report matrix:
  - i. Include columns for both ABM2LTE & ABM2S65G for comparison.
  - ii. Establish the S+N1/N2 for the rating.
    - 1.S+N1 = ABM1LTE (step 2) and
    - 2.N2 = ABM2S65G (step 4).
    - 3.Subtract 3 dB from S+N1/N2.
  - iii. Rating based on (ABM1LTE/ ABM2S65G) -3dB.
7. Manufacture must provide an attestation (cover letter) confirming that the results using ABM1 values obtained from VoLTE connections over LTE bands and ABM2 values for 5G sub 6 connections over the same bands provide a reasonable representation of the HAC rating over the 5G sub 6 connections.
8. A grant note comment “T-coil 5G sub 6 bands appraised as equivalent LTE connections”.
9. Manufacture must also comply with 20.19 (f) (i) Disclosure requirements relating to handsets treated as hearing aid-compatible over fewer than all their operations.
10. This procedure qualifies for Reuse procedures as defined in Q8 above.

#### **Change Notice:**

**04/06/2020** 285076 D03 HAC FAQ v01r01 replaces 285076 D03 HAC FAQ v01. V01r01 added Question 8 to provide guidance for PAG reuse policy of Publication 388624.

**07/29/2020** 285076 D03 HAC FAQ v01r02 replaces 285076 D03 HAC FAQ V01r01. Added Question 9 to provide guidance for PAG testing a 5G Sub6 interim procedure.

**10/13/2020** 85076 D03 HAC FAQ v01r03 replaces 285076 D03 HAC FAQ v01r02. V01r03 added to Question 9 to provide interim guidance for PAG testing a 5G Sub6 interim procedure to include OTT voice services.