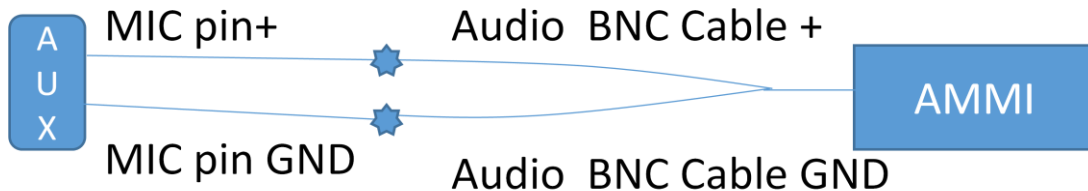


HAC OTT Test Procedure

Preparation

- 1: Auxiliary phone (Smart Phone FCC ID:R38YLCP3669AS): Remove MIC but keep the "Output & GND pin" of MIC. Ensure that environment noise should not be collected by MIC and then transfer to the phone call.
- 2: Cable of BNC connector to Alligator clip: connect AMMI to "Output & GND pin" of auxiliary phone.



Figure_1 MIC audio cable connection

3: The information of router is as follows:

Name:TD-LTE wireless data terminal

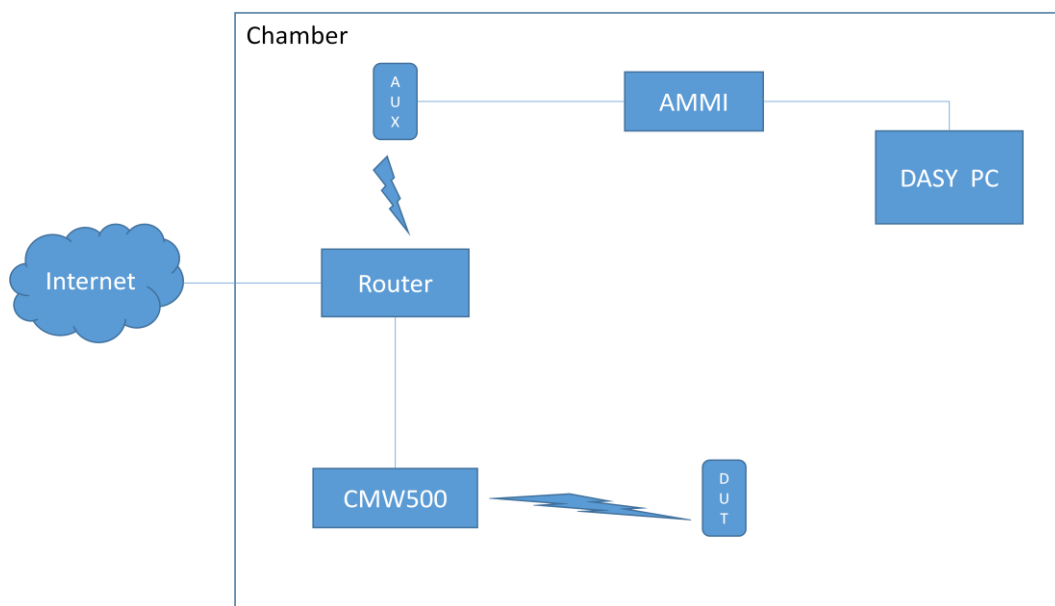
Model:B311As-853

S/N:UNL7S18403002257

Manufacturer :Huawei Technology Co., Ltd

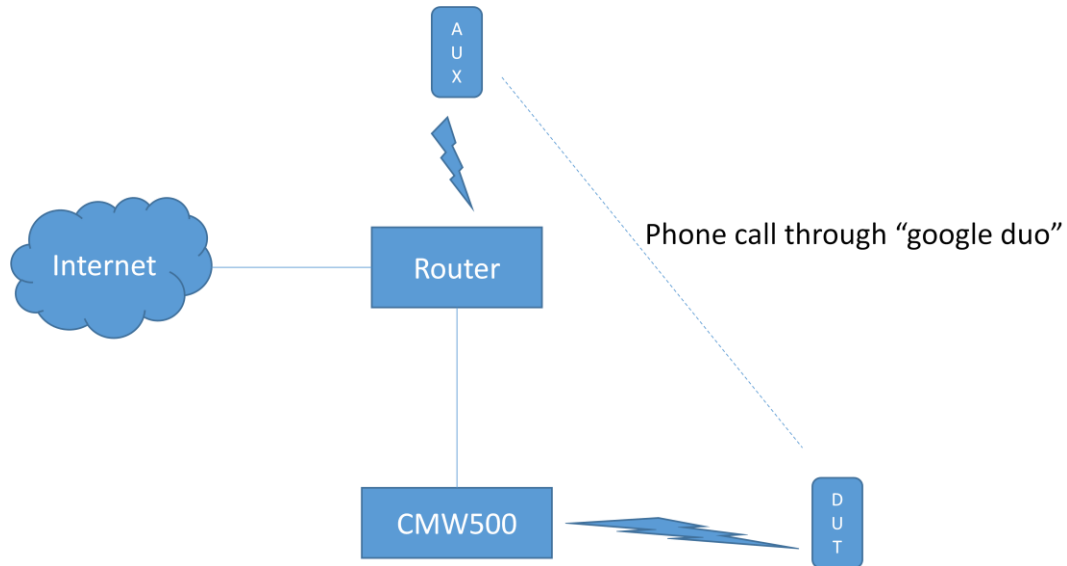
Test Procedure

Test **Setup** showing below, all the measurement inside chamber. Conducted and radiated structures are mentioned clearly. OTT is based on E2E telecommunication, so AUX phone is necessary. The CMW500 is aim to set different kind of networks (GSM/WCDMA/LTE/WLAN) and configuration relevant (Frequency band, BW, Channel etc...) for DUT. The DAU inside CMW500 is indispensable to assign foreign IP address and DNS for WWAN/WLAN cells or DUT.



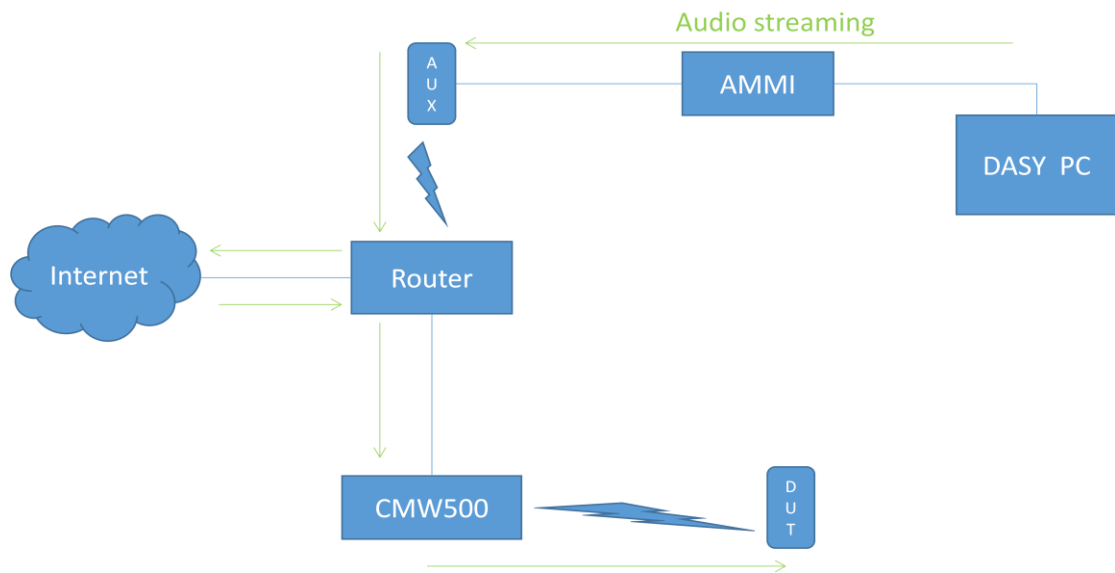
Figure_2 Test setup overview

Stage1: Establish E2E communication through internet, and make sure the 3rd APP “google duo” which providing VOIP service works well. (We also need to configure VPN on telephones for connecting Google server)



Figure_3 Establish phone call

Stage2: Ensure that digital audio stream (.WAV audio files including 48k_voice_1khz_1s and 48k_voice_300-3000_2s) controlled by DASY system delivery to the DUT.



Figure_4 audio streaming

Stage3: Calibrating audio input level and Carry on the HAC OTT testing.

The codec used by special "Google duo" is (OPUS codec), and the bit rates could be changed from 6kbps up to 75kbps, so SRTC perform codec investigation for different bit rates (6kbps, 32kbps, 76kbps) as well as wireless interface investigation mentioned in test report.

All air interfaces capable of a data connection were evaluated with Google Duo.

When HAC testing we are using the Google Duo version is 26.0.179825522.alpha.DEV

and the bit rate configuration can find at settings → Voice call parameters settings →

Audio codec bit rate(6-75kbps).

Audio Level Settings

According to KDB 285076 D02, the average speech level of -20dBm0 shall be used for protocols not specifically listed in Table 7.1 of ANSI C63.19-2011.

Determine Input Audio level is based on the Added additional dBFS level readout by Google Duo customize application and five steps need to do.

1. According to the figure_ 4 audio streaming to build link environment. Adjust the gain value through DASY5 software until the full scale digital level is monitored on the auxiliary phone. The auxiliary phone's full scale digital level is 0dBFS.

2.However, digital saturation is generally not 0 dBm0.OPUS is kind of A-law codec, For A-law codec, 0 dBm0 is 3.14 dB below digital full scale (0dBFS) . Determining audio input level of auxiliary phone reach to -20dBm0, digital audio signal level is around -23.14dBFS.

3.Input a gain value on DASY,and to readout the -23dBFS on GoogleDuo of the Auxiliary phone.

4. Adjust gain level to readout the dBFS level until it changes to -24dBFS.

5. Based on the step 3 and 4, and then calculate the gain value(dB) by interpolation to get the - 20dBm0 corresponding gain value.

Android Partners > Google Mobile Services > Testing

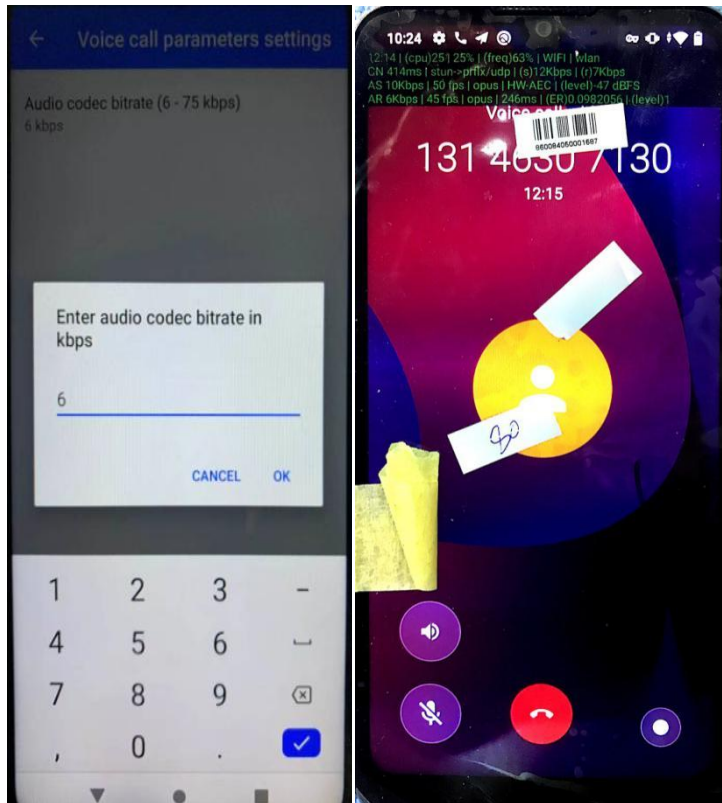


Testing Google Duo for Accessibility

SEND FEEDBACK

To ensure that Google Duo integrations comply with AC Hearing Aid Compatibility, Google provides an audio performance test. This is an engineering test build, provided under NDA for testing purposes only. To download the test, see the [Duo Audio Test Build APK](#).

Google Duo exclusively uses the Opus codec. Depending on network conditions, Google Duo uses variable bit rates between 6 to 75 kbps. The audio performance tests lets partners manually control the audio bitrate used and see a live read-out of audio input levels for test instrument calibration.



Figure_5 special "Google duo" APP (provided by Google).