



Volume Control TEST REPORT

No.24T04Z102392-006

for

BLU Products,Inc.

Smart phone

B1660V

FCC ID: YHLBLUB1660V

with

Hardware Version: V1.0

Software Version: BLU_B1660V_V15.0.01.05.01.05_FSec

Issued Date: 2025-03-10

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
24T04Z102392-006	Rev.0	1st edition	2025-01-22
24T04Z102392-006	Rev.1	Added the vol investigation results in table 6.3 in page11.	2025-03-10

Note: the latest revision of the test report supersedes all previous version.

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1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

1.2. Testing Location

Location 1: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China 100191

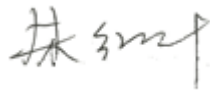
1.3. Testing Environment

Normal Temperature: 18-28℃
Relative Humidity: 0-80%
Ambient noise of 14dB(A) and is compliance with requirement of standards
acoustic chamber (SEE ANNEX H)

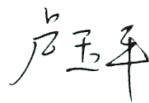
1.4. Project data

Testing Start Date: 2024-12-12
Testing End Date: 2025-01-15

1.5. Signature



Zhu Hongye
(Prepared this test report)



Lu Yuping
(Reviewed this test report)



Zhao Xinglong
(Approved this test report)



No. 24T04Z102392-006

2. Client Information

2.1. Applicant Information

Company Name	BLU Products, Inc.
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2.2. Manufacturer Information

Company Name	BLU Products, Inc.
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Contact	Zeng wei
Email	zwei@ctasiasz.com
Tel.	305.715.7171
Fax	305.436.8819

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

General Information:

Description	Smart phone
Model name/HVIN	B1660V
Brand name	BLU
FCC ID	YHLBLUB1660V
Extreme Temperature	0~45℃
Nominal Voltage	3.87V
Extreme High Voltage	4.45V
Extreme Low Voltage	3.45V

Supported Bands:

UMTS Frequency Band(s)	B 2/4/5
GSM Frequency Band(s)	Not support
E-UTRA Frequency Band(s)	B 2/4/5/12/13/66
WLAN Frequency Band(s)	2.4G/5GHz
5G Frequency Band(s)	N 2/5/66/77 NSA only

Supported Codecs:

UMTS Audio Codec(s)	AMR NB/AMR WB
GSM Audio Codec (s)	Not support
E-UTRA Audio Codec(s)	AMR NB/AMR WB/EVS NB/EVS WB
WLAN Audio Codec(s)	AMR NB/AMR WB/EVS NB/EVS WB
5G Audio Codec(s)	AMR NB/AMR WB/EVS NB/EVS WB
OTT	Google Meet

Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT46a	IMEI: 354154670008132	V1.0	BLU_B1660V_V15.0.01.05.01.05_FSec	2024-12-02

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description	SN
/	/	/

*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1. Documents supplied by applicant

EUT parameters, referring to Annex B for detailed information, is supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
ANSI C63.19	American National Standard Methods of Measurement of Compatibility Between Wireless Communications Devices and Hearing Aids	2019
TIA 5050	Telecommunications Communications Products Receive Volume Control Requirements for Wireless (Mobile) Devices	2018 Edition
285076 D04 Volume Control v02	GUIDANCE FOR PERFORMING VOLUME CONTROL MEASUREMENTS ON MOBILE HANDSETS	2023.09.29
285076 D05 HAC Waiver DA 23-914 v01	HAC COMPLIANCE UNDER WAIVER DA 23-914	2023.09.29

5. Air Interfaces / Bands used for testing

The codec bit rates of the applicant's choosing are EVS-NB 13.2kbps and EVS-WB 13.2kbps.

Air-interface	Band	Tested Codec	Tested Rate(kbps)
WCDMA (UMTS)	B2/4/5	AMR-NB	4.75/12.2
		AMR-WB	6.6/23.85
VoLTE	B2/4/5/12/13/66	AMR-NB	4.75/12.2
		AMR-WB	6.6/23.85
		EVS-NB	13.2
		EVS-WB	13.2
VoWiFi	802.11g/ac	AMR-NB	4.75
		EVS-NB	13.2
VoNR	N 2/5/66/77	AMR-NB	4.75
		EVS-NB	13.2

6. Test Results

6.1. Test summary and Conclusions

The volume control measurement method is in accordance with the TIA 5050-2018.

The EUT was tested in CTTL acoustics laboratory. All the detail results are showed in section 6.3.

I: Under the waiver, only CMRS narrowband and CMRS wideband voice codecs are required to comply with the volume control requirements of the TIA 5050-2018 Volume Control Standard as amended as follows:

- a. For the 2N mounting force test, one narrowband and one wideband voice codec embedded with the handset must pass with at least one volume control setting with a conversational gain of ≥ 6 dB for all voice services, bands of operation and air interfaces over which it operates using one codec bit rate of the applicant's choosing.
- b. For the 8N mounting force test, one narrowband and one wideband voice codec embedded with the handset must pass with at least one volume control setting with a conversational gain of ≥ 6 dB for all voice services, bands of operation and air interfaces over which they operate but is not required to meet or exceed the full 18 dB of conversational gain specified in section 5.1.1 of the TIA 5050 Volume Control Standard using one codec bit rate of the applicant's choosing.

II: For all other narrowband and wideband codecs not evaluated in I.a. above, TIA 5050-2018 Receive Distortion and Noise Performance and Receive Acoustic Frequency Response Performance evaluations are not required; however, these codecs shall be assessed for conversational gain and documented in the test report at the 2N and 8N levels with a gain of ≥ 6 dB for all voice services, bands of operation and air interfaces over which they operate. The handset volume setting used to comply with I.a. shall be used for these other CMRS codec evaluations.

III. Any other codec for voice services embedded in the handset, not identified in I and II above, is not required to comply or demonstrate in the test reports for conversational gain.

Table 6.1-1: the worst-case test results of the chosen codec of telephony call

Band	Channel	Bandwidth	Modulation	RB Size	RB Offset	Volume Level	Codec	NB/WB	Bit Rate	2N/8N	Conv. Gain (ANN EX D)	RFR (ANNEX D)	Mini PN-SDNR (ANNEX D)		Verdict
		[MHz]							[kbps]		[dB]		[Hz]	[dB]	
B2	18900	10	16QAM	1	0	Max-2	EVS	NB	13.2	2N	12.50	PASS	800s	23.86	PASS
B2	18900	10	16QAM	1	0	Max-2	EVS	NB	13.2	8N	16.42	PASS	800	21.67	PASS
B2	18900	10	16QAM	1	0	Max-2	EVS	WB	13.2	2N	13.85	PASS	250	27.21	PASS
B2	18900	10	16QAM	1	0	Max-2	EVS	WB	13.2	8N	17.43	PASS	315	25.55	PASS

Table 6.1-2: the worst-case test results of other codecs of telephony call

Band	Channel	Bandwidth	Modulation	RB Size	RB Offset	Volume Level	Codec	NB/WB	Bit Rate	2N/8N	Conv. Gain (ANN EX E)	FR	Min PN-SDNR		Verdict
		[MHz]							[kbps]		[dB]		[Hz]	[dB]	
B5	20525	1.4	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.41	/	/	/	PASS
B5	20525	1.4	QPSK	1	0	Max-2	AMR	NB	4.75	8N	16.22	/	/	/	PASS
B5	20525	1.4	QPSK	1	0	Max-2	AMR	WB	6.6	2N	13.73	/	/	/	PASS
B5	20525	1.4	QPSK	1	0	Max-2	AMR	WB	6.6	8N	17.45	/	/	/	PASS

Table 6.1-3: the worst conversational gains

Volume Level	Codec	NB/WB	HAC ON-2N/ HAC OFF-8N	Conv. Gain
				[dB]
Max	EVS	NB	8N-HAC OFF	15.93
Max	AMR	NB	2N-HAC ON	12.41

6.2. Description of Test Setup

In order to provide the complete information about the measurement environment within this report the setup is described in this chapter. Figure 6.2.1 shows a block diagram of the test arrangement.

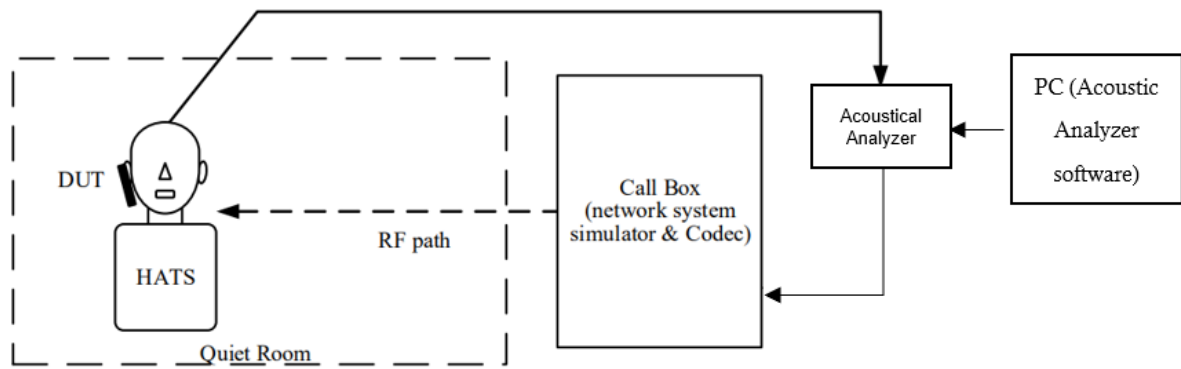


Fig. 6.2.1: Block diagram of the test setup

An artificial head measurement system according to ITU-T Recommendation P.58 equipped with artificial ears (Type3.3 acc. ITU-T Rec. P.57) are used. The artificial head is placed in the center of an anechoic test room. The measurements are implemented in the HEAD acoustics software ACQUA and can be carried out automatically. They allow signal recording at the artificial ears and feeding at the network simulator.

The network simulators (e.g. Rohde & Schwarz CMW500, CMX500) establish the call to the mobile phone via an antenna connection. The EUT was tested using EFR/AMR-NB/AMR-WB/EVS-NB/EVS-WB codecs.

ANNEX C shows the handheld Positioner with mounted EUT. The application force between the phone and the artificial ear is adjusted. A mounting force of 2N or 8 N is adjusted.

6.3. Test Detail Results

According to TIA 5050, the mobile DUT's frequency response and distortion failures occur at the maximum and max-1 volume control setting, the max-2 volume is found for which the conversational gain requirement is met without a frequency response or a distortion failure.

Table 6.3: the **volume** investigating results

Volume Level	Code c	NB/ WB	Bit Rate	2N/ 8N	Conv Gain	FR	Min PN-SDNR		Verdict
			[kbps]	[N]	[dB]		[Hz]	[dB]	
Max	EVS	NB	13.2	2N	20.30	PASS	800	22.45	*Note1
	EVS	NB	13.2	8N	23.95	PASS	800	23.02	
	EVS	WB	13.2	2N	24.67	Fail	4000	18.21	
	EVS	WB	13.2	8N	24.97	Fail	4000	19.28	
Max-1	EVS	NB	13.2	2N	15.77	PASS	800	24.01	*Note2
	EVS	NB	13.2	8N	19.46	PASS	800	22.17	

	EVS	WB	13.2	2N	16.80	Fail	250	27.18	
	EVS	WB	13.2	8N	20.65	PASS	250	27.19	
Max-2	EVS	NB	13.2	2N	12.51	PASS	800	22.51	pass
	EVS	NB	13.2	8N	15.93	PASS	800	22.09	
	EVS	WB	13.2	2N	13.75	PASS	250	27.55	
	EVS	WB	13.2	8N	17.79	PASS	250	27.70	

***Note1:** According to TIA 5050 5.1.2, measure the output distortion per clause 5.2. If a distortion failure occurs at the maximum volume control setting, reduce the volume control setting and repeat the measurement to determine if a setting can be found for which the conversational gain requirement is met without a distortion failure.

***Note2:** According to TIA 5050 5.3.2, If the default tone control setting does not meet the requirement, repeat the above steps for other tone control settings to determine a tone control setting that meets the requirements.

6.3.1 VoLTE IMS call investigation

Table 6.3.1-1: the **Codec** and **Bandwidth** investigating results of **VoLTE** IMS call

Band	Channel	Bandwidth	Modulation	RB Size	RB Offset	Volume Level	Codec	NB/WB	Bit Rate	2N/8N	Conv Gain	FR	Min PN-SDNR	
		[MHz]							[kbps]	[N]	[dB]		[Hz]	[dB]
B2	18900	10	QPSK	50	0	Max-2	EVS	NB	13.2	2N	12.51	PASS	800	22.51
B2	18900	10	QPSK	50	0	Max-2	EVS	NB	13.2	8N	15.93	PASS	800	22.09
B2	18900	10	QPSK	50	0	Max-2	EVS	WB	13.2	2N	13.75	PASS	250	27.55
B2	18900	10	QPSK	50	0	Max-2	EVS	WB	13.2	8N	17.79	PASS	250	27.70
B2	18900	10	QPSK	50	0	Max-2	AMR	NB	4.75	2N	13.06	/	/	/
B2	18900	10	QPSK	50	0	Max-2	AMR	NB	12.2	2N	13.43	/	/	/
B2	18900	10	QPSK	50	0	Max-2	AMR	NB	4.75	8N	16.39	/	/	/
B2	18900	10	QPSK	50	0	Max-2	AMR	WB	6.6	2N	13.98	/	/	/
B2	18900	10	QPSK	50	0	Max-2	AMR	WB	23.85	2N	14.15	/	/	/
B2	18900	10	QPSK	50	0	Max-2	AMR	WB	6.6	8N	17.74	/	/	/

Table 6.3.1-2: the **Radio Configuration** investigating results of **VoLTE** IMS call

Band	Channel	Bandwidth	Modulation	RB Size	RB Offset	Volume Level	Codec	NB/WB	Bit Rate	2N/8N	Conv Gain	FR	Min PN-SDNR	
		[MHz]							[kbps]	[N]	[dB]		[Hz]	[dB]
B2	18900	10	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.55	PASS	800	24.39

B2	18900	10	QPSK	1	49	Max-2	EVS	NB	13.2	8N	16.55	PASS	800	21.67
B2	18900	10	16QAM	1	0	Max-2	EVS	NB	13.2	8N	16.42	PASS	800	21.67
B2	18900	10	16QAM	1	49	Max-2	EVS	NB	13.2	8N	16.52	PASS	800	22.44
B2	18900	10	16QAM	50	0	Max-2	EVS	NB	13.2	8N	16.49	PASS	1350	23.94
B2	18900	20	QPSK	100	0	Max-2	EVS	NB	13.2	8N	16.71	PASS	800	23.11
B2	18900	20	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.63	PASS	800	22.54
B2	18900	20	QPSK	1	99	Max-2	EVS	NB	13.2	8N	16.64	PASS	800	22.85
B2	18900	20	16QAM	1	0	Max-2	EVS	NB	13.2	8N	16.58	PASS	800	24.12
B2	18900	20	16QAM	1	99	Max-2	EVS	NB	13.2	8N	16.62	PASS	800	23.07
B2	18900	20	16QAM	100	0	Max-2	EVS	NB	13.2	8N	16.65	PASS	800	22.32
B2	18900	15	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.66	PASS	800	23.45
B2	18900	15	QPSK	1	74	Max-2	EVS	NB	13.2	8N	16.56	PASS	800	23.47
B2	18900	15	16QAM	1	74	Max-2	EVS	NB	13.2	8N	16.58	PASS	800	22.47
B2	18900	15	16QAM	75	0	Max-2	EVS	NB	13.2	8N	16.50	PASS	800	22.15
B2	18900	5	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.45	PASS	800	23.72
B2	18900	5	16QAM	25	0	Max-2	EVS	NB	13.2	8N	16.44	PASS	800	22.49
B2	18900	3	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.45	PASS	800	21.87
B2	18900	3	16QAM	15	0	Max-2	EVS	NB	13.2	8N	16.45	PASS	800	24.62
B2	18900	1.4	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.56	PASS	800	23.01
B2	18900	1.4	16QAM	6	0	Max-2	EVS	NB	13.2	8N	16.44	PASS	800	23.43
B2	18900	10	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.62	/	/	/
B2	18900	10	QPSK	1	49	Max-2	AMR	NB	4.75	2N	12.63	/	/	/
B2	18900	10	16QAM	1	0	Max-2	AMR	NB	4.75	2N	12.66	/	/	/
B2	18900	10	16QAM	1	49	Max-2	AMR	NB	4.75	2N	12.74	/	/	/
B2	18900	10	16QAM	50	0	Max-2	AMR	NB	4.75	2N	12.69	/	/	/
B2	18900	20	QPSK	100	0	Max-2	AMR	NB	4.75	2N	12.77	/	/	/
B2	18900	20	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.81	/	/	/
B2	18900	20	QPSK	1	99	Max-2	AMR	NB	4.75	2N	12.63	/	/	/

B2	18900	20	16QAM	1	0	Max-2	AMR	NB	4.75	2N	12.82	/	/	/
B2	18900	20	16QAM	1	99	Max-2	AMR	NB	4.75	2N	12.76	/	/	/
B2	18900	20	16QAM	100	0	Max-2	AMR	NB	4.75	2N	12.80	/	/	/
B2	18900	15	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.58	/	/	/
B2	18900	15	QPSK	1	74	Max-2	AMR	NB	4.75	2N	12.72	/	/	/
B2	18900	15	16QAM	1	0	Max-2	AMR	NB	4.75	2N	12.84	/	/	/
B2	18900	15	16QAM	75	0	Max-2	AMR	NB	4.75	2N	12.73	/	/	/
B2	18900	5	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.69	/	/	/
B2	18900	5	16QAM	25	0	Max-2	AMR	NB	4.75	2N	12.61	/	/	/
B2	18900	3	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.75	/	/	/
B2	18900	3	16QAM	15	0	Max-2	AMR	NB	4.75	2N	12.85	/	/	/
B2	18900	1.4	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.72	/	/	/
B2	18900	1.4	16QAM	6	0	Max-2	AMR	NB	4.75	2N	12.73	/	/	/

Table 6.3.1-3: the **LTE Band** investigating results of **VoLTE** IMS call

Band	Channel	Bandwidth	Modulation	RB Size	RB Offset	Volume Level	Code c	NB/WB	Bit Rate	2N/8N	Conv Gain	FR	Min PN-SDNR	
		[MHz]							[kbps]	[N]	[dB]		[Hz]	[dB]
B4	20175	10	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.33	PASS	800	22.44
B5	20525	10	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.48	PASS	800	23.76
B12	23095	10	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.32	PASS	800	23.45
B13	23230	10	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.41	PASS	800	22.74
B66	132322	10	QPSK	1	0	Max-2	EVS	NB	13.2	8N	16.50	PASS	800	23.01
B4	20175	1.4	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.61	/	/	/
B5	20525	1.4	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.41	/	/	/
B12	23095	1.4	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.59	/	/	/
B13	23230	1.4	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.79	/	/	/
B66	132322	1.4	QPSK	1	0	Max-2	AMR	NB	4.75	2N	12.50	/	/	/

6.3.2 VoWiFi IMS call investigation

Table 6.3.2: the investigating results of **VoWiFi** IMS call

Mode	Channel	Modulation	Data Rate	Volume Level	Codec	NB/WB	Bit Rate	2N/8 N	Conv. Gain	FR	Min PN-SDNR	
			[Mbps]				[kbps]	[N]	[dB]		[Hz]	[dB]
802.11g	6	DSSS	1	Max-2	EVS	NB	13.2	8N	16.45	PASS	800	22.98
802.11g	6	DSSS	2	Max-2	EVS	NB	13.2	8N	16.43	PASS	800	22.77
802.11g	6	CCK	5.5	Max-2	EVS	NB	13.2	8N	16.42	PASS	800	24.12
802.11g	6	CCK	11	Max-2	EVS	NB	13.2	8N	16.45	PASS	800	22.00
802.11ac	44	BPSK	6	Max-2	EVS	NB	13.2	8N	16.41	PASS	800	23.39
802.11ac	44	BPSK	9	Max-2	EVS	NB	13.2	8N	16.48	PASS	800	23.56
802.11ac	44	QPSK	12	Max-2	EVS	NB	13.2	8N	16.40	PASS	800	21.82
802.11ac	44	QPSK	18	Max-2	EVS	NB	13.2	8N	16.42	PASS	800	23.42
802.11ac	44	16-QAM	24	Max-2	EVS	NB	13.2	8N	16.38	PASS	800	22.99
802.11ac	44	16-QAM	36	Max-2	EVS	NB	13.2	8N	16.44	PASS	800	22.18
802.11ac	44	64-QAM	48	Max-2	EVS	NB	13.2	8N	16.46	PASS	800	23.87
802.11ac	44	64-QAM	54	Max-2	EVS	NB	13.2	8N	16.39	PASS	800	22.44
802.11g	6	DSSS	1	Max-2	AMR	NB	4.75	2N	12.61	/	/	/
802.11g	6	DSSS	2	Max-2	AMR	NB	4.75	2N	12.73	/	/	/
802.11g	6	CCK	5.5	Max-2	AMR	NB	4.75	2N	12.54	/	/	/
802.11g	6	CCK	11	Max-2	AMR	NB	4.75	2N	12.47	/	/	/
802.11ac	44	BPSK	6	Max-2	AMR	NB	4.75	2N	12.52	/	/	/
802.11ac	44	BPSK	9	Max-2	AMR	NB	4.75	2N	12.56	/	/	/
802.11ac	44	QPSK	12	Max-2	AMR	NB	4.75	2N	12.57	/	/	/
802.11ac	44	QPSK	18	Max-2	AMR	NB	4.75	2N	12.74	/	/	/
802.11ac	44	16-QAM	24	Max-2	AMR	NB	4.75	2N	12.64	/	/	/
802.11ac	44	16-QAM	36	Max-2	AMR	NB	4.75	2N	12.49	/	/	/
802.11ac	44	64-QAM	48	Max-2	AMR	NB	4.75	2N	12.70	/	/	/
802.11ac	44	64-QAM	54	Max-2	AMR	NB	4.75	2N	12.70	/	/	/

6.3.3 WCDMA call investigation

Table 6.3.3: the investigating results of **WCDMA** call

air interface	Band	Channel	Volume Level	Codec	Voice bandwidth	Bit Rate	2N/8 N	Conv. Gain	FR	Min PN-SDNR	
						[kbps]	[N]	[dB]		[Hz]	[dB]

WCDMA	Band2	9800	Max-2	AMR	NB	4.75	2N	12.93	/	/	/
WCDMA	Band2	9800	Max-2	AMR	NB	12.2	2N	13.50	/	/	/
WCDMA	Band2	9800	Max-2	AMR	NB	4.75	8N	16.40	/	/	/
WCDMA	Band2	9800	Max-2	AMR	WB	6.6	2N	14.22	/	/	/
WCDMA	Band2	9800	Max-2	AMR	WB	23.85	2N	14.45	/	/	/
WCDMA	Band2	9800	Max-2	AMR	WB	6.6	8N	17.89	/	/	/
WCDMA	Band4	1312	Max-2	AMR	NB	4.75	2N	12.88	/	/	/
WCDMA	Band5	4132	Max-2	AMR	NB	4.75	2N	12.94	/	/	/

6.3.4 VoNR call investigation

Table6.3.4: the investigating results of **VoNR** call

5G Band	4G Band	Bandwidth [MHz]	Modulation	SCS (kHz)	RB	Volume Level	Codec	NB/WB	Bit Rate	2N/8N [N]	Conv. Gain [dB]	FR	Min PN-SDNR	
									[kbps]				[Hz]	[dB]
N77	B5	100	QPSK	30	273	Max-2	EVS	NB	13.2	8N	16.05	PASS	3150	26.31
N77	B5	100	QPSK	30	137	Max-2	EVS	NB	13.2	8N	15.96	PASS	3150	26.31
N77	B5	100	16QAM	30	273	Max-2	EVS	NB	13.2	8N	16.07	PASS	3150	26.31
N77	B5	100	16QAM	30	1	Max-2	EVS	NB	13.2	8N	15.96	PASS	3150	26.31
N77	B5	100	64QAM	30	273	Max-2	EVS	NB	13.2	8N	16.24	PASS	3150	26.28
N77	B5	100	64QAM	30	1	Max-2	EVS	NB	13.2	8N	16.23	PASS	3150	26.27
N77	B5	100	256QAM	30	273	Max-2	EVS	NB	13.2	8N	16.25	PASS	3150	26.25
N77	B5	100	256QAM	30	1	Max-2	EVS	NB	13.2	8N	16.24	PASS	3150	26.28
N77	B5	80	QPSK	30	109	Max-2	EVS	NB	13.2	8N	16.31	PASS	3150	26.29
N77	B5	80	16QAM	30	1	Max-2	EVS	NB	13.2	8N	16.19	PASS	3150	26.29
N77	B5	80	64QAM	30	1	Max-2	EVS	NB	13.2	8N	16.25	PASS	3150	26.29
N77	B5	80	256QAM	30	217	Max-2	EVS	NB	13.2	8N	16.17	PASS	3150	26.29
N77	B5	50	64QAM	30	1	Max-2	EVS	NB	13.2	8N	16.21	PASS	3150	26.30
N77	B5	50	256QAM	30	133	Max-2	EVS	NB	13.2	8N	16.20	PASS	3150	26.29
N77	B5	20	64QAM	30	1	Max-2	EVS	NB	13.2	8N	16.18	PASS	3150	26.31
N77	B5	20	256QAM	30	51	Max-2	EVS	NB	13.2	8N	16.24	PASS	3150	26.30
N77	B5	10	64QAM	30	1	Max-2	EVS	NB	13.2	8N	16.25	PASS	3150	26.30
N77	B5	10	256QAM	30	24	Max-2	EVS	NB	13.2	8N	16.25	PASS	3150	26.30
N2	B5	20	256QAM	15	106	Max-2	EVS	NB	13.2	8N	16.21	PASS	3150	26.30
N5	B5	20	256QAM	15	106	Max-2	EVS	NB	13.2	8N	16.14	PASS	3150	26.30
N66	B5	20	256QAM	15	106	Max-2	EVS	NB	13.2	8N	16.19	PASS	3150	26.30
N77	B5	100	QPSK	30	273	Max-2	AMR	NB	4.75	2N	12.67	/	/	/

N77	B5	100	QPSK	30	137	Max-2	AMR	NB	4.75	2N	12.62	/	/	/
N77	B5	100	16QAM	30	273	Max-2	AMR	NB	4.75	2N	12.62	/	/	/
N77	B5	100	16QAM	30	1	Max-2	AMR	NB	4.75	2N	12.68	/	/	/
N77	B5	100	64QAM	30	273	Max-2	AMR	NB	4.75	2N	12.57	/	/	/
N77	B5	100	64QAM	30	1	Max-2	AMR	NB	4.75	2N	12.68	/	/	/
N77	B5	100	256QAM	30	273	Max-2	AMR	NB	4.75	2N	12.64	/	/	/
N77	B5	100	256QAM	30	1	Max-2	AMR	NB	4.75	2N	12.66	/	/	/
N77	B5	80	QPSK	30	109	Max-2	AMR	NB	4.75	2N	12.64	/	/	/
N77	B5	80	16QAM	30	217	Max-2	AMR	NB	4.75	2N	12.64	/	/	/
N77	B5	80	64QAM	30	217	Max-2	AMR	NB	4.75	2N	12.58	/	/	/
N77	B5	80	256QAM	30	217	Max-2	AMR	NB	4.75	2N	12.89	/	/	/
N77	B5	50	16QAM	30	133	Max-2	AMR	NB	4.75	2N	12.61	/	/	/
N77	B5	50	64QAM	30	133	Max-2	AMR	NB	4.75	2N	12.84	/	/	/
N77	B5	20	16QAM	30	51	Max-2	AMR	NB	4.75	2N	12.56	/	/	/
N77	B5	20	64QAM	30	51	Max-2	AMR	NB	4.75	2N	12.57	/	/	/
N77	B5	10	16QAM	30	24	Max-2	AMR	NB	4.75	2N	12.85	/	/	/
N77	B5	10	64QAM	30	24	Max-2	AMR	NB	4.75	2N	12.62	/	/	/
N2	B5	20	16QAM	15	106	Max-2	AMR	NB	4.75	2N	12.94	/	/	/
N5	B5	20	16QAM	15	106	Max-2	AMR	NB	4.75	2N	12.58	/	/	/
N66	B5	20	16QAM	15	106	Max-2	AMR	NB	4.75	2N	12.80	/	/	/

7. Test Facilities Utilized

No	Name	Type	SN	Manufacturer	Cal.Due Date
1	Measurement Frontend	Labcore	77000136	HEAD acoustics GmbH	2025-11-29
2	HEAD measurement system	HMS II.3	12306194 (torso137 40182)	HEAD acoustics GmbH	2026-09-25
3	Universal communication tester	CMW500	170430	Rohde&Schwarz	2026-08-03
4	Universal communication tester	CMX500	101626	Rohde&Schwarz	2026-08-05
5	Acoustic chamber	4.70 m×4.30 m×2.10 m	None	Ruisen	2026-10-26
Software					
Name		Version			
ACQUA		V 6.0.200			

END OF REPORT BODY

ANNEX A: EUT photograph

No phone's photos for Confidentiality requirements.

ANNEX B: EUT parameters

Disclaimer: The bands and codecs of EUT provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

General Information:

Description	Smart phone
Model name/HVIN	B1660V
Brand name	BLU
FCC ID	YHLBLUB1660V
Extreme Temperature	0~45℃
Nominal Voltage	3.87V
Extreme High Voltage	4.45V
Extreme Low Voltage	3.45V

Supported Bands:

UMTS Frequency Band(s)	B 2/4/5
GSM Frequency Band(s)	Not support
E-UTRA Frequency Band(s)	B 2/4/5/12/13/66
WLAN Frequency Band(s)	2.4G/5GHz
5G Frequency Band(s)	N 2/5/66/77 NSA only

Supported Codecs:

UMTS Audio Codec(s)	AMR NB/AMR WB
GSM Audio Codec (s)	Not support
E-UTRA Audio Codec(s)	AMR NB/AMR WB/EVS NB/EVS WB
WLAN Audio Codec(s)	AMR NB/AMR WB/EVS NB/EVS WB
5G Audio Codec(s)	AMR NB/AMR WB/EVS NB/EVS WB
OTT	Google Meet

ANNEX C: Test Layout

Artificial Ear Type		3.3
Mounting Force [N]		2 and 8
Center Fork Offset [°]		0
Volume Level		5 (1-7)
Angle settings		
Xe [°]	Ye [°]	Ze[°]
0	0	5

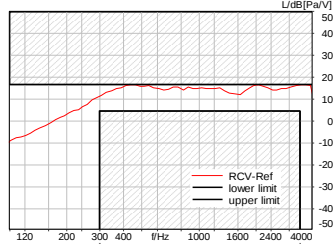
NOTE: The handset shall be placed in either the standard test position as specified in IEEE Std 269 or a recommended test position specified by the manufacturer that complies with the recommended test position requirements in IEEE Std 269.

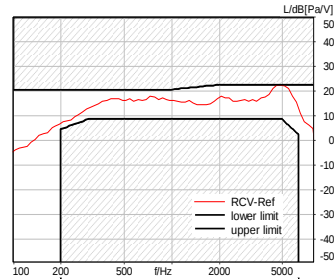
No phone's photos for Confidentiality requirements.

ANNEX D: The Worst-case Measurement Data of The Chosen Codec of Telephony Call

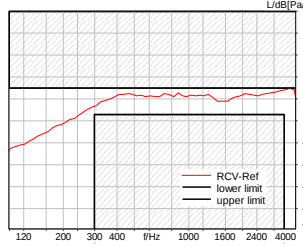
SMD	Status	Single Value Description	Single Value	Object
5.1 Receive Volume Control Performance 8N 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Speech Level [dB[SPL]]	86.42	24T04Z102392 VoLTE EVS
5.1.1 -1 Conversation Gain 8N 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Ok	Calculated Value [dB]	16.42	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 400Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	26.23	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 500Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	27.72	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 630Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	25.64	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 800Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	21.67	24T04Z102392 VoLTE EVS

Receive path - distortion and noise 1000Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	36.08	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1250Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	32.26	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1600Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	33.56	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 2000Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	36.43	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 2500Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	30.31	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 3150Hz WB&NB 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Done	Distortion (Noise) [dB], 0.0 dB	28.49	24T04Z102392 VoLTE EVS
5.2 Receive path – distortion and noise 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Ok			24T04Z102392 VoLTE EVS

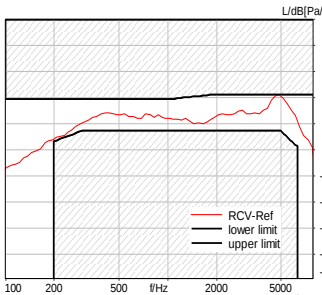
5.3 Receive Acoustic Frequency response Performance 16QAM,RB Size=1,RB Offset=0; Table-3; Table-8	Ok	Min. dist. to tolerance scheme [dB], 305.9 Hz		24T04Z102392 VoLTE EVS
			7.14	
5.1 Receive Volume Control Performance 8N Table-8	Done	Speech Level [dB[SPL]]	87.43	24T04Z102392 VoLTE EVS
5.1.1 -1 Conversation Gain 8N Table-8	Ok	Calculated Value [dB]	17.43	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 250 WOnly Table-8	Done	Distortion (Noise) [dB], 0.0 dB	25.62	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 315Hz WOnly Table-8	Done	Distortion (Noise) [dB], 0.0 dB	25.55	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 400Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	36.06	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 500Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	32.57	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 630Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	38.64	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 800Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	39.50	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1000Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	37.90	24T04Z102392 VoLTE EVS

Receive path - distortion and noise 1250Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	33.04	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1600Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	36.98	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 2000Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	38.77	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 2500Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	34.24	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 3150Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	32.93	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 4000Hz WBonly Table-8	Done	Distortion (Noise) [dB], 0.0 dB	31.81	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 5000Hz WBonly Table-8	Done	Distortion (Noise) [dB], 0.0 dB	36.22	24T04Z102392 VoLTE EVS
5.2 Receive path – distortion and noise Table-8	Ok			24T04Z102392 VoLTE EVS
5.3 Receive Acoustic Frequency response Performance Table-8	Ok	Min. dist. to tolerance scheme [dB], 230.2 Hz		24T04Z102392 VoLTE EVS
5.1 Receive Volume Control Performance 2N Table-8	Done	Speech Level [dB[SPL]]	82.50	24T04Z102392 VoLTE EVS

5.1.1 -1 Conversation Gain 2N Table-8	Ok	Calculated Value [dB]	12.50	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 400Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	29.78	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 500Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	26.77	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 630Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	24.96	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 800Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	23.86	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1000Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	34.56	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1250Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	32.13	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1600Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	34.01	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 2000Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	36.00	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 2500Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	32.20	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 3150Hz	Done	Distortion (Noise) [dB], 0.0 dB	27.59	24T04Z102392 VoLTE EVS

WB&NB Table-8				
5.2 Receive path – distortion and noise Table-8	Ok			24T04Z102392 VoLTE EVS
5.3 Receive Acoustic Frequency response Performance Table-8	Ok	Min. dist. to tolerance scheme [dB], 305.9 Hz		24T04Z102392 VoLTE EVS 4.30
5.1 Receive Volume Control Performance 2N Table-8	Done	Speech Level [dB[SPL]]	83.85	24T04Z102392 VoLTE EVS
5.1.1 -1 Conversation Gain 2N Table-8	Ok	Calculated Value [dB]	13.85	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 250 WOnly Table-8	Done	Distortion (Noise) [dB], 0.0 dB	27.21	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 315Hz WOnly Table-8	Done	Distortion (Noise) [dB], 0.0 dB	28.70	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 4000Hz WOnly Table-8	Done	Distortion (Noise) [dB], 0.0 dB	31.03	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 400Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	35.55	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 500Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	36.27	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 630Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	38.24	24T04Z102392 VoLTE EVS

Receive path - distortion and noise 800Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	38.42	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1000Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	37.84	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1250Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	33.67	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 1600Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	36.47	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 2000Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	36.89	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 2500Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	34.17	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 3150Hz WB&NB Table-8	Done	Distortion (Noise) [dB], 0.0 dB	33.12	24T04Z102392 VoLTE EVS
Receive path - distortion and noise 5000Hz WBonly Table-8	Done	Distortion (Noise) [dB], 0.0 dB	37.63	24T04Z102392 VoLTE EVS
5.2 Receive path – distortion and noise Table-8	Ok			24T04Z102392 VoLTE EVS

5.3 Receive Acoustic Frequency response Performance Table-8	Ok	Min. dist. to tolerance scheme [dB], 230.2 Hz	 24T04Z102392 VoLTE EVS 0.77	
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ANNEX E: The Worst-case Measurement Data of Other Codecs of Telephony Call

SMD	Status	Single Value Description	Single Value	Object
5.1 Receive Volume Control Performance 8N Table-9	Done	Speech Level [dB[SPL]]	86.22	24T04Z102392 VoLTE AMR
5.1.1 -1 Conversation Gain 8N Table-9	Ok	Calculated Value [dB]	16.22	24T04Z102392 VoLTE AMR
5.1 Receive Volume Control Performance 8N Table-9	Done	Speech Level [dB[SPL]]	87.45	24T04Z102392 VoLTE AMR
5.1.1 -1 Conversation Gain 8N Table-9	Ok	Calculated Value [dB]	17.45	24T04Z102392 VoLTE AMR
5.1 Receive Volume Control Performance 2N Table-9	Done	Speech Level [dB[SPL]]	83.73	24T04Z102392 VoLTE AMR
5.1.1 -1 Conversation Gain 2N Table-9	Ok	Calculated Value [dB]	13.73	24T04Z102392 VoLTE AMR
5.1 Receive Volume Control Performance 2N B5;Table-4; Table-9	Done	Speech Level [dB[SPL]]	82.41	24T04Z102392 VoLTE AMR
5.1.1 -1 Conversation Gain 2N B5;Table-4; Table-9	Ok	Calculated Value [dB]	12.41	24T04Z102392 VoLTE AMR

ANNEX F: FREQUENCY RESPONSE USED DF and 1/12 OCTAVE

Title:	5.3 Receive Acoustic Frequency response Performance		
Mode:	Do measurement	File to analyse:	
Source			
Use source file:	Yes	Source file:	ale_dual_nb.dat
Source level adj.:	Ch.1: -90.00 dB; Ch.2: -4.00 dB		
Delayed channels:	Off		
Filter (out):	Off		
Sink			
Number of channels:	2		
Record length:	10616.02	ms	Sampling freq.: 48000 Hz
Filter (in):	FIR: Ch.2, File:drp2df_ieee1652.fft		
Measurement			
Pre measure info:	No	Run time info:	No
Analysis			
Channels to analyse:	2		
Reference:	rcv_nb_ref1.fft (ext. created)		
Time range:	250.0..10450.0 ms		
Transformation:	12th octave, Hann, FFT:16384, OV:75%		
Tolerance scheme:	nb_fr_tol.tol, adj. to upper, 100..4000 Hz		
Calculate value:	No		
Result			
Check min. dist.:	> 0.0 dB, (Req.)		
Representation:	-5..5 , 100..4000 Hz, -50..50 dB		
Special features			
Special features:	Comp.delay, Store to rcv_fr.fft		

ANNEX G: HATS CERTIFICATE

中国计量科学研究院



证书编号 LSsx2024-14143

校准结果

表 2 HATS 右耳校准结果

频率/Hz	31.5	63	125	250	500	1000
REF/dB	92.42	92.45	92.47	92.55	92.92	94.02
(REF+10)/dB	102.45	102.46	102.49	102.56	102.92	104.02
差值/dB	10.03	10.01	10.02	10.01	10.00	10.00
频率/Hz	2000	4000	8000	12500	16000	/
REF/dB	98.07	103.39	116.24	115.61	94.06	/
(REF+10)/dB	108.07	113.38	126.08	125.42	103.83	/
差值/dB	10.00	9.99	9.84	9.81	9.77	/

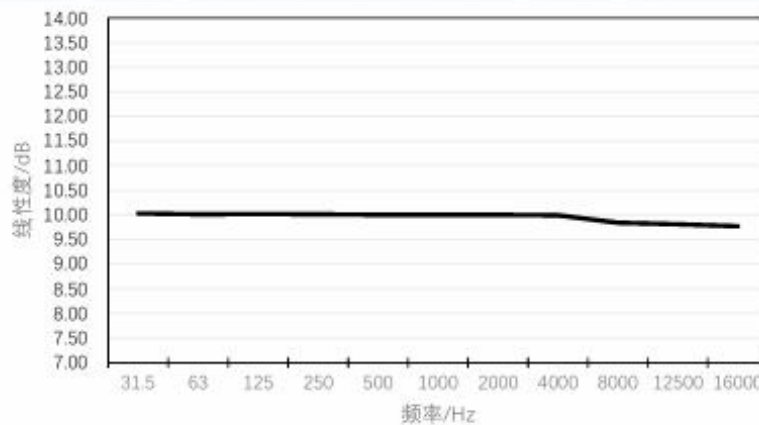


图 2 HATS 右耳线性度图

输出部分

2、频率响应

校准时用 B&K 4938 型压力场传声器在 HATS 嘴正前方，在其参考点处进行校准，测得其嘴（配 PA50 型功率放大器）的频谱如图 3 所示，100 Hz 至 10 kHz 范围内 1/3 倍频程中心频率频谱数据见表 3。

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ANNEX H: ACOUSTIC CHAMBER CERTIFICATE



中国计量科学研究院

证书编号 LSsx2021-19386

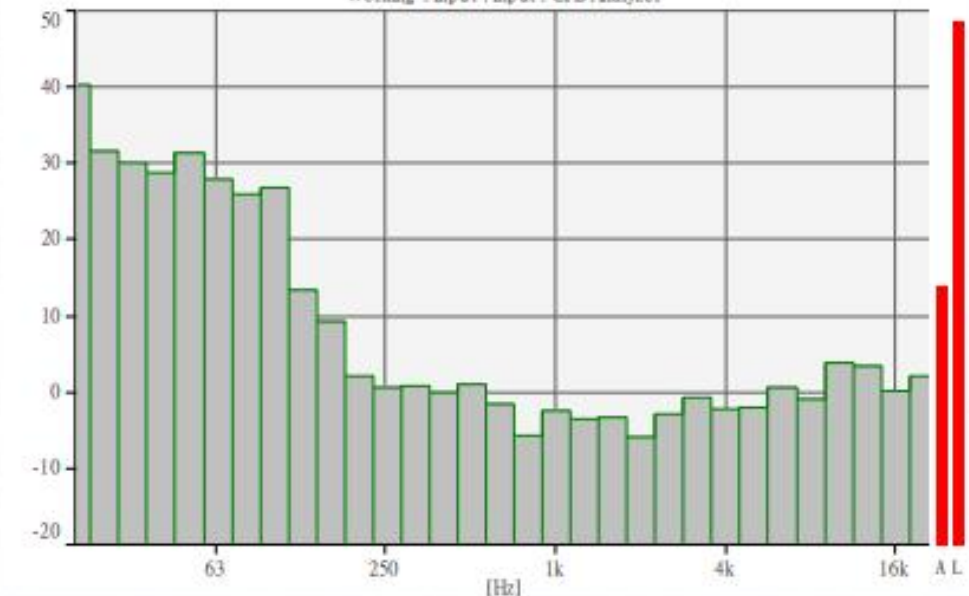
校准结果

二、背景噪声校准结果

正常情况下，消声室的 A 计权背景噪声为 14 dB，其 1/3 倍频频谱见图 2。

[dB/20.0u Pa]

Autospectrum(zb) - Input
Working : Input ; Input : CFB Analyzer



[Hz]

图 2 背景噪声频谱图

声压级校准结果不确定度：U=0.6 dB (k=2)

-----以下空白-----

说明：

根据校准规范 JJF 1147-2006 的规定，通常情况下 60 个月校准一次。

声明：

1. 我院仅对加盖“中国计量科学研究院校准专用章”的完整证书负责。
2. 本证书的校准结果仅对本次所校准的计量器具有效。

校准员： 郑云山

核验员： 牛辉

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ANNEX I: Accreditation Certificate



Accredited Laboratory

A2LA has accredited

TELECOMMUNICATION TECHNOLOGY LABS, CAICT

Beijing, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 23rd day of July 2024.



Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 7049.01
Valid to July 31, 2026

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

END OF REPORT