Measurement Protocol

Measurement Object	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 14:57
Responsible Person	audio

Status Overview

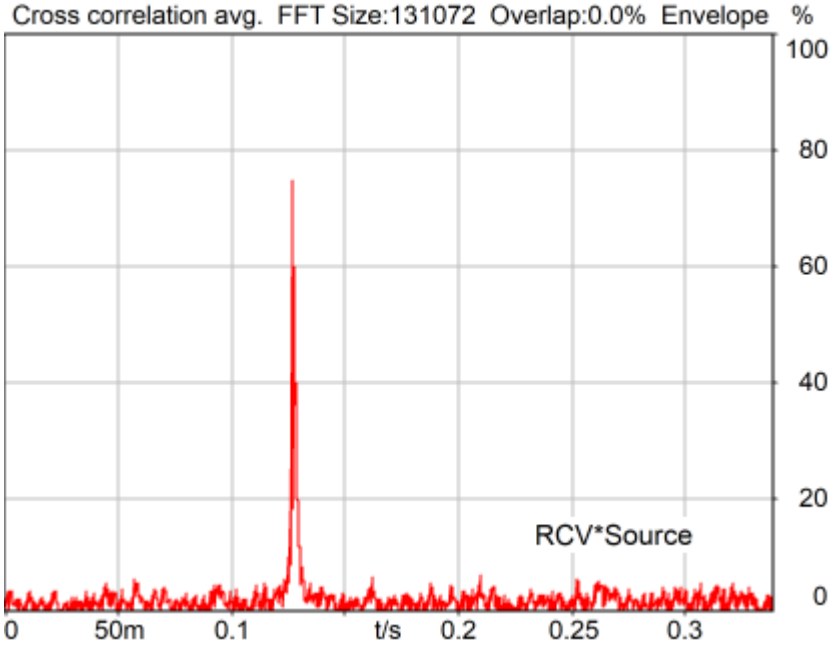
SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay NB	Done	Delay (Cross) [ms]	127.2	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.1a Receive Volume Control Performance 8N NB	Ok	Corrected Speech Level [dB[SPL]]	21.95	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.1b Receive Volume Control Performance 2N NB	Ok	Corrected Speech Level [dB[SPL]]	16.82	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 400 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.38	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.12	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 630 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.93	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 800 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.76	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.60	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1250 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	23.25	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1600 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.29	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 2000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	21.51	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 2500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	23.63	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 3150 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	27.90	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.51	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 400 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.07	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.22	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and	Ok	Distortion (Noise)	35.45	HUHAO_2403_LTE

Noise - 630 Hz NB		[dB], 0.0 dB		Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 800 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.88	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.44	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1250 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	22.99	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1600 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	23.89	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 2000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	22.74	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 2500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	28.05	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 3150 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	31.38	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	22.74	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.3 Frequency Response 8N FF HANB	Not Ok	Min. dist. to tolerance scheme [dB], 1447.5 Hz	-2.57	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.3 Frequency Response 8N DF HANB	Ok	Min. dist. to tolerance scheme [dB], 974.0 Hz	0.94	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.3 Frequency Response 2N FF HANB	Ok	Min. dist. to tolerance scheme [dB], 1447.5 Hz	0.76	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322
5.3 Frequency Response 2N DF HANB	Ok	Min. dist. to tolerance scheme [dB], 3882.4 Hz	2.28	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS NB 24.4kbps_CH132322

Overall Receive Delay NB 5
5.1a Receive Volume Control Performance 8N NB 5
5.1b Receive Volume Control Performance 2N NB 6
5.2 RCV Distortion and Noise - 400 Hz NB 7
5.2 RCV Distortion and Noise - 500 Hz NB 8
5.2 RCV Distortion and Noise - 630 Hz NB 9
5.2 RCV Distortion and Noise - 800 Hz NB 10
5.2 RCV Distortion and Noise - 1000 Hz NB 11
5.2 RCV Distortion and Noise - 1250 Hz NB 12
5.2 RCV Distortion and Noise - 1600 Hz NB 13
5.2 RCV Distortion and Noise - 2000 Hz NB 14
5.2 RCV Distortion and Noise - 2500 Hz NB 15
5.2 RCV Distortion and Noise - 3150 Hz NB 16
Report - Receive Distortion and Noise (Conversational Gain) 17
5.2 RCV Distortion and Noise - 400 Hz NB 18
5.2 RCV Distortion and Noise - 500 Hz NB 18
5.2 RCV Distortion and Noise - 630 Hz NB 19
5.2 RCV Distortion and Noise - 800 Hz NB 20
5.2 RCV Distortion and Noise - 1000 Hz NB 21
5.2 RCV Distortion and Noise - 1250 Hz NB 22
5.2 RCV Distortion and Noise - 1600 Hz NB 23
5.2 RCV Distortion and Noise - 2000 Hz NB 24
5.2 RCV Distortion and Noise - 2500 Hz NB 25
5.2 RCV Distortion and Noise - 3150 Hz NB 26
Report - Receive Distortion and Noise (Conversational Gain) 27
5.3 Frequency Response 8N FF HANB 28
5.3 Frequency Response 8N DF HANB 29
5.3 Frequency Response 2N FF HANB 29
5.3 Frequency Response 2N DF HANB 30

Overall Receive Delay NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ Preparation - Delay measurement



Channel	Delay
RCV*Source	127.2 ms

2025/2/5 13:46 ACQUA 6.0.200
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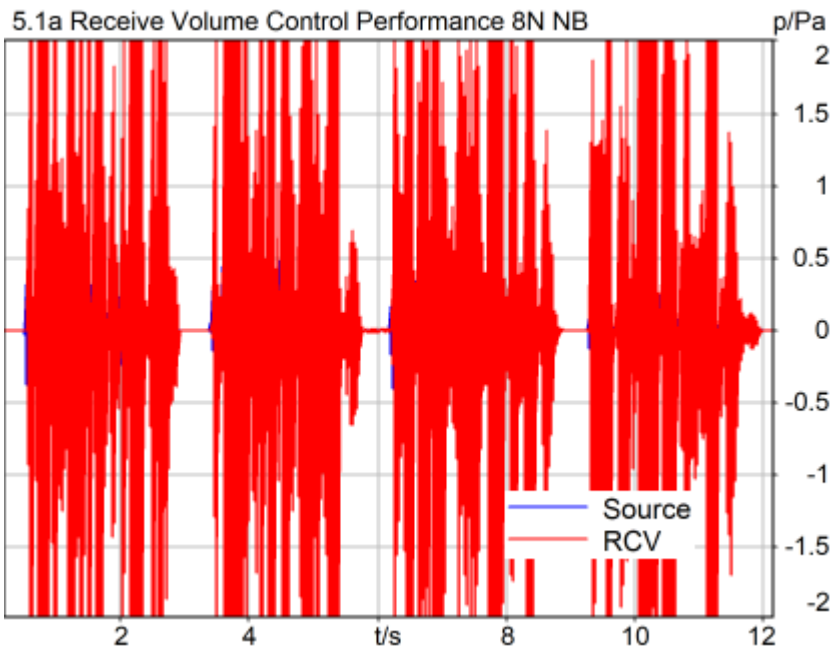
5.1a Receive Volume Control Performance 8N NB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	91.95 dB[SPL]	84.11%	21.95 dB[SPL]	Ok

Ok

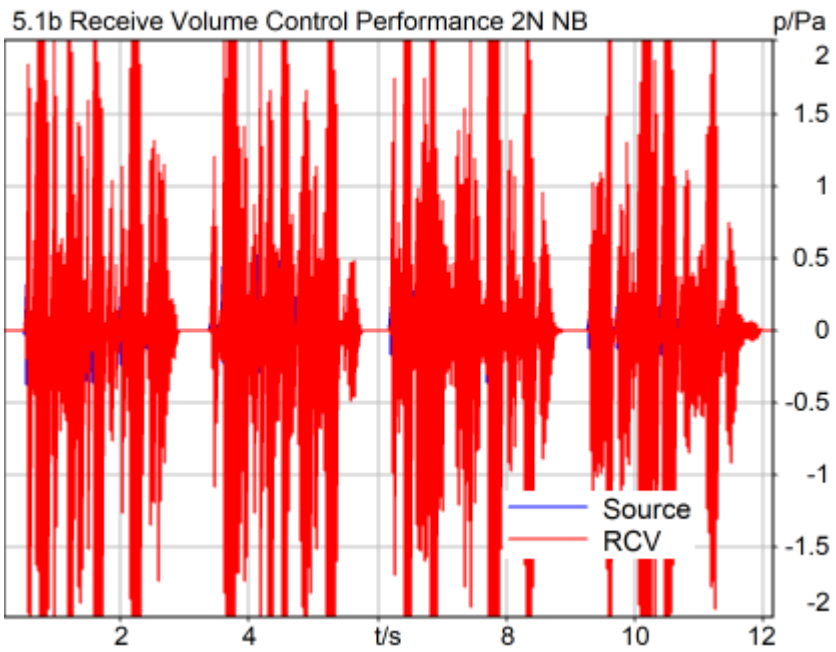
2025/3/19 15:19 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.1b Receive Volume Control Performance 2N NB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	86.82 dB[SPL]	84.03%	16.82 dB[SPL]	Ok

Ok

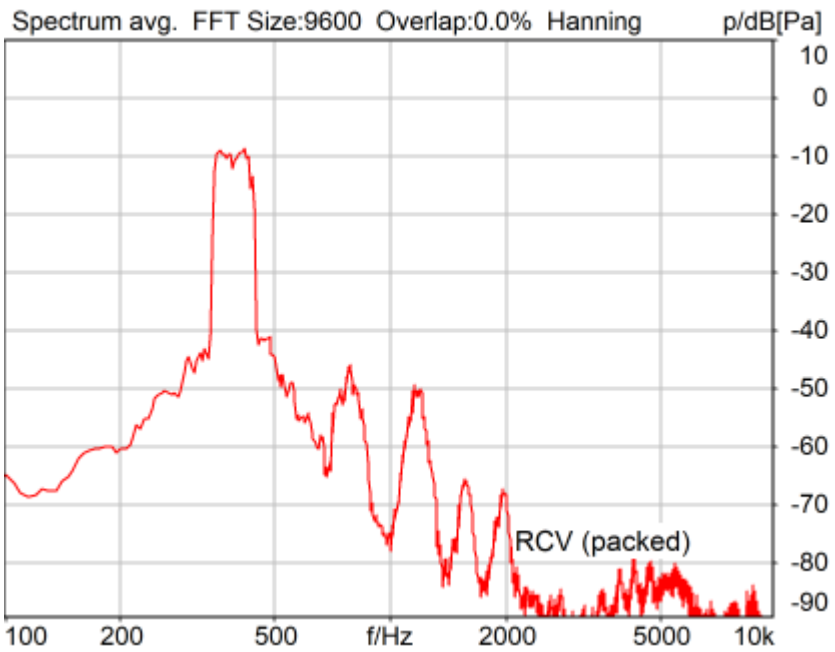
2025/3/19 15:21 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 400 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.38 dB (1.91%) Ok

Ok

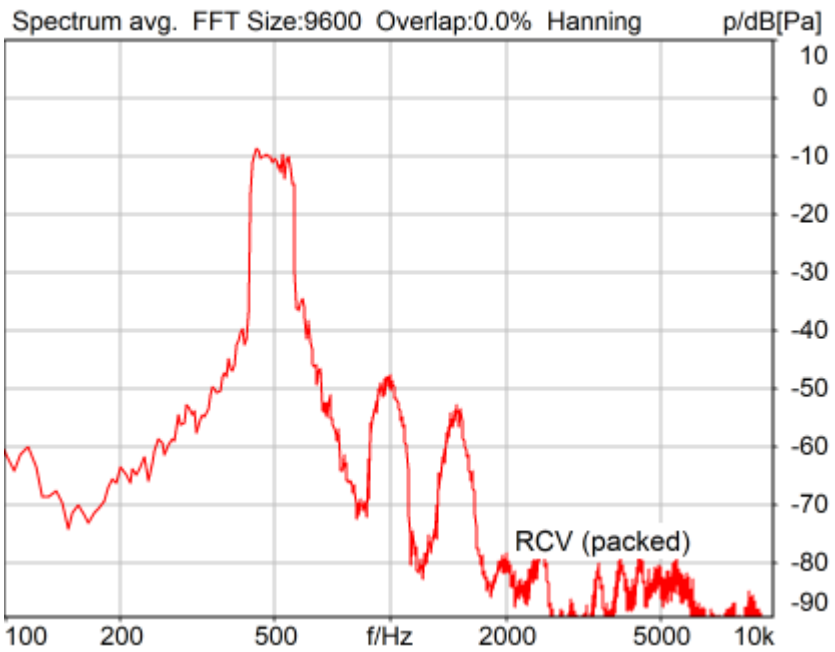
2025/2/5 13:53 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.12 dB (2.21%) Ok

Ok

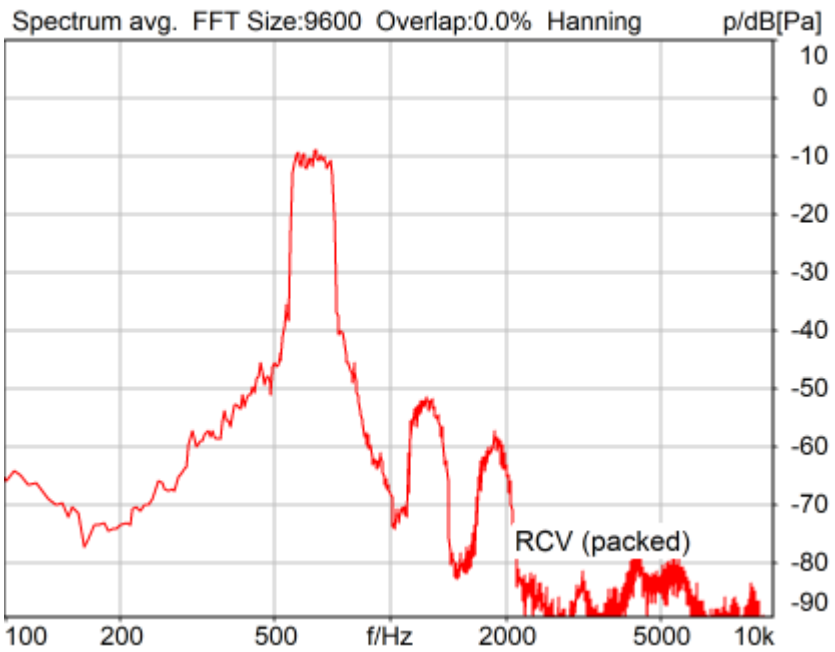
2025/2/5 13:53 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.93 dB (1.79%) Ok

Ok

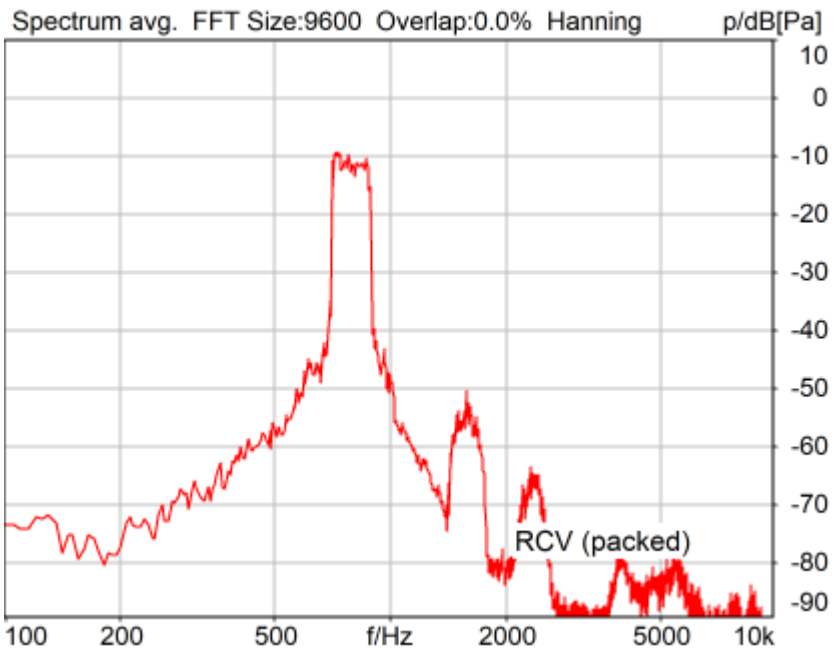
2025/2/5 13:54 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.76 dB (1.83%) Ok

Ok

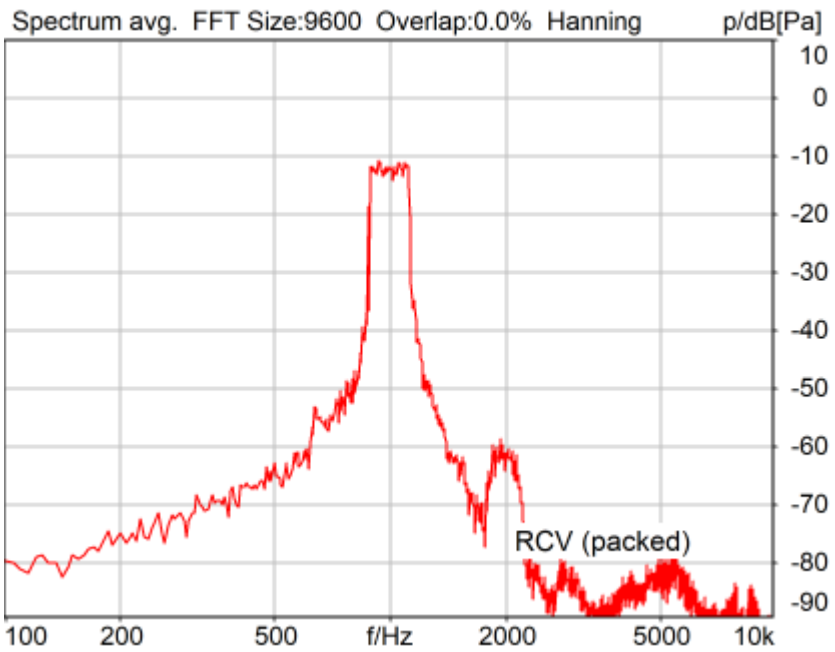
2025/2/5 13:54 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.60 dB (2.34%) Ok

Ok

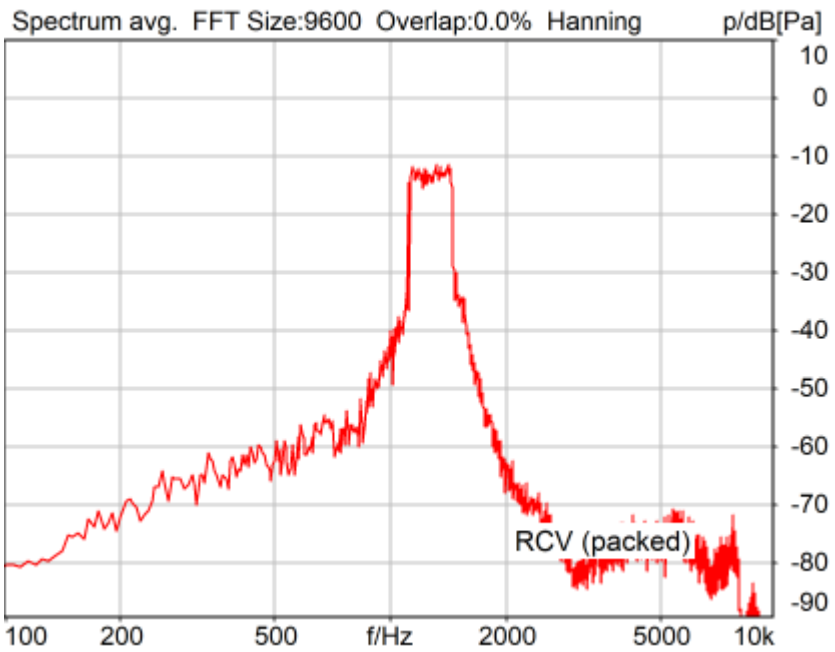
2025/2/5 13:54 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.25 dB (6.88%) Ok

Ok

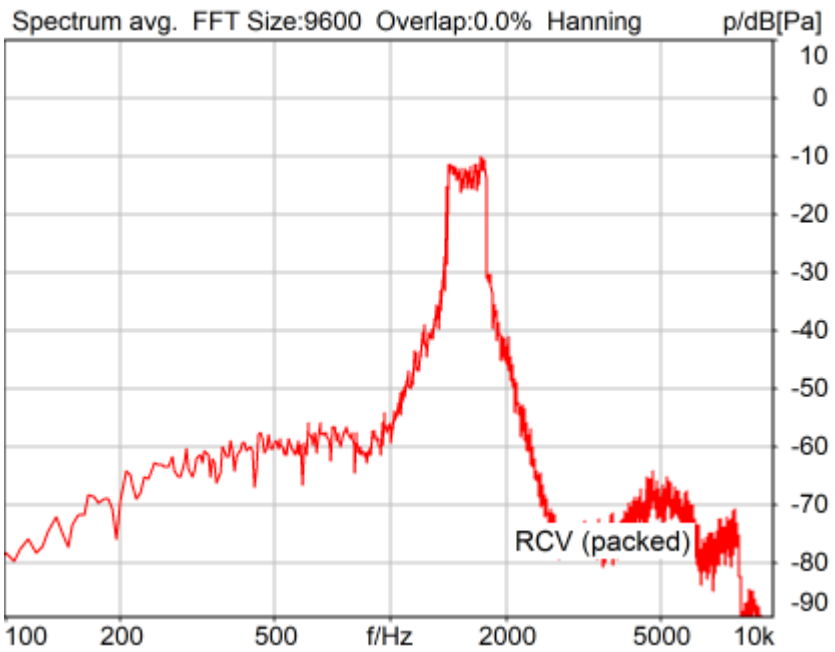
2025/2/5 13:55 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.29 dB (6.10%) Ok

Ok

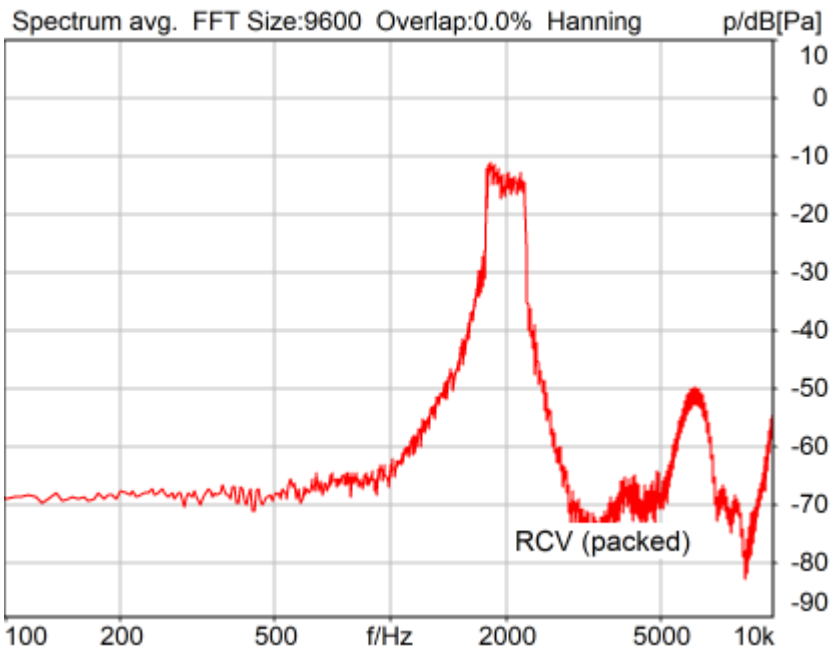
2025/2/5 13:55 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 21.51 dB (8.40%) Ok

Ok

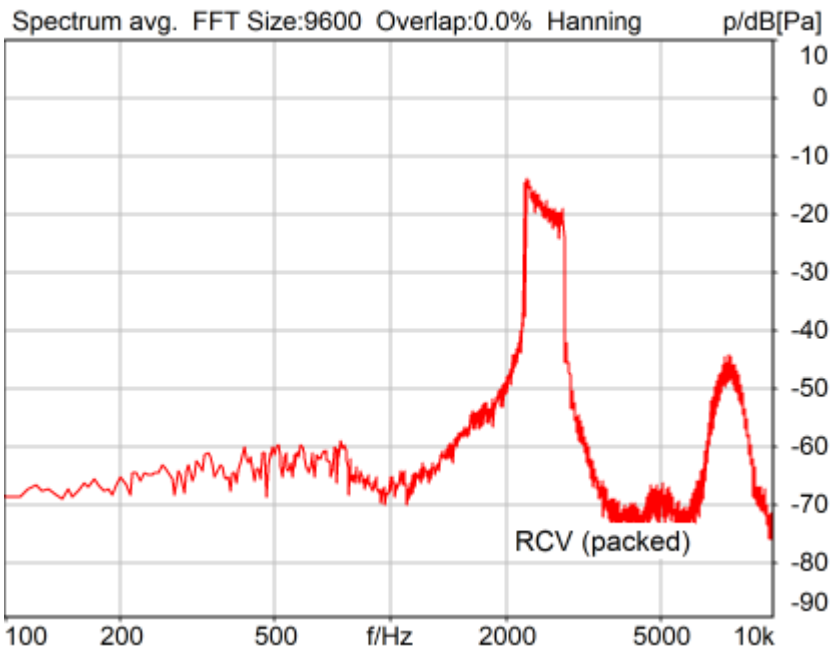
2025/2/5 13:56 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.63 dB (6.58%) Ok

Ok

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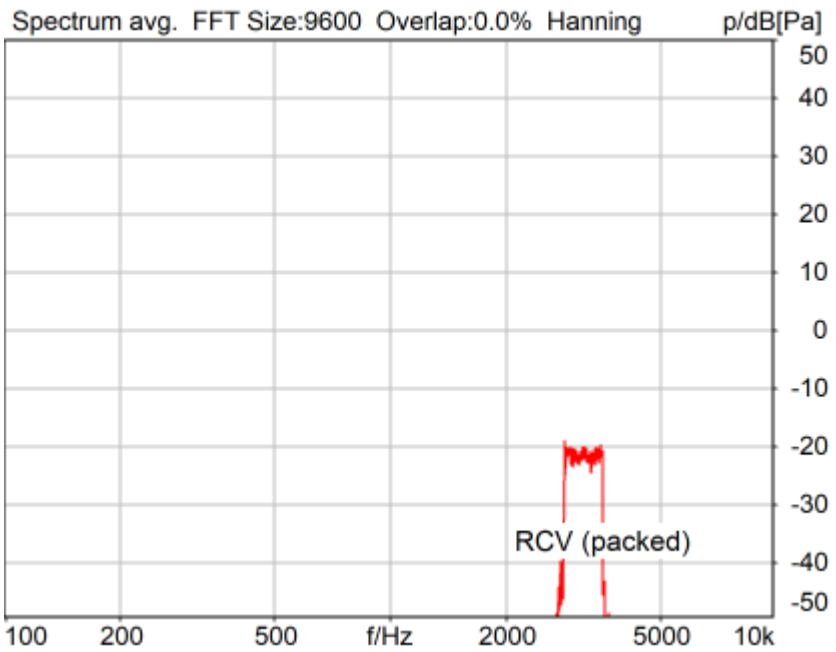
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 27.90 dB (4.03%) Ok

Ok

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Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N

Region	Frequency	SDNR
1	400Hz	34.38 dB
2	500Hz	33.12 dB
3	630Hz	34.93 dB
4	800Hz	34.76 dB
5	1000Hz	32.60 dB
6	1250Hz	23.25 dB
7	1600Hz	24.29 dB
8	2000Hz	21.51 dB
9	2500Hz	23.63 dB
10	3150Hz	27.90 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.51dB at 2000Hz.

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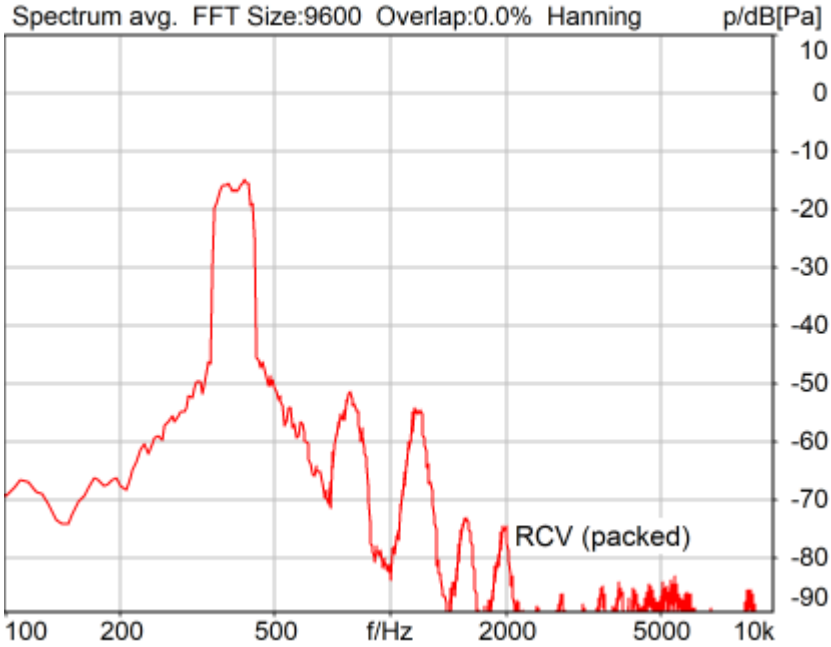
5.2 RCV Distortion and Noise - 400 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.07 dB (2.22%) Ok

Ok

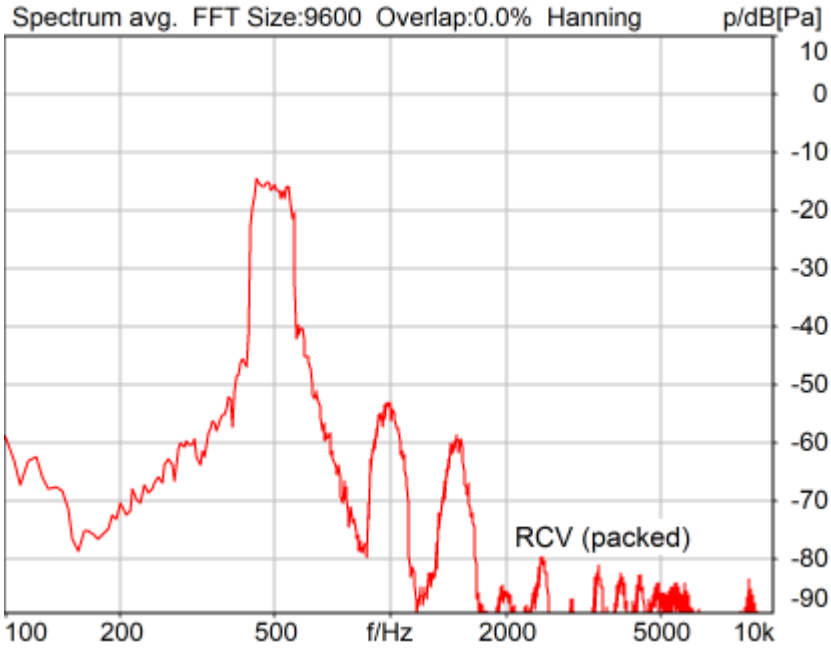
2025/2/5 13:36 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.22 dB (2.18%) Ok

Ok

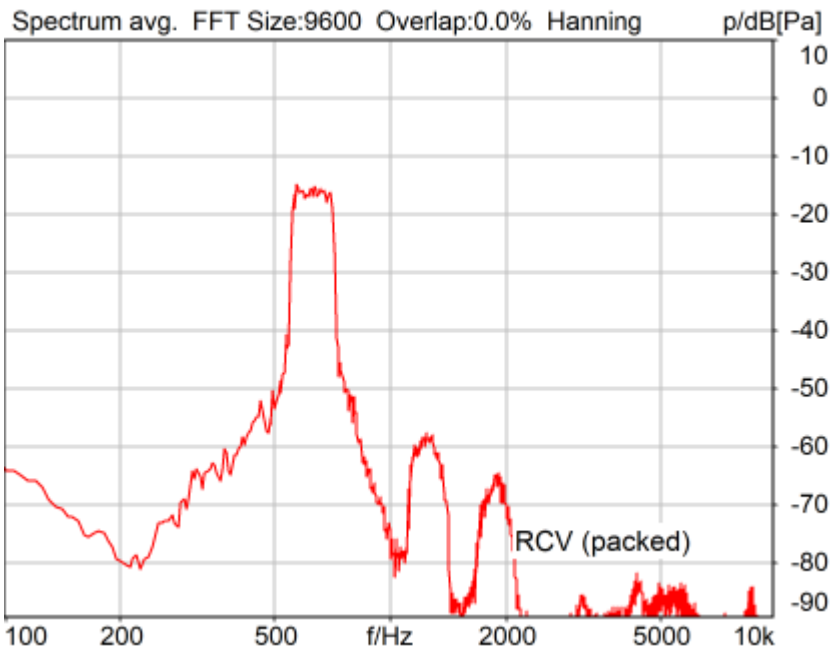
2025/2/5 13:37 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 35.45 dB (1.69%) Ok

Ok

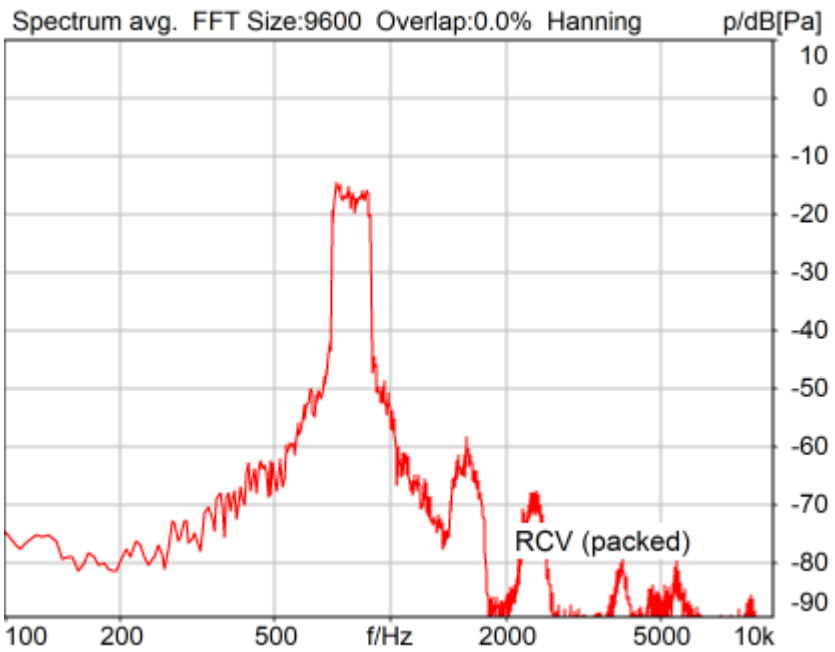
2025/2/5 13:37 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.88 dB (1.80%) Ok

Ok

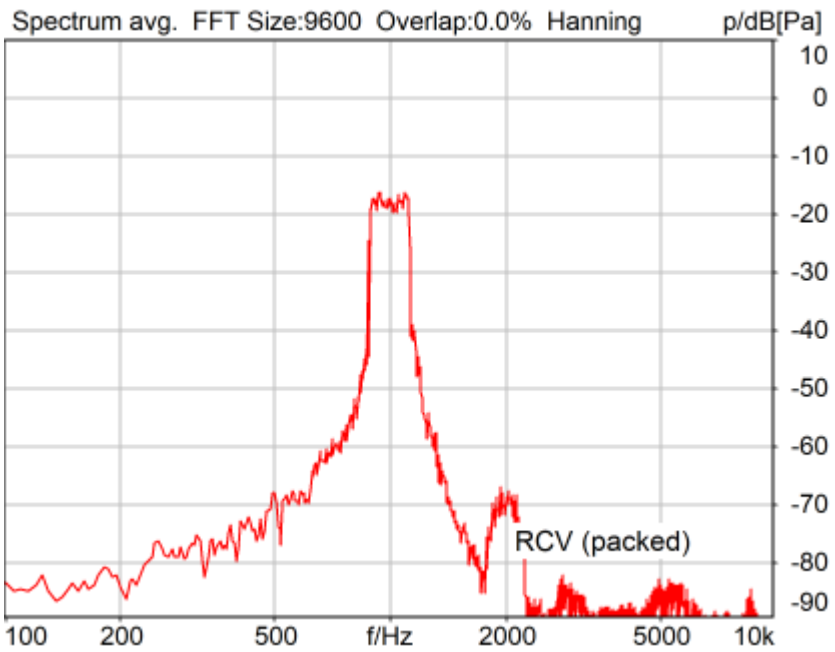
2025/2/5 13:37 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.44 dB (2.39%) Ok

Ok

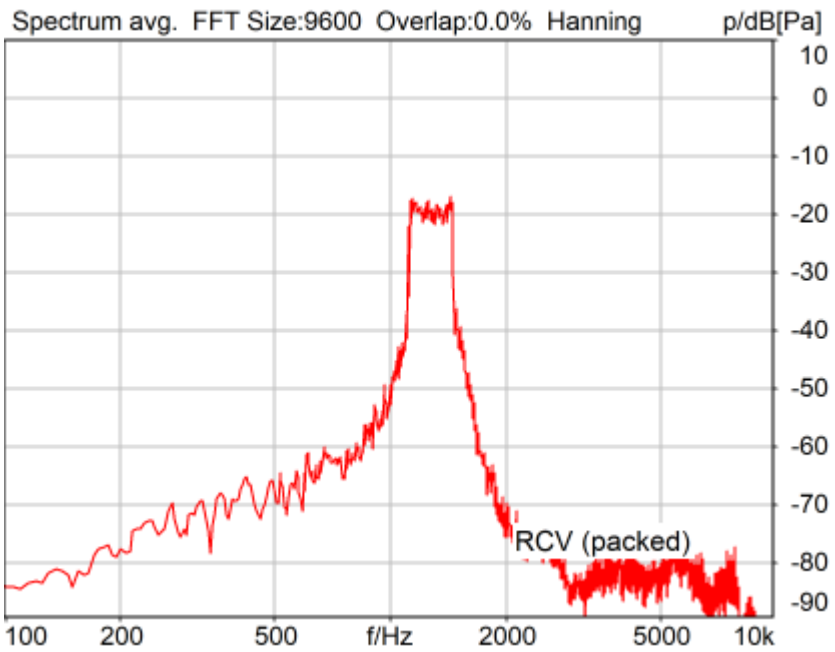
2025/2/5 13:38 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 22.99 dB (7.09%) Ok

Ok

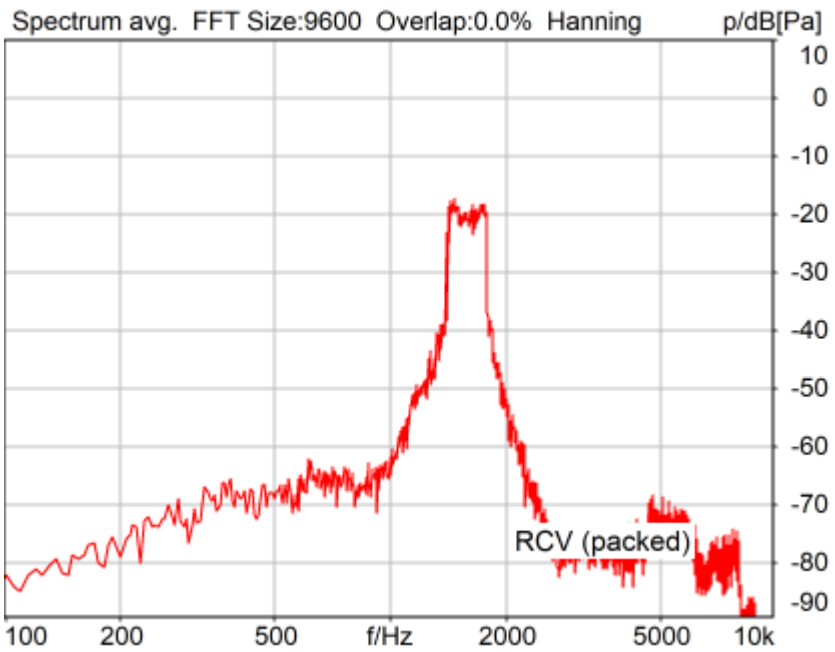
2025/2/5 13:38 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 23.89 dB (6.39%) Ok

Ok

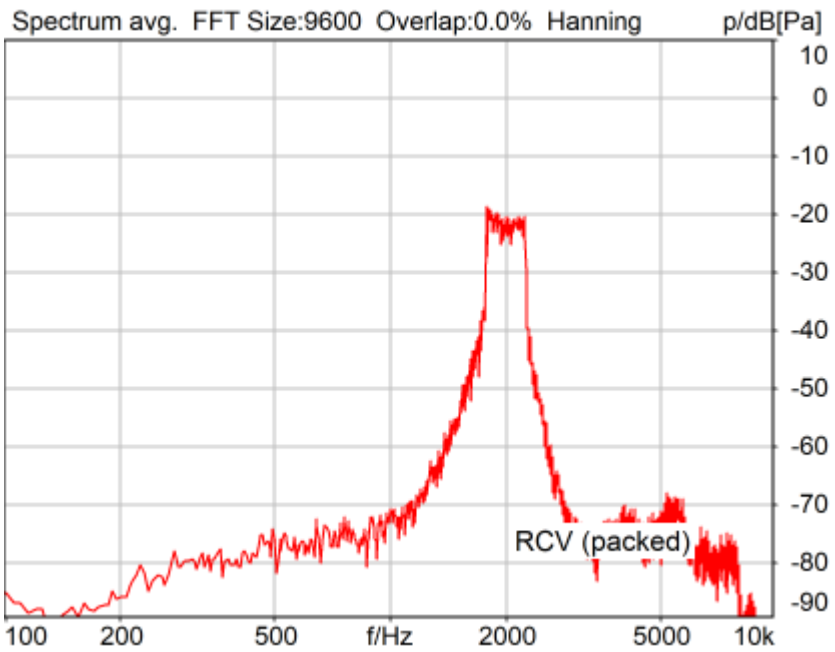
2025/2/5 13:38 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 22.74 dB (7.29%) Ok

Ok

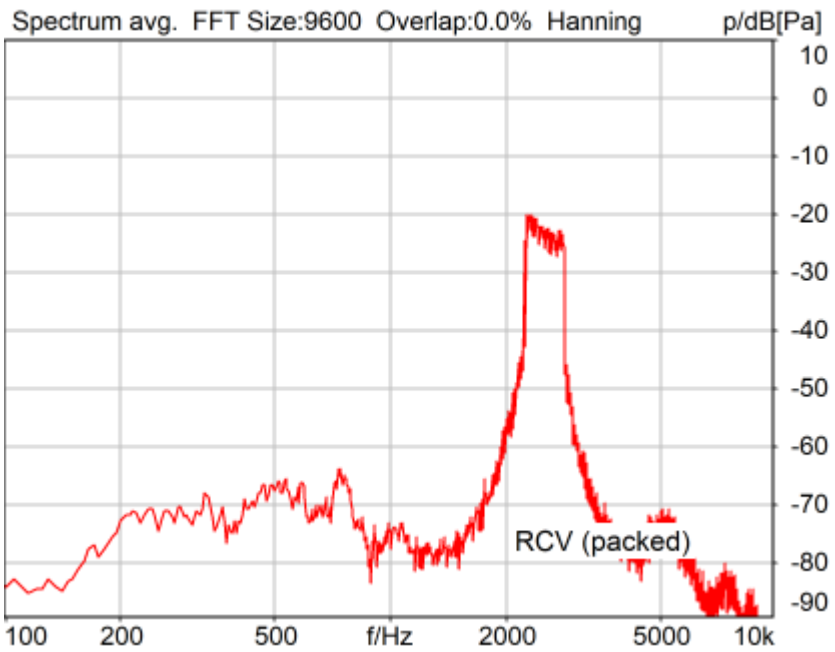
2025/2/5 13:39 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 28.05 dB (3.96%) Ok

Ok

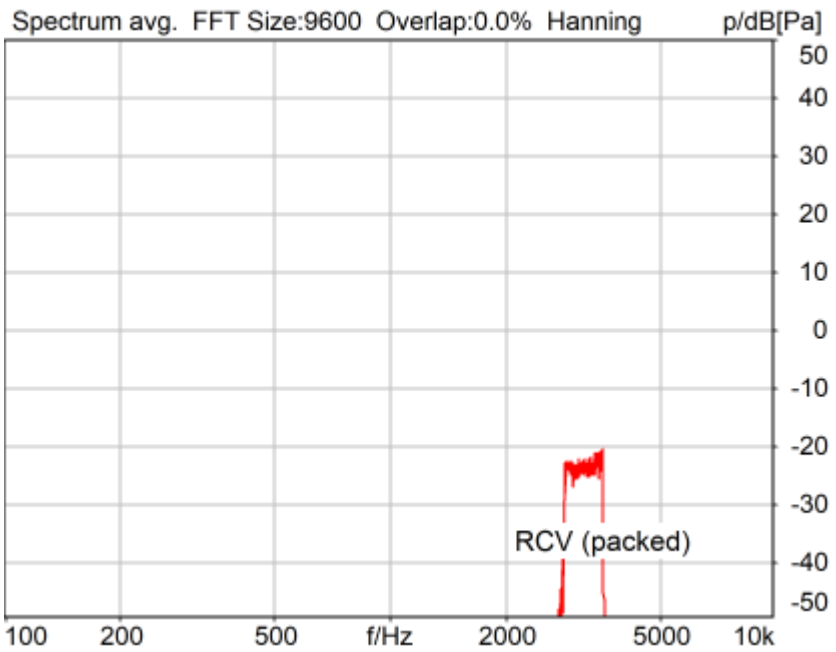
2025/2/5 13:39 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 31.38 dB (2.70%) Ok

Ok

2025/2/5 13:40 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N

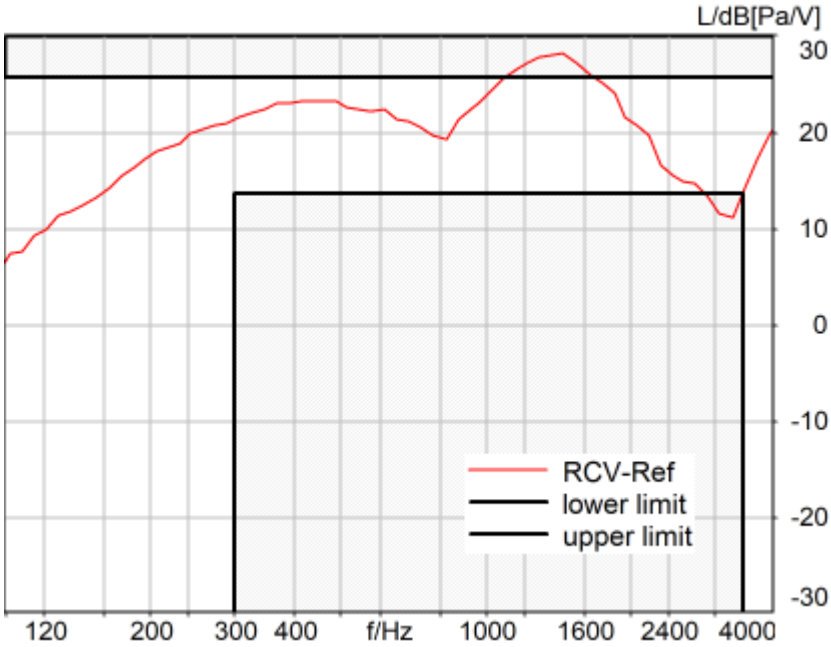
Region	Frequency	SDNR
1	400Hz	33.07 dB
2	500Hz	33.22 dB
3	630Hz	35.45 dB
4	800Hz	34.88 dB
5	1000Hz	32.44 dB
6	1250Hz	22.99 dB
7	1600Hz	23.89 dB
8	2000Hz	22.74 dB
9	2500Hz	28.05 dB
10	3150Hz	31.38 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 22.74dB at 2000Hz.

2025/2/5 13:40 ACQUA

5.3 Frequency Response 8N FF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
-2.57 dB at 1447.5 Hz Not Ok

Not Ok

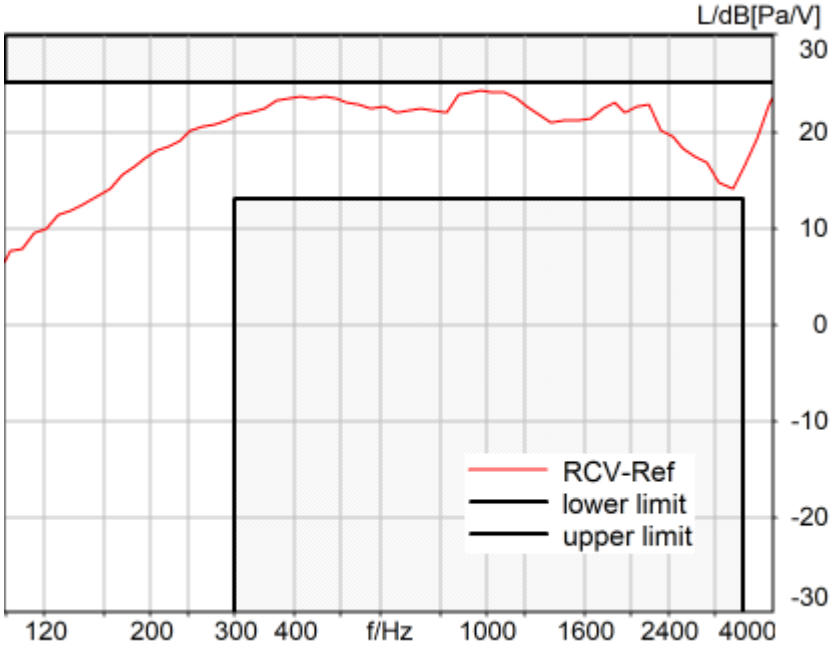
2025/2/5 13:46 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 8N DF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
0.94 dB at 974.0 Hz Ok

Ok

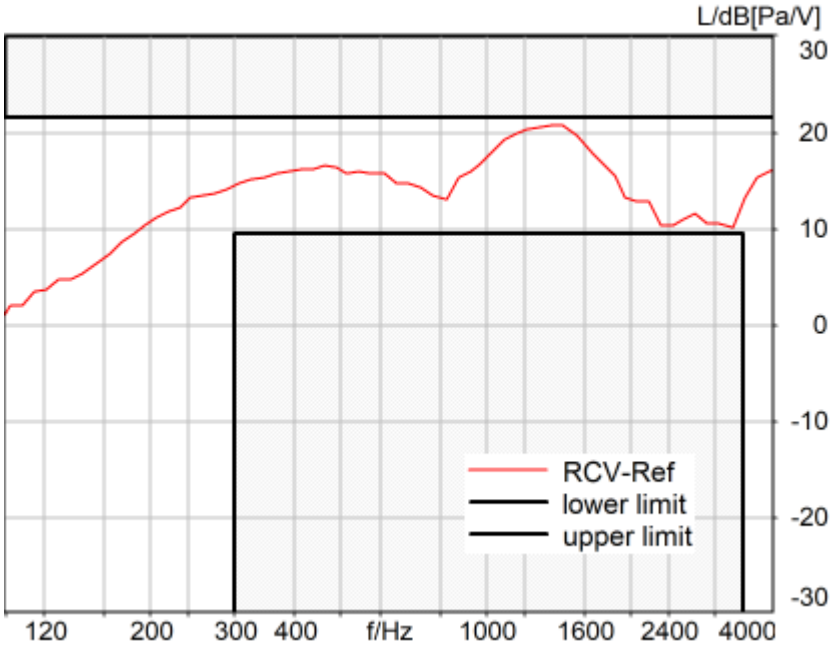
2025/2/5 13:45 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N FF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
0.76 dB at 1447.5 Hz Ok

Ok

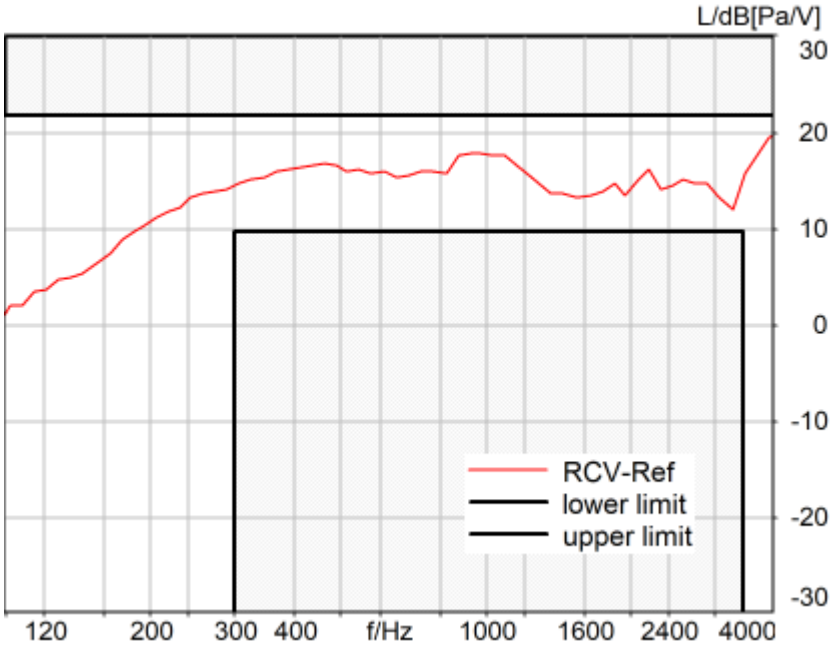
2025/2/5 13:41 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N DF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
2.28 dB at 3882.4 Hz Ok

Ok

2025/2/5 13:42 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

Measurement Protocol

Measurement Object	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 14:58
Responsible Person	audio

Status Overview

SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay WB	Done	Delay (Cross) [ms]	129.5	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.1a Receive Volume Control Performance 8N WB	Ok	Corrected Speech Level [dB[SPL]]	21.82	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.1b Receive Volume Control Performance 2N WB	Ok	Corrected Speech Level [dB[SPL]]	16.01	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	28.11	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 315 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	31.78	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 400 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.26	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.84	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 630 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	35.04	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 800 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.77	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.11	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.14	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1600 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.18	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 2000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	21.83	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 2500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.78	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 3150 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	27.99	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 4000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.16	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and	Ok	Distortion (Noise)	25.94	HUHAO_2403_LTE

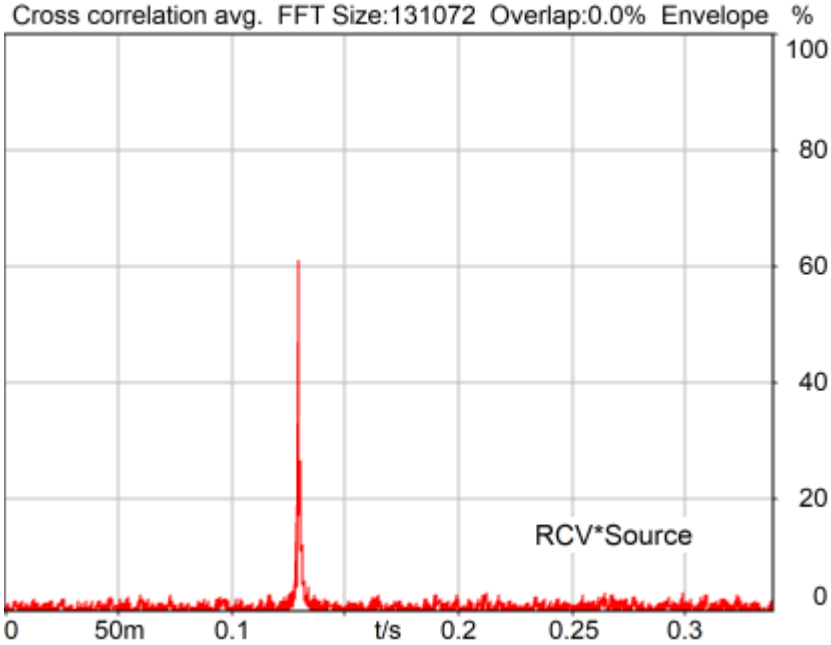
Noise - 5000 Hz WB		[dB], 0.0 dB		Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.83	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	27.74	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 315 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	30.83	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 400 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.35	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.77	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 630 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	35.46	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 800 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	35.18	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.77	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.80	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 1600 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.99	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 2000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	21.67	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 2500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	28.82	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 3150 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	30.46	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 4000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	26.93	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.2 RCV Distortion and Noise - 5000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.73	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.67	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.3 Frequency Response 8N DF	Ok	Min. dist. to tolerance scheme [dB], 5443.6 Hz	0.06	HUHAO_2403_LTE Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322
5.3 Frequency Response	Ok	Min. dist. to	1.28	HUHAO_2403_LTE

2N DF		tolerance scheme [dB], 5443.6 Hz		Band66_20_QPSK_1_0_EVS WB 24.4kbps_CH132322

Overall Receive Delay WB 6
5.1a Receive Volume Control Performance 8N WB 6
5.1b Receive Volume Control Performance 2N WB 7
5.2 RCV Distortion and Noise - 250 Hz WB 8
5.2 RCV Distortion and Noise - 315 Hz WB 9
5.2 RCV Distortion and Noise - 400 Hz WB 10
5.2 RCV Distortion and Noise - 500 Hz WB 11
5.2 RCV Distortion and Noise - 630 Hz WB 12
5.2 RCV Distortion and Noise - 800 Hz WB 13
5.2 RCV Distortion and Noise - 1000 Hz WB 14
5.2 RCV Distortion and Noise - 1250 Hz WB 15
5.2 RCV Distortion and Noise - 1600 Hz WB 16
5.2 RCV Distortion and Noise - 2000 Hz WB 17
5.2 RCV Distortion and Noise - 2500 Hz WB 18
5.2 RCV Distortion and Noise - 3150 Hz WB 19
5.2 RCV Distortion and Noise - 4000 Hz WB 20
5.2 RCV Distortion and Noise - 5000 Hz WB 21
Report - Receive Distortion and Noise (Conversational Gain) 22
5.2 RCV Distortion and Noise - 250 Hz WB 23
5.2 RCV Distortion and Noise - 315 Hz WB 24
5.2 RCV Distortion and Noise - 400 Hz WB 24
5.2 RCV Distortion and Noise - 500 Hz WB 25
5.2 RCV Distortion and Noise - 630 Hz WB 26
5.2 RCV Distortion and Noise - 800 Hz WB 27
5.2 RCV Distortion and Noise - 1000 Hz WB 28
5.2 RCV Distortion and Noise - 1250 Hz WB 29
5.2 RCV Distortion and Noise - 1600 Hz WB 30
5.2 RCV Distortion and Noise - 2000 Hz WB 31
5.2 RCV Distortion and Noise - 2500 Hz WB 32
5.2 RCV Distortion and Noise - 3150 Hz WB 33
5.2 RCV Distortion and Noise - 4000 Hz WB 34
5.2 RCV Distortion and Noise - 5000 Hz WB 35
Report - Receive Distortion and Noise (Conversational Gain) 36
5.3 Frequency Response 8N DF 37
5.3 Frequency Response 2N DF 38

Overall Receive Delay WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ Preparation - Delay measurement

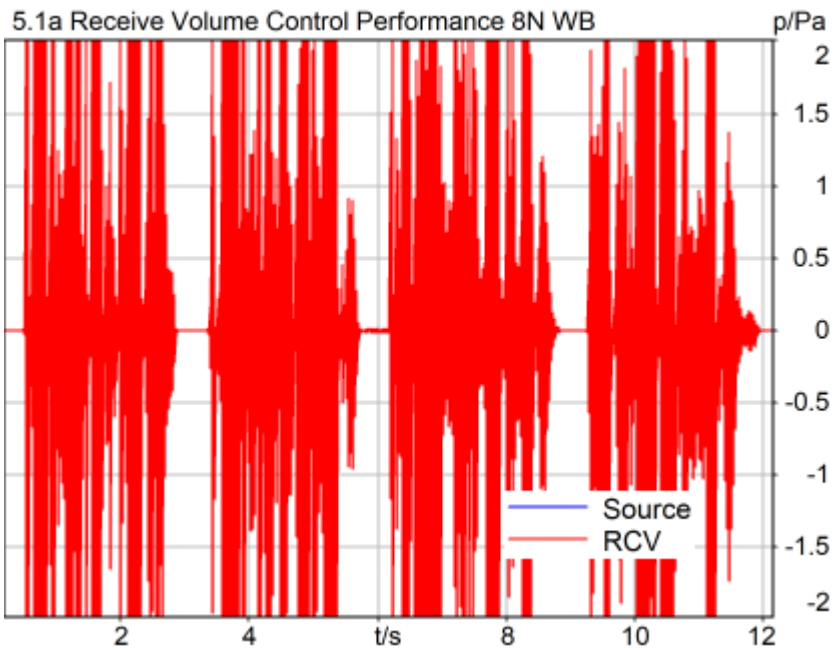


Channel	Delay
RCV*Source	129.5 ms

2025/2/5 13:59 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

5.1a Receive Volume Control Performance 8N WB

TIA-5050 (2018-01) \ Measurements \ Wideband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	91.82 dB[SPL]	84.23%	21.82 dB[SPL]	Ok

Ok

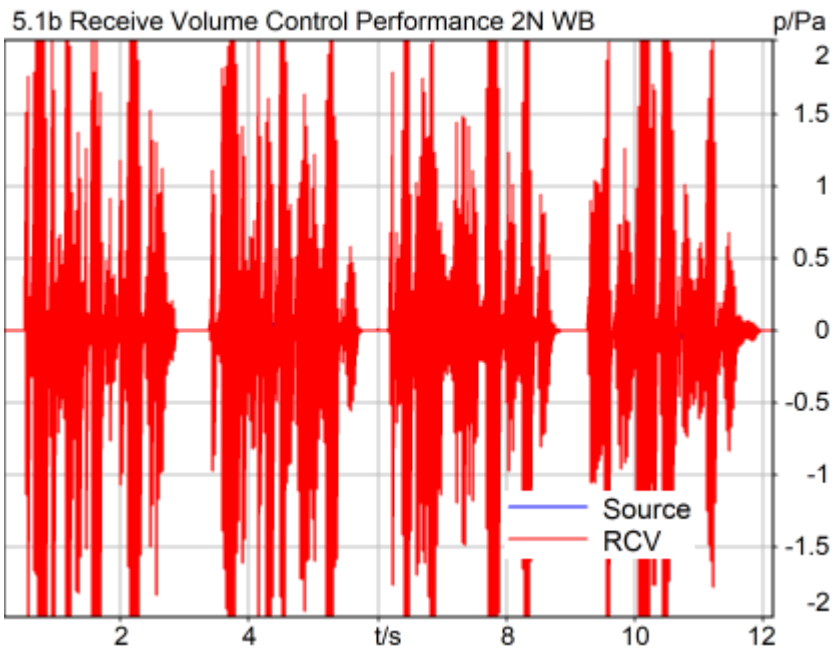
2025/2/5 14:00 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.1b Receive Volume Control Performance 2N WB

TIA-5050 (2018-01) \ Measurements \ Wideband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	86.01 dB[SPL]	84.32%	16.01 dB[SPL]	Ok

Ok

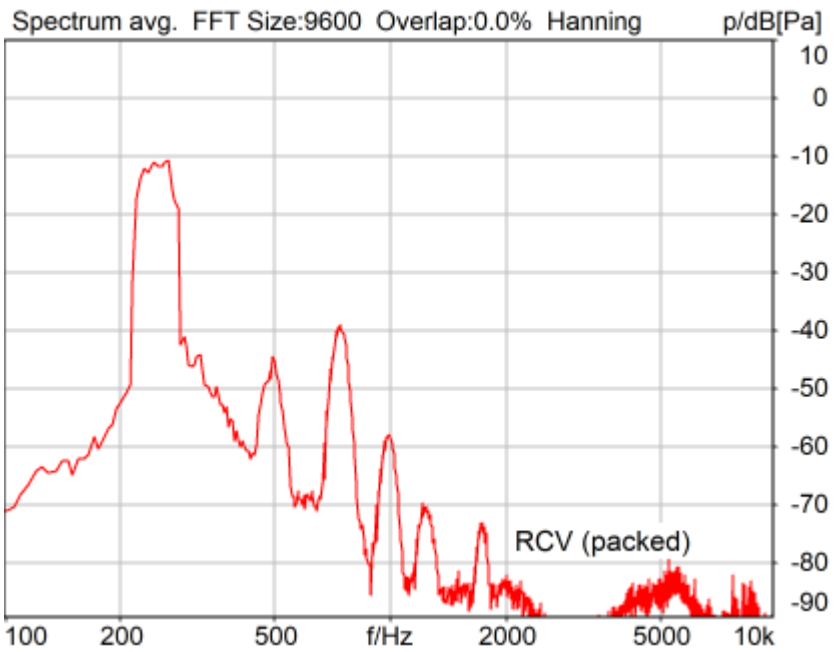
2025/2/5 14:18 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 28.11 dB (3.93%) Ok

Ok

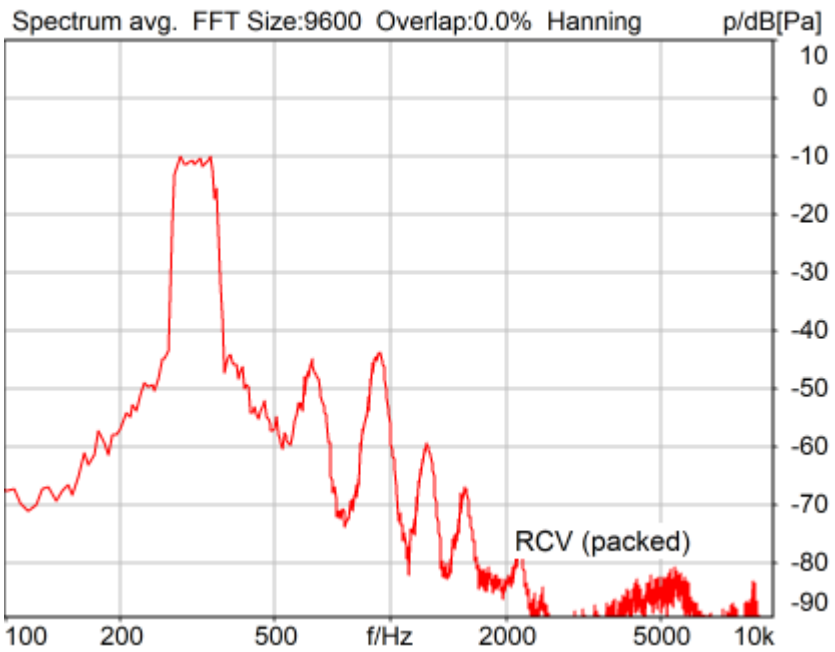
2025/2/5 14:01 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 315 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 31.78 dB (2.58%) Ok

Ok

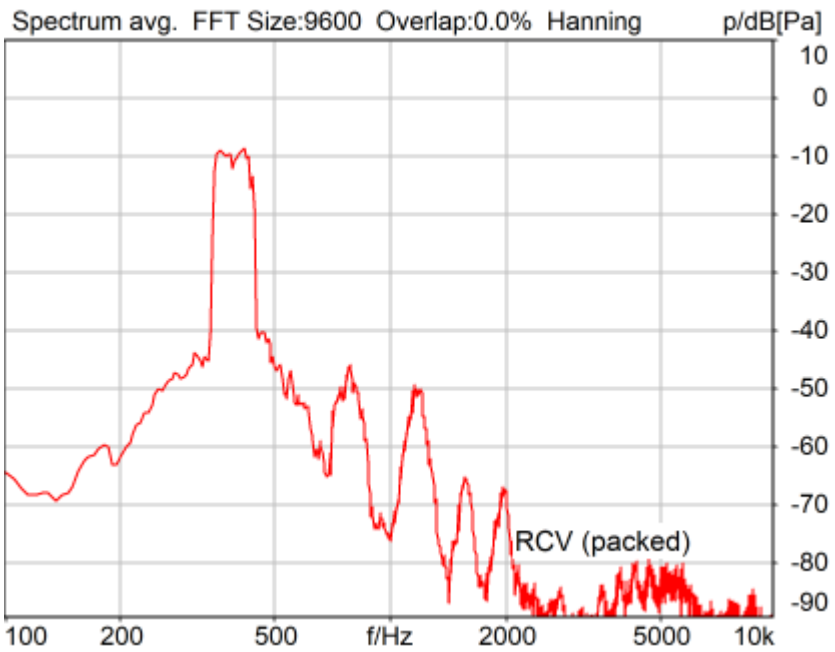
2025/2/5 14:01 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 400 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.26 dB (1.94%) Ok

Ok

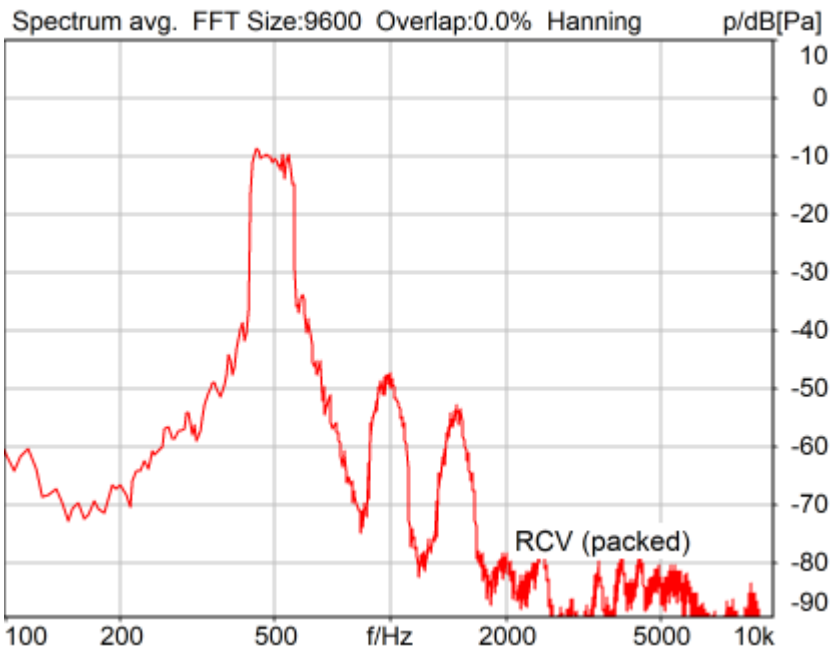
2025/2/5 14:01 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.84 dB (2.28%) Ok

Ok

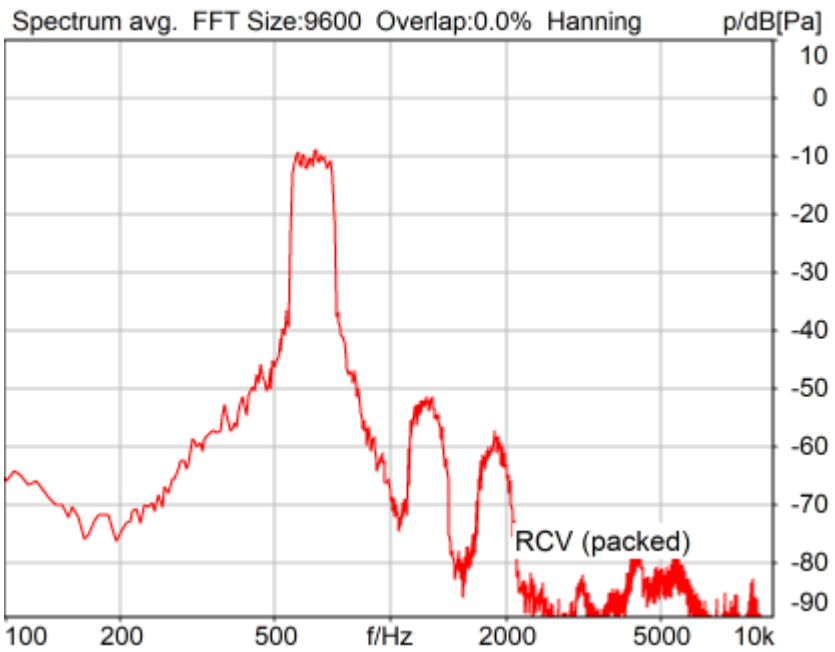
2025/2/5 14:02 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 35.04 dB (1.77%) Ok

Ok

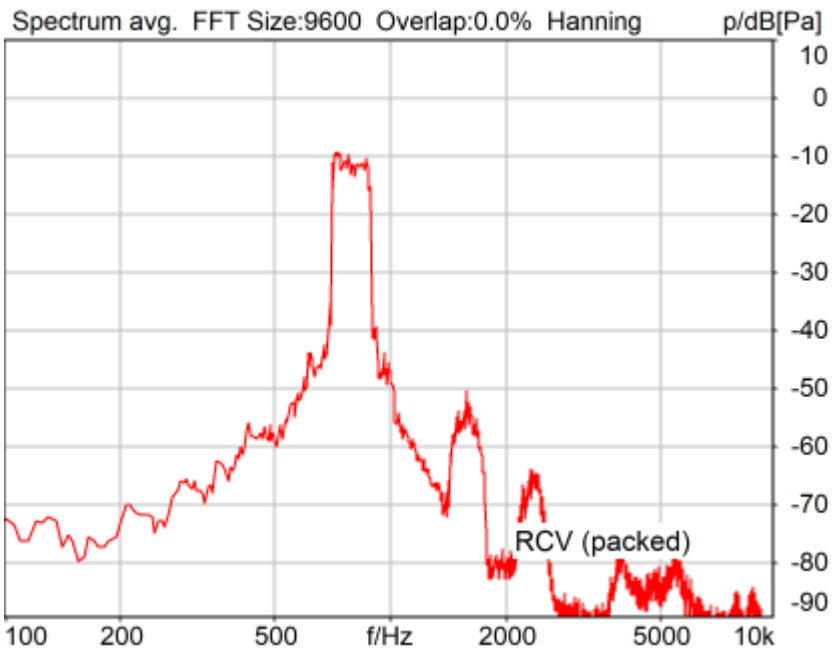
2025/2/5 14:02 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.77 dB (1.83%) Ok

Ok

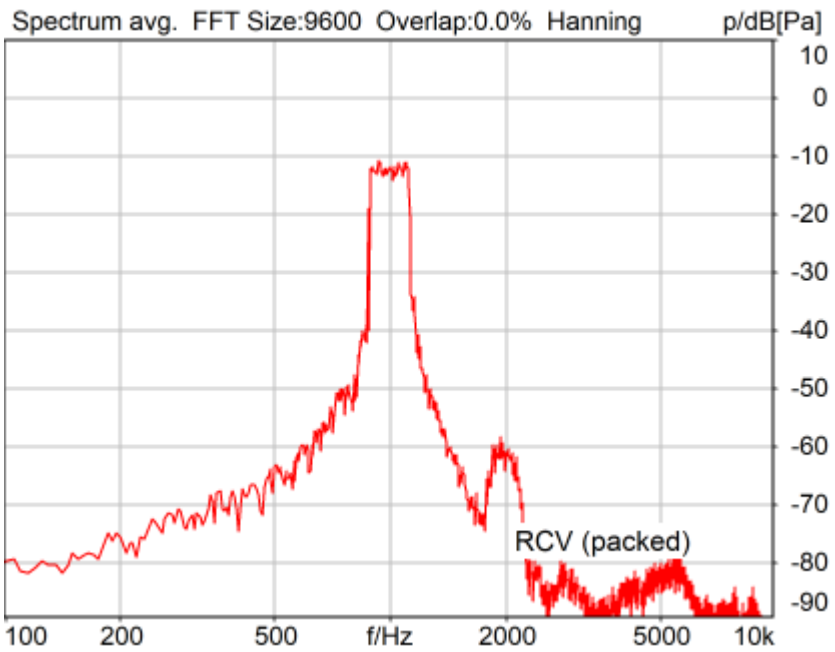
2025/2/5 14:03 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.11 dB (2.21%) Ok

Ok

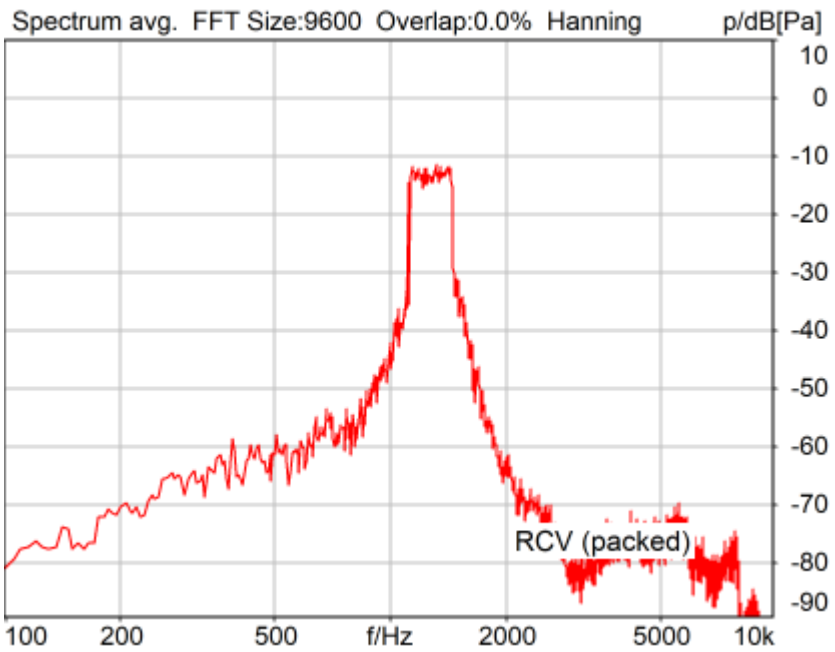
2025/2/5 14:03 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.14 dB (6.97%) Ok

Ok

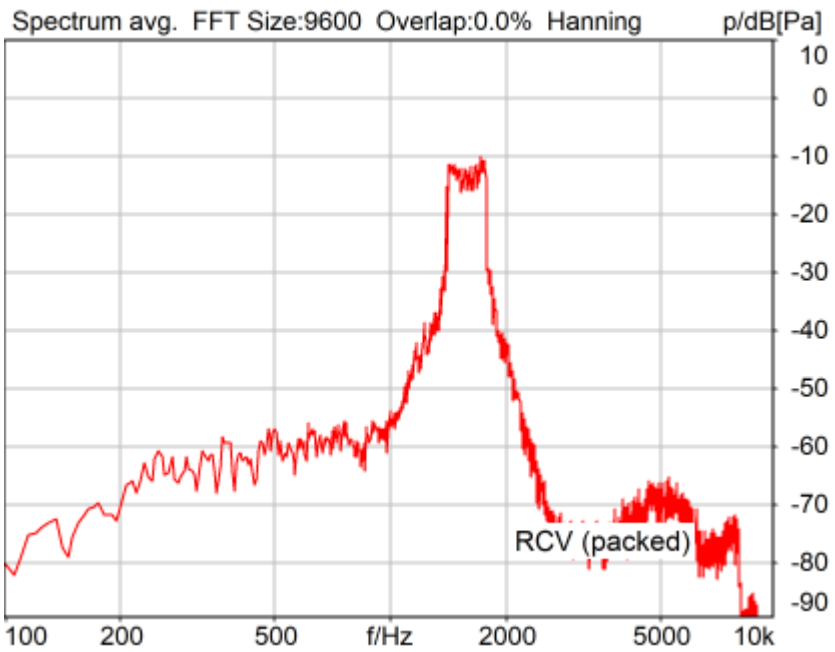
2025/2/5 14:03 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.18 dB (6.18%) Ok

Ok

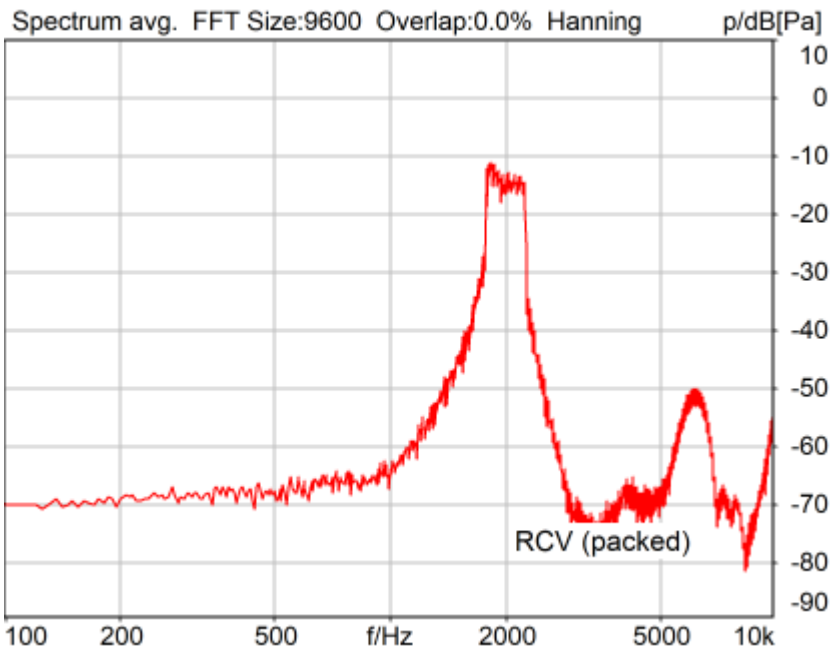
2025/2/5 14:04 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 21.83 dB (8.10%) Ok

Ok

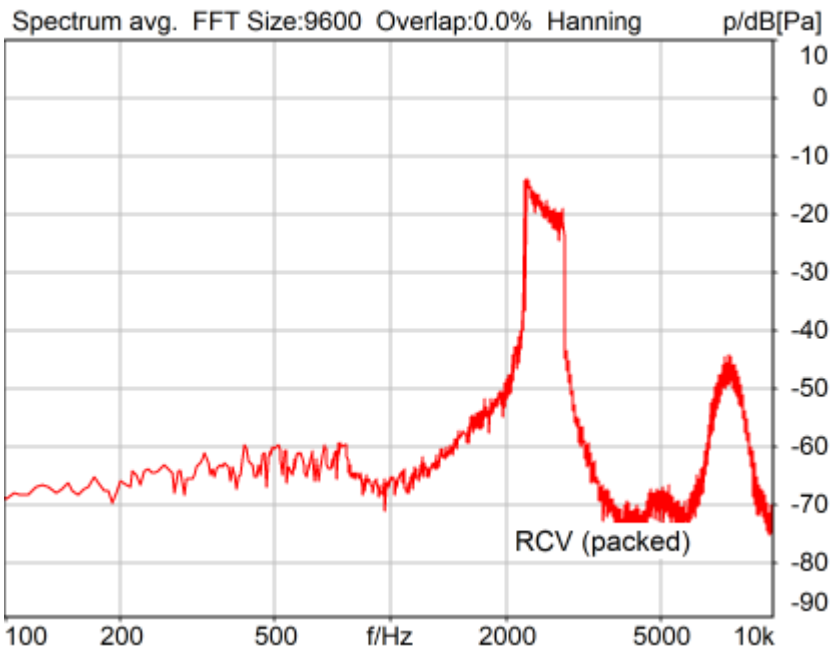
2025/2/5 14:04 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.78 dB (6.47%) Ok

Ok

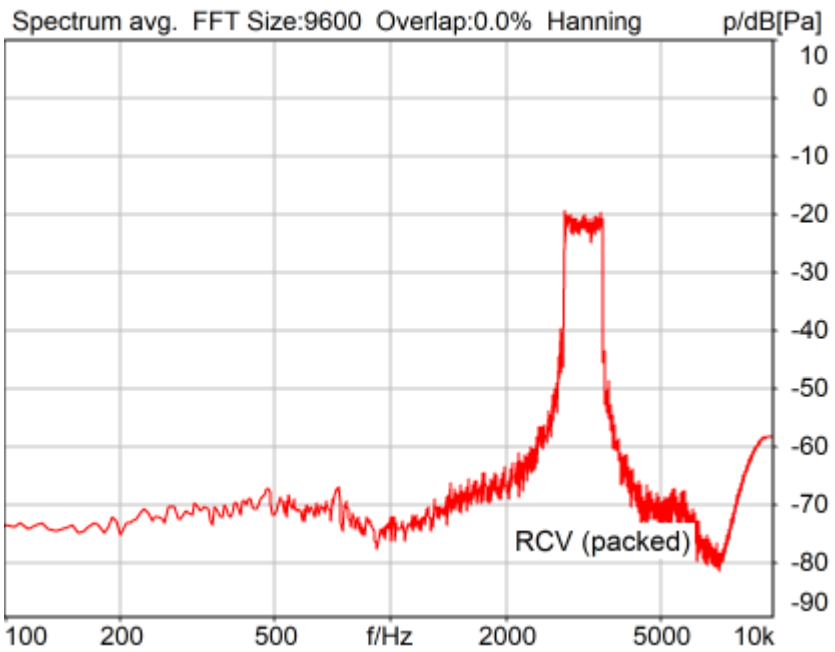
2025/2/5 14:05 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 27.99 dB (3.99%) Ok

Ok

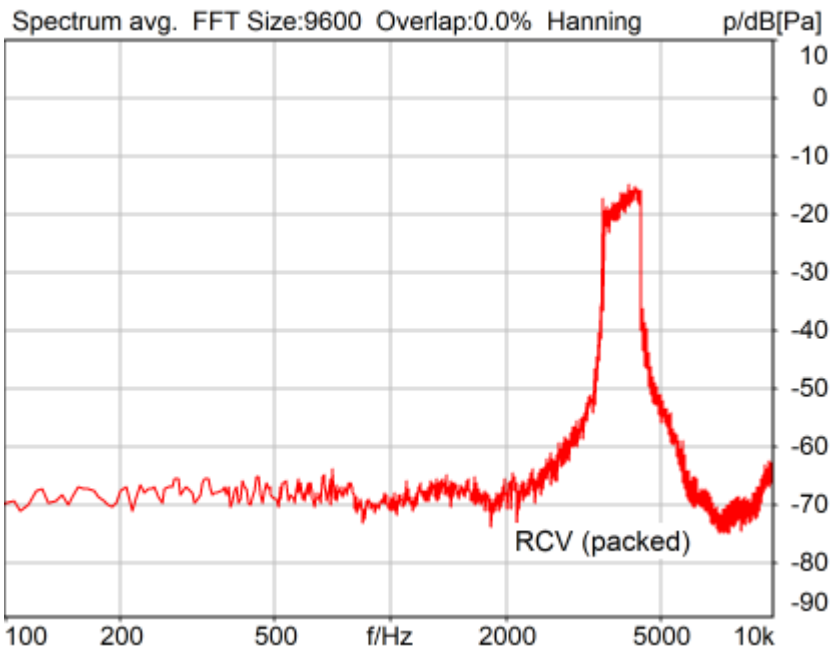
2025/2/5 14:05 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 4000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.16 dB (6.19%) Ok

Ok

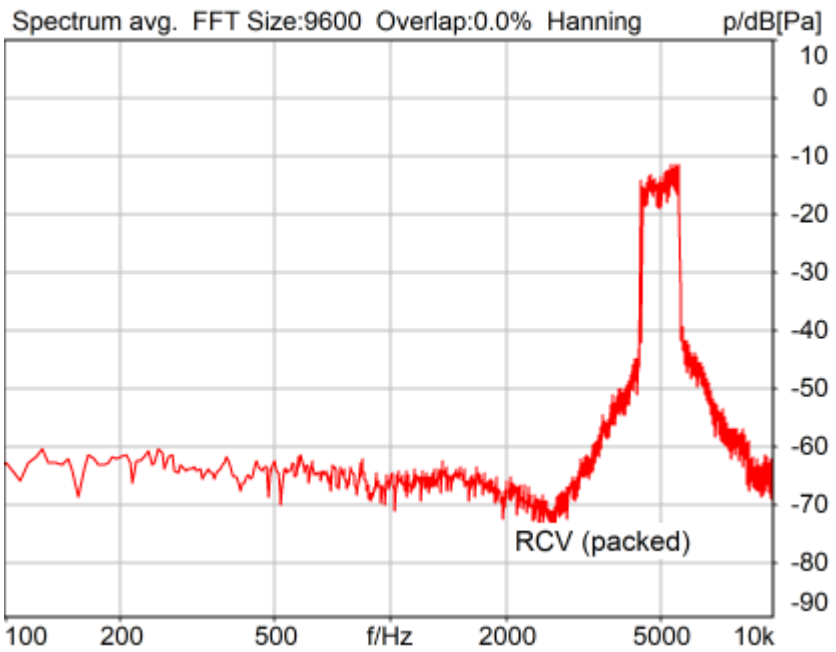
2025/2/5 14:05 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 5000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 25.94 dB (5.05%) Ok

Ok

2025/2/5 14:06 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N

Region	Frequency	SDNR
1	250Hz	28.11 dB
2	315Hz	31.78 dB
3	400Hz	34.26 dB
4	500Hz	32.84 dB
5	630Hz	35.04 dB
6	800Hz	34.77 dB
7	1000Hz	33.11 dB
8	1250Hz	23.14 dB
9	1600Hz	24.18 dB
10	2000Hz	21.83 dB

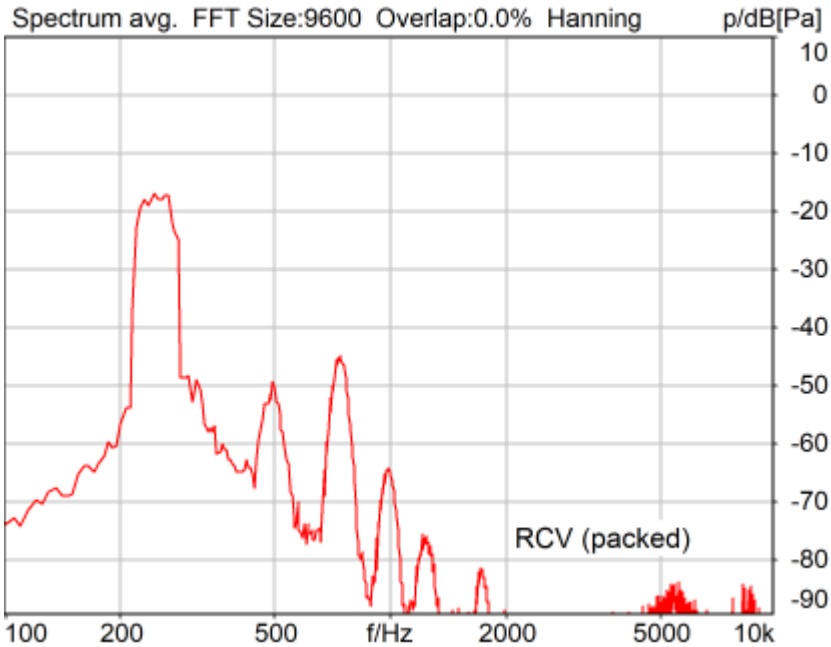
11	2500Hz	23.78 dB
12	3150Hz	27.99 dB
13	4000Hz	24.16 dB
14	5000Hz	25.94 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.83dB at 2000Hz.

2025/2/5 14:07 ACQUA

5.2 RCV Distortion and Noise - 250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 27.74 dB (4.10%) Ok

Ok

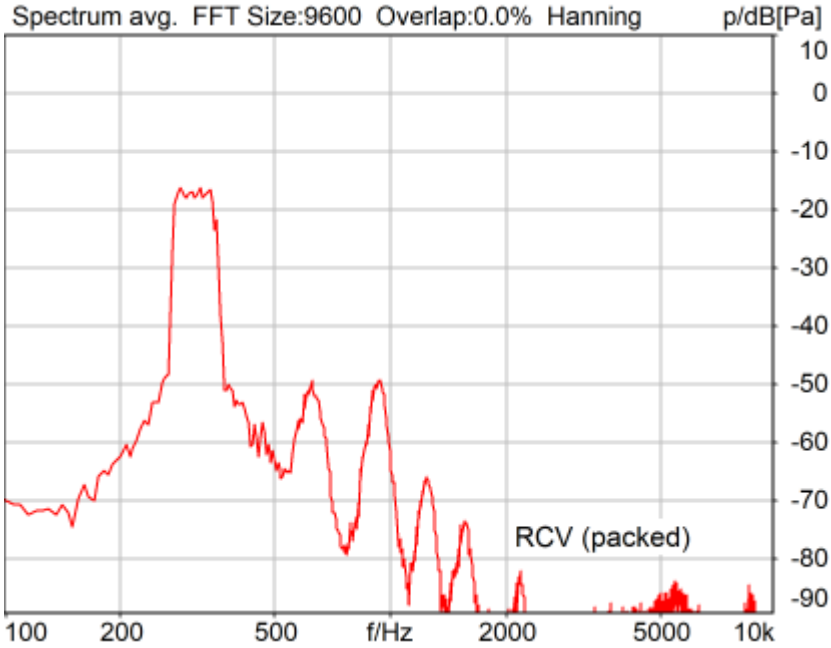
2025/2/5 14:18 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 315 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.83 dB (2.87%) Ok

Ok

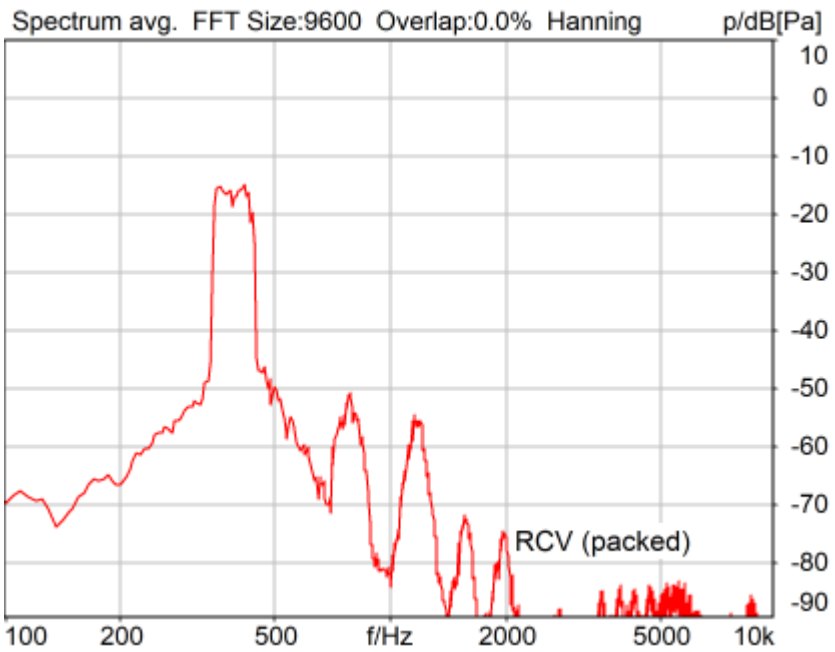
2025/2/5 14:18 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 400 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.35 dB (2.15%) Ok

Ok

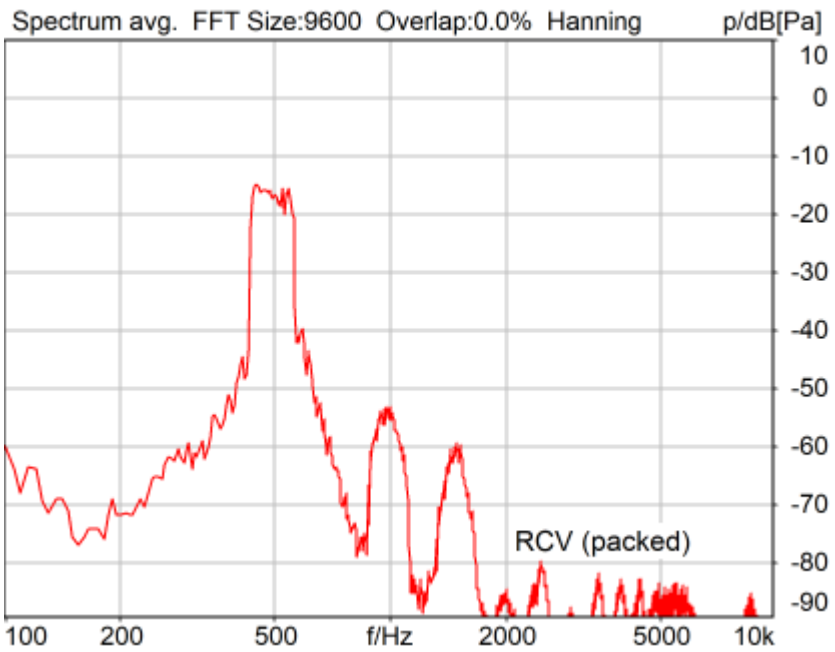
2025/2/5 14:19 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.77 dB (2.30%) Ok

Ok

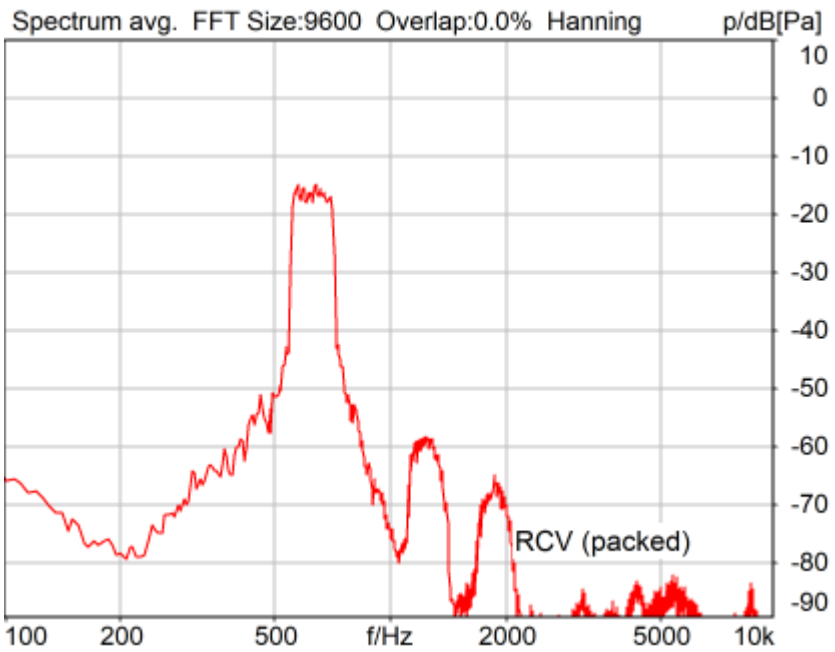
2025/2/5 14:19 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 35.46 dB (1.69%) Ok

Ok

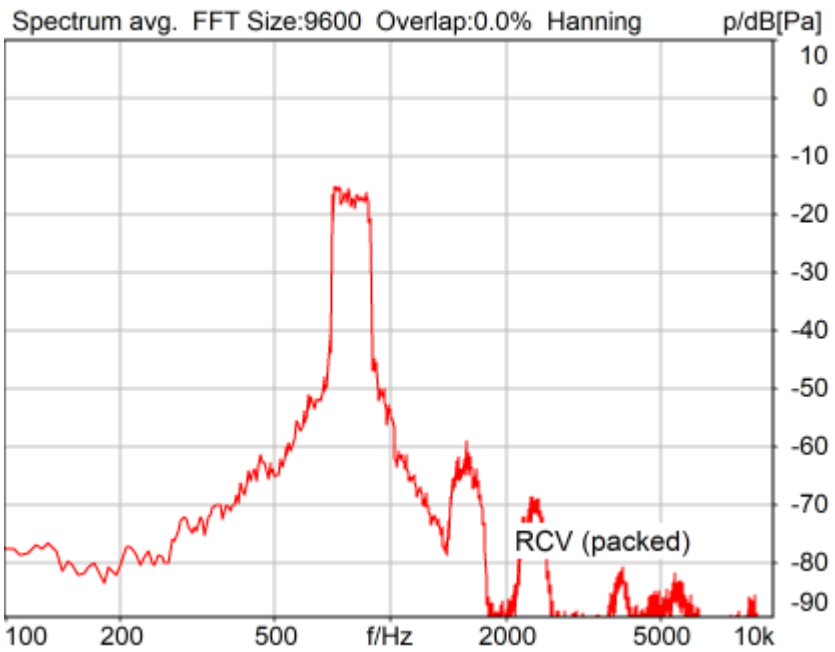
2025/2/5 14:20 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 35.18 dB (1.74%) Ok

Ok

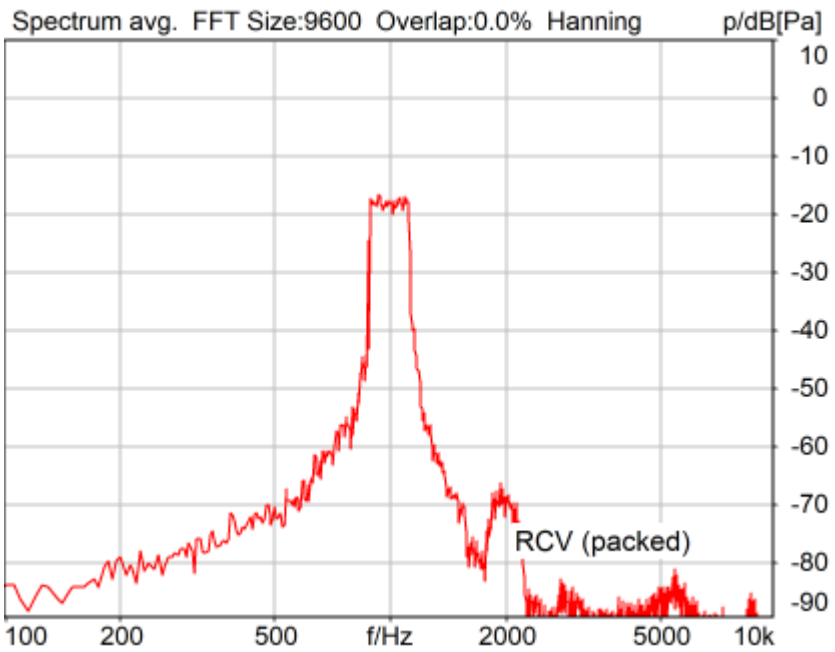
2025/2/5 14:20 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.77 dB (2.30%) Ok

Ok

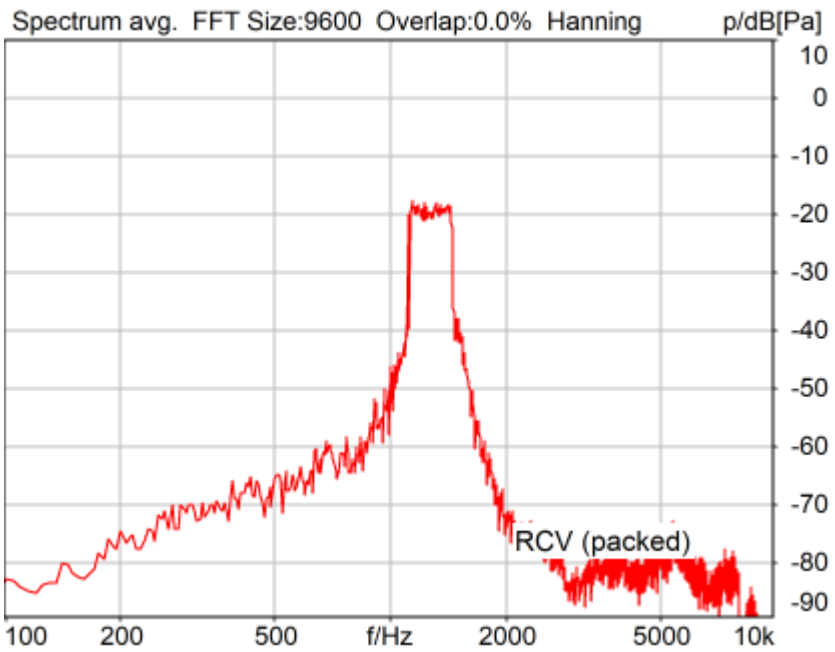
2025/2/5 14:20 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 23.80 dB (6.45%) Ok

Ok

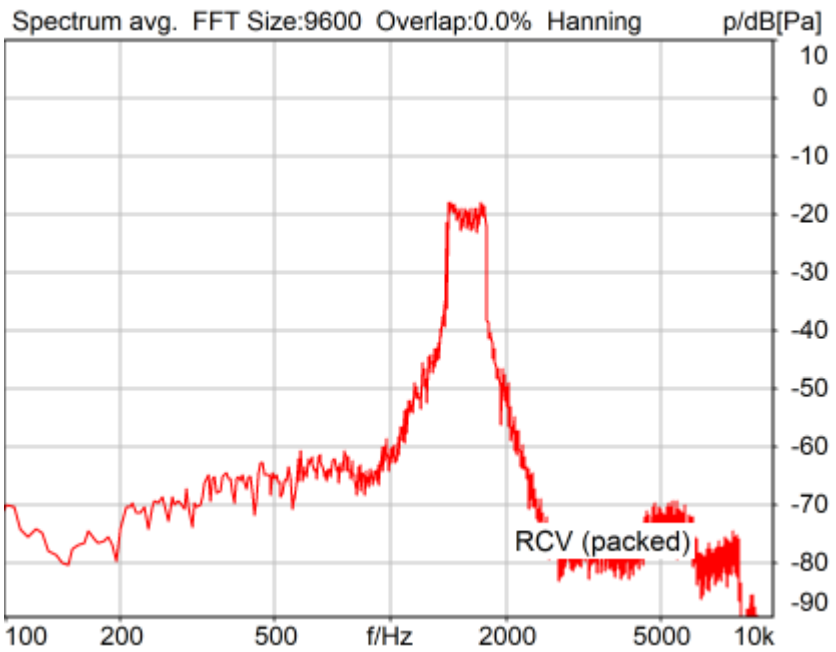
2025/2/5 14:21 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 23.99 dB (6.31%) Ok

Ok

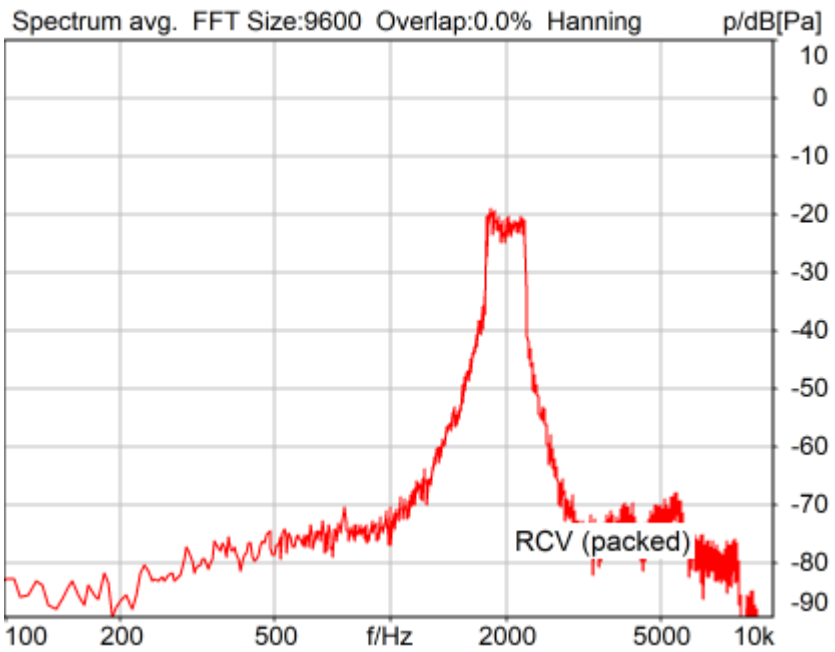
2025/2/5 14:21 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 21.67 dB (8.25%) Ok

Ok

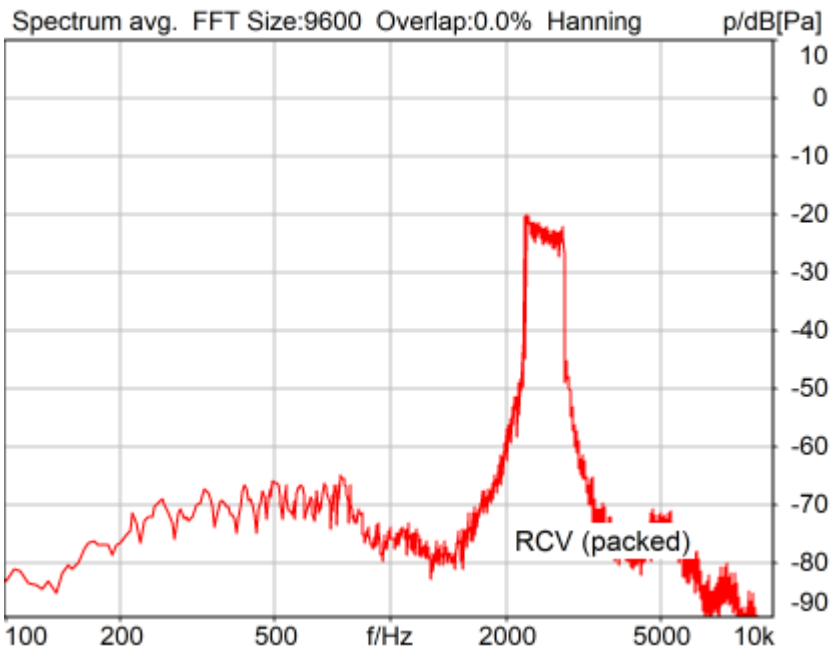
2025/2/5 14:21 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 28.82 dB (3.62%) Ok

Ok

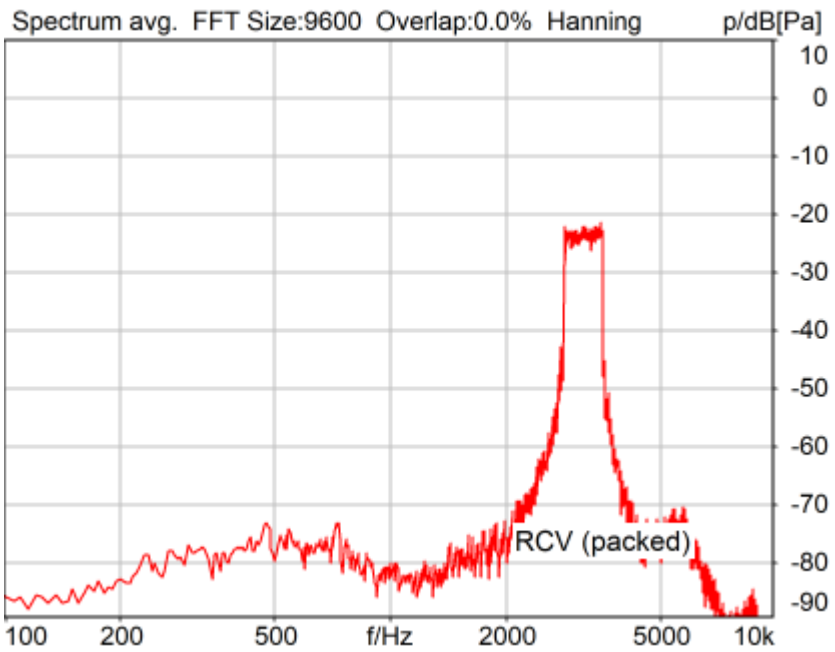
2025/2/5 14:22 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.46 dB (3.00%) Ok

Ok

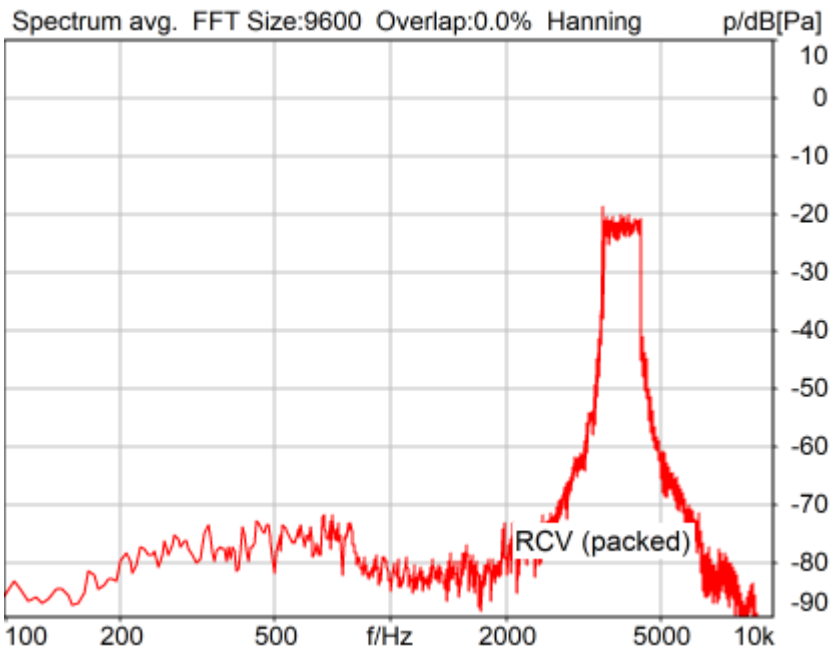
2025/2/5 14:22 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 4000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 26.93 dB (4.51%) Ok

Ok

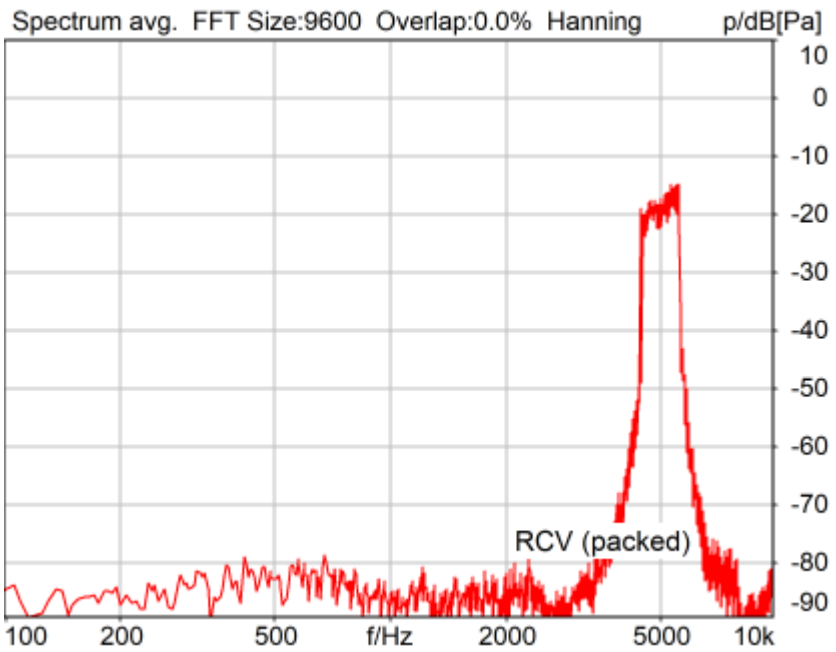
2025/2/5 14:23 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 5000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.73 dB (1.83%) Ok

Ok

2025/2/5 14:23 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N

Region	Frequency	SDNR
1	250Hz	27.74 dB
2	315Hz	30.83 dB
3	400Hz	33.35 dB
4	500Hz	32.77 dB
5	630Hz	35.46 dB
6	800Hz	35.18 dB
7	1000Hz	32.77 dB
8	1250Hz	23.80 dB
9	1600Hz	23.99 dB
10	2000Hz	21.67 dB

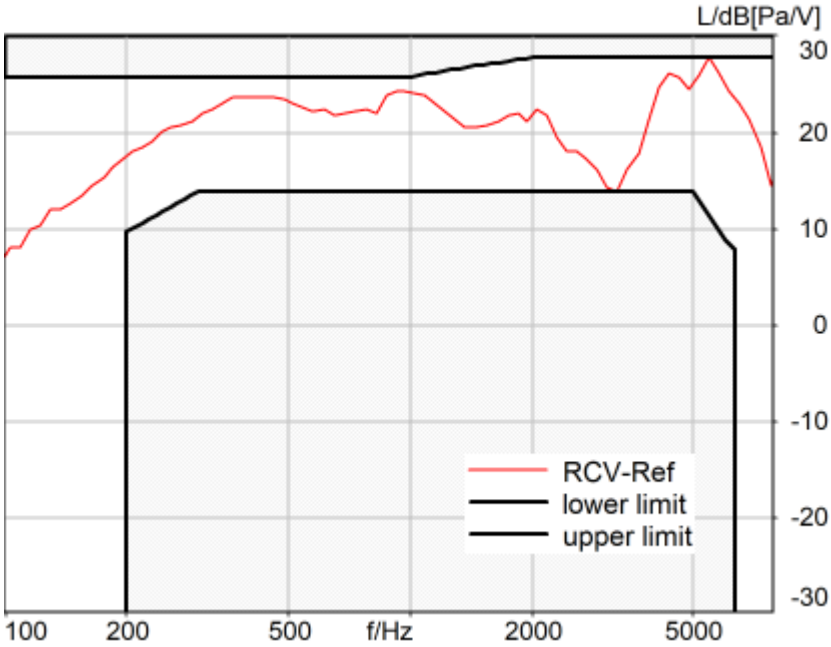
11	2500Hz	28.82 dB
12	3150Hz	30.46 dB
13	4000Hz	26.93 dB
14	5000Hz	34.73 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.67dB at 2000Hz.

2025/2/5 14:24 ACQUA

5.3 Frequency Response 8N DF

TIA-5050 (2018-01) \ Measurements \ Wideband



Absolute minimal distance
0.06 dB at 5443.6 Hz Ok

Ok

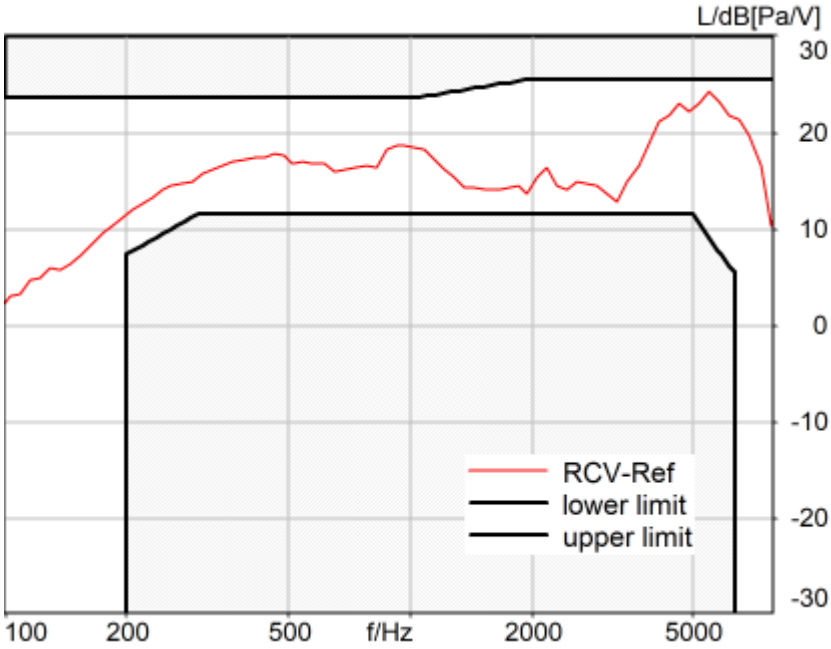
2025/2/5 14:08 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N DF

TIA-5050 (2018-01) \ Measurements \ Wideband



Absolute minimal distance
1.28 dB at 5443.6 Hz Ok

Ok

2025/2/5 14:10 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

Measurement Protocol

Measurement Object	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 14:59
Responsible Person	audio

Status Overview

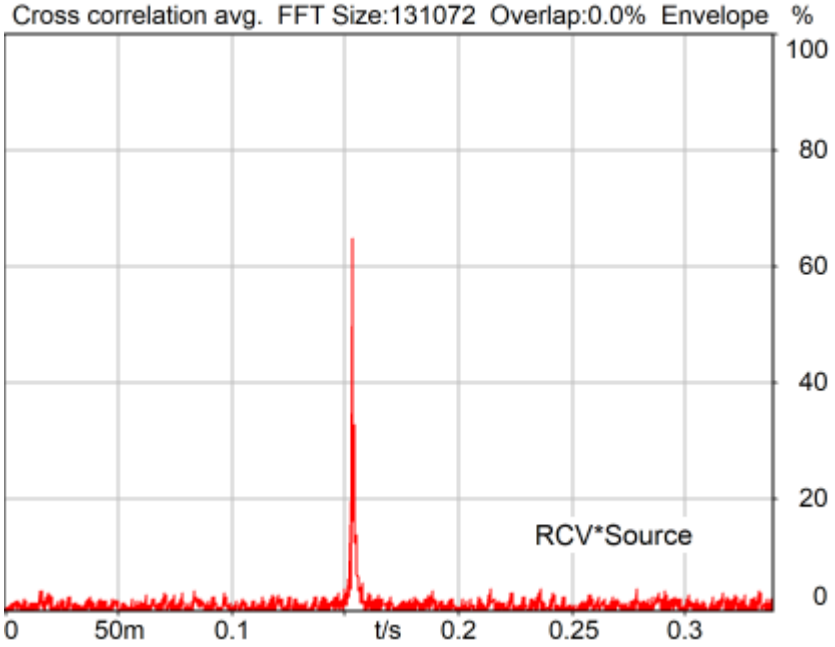
SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay NB	Done	Delay (Cross) [ms]	153.5	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.1a Receive Volume Control Performance 8N NB	Ok	Corrected Speech Level [dB[SPL]]	22.05	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.1b Receive Volume Control Performance 2N NB	Ok	Corrected Speech Level [dB[SPL]]	16.19	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 400 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.23	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.53	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 630 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.73	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 800 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	35.19	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.09	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1250 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	23.74	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1600 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.43	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 2000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	22.15	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 2500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	22.65	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 3150 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	27.59	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	22.15	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 400 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.41	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.45	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and	Ok	Distortion (Noise)	35.16	HUHAO_2403_n2_DFT-QPSK20

Noise - 630 Hz NB		[dB], 0.0 dB		M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 800 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	35.10	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.69	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1250 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.10	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1600 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.13	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 2000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	22.32	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 2500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	28.40	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 3150 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	30.91	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	22.32	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.3 Frequency Response 8N FF HANB	Not Ok	Min. dist. to tolerance scheme [dB], 3245.6 Hz	-2.26	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.3 Frequency Response 8N DF HANB	Ok	Min. dist. to tolerance scheme [dB], 3245.6 Hz	0.86	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.3 Frequency Response 2N FF HANB	Ok	Min. dist. to tolerance scheme [dB], 3245.6 Hz	0.39	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000
5.3 Frequency Response 2N DF HANB	Ok	Min. dist. to tolerance scheme [dB], 3245.6 Hz	2.60	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH376000

Overall Receive Delay NB 5
5.1a Receive Volume Control Performance 8N NB 5
5.1b Receive Volume Control Performance 2N NB 6
5.2 RCV Distortion and Noise - 400 Hz NB 7
5.2 RCV Distortion and Noise - 500 Hz NB 8
5.2 RCV Distortion and Noise - 630 Hz NB 9
5.2 RCV Distortion and Noise - 800 Hz NB 10
5.2 RCV Distortion and Noise - 1000 Hz NB 11
5.2 RCV Distortion and Noise - 1250 Hz NB 12
5.2 RCV Distortion and Noise - 1600 Hz NB 13
5.2 RCV Distortion and Noise - 2000 Hz NB 14
5.2 RCV Distortion and Noise - 2500 Hz NB 15
5.2 RCV Distortion and Noise - 3150 Hz NB 16
Report - Receive Distortion and Noise (Conversational Gain) 17
5.2 RCV Distortion and Noise - 400 Hz NB 18
5.2 RCV Distortion and Noise - 500 Hz NB 18
5.2 RCV Distortion and Noise - 630 Hz NB 19
5.2 RCV Distortion and Noise - 800 Hz NB 20
5.2 RCV Distortion and Noise - 1000 Hz NB 21
5.2 RCV Distortion and Noise - 1250 Hz NB 22
5.2 RCV Distortion and Noise - 1600 Hz NB 23
5.2 RCV Distortion and Noise - 2000 Hz NB 24
5.2 RCV Distortion and Noise - 2500 Hz NB 25
5.2 RCV Distortion and Noise - 3150 Hz NB 26
Report - Receive Distortion and Noise (Conversational Gain) 27
5.3 Frequency Response 8N FF HANB 28
5.3 Frequency Response 8N DF HANB 29
5.3 Frequency Response 2N FF HANB 29
5.3 Frequency Response 2N DF HANB 30

Overall Receive Delay NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ Preparation - Delay measurement

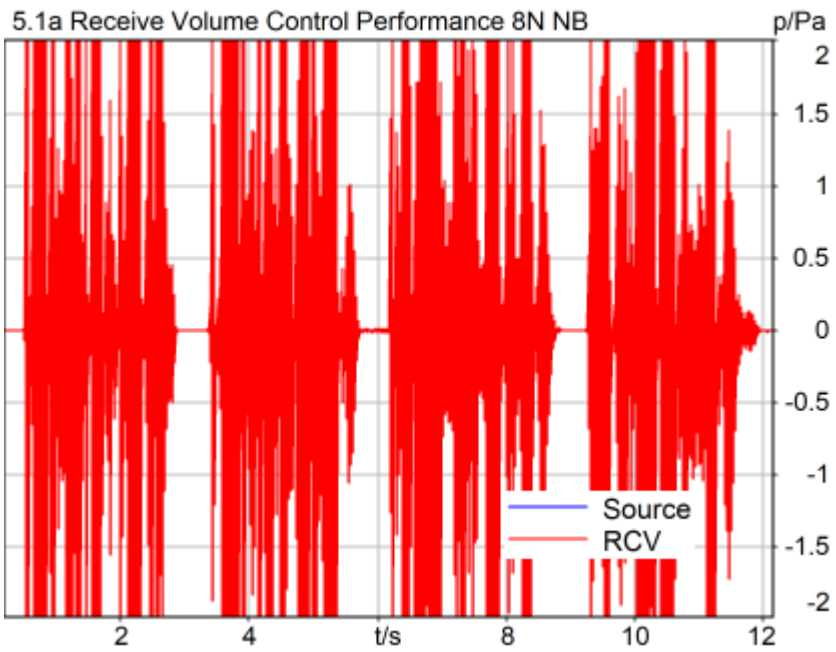


Channel	Delay
RCV*Source	153.5 ms

2025/2/8 16:36 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

5.1a Receive Volume Control Performance 8N NB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	92.05 dB[SPL]	84.15%	22.05 dB[SPL]	Ok

Ok

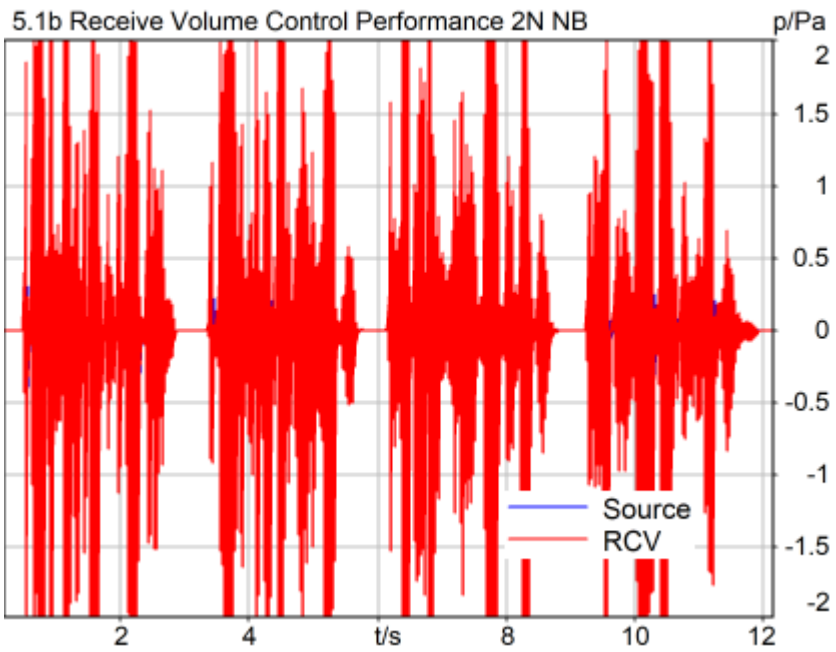
2025/2/8 16:37 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.1b Receive Volume Control Performance 2N NB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	86.19 dB[SPL]	84.13%	16.19 dB[SPL]	Ok

Ok

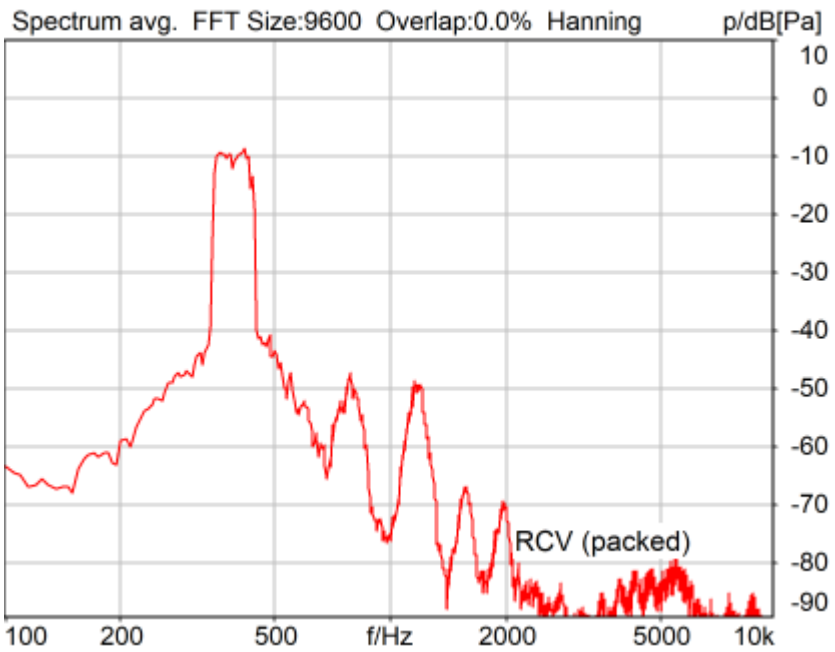
2025/2/8 16:47 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 400 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.23 dB (1.94%) Ok

Ok

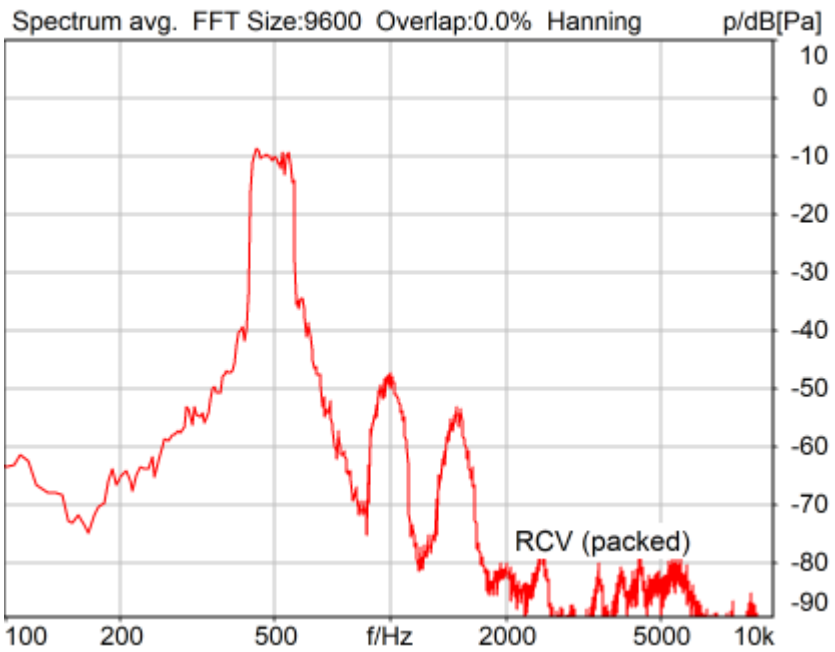
2025/2/8 16:37 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.53 dB (2.11%) Ok

Ok

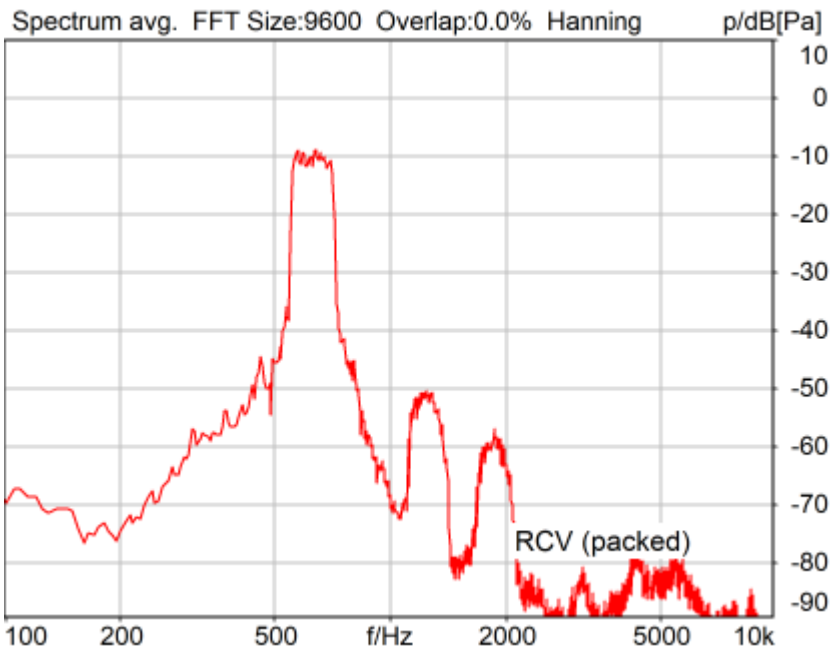
2025/2/8 16:38 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.73 dB (1.83%) Ok

Ok

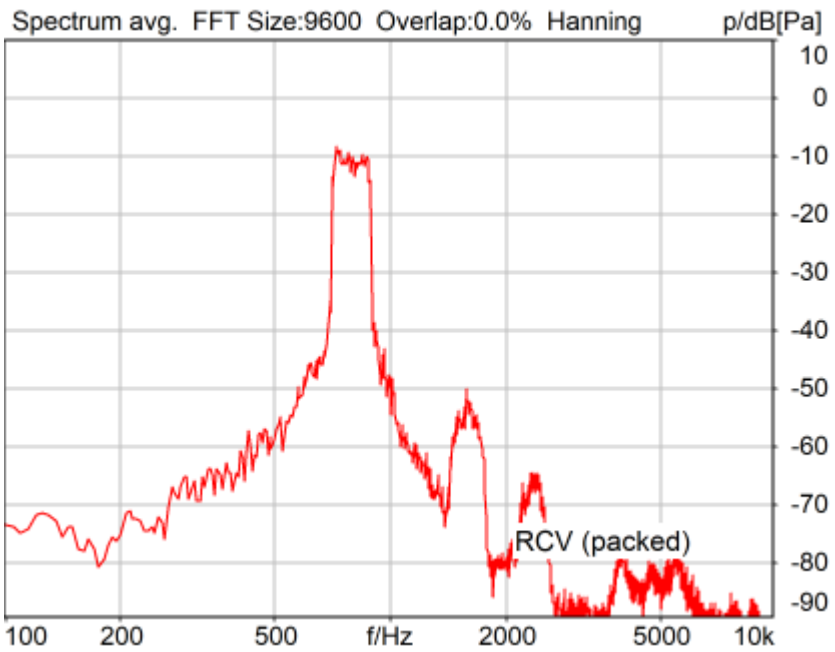
2025/2/8 16:38 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 35.19 dB (1.74%) Ok

Ok

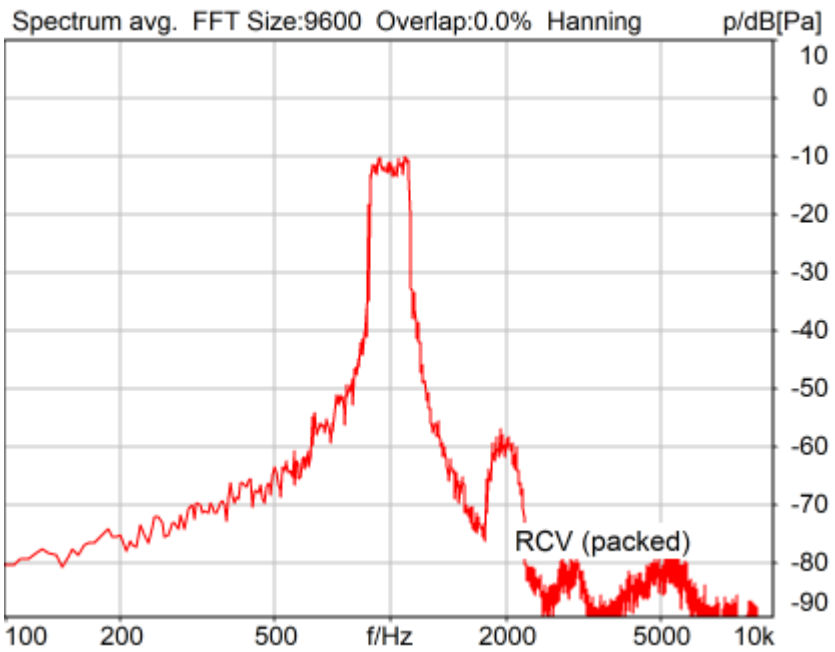
2025/2/8 16:38 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.09 dB (2.22%) Ok

Ok

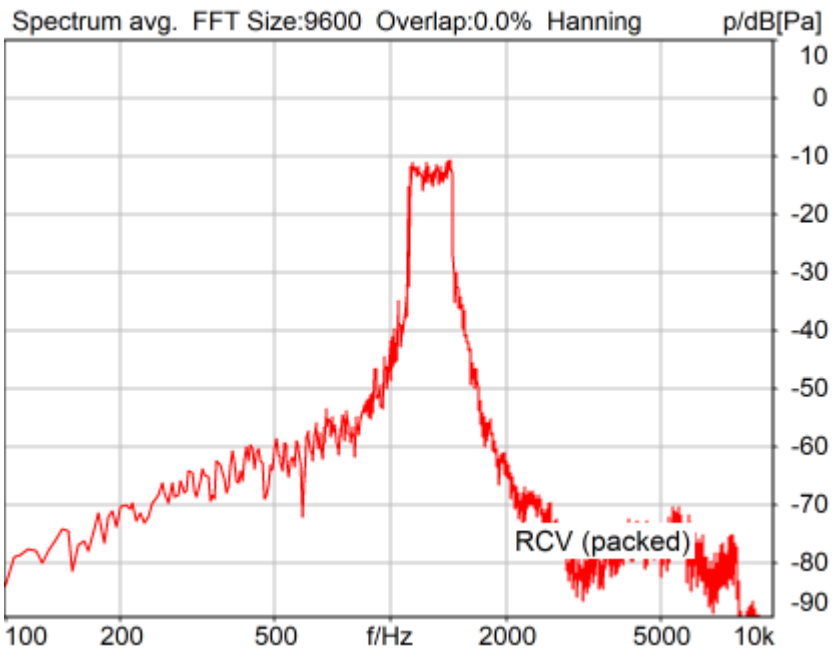
2025/2/8 16:39 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.74 dB (6.50%) Ok

Ok

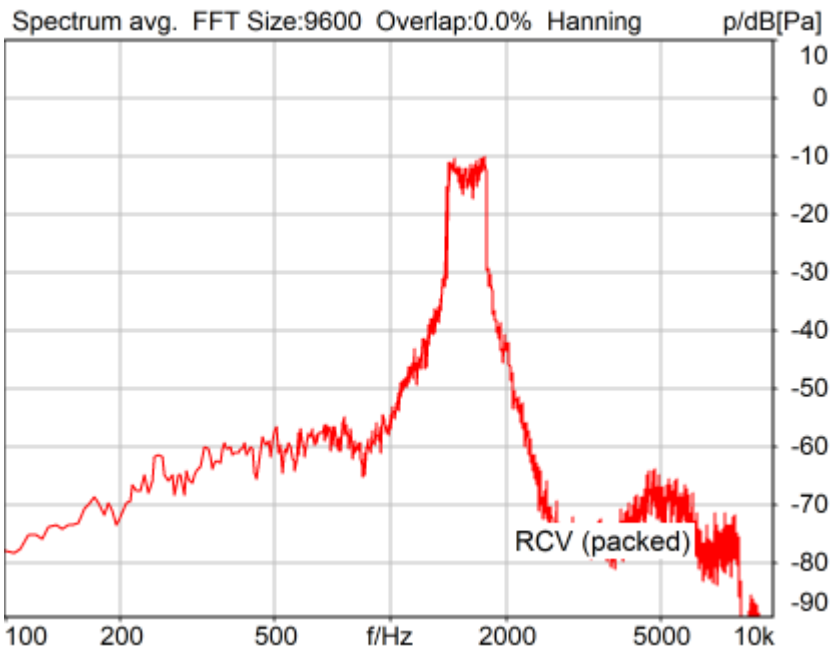
2025/2/8 16:39 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.43 dB (6.01%) Ok

Ok

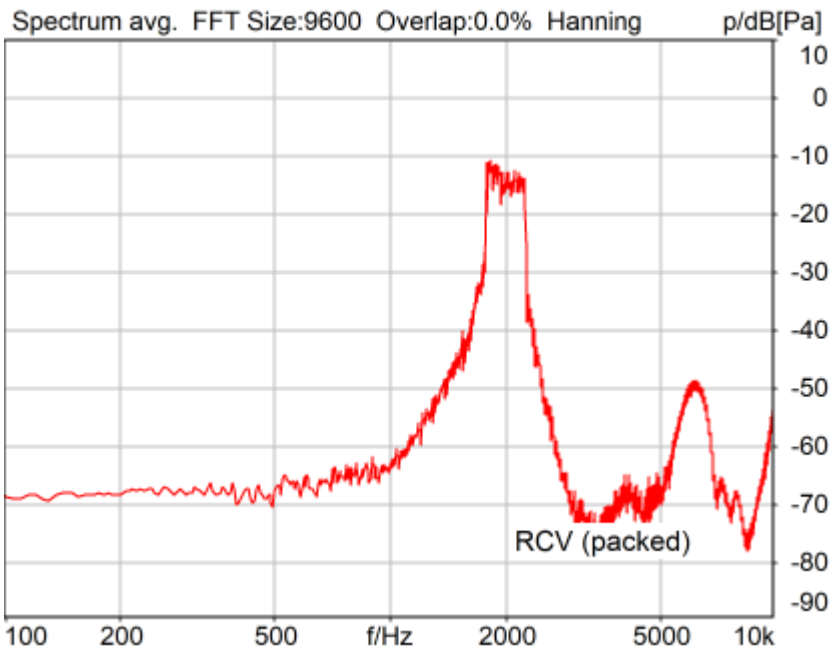
2025/2/8 16:39 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 22.15 dB (7.81%) Ok

Ok

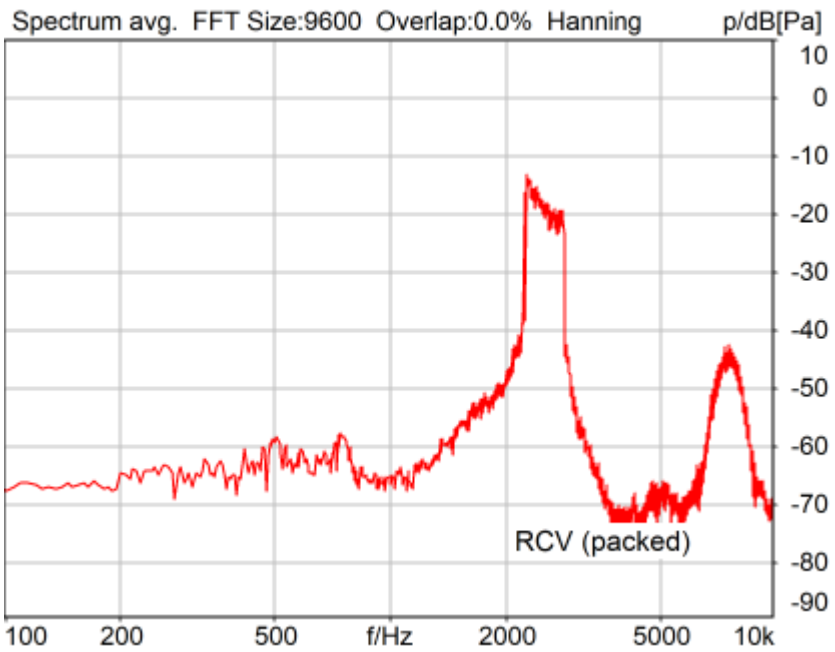
2025/2/8 16:40 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 22.65 dB (7.37%) Ok

Ok

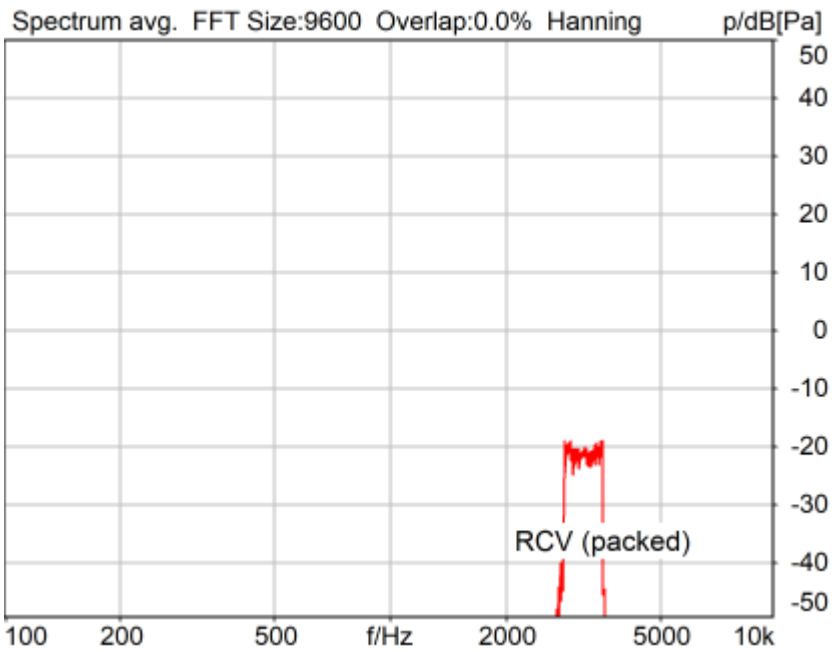
2025/2/8 16:40 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 27.59 dB (4.17%) Ok

Ok

2025/2/8 16:41 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N

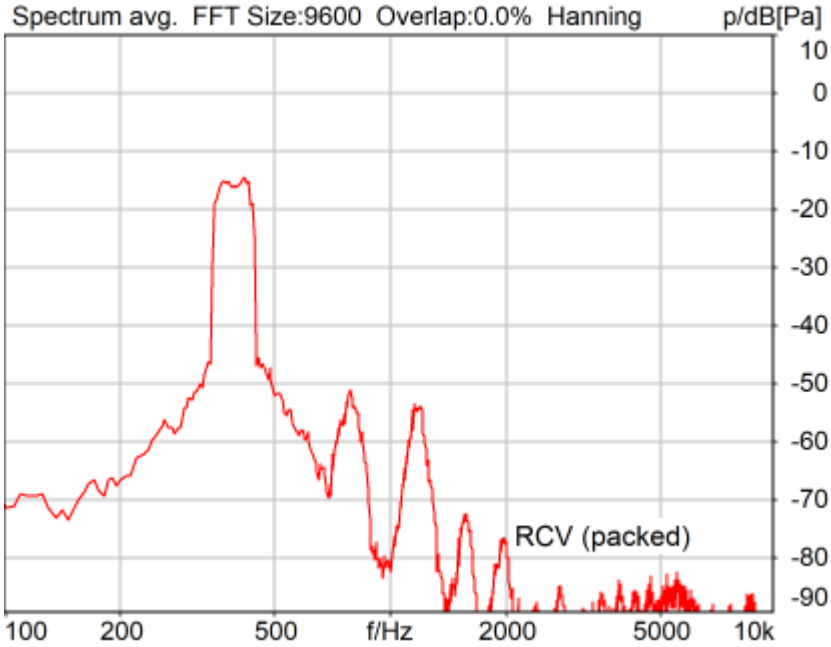
Region	Frequency	SDNR
1	400Hz	34.23 dB
2	500Hz	33.53 dB
3	630Hz	34.73 dB
4	800Hz	35.19 dB
5	1000Hz	33.09 dB
6	1250Hz	23.74 dB
7	1600Hz	24.43 dB
8	2000Hz	22.15 dB
9	2500Hz	22.65 dB
10	3150Hz	27.59 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 22.15dB at 2000Hz.

2025/2/8 16:41 ACQUA

5.2 RCV Distortion and Noise - 400 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.41 dB (2.14%) Ok

Ok

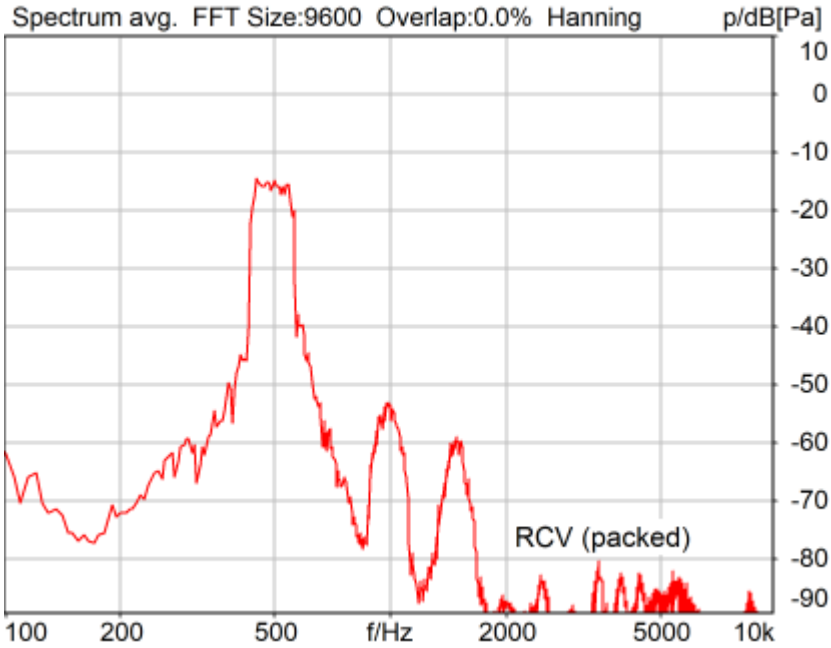
2025/2/8 16:47 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.45 dB (2.13%) Ok

Ok

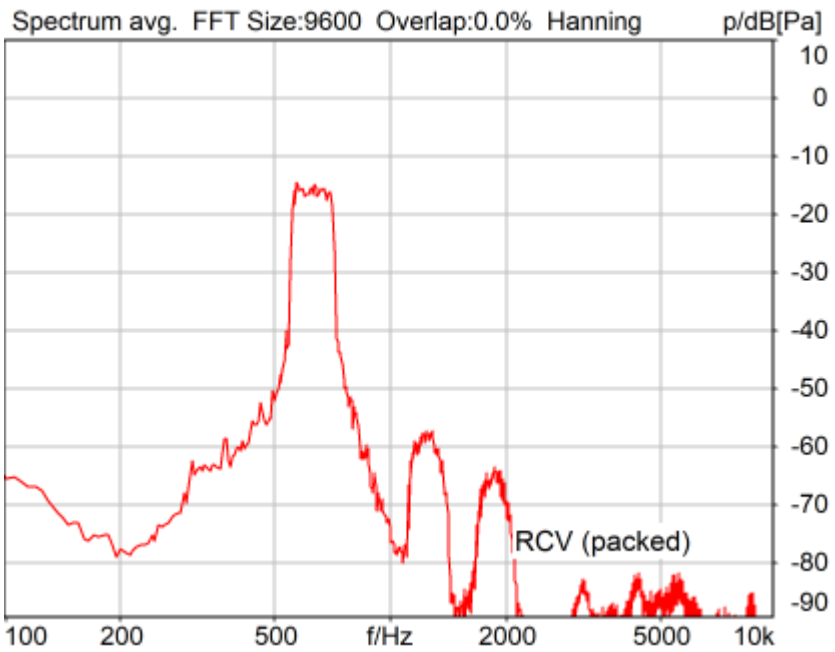
2025/2/8 16:47 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 35.16 dB (1.75%) Ok

Ok

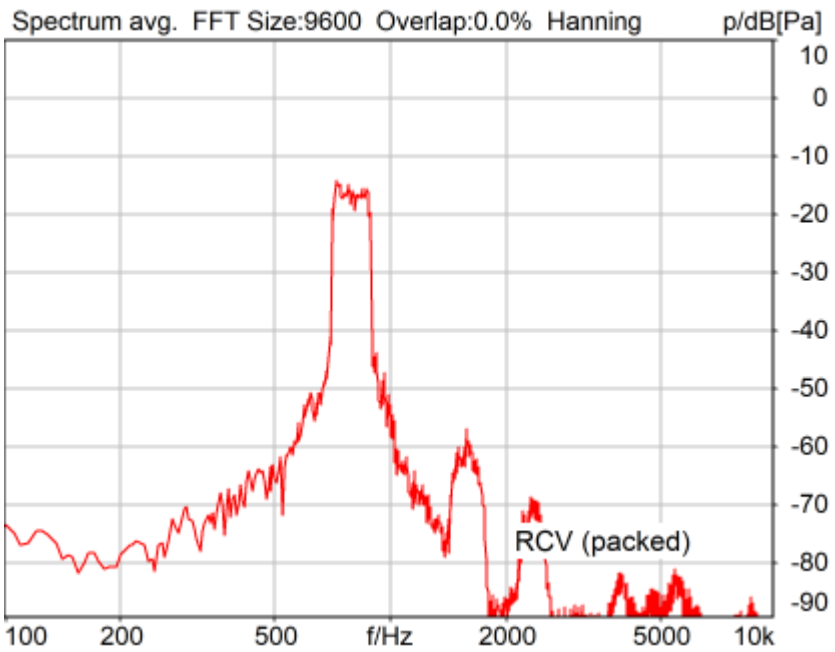
2025/2/8 16:48 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 35.10 dB (1.76%) Ok

Ok

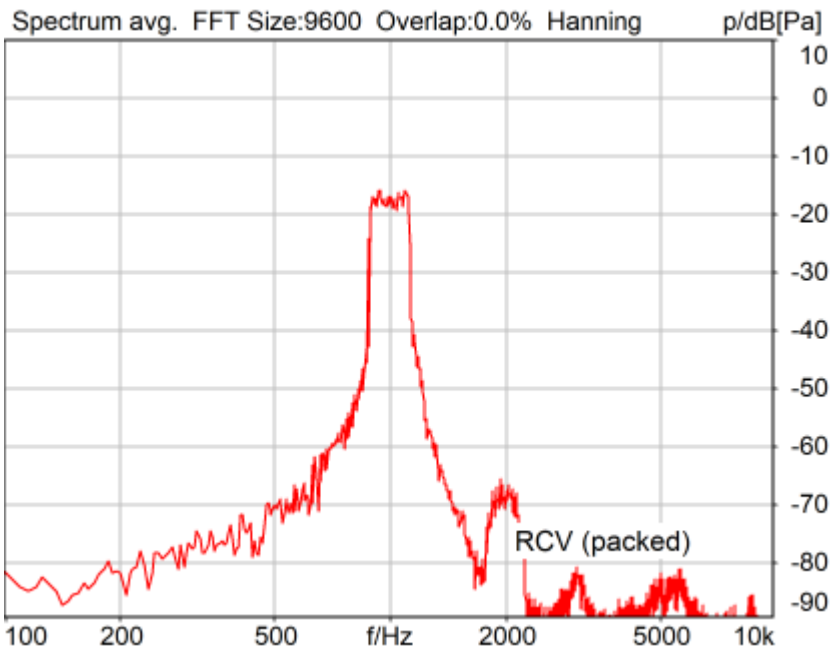
2025/2/8 16:48 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.69 dB (2.32%) Ok

Ok

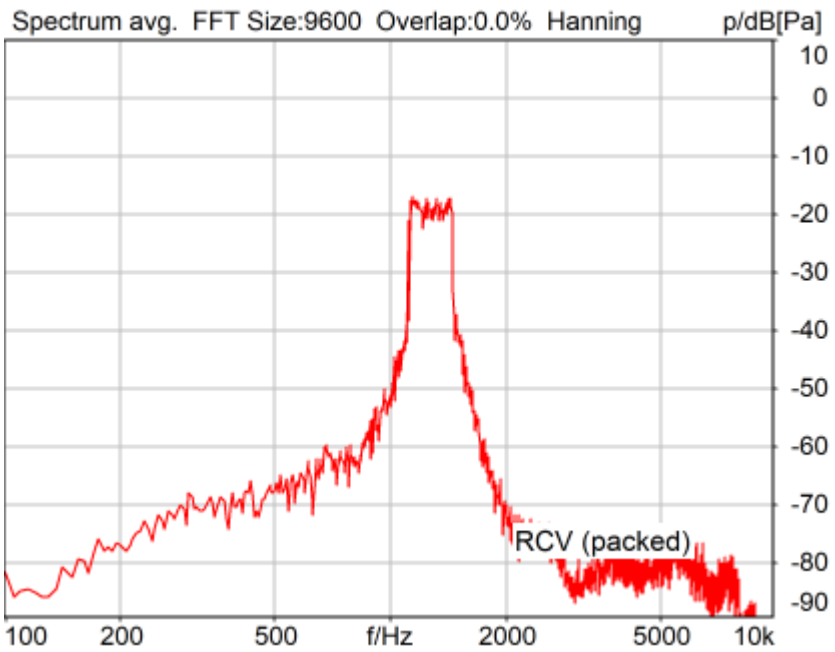
2025/2/8 16:49 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 24.10 dB (6.24%) Ok

Ok

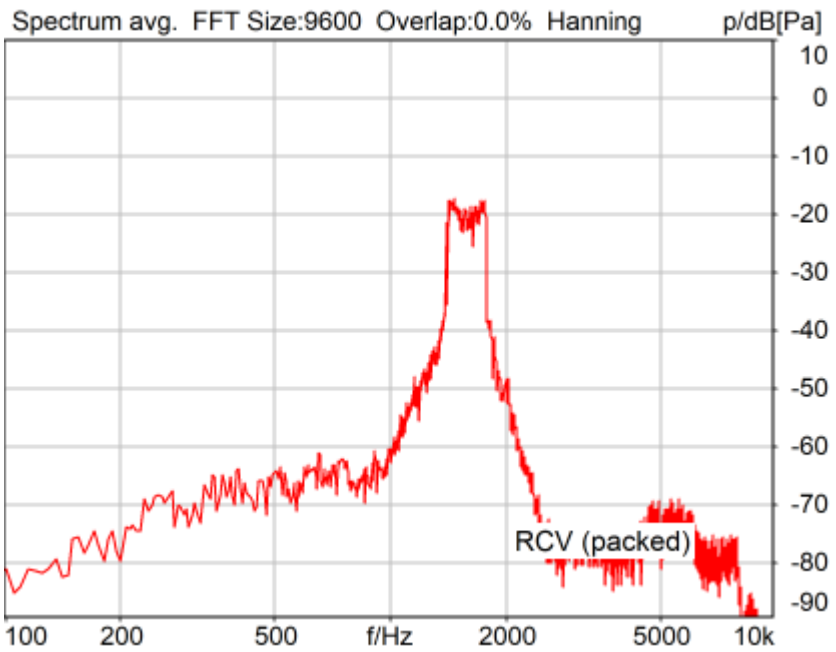
2025/2/8 16:49 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 24.13 dB (6.22%) Ok

Ok

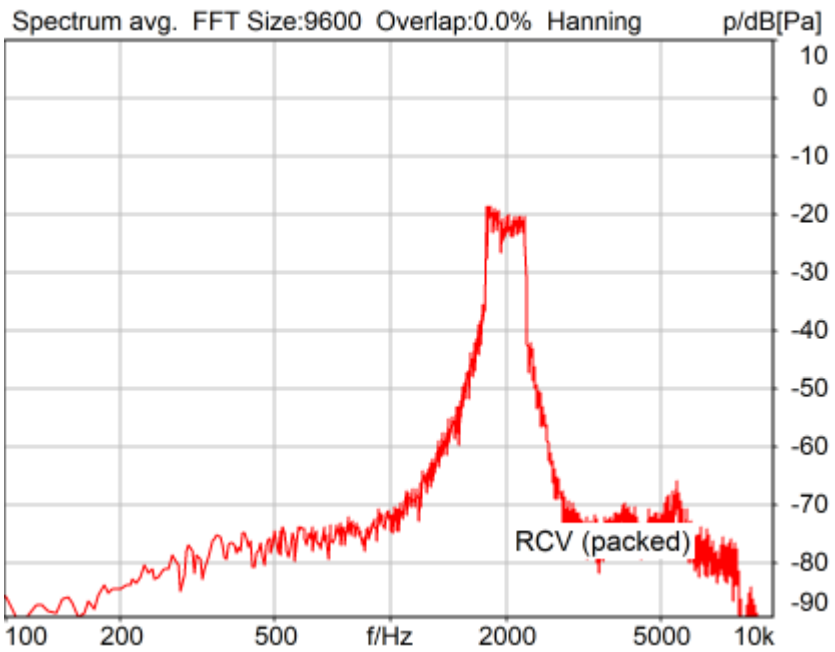
2025/2/8 16:49 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 22.32 dB (7.66%) Ok

Ok

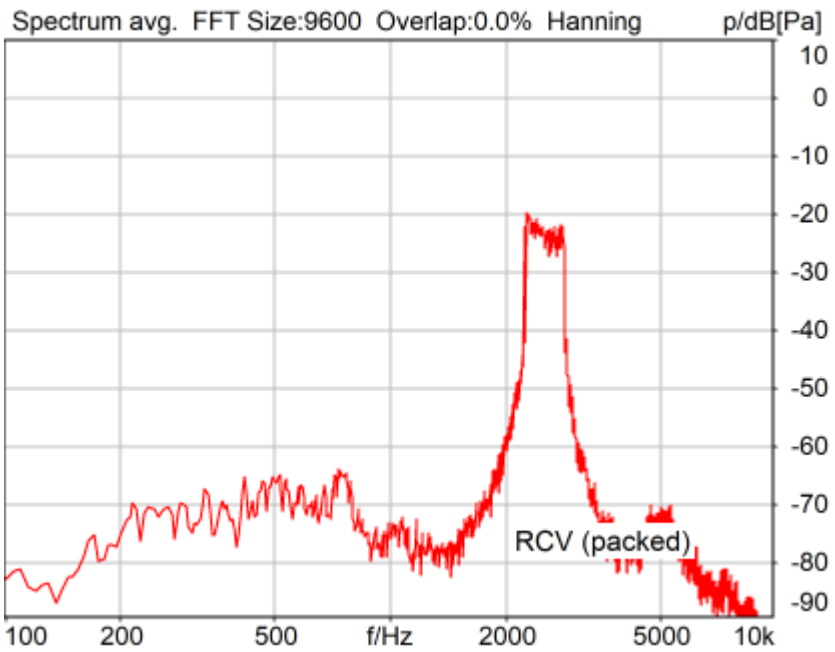
2025/2/8 16:50 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 28.40 dB (3.80%) Ok

Ok

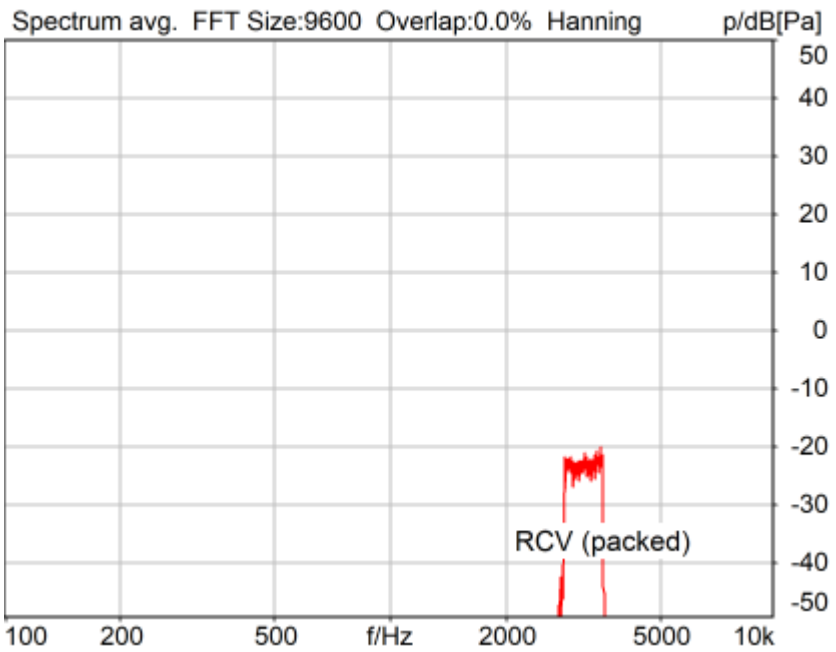
2025/2/8 16:50 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.91 dB (2.85%) Ok

Ok

2025/2/8 16:51 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N

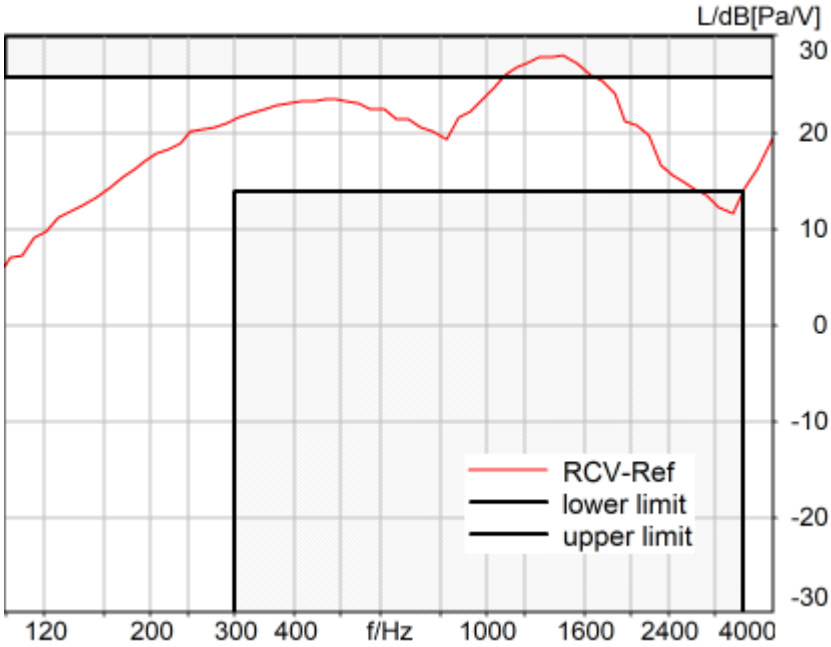
Region	Frequency	SDNR
1	400Hz	33.41 dB
2	500Hz	33.45 dB
3	630Hz	35.16 dB
4	800Hz	35.10 dB
5	1000Hz	32.69 dB
6	1250Hz	24.10 dB
7	1600Hz	24.13 dB
8	2000Hz	22.32 dB
9	2500Hz	28.40 dB
10	3150Hz	30.91 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 22.32dB at 2000Hz.

2025/2/8 16:51 ACQUA

5.3 Frequency Response 8N FF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
-2.26 dB at 3245.6 Hz Not Ok

Not Ok

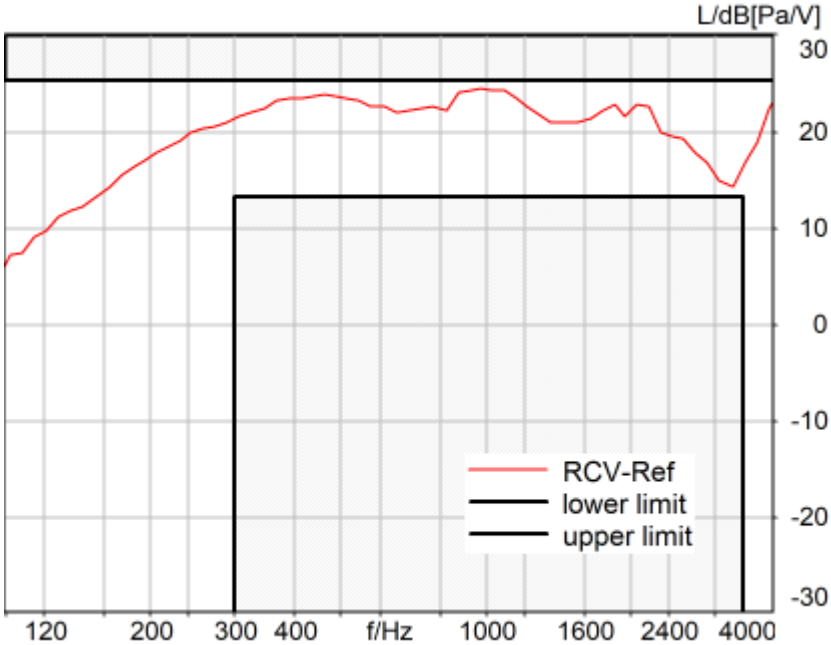
2025/2/8 16:43 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 8N DF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
0.86 dB at 3245.6 Hz Ok

Ok

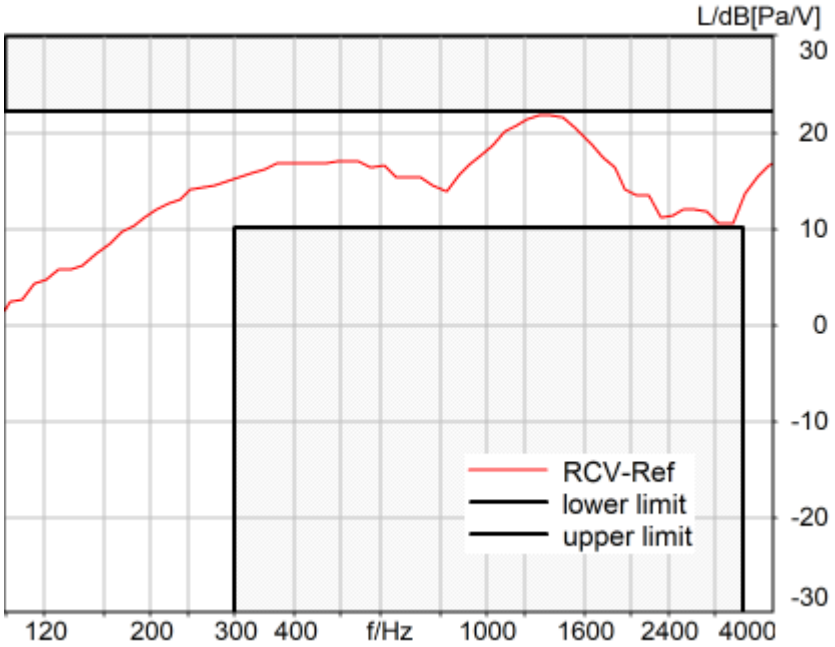
2025/2/8 16:43 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N FF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
0.39 dB at 3245.6 Hz Ok

Ok

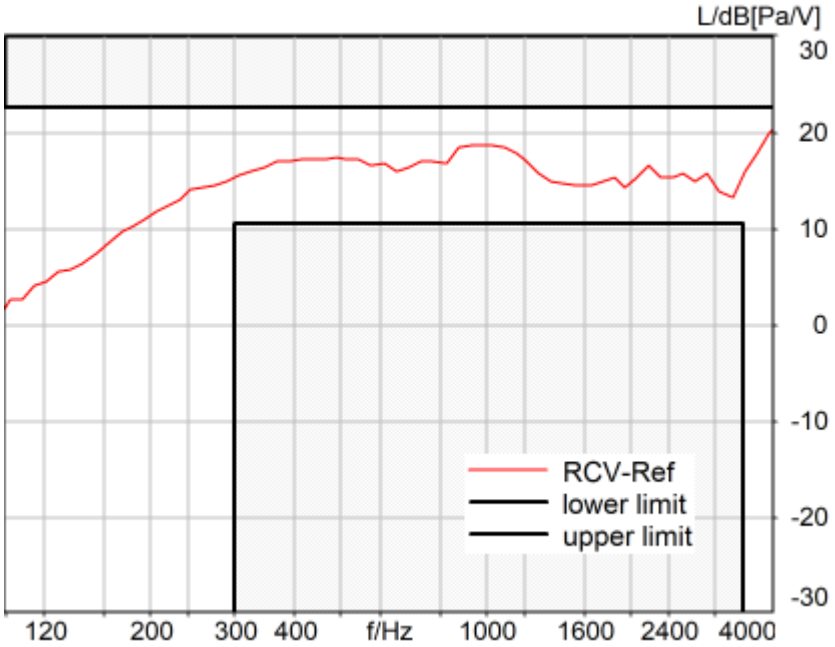
2025/2/8 16:45 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N DF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
2.60 dB at 3245.6 Hz Ok

Ok

2025/2/8 16:45 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

Measurement Protocol

Measurement Object	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 14:59
Responsible Person	audio

Status Overview

SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay WB	Done	Delay (Cross) [ms]	166.8	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.1a Receive Volume Control Performance 8N WB	Ok	Corrected Speech Level [dB[SPL]]	22.13	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.1b Receive Volume Control Performance 2N WB	Ok	Corrected Speech Level [dB[SPL]]	16.24	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	28.28	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 315 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	31.78	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 400 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.54	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.80	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 630 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.95	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 800 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.73	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.10	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	22.72	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1600 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.89	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 2000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	22.81	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 2500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.20	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 3150 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	28.25	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 4000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	25.24	HUHAO_2403_n2_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and	Ok	Distortion (Noise)	23.62	HUHAO_2403_n2_DFT-QPSK20

Noise - 5000 Hz WB		[dB], 0.0 dB		M_1_1_EVS WB 24.4kbps_CH376000
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 1250Hz)	22.72	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	27.84	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 315 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	31.03	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 400 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.91	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.08	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 630 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.23	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 800 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.99	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.57	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.35	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 1600 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.03	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 2000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	22.25	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 2500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	28.31	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 3150 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	31.15	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 4000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	28.94	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.2 RCV Distortion and Noise - 5000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	37.52	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	22.25	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.3 Frequency Response 8N DF	Ok	Min. dist. to tolerance scheme [dB], 3245.6 Hz	0.03	HUHAO_2403_n2_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH376000
5.3 Frequency Response	Ok	Min. dist. to tolerance	0.60	HUHAO_2403_n2_DFT-QPSK20

2N DF		scheme [dB], 5443.6 Hz		M_1_1_EVS WB 24.4kbps_CH376000

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5.2 RCV Distortion and Noise - 500 Hz WB 11
5.2 RCV Distortion and Noise - 630 Hz WB 12
5.2 RCV Distortion and Noise - 800 Hz WB 13
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5.2 RCV Distortion and Noise - 630 Hz WB 26
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5.2 RCV Distortion and Noise - 1600 Hz WB 30
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5.2 RCV Distortion and Noise - 3150 Hz WB 33
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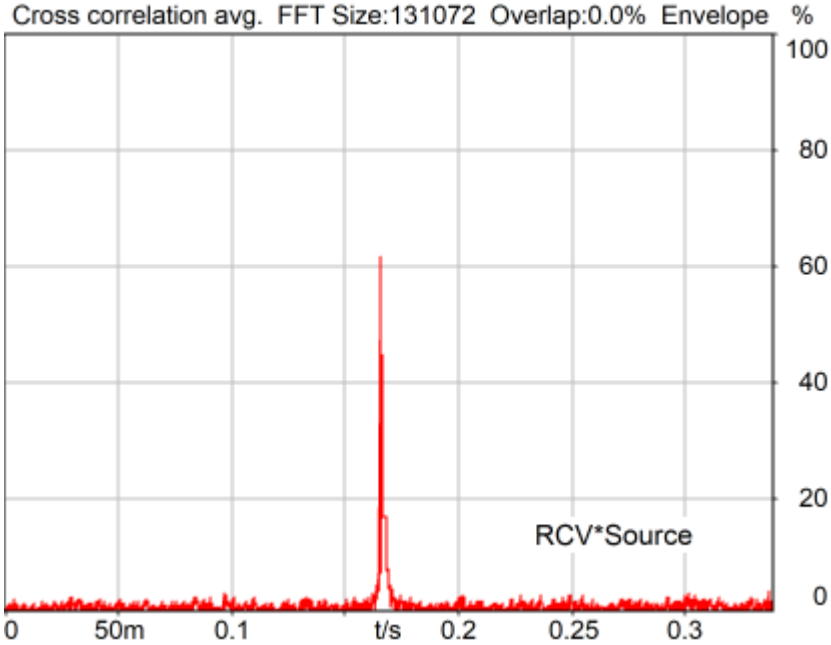
5.3 Frequency Response 8N DF 37
5.3 Frequency Response 2N DF 38

Overall Receive Delay WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ Preparation - Delay measurement



Channel	Delay
RCV*Source	166.8 ms

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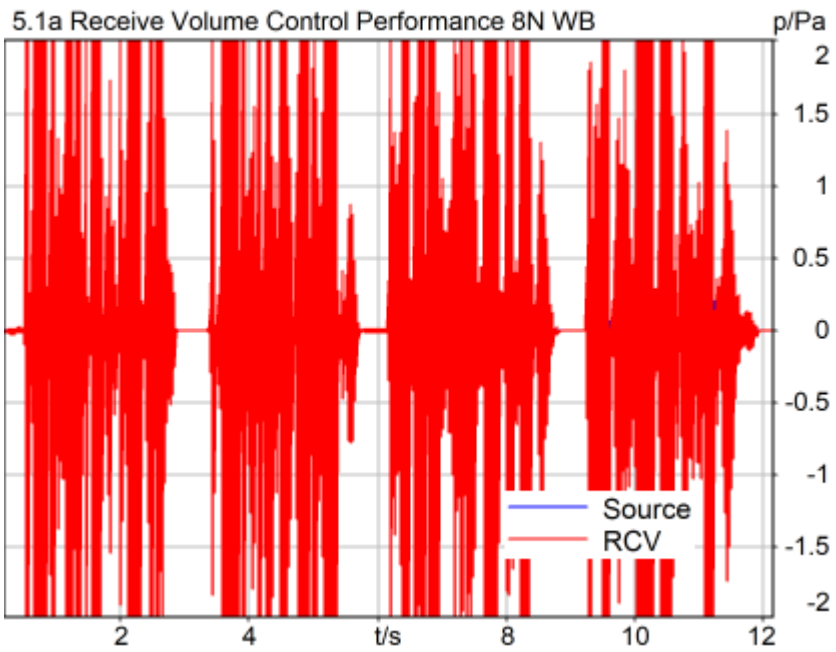
5.1a Receive Volume Control Performance 8N WB

TIA-5050 (2018-01) \ Measurements \ Wideband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	92.13 dB[SPL]	84.14%	22.13 dB[SPL]	Ok

Ok

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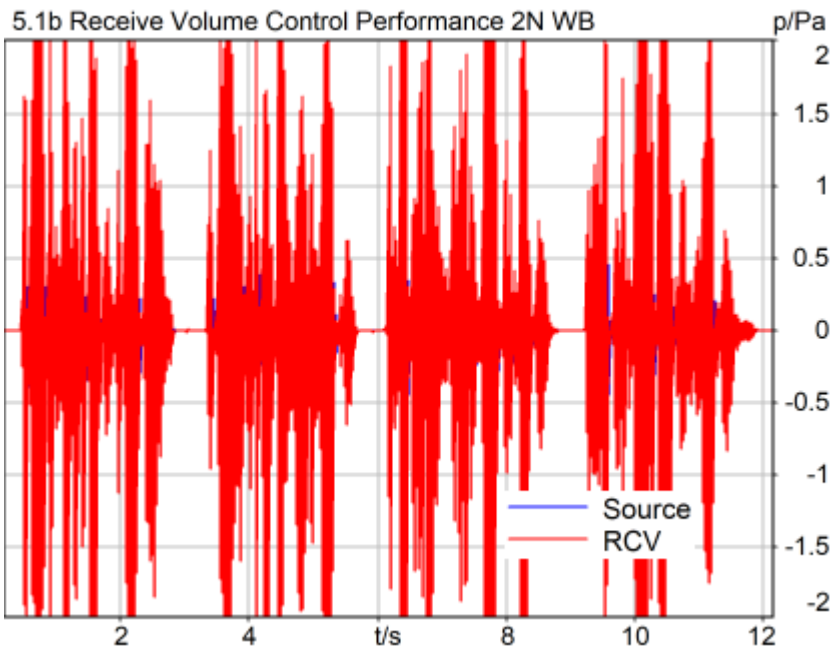
Limits

	lower
Run 1	6.00 dB20uPa

5.1b Receive Volume Control Performance 2N WB

TIA-5050 (2018-01) \ Measurements \ Wideband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	86.24 dB[SPL]	84.52%	16.24 dB[SPL]	Ok

Ok

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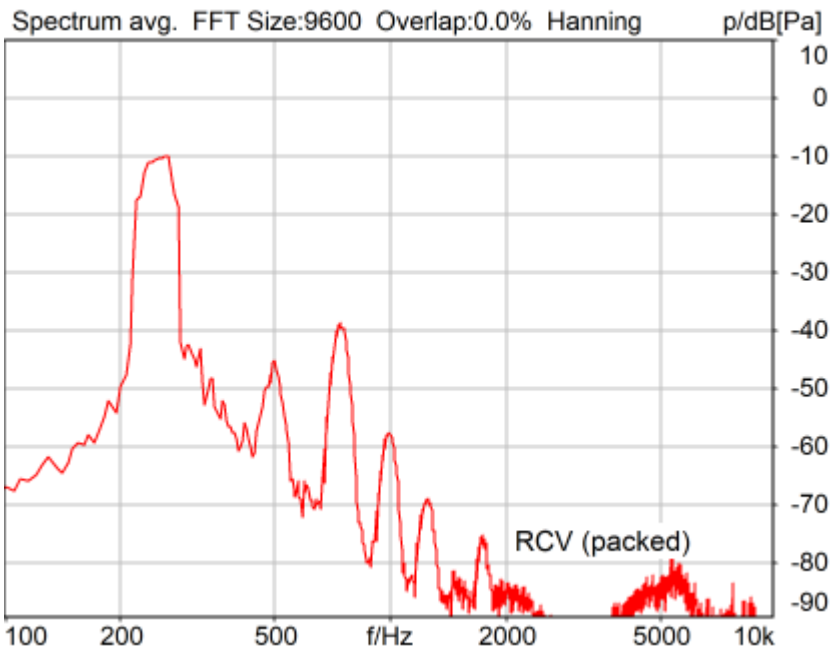
Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 28.28 dB (3.85%) Ok

Ok

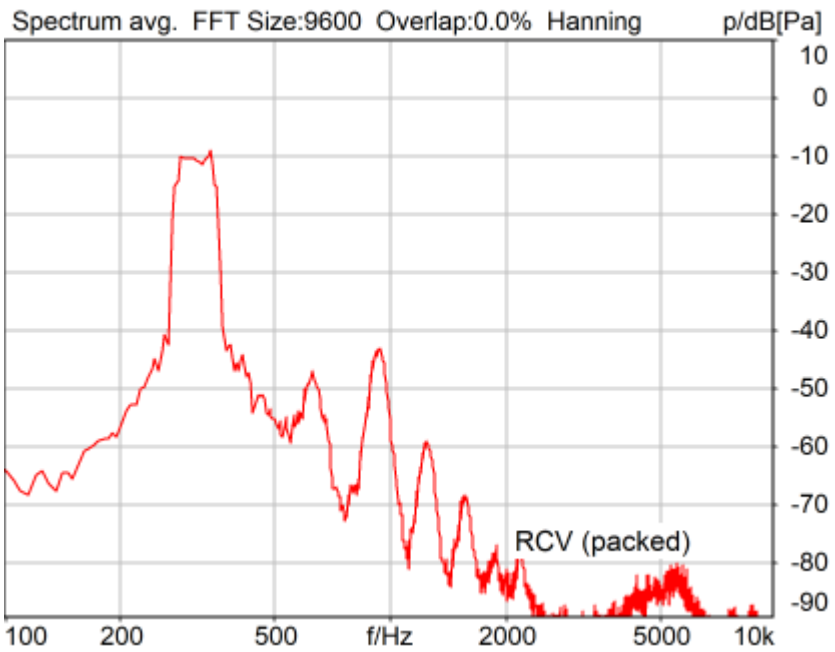
2025/2/8 16:59 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 315 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 31.78 dB (2.58%) Ok

Ok

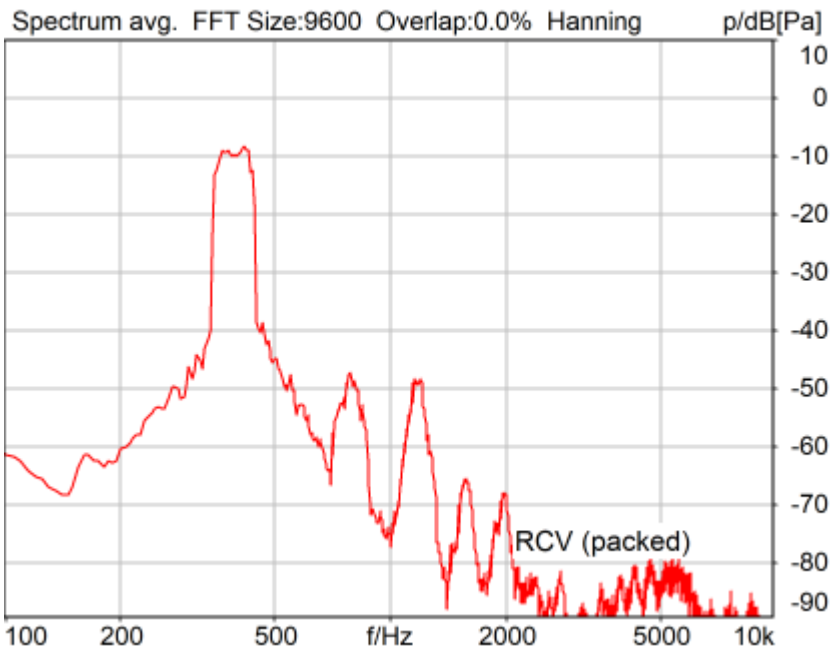
2025/2/8 16:59 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 400 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.54 dB (1.88%) Ok

Ok

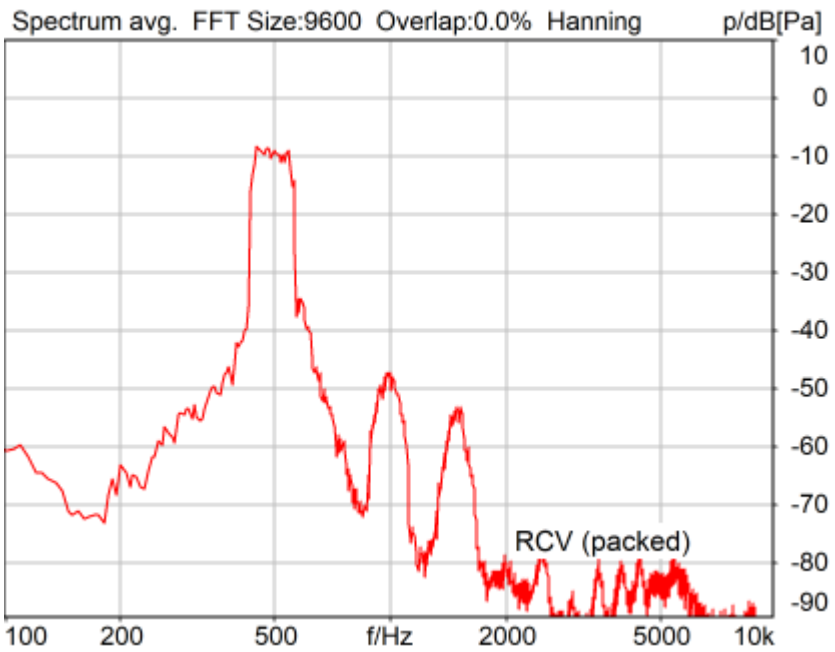
2025/2/8 17:00 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.80 dB (2.04%) Ok

Ok

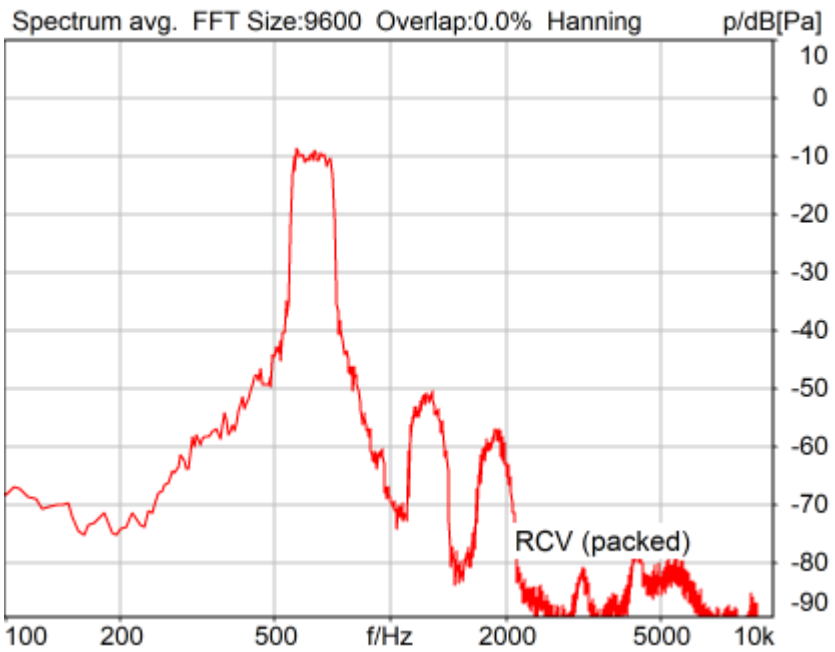
2025/2/8 17:00 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.95 dB (1.79%) Ok

Ok

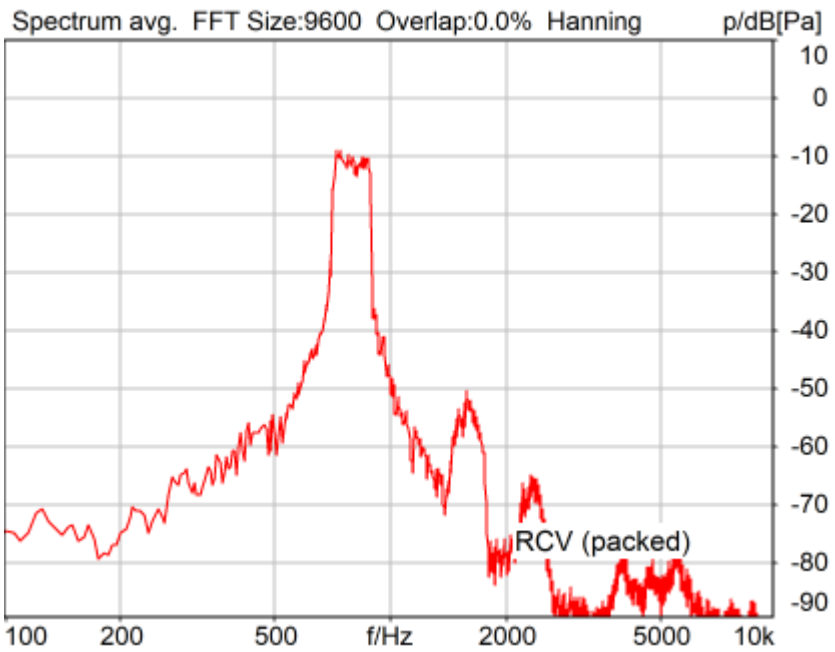
2025/2/8 17:00 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.73 dB (2.31%) Ok

Ok

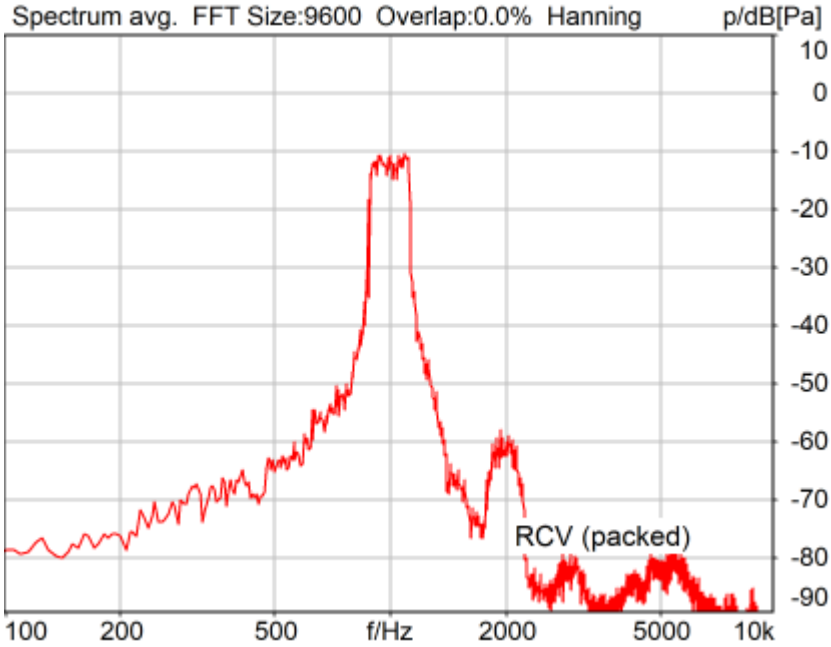
2025/2/8 17:01 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.10 dB (2.48%) Ok

Ok

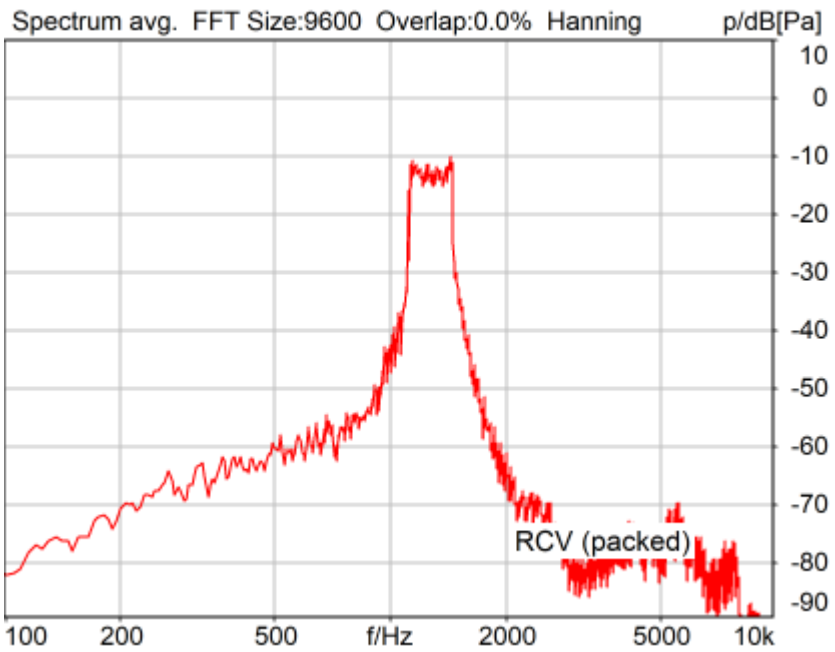
2025/2/8 17:01 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 22.72 dB (7.31%) Ok

Ok

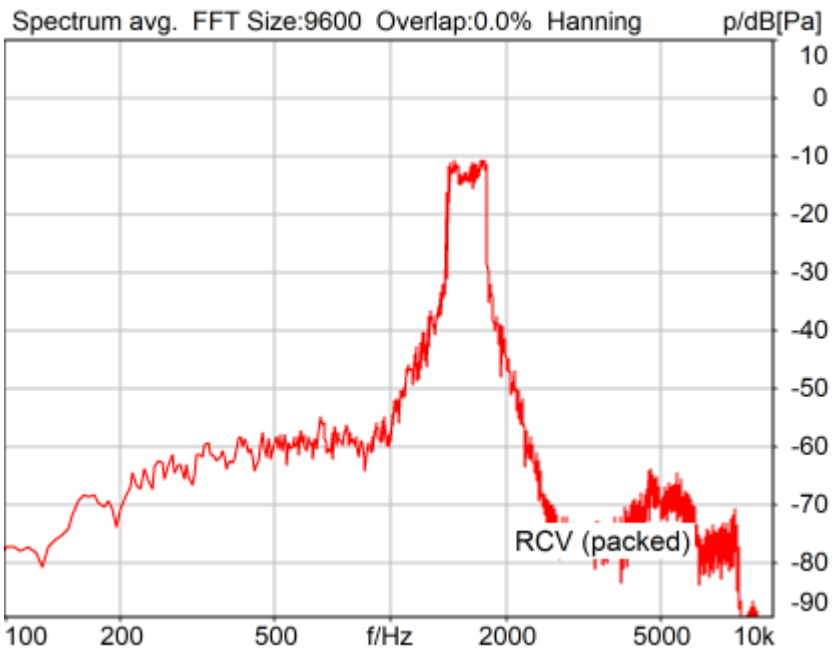
2025/2/8 17:02 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.89 dB (5.69%) Ok

Ok

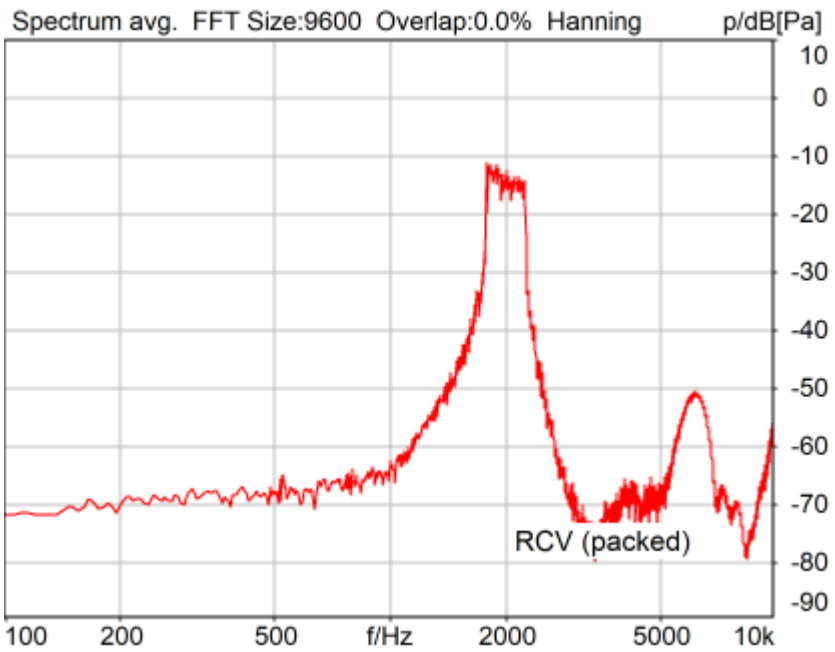
2025/2/8 17:02 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 22.81 dB (7.24%) Ok

Ok

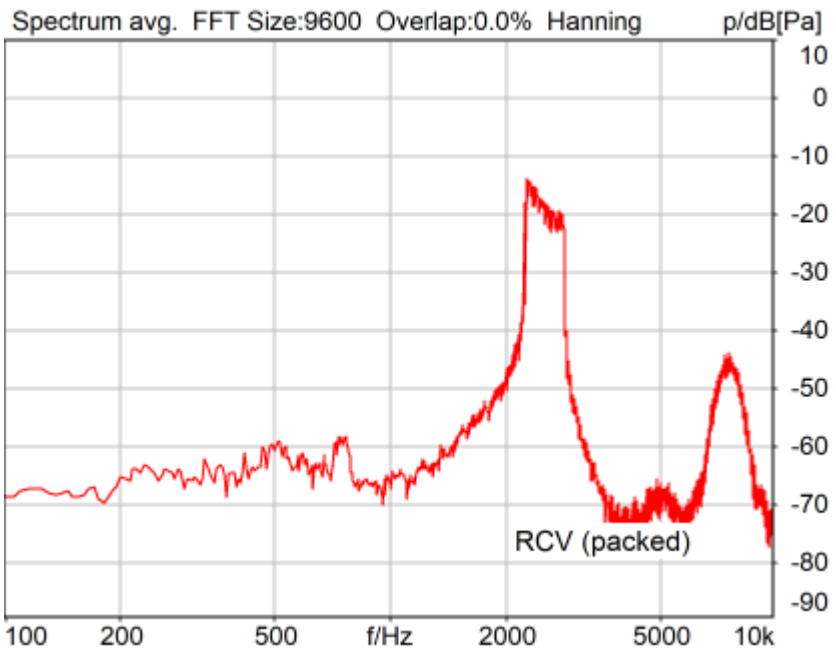
2025/2/8 17:02 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.20 dB (6.92%) Ok

Ok

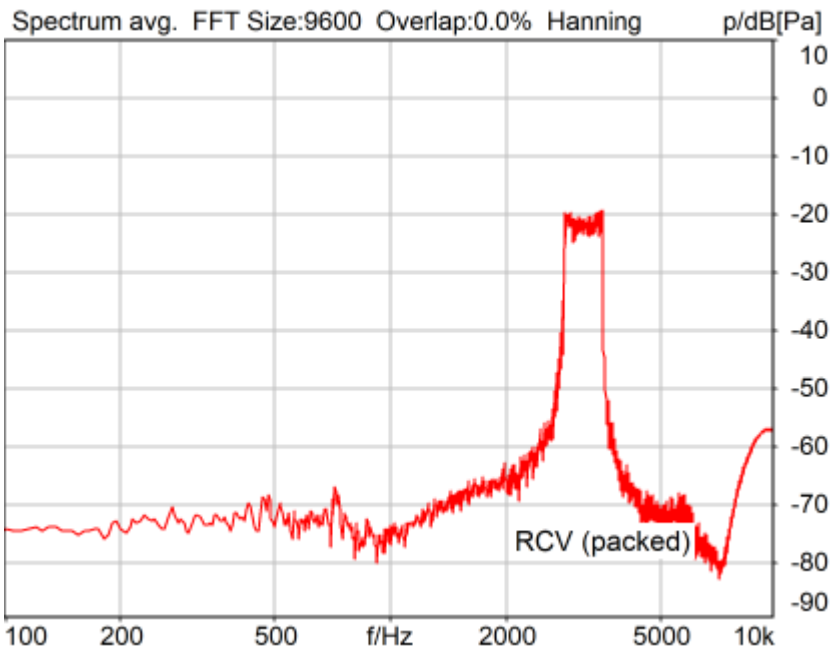
2025/2/8 17:03 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 28.25 dB (3.87%) Ok

Ok

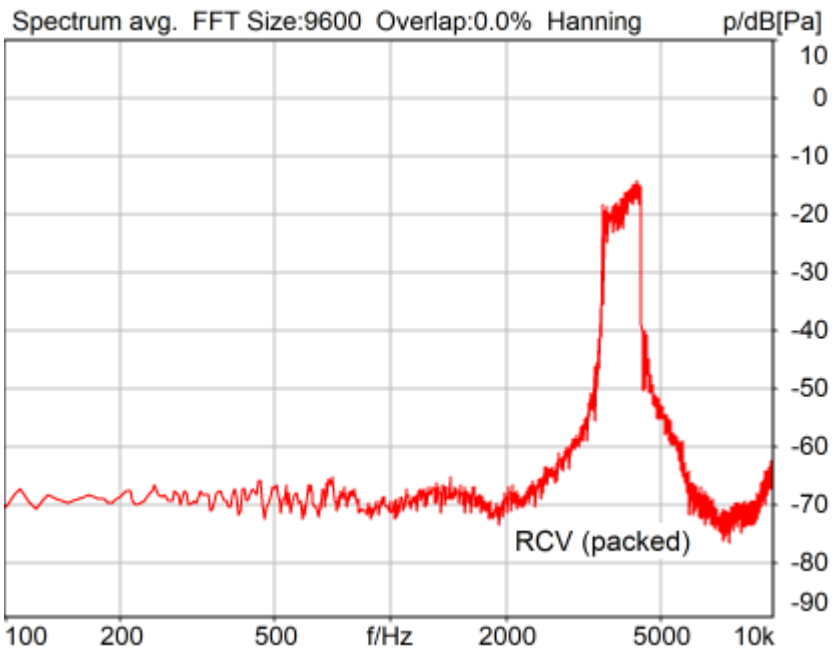
2025/2/8 17:03 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 4000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 25.24 dB (5.47%) Ok

Ok

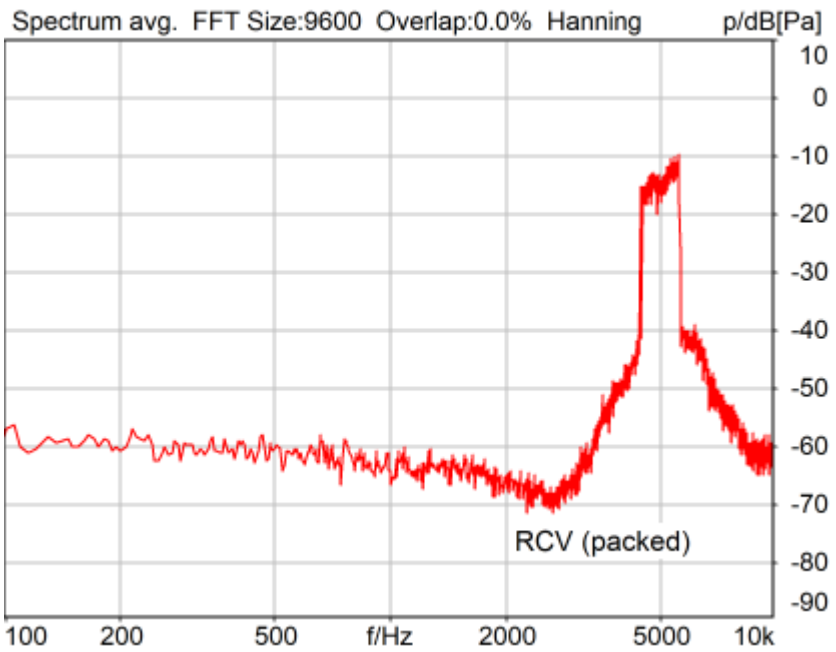
2025/2/8 17:03 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 5000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.62 dB (6.59%) Ok

Ok

2025/2/8 17:04 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N

Region	Frequency	SDNR
1	250Hz	28.28 dB
2	315Hz	31.78 dB
3	400Hz	34.54 dB
4	500Hz	33.80 dB
5	630Hz	34.95 dB
6	800Hz	32.73 dB
7	1000Hz	32.10 dB
8	1250Hz	22.72 dB
9	1600Hz	24.89 dB
10	2000Hz	22.81 dB

11	2500Hz	23.20 dB
12	3150Hz	28.25 dB
13	4000Hz	25.24 dB
14	5000Hz	23.62 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 22.72dB at 1250Hz.

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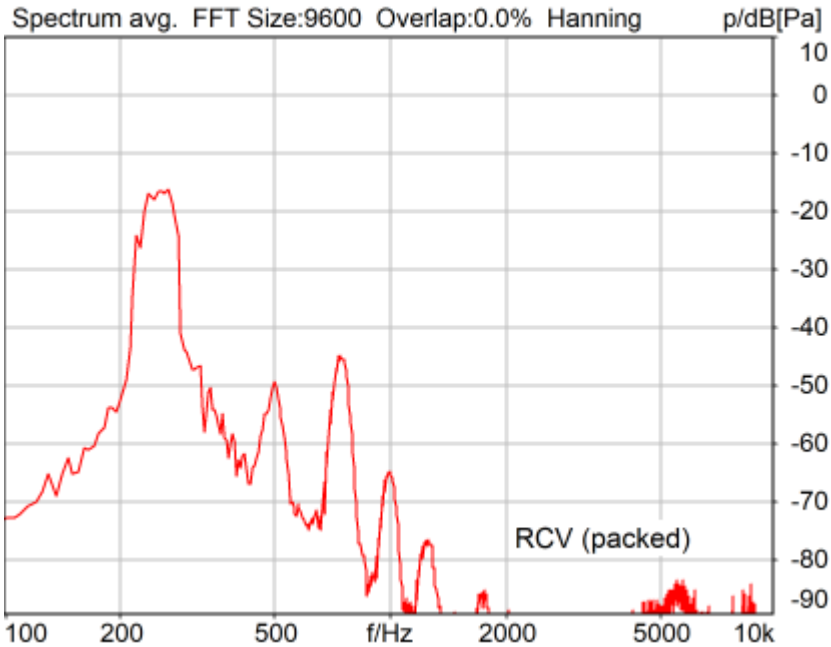
5.2 RCV Distortion and Noise - 250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 27.84 dB (4.05%) Ok

Ok

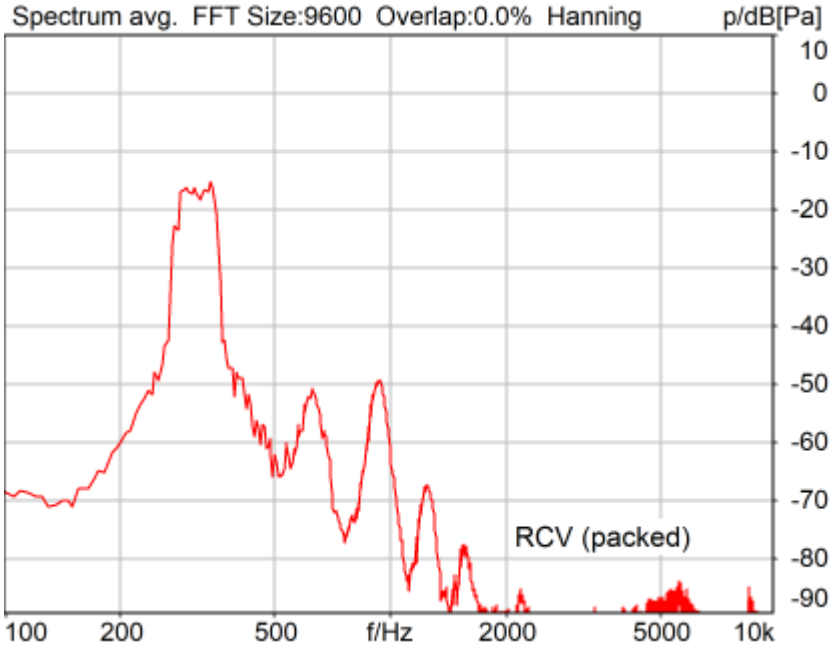
2025/2/8 17:12 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 315 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 31.03 dB (2.81%) Ok

Ok

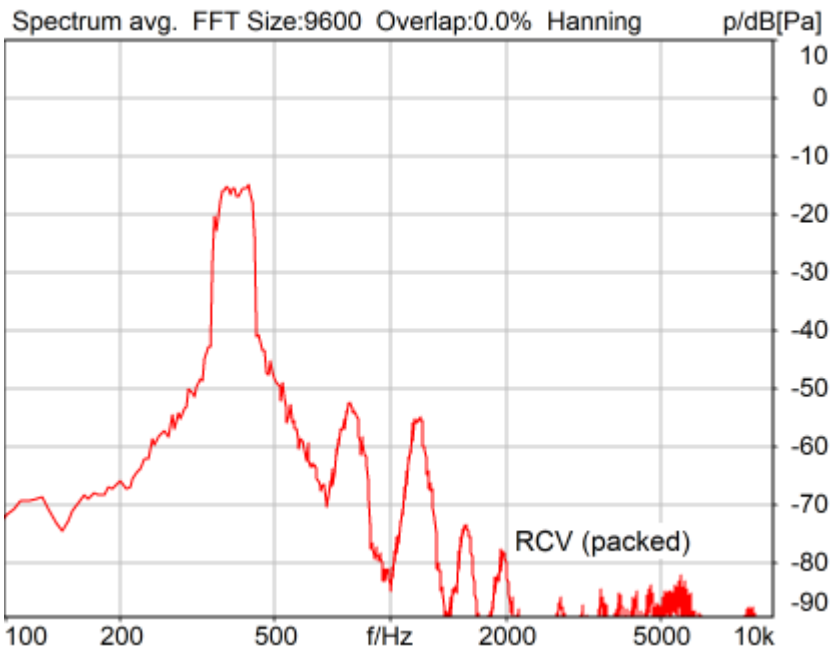
2025/2/8 17:13 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 400 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.91 dB (2.26%) Ok

Ok

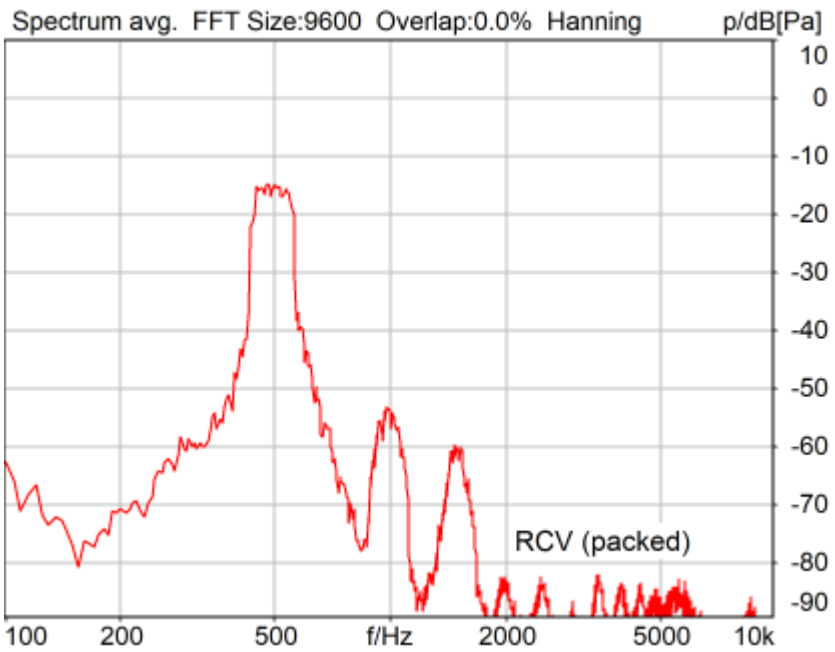
2025/2/8 17:13 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.08 dB (2.22%) Ok

Ok

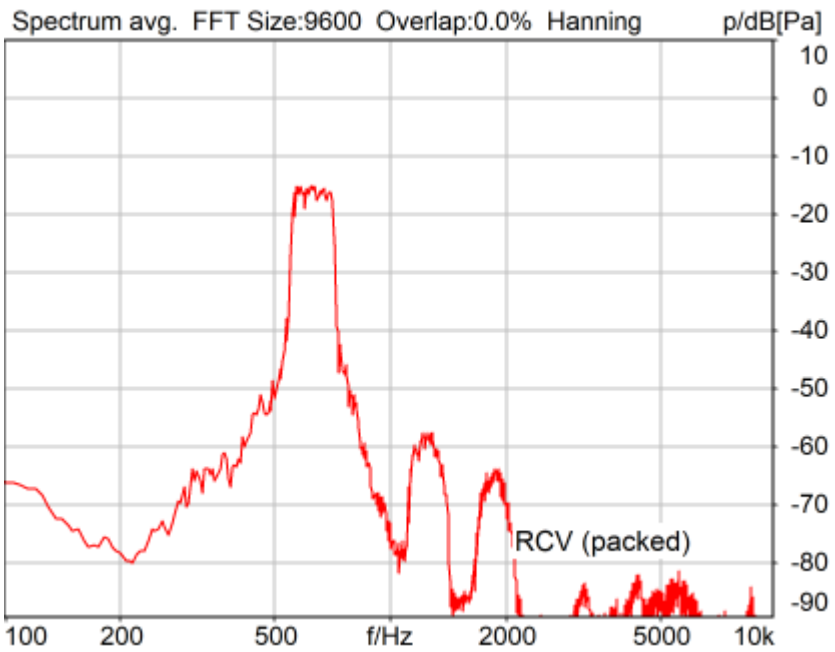
2025/2/8 17:13 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.23 dB (1.94%) Ok

Ok

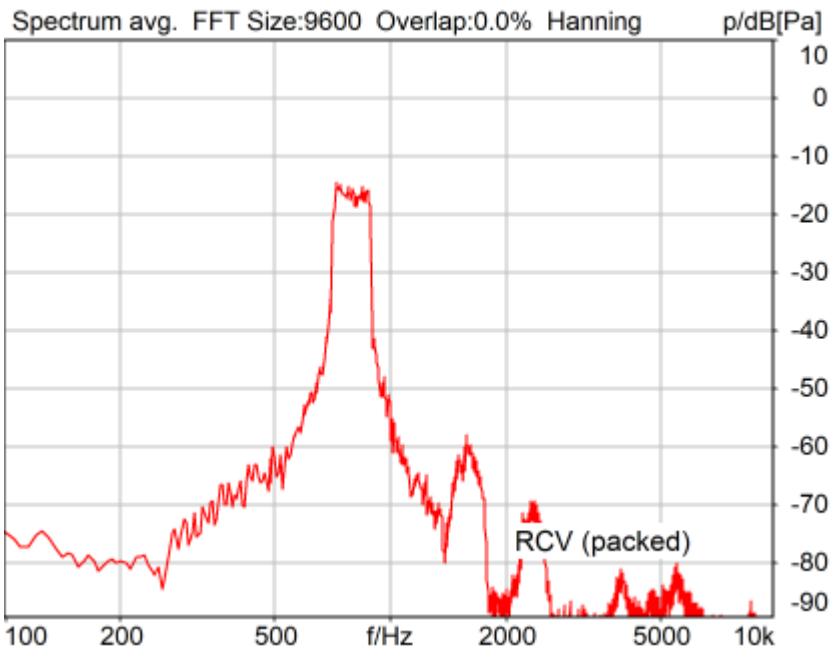
2025/2/8 17:14 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.99 dB (2.00%) Ok

Ok

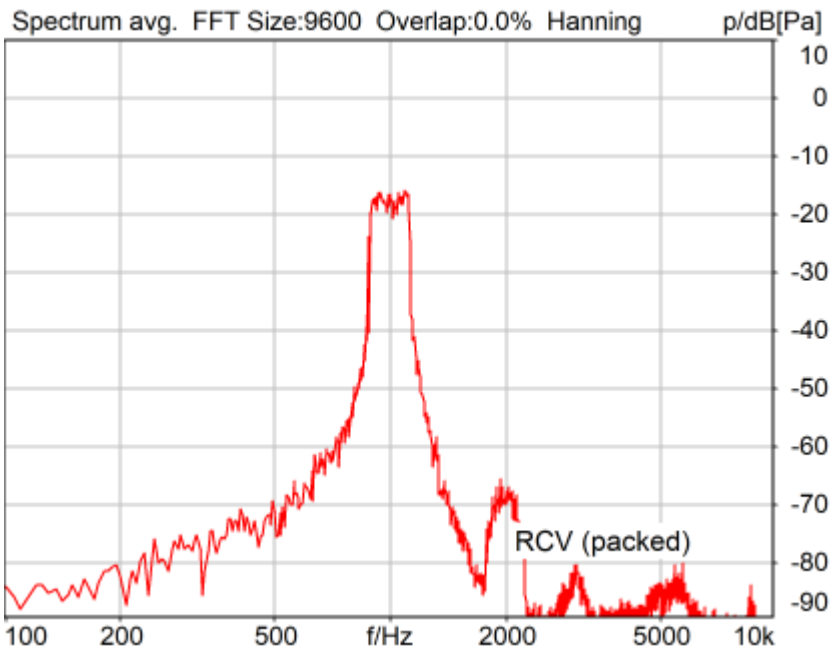
2025/2/8 17:14 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.57 dB (2.35%) Ok

Ok

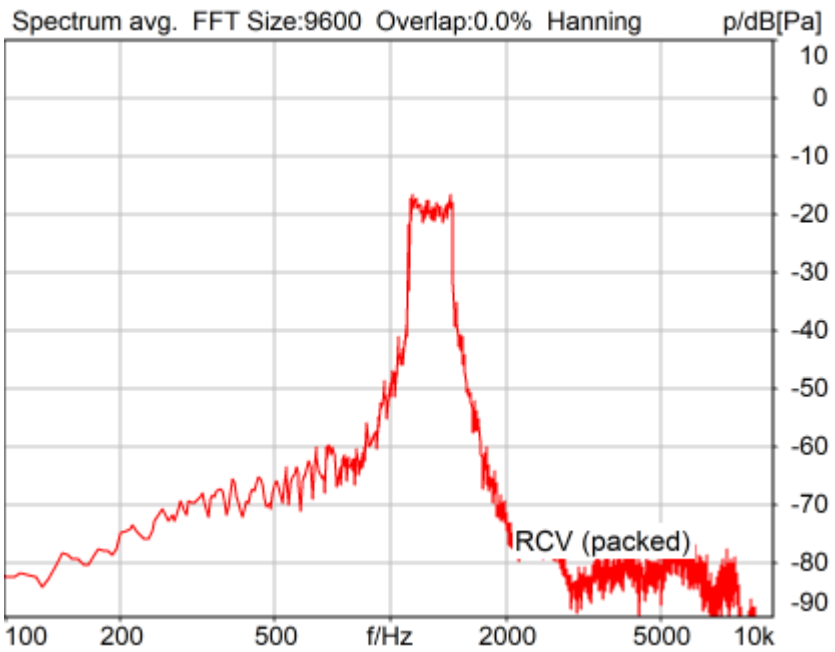
2025/2/8 17:14 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 23.35 dB (6.80%) Ok

Ok

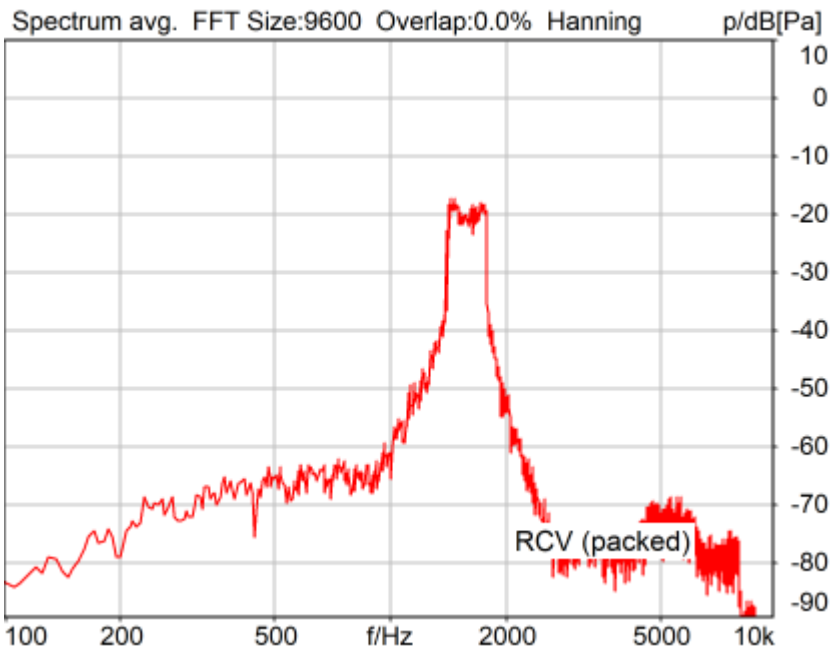
2025/2/8 17:15 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 24.03 dB (6.29%) Ok

Ok

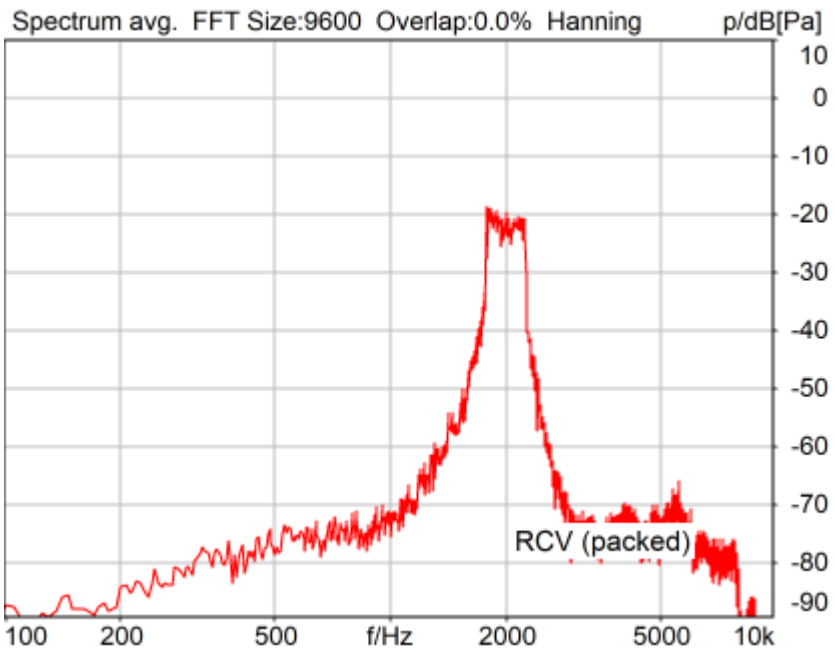
2025/2/8 17:15 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 22.25 dB (7.72%) Ok

Ok

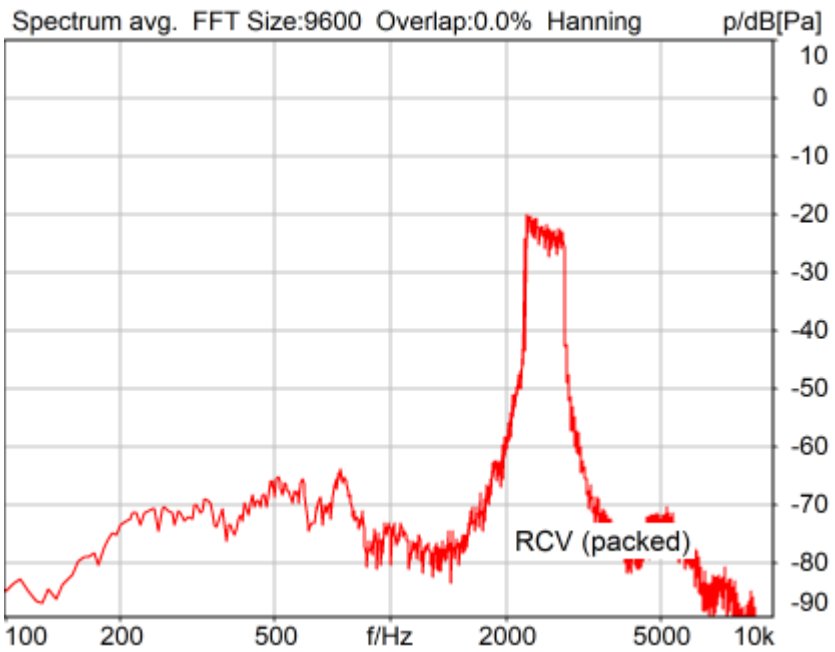
2025/2/8 17:16 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 28.31 dB (3.84%) Ok

Ok

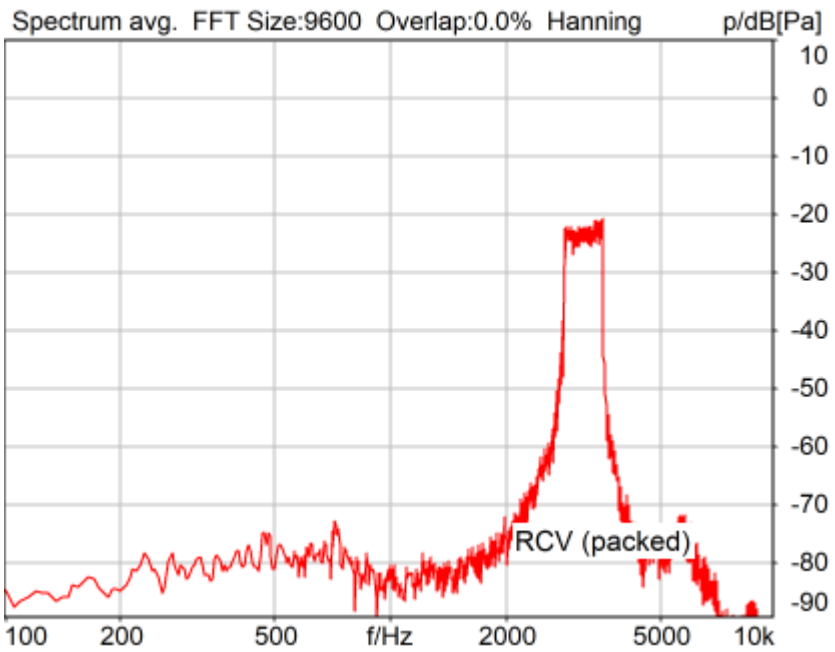
2025/2/8 17:16 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 31.15 dB (2.77%) Ok

Ok

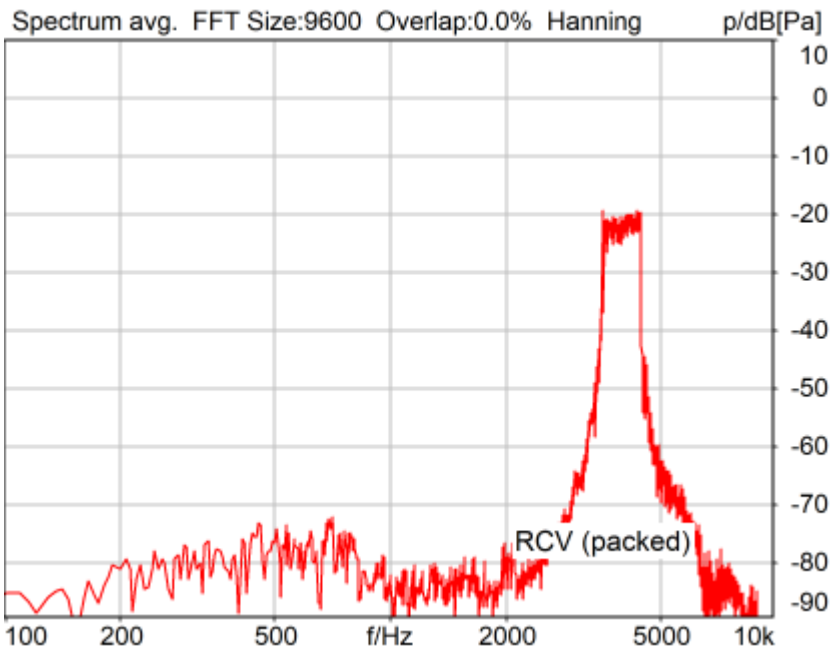
2025/2/8 17:16 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 4000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 28.94 dB (3.57%) Ok

Ok

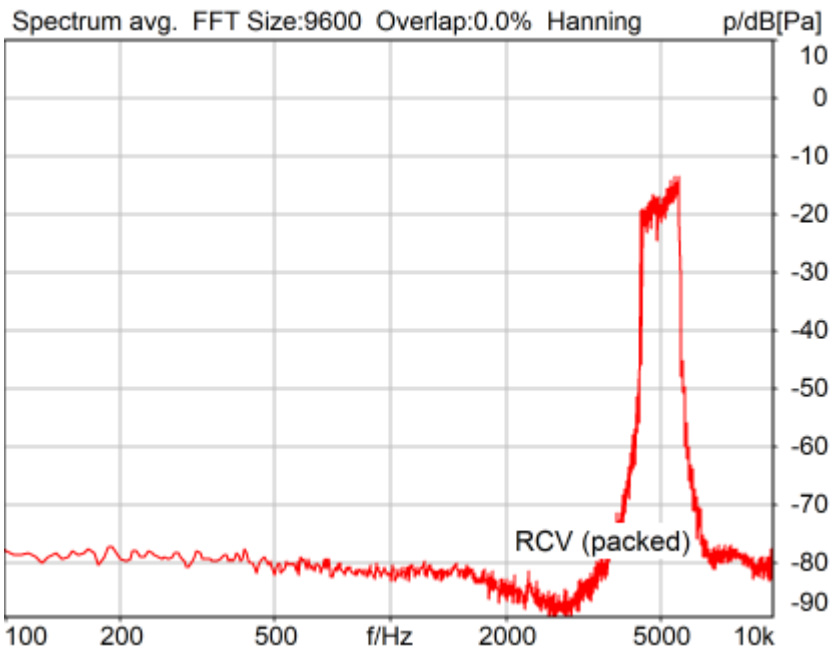
2025/2/8 17:17 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 5000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 37.52 dB (1.33%) Ok

Ok

2025/2/8 17:17 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N

Region	Frequency	SDNR
1	250Hz	27.84 dB
2	315Hz	31.03 dB
3	400Hz	32.91 dB
4	500Hz	33.08 dB
5	630Hz	34.23 dB
6	800Hz	33.99 dB
7	1000Hz	32.57 dB
8	1250Hz	23.35 dB
9	1600Hz	24.03 dB
10	2000Hz	22.25 dB

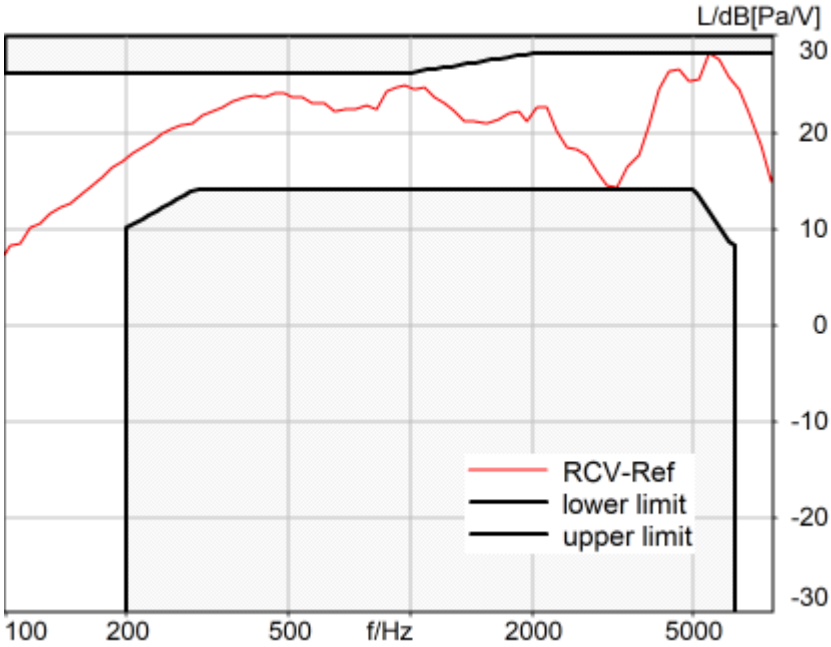
11	2500Hz	28.31 dB
12	3150Hz	31.15 dB
13	4000Hz	28.94 dB
14	5000Hz	37.52 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 22.25dB at 2000Hz.

2025/2/8 17:17 ACQUA

5.3 Frequency Response 8N DF

TIA-5050 (2018-01) \ Measurements \ Wideband



Absolute minimal distance
0.03 dB at 3245.6 Hz Ok

Ok

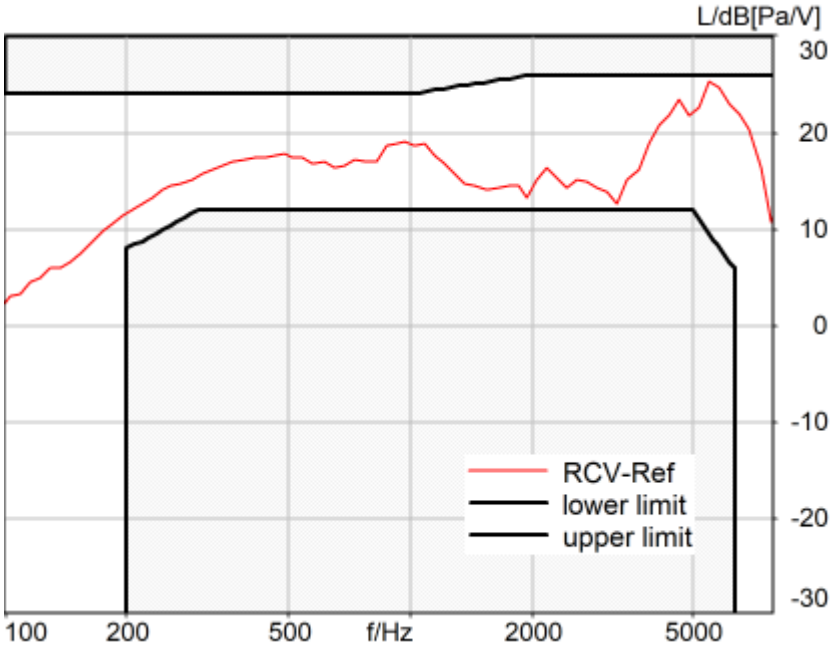
2025/2/8 17:29 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N DF

TIA-5050 (2018-01) \ Measurements \ Wideband



Absolute minimal distance
0.60 dB at 5443.6 Hz Ok

Ok

2025/2/8 17:10 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

Measurement Protocol

Measurement Object	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 15:17
Responsible Person	audio

Status Overview

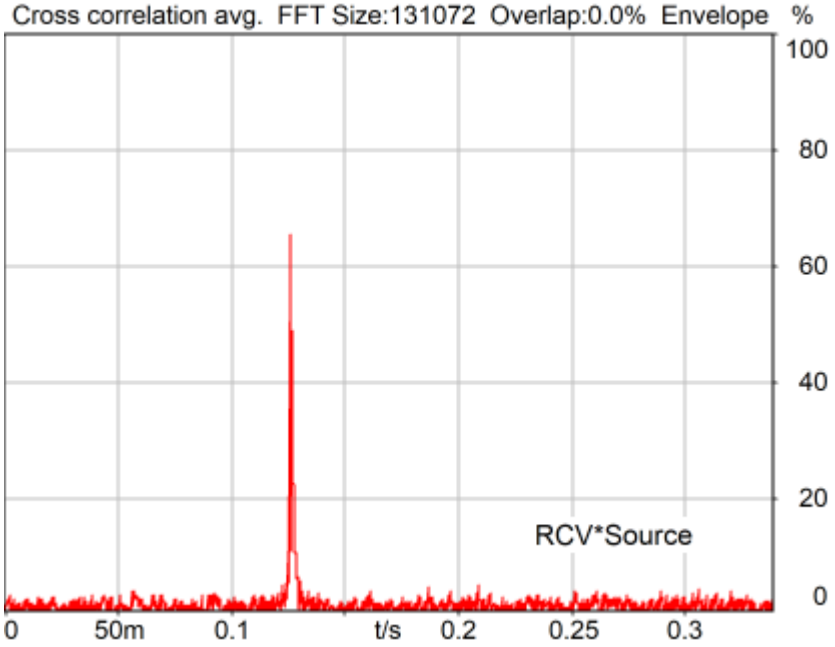
SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay NB	Done	Delay (Cross) [ms]	126.4	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.1a Receive Volume Control Performance 8N NB	Ok	Corrected Speech Level [dB[SPL]]	22.11	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.1b Receive Volume Control Performance 2N NB	Ok	Corrected Speech Level [dB[SPL]]	16.64	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 400 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.28	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.37	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 630 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.92	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 800 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	35.30	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.52	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1250 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	23.27	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1600 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.44	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 2000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	21.32	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 2500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	23.40	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 3150 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	28.47	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.32	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 400 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.48	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.54	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and	Ok	Distortion (Noise)	30.89	HUHAO_2403_n5_DFT-QPSK20

Noise - 630 Hz NB		[dB], 0.0 dB		M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 800 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.44	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.66	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1250 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	23.66	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1600 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.85	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 2000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	21.87	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 2500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	28.96	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 3150 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	30.82	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.87	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.3 Frequency Response 8N FF HANB	Not Ok	Min. dist. to tolerance scheme [dB], 1447.5 Hz	-2.19	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.3 Frequency Response 8N DF HANB	Ok	Min. dist. to tolerance scheme [dB], 974.0 Hz	0.64	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.3 Frequency Response 2N FF HANB	Ok	Min. dist. to tolerance scheme [dB], 1285.9 Hz	0.23	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300
5.3 Frequency Response 2N DF HANB	Ok	Min. dist. to tolerance scheme [dB], 3245.6 Hz	2.66	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300

Overall Receive Delay NB 5
5.1a Receive Volume Control Performance 8N NB 5
5.1b Receive Volume Control Performance 2N NB 6
5.2 RCV Distortion and Noise - 400 Hz NB 7
5.2 RCV Distortion and Noise - 500 Hz NB 8
5.2 RCV Distortion and Noise - 630 Hz NB 9
5.2 RCV Distortion and Noise - 800 Hz NB 10
5.2 RCV Distortion and Noise - 1000 Hz NB 11
5.2 RCV Distortion and Noise - 1250 Hz NB 12
5.2 RCV Distortion and Noise - 1600 Hz NB 13
5.2 RCV Distortion and Noise - 2000 Hz NB 14
5.2 RCV Distortion and Noise - 2500 Hz NB 15
5.2 RCV Distortion and Noise - 3150 Hz NB 16
Report - Receive Distortion and Noise (Conversational Gain) 17
5.2 RCV Distortion and Noise - 400 Hz NB 18
5.2 RCV Distortion and Noise - 500 Hz NB 18
5.2 RCV Distortion and Noise - 630 Hz NB 19
5.2 RCV Distortion and Noise - 800 Hz NB 20
5.2 RCV Distortion and Noise - 1000 Hz NB 21
5.2 RCV Distortion and Noise - 1250 Hz NB 22
5.2 RCV Distortion and Noise - 1600 Hz NB 23
5.2 RCV Distortion and Noise - 2000 Hz NB 24
5.2 RCV Distortion and Noise - 2500 Hz NB 25
5.2 RCV Distortion and Noise - 3150 Hz NB 26
Report - Receive Distortion and Noise (Conversational Gain) 27
5.3 Frequency Response 8N FF HANB 28
5.3 Frequency Response 8N DF HANB 29
5.3 Frequency Response 2N FF HANB 29
5.3 Frequency Response 2N DF HANB 30

Overall Receive Delay NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ Preparation - Delay measurement

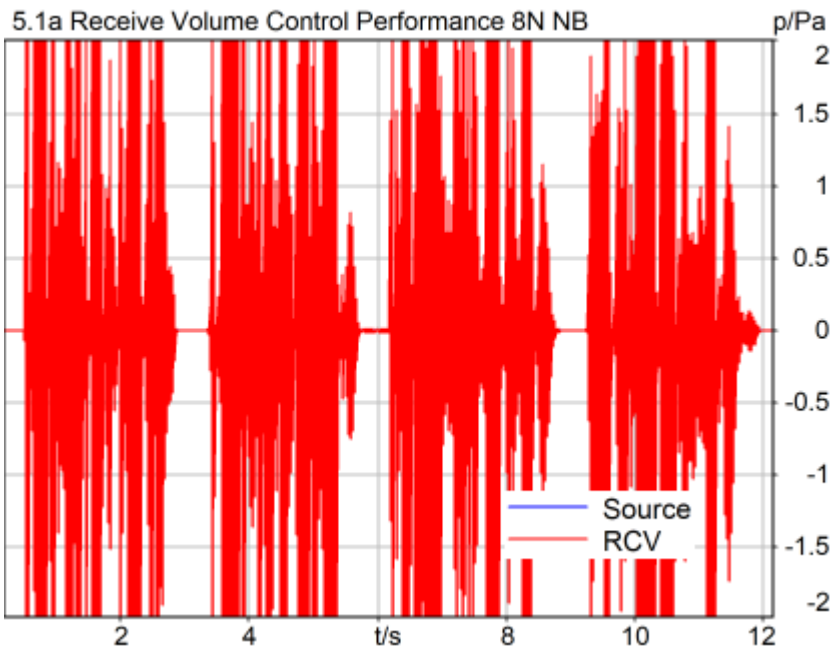


Channel	Delay
RCV*Source	126.4 ms

2025/2/10 12:50 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

5.1a Receive Volume Control Performance 8N NB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	92.11 dB[SPL]	84.03%	22.11 dB[SPL]	Ok

Ok

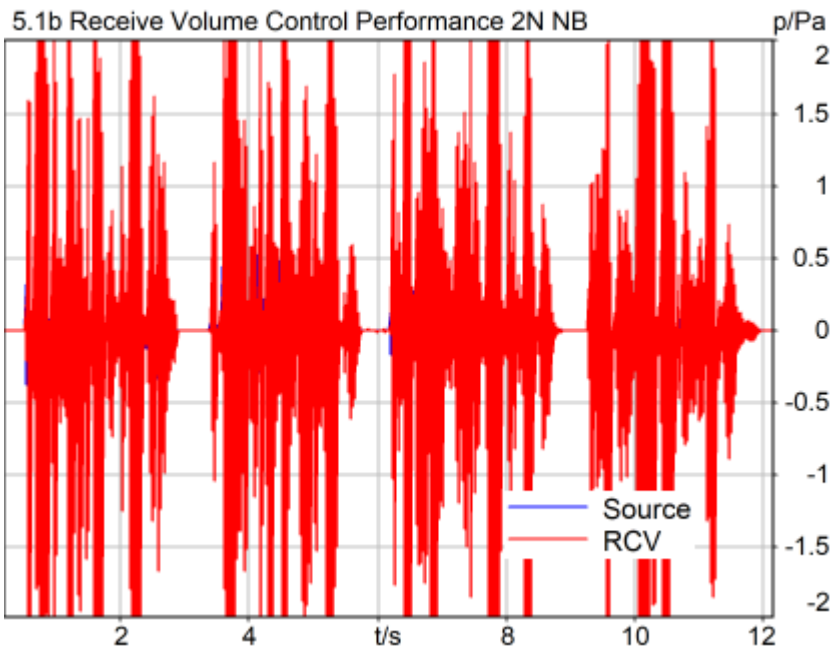
2025/2/10 12:51 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.1b Receive Volume Control Performance 2N NB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	86.64 dB[SPL]	84.40%	16.64 dB[SPL]	Ok

Ok

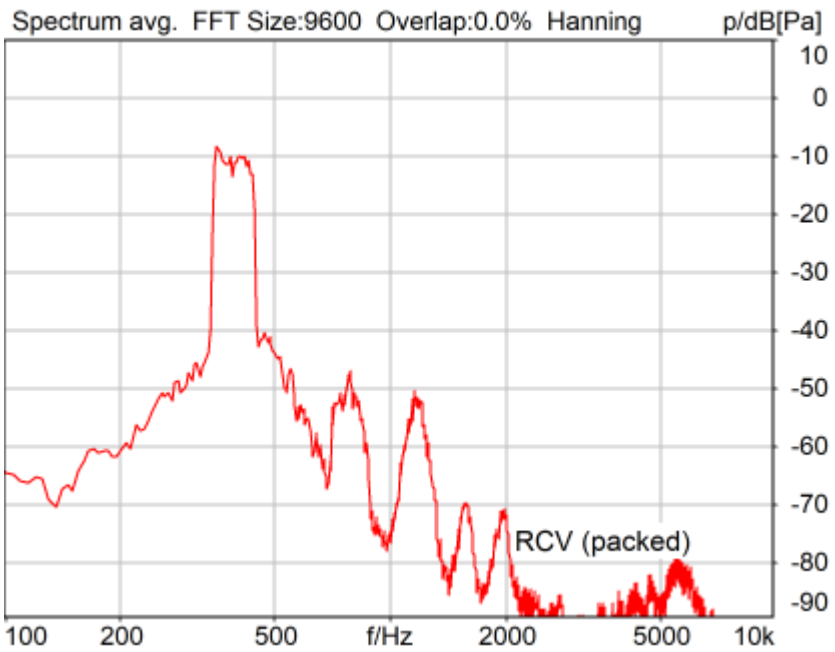
2025/2/10 12:41 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 400 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.28 dB (1.93%) Ok

Ok

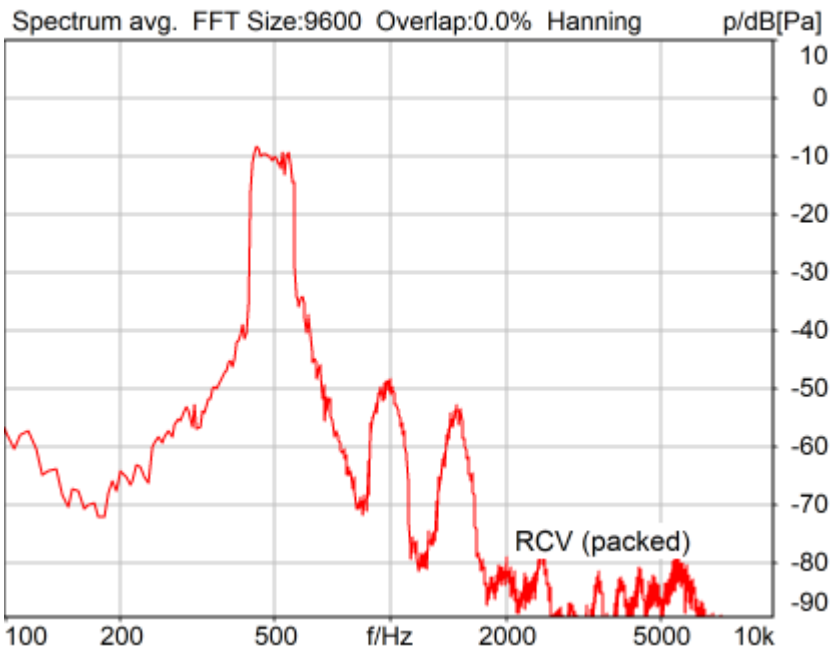
2025/2/10 12:51 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.37 dB (2.14%) Ok

Ok

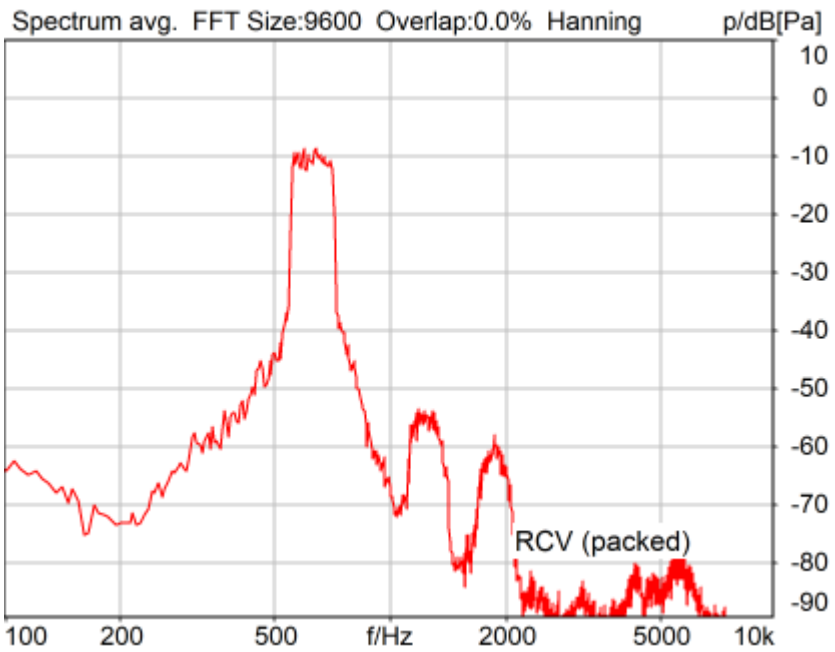
2025/2/10 12:52 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.92 dB (1.80%) Ok

Ok

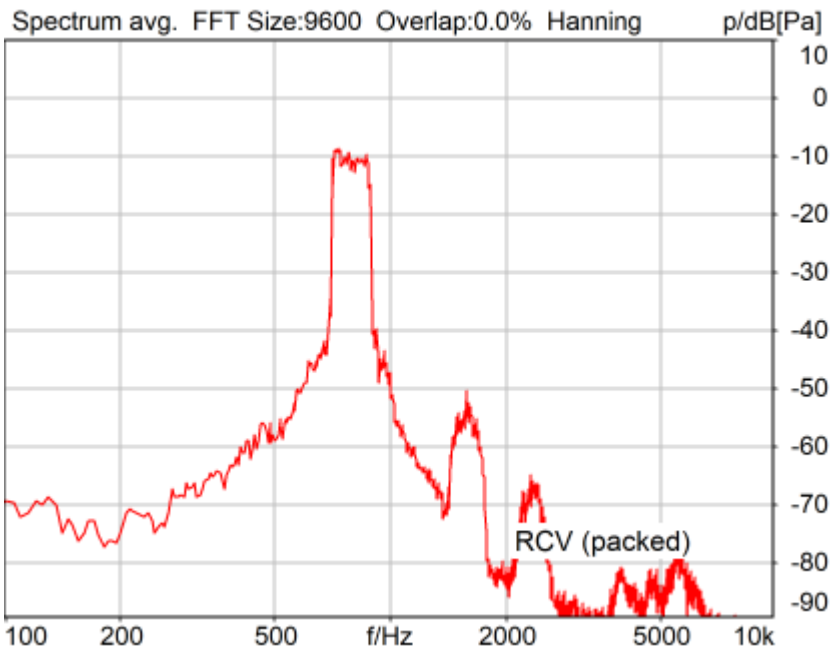
2025/2/10 12:52 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 35.30 dB (1.72%) Ok

Ok

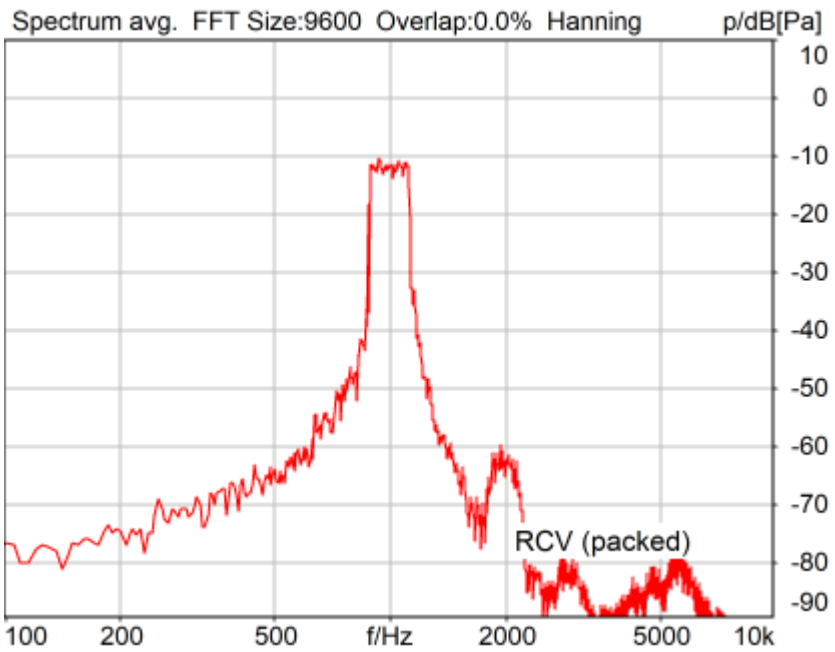
2025/2/10 12:52 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.52 dB (2.37%) Ok

Ok

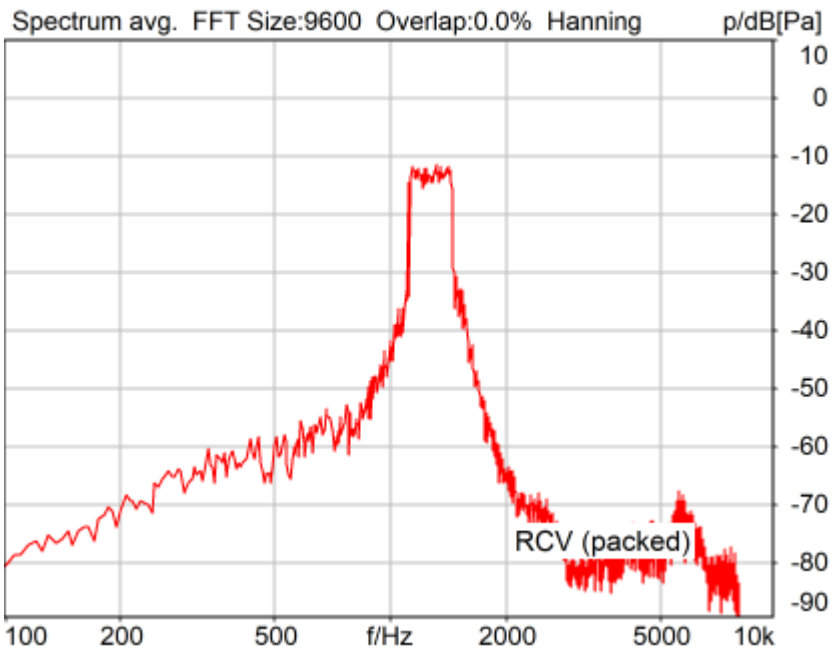
2025/2/10 12:53 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.27 dB (6.86%) Ok

Ok

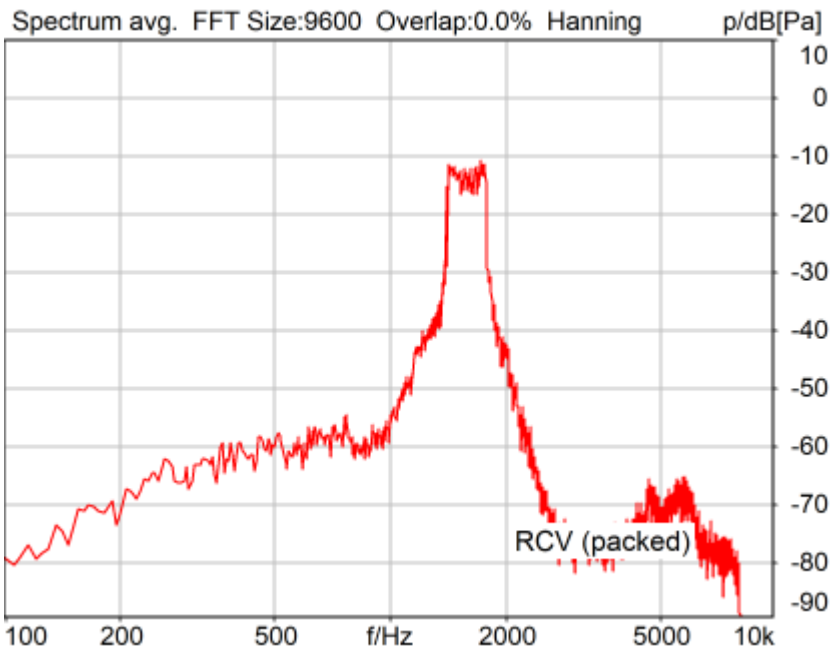
2025/2/10 12:53 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.44 dB (6.00%) Ok

Ok

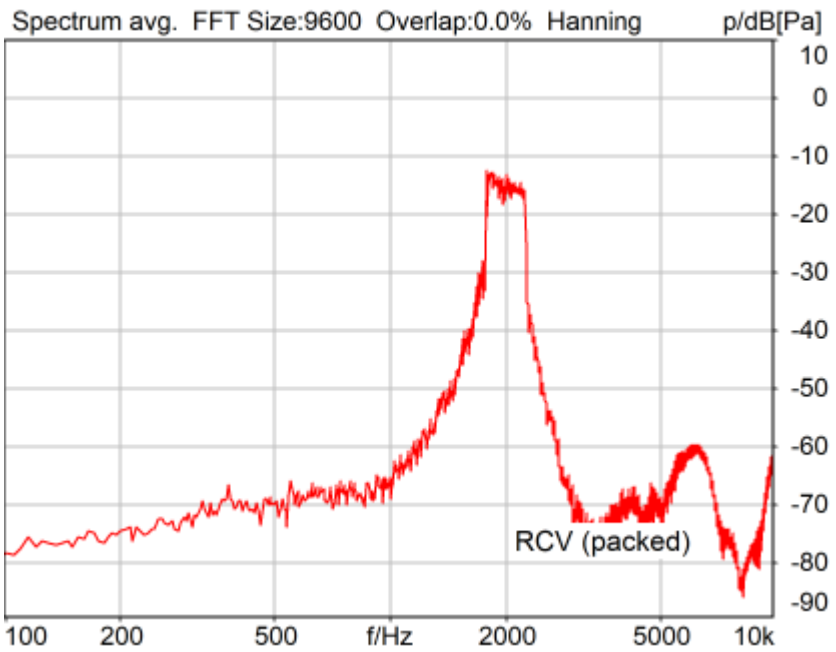
2025/2/10 12:54 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 21.32 dB (8.59%) Ok

Ok

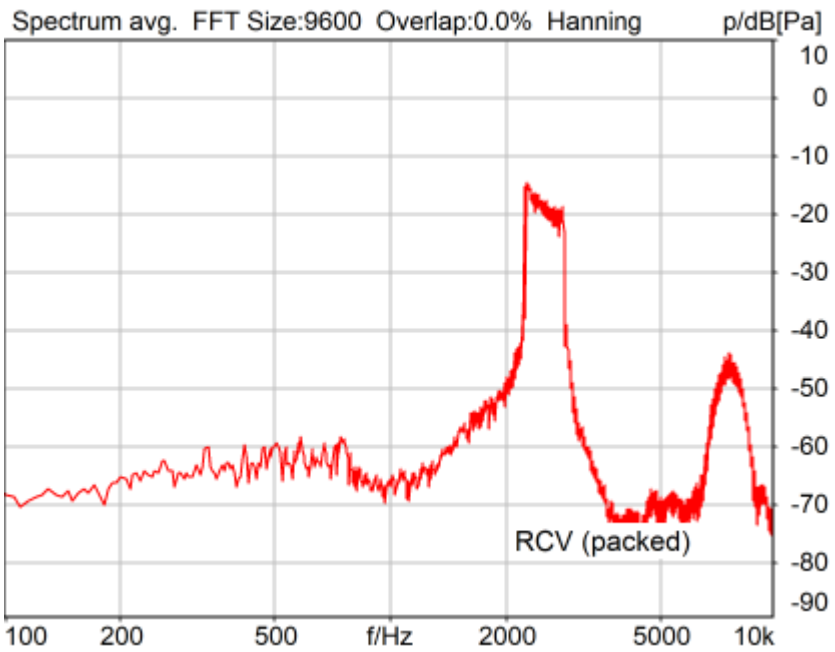
2025/2/10 12:54 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.40 dB (6.76%) Ok

Ok

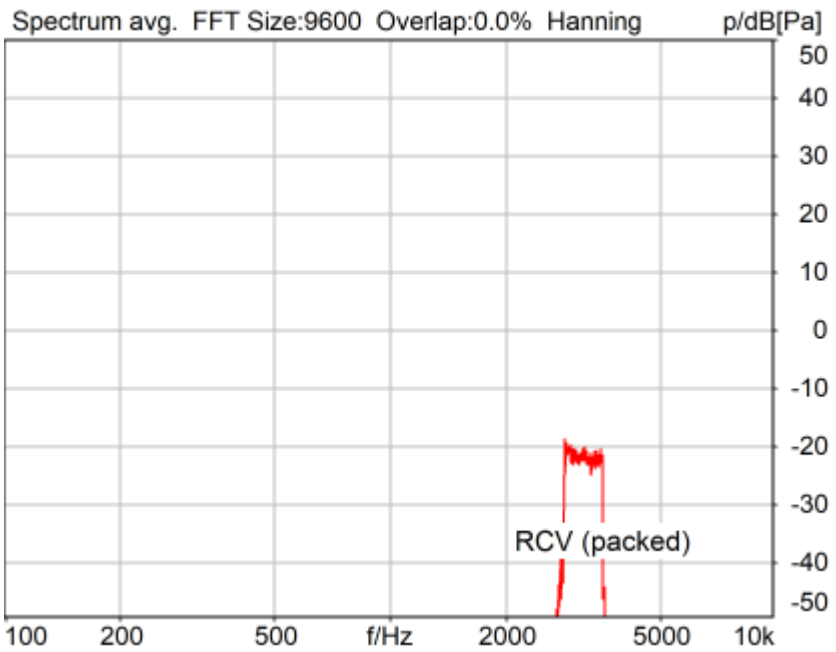
2025/2/10 12:54 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 28.47 dB (3.77%) Ok

Ok

2025/2/10 12:55 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N

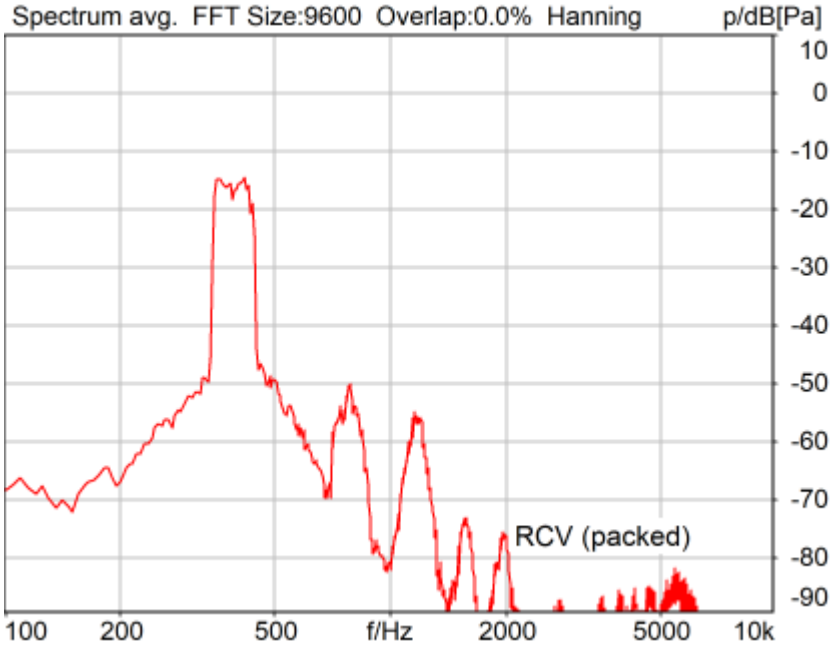
Region	Frequency	SDNR
1	400Hz	34.28 dB
2	500Hz	33.37 dB
3	630Hz	34.92 dB
4	800Hz	35.30 dB
5	1000Hz	32.52 dB
6	1250Hz	23.27 dB
7	1600Hz	24.44 dB
8	2000Hz	21.32 dB
9	2500Hz	23.40 dB
10	3150Hz	28.47 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.32dB at 2000Hz.

2025/2/10 12:55 ACQUA

5.2 RCV Distortion and Noise - 400 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.48 dB (2.12%) Ok

Ok

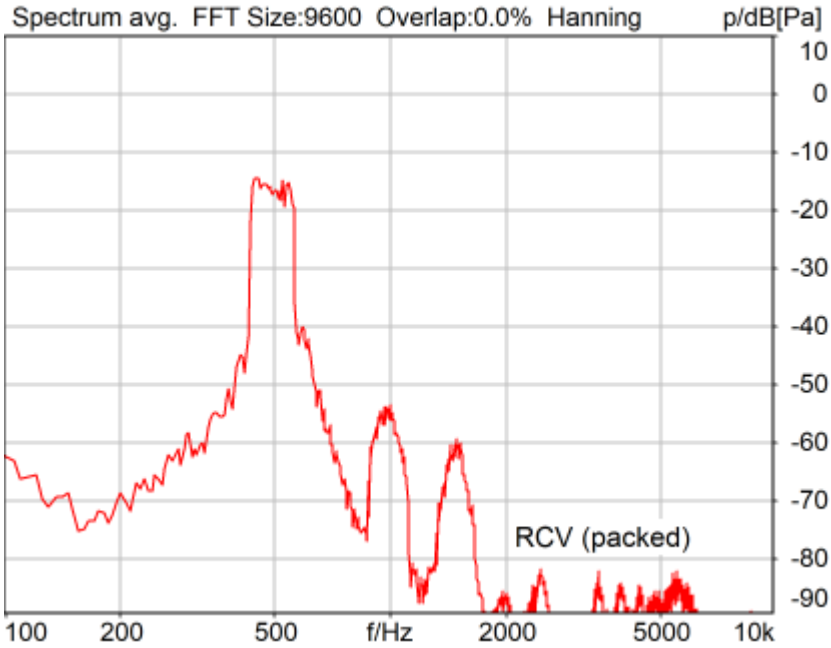
2025/2/10 12:41 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.54 dB (2.36%) Ok

Ok

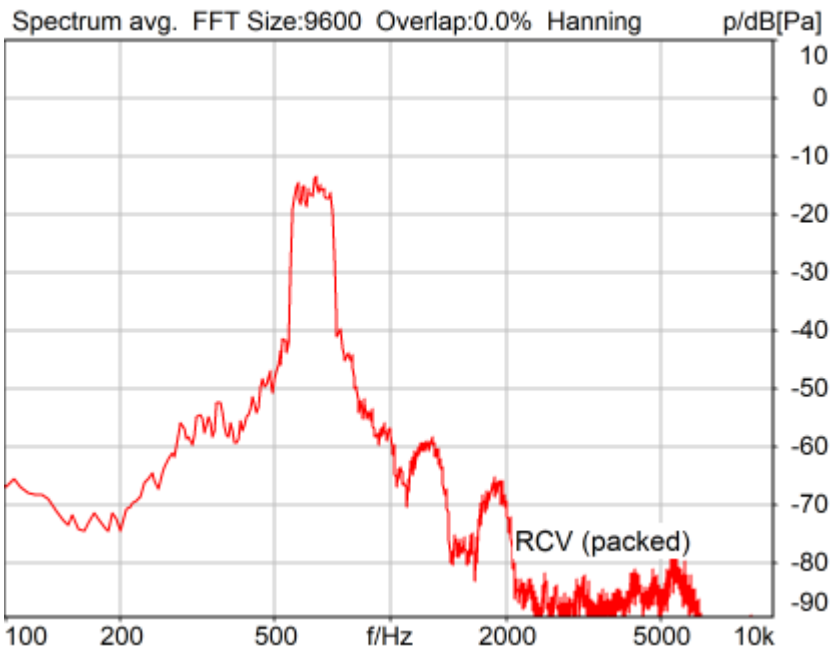
2025/2/10 12:42 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.89 dB (2.85%) Ok

Ok

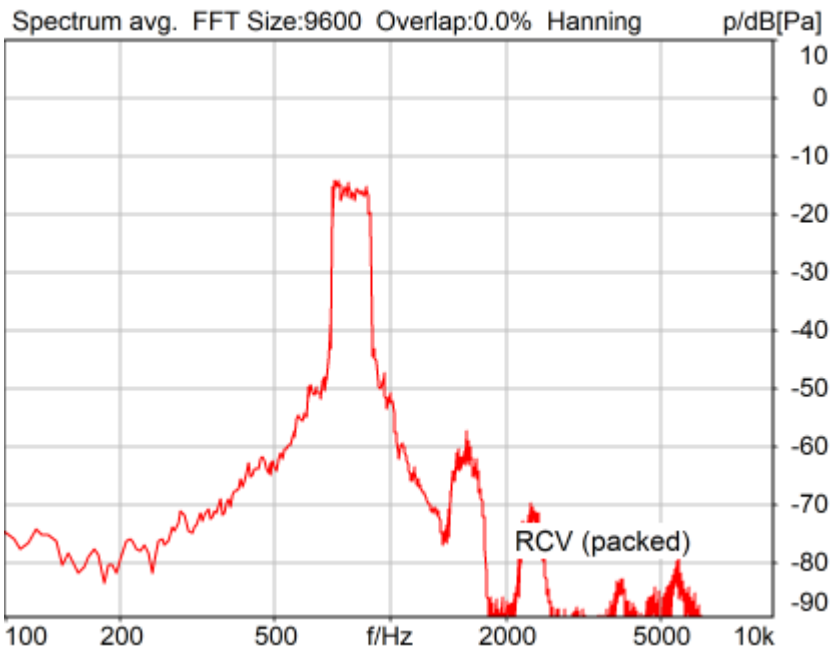
2025/2/10 12:42 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.44 dB (1.90%) Ok

Ok

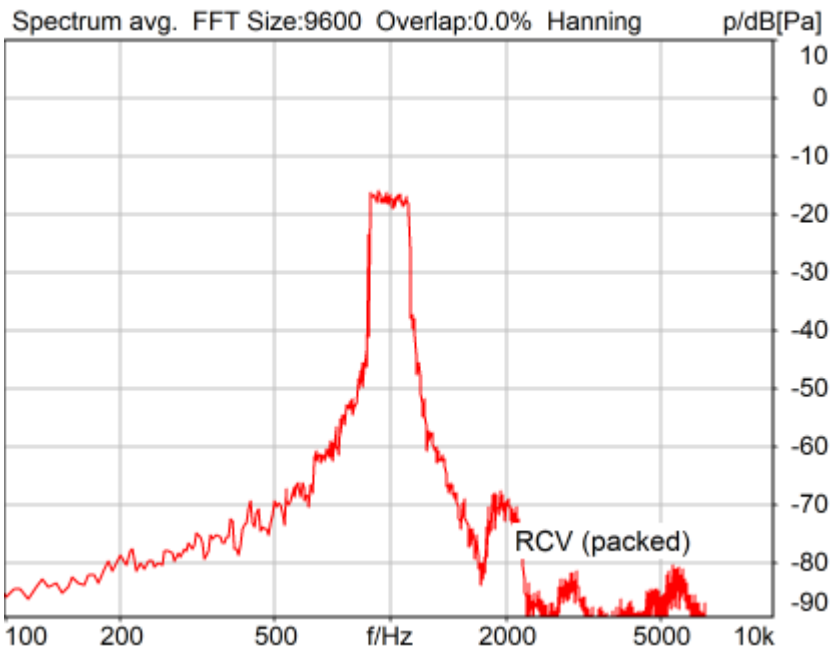
2025/2/10 12:42 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.66 dB (2.33%) Ok

Ok

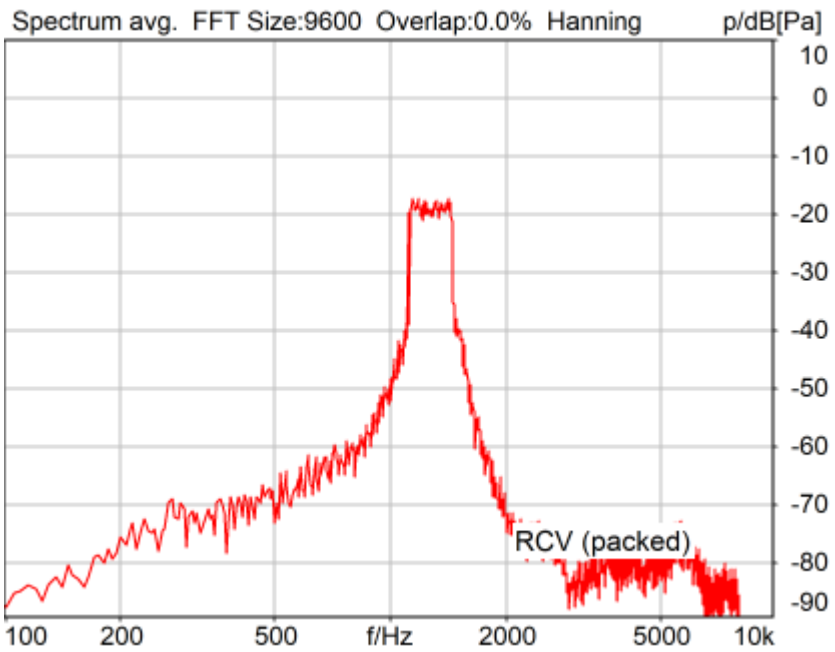
2025/2/10 12:43 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 23.66 dB (6.56%) Ok

Ok

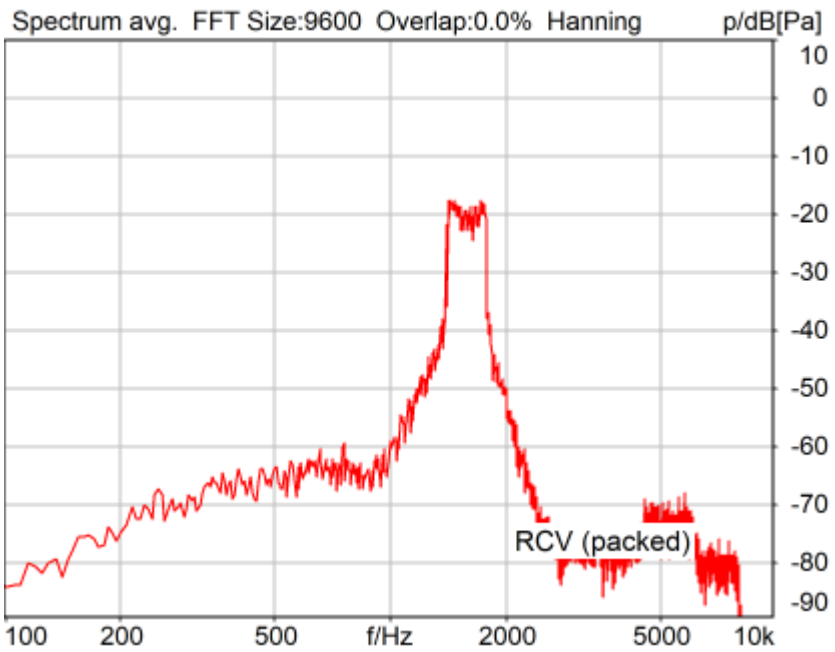
2025/2/10 12:43 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 24.85 dB (5.72%) Ok

Ok

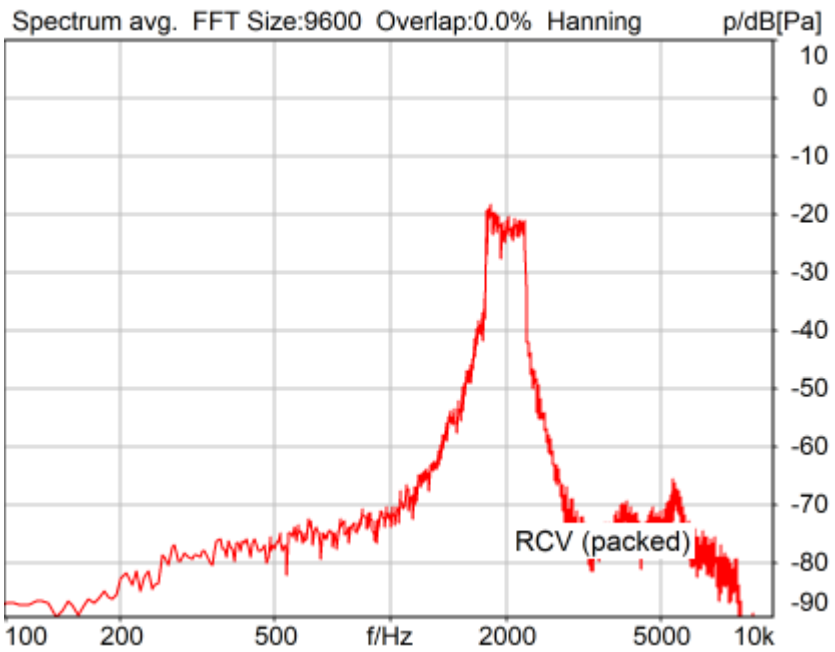
2025/2/10 12:44 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 21.87 dB (8.06%) Ok

Ok

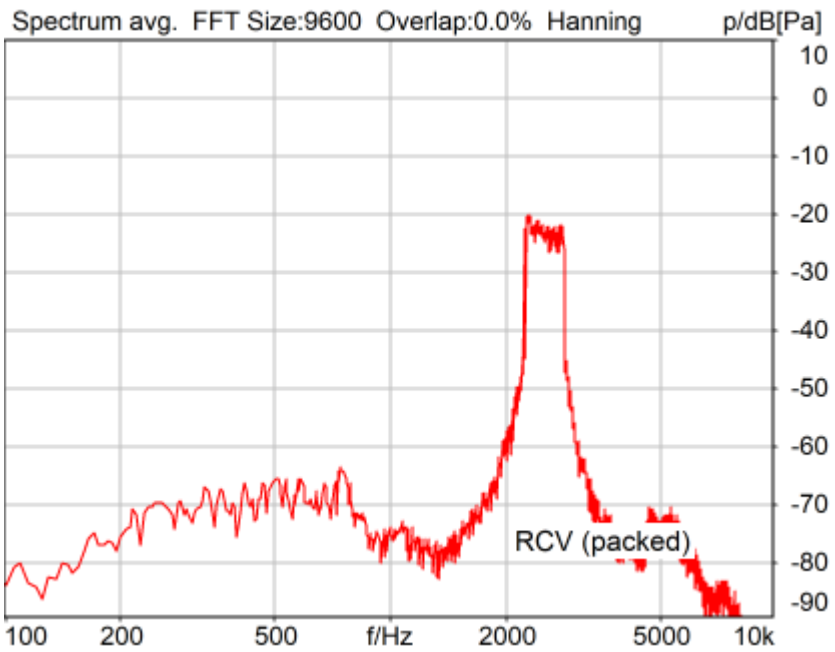
2025/2/10 12:44 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 28.96 dB (3.56%) Ok

Ok

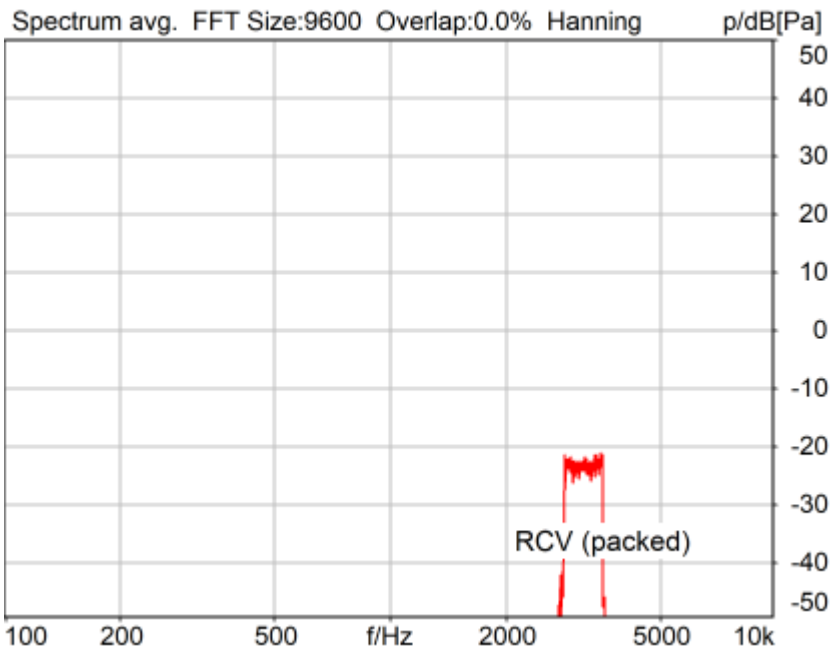
2025/2/10 12:45 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.82 dB (2.88%) Ok

Ok

2025/2/10 12:45 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N

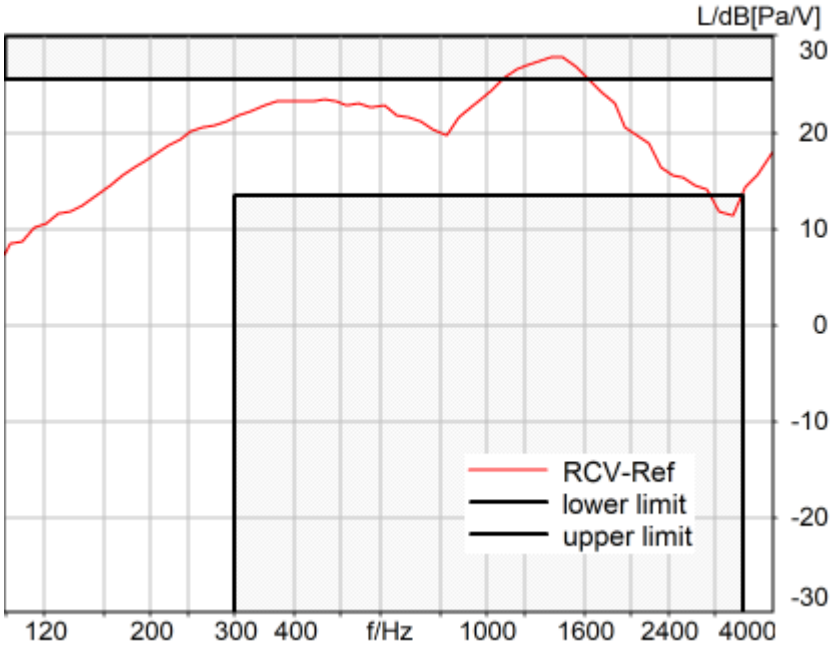
Region	Frequency	SDNR
1	400Hz	33.48 dB
2	500Hz	32.54 dB
3	630Hz	30.89 dB
4	800Hz	34.44 dB
5	1000Hz	32.66 dB
6	1250Hz	23.66 dB
7	1600Hz	24.85 dB
8	2000Hz	21.87 dB
9	2500Hz	28.96 dB
10	3150Hz	30.82 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.87dB at 2000Hz.

2025/2/10 12:45 ACQUA

5.3 Frequency Response 8N FF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
-2.19 dB at 1447.5 Hz Not Ok

Not Ok

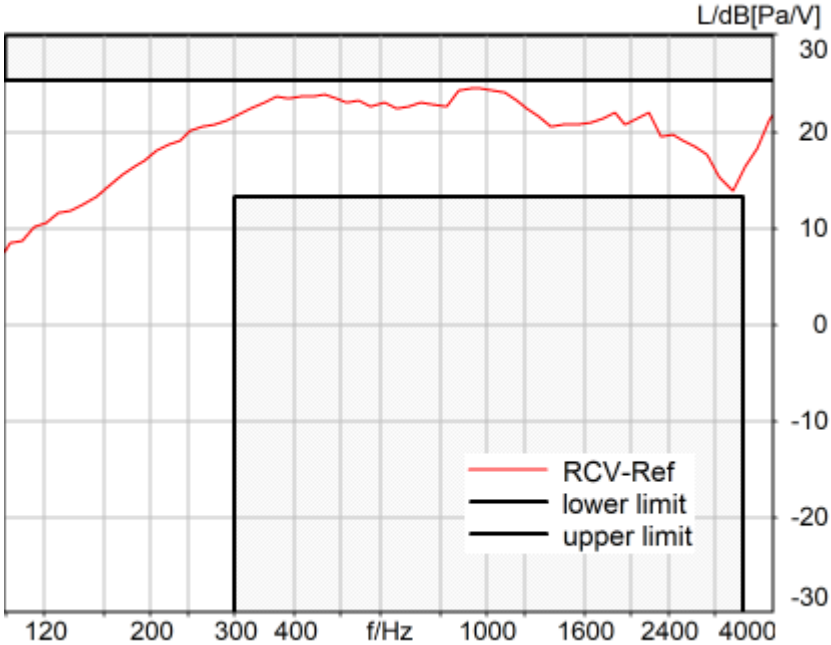
2025/2/10 12:49 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 8N DF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
0.64 dB at 974.0 Hz Ok

Ok

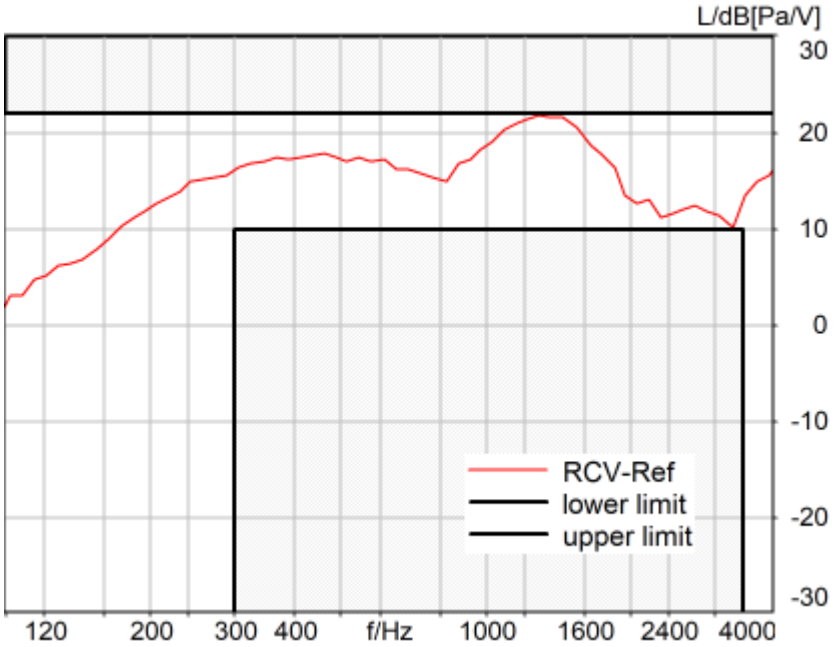
2025/2/10 12:48 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N FF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
0.23 dB at 1285.9 Hz Ok

Ok

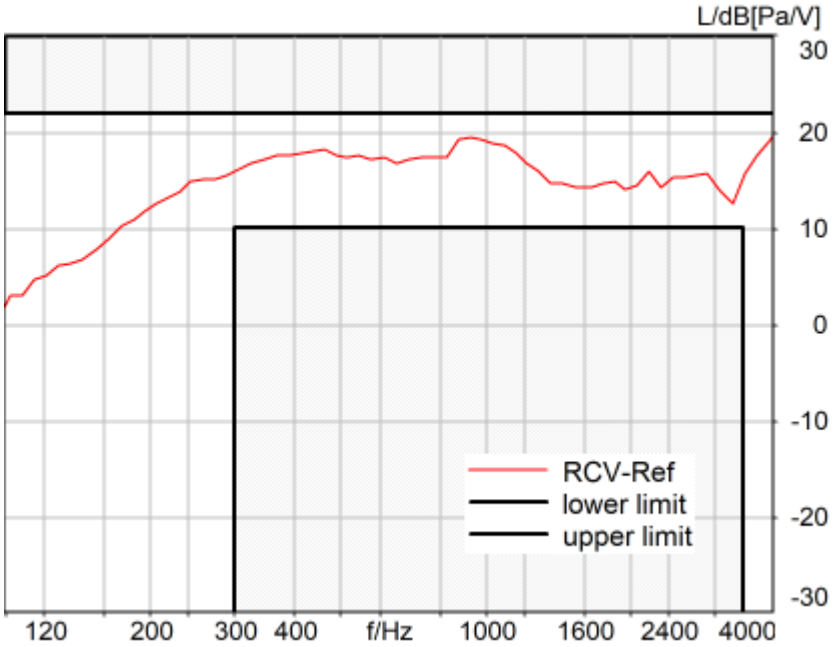
2025/2/10 12:47 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N DF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
2.66 dB at 3245.6 Hz Ok

Ok

2025/2/10 12:47 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

Measurement Protocol

Measurement Object	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 15:19
Responsible Person	audio

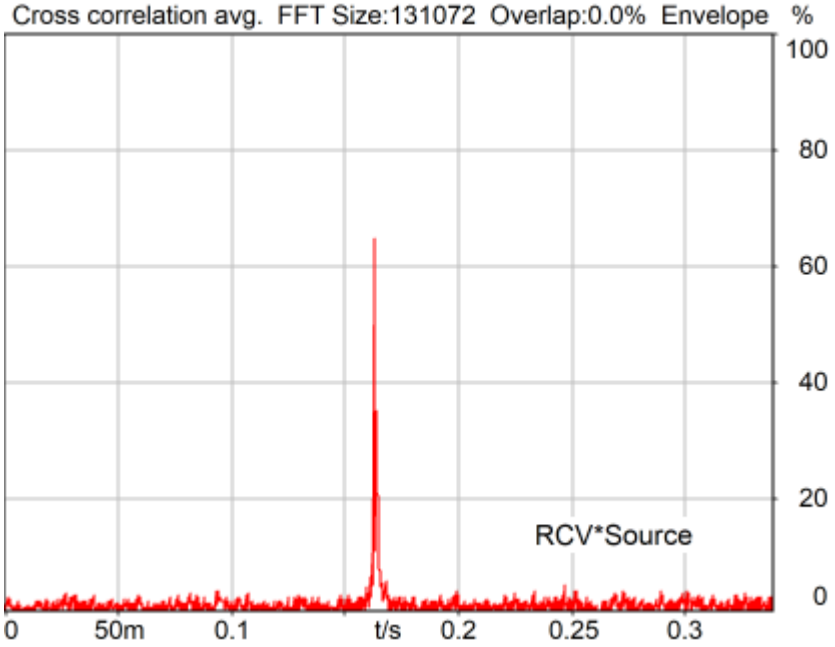
Status Overview

SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay NB	Done	Delay (Cross) [ms]	163.9	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.1a Receive Volume Control Performance 8N NB	Ok	Corrected Speech Level [dB[SPL]]	22.06	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 400 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.67	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.35	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 630 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.70	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 800 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.88	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 1000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.35	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 1250 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	23.03	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 1600 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.72	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 2000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	22.96	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 2500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.27	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.2 RCV Distortion and Noise - 3150 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	28.92	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	22.96	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2
5.3 Frequency Response 8N DF HANB	Ok	Min. dist. to tolerance scheme [dB], 1088.7 Hz	0.89	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS NB 24.4kbps_CH167300_Sample2

Overall Receive Delay NB 4
5.1a Receive Volume Control Performance 8N NB 4
5.2 RCV Distortion and Noise - 400 Hz NB 5
5.2 RCV Distortion and Noise - 500 Hz NB 6
5.2 RCV Distortion and Noise - 630 Hz NB 7
5.2 RCV Distortion and Noise - 800 Hz NB 8
5.2 RCV Distortion and Noise - 1000 Hz NB 9
5.2 RCV Distortion and Noise - 1250 Hz NB 10
5.2 RCV Distortion and Noise - 1600 Hz NB 11
5.2 RCV Distortion and Noise - 2000 Hz NB 12
5.2 RCV Distortion and Noise - 2500 Hz NB 13
5.2 RCV Distortion and Noise - 3150 Hz NB 14
Report - Receive Distortion and Noise (Conversational Gain) 15
5.3 Frequency Response 8N DF HANB 16

Overall Receive Delay NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ Preparation - Delay measurement

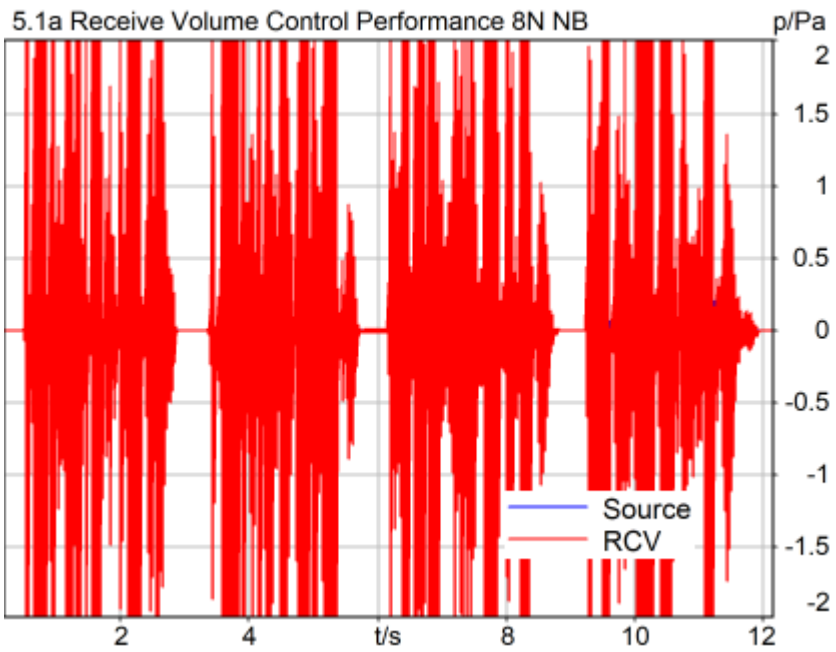


Channel	Delay
RCV*Source	163.9 ms

2025/3/18 14:53 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

5.1a Receive Volume Control Performance 8N NB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	92.06 dB[SPL]	84.22%	22.06 dB[SPL]	Ok

Ok

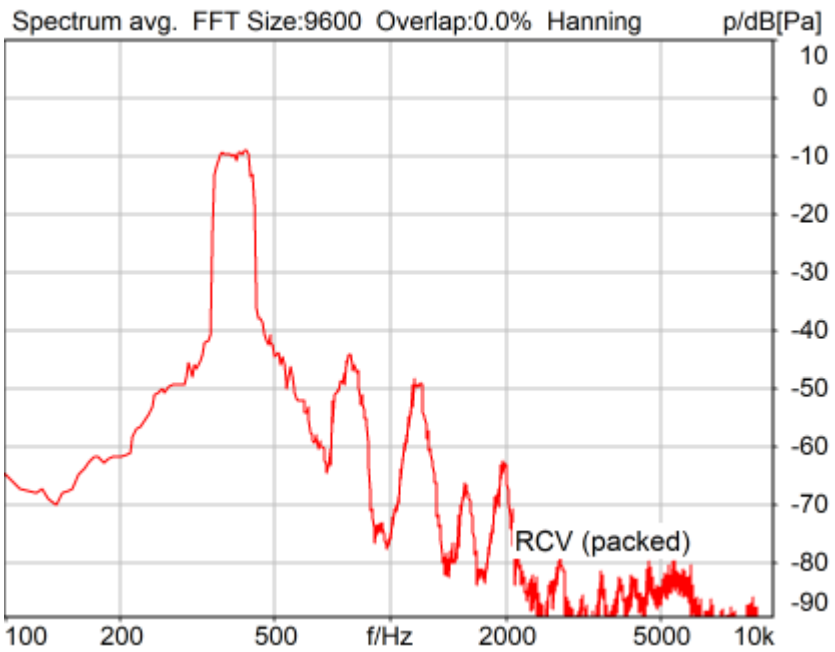
2025/3/18 14:53 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 400 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.67 dB (2.33%) Ok

Ok

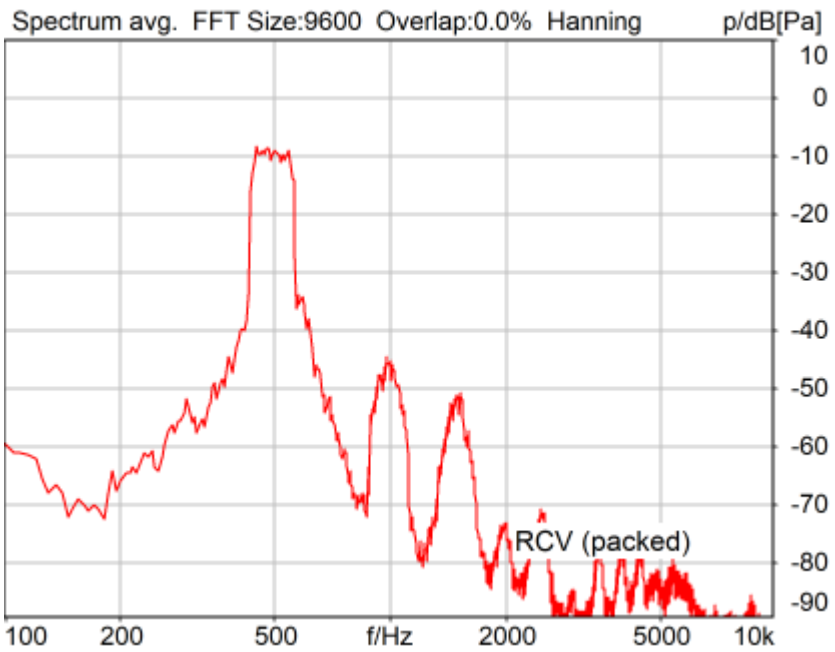
2025/3/18 14:54 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.35 dB (2.41%) Ok

Ok

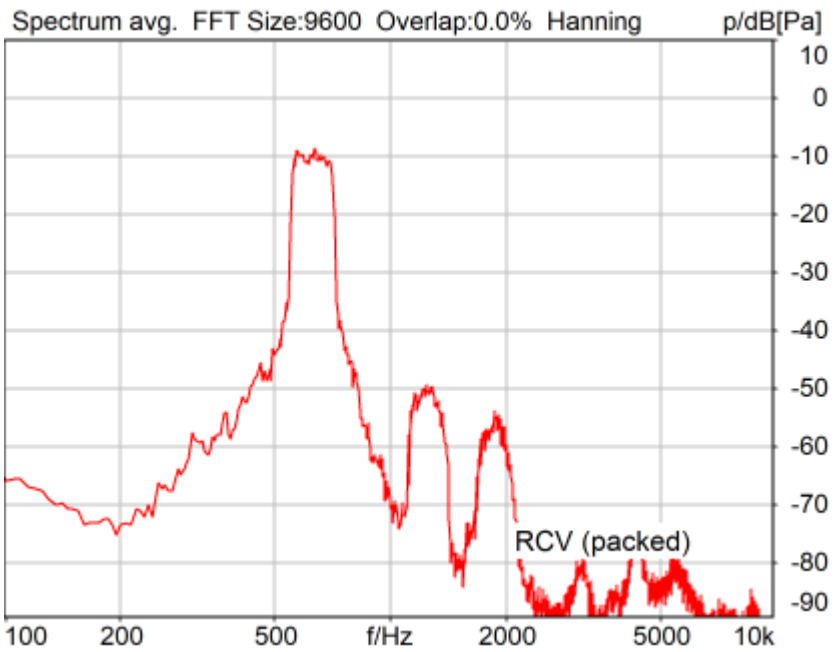
2025/3/18 14:54 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.70 dB (2.07%) Ok

Ok

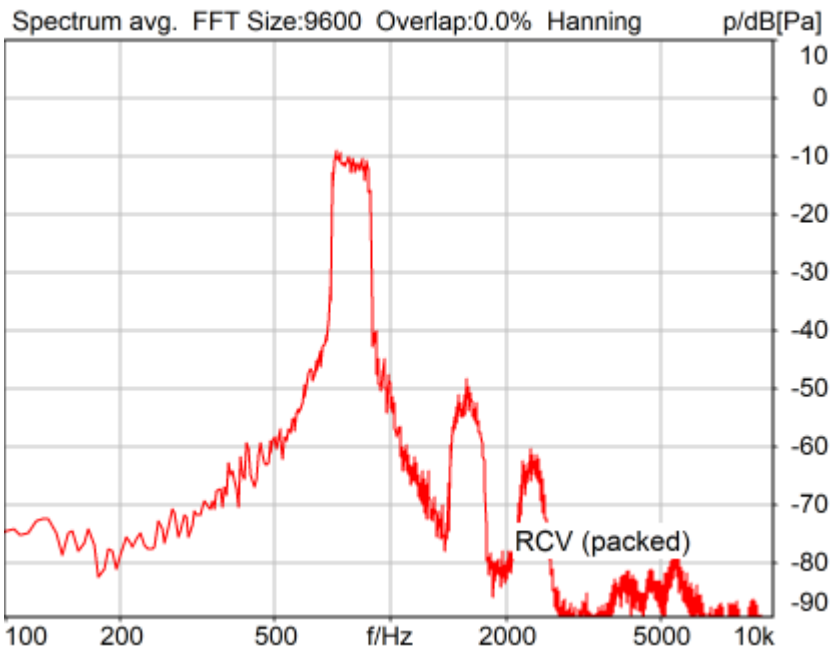
2025/3/18 14:55 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.88 dB (1.80%) Ok

Ok

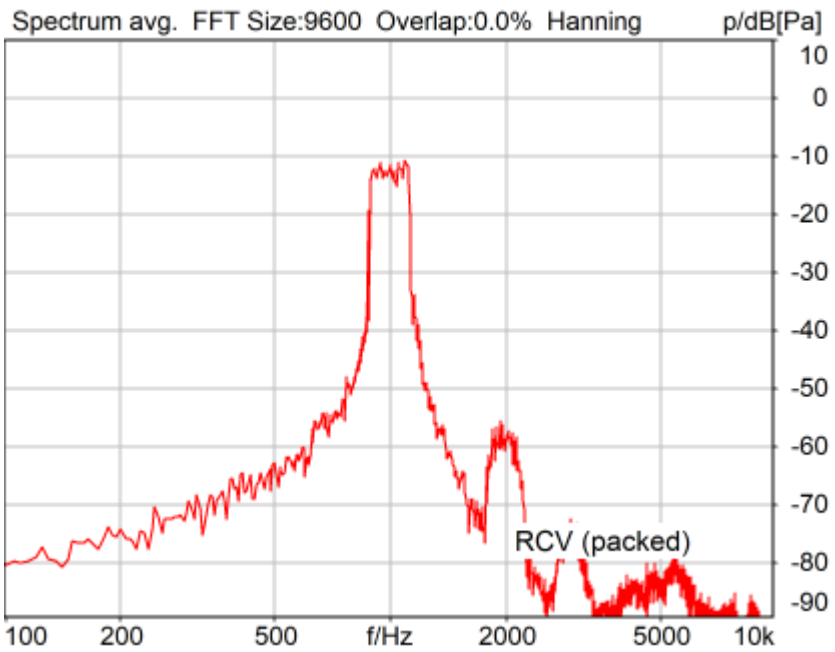
2025/3/18 14:55 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.35 dB (2.41%) Ok

Ok

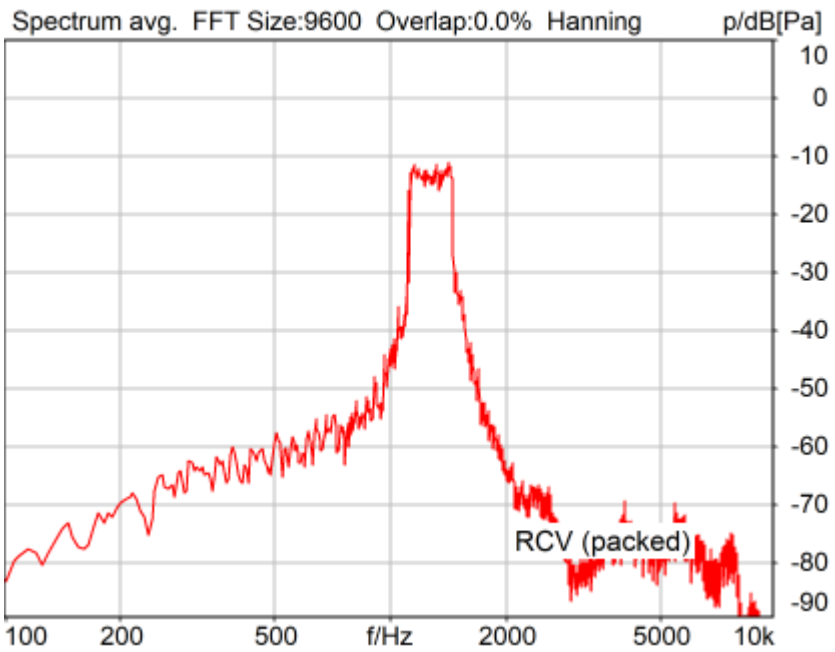
2025/3/18 14:56 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.03 dB (7.06%) Ok

Ok

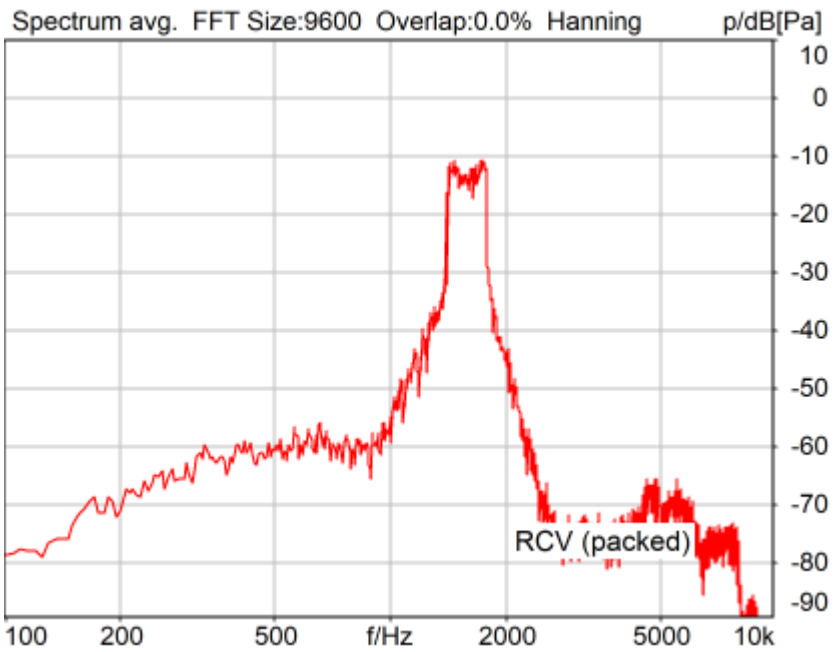
2025/3/18 14:56 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.72 dB (5.81%) Ok

Ok

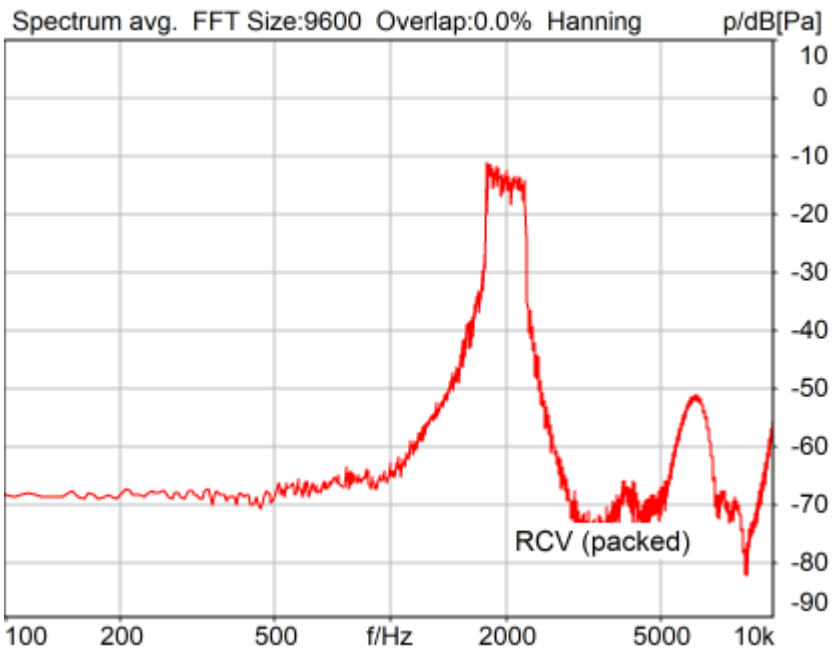
2025/3/18 14:56 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 22.96 dB (7.11%) Ok

Ok

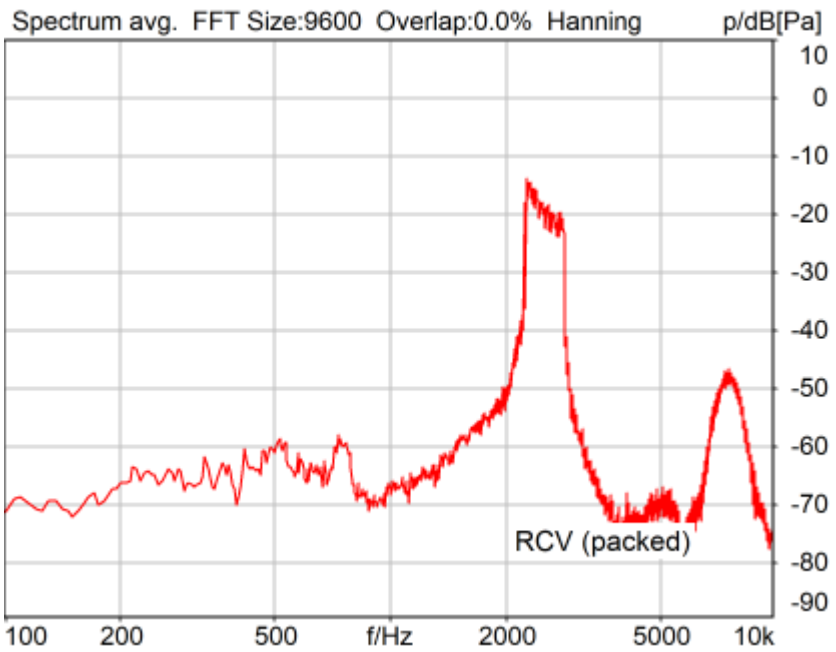
2025/3/18 14:57 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.27 dB (6.12%) Ok

Ok

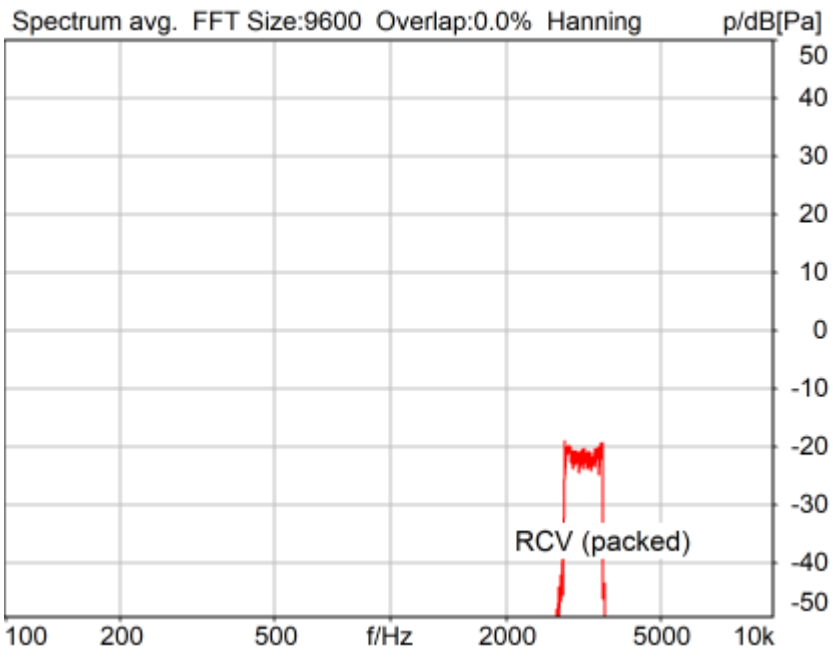
2025/3/18 14:57 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 28.92 dB (3.58%) Ok

Ok

2025/3/18 14:58 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N

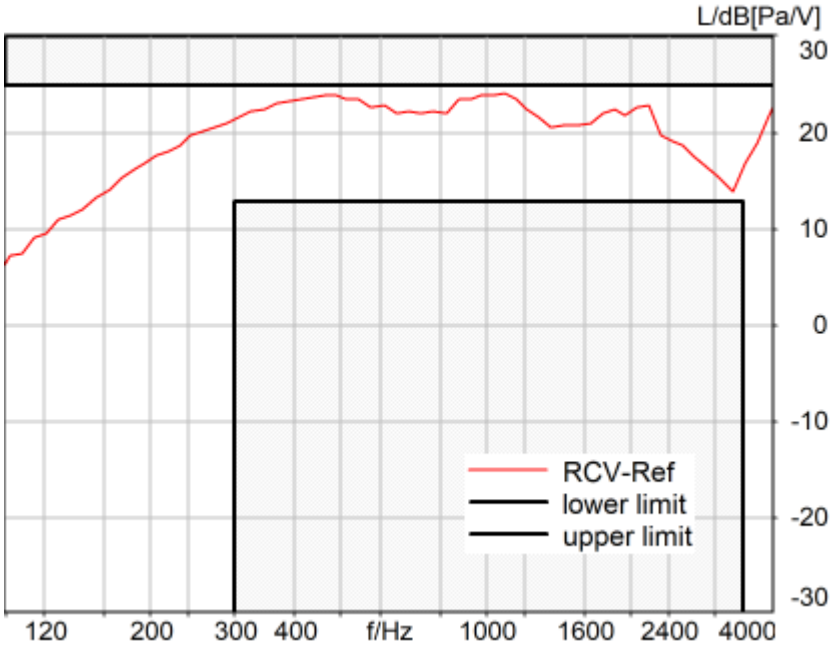
Region	Frequency	SDNR
1	400Hz	32.67 dB
2	500Hz	32.35 dB
3	630Hz	33.70 dB
4	800Hz	34.88 dB
5	1000Hz	32.35 dB
6	1250Hz	23.03 dB
7	1600Hz	24.72 dB
8	2000Hz	22.96 dB
9	2500Hz	24.27 dB
10	3150Hz	28.92 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 22.96dB at 2000Hz.

2025/3/18 14:59 ACQUA

5.3 Frequency Response 8N DF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
0.89 dB at 1088.7 Hz Ok

Ok

2025/3/18 15:01 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

Measurement Protocol

Measurement Object	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 15:18
Responsible Person	audio

Status Overview

SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay WB	Done	Delay (Cross) [ms]	141.2	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.1a Receive Volume Control Performance 8N WB	Ok	Corrected Speech Level [dB[SPL]]	21.94	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.1b Receive Volume Control Performance 2N WB	Ok	Corrected Speech Level [dB[SPL]]	16.03	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	27.62	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 315 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	31.39	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 400 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.04	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.05	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 630 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.82	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 800 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.10	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.78	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	22.80	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1600 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.53	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 2000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	21.54	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 2500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.78	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 3150 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	27.98	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 4000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.35	HUHAO_2403_n5_DFT-QPSK20M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and	Ok	Distortion (Noise)	28.65	HUHAO_2403_n5_DFT-QPSK20

Noise - 5000 Hz WB		[dB], 0.0 dB		M_1_1_EVS WB 24.4kbps_CH167300
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.54	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	28.27	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 315 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	30.48	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 400 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.08	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	31.75	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 630 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.38	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 800 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.45	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.28	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.49	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 1600 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.49	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 2000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	21.50	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 2500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	29.27	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 3150 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	30.33	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 4000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	27.96	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.2 RCV Distortion and Noise - 5000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.84	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.50	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.3 Frequency Response 8N DF	Ok	Min. dist. to tolerance scheme [dB], 5443.6 Hz	0.65	HUHAO_2403_n5_DFT-QPSK20 M_1_1_EVS WB 24.4kbps_CH167300
5.3 Frequency Response	Ok	Min. dist. to tolerance	1.45	HUHAO_2403_n5_DFT-QPSK20

2N DF		scheme [dB], 5443.6 Hz		M_1_1_EVS WB 24.4kbps_CH167300

Overall Receive Delay WB 6
5.1a Receive Volume Control Performance 8N WB 6
5.1b Receive Volume Control Performance 2N WB 7
5.2 RCV Distortion and Noise - 250 Hz WB 8
5.2 RCV Distortion and Noise - 315 Hz WB 9
5.2 RCV Distortion and Noise - 400 Hz WB 10
5.2 RCV Distortion and Noise - 500 Hz WB 11
5.2 RCV Distortion and Noise - 630 Hz WB 12
5.2 RCV Distortion and Noise - 800 Hz WB 13
5.2 RCV Distortion and Noise - 1000 Hz WB 14
5.2 RCV Distortion and Noise - 1250 Hz WB 15
5.2 RCV Distortion and Noise - 1600 Hz WB 16
5.2 RCV Distortion and Noise - 2000 Hz WB 17
5.2 RCV Distortion and Noise - 2500 Hz WB 18
5.2 RCV Distortion and Noise - 3150 Hz WB 19
5.2 RCV Distortion and Noise - 4000 Hz WB 20
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5.2 RCV Distortion and Noise - 250 Hz WB 23
5.2 RCV Distortion and Noise - 315 Hz WB 24
5.2 RCV Distortion and Noise - 400 Hz WB 24
5.2 RCV Distortion and Noise - 500 Hz WB 25
5.2 RCV Distortion and Noise - 630 Hz WB 26
5.2 RCV Distortion and Noise - 800 Hz WB 27
5.2 RCV Distortion and Noise - 1000 Hz WB 28
5.2 RCV Distortion and Noise - 1250 Hz WB 29
5.2 RCV Distortion and Noise - 1600 Hz WB 30
5.2 RCV Distortion and Noise - 2000 Hz WB 31
5.2 RCV Distortion and Noise - 2500 Hz WB 32
5.2 RCV Distortion and Noise - 3150 Hz WB 33
5.2 RCV Distortion and Noise - 4000 Hz WB 34
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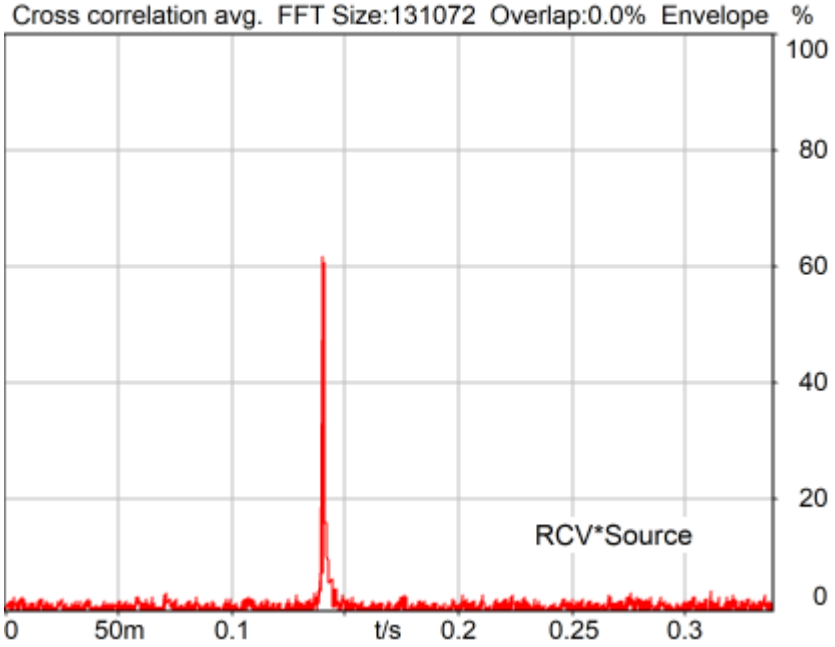
5.3 Frequency Response 8N DF 37
5.3 Frequency Response 2N DF 38

Overall Receive Delay WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ Preparation - Delay measurement

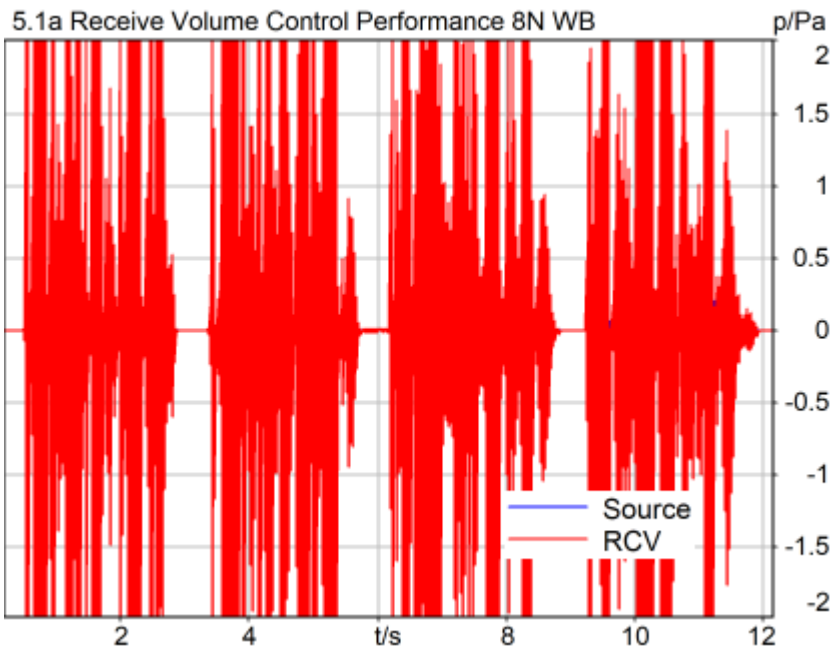


Channel	Delay
RCV*Source	141.2 ms

2025/2/10 13:16 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

5.1a Receive Volume Control Performance 8N WB

TIA-5050 (2018-01) \ Measurements \ Wideband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	91.94 dB[SPL]	84.07%	21.94 dB[SPL]	Ok

Ok

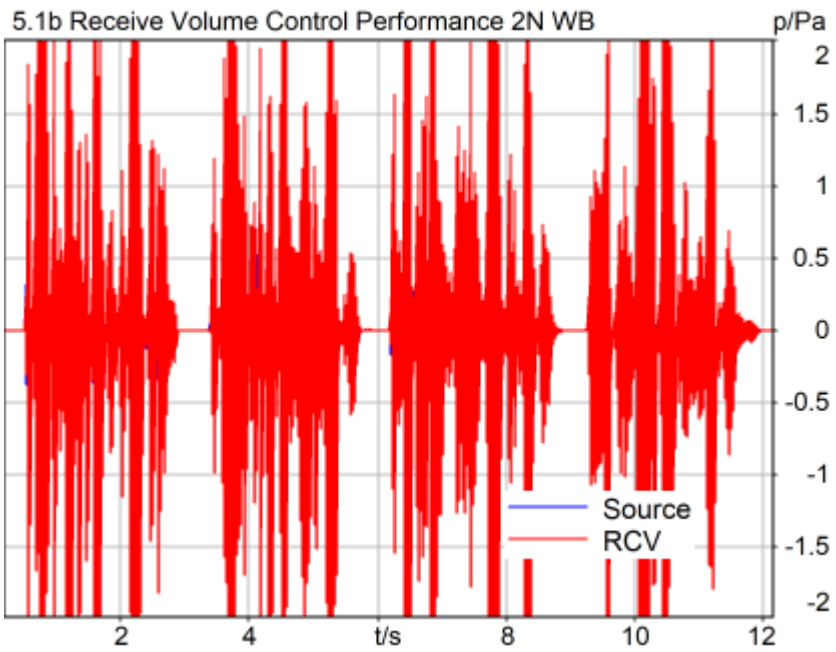
2025/2/10 13:16 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.1b Receive Volume Control Performance 2N WB

TIA-5050 (2018-01) \ Measurements \ Wideband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	86.03 dB[SPL]	84.12%	16.03 dB[SPL]	Ok

Ok

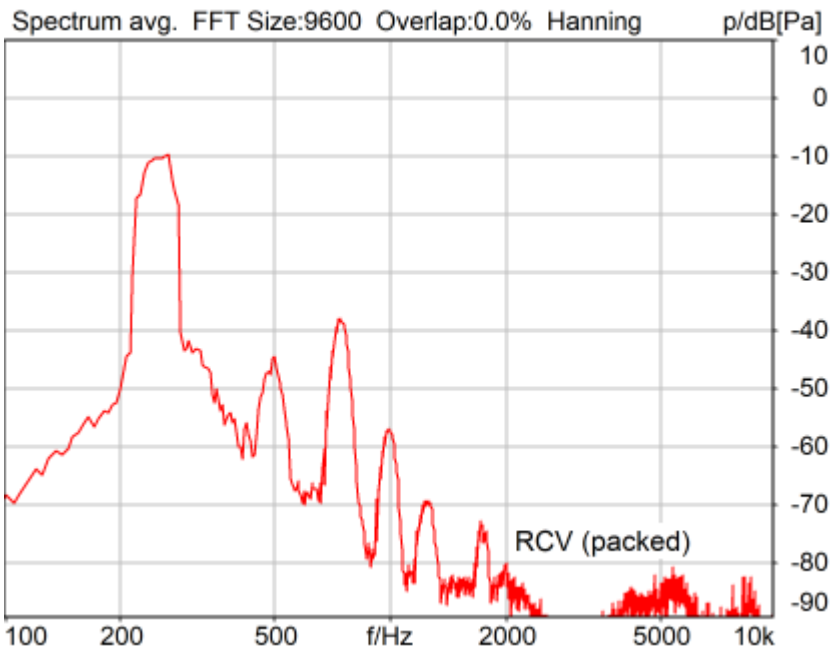
2025/2/10 13:04 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 27.62 dB (4.16%) Ok

Ok

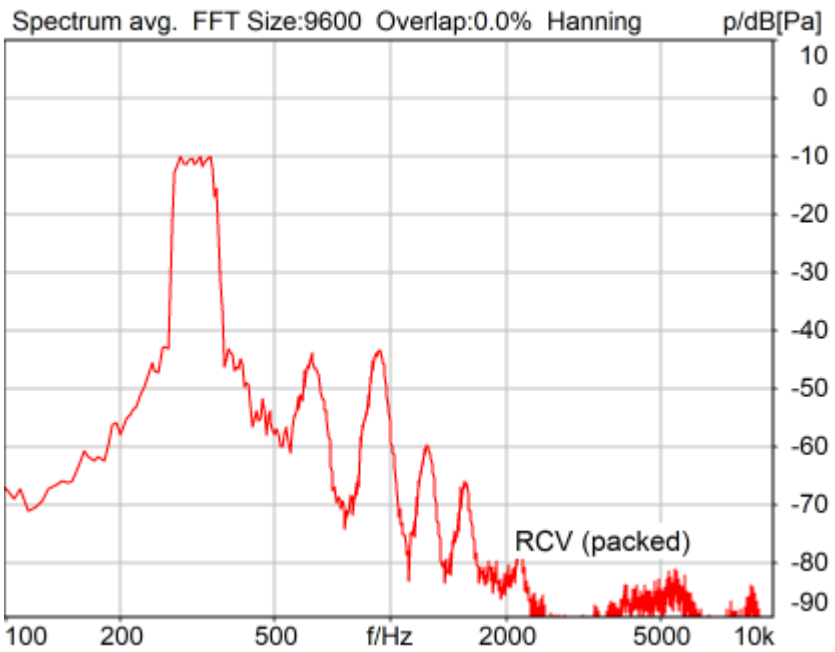
2025/2/10 13:17 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 315 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 31.39 dB (2.70%) Ok

Ok

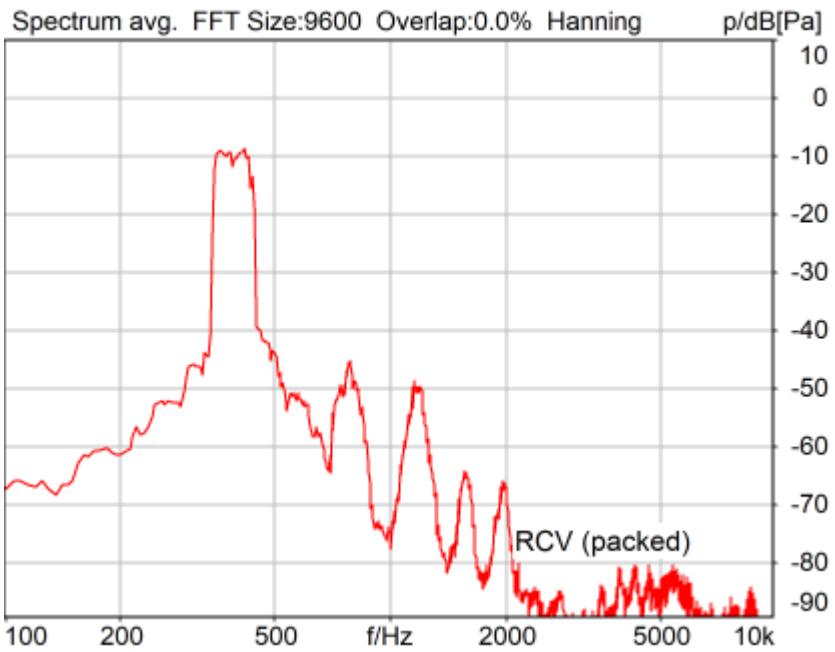
2025/2/10 13:17 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 400 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.04 dB (1.99%) Ok

Ok

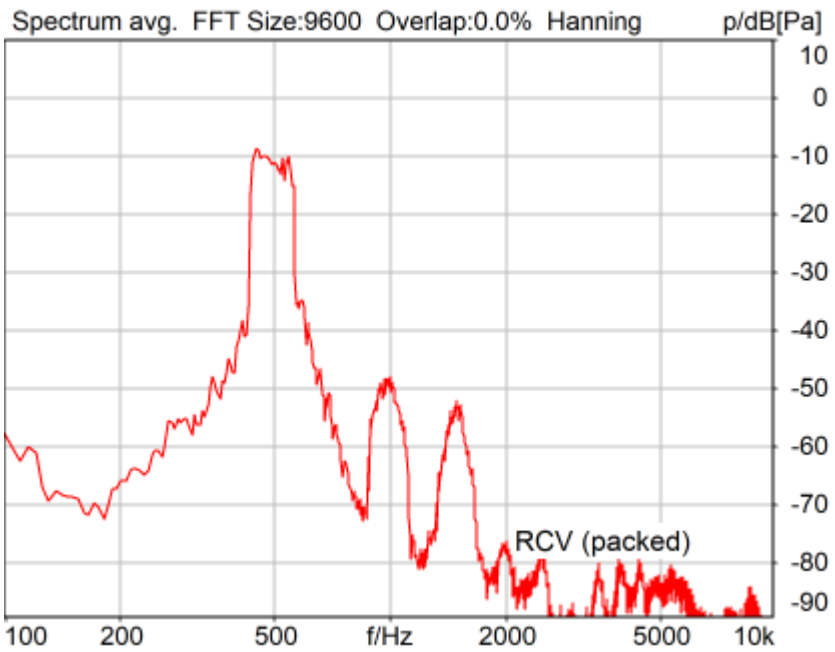
2025/2/10 13:17 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.05 dB (2.23%) Ok

Ok

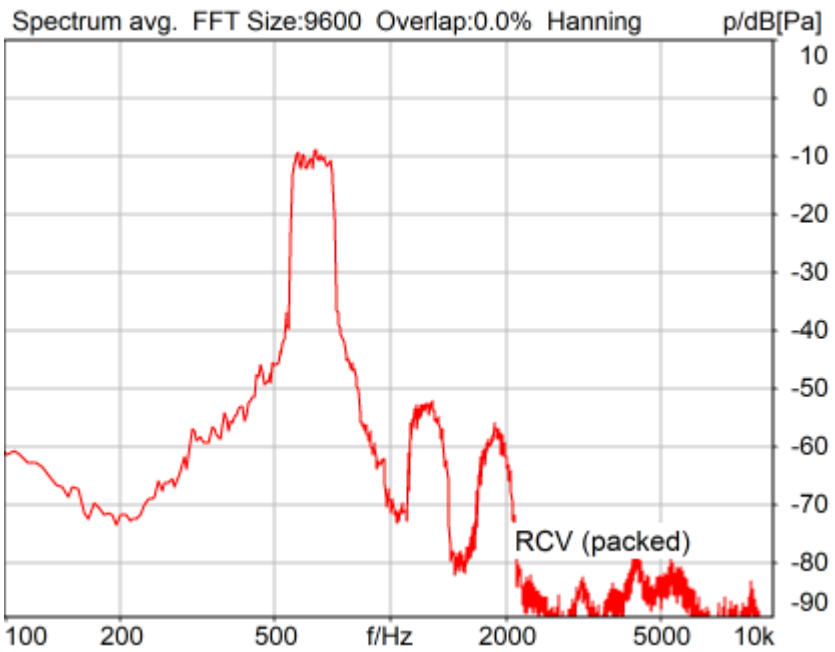
2025/2/10 13:18 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.82 dB (1.82%) Ok

Ok

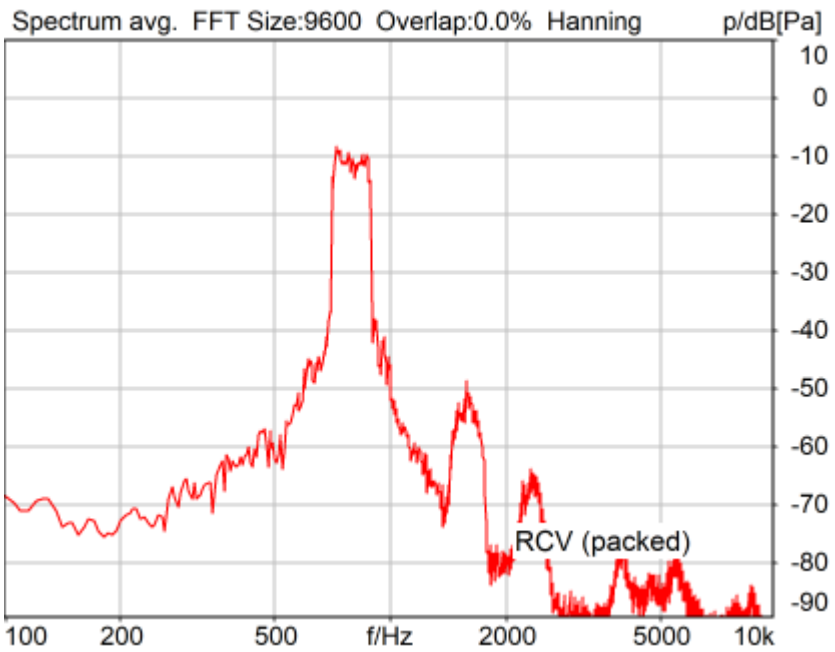
2025/2/10 13:18 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.10 dB (1.97%) Ok

Ok

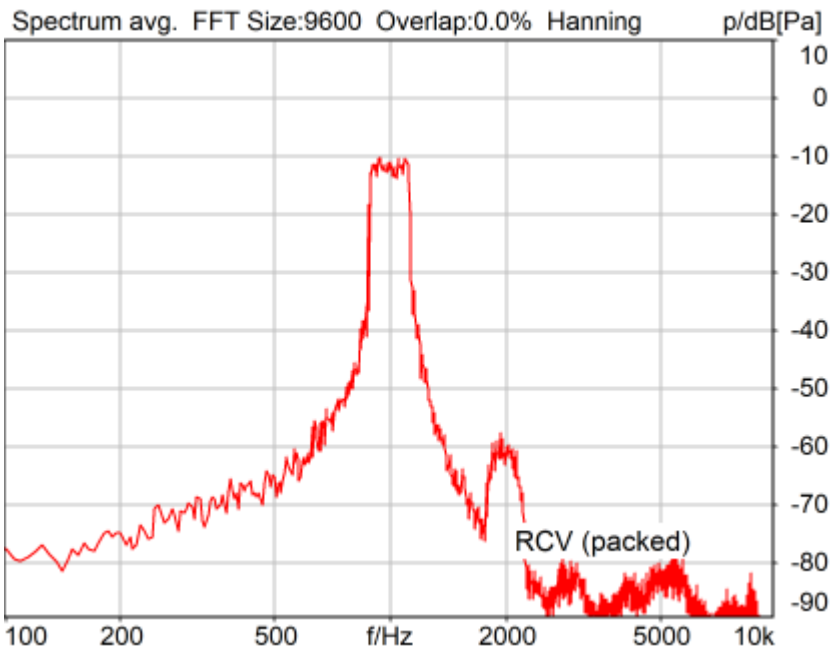
2025/2/10 13:19 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.78 dB (2.30%) Ok

Ok

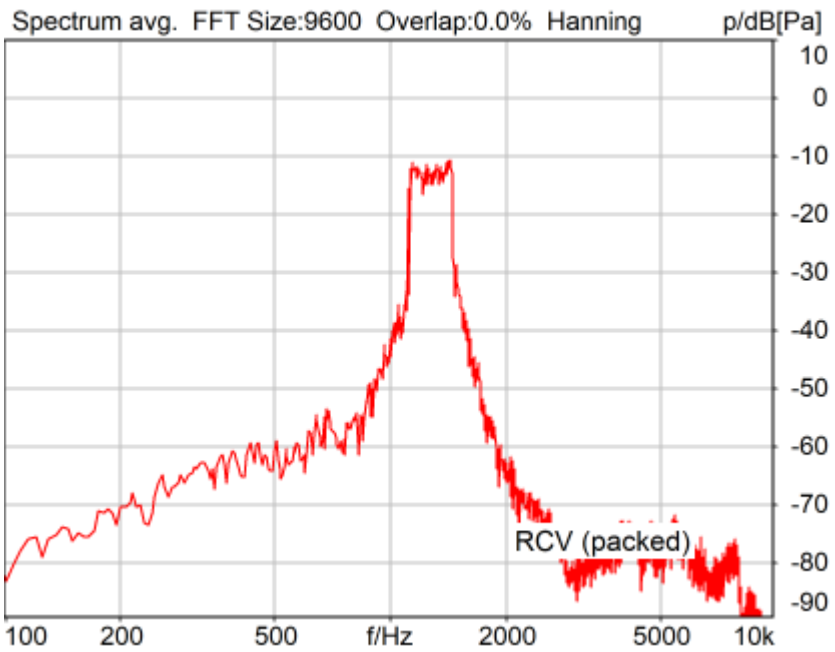
2025/2/10 13:19 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 22.80 dB (7.25%) Ok

Ok

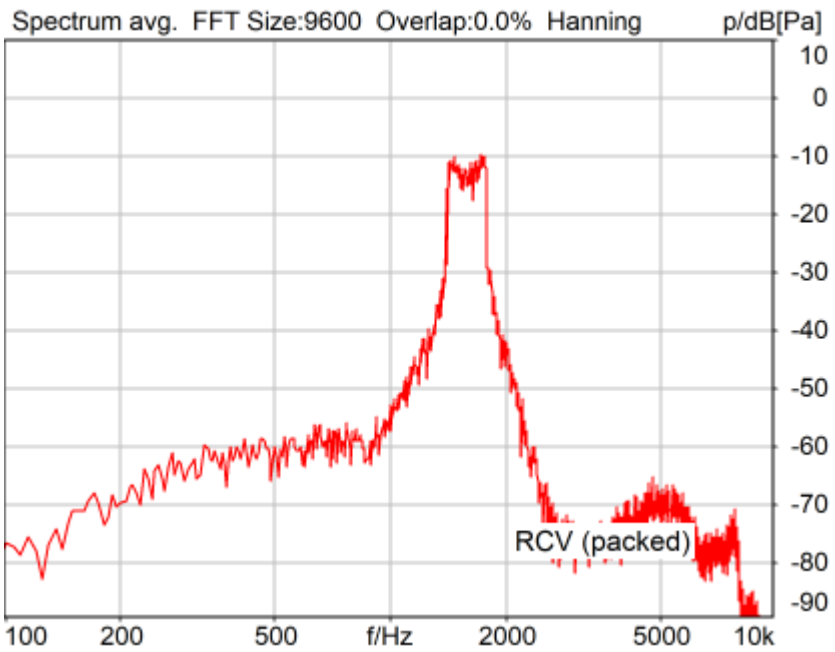
2025/2/10 13:19 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.53 dB (5.93%) Ok

Ok

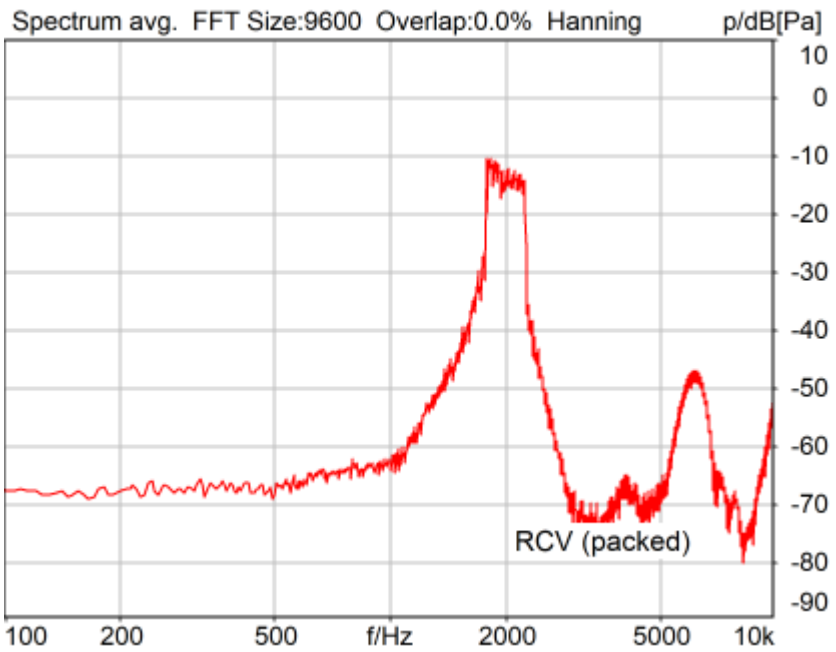
2025/2/10 13:20 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 21.54 dB (8.37%) Ok

Ok

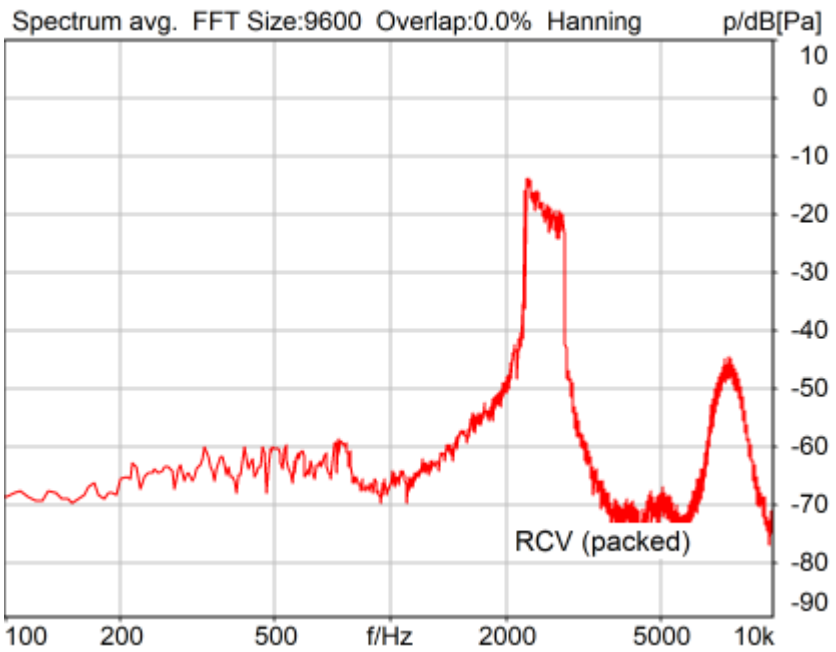
2025/2/10 13:20 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.78 dB (6.47%) Ok

Ok

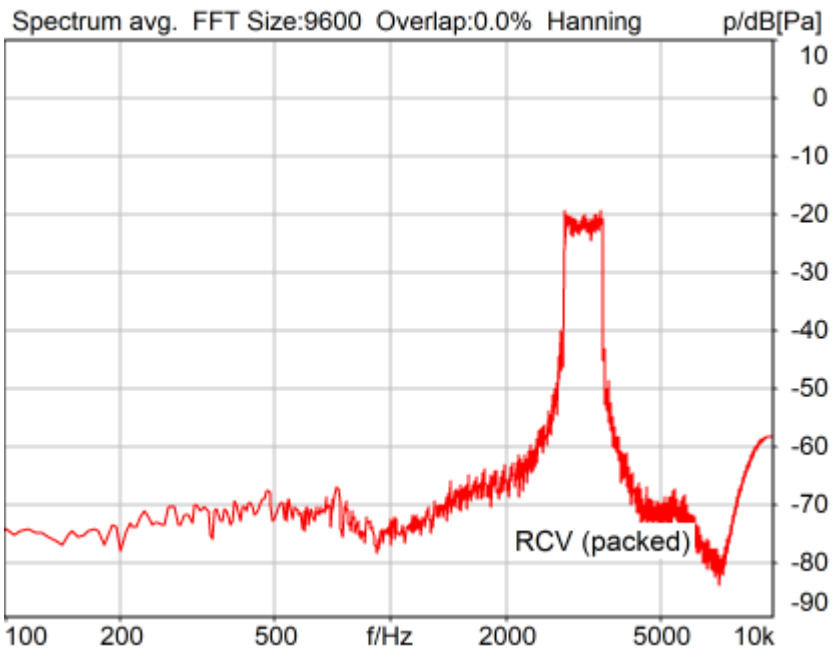
2025/2/10 13:21 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 27.98 dB (3.99%) Ok

Ok

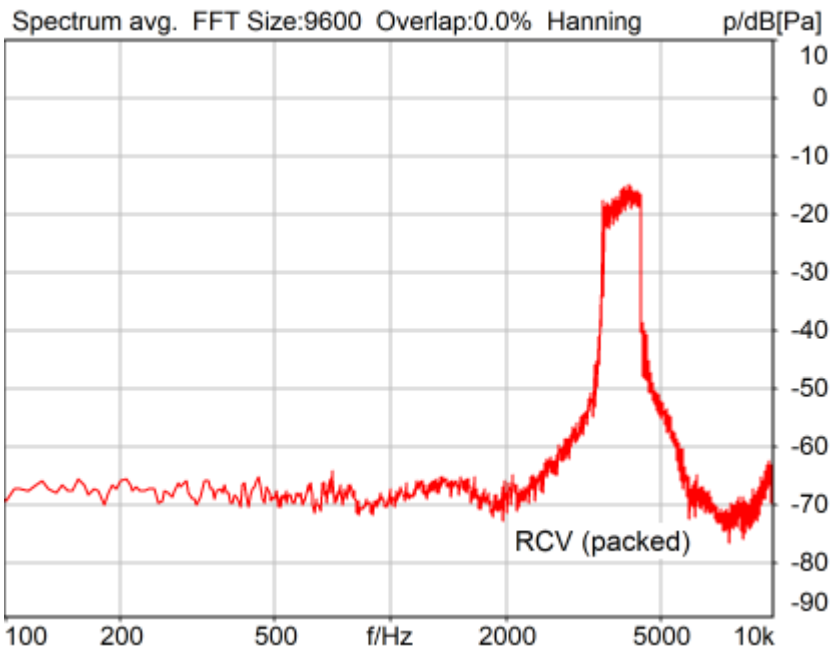
2025/2/10 13:21 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 4000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.35 dB (6.06%) Ok

Ok

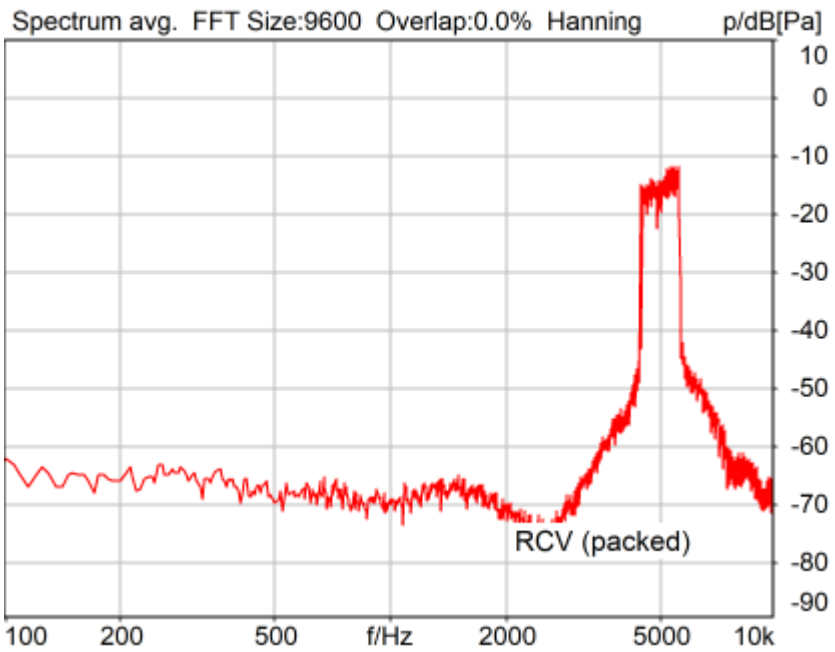
2025/2/10 13:22 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 5000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 28.65 dB (3.69%) Ok

Ok

2025/2/10 13:22 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N

Region	Frequency	SDNR
1	250Hz	27.62 dB
2	315Hz	31.39 dB
3	400Hz	34.04 dB
4	500Hz	33.05 dB
5	630Hz	34.82 dB
6	800Hz	34.10 dB
7	1000Hz	32.78 dB
8	1250Hz	22.80 dB
9	1600Hz	24.53 dB
10	2000Hz	21.54 dB

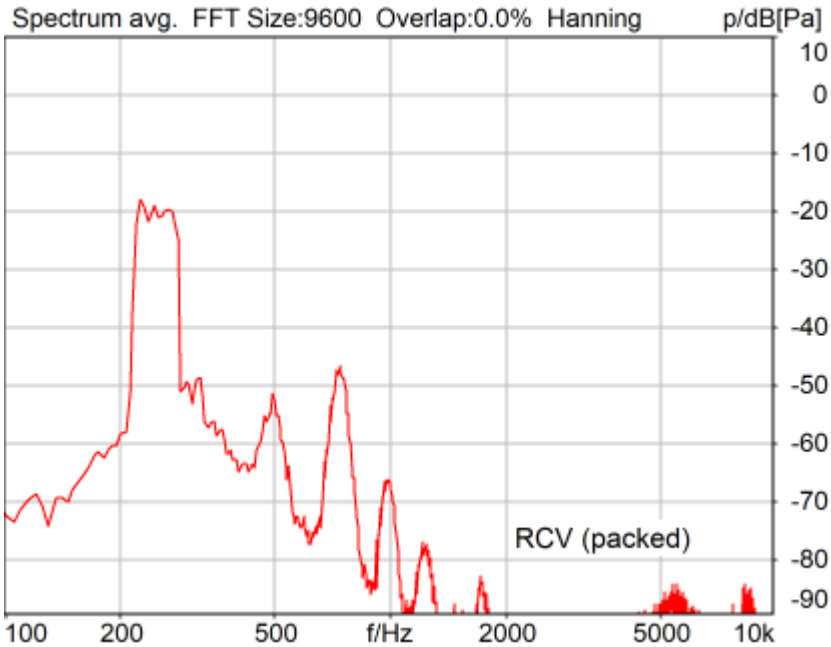
11	2500Hz	23.78 dB
12	3150Hz	27.98 dB
13	4000Hz	24.35 dB
14	5000Hz	28.65 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.54dB at 2000Hz.

2025/2/10 13:22 ACQUA

5.2 RCV Distortion and Noise - 250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 28.27 dB (3.86%) Ok

Ok

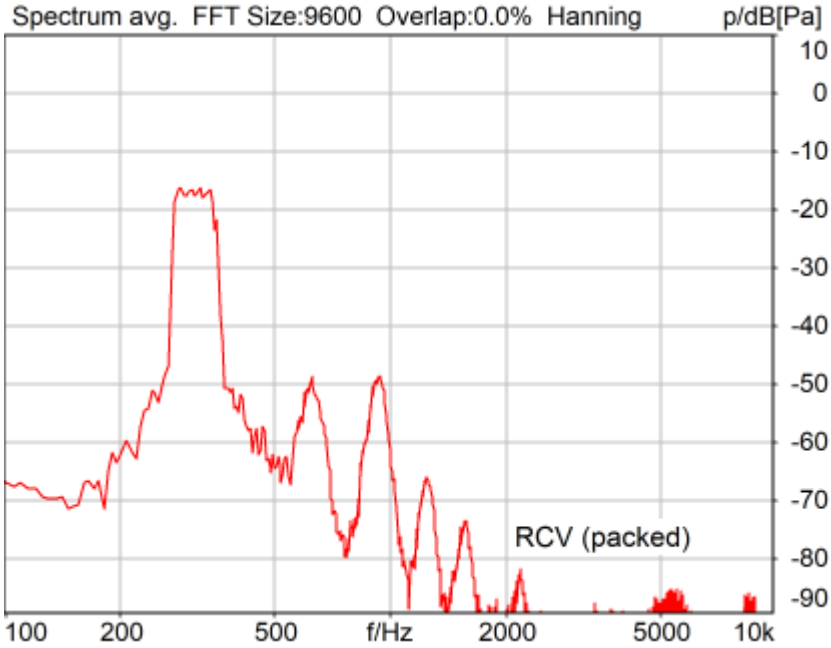
2025/2/10 13:05 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 315 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.48 dB (2.99%) Ok

Ok

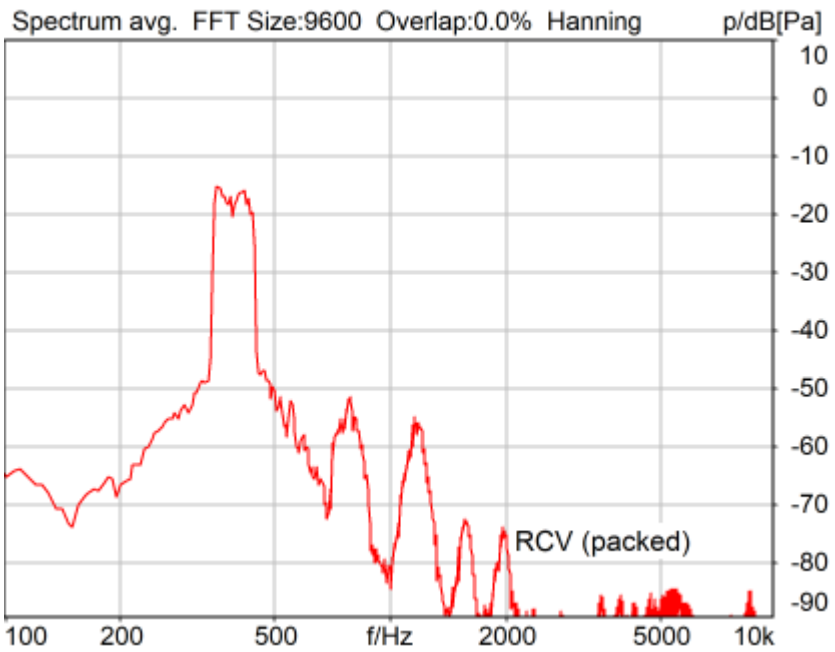
2025/2/10 13:06 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 400 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.08 dB (2.22%) Ok

Ok

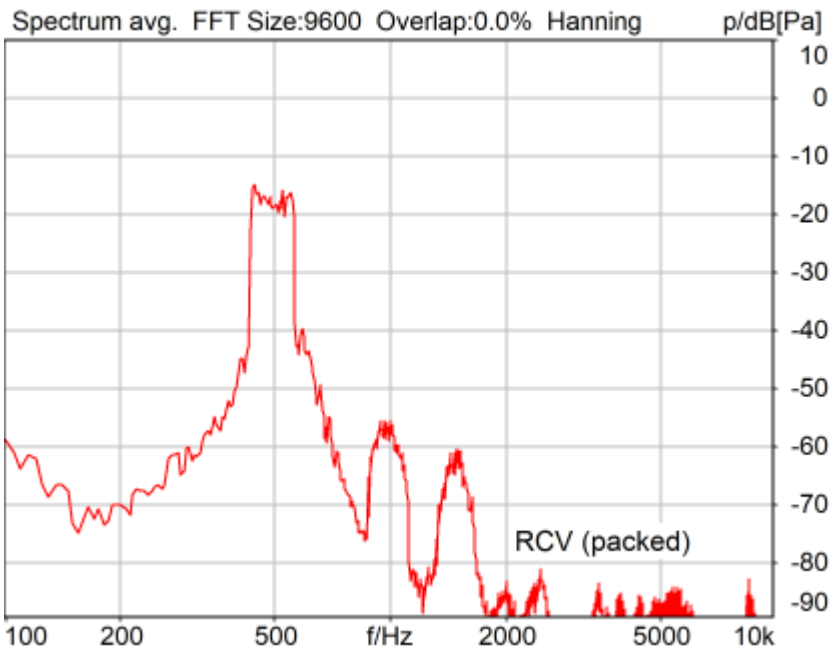
2025/2/10 13:06 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 31.75 dB (2.58%) Ok

Ok

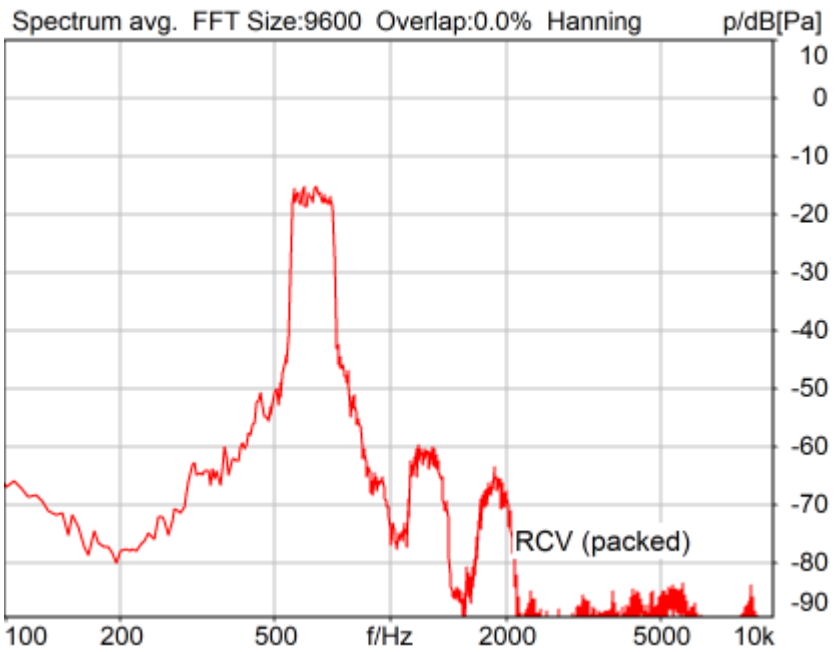
2025/2/10 13:06 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.38 dB (1.91%) Ok

Ok

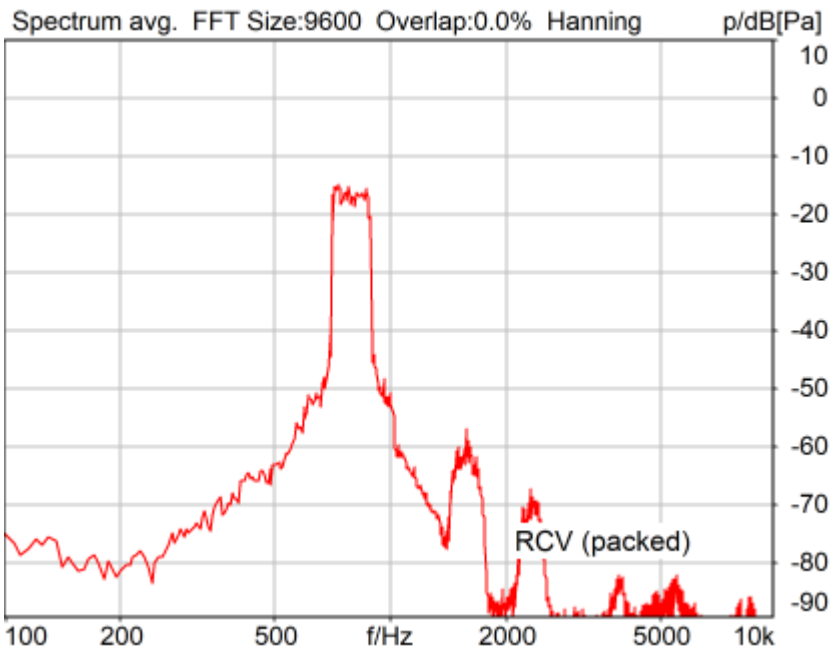
2025/2/10 13:07 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.45 dB (1.90%) Ok

Ok

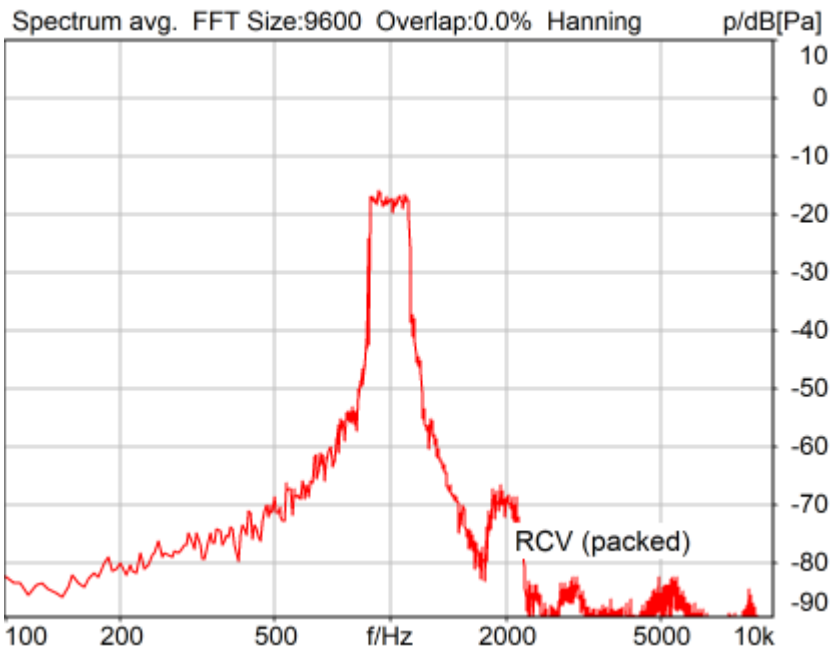
2025/2/10 13:07 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.28 dB (2.43%) Ok

Ok

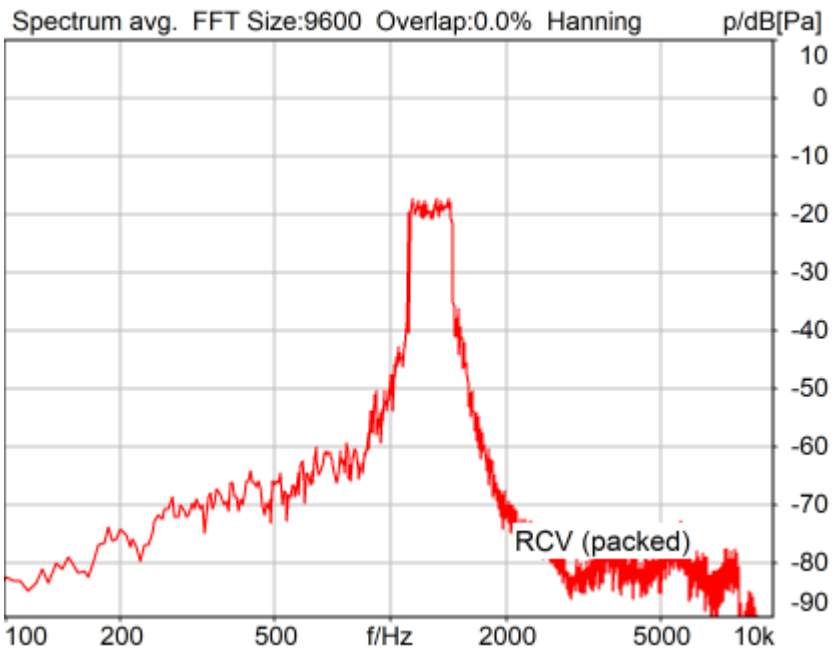
2025/2/10 13:08 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 23.49 dB (6.69%) Ok

Ok

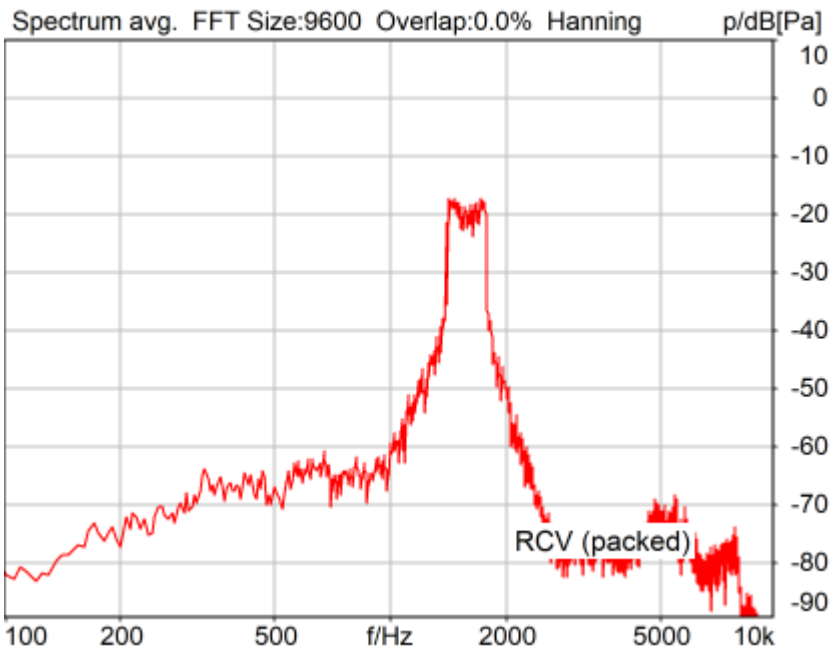
2025/2/10 13:08 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 24.49 dB (5.97%) Ok

Ok

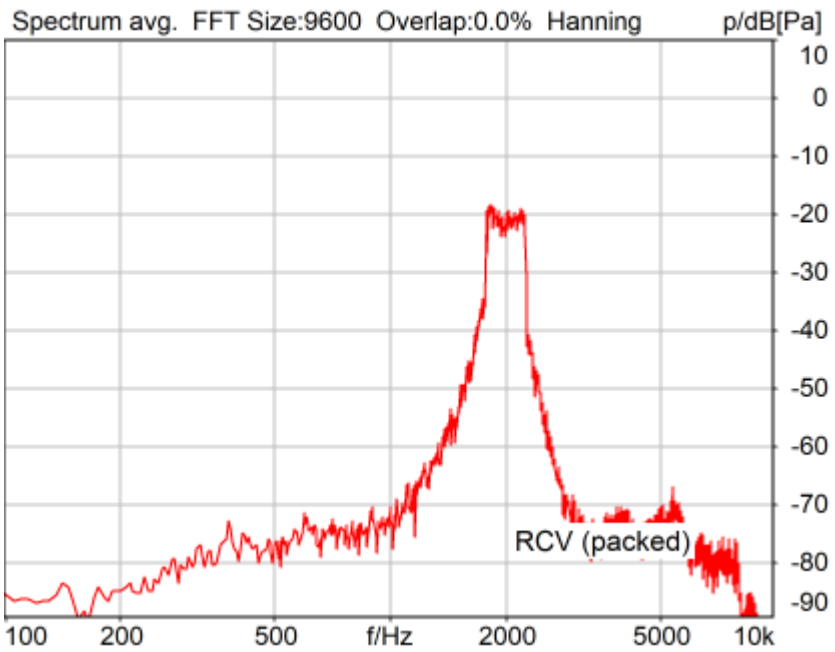
2025/2/10 13:09 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 21.50 dB (8.41%) Ok

Ok

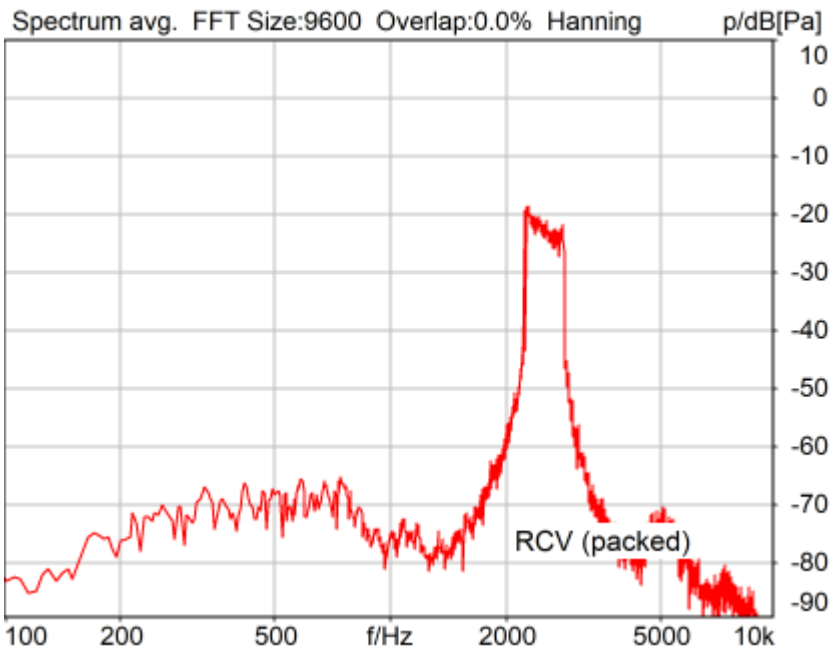
2025/2/10 13:09 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 29.27 dB (3.44%) Ok

Ok

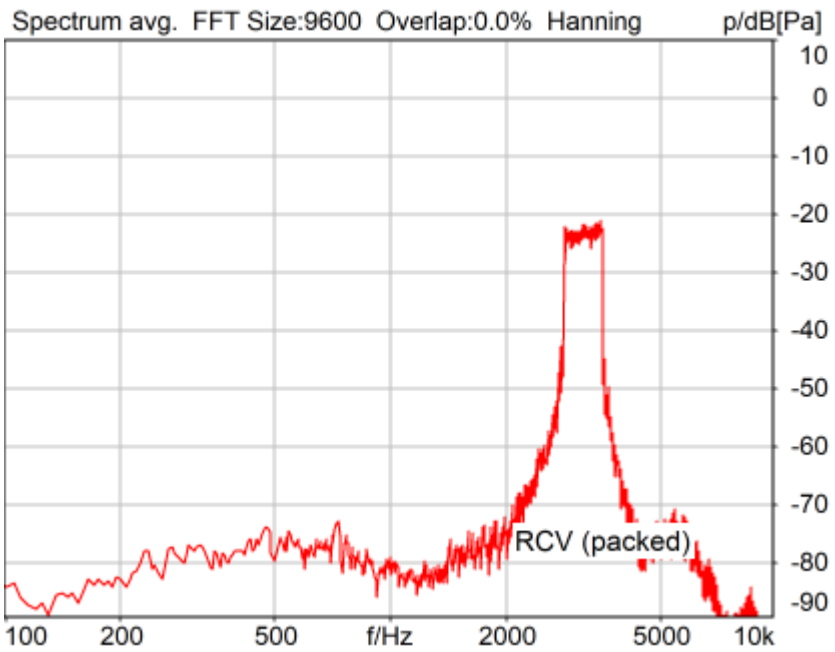
2025/2/10 13:09 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.33 dB (3.05%) Ok

Ok

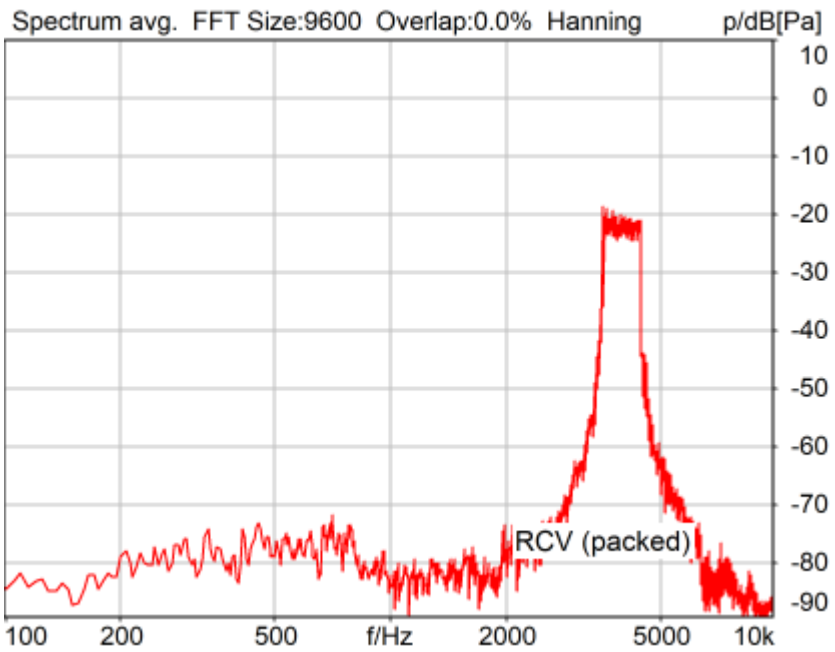
2025/2/10 13:10 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 4000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 27.96 dB (4.00%) Ok

Ok

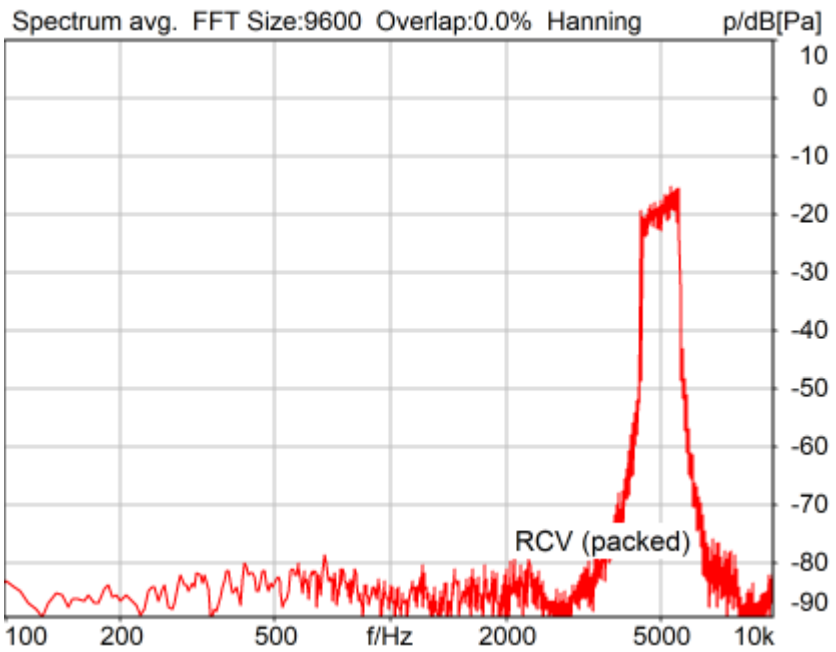
2025/2/10 13:10 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 5000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.84 dB (1.81%) Ok

Ok

2025/2/10 13:11 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N

Region	Frequency	SDNR
1	250Hz	28.27 dB
2	315Hz	30.48 dB
3	400Hz	33.08 dB
4	500Hz	31.75 dB
5	630Hz	34.38 dB
6	800Hz	34.45 dB
7	1000Hz	32.28 dB
8	1250Hz	23.49 dB
9	1600Hz	24.49 dB
10	2000Hz	21.50 dB

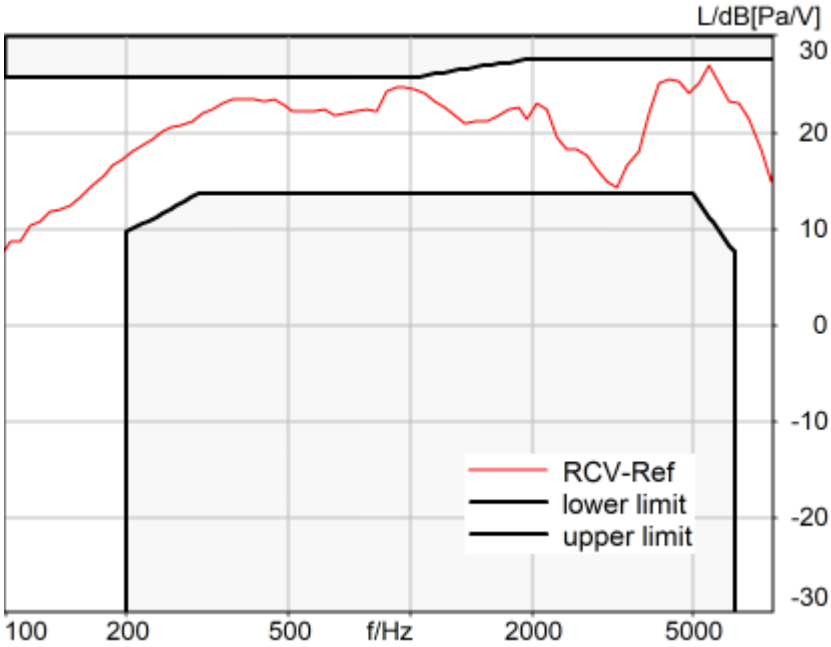
11	2500Hz	29.27 dB
12	3150Hz	30.33 dB
13	4000Hz	27.96 dB
14	5000Hz	34.84 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.50dB at 2000Hz.

2025/2/10 13:11 ACQUA

5.3 Frequency Response 8N DF

TIA-5050 (2018-01) \ Measurements \ Wideband



Absolute minimal distance
0.65 dB at 5443.6 Hz Ok

Ok

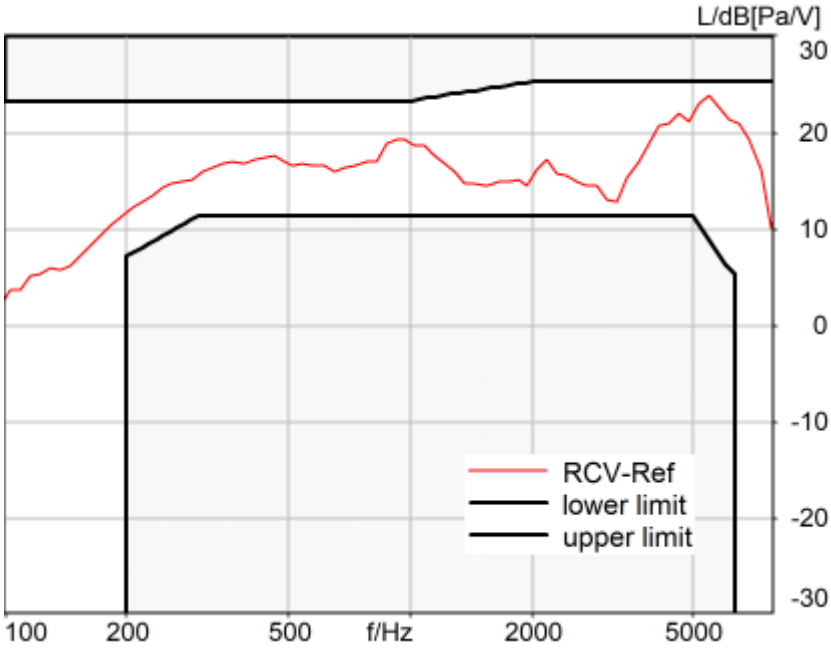
2025/2/10 13:14 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N DF

TIA-5050 (2018-01) \ Measurements \ Wideband



Absolute minimal distance
1.45 dB at 5443.6 Hz Ok

Ok

2025/2/10 13:13 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

Measurement Protocol

Measurement Object	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 15:28
Responsible Person	audio

Status Overview

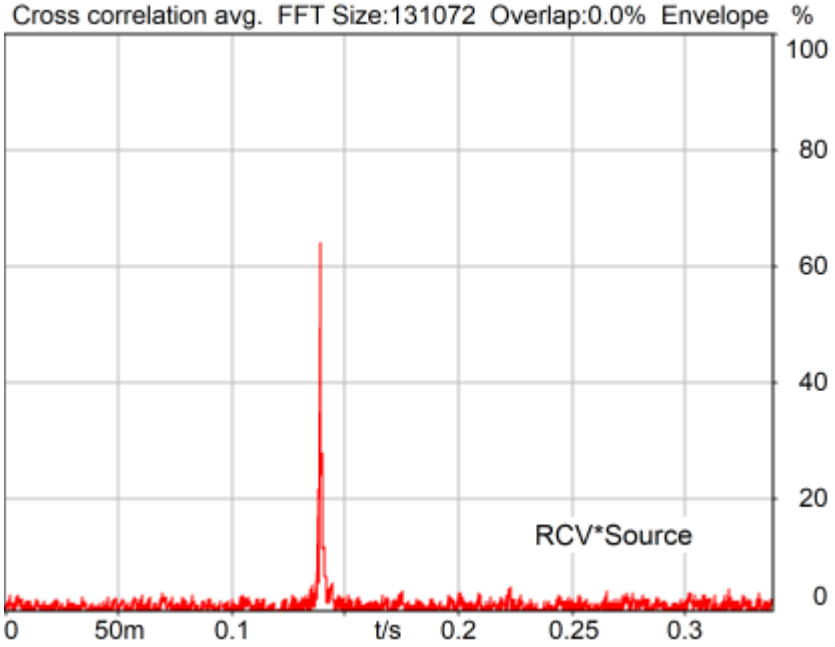
SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay NB	Done	Delay (Cross) [ms]	139.6	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.1a Receive Volume Control Performance 8N NB	Ok	Corrected Speech Level [dB[SPL]]	21.97	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.1b Receive Volume Control Performance 2N NB	Ok	Corrected Speech Level [dB[SPL]]	16.29	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 400 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.33	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.49	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 630 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.88	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 800 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.18	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	32.02	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1250 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	22.99	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1600 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.59	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 2000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	21.44	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 2500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.20	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 3150 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	28.14	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.44	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 400 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	33.79	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	31.49	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and	Ok	Distortion (Noise)	33.68	HUHAO_2403_n66_DFT-QPSK3

Noise - 630 Hz NB		[dB], 0.0 dB		0M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 800 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	34.95	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	31.22	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1250 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	23.60	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1600 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	24.36	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 2000 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	21.48	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 2500 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	27.74	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 3150 Hz NB	Ok	Distortion (Noise) [dB], 0.0 dB	31.07	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.48	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.3 Frequency Response 8N FF HANB	Not Ok	Min. dist. to tolerance scheme [dB], 1360.9 Hz	-2.68	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.3 Frequency Response 8N DF HANB	Ok	Min. dist. to tolerance scheme [dB], 974.0 Hz	0.73	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.3 Frequency Response 2N FF HANB	Ok	Min. dist. to tolerance scheme [dB], 1360.9 Hz	0.38	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000
5.3 Frequency Response 2N DF HANB	Ok	Min. dist. to tolerance scheme [dB], 3882.4 Hz	2.77	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS NB 24.4kbps_CH349000

Overall Receive Delay NB 5
5.1a Receive Volume Control Performance 8N NB 5
5.1b Receive Volume Control Performance 2N NB 6
5.2 RCV Distortion and Noise - 400 Hz NB 7
5.2 RCV Distortion and Noise - 500 Hz NB 8
5.2 RCV Distortion and Noise - 630 Hz NB 9
5.2 RCV Distortion and Noise - 800 Hz NB 10
5.2 RCV Distortion and Noise - 1000 Hz NB 11
5.2 RCV Distortion and Noise - 1250 Hz NB 12
5.2 RCV Distortion and Noise - 1600 Hz NB 13
5.2 RCV Distortion and Noise - 2000 Hz NB 14
5.2 RCV Distortion and Noise - 2500 Hz NB 15
5.2 RCV Distortion and Noise - 3150 Hz NB 16
Report - Receive Distortion and Noise (Conversational Gain) 17
5.2 RCV Distortion and Noise - 400 Hz NB 18
5.2 RCV Distortion and Noise - 500 Hz NB 18
5.2 RCV Distortion and Noise - 630 Hz NB 19
5.2 RCV Distortion and Noise - 800 Hz NB 20
5.2 RCV Distortion and Noise - 1000 Hz NB 21
5.2 RCV Distortion and Noise - 1250 Hz NB 22
5.2 RCV Distortion and Noise - 1600 Hz NB 23
5.2 RCV Distortion and Noise - 2000 Hz NB 24
5.2 RCV Distortion and Noise - 2500 Hz NB 25
5.2 RCV Distortion and Noise - 3150 Hz NB 26
Report - Receive Distortion and Noise (Conversational Gain) 27
5.3 Frequency Response 8N FF HANB 28
5.3 Frequency Response 8N DF HANB 29
5.3 Frequency Response 2N FF HANB 29
5.3 Frequency Response 2N DF HANB 30

Overall Receive Delay NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ Preparation - Delay measurement

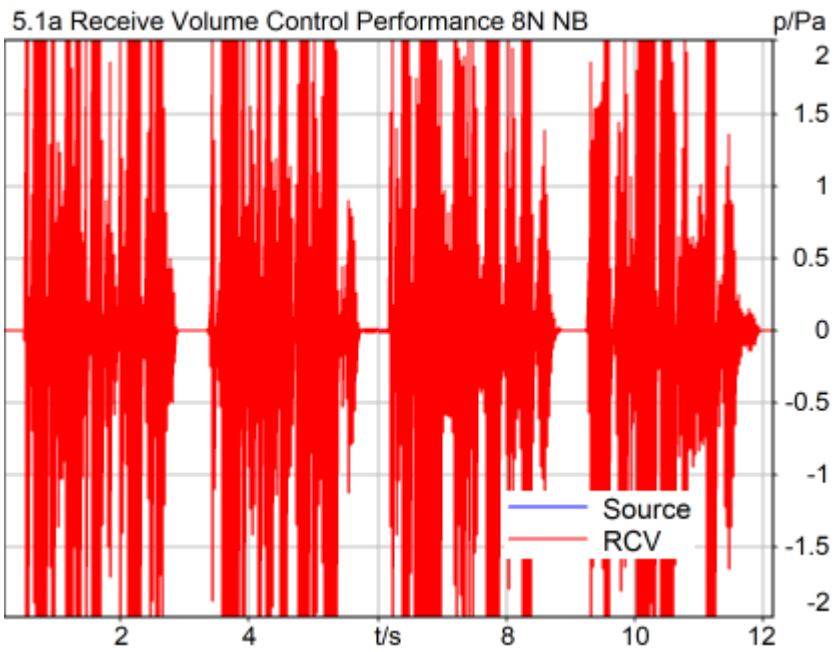


Channel	Delay
RCV*Source	139.6 ms

2025/2/10 9:44 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

5.1a Receive Volume Control Performance 8N NB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	91.97 dB[SPL]	84.13%	21.97 dB[SPL]	Ok

Ok

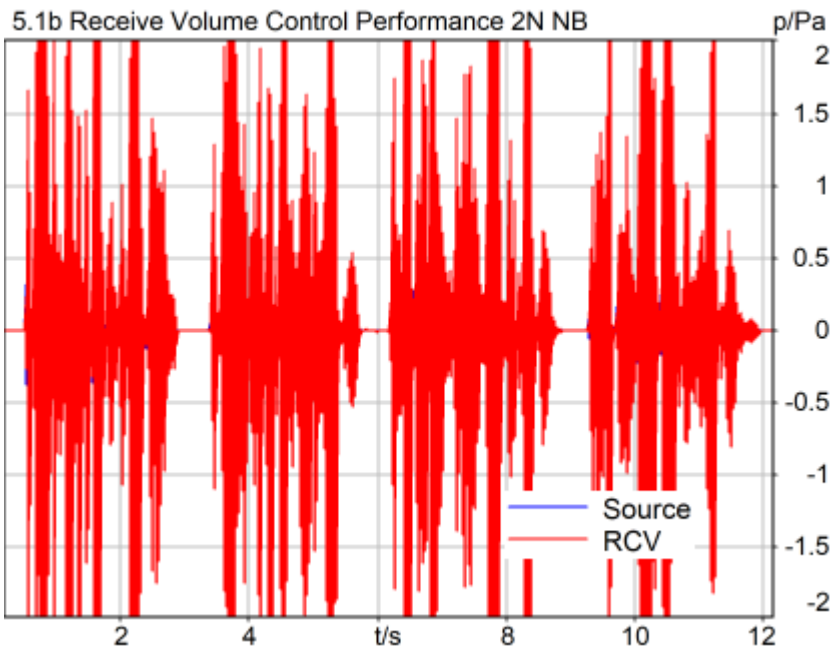
2025/2/10 9:44 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.1b Receive Volume Control Performance 2N NB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	86.29 dB[SPL]	84.29%	16.29 dB[SPL]	Ok

Ok

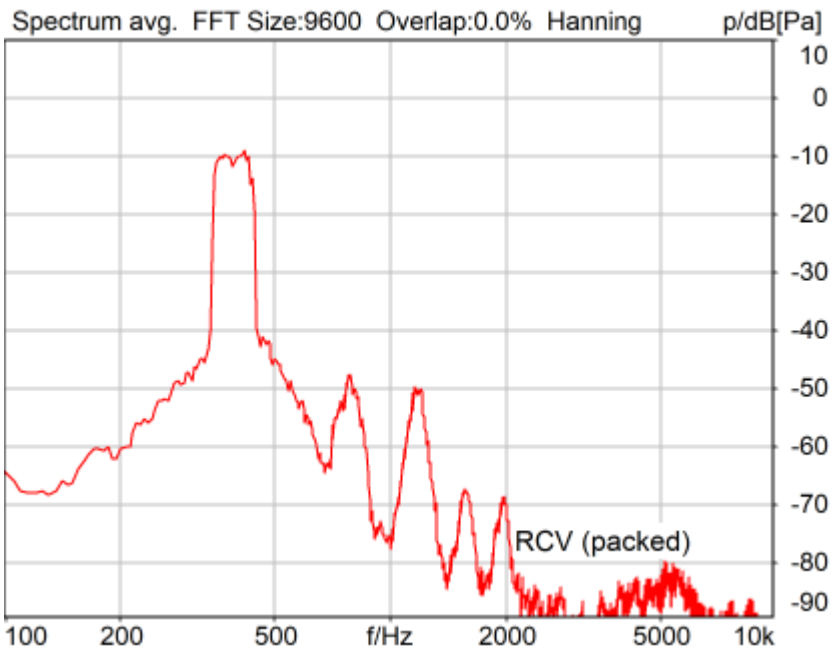
2025/2/10 9:32 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 400 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.33 dB (1.92%) Ok

Ok

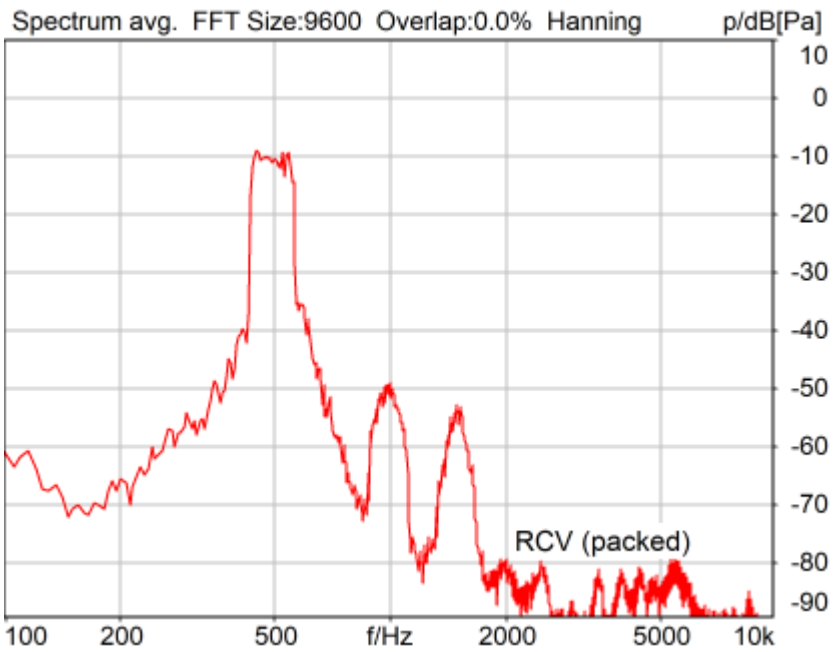
2025/2/10 9:45 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.49 dB (2.12%) Ok

Ok

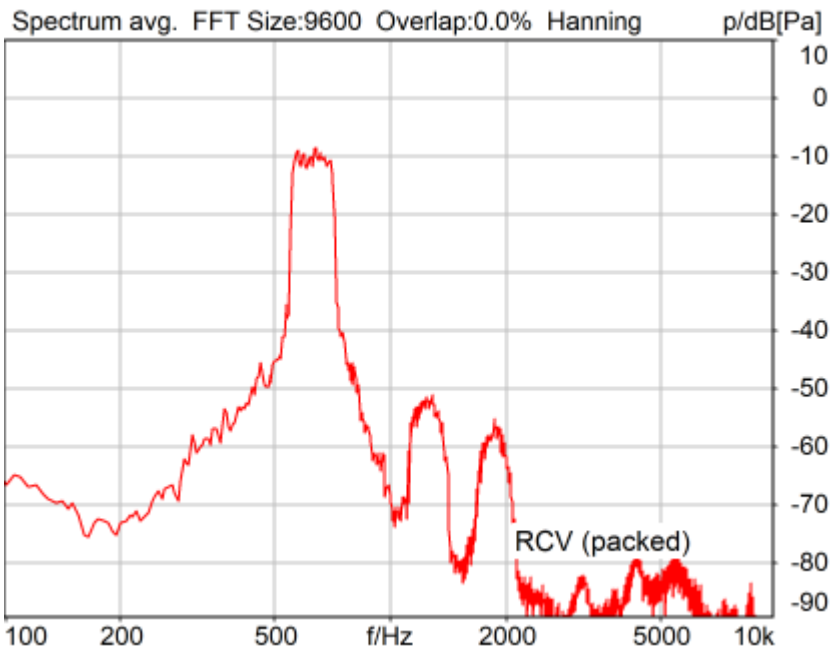
2025/2/10 9:45 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.88 dB (1.80%) Ok

Ok

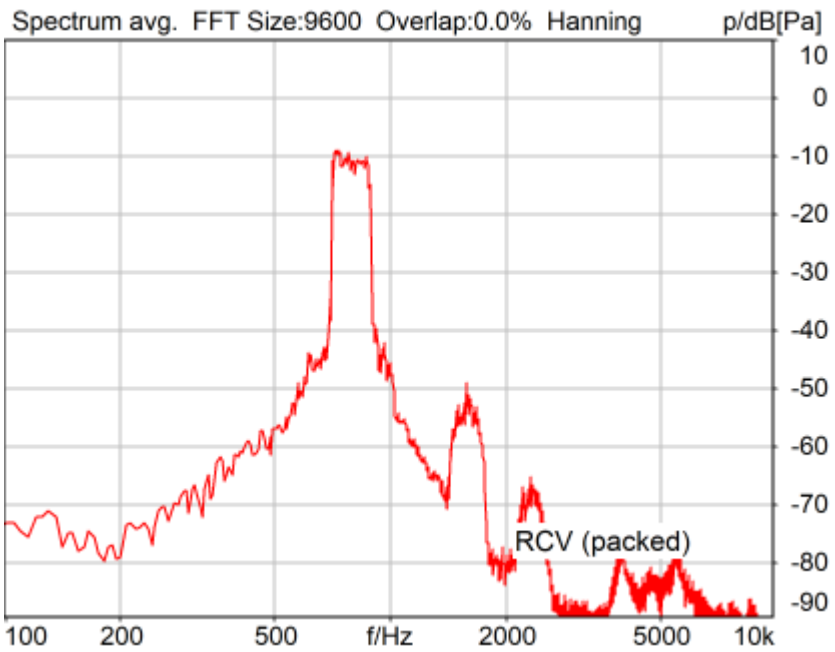
2025/2/10 9:46 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.18 dB (1.95%) Ok

Ok

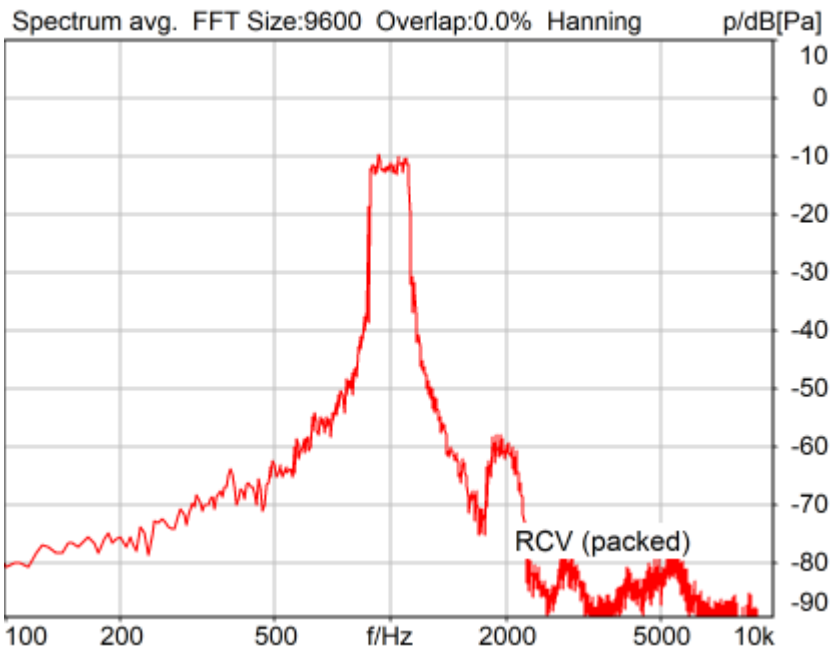
2025/2/10 9:46 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.02 dB (2.51%) Ok

Ok

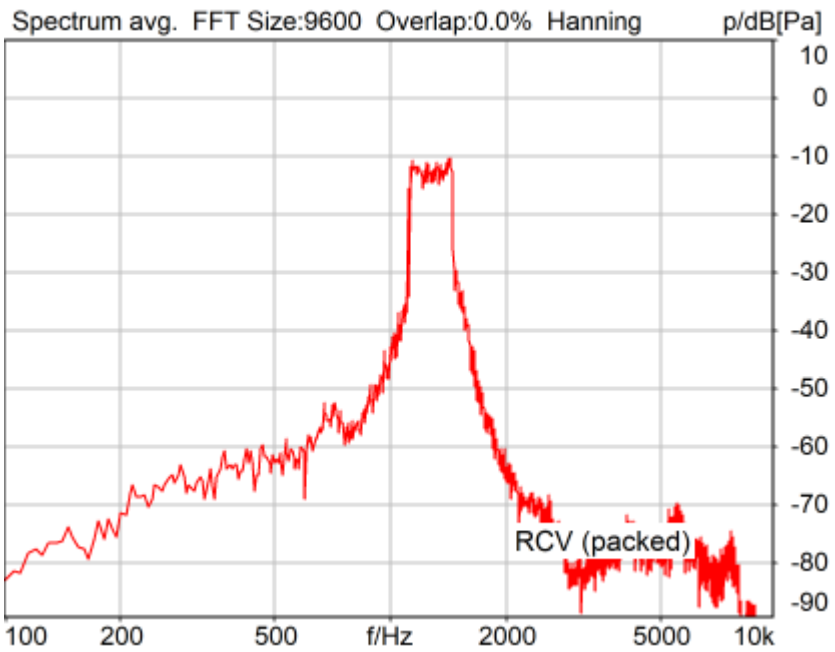
2025/2/10 9:47 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 22.99 dB (7.08%) Ok

Ok

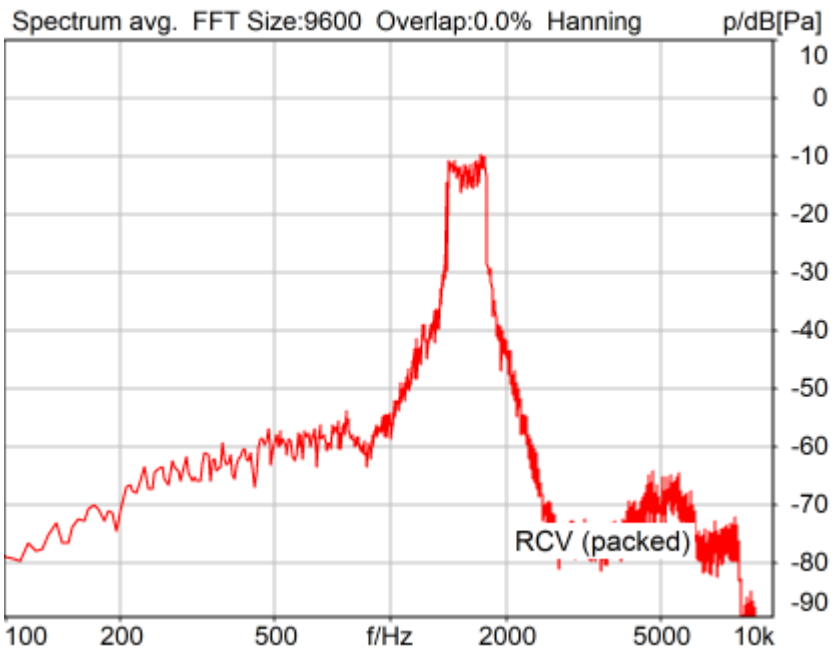
2025/2/10 9:47 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.59 dB (5.89%) Ok

Ok

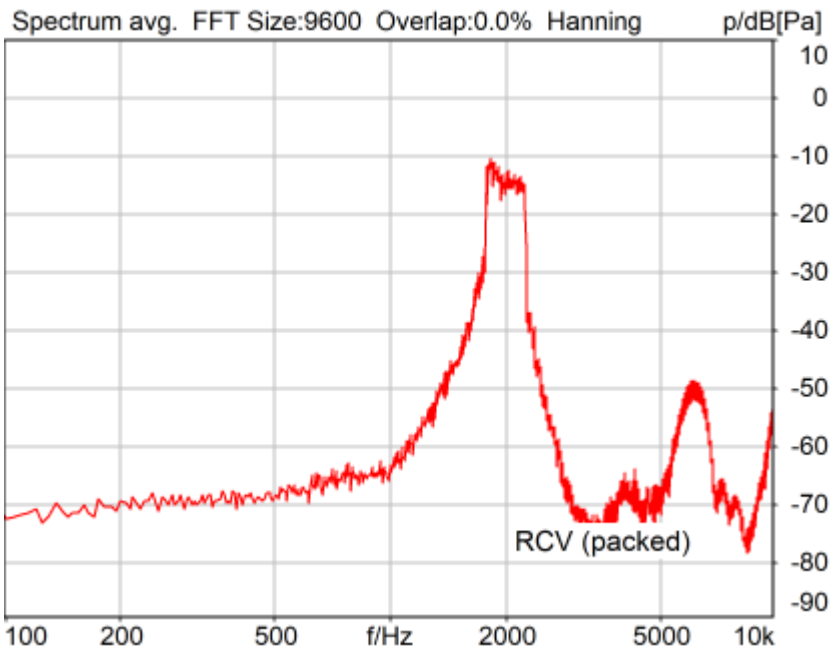
2025/2/10 9:47 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 21.44 dB (8.48%) Ok

Ok

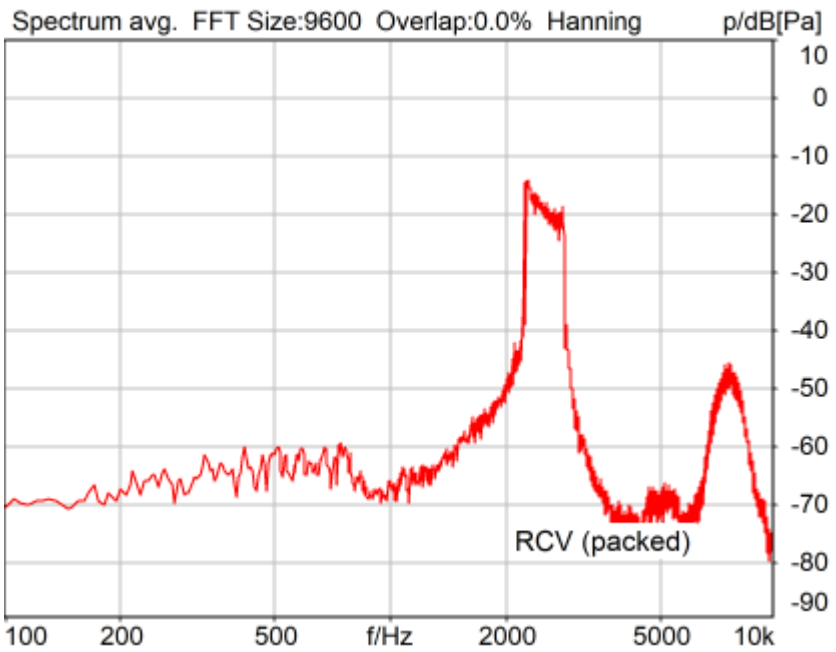
2025/2/10 9:48 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.20 dB (6.16%) Ok

Ok

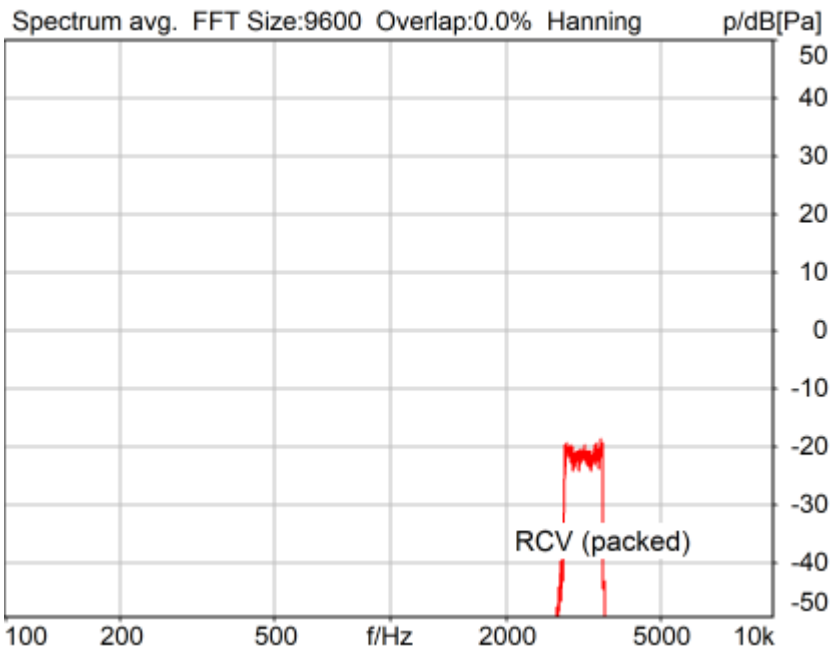
2025/2/10 9:48 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 28.14 dB (3.92%) Ok

Ok

2025/2/10 9:49 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 8N

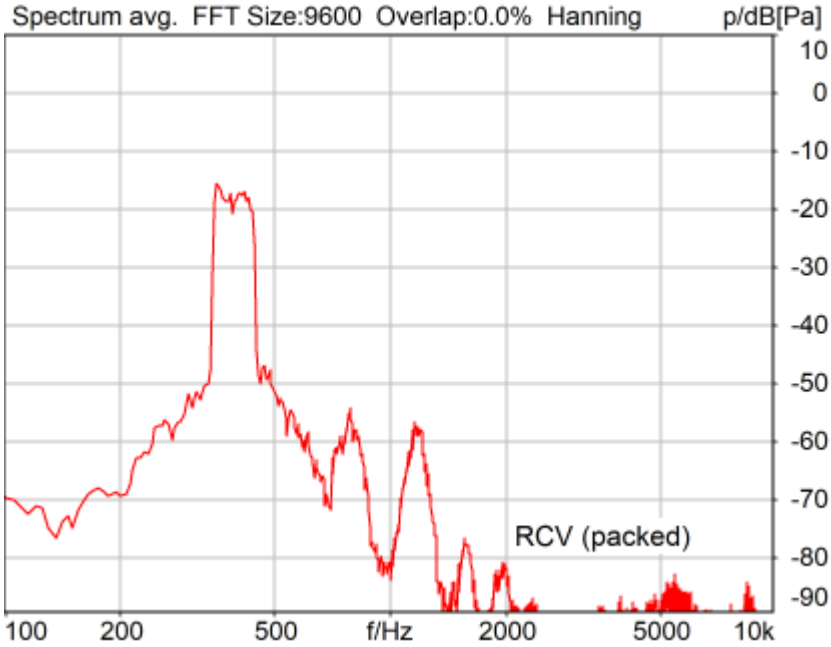
Region	Frequency	SDNR
1	400Hz	34.33 dB
2	500Hz	33.49 dB
3	630Hz	34.88 dB
4	800Hz	34.18 dB
5	1000Hz	32.02 dB
6	1250Hz	22.99 dB
7	1600Hz	24.59 dB
8	2000Hz	21.44 dB
9	2500Hz	24.20 dB
10	3150Hz	28.14 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.44dB at 2000Hz.

2025/2/10 9:49 ACQUA

5.2 RCV Distortion and Noise - 400 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.79 dB (2.04%) Ok

Ok

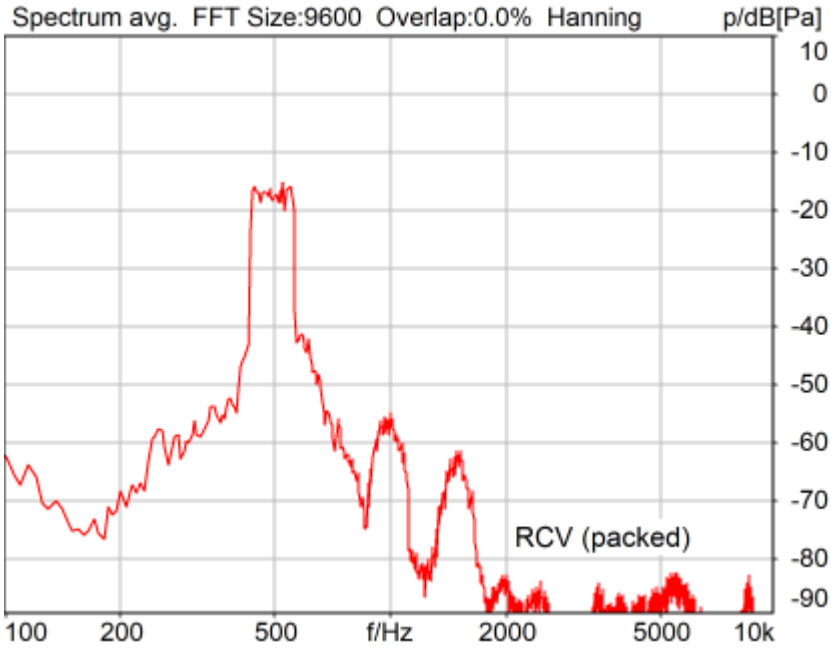
2025/2/10 9:33 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 31.49 dB (2.66%) Ok

Ok

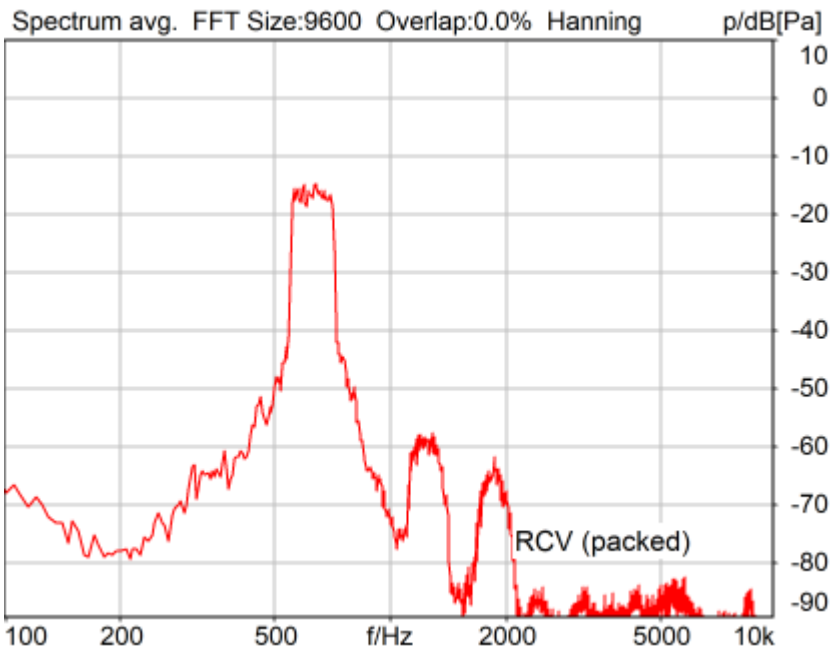
2025/2/10 9:33 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.68 dB (2.07%) Ok

Ok

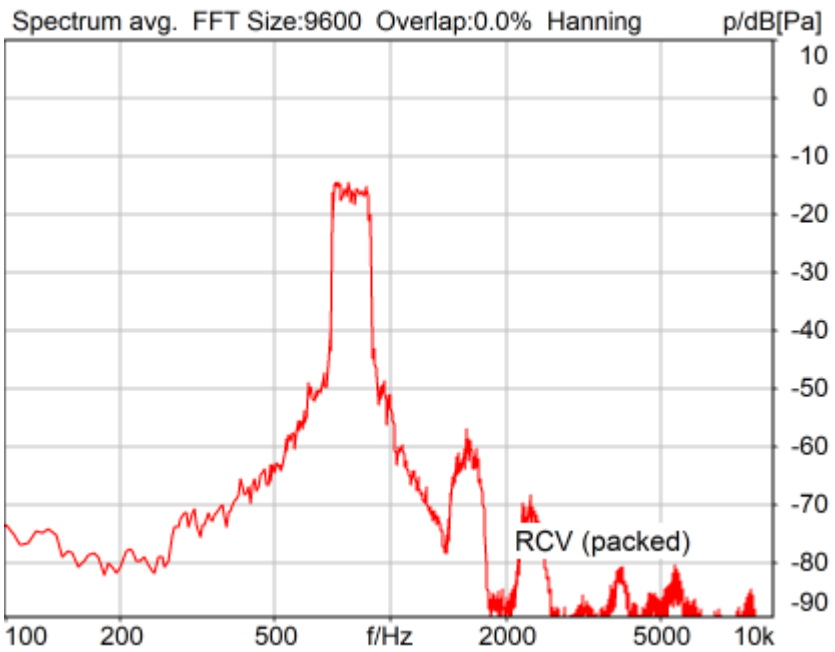
2025/2/10 9:34 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.95 dB (1.79%) Ok

Ok

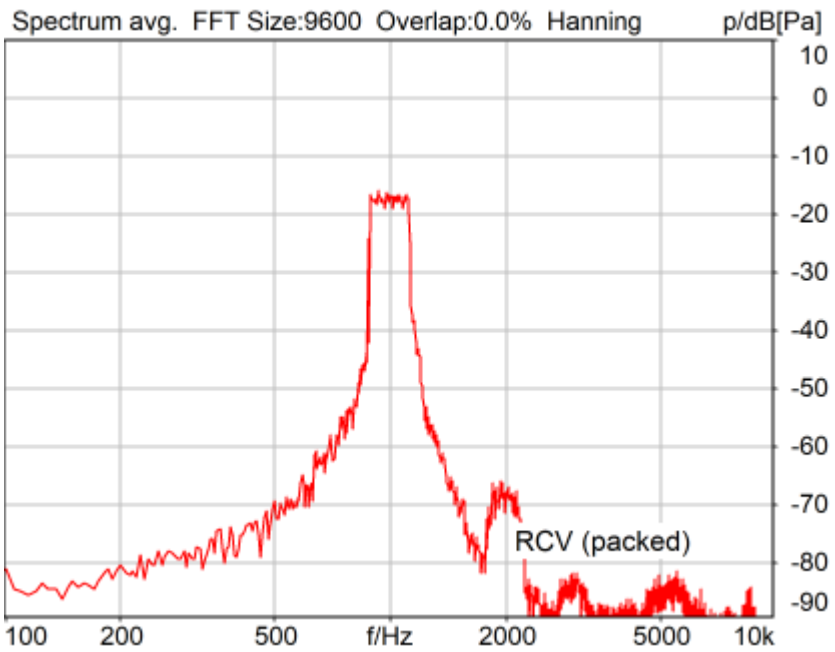
2025/2/10 9:34 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 31.22 dB (2.75%) Ok

Ok

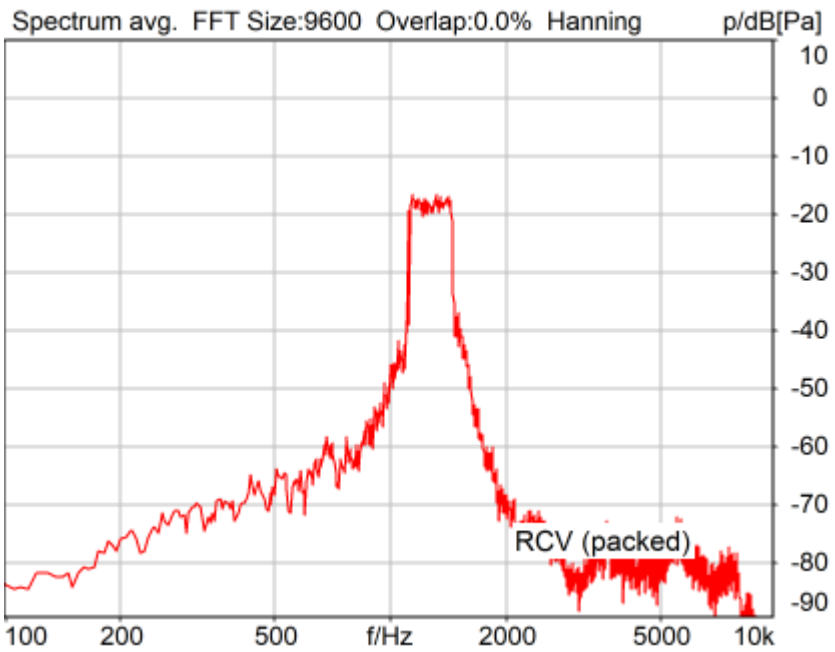
2025/2/10 9:35 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 23.60 dB (6.61%) Ok

Ok

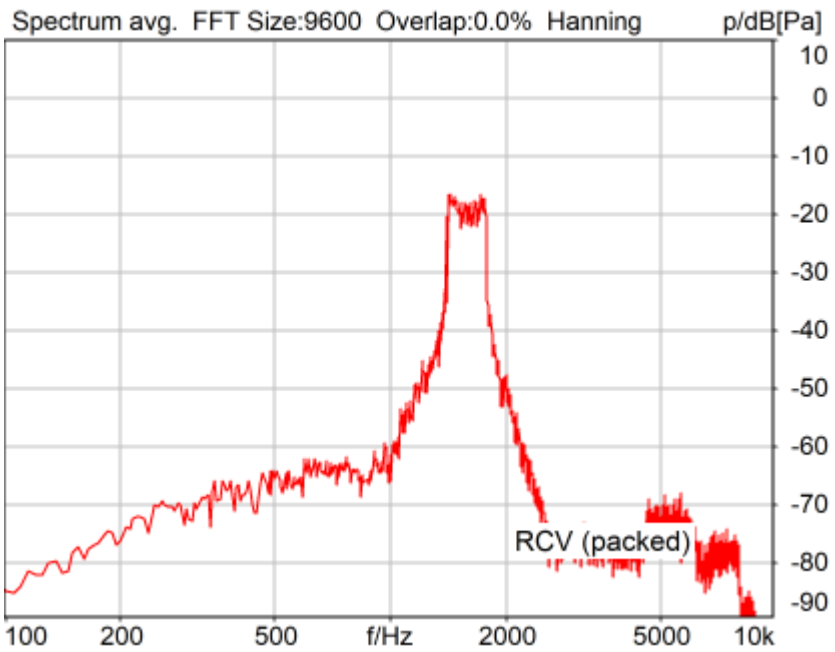
2025/2/10 9:35 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 24.36 dB (6.05%) Ok

Ok

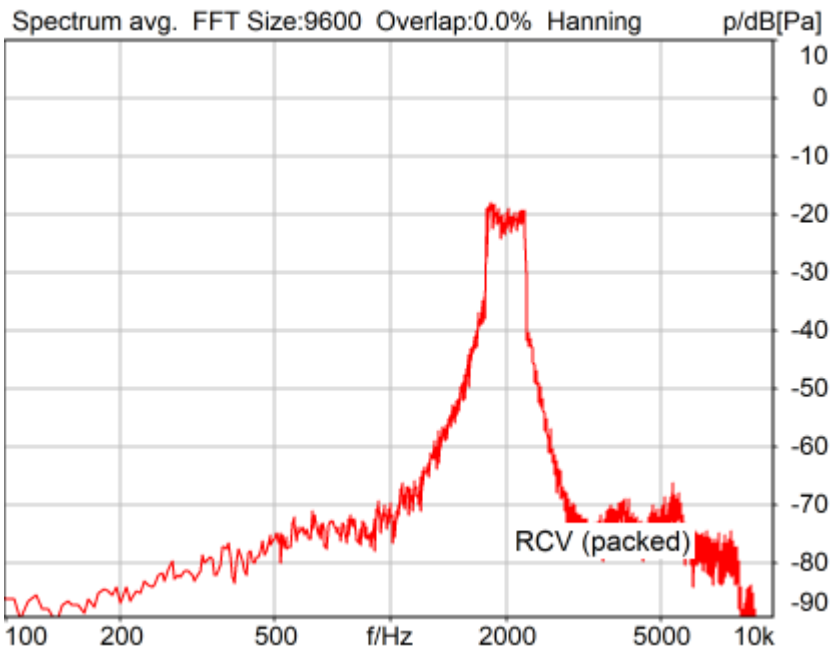
2025/2/10 9:35 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 21.48 dB (8.43%) Ok

Ok

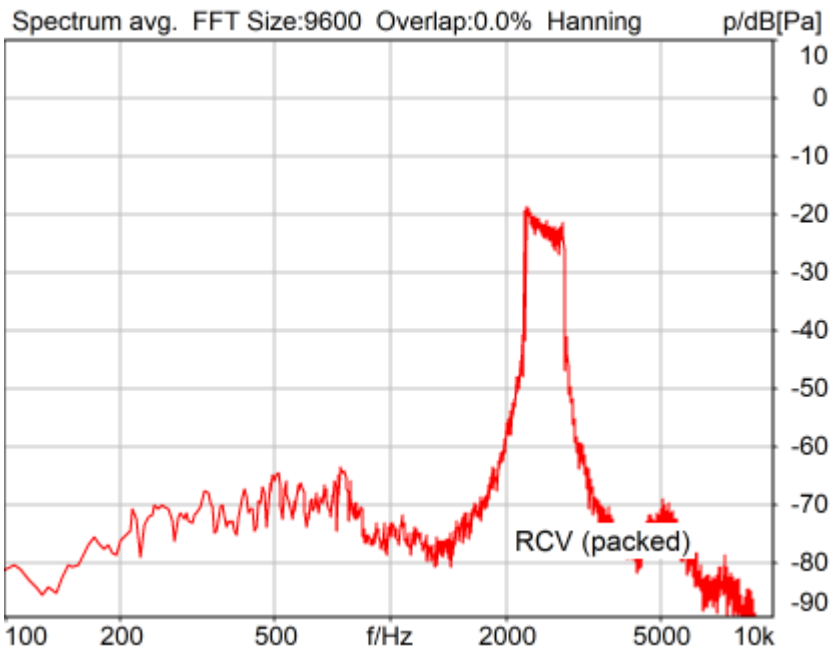
2025/2/10 9:36 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 27.74 dB (4.10%) Ok

Ok

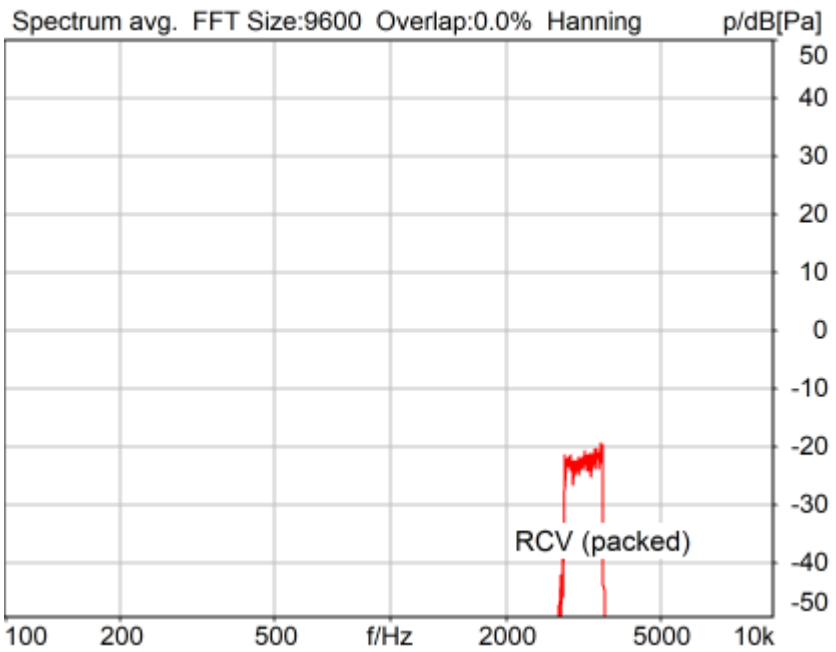
2025/2/10 9:36 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz NB

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 31.07 dB (2.80%) Ok

Ok

2025/2/10 9:37 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Narrowband \ 5.2 Receive Distortion and Noise 2N

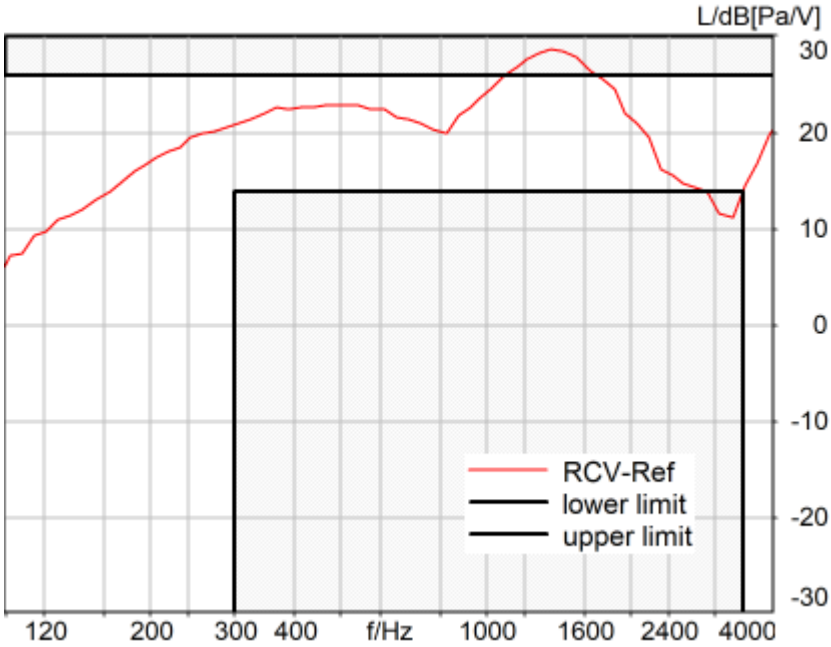
Region	Frequency	SDNR
1	400Hz	33.79 dB
2	500Hz	31.49 dB
3	630Hz	33.68 dB
4	800Hz	34.95 dB
5	1000Hz	31.22 dB
6	1250Hz	23.60 dB
7	1600Hz	24.36 dB
8	2000Hz	21.48 dB
9	2500Hz	27.74 dB
10	3150Hz	31.07 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.48dB at 2000Hz.

2025/2/10 9:39 ACQUA

5.3 Frequency Response 8N FF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
-2.68 dB at 1360.9 Hz Not Ok

Not Ok

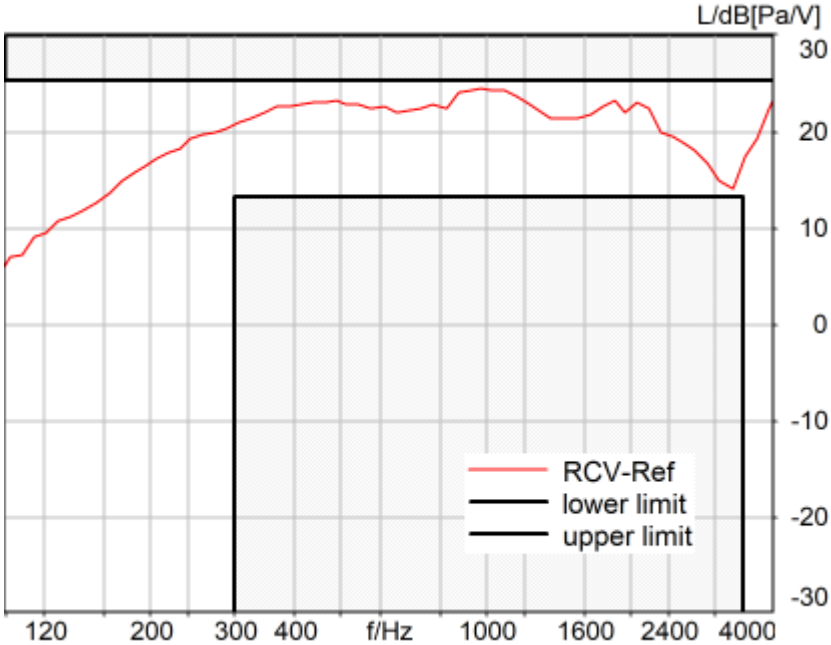
2025/2/10 9:43 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 8N DF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
0.73 dB at 974.0 Hz Ok

Ok

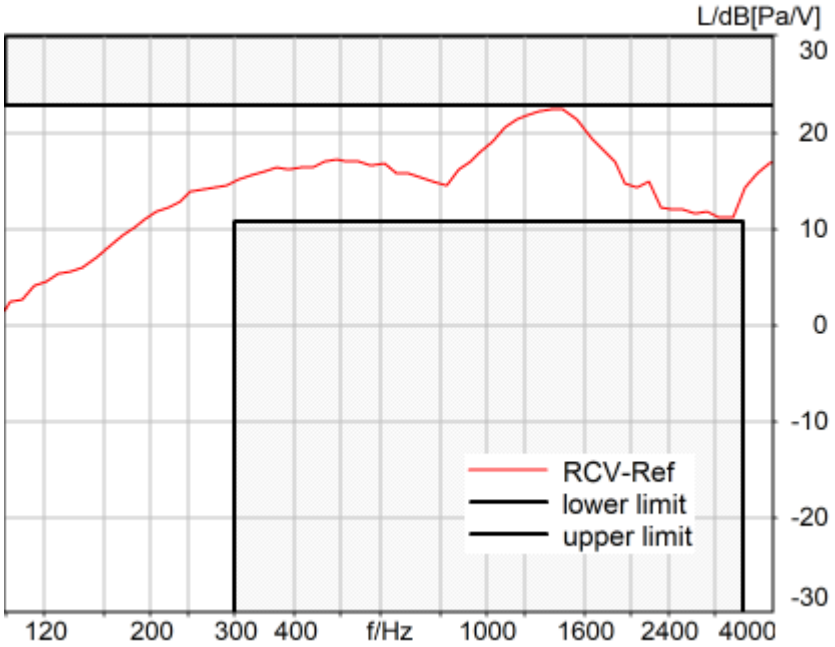
2025/2/10 9:42 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N FF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
0.38 dB at 1360.9 Hz Ok

Ok

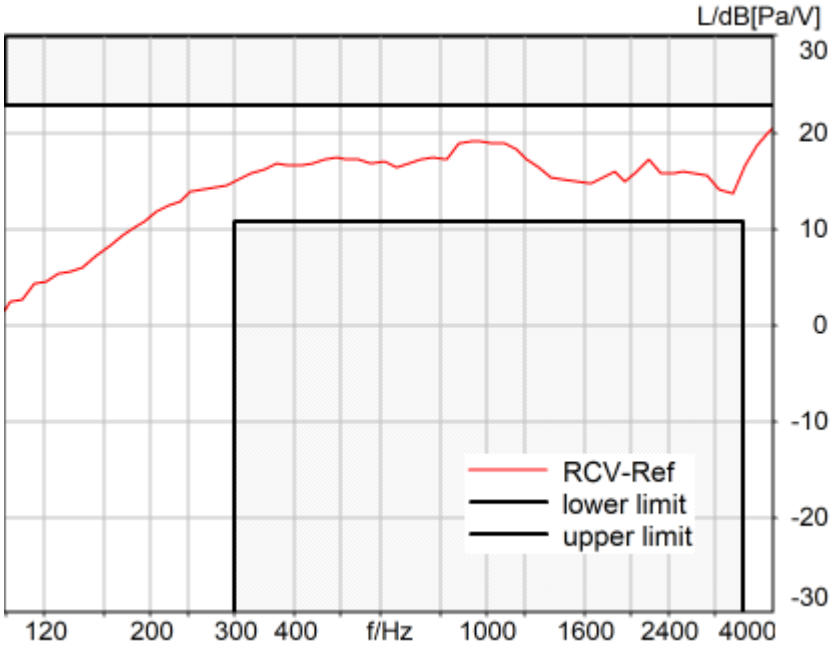
2025/2/10 9:41 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N DF HANB

TIA-5050 (2018-01) \ Measurements \ Narrowband



Absolute minimal distance
2.77 dB at 3882.4 Hz Ok

Ok

2025/2/10 9:41 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

Measurement Protocol

Measurement Object	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 15:29
Responsible Person	audio

Status Overview

SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay WB	Done	Delay (Cross) [ms]	123.5	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.1a Receive Volume Control Performance 8N WB	Ok	Corrected Speech Level [dB[SPL]]	21.99	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.1b Receive Volume Control Performance 2N WB	Ok	Corrected Speech Level [dB[SPL]]	16.78	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	27.98	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 315 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	31.77	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 400 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.78	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.82	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 630 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.81	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 800 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.03	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.78	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.32	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1600 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.20	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 2000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	21.98	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 2500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.13	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 3150 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	28.53	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 4000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	26.16	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and	Ok	Distortion (Noise)	25.34	HUHAO_2403_n66_DFT-QPSK3

Noise - 5000 Hz WB		[dB], 0.0 dB		0M_1_1_EVS WB 24.4kbps_CH349000
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	21.98	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	29.41	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 315 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.36	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 400 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.26	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	31.54	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 630 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.94	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 800 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.94	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.85	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	23.36	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 1600 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.53	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 2000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	20.74	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 2500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	28.74	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 3150 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	30.05	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 4000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	27.70	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.2 RCV Distortion and Noise - 5000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	35.23	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
Report - Receive Distortion and Noise (Conversational Gain)	Ok	Minimum SDNR [dB], (occured at 2000Hz)	20.74	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.3 Frequency Response 8N DF	Ok	Min. dist. to tolerance scheme [dB], 6117.2 Hz	0.07	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000
5.3 Frequency Response	Ok	Min. dist. to tolerance	0.60	HUHAO_2403_n66_DFT-QPSK3

2N DF		scheme [dB], 5443.6 Hz		0M_1_1_EVS WB 24.4kbps_CH349000

Overall Receive Delay WB 6
5.1a Receive Volume Control Performance 8N WB 6
5.1b Receive Volume Control Performance 2N WB 7
5.2 RCV Distortion and Noise - 250 Hz WB 8
5.2 RCV Distortion and Noise - 315 Hz WB 9
5.2 RCV Distortion and Noise - 400 Hz WB 10
5.2 RCV Distortion and Noise - 500 Hz WB 11
5.2 RCV Distortion and Noise - 630 Hz WB 12
5.2 RCV Distortion and Noise - 800 Hz WB 13
5.2 RCV Distortion and Noise - 1000 Hz WB 14
5.2 RCV Distortion and Noise - 1250 Hz WB 15
5.2 RCV Distortion and Noise - 1600 Hz WB 16
5.2 RCV Distortion and Noise - 2000 Hz WB 17
5.2 RCV Distortion and Noise - 2500 Hz WB 18
5.2 RCV Distortion and Noise - 3150 Hz WB 19
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5.2 RCV Distortion and Noise - 250 Hz WB 23
5.2 RCV Distortion and Noise - 315 Hz WB 24
5.2 RCV Distortion and Noise - 400 Hz WB 24
5.2 RCV Distortion and Noise - 500 Hz WB 25
5.2 RCV Distortion and Noise - 630 Hz WB 26
5.2 RCV Distortion and Noise - 800 Hz WB 27
5.2 RCV Distortion and Noise - 1000 Hz WB 28
5.2 RCV Distortion and Noise - 1250 Hz WB 29
5.2 RCV Distortion and Noise - 1600 Hz WB 30
5.2 RCV Distortion and Noise - 2000 Hz WB 31
5.2 RCV Distortion and Noise - 2500 Hz WB 32
5.2 RCV Distortion and Noise - 3150 Hz WB 33
5.2 RCV Distortion and Noise - 4000 Hz WB 34
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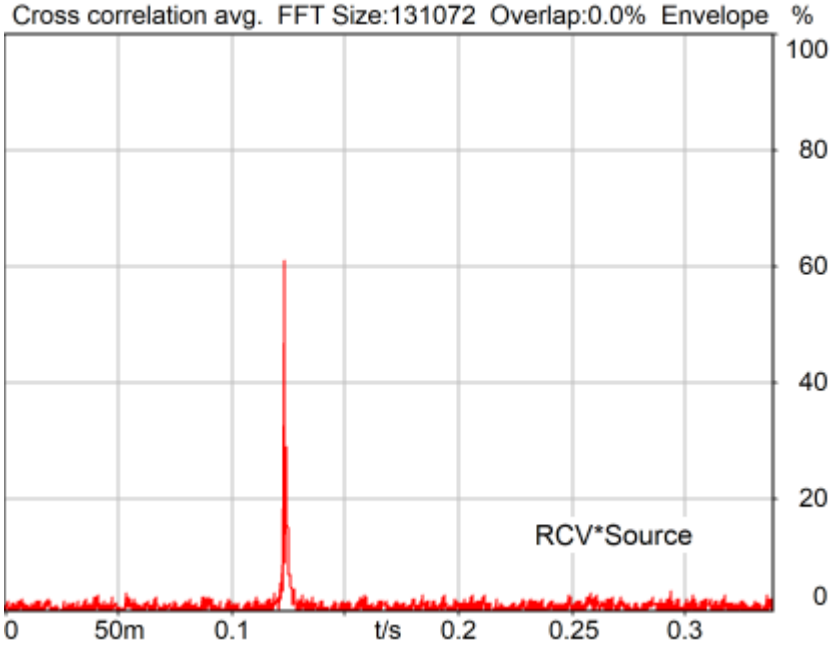
Report - Receive Distortion and Noise (Conversational Gain) 36
5.3 Frequency Response 8N DF 37
5.3 Frequency Response 2N DF 38

Overall Receive Delay WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ Preparation - Delay measurement

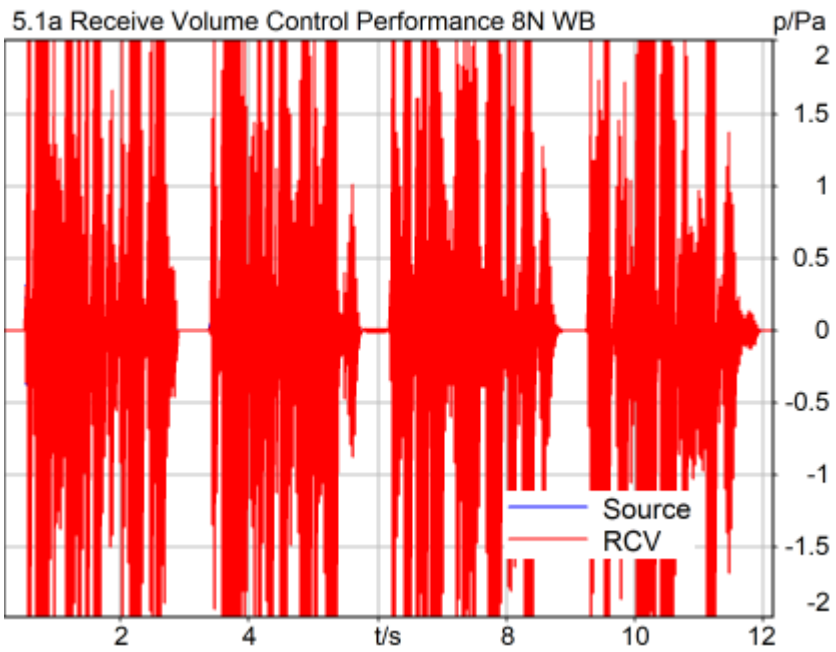


Channel	Delay
RCV*Source	123.5 ms

2025/2/10 10:15 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

5.1a Receive Volume Control Performance 8N WB

TIA-5050 (2018-01) \ Measurements \ Wideband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	91.99 dB[SPL]	84.15%	21.99 dB[SPL]	Ok

Ok

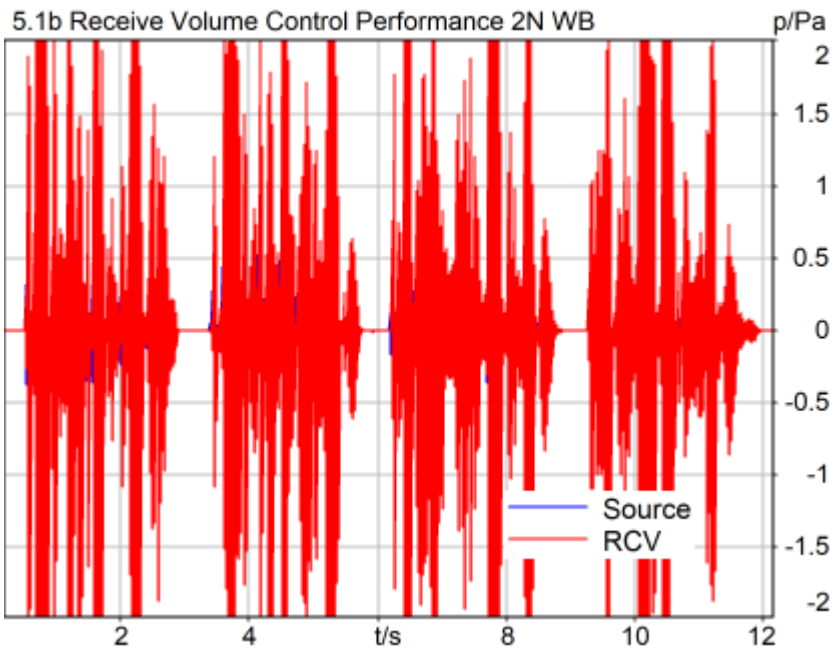
2025/2/10 10:16 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.1b Receive Volume Control Performance 2N WB

TIA-5050 (2018-01) \ Measurements \ Wideband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	86.78 dB[SPL]	84.41%	16.78 dB[SPL]	Ok

Ok

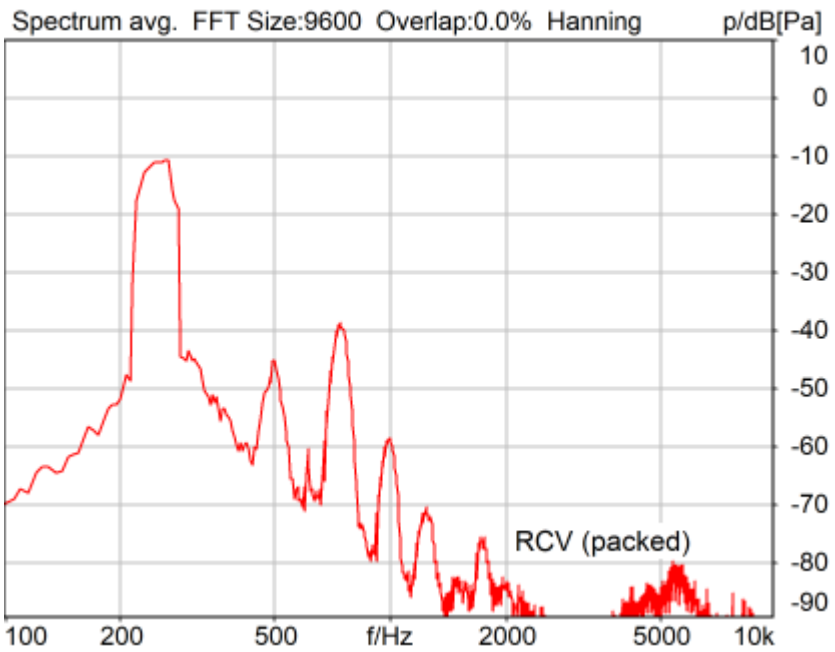
2025/2/10 9:57 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 27.98 dB (3.99%) Ok

Ok

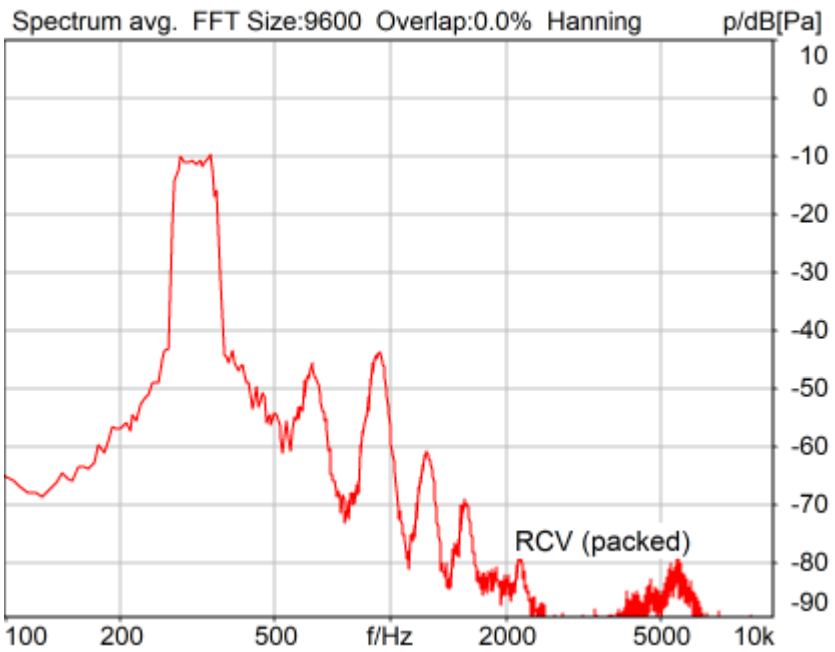
2025/2/10 10:09 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 315 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 31.77 dB (2.58%) Ok

Ok

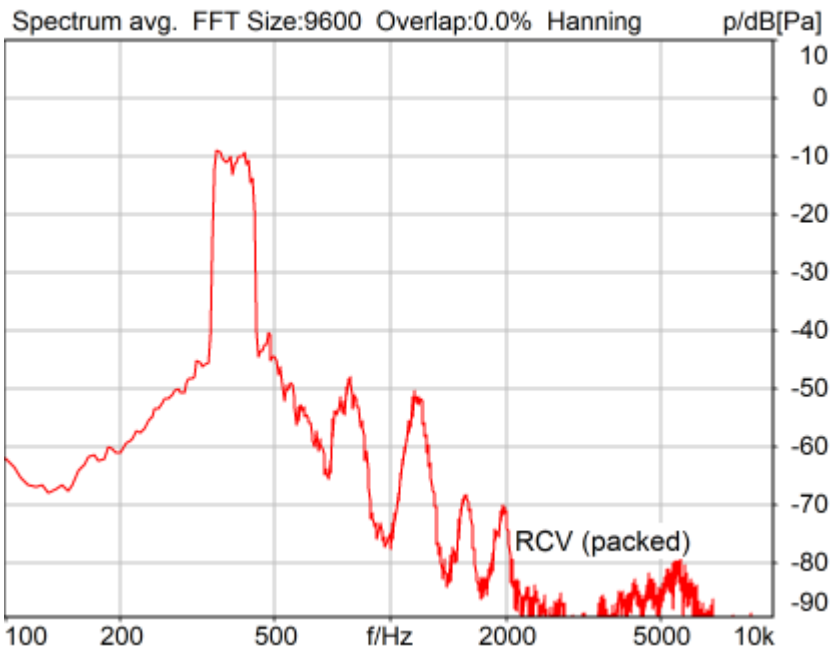
2025/2/10 10:09 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 400 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.78 dB (1.82%) Ok

Ok

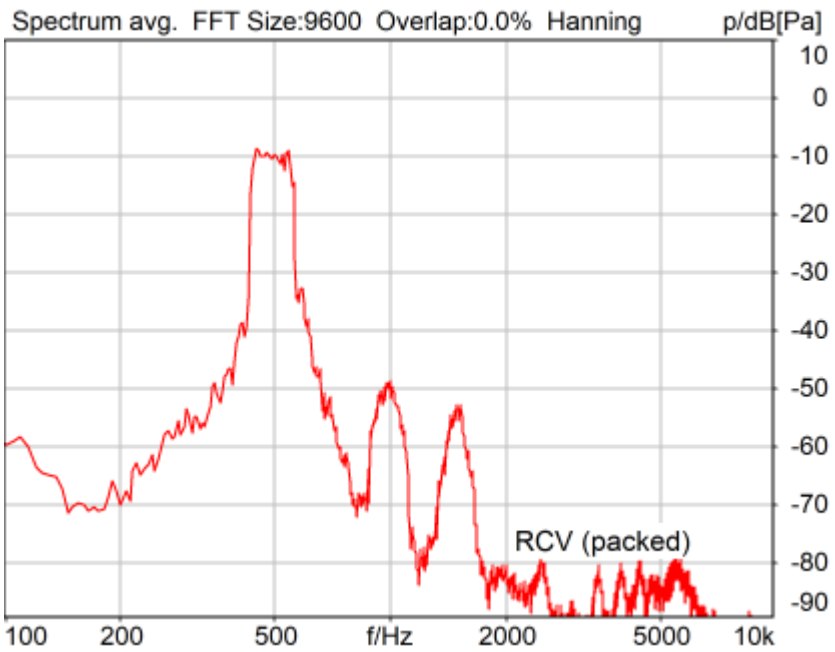
2025/2/10 10:10 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 33.82 dB (2.04%) Ok

Ok

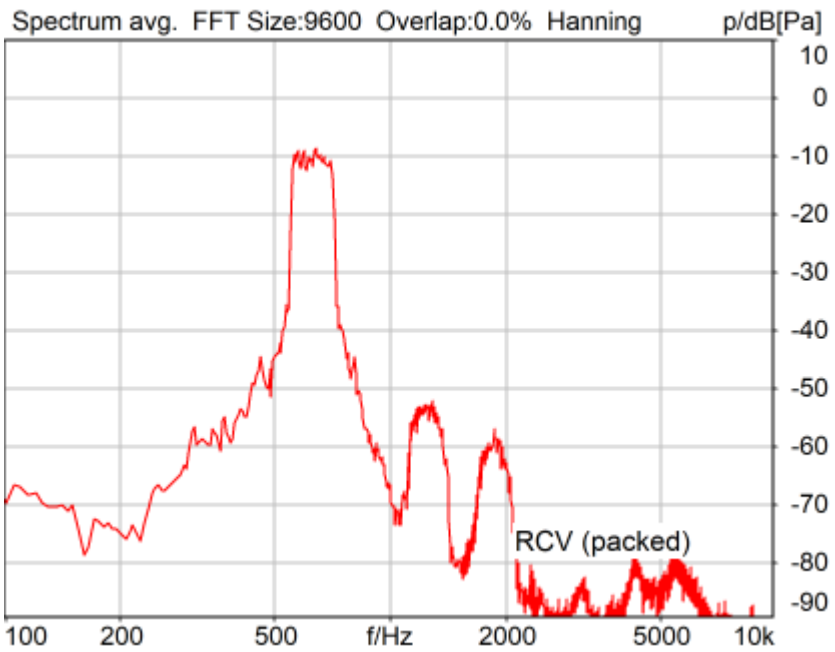
2025/2/10 10:10 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.81 dB (1.82%) Ok

Ok

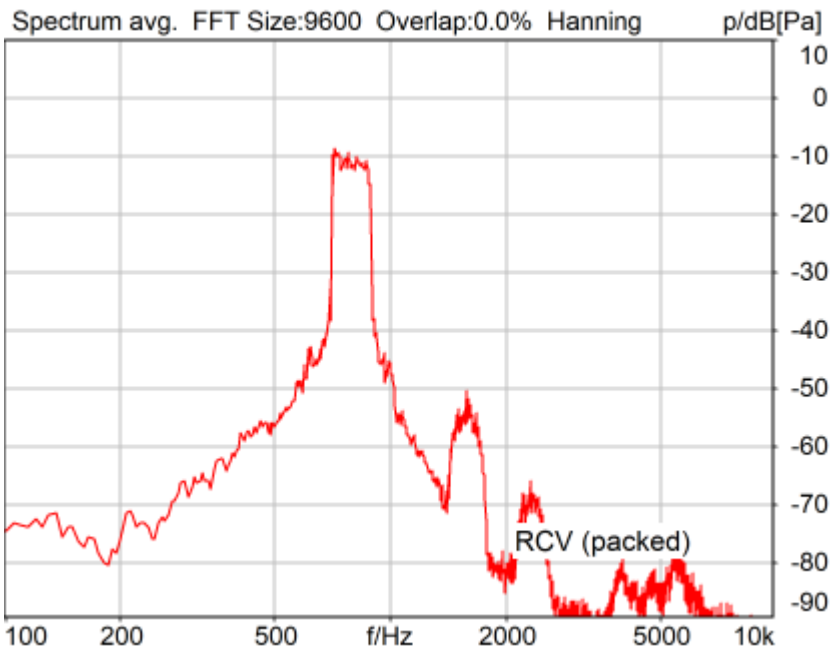
2025/2/10 10:11 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 34.03 dB (1.99%) Ok

Ok

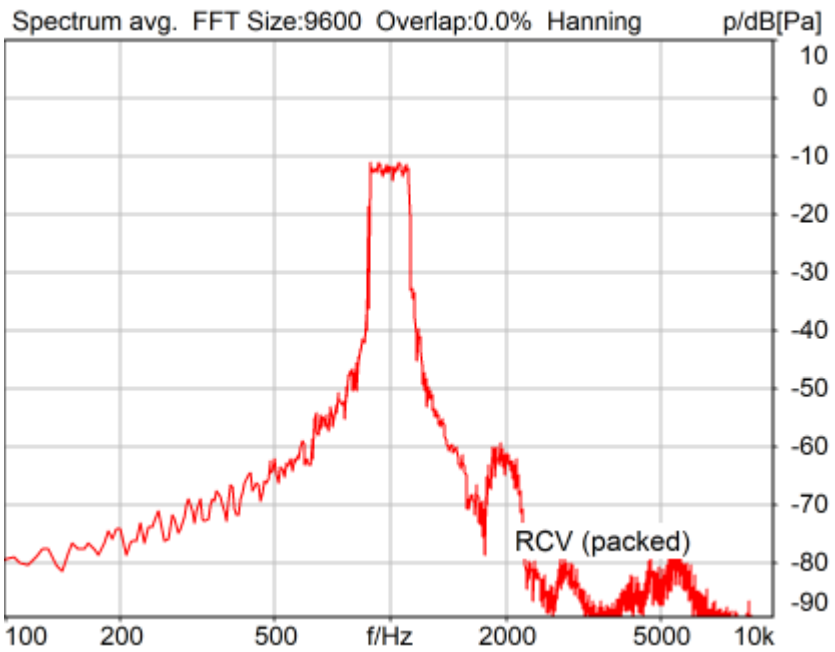
2025/2/10 10:11 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 32.78 dB (2.29%) Ok

Ok

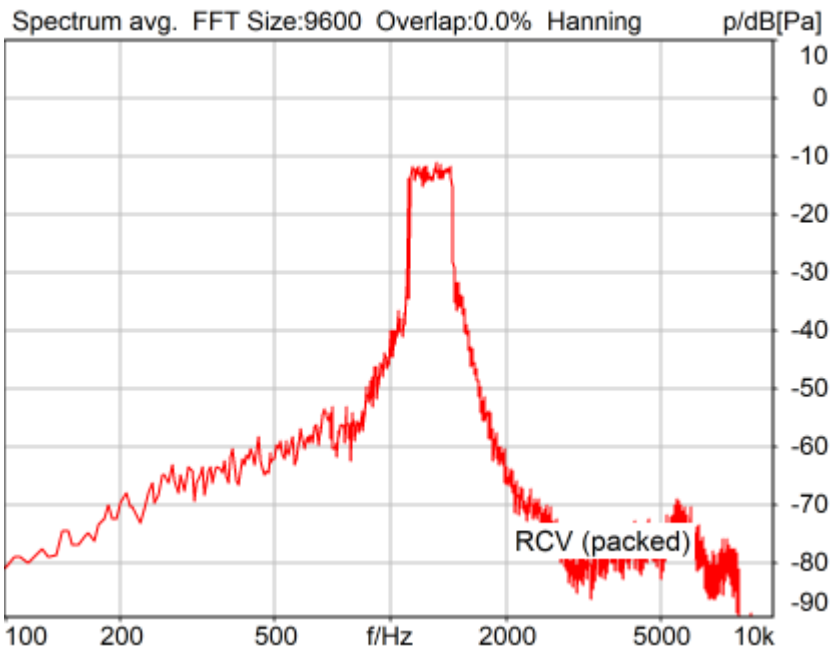
2025/2/10 10:12 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 23.32 dB (6.83%) Ok

Ok

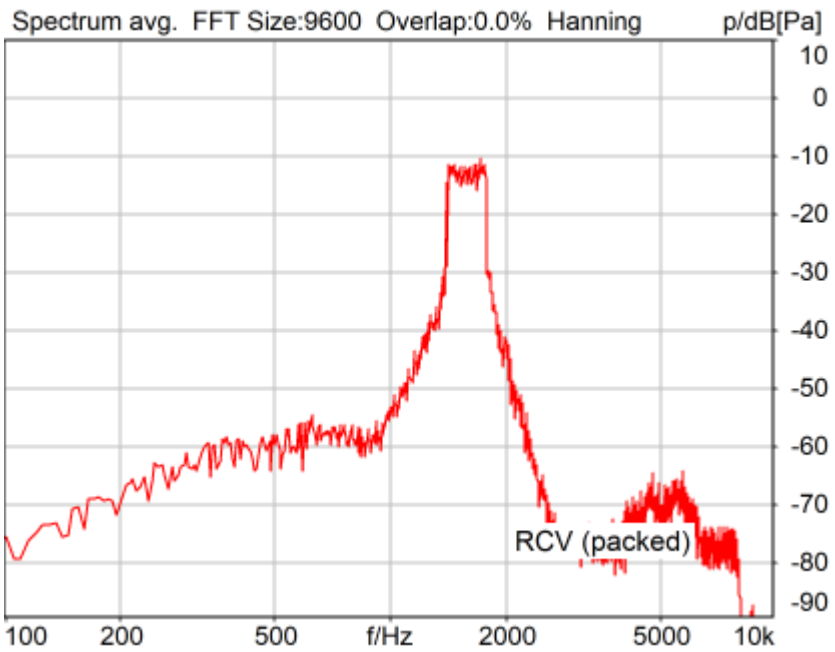
2025/2/10 10:12 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.20 dB (6.17%) Ok

Ok

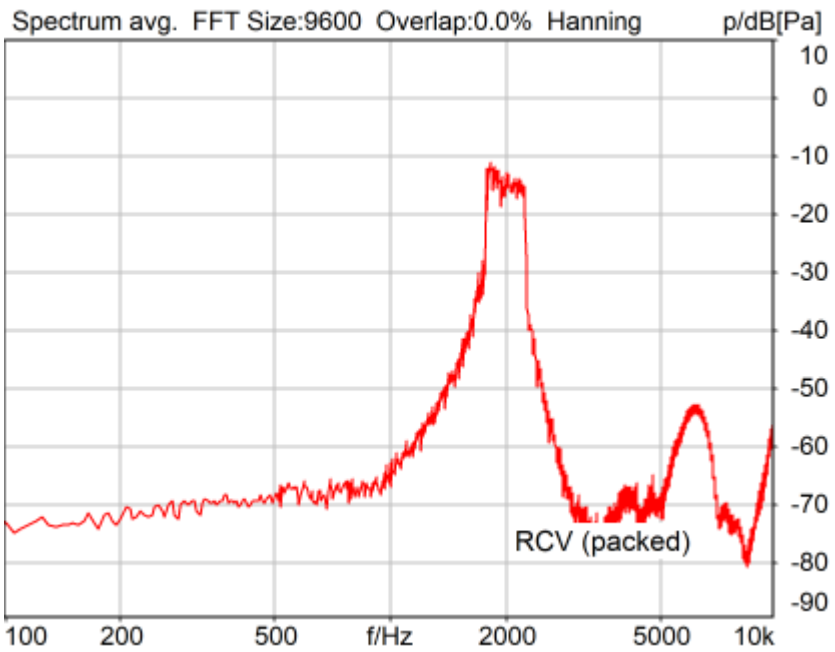
2025/2/10 10:12 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 21.98 dB (7.96%) Ok

Ok

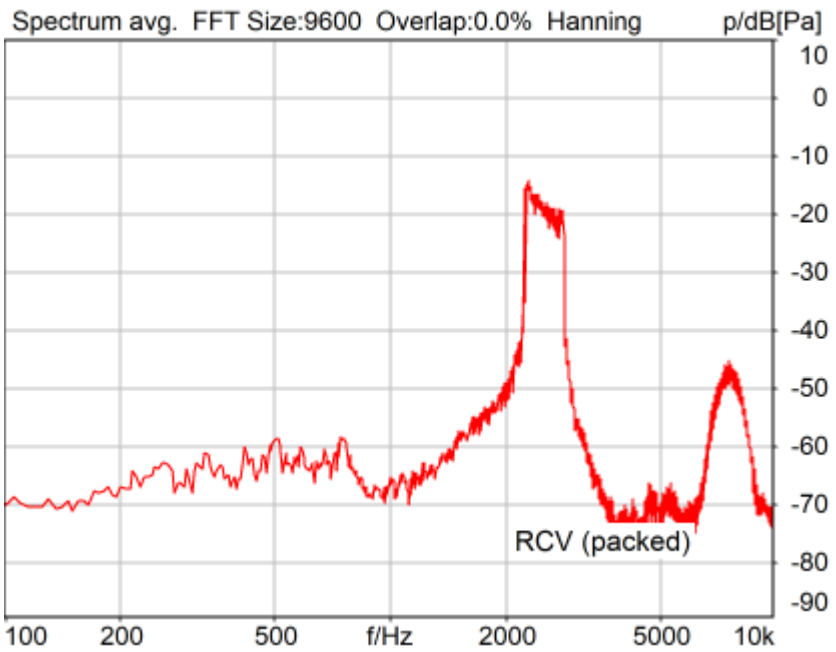
2025/2/10 10:13 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 24.13 dB (6.22%) Ok

Ok

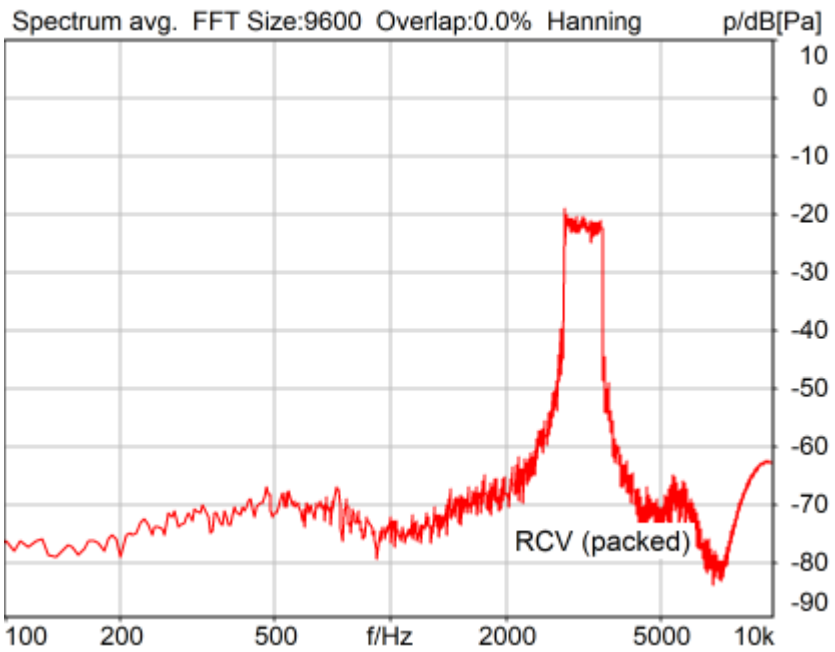
2025/2/10 10:13 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 28.53 dB (3.74%) Ok

Ok

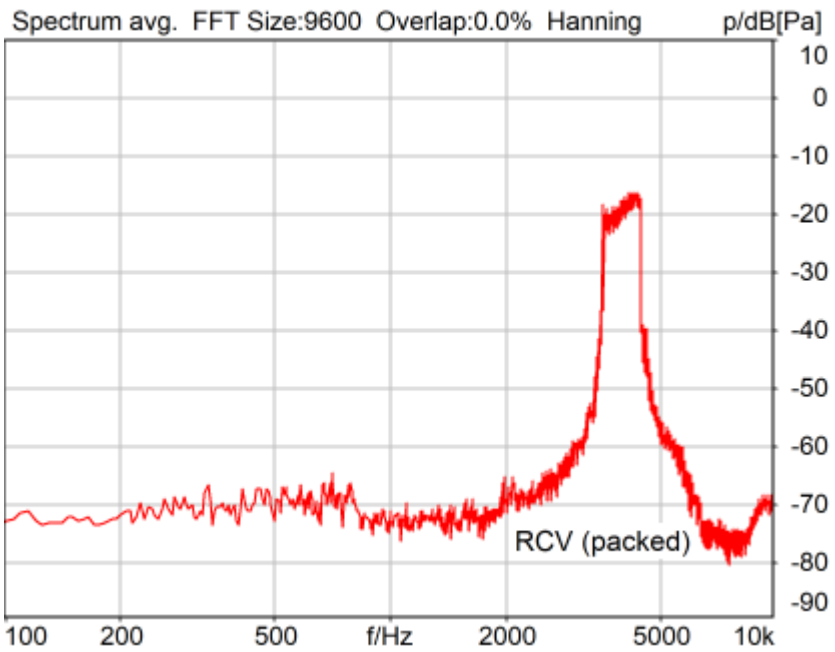
2025/2/10 10:14 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 4000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 26.16 dB (4.92%) Ok

Ok

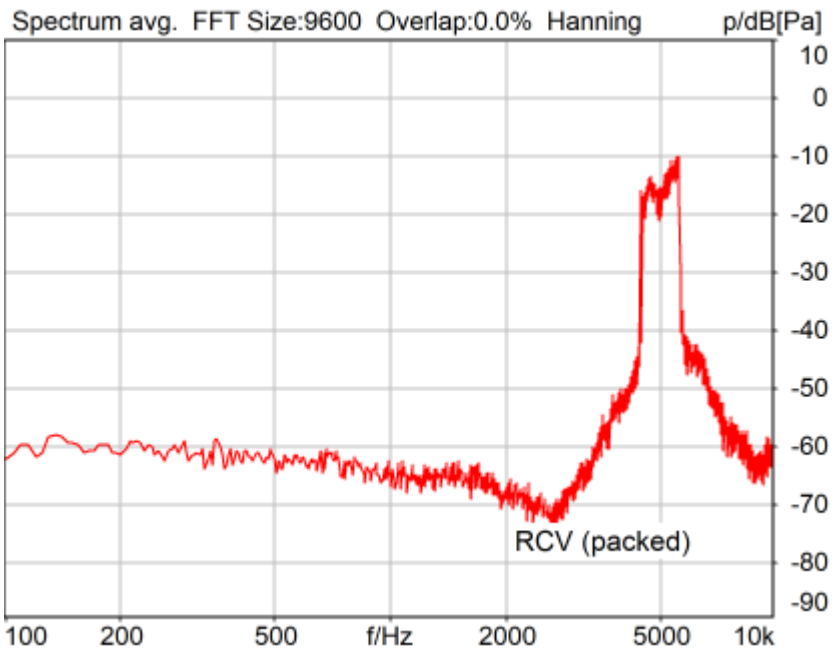
2025/2/10 10:14 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 5000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N



Distortion (Noise) RCV (packed): 25.34 dB (5.41%) Ok

Ok

2025/2/10 10:14 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 8N

Region	Frequency	SDNR
1	250Hz	27.98 dB
2	315Hz	31.77 dB
3	400Hz	34.78 dB
4	500Hz	33.82 dB
5	630Hz	34.81 dB
6	800Hz	34.03 dB
7	1000Hz	32.78 dB
8	1250Hz	23.32 dB
9	1600Hz	24.20 dB
10	2000Hz	21.98 dB

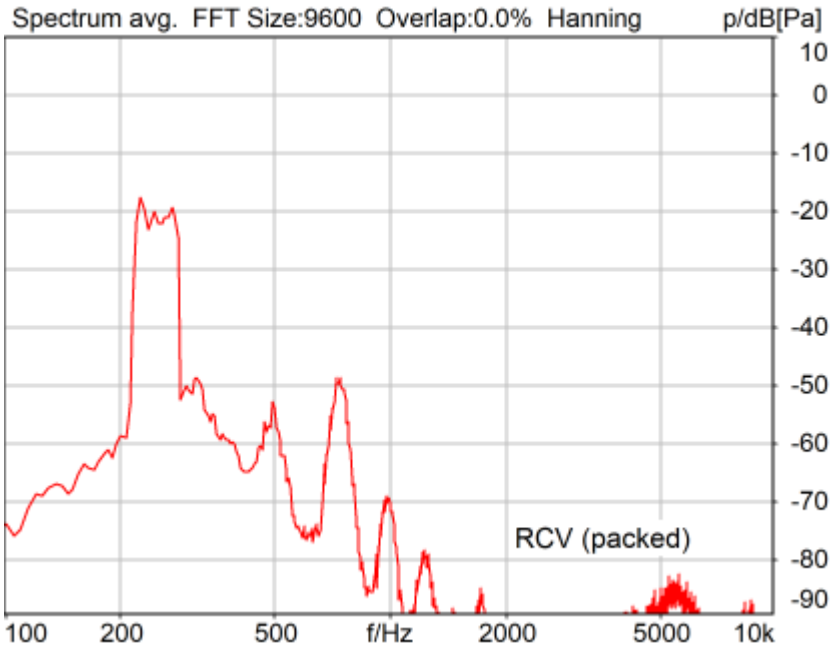
11	2500Hz	24.13 dB
12	3150Hz	28.53 dB
13	4000Hz	26.16 dB
14	5000Hz	25.34 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.98dB at 2000Hz.

2025/2/10 10:15 ACQUA

5.2 RCV Distortion and Noise - 250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 29.41 dB (3.39%) Ok

Ok

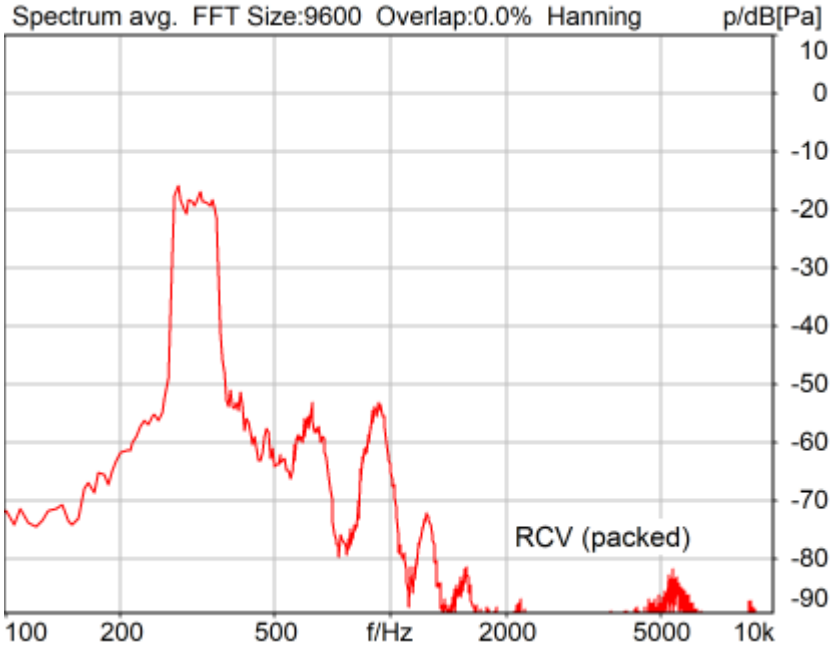
2025/2/10 9:57 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 315 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.36 dB (2.15%) Ok

Ok

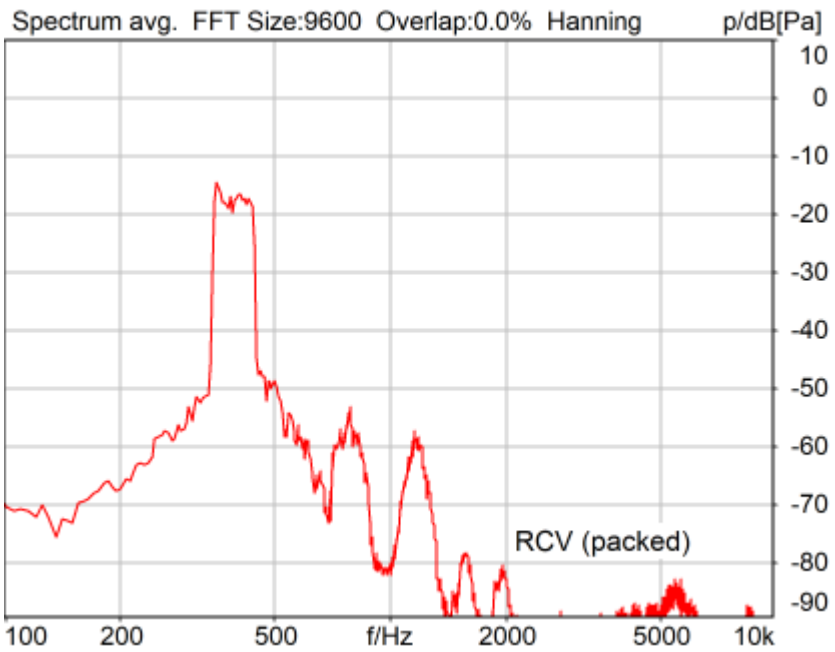
2025/2/10 9:58 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 400 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.26 dB (1.94%) Ok

Ok

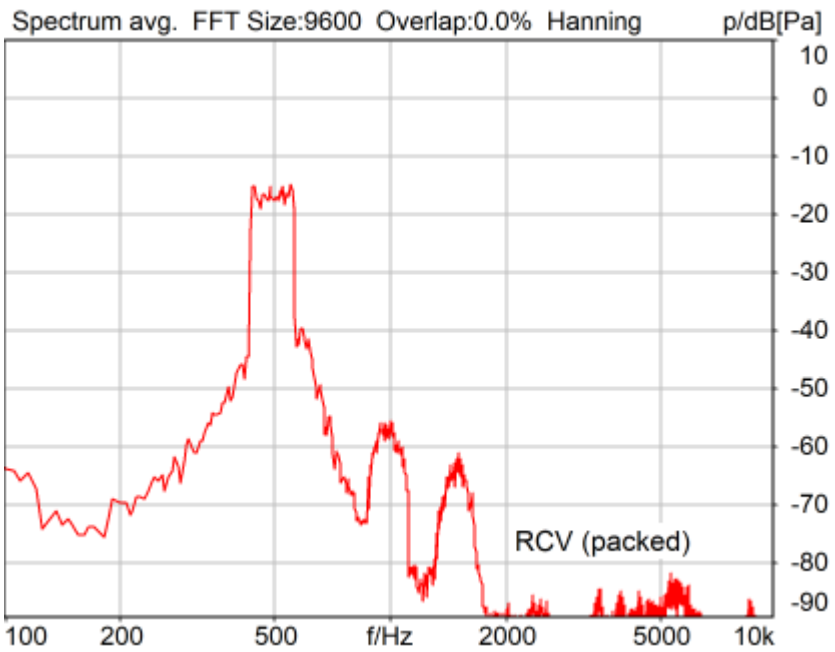
2025/2/10 9:58 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 31.54 dB (2.65%) Ok

Ok

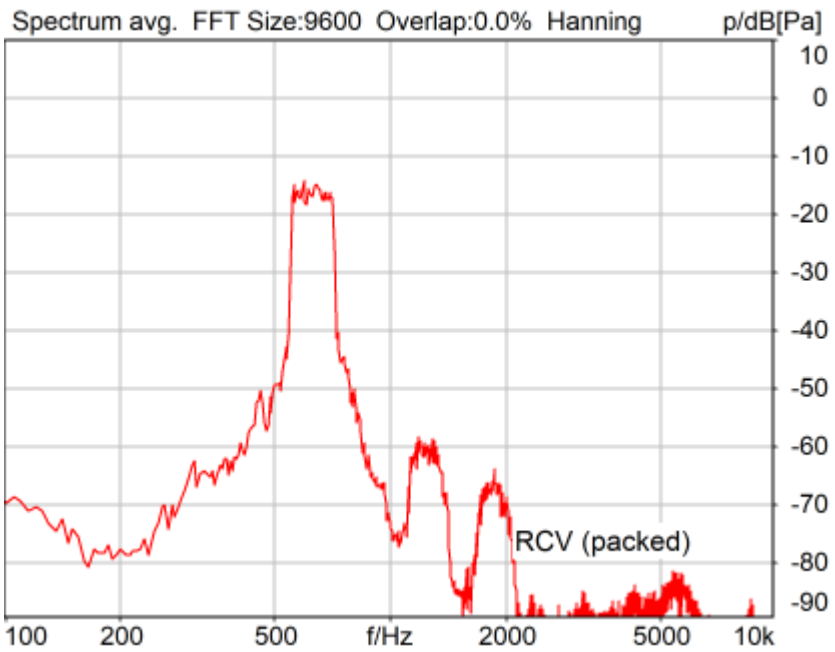
2025/2/10 9:59 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.94 dB (2.01%) Ok

Ok

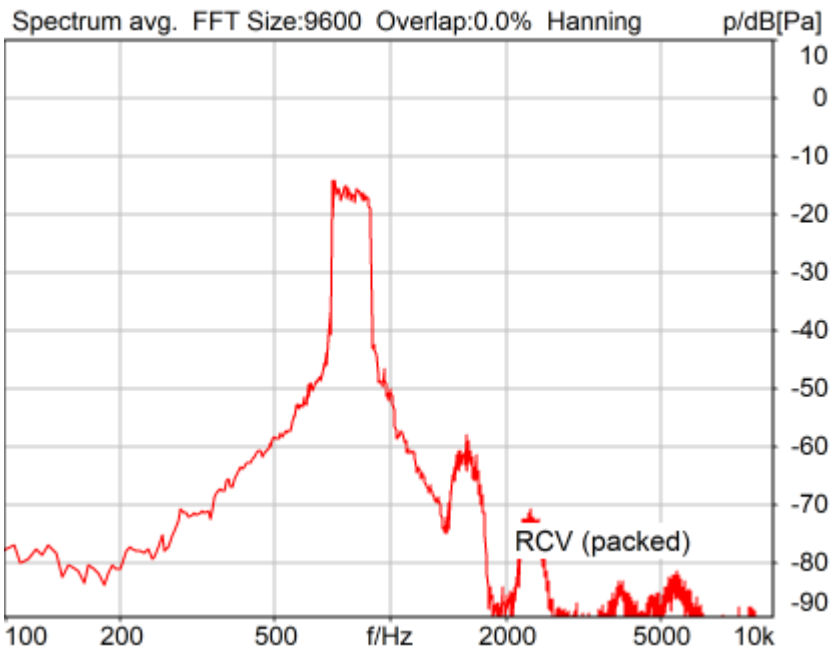
2025/2/10 9:59 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.94 dB (2.26%) Ok

Ok

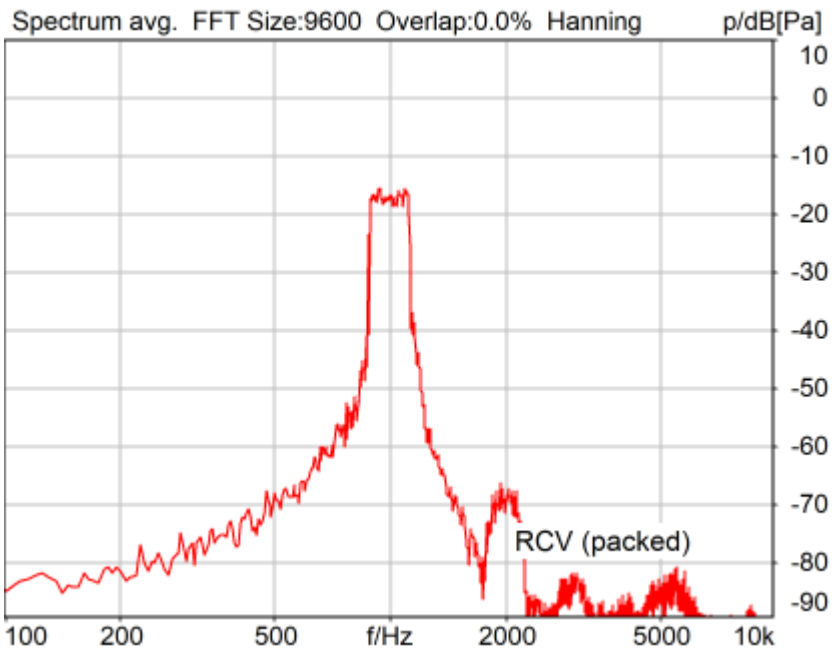
2025/2/10 10:00 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.85 dB (2.28%) Ok

Ok

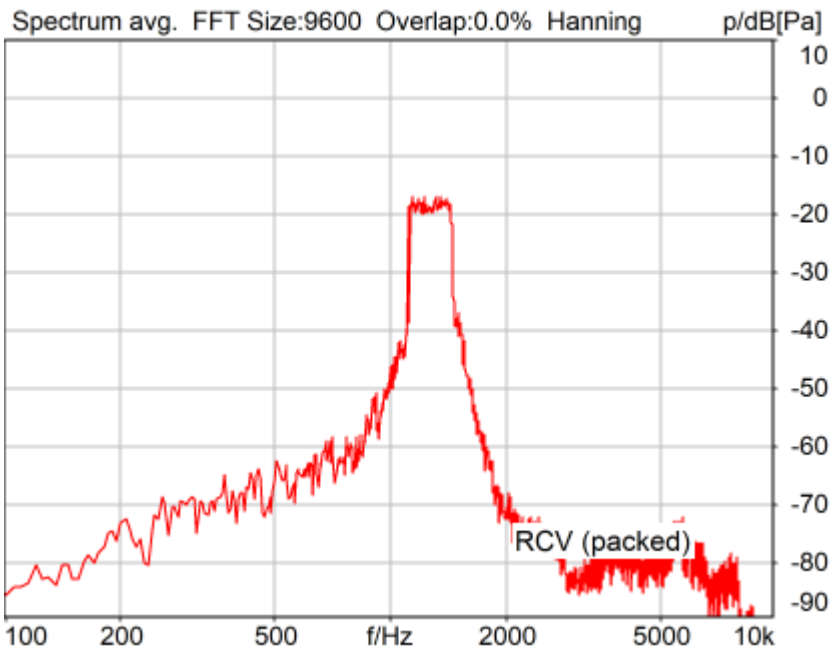
2025/2/10 10:00 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 23.36 dB (6.79%) Ok

Ok

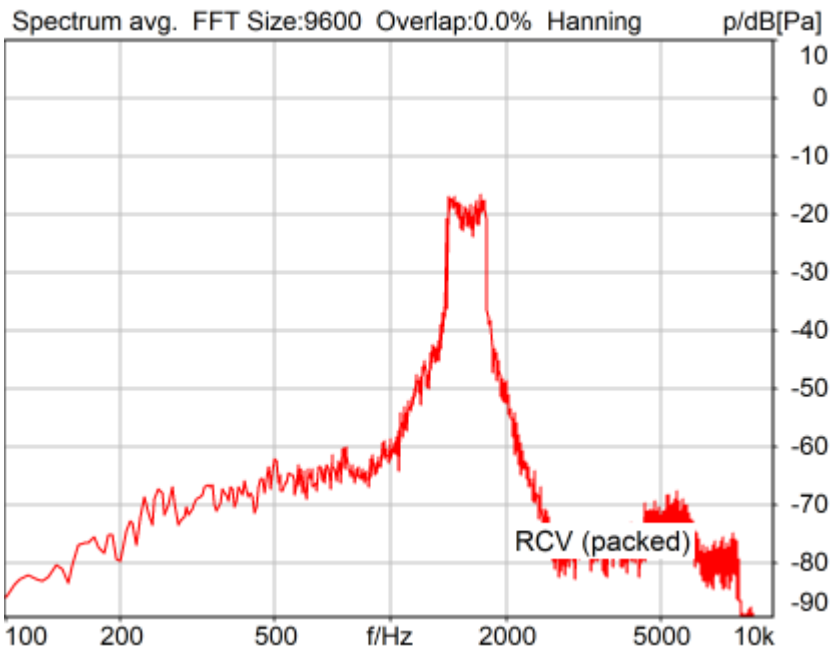
2025/2/10 10:00 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 24.53 dB (5.93%) Ok

Ok

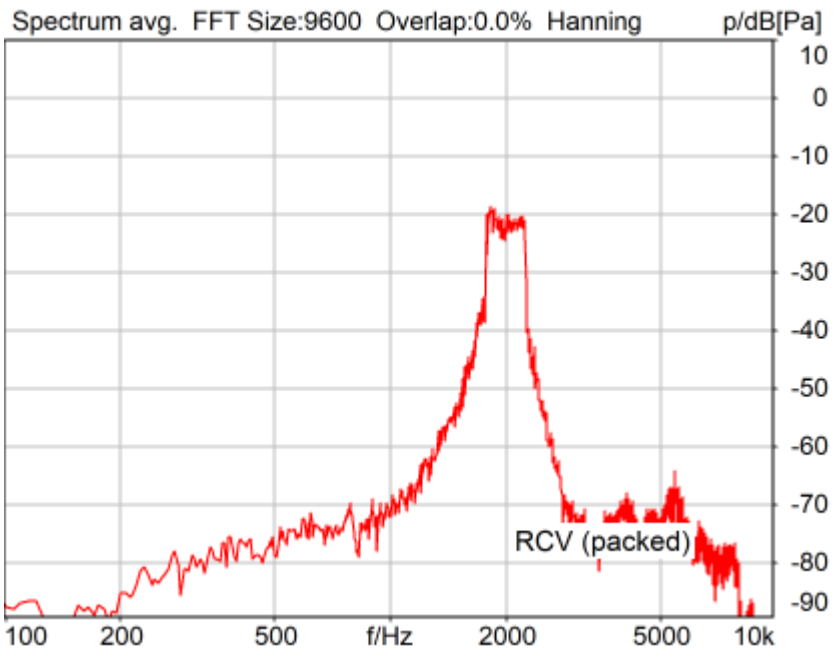
2025/2/10 10:01 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 20.74 dB (9.18%) Ok

Ok

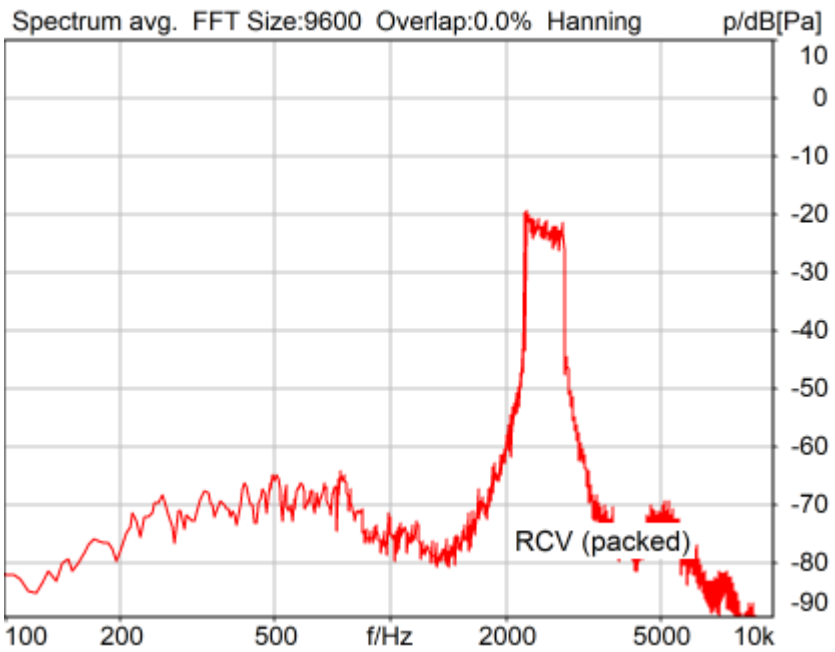
2025/2/10 10:01 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 28.74 dB (3.66%) Ok

Ok

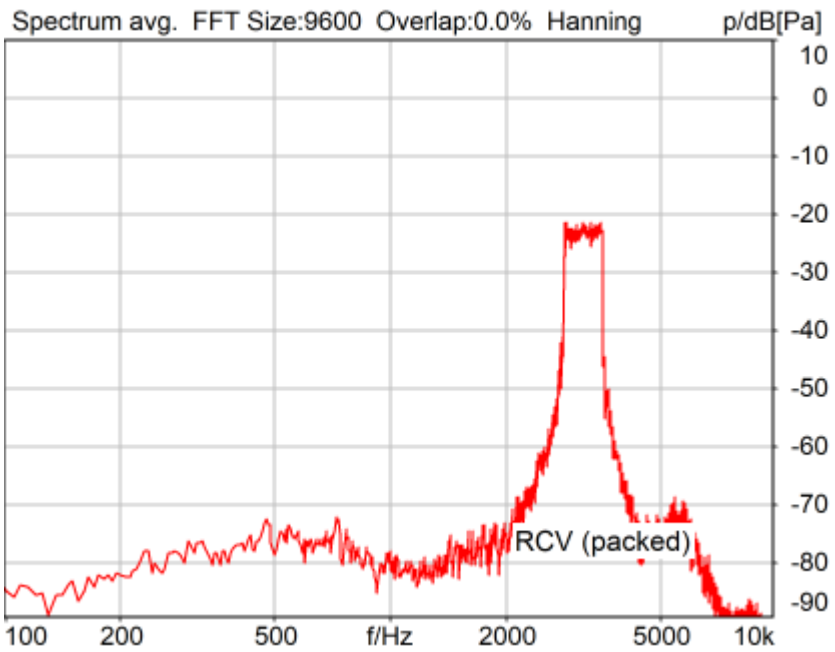
2025/2/10 10:02 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.05 dB (3.14%) Ok

Ok

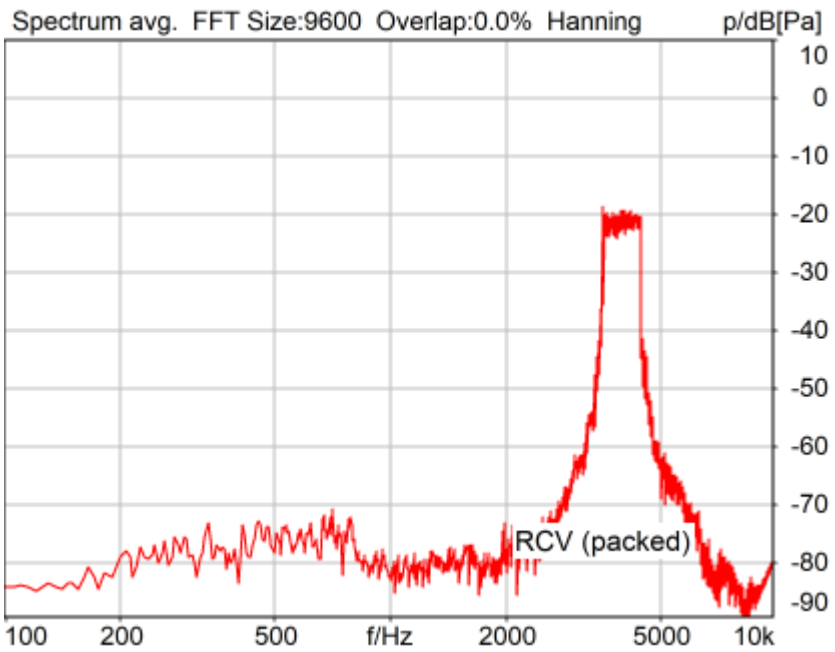
2025/2/10 10:02 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 4000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 27.70 dB (4.12%) Ok

Ok

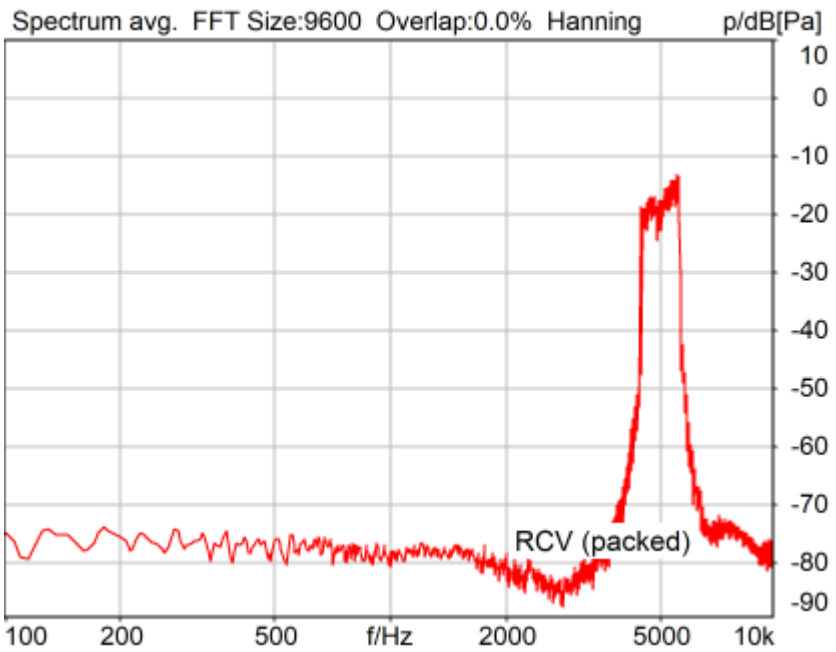
2025/2/10 10:02 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 5000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 35.23 dB (1.73%) Ok

Ok

2025/2/10 10:03 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N

Region	Frequency	SDNR
1	250Hz	29.41 dB
2	315Hz	33.36 dB
3	400Hz	34.26 dB
4	500Hz	31.54 dB
5	630Hz	33.94 dB
6	800Hz	32.94 dB
7	1000Hz	32.85 dB
8	1250Hz	23.36 dB
9	1600Hz	24.53 dB
10	2000Hz	20.74 dB

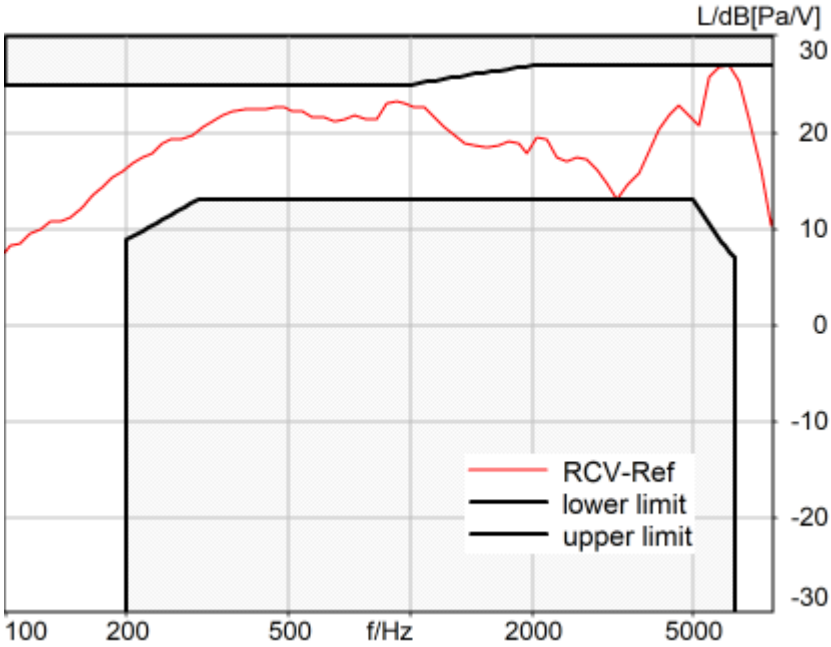
11	2500Hz	28.74 dB
12	3150Hz	30.05 dB
13	4000Hz	27.70 dB
14	5000Hz	35.23 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 20.74dB at 2000Hz.

2025/2/10 10:04 ACQUA

5.3 Frequency Response 8N DF

TIA-5050 (2018-01) \ Measurements \ Wideband



Absolute minimal distance
0.07 dB at 6117.2 Hz Ok

Ok

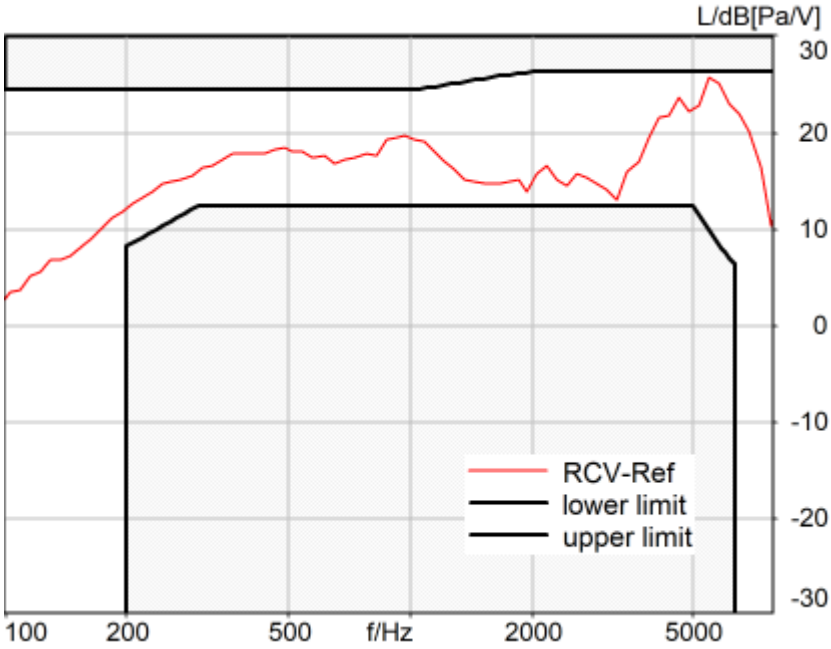
2025/2/10 10:34 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

5.3 Frequency Response 2N DF

TIA-5050 (2018-01) \ Measurements \ Wideband



Absolute minimal distance
0.60 dB at 5443.6 Hz Ok

Ok

2025/2/10 10:06 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance

Measurement Protocol

Measurement Object	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2

Project	TIA-5050 (2018-01)
Report Generation Date	2025/3/20 15:29
Responsible Person	audio

Status Overview

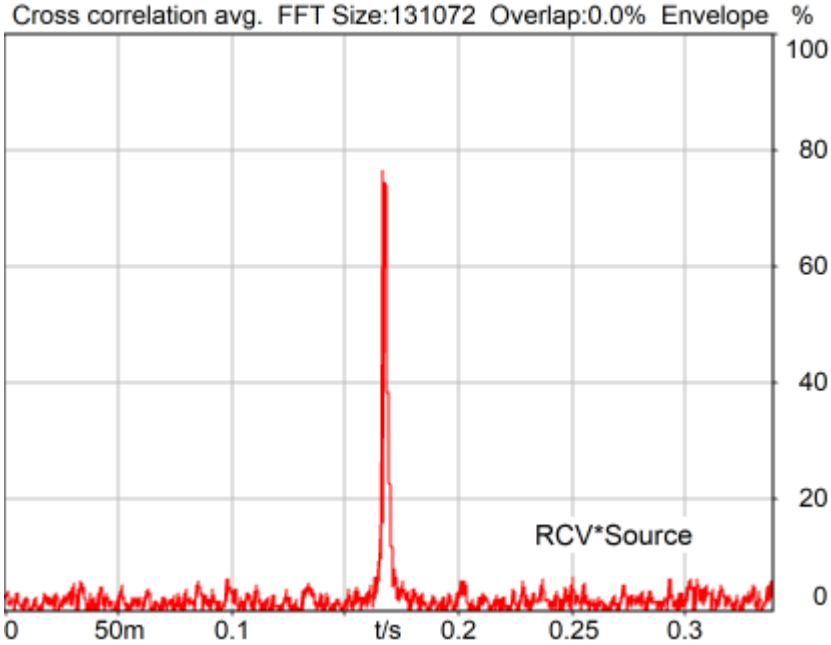
SMD	Status	Single Value Description	Single Value	Object
Overall Receive Delay WB	Done	Delay (Cross) [ms]	167.7	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.1b Receive Volume Control Performance 2N WB	Ok	Corrected Speech Level [dB[SPL]]	16.47	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	30.09	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 315 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.61	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 400 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.36	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	34.15	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 630 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	33.68	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 800 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.58	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 1000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	32.85	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 1250 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.78	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 1600 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	24.28	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 2000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	21.77	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 2500 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	26.81	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 3150 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	29.77	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 4000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	30.03	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.2 RCV Distortion and Noise - 5000 Hz WB	Ok	Distortion (Noise) [dB], 0.0 dB	37.18	HUHAO_2403_n66_DFT-QPSK30M_1_1_EVS WB 24.4kbps_CH349000_Sample2
Report - Receive	Ok	Minimum SDNR	21.77	HUHAO_2403_n66_DFT-QPSK30M

Distortion and Noise (Conversational Gain)		[dB], (occured at 2000Hz)		_1_1_EVS WB 24.4kbps_CH349000_Sample2
5.3 Frequency Response 2N DF	Ok	Min. dist. to tolerance scheme [dB], 5443.6 Hz	1.81	HUHAO_2403_n66_DFT-QPSK30M _1_1_EVS WB 24.4kbps_CH349000_Sample2

Overall Receive Delay WB 5
5.1b Receive Volume Control Performance 2N WB 5
5.2 RCV Distortion and Noise - 250 Hz WB 6
5.2 RCV Distortion and Noise - 315 Hz WB 7
5.2 RCV Distortion and Noise - 400 Hz WB 8
5.2 RCV Distortion and Noise - 500 Hz WB 9
5.2 RCV Distortion and Noise - 630 Hz WB 10
5.2 RCV Distortion and Noise - 800 Hz WB 11
5.2 RCV Distortion and Noise - 1000 Hz WB 12
5.2 RCV Distortion and Noise - 1250 Hz WB 13
5.2 RCV Distortion and Noise - 1600 Hz WB 14
5.2 RCV Distortion and Noise - 2000 Hz WB 15
5.2 RCV Distortion and Noise - 2500 Hz WB 16
5.2 RCV Distortion and Noise - 3150 Hz WB 17
5.2 RCV Distortion and Noise - 4000 Hz WB 18
5.2 RCV Distortion and Noise - 5000 Hz WB 19
Report - Receive Distortion and Noise (Conversational Gain) 20
5.3 Frequency Response 2N DF 21

Overall Receive Delay WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ Preparation - Delay measurement

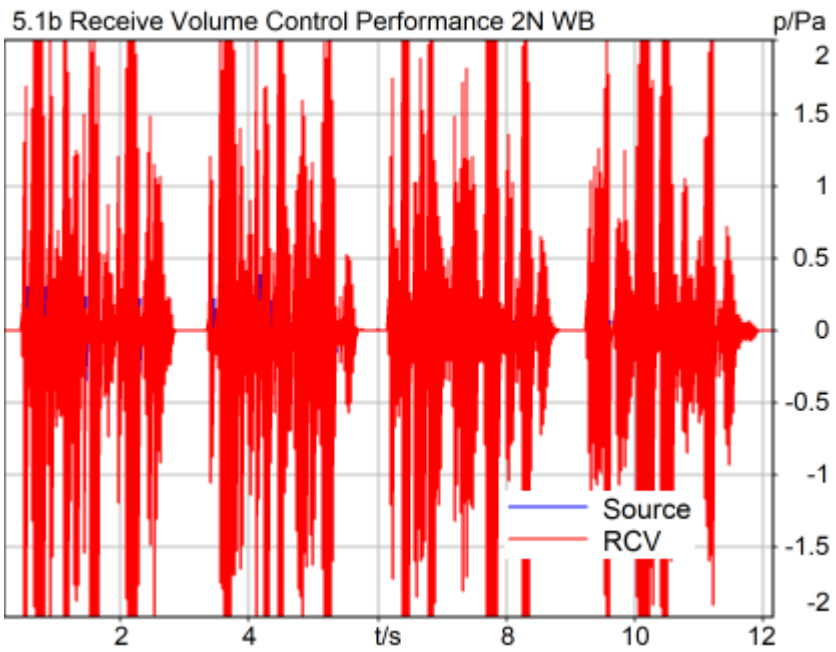


Channel	Delay
RCV*Source	167.7 ms

2025/3/18 15:14 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

5.1b Receive Volume Control Performance 2N WB

TIA-5050 (2018-01) \ Measurements \ Wideband



Correction

X - 70

Channel	Speech level	Activity	Corrected speech level	
RCV	86.47 dB[SPL]	84.63%	16.47 dB[SPL]	Ok

Ok

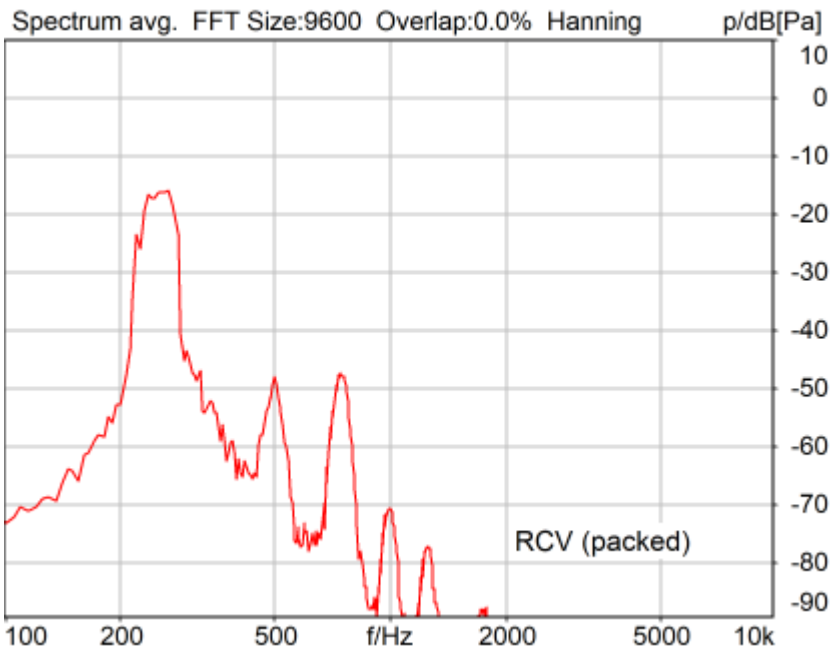
2025/3/18 15:57 ACQUA 6.0.200

Limits

	lower
Run 1	6.00 dB20uPa

5.2 RCV Distortion and Noise - 250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.09 dB (3.13%) Ok

Ok

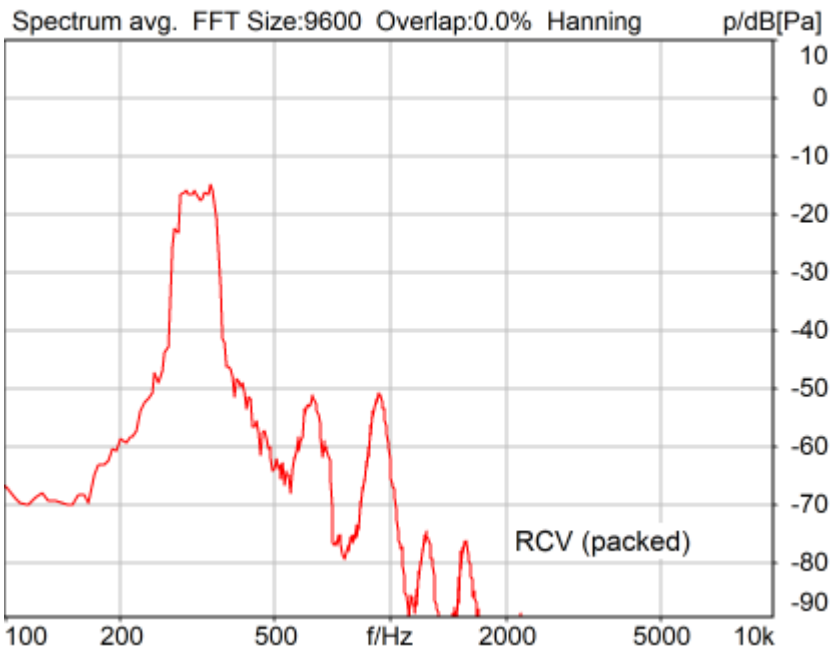
2025/3/18 15:30 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 315 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.61 dB (2.34%) Ok

Ok

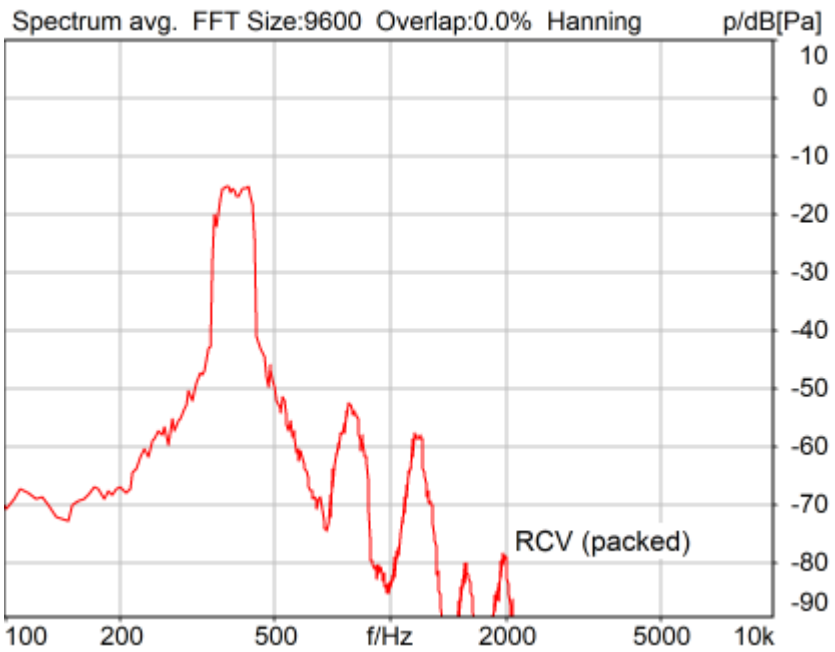
2025/3/18 15:30 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 400 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.36 dB (1.91%) Ok

Ok

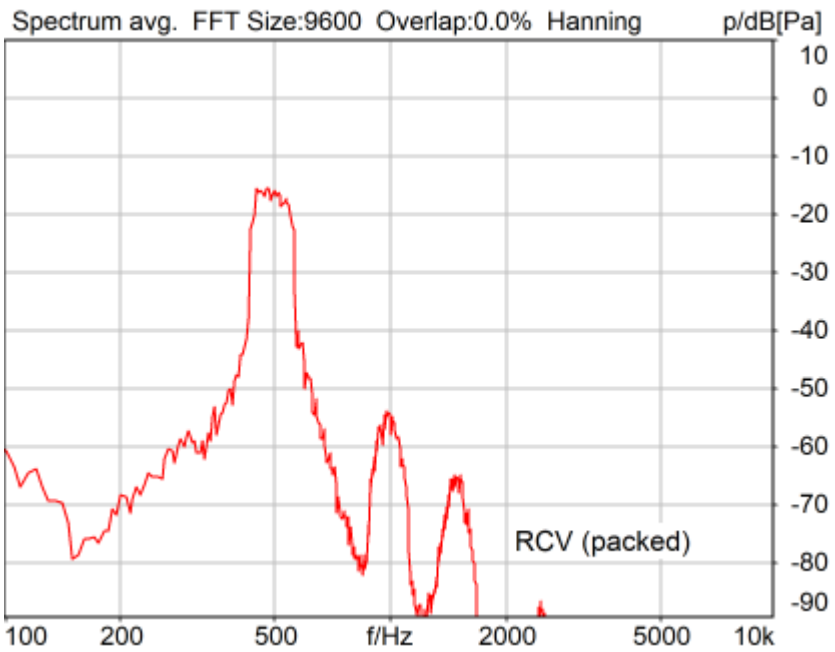
2025/3/18 15:31 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 34.15 dB (1.96%) Ok

Ok

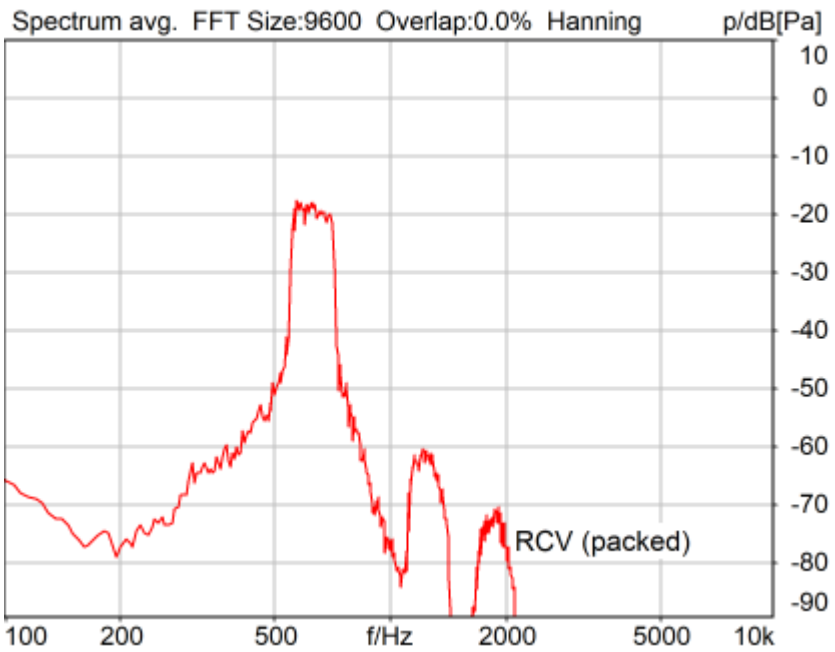
2025/3/18 15:31 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 630 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 33.68 dB (2.07%) Ok

Ok

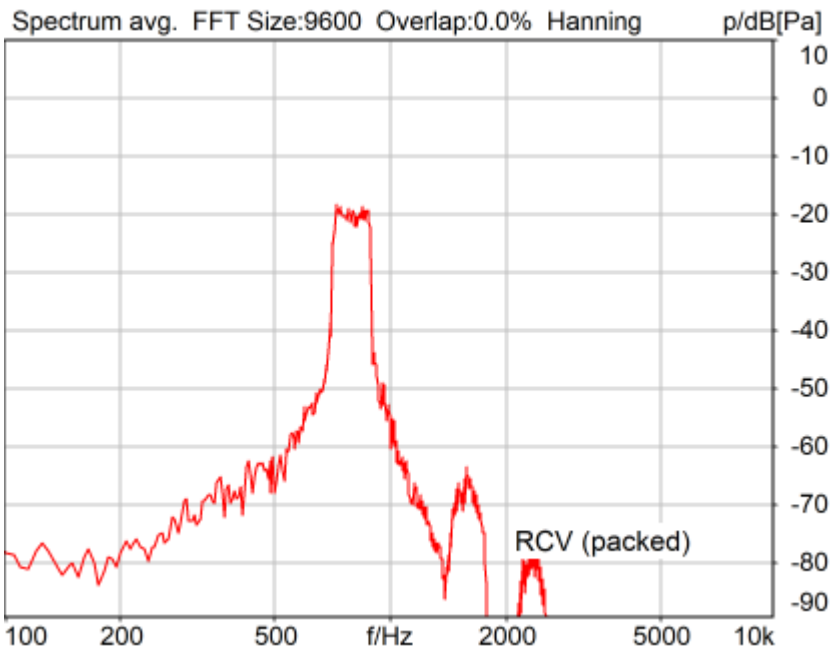
2025/3/18 15:31 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 800 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.58 dB (2.35%) Ok

Ok

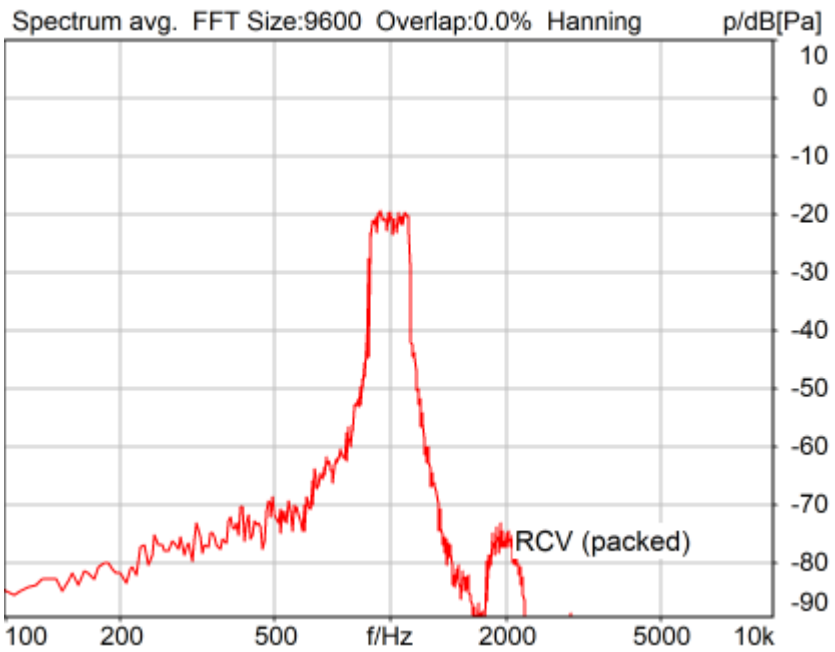
2025/3/18 15:32 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 32.85 dB (2.28%) Ok

Ok

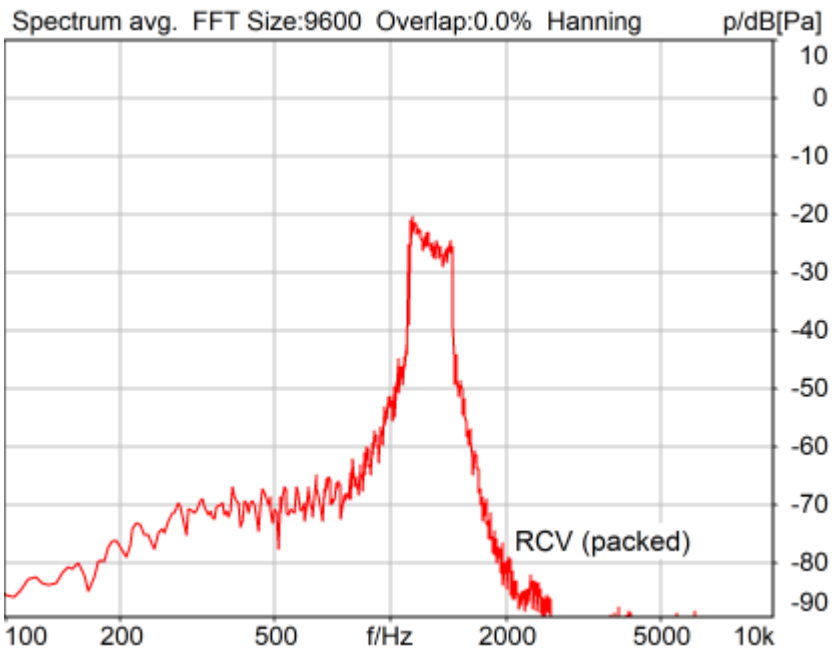
2025/3/18 15:32 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1250 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 24.78 dB (5.77%) Ok

Ok

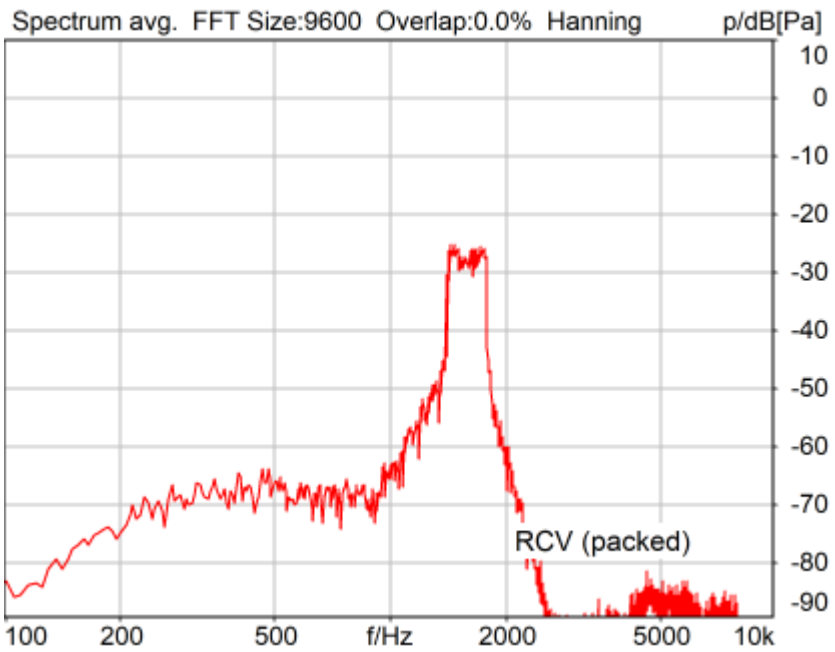
2025/3/18 15:33 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 1600 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 24.28 dB (6.11%) Ok

Ok

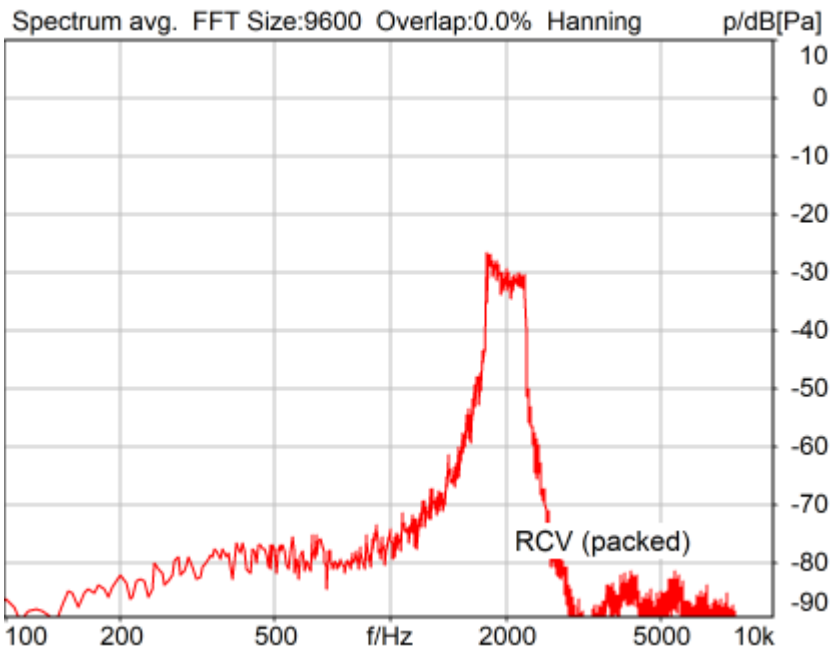
2025/3/18 15:33 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 21.77 dB (8.16%) Ok

Ok

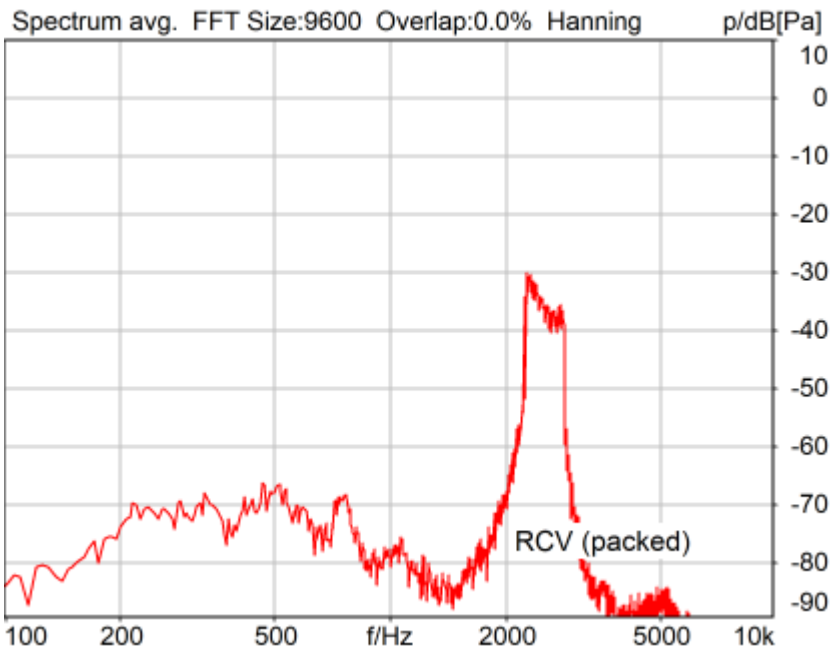
2025/3/18 15:33 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 2500 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 26.81 dB (4.57%) Ok

Ok

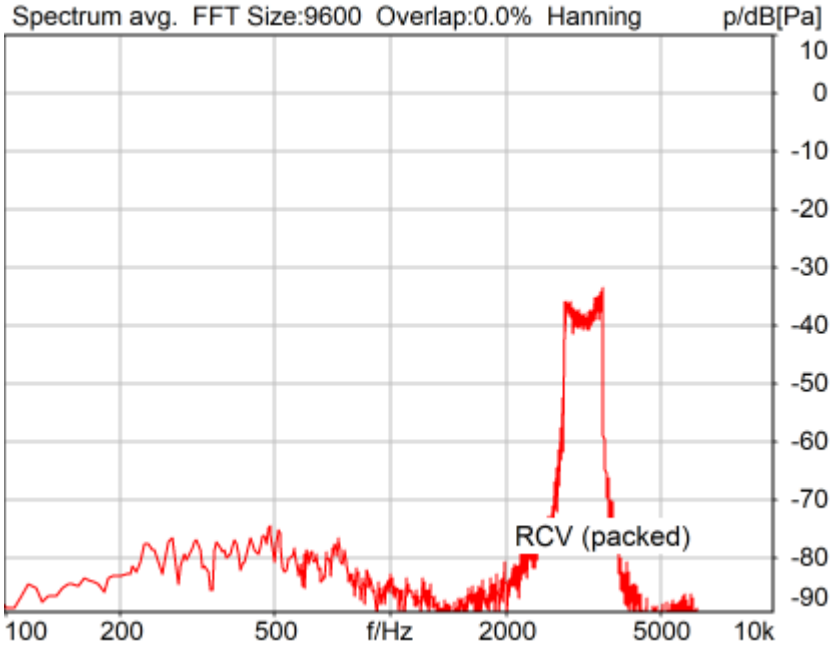
2025/3/18 15:34 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 3150 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 29.77 dB (3.25%) Ok

Ok

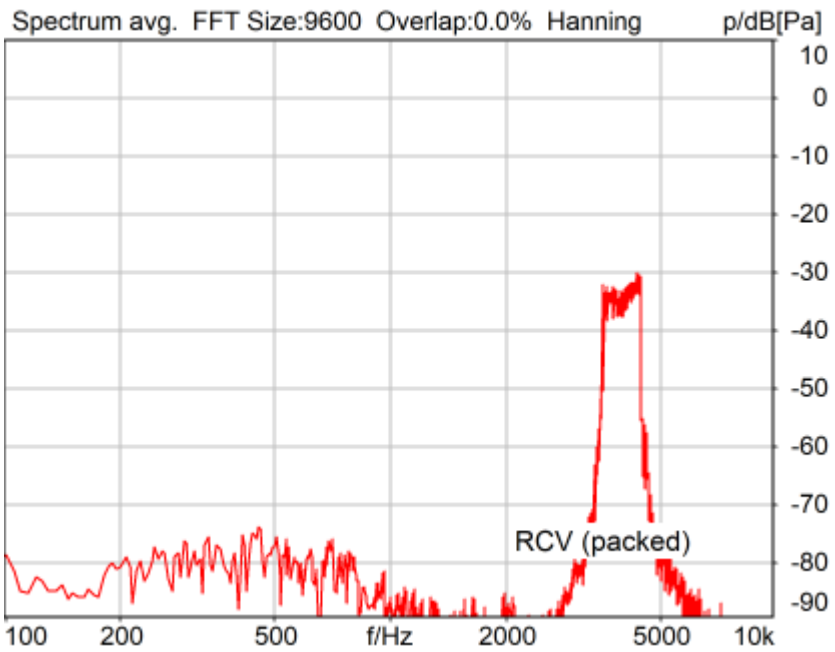
2025/3/18 15:34 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 4000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 30.03 dB (3.15%) Ok

Ok

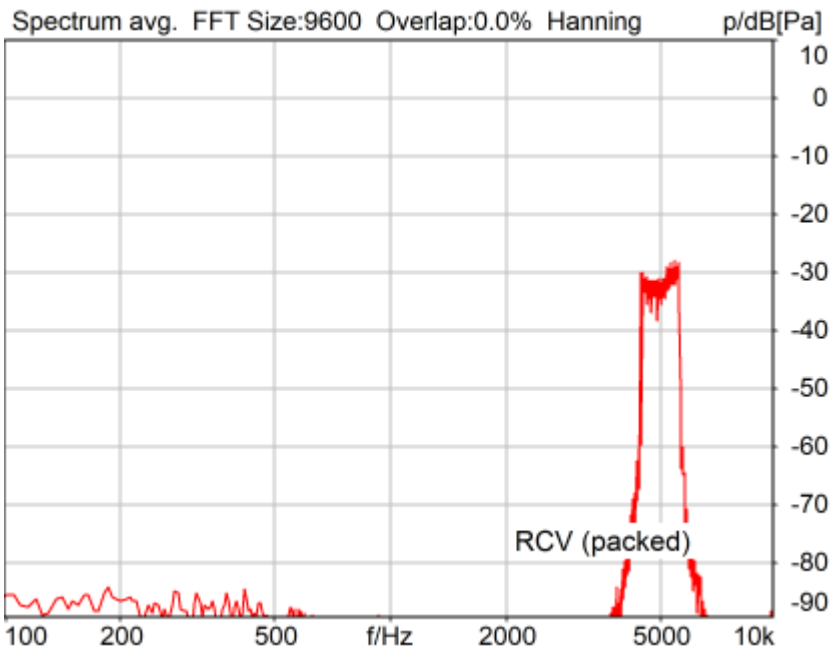
2025/3/18 15:35 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

5.2 RCV Distortion and Noise - 5000 Hz WB

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N



Distortion (Noise) RCV (packed): 37.18 dB (1.38%) Ok

Ok

2025/3/18 15:35 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	20.00 dB

Report - Receive Distortion and Noise (Conversational Gain)

TIA-5050 (2018-01) \ Measurements \ Wideband \ 5.2 Receive Distortion and Noise 2N

Region	Frequency	SDNR
1	250Hz	30.09 dB
2	315Hz	32.61 dB
3	400Hz	34.36 dB
4	500Hz	34.15 dB
5	630Hz	33.68 dB
6	800Hz	32.58 dB
7	1000Hz	32.85 dB
8	1250Hz	24.78 dB
9	1600Hz	24.28 dB
10	2000Hz	21.77 dB

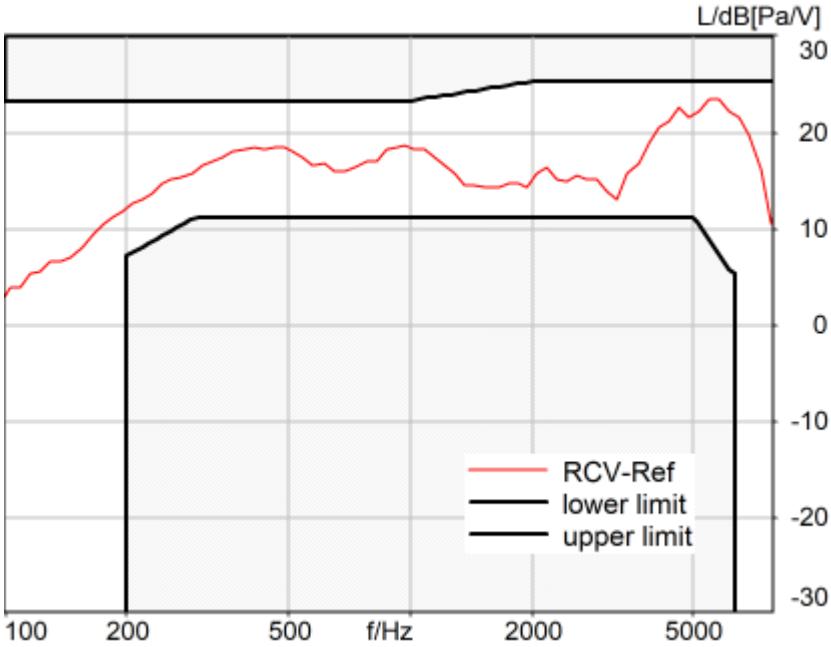
11	2500Hz	26.81 dB
12	3150Hz	29.77 dB
13	4000Hz	30.03 dB
14	5000Hz	37.18 dB

All SDNRs were greater than 20.0 dB, requirement was met.
Smallest SDNR was 21.77dB at 2000Hz.

2025/3/18 15:36 ACQUA

5.3 Frequency Response 2N DF

TIA-5050 (2018-01) \ Measurements \ Wideband



Absolute minimal distance
1.81 dB at 5443.6 Hz Ok

Ok

2025/3/18 15:55 ACQUA 6.0.200
Unmodified HEAD acoustics Measurement Descriptor

Limits

	lower
Run 1	Fit into tolerance