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## **Measurement Protocol**

|                    |                                                            |
|--------------------|------------------------------------------------------------|
| Measurement Object | LTE Band 26_15M_QPSK_75RB_0Offset_EVS WB 64Kbps_Ch26865_2N |
|--------------------|------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/21 20:46             |
|                        |                              |

## Status Overview

| SMD                                           | Status | Single Value Description        | Single Value | Object                                                            |
|-----------------------------------------------|--------|---------------------------------|--------------|-------------------------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]              | 99.7         | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.1b Receive Volume Control Performance 2N WB | Ok     | Speech Level [dB[SPL]]          | 84.38        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 21.52        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 24.50        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 27.43        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.40        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.39        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.76        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 31.28        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 33.70        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 44.83        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 43.30        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 46.11        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 41.10        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.83        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 46.79        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_2N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR                    | 21.52        | LTE Band                                                          |

|                                 |    |                                                |      |                                                               |
|---------------------------------|----|------------------------------------------------|------|---------------------------------------------------------------|
| and Noise (Conversational Gain) |    | [dB], (occured at 250Hz)                       |      | 26_15M_QPSK_75RB_0Offset_EVS WB 64Kbps_Ch26865_2N             |
| 5.3 Frequency Response 2N FF    | Ok | Min. dist. to tolerance scheme [dB], 611.7 Hz  | 1.16 | LTE Band<br>26_15M_QPSK_75RB_0Offset_EVS WB 64Kbps_Ch26865_2N |
| 5.3 Frequency Response 2N DF    | Ok | Min. dist. to tolerance scheme [dB], 2432.3 Hz | 0.73 | LTE Band<br>26_15M_QPSK_75RB_0Offset_EVS WB 64Kbps_Ch26865_2N |

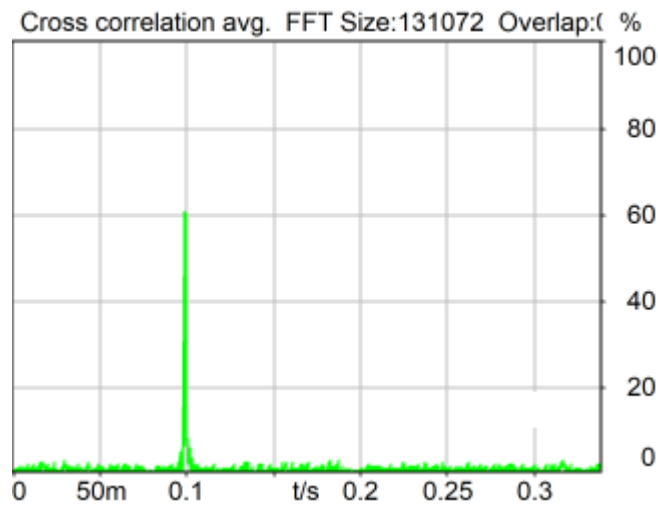
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1b Receive Volume Control Performance 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 |
| 5.3 Frequency Response 2N FF                                | 23 |
| 5.3 Frequency Response 2N DF                                | 24 |



## Overall Receive Delay WB

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



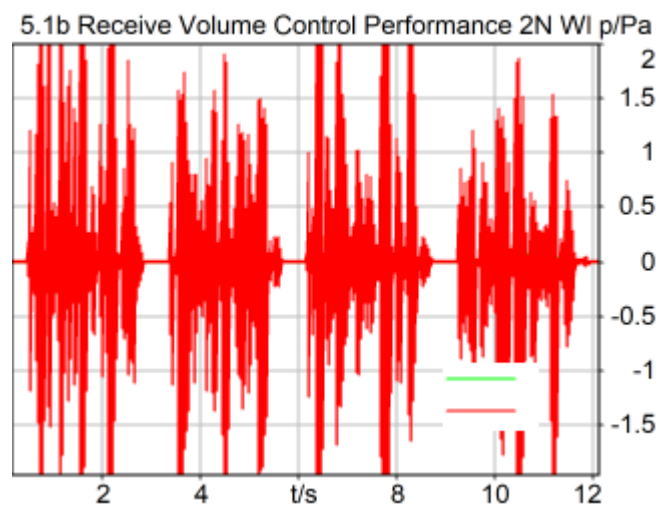
Delay (Cross): 99.7 ms

2023/11/13 1:30 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1b Receive Volume Control Performance 2N WB**

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



Speech Level RCV: 84.38 dB[SPL], Act.: 80.99% Ok

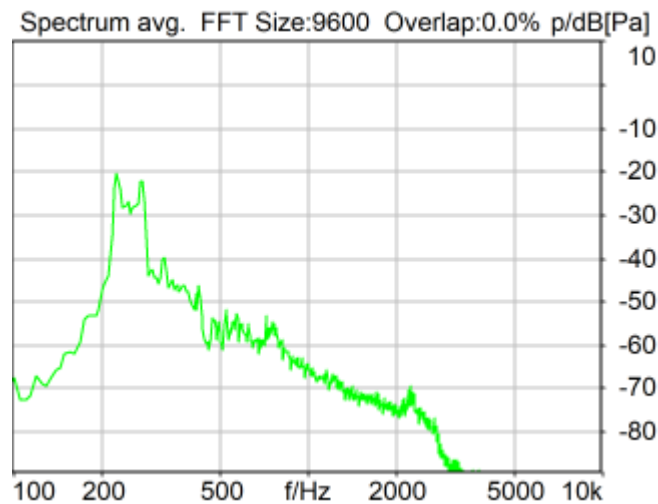
**Ok**

2023/11/13 1:31 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 21.52 dB (8.39%) Ok

**Ok**

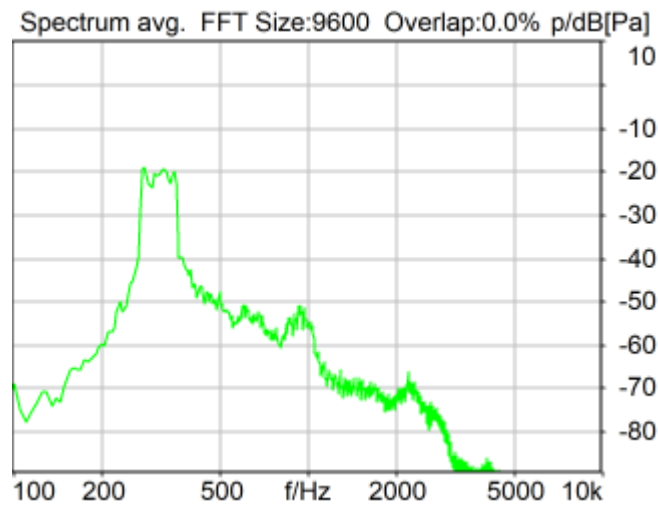
2023/11/13 1:31 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 24.50 dB (5.96%) Ok

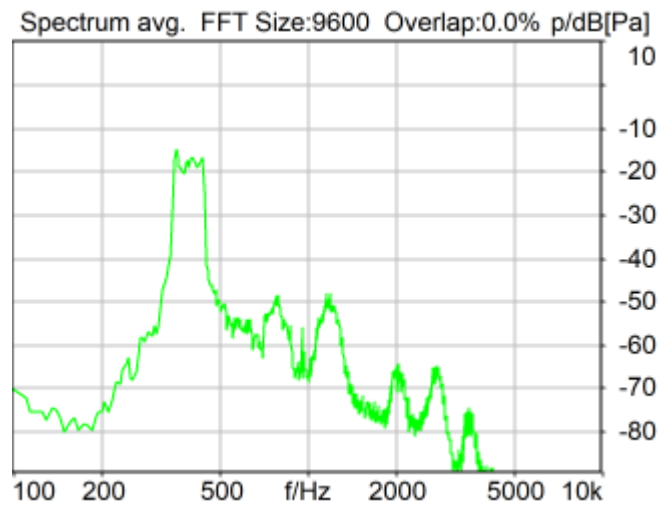
**Ok**

2023/11/13 1:31 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.43 dB (4.25%) Ok

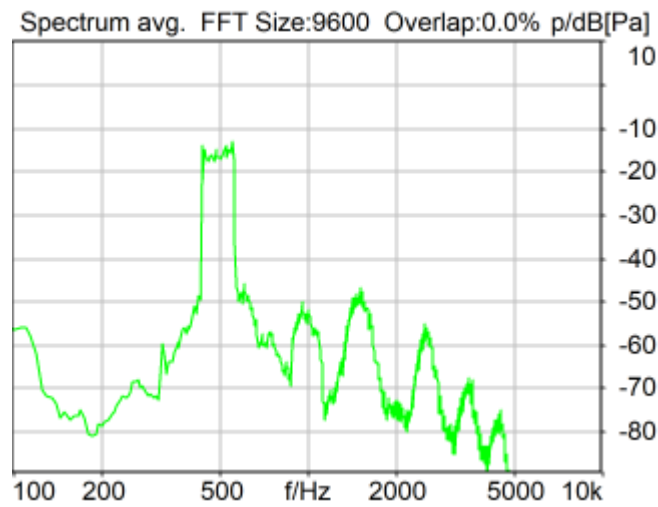
**Ok**

2023/11/13 1:32 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.40 dB (3.80%) Ok

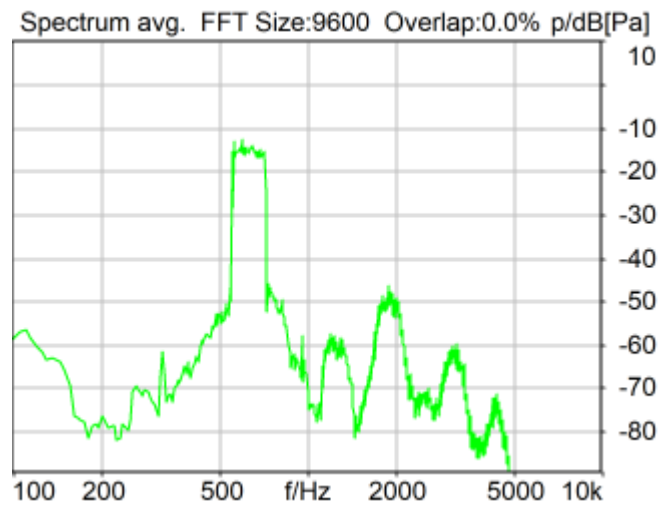
**Ok**

2023/11/13 1:32 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.39 dB (3.39%) Ok

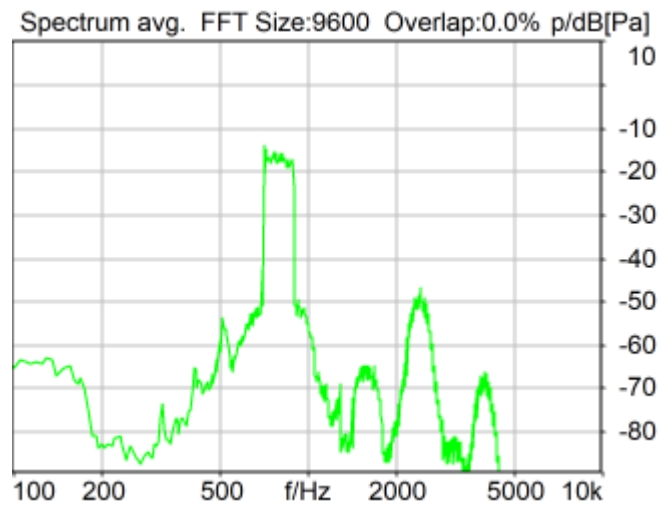
**Ok**

2023/11/13 1:33 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.76 dB (3.65%) Ok

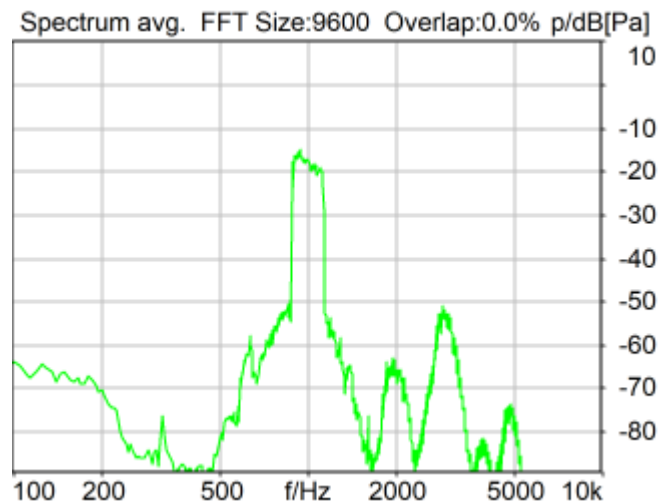
**Ok**

2023/11/13 1:33 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 31.28 dB (2.73%) Ok

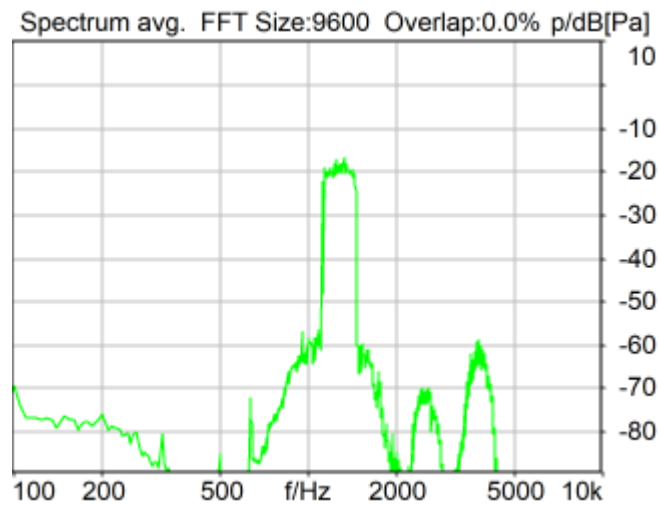
**Ok**

2023/11/13 1:33 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 33.70 dB (2.07%) Ok

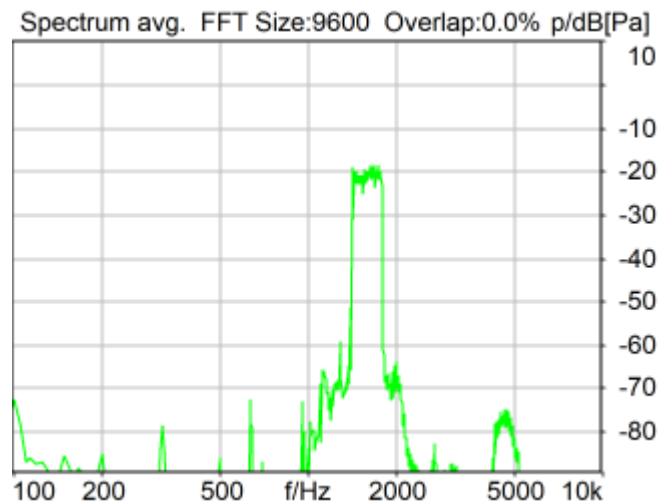
**Ok**

2023/11/13 1:34 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 44.83 dB (0.57%) Ok

**Ok**

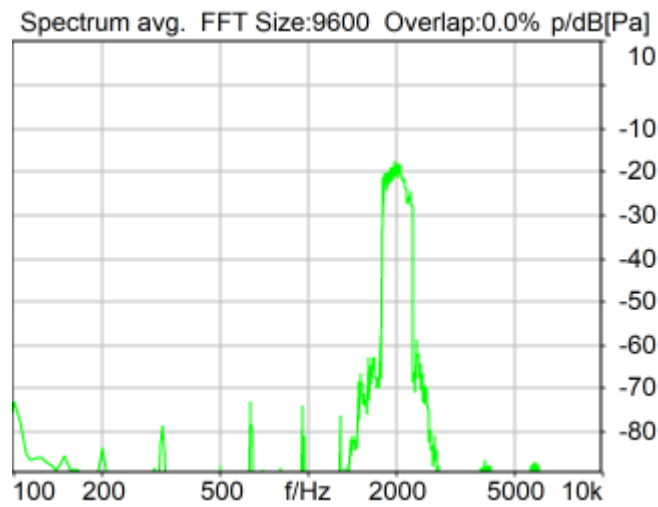
2023/11/13 1:34 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 43.30 dB (0.68%) Ok

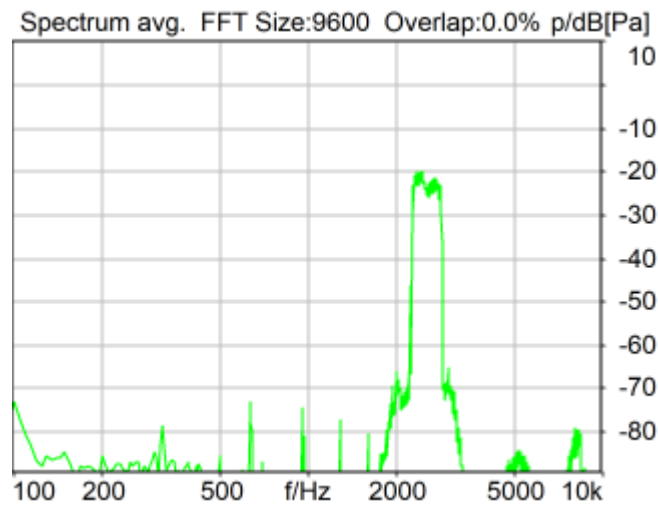
**Ok**

2023/11/13 1:35 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 46.11 dB (0.49%) Ok

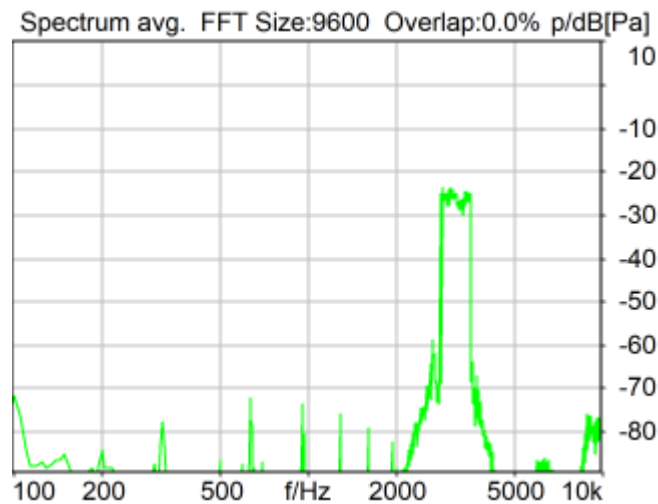
**Ok**

2023/11/13 1:35 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 41.10 dB (0.88%) Ok

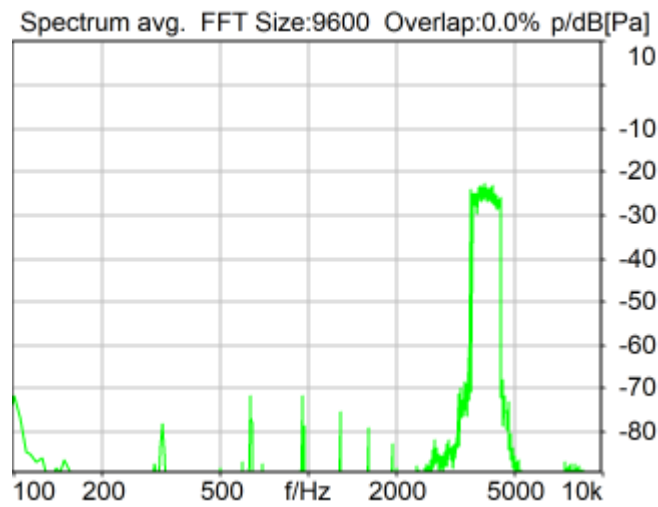
**Ok**

2023/11/13 1:35 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 45.83 dB (0.51%) Ok

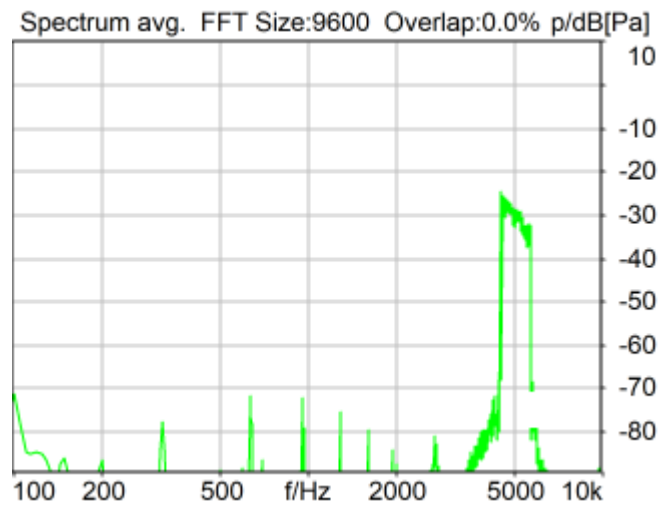
**Ok**

2023/11/13 1:36 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 46.79 dB (0.46%) Ok

**Ok**

2023/11/13 1:36 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 21.52 dB |
| 2      | 315Hz     | 24.50 dB |
| 3      | 400Hz     | 27.43 dB |
| 4      | 500Hz     | 28.40 dB |
| 5      | 630Hz     | 29.39 dB |
| 6      | 800Hz     | 28.76 dB |
| 7      | 1000Hz    | 31.28 dB |
| 8      | 1250Hz    | 33.70 dB |
| 9      | 1600Hz    | 44.83 dB |
| 10     | 2000Hz    | 43.30 dB |
| 11     | 2500Hz    | 46.11 dB |
| 12     | 3150Hz    | 41.10 dB |
| 13     | 4000Hz    | 45.83 dB |
| 14     | 5000Hz    | 46.79 dB |

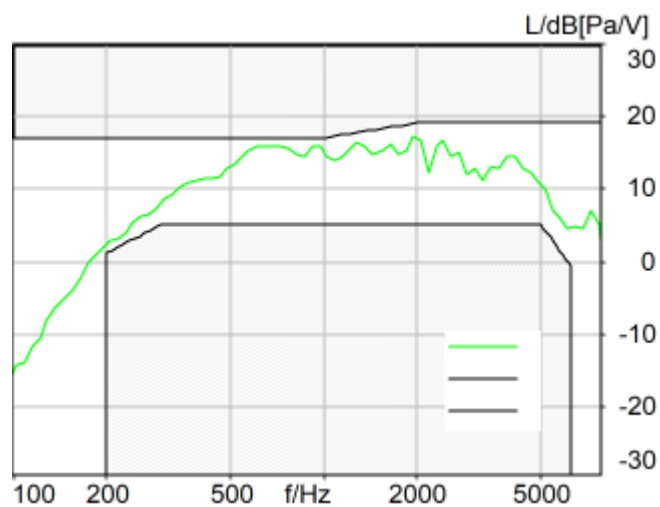
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 21.52dB at 250Hz.

2023/11/13 1:41 ACQUA

## 5.3 Frequency Response 2N FF

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



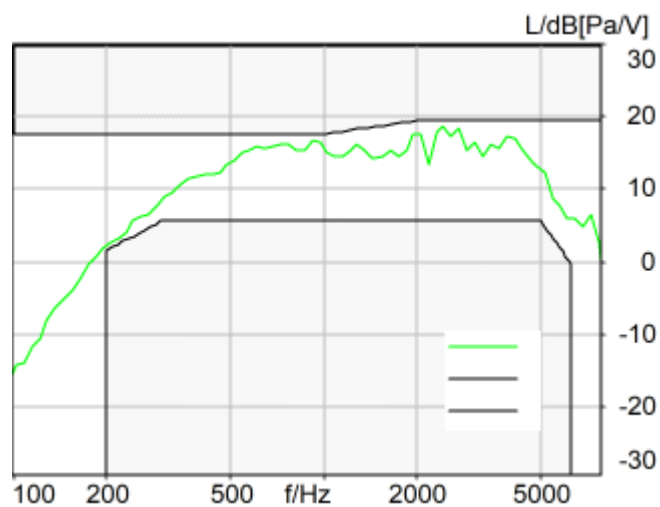
Absolute minimal distance  
1.16 dB at 611.7 Hz Ok

Ok

2023/11/13 1:42 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 2N DF

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



Absolute minimal distance  
0.73 dB at 2432.3 Hz Ok

Ok

2023/11/13 1:42 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor



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## **Measurement Protocol**

|                    |                                                            |
|--------------------|------------------------------------------------------------|
| Measurement Object | LTE Band 26_15M_QPSK_75RB_0Offset_EVS WB 64Kbps_Ch26865_8N |
|--------------------|------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/21 20:47             |
|                        |                              |

## Status Overview

| SMD                                           | Status | Single Value Description        | Single Value | Object                                                            |
|-----------------------------------------------|--------|---------------------------------|--------------|-------------------------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]              | 479.9        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.1a Receive Volume Control Performance 8N WB | Ok     | Speech Level [dB[SPL]]          | 88.25        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 23.80        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 24.85        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 27.02        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.79        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.63        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.86        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 32.61        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 34.47        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.47        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 43.51        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.49        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 39.13        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.51        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 47.22        | LTE Band<br>26_15M_QPSK_75RB_0Offset_E<br>VS WB 64Kbps_Ch26865_8N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR                    | 23.80        | LTE Band                                                          |

|                                 |    |                                               |      |                                                               |
|---------------------------------|----|-----------------------------------------------|------|---------------------------------------------------------------|
| and Noise (Conversational Gain) |    | [dB], (occured at 250Hz)                      |      | 26_15M_QPSK_75RB_0Offset_EVS WB 64Kbps_Ch26865_8N             |
| 5.3 Frequency Response 8N FF    | Ok | Min. dist. to tolerance scheme [dB], 611.7 Hz | 1.29 | LTE Band<br>26_15M_QPSK_75RB_0Offset_EVS WB 64Kbps_Ch26865_8N |
| 5.3 Frequency Response 8N DF    | Ok | Min. dist. to tolerance scheme [dB], 974.0 Hz | 1.03 | LTE Band<br>26_15M_QPSK_75RB_0Offset_EVS WB 64Kbps_Ch26865_8N |

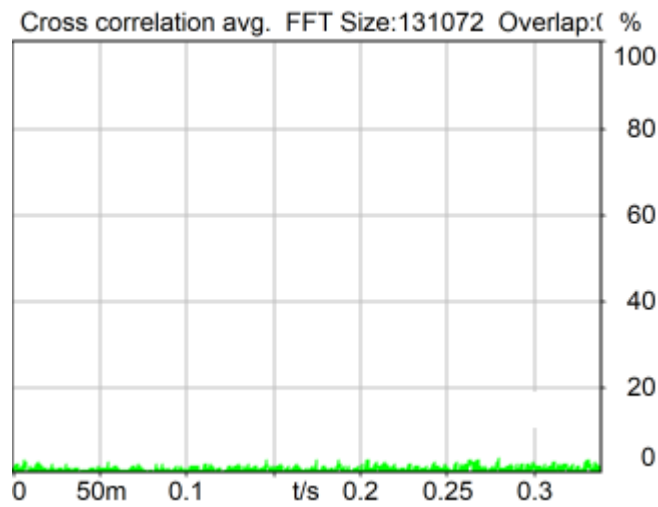
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1a Receive Volume Control Performance 8N 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 |
| 5.3 Frequency Response 8N FF                                | 23 |
| 5.3 Frequency Response 8N DF                                | 24 |



## Overall Receive Delay WB

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



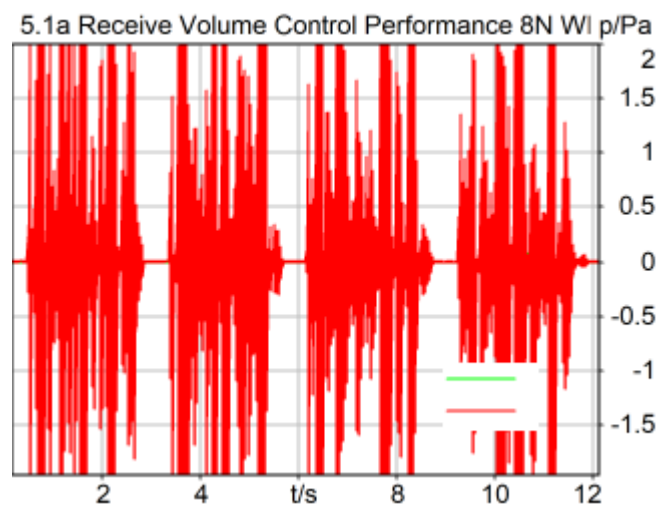
Delay (Cross): 479.9 ms

2023/11/13 1:45 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1a Receive Volume Control Performance 8N WB**

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



Speech Level RCV: 88.25 dB[SPL], Act.: 80.82% Ok

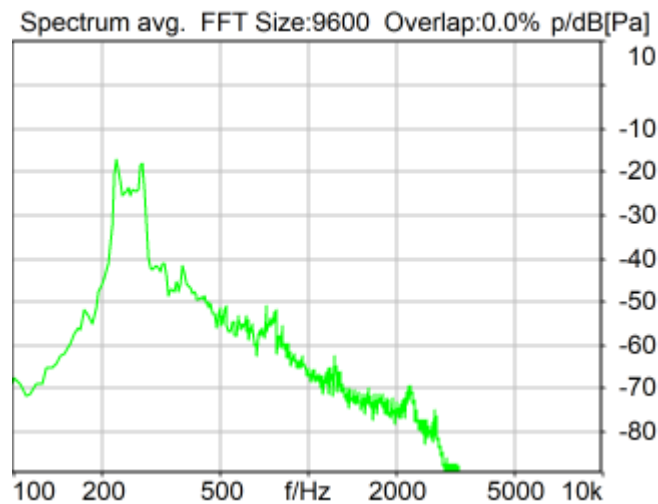
**Ok**

2023/11/13 1:46 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 23.80 dB (6.46%) Ok

**Ok**

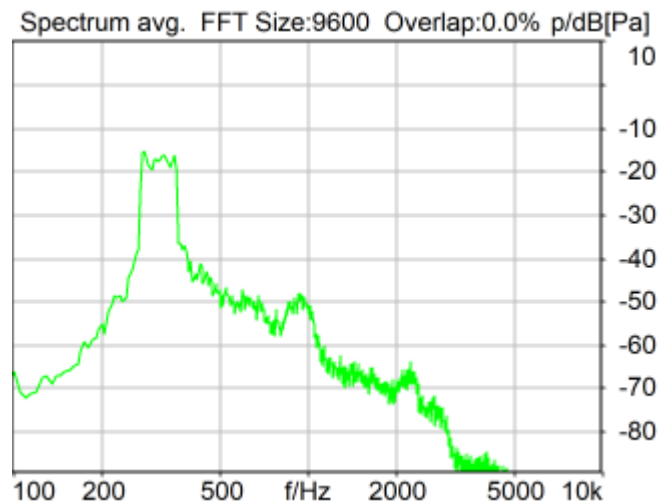
2023/11/13 1:46 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 24.85 dB (5.72%) Ok

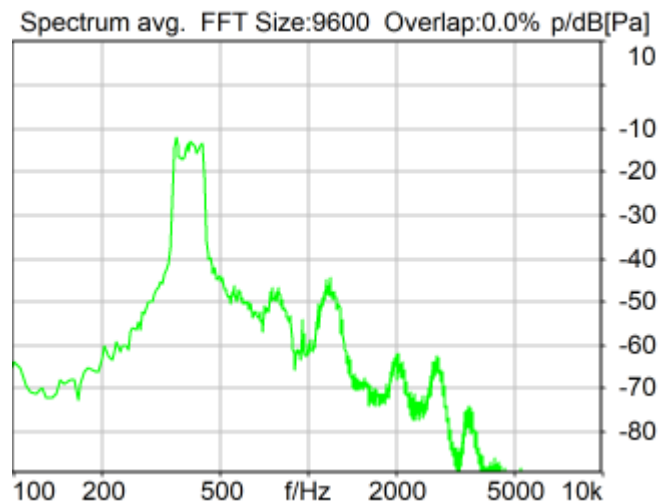
**Ok**

2023/11/13 1:46 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.02 dB (4.46%) Ok

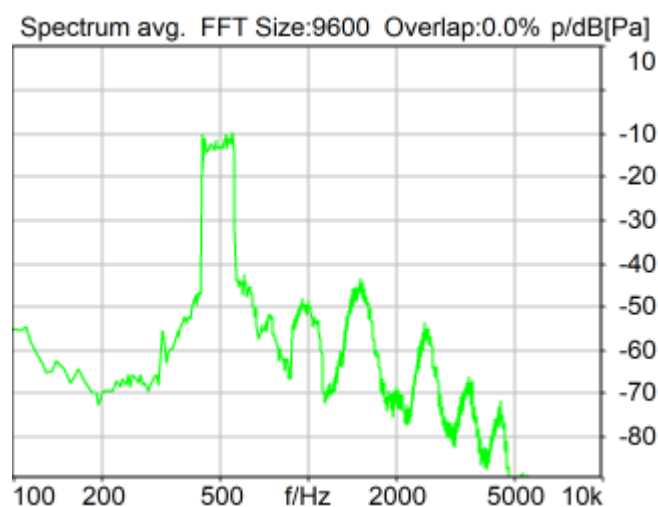
**Ok**

2023/11/13 1:47 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.79 dB (3.64%) Ok

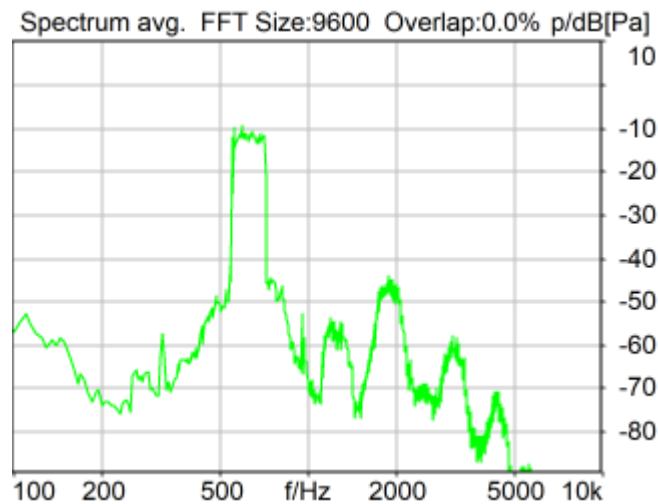
**Ok**

2023/11/13 1:47 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.63 dB (3.30%) Ok

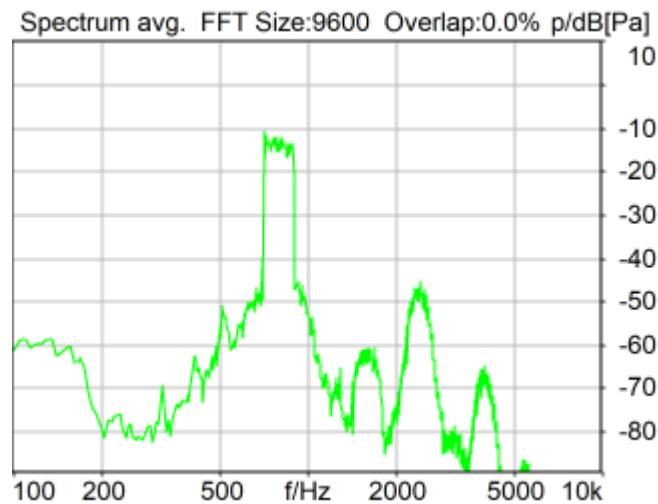
**Ok**

2023/11/13 1:48 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.86 dB (3.21%) Ok

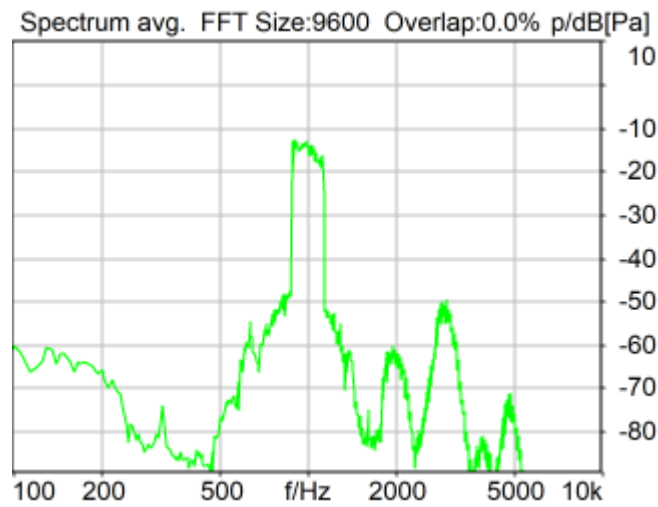
**Ok**

2023/11/13 1:48 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 32.61 dB (2.34%) Ok

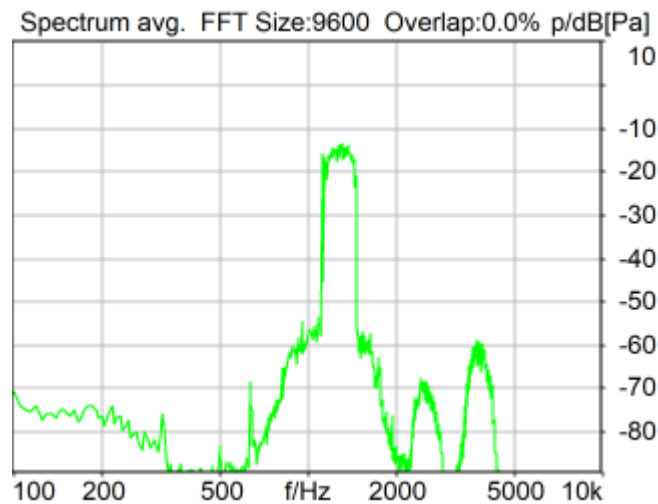
**Ok**

2023/11/13 1:48 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 34.47 dB (1.89%) Ok

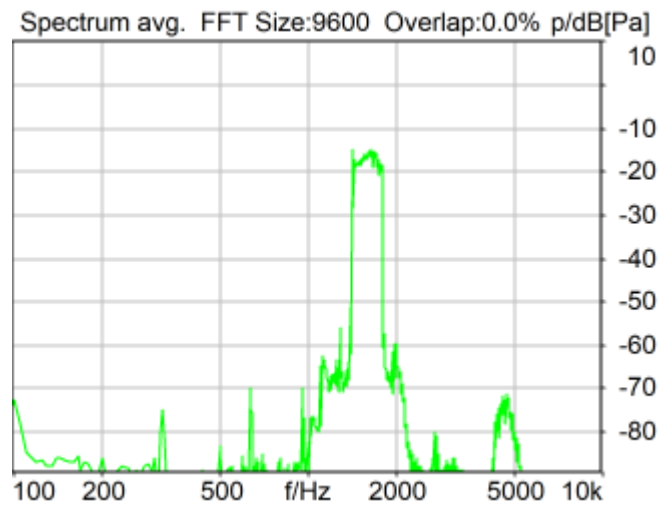
**Ok**

2023/11/13 1:49 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 45.47 dB (0.53%) Ok

**Ok**

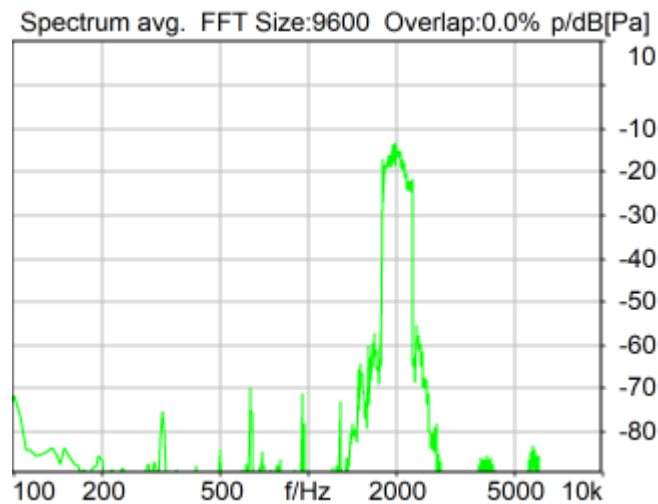
2023/11/13 1:49 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 43.51 dB (0.67%) Ok

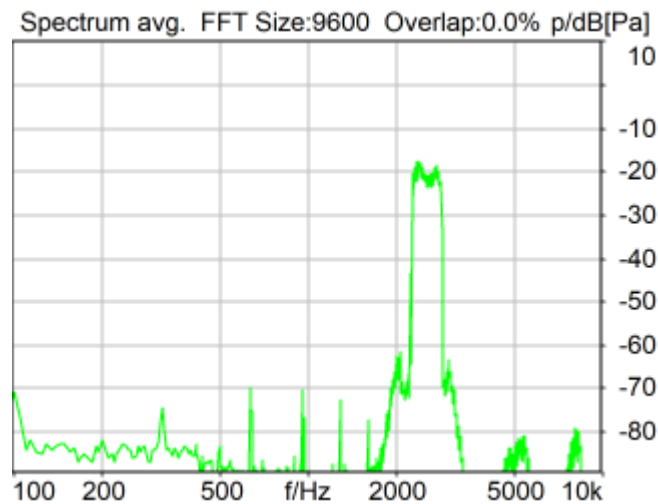
**Ok**

2023/11/13 1:50 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 45.49 dB (0.53%) Ok

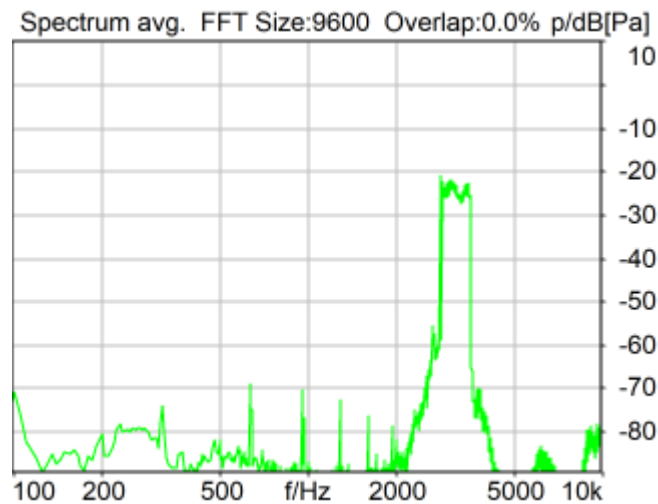
**Ok**

2023/11/13 1:50 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 39.13 dB (1.11%) Ok

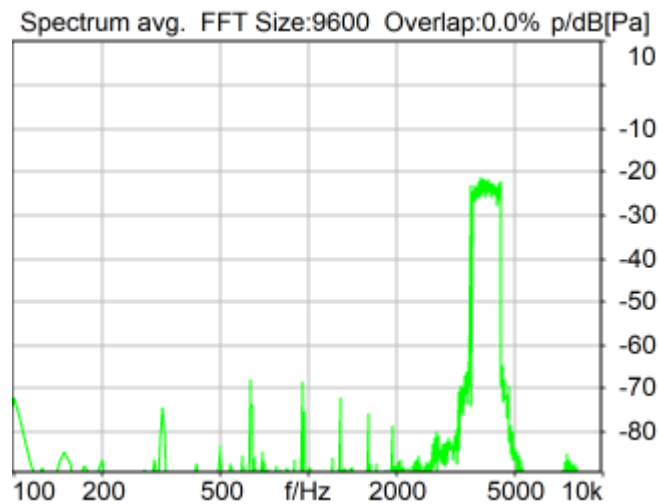
**Ok**

2023/11/13 1:50 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 45.51 dB (0.53%) Ok

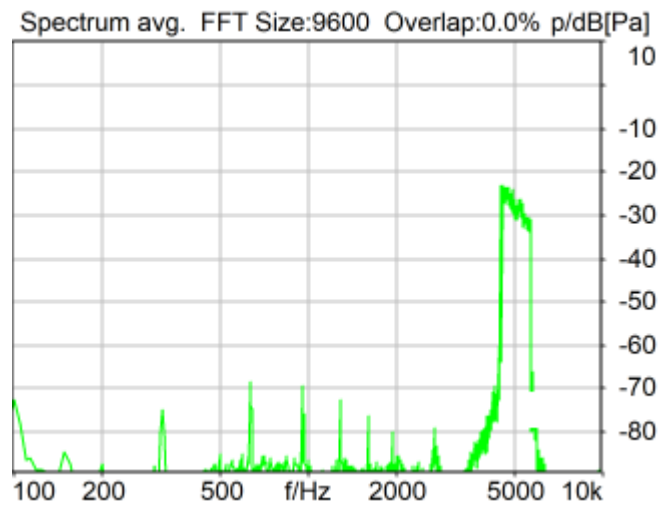
**Ok**

2023/11/13 1:51 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 47.22 dB (0.44%) Ok

**Ok**

2023/11/13 1:51 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 23.80 dB |
| 2      | 315Hz     | 24.85 dB |
| 3      | 400Hz     | 27.02 dB |
| 4      | 500Hz     | 28.79 dB |
| 5      | 630Hz     | 29.63 dB |
| 6      | 800Hz     | 29.86 dB |
| 7      | 1000Hz    | 32.61 dB |
| 8      | 1250Hz    | 34.47 dB |
| 9      | 1600Hz    | 45.47 dB |
| 10     | 2000Hz    | 43.51 dB |
| 11     | 2500Hz    | 45.49 dB |
| 12     | 3150Hz    | 39.13 dB |
| 13     | 4000Hz    | 45.51 dB |
| 14     | 5000Hz    | 47.22 dB |

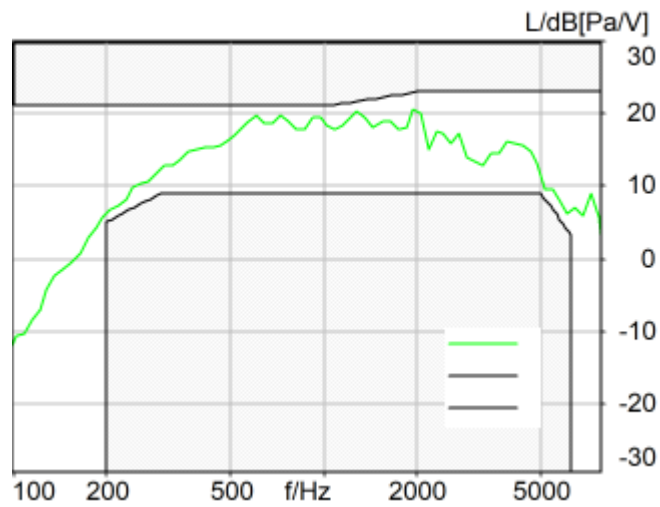
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 23.80dB at 250Hz.

2023/11/13 1:52 ACQUA

### **5.3 Frequency Response 8N FF**

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



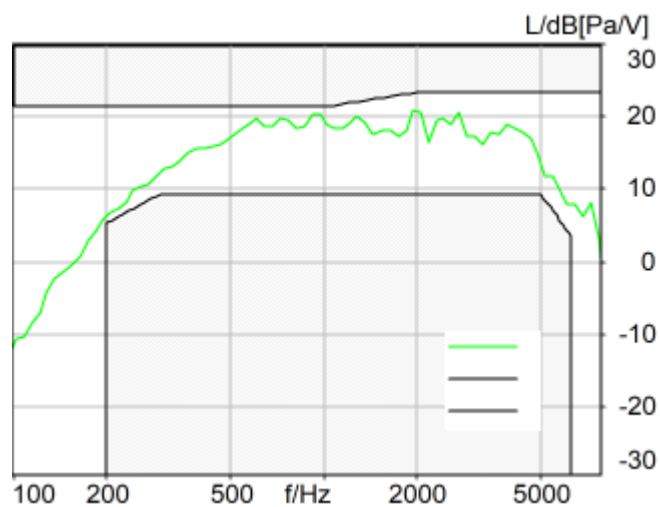
Absolute minimal distance  
1.29 dB at 611.7 Hz Ok

**Ok**

2023/11/13 1:52 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 8N DF

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



Absolute minimal distance  
1.03 dB at 974.0 Hz Ok

Ok

2023/11/13 1:53 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor



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## **Measurement Protocol**

|                    |                                                                |
|--------------------|----------------------------------------------------------------|
| Measurement Object | LTE Band 66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
|--------------------|----------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 3:19              |
|                        |                              |

## Status Overview

| SMD                                                         | Status | Single Value Description                       | Single Value | Object                                                            |
|-------------------------------------------------------------|--------|------------------------------------------------|--------------|-------------------------------------------------------------------|
| Overall Receive Delay NB                                    | Done   | Delay (Cross) [ms]                             | 121.7        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.1b Receive Volume Control Performance 2N NB               | Ok     | Speech Level [dB[SPL]]                         | 86.08        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 400 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 25.97        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 500 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.40        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 630 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.30        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 800 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 26.06        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 1000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.01        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 1250 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 29.75        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 1600 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 38.23        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 2000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 39.69        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 2500 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 38.49        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 3150 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 38.08        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| Report - Receive Distortion and Noise (Conversational Gain) | Ok     | Minimum SDNR [dB], (occured at 400Hz)          | 25.97        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.3 Frequency Response 2N FF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 1447.5 Hz | 0.37         | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |
| 5.3 Frequency Response 2N DF HANB                           | Not Ok | Min. dist. to tolerance scheme [dB], 2177.4 Hz | -0.18        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_2N |

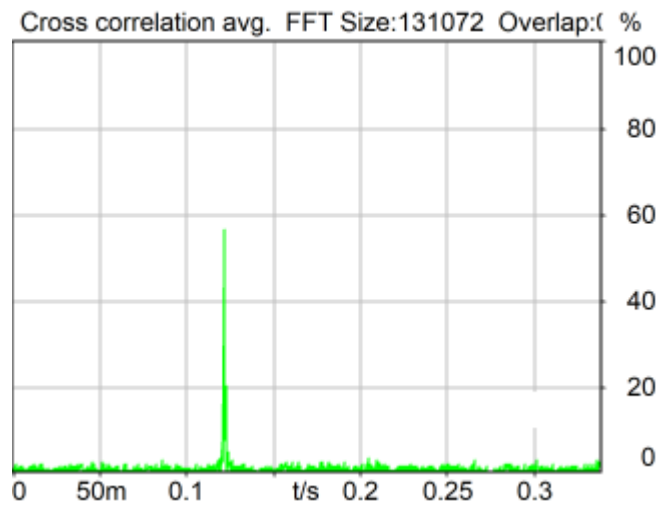
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay NB                                    | 5  |
| 5.1b Receive Volume Control Performance 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 |
| 5.3 Frequency Response 2N FF HANB                           | 18 |
| 5.3 Frequency Response 2N DF HANB                           | 19 |



## Overall Receive Delay NB

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



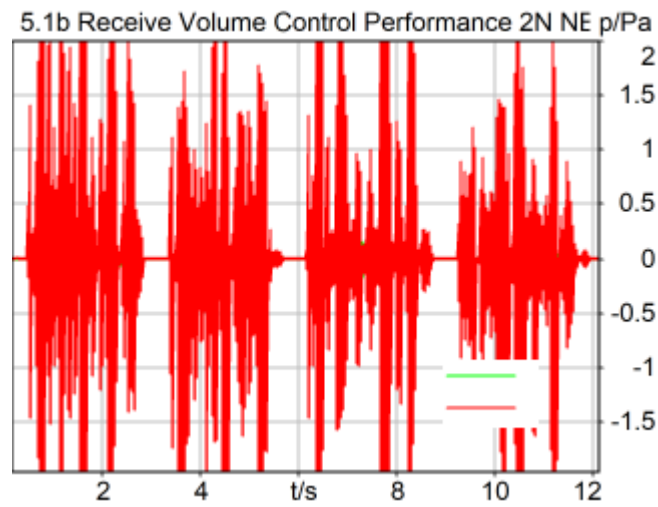
Delay (Cross): 121.7 ms

2023/11/13 3:13 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1b Receive Volume Control Performance 2N NB**

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



Speech Level RCV: 86.08 dB[SPL], Act.: 81.08% Ok

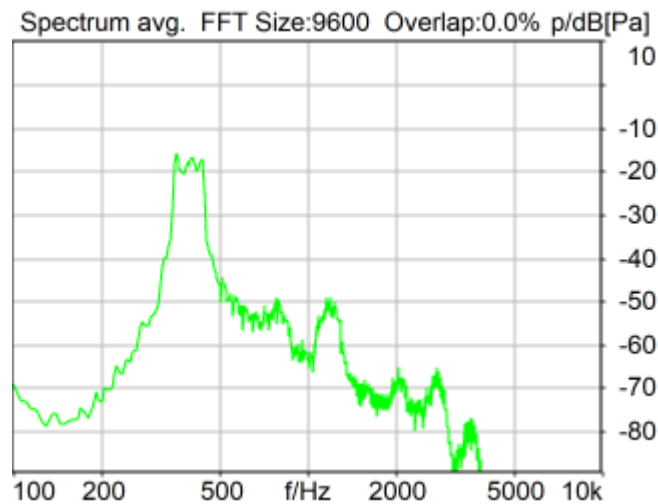
**Ok**

2023/11/13 3:13 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 25.97 dB (5.03%) Ok

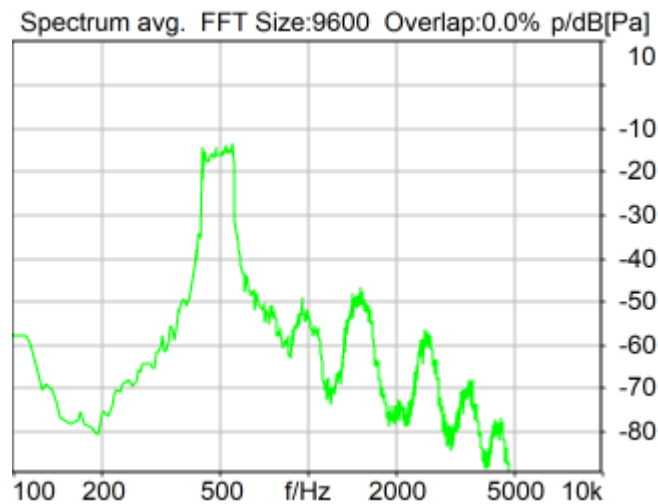
**Ok**

2023/11/13 3:14 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.40 dB (4.26%) Ok

**Ok**

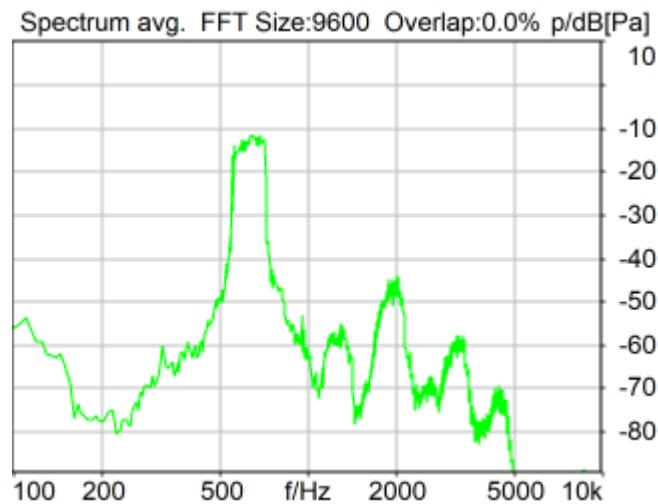
2023/11/13 3:14 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 28.30 dB (3.84%) Ok

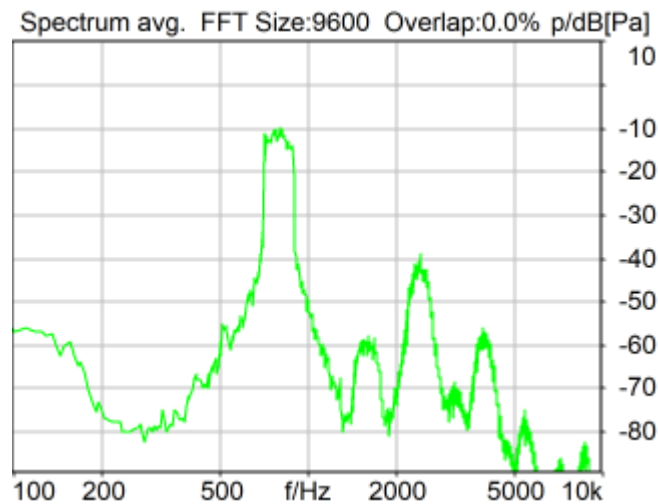
**Ok**

2023/11/13 3:15 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.06 dB (4.98%) Ok

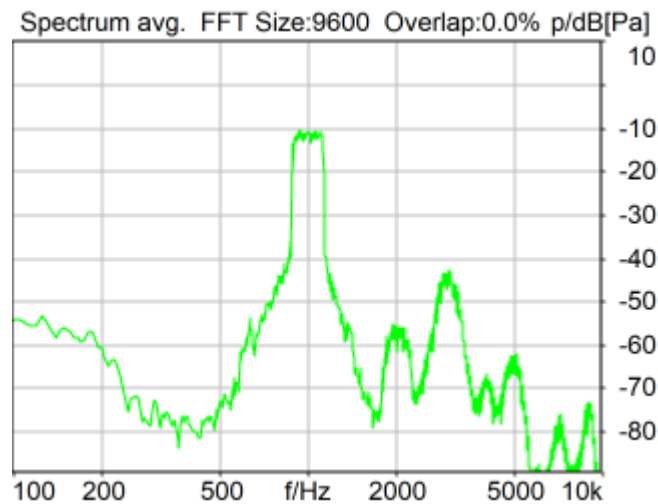
**Ok**

2023/11/13 3:15 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.01 dB (3.98%) Ok

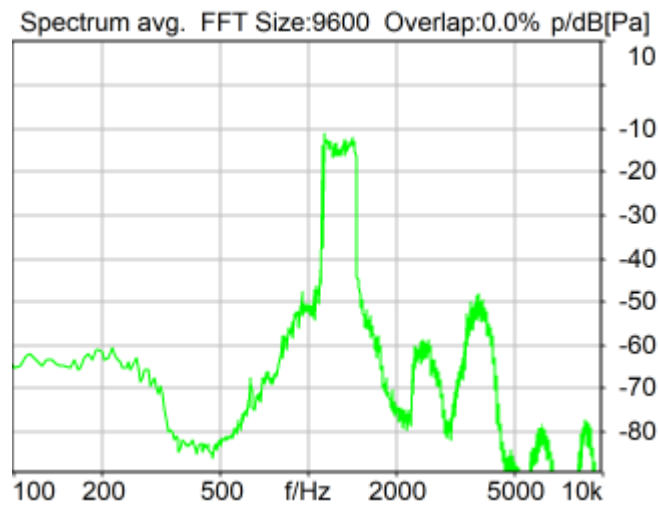
**Ok**

2023/11/13 3:15 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.75 dB (3.26%) Ok

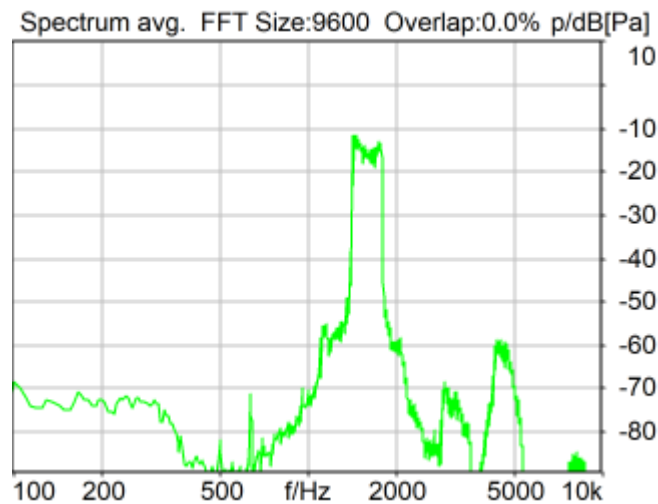
**Ok**

2023/11/13 3:16 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.23 dB (1.23%) Ok

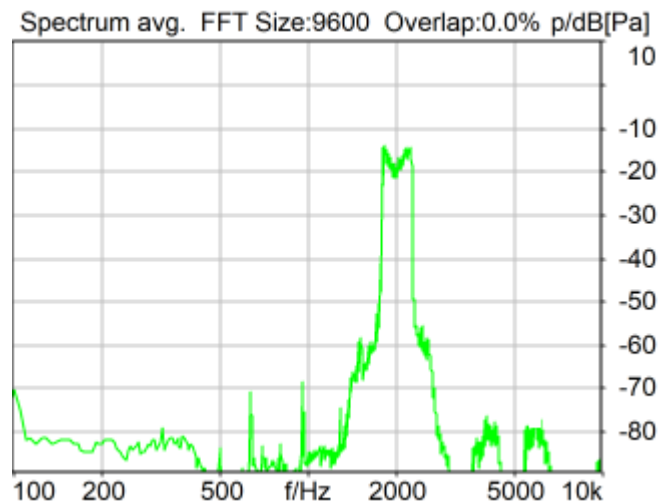
**Ok**

2023/11/13 3:16 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 39.69 dB (1.04%) Ok

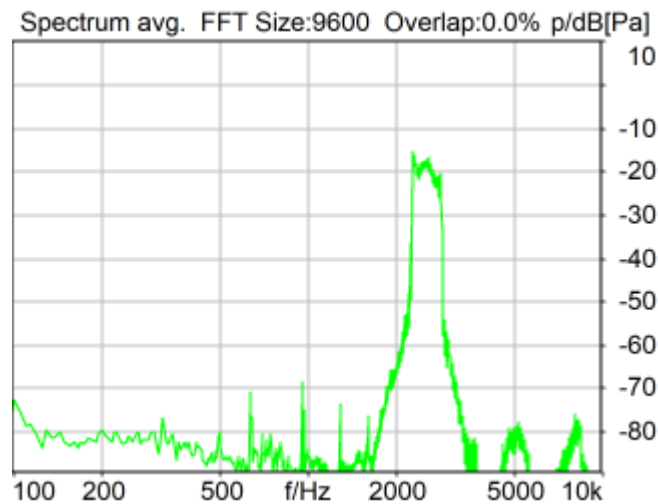
**Ok**

2023/11/13 3:17 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.49 dB (1.19%) Ok

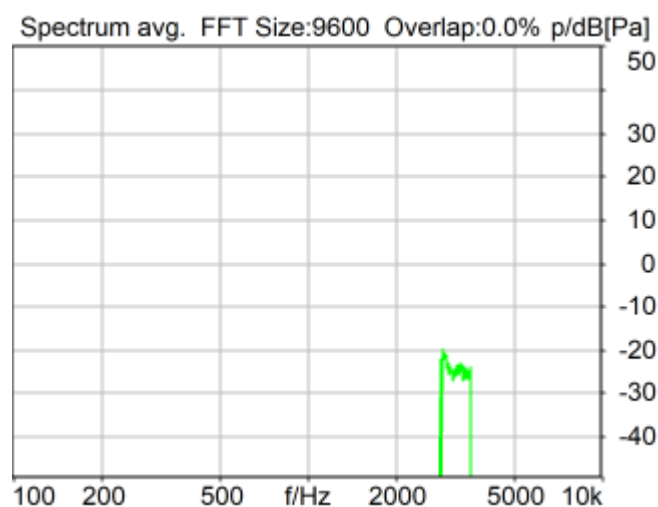
**Ok**

2023/11/13 3:17 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.08 dB (1.25%) Ok

**Ok**

2023/11/13 3:17 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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     | 25.97 dB |
| 2      | 500Hz     | 27.40 dB |
| 3      | 630Hz     | 28.30 dB |
| 4      | 800Hz     | 26.06 dB |
| 5      | 1000Hz    | 28.01 dB |
| 6      | 1250Hz    | 29.75 dB |
| 7      | 1600Hz    | 38.23 dB |
| 8      | 2000Hz    | 39.69 dB |
| 9      | 2500Hz    | 38.49 dB |
| 10     | 3150Hz    | 38.08 dB |

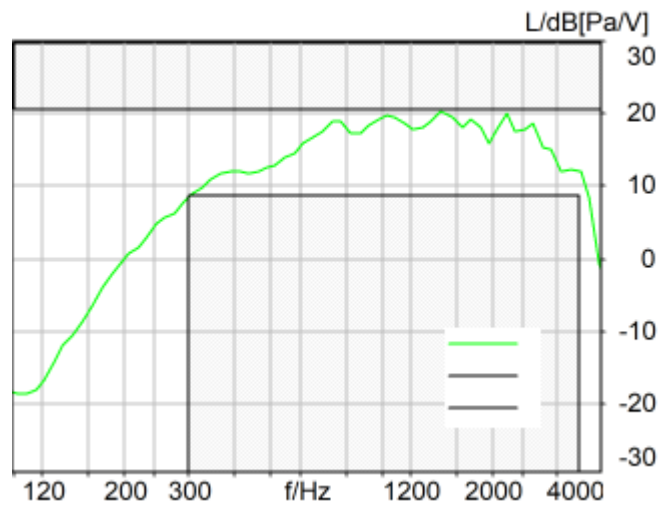
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 25.97dB at 400Hz.

2023/11/13 3:17 ACQUA

## 5.3 Frequency Response 2N FF HANB

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



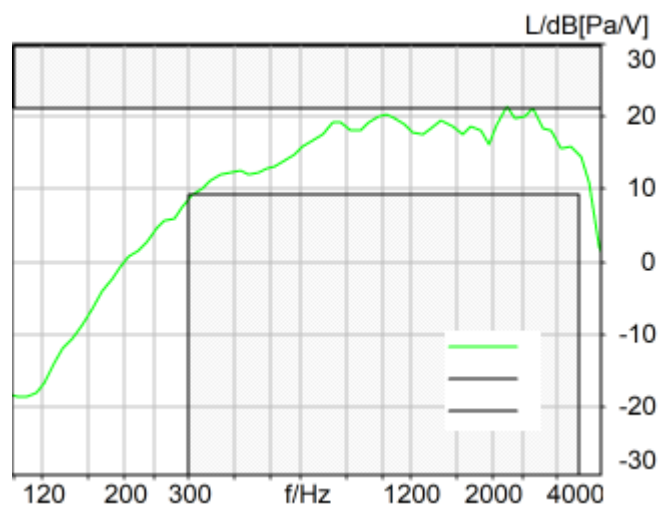
Absolute minimal distance  
0.37 dB at 1447.5 Hz Ok

Ok

2023/11/13 3:18 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 2N DF HANB

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



Absolute minimal distance  
-0.18 dB at 2177.4 Hz Not Ok

**Not Ok**

2023/11/13 3:18 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

---

## **Measurement Protocol**

|                    |                                                                |
|--------------------|----------------------------------------------------------------|
| Measurement Object | LTE Band 66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
|--------------------|----------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 3:31              |
|                        |                              |

## Status Overview

| SMD                                                         | Status | Single Value Description                       | Single Value | Object                                                            |
|-------------------------------------------------------------|--------|------------------------------------------------|--------------|-------------------------------------------------------------------|
| Overall Receive Delay NB                                    | Done   | Delay (Cross) [ms]                             | 161.5        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.1a Receive Volume Control Performance 8N NB               | Ok     | Speech Level [dB[SPL]]                         | 90.14        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 400 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 24.48        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 500 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.19        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 630 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.04        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 800 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 26.27        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 1000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.21        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 1250 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 26.01        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 1600 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 36.41        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 2000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 33.92        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 2500 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.33        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 3150 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 37.20        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| Report - Receive Distortion and Noise (Conversational Gain) | Ok     | Minimum SDNR [dB], (occured at 400Hz)          | 24.48        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.3 Frequency Response 8N FF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 1447.5 Hz | 0.65         | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |
| 5.3 Frequency Response 8N DF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 2177.4 Hz | 0.23         | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch132322_8N |

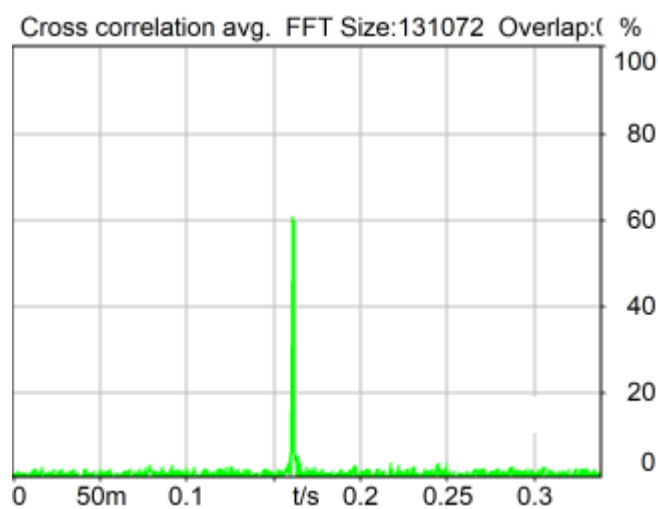
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay NB                                    | 5  |
| 5.1a Receive Volume Control Performance 8N 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 |
| 5.3 Frequency Response 8N FF HANB                           | 18 |
| 5.3 Frequency Response 8N DF HANB                           | 19 |



## Overall Receive Delay NB

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



Delay (Cross): 161.5 ms

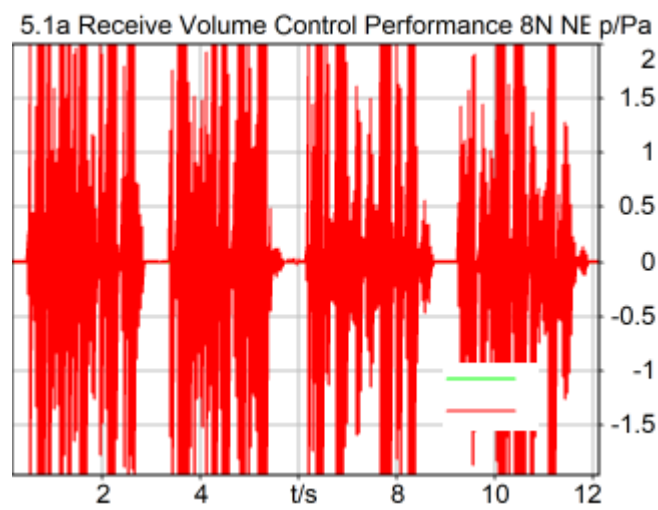
2023/11/13 3:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **5.1a Receive Volume Control Performance 8N NB**

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



Speech Level RCV: 90.14 dB[SPL], Act.: 80.80% Ok

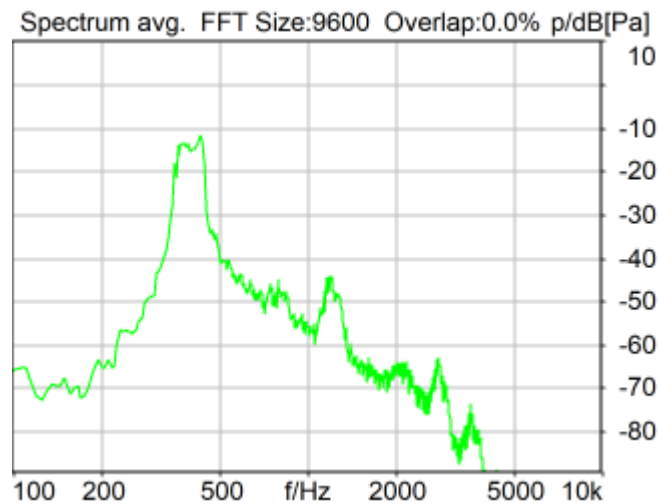
**Ok**

2023/11/13 3:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 24.48 dB (5.97%) Ok

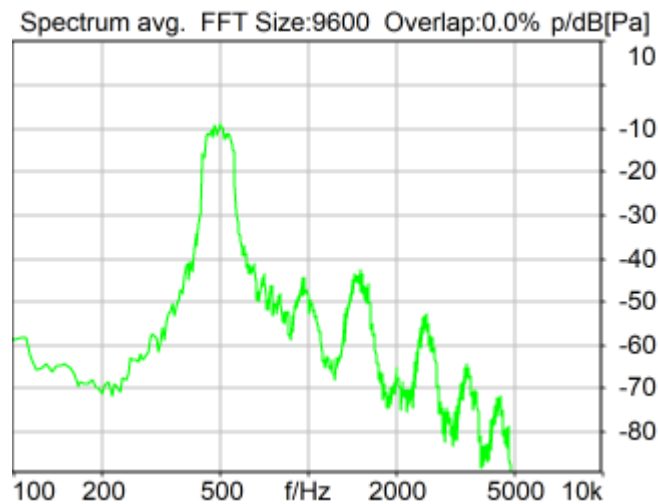
**Ok**

2023/11/13 3:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.19 dB (4.37%) Ok

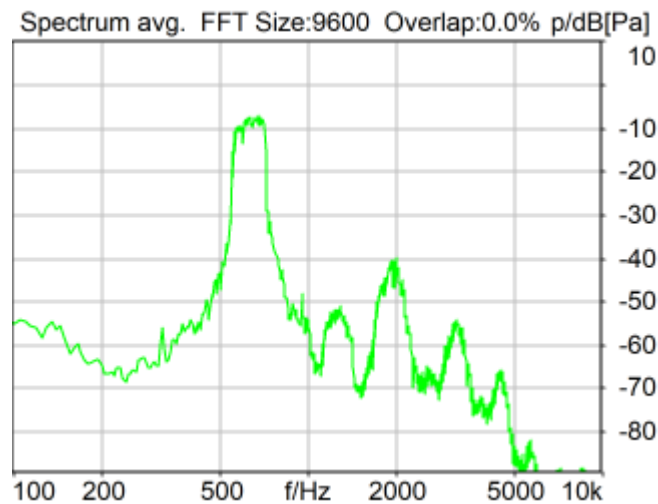
**Ok**

2023/11/13 3:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.04 dB (3.96%) Ok

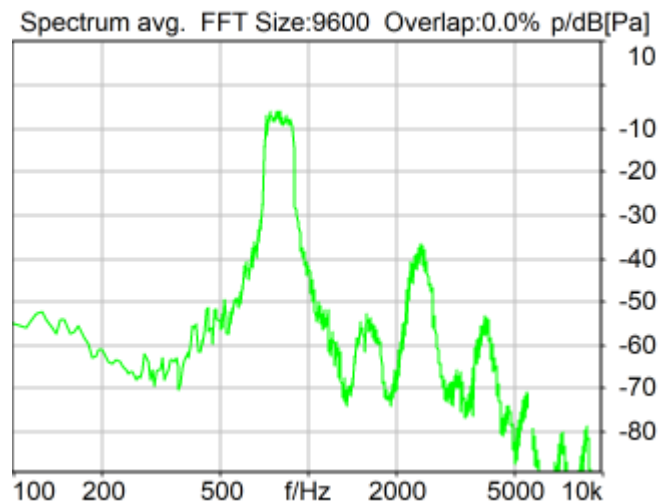
**Ok**

2023/11/13 3:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.27 dB (4.86%) Ok

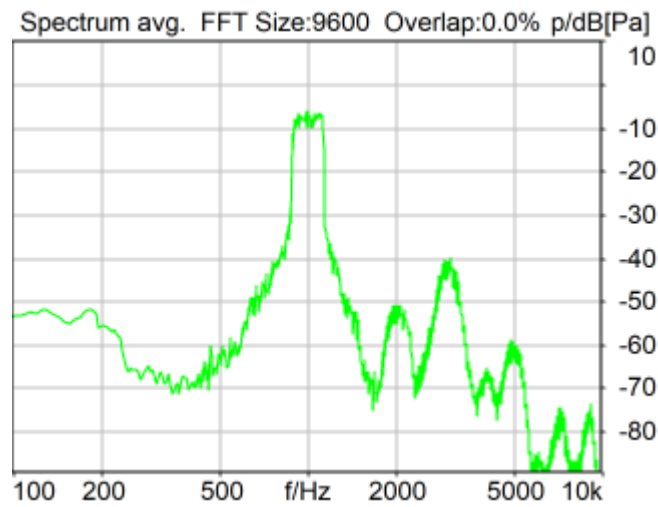
**Ok**

2023/11/13 3:24 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.21 dB (3.88%) Ok

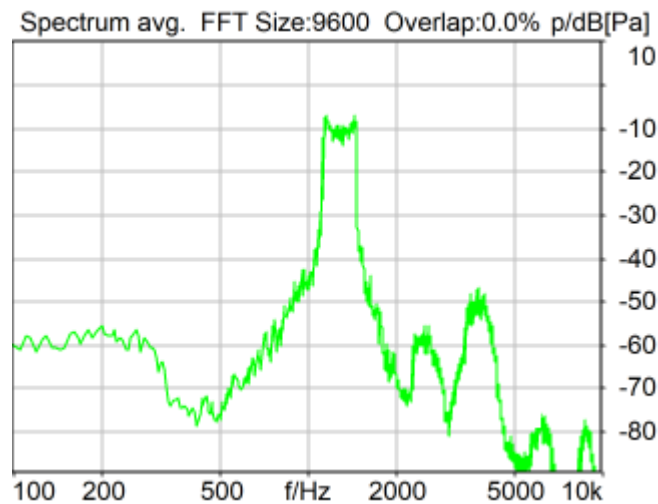
**Ok**

2023/11/13 3:24 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.01 dB (5.01%) Ok

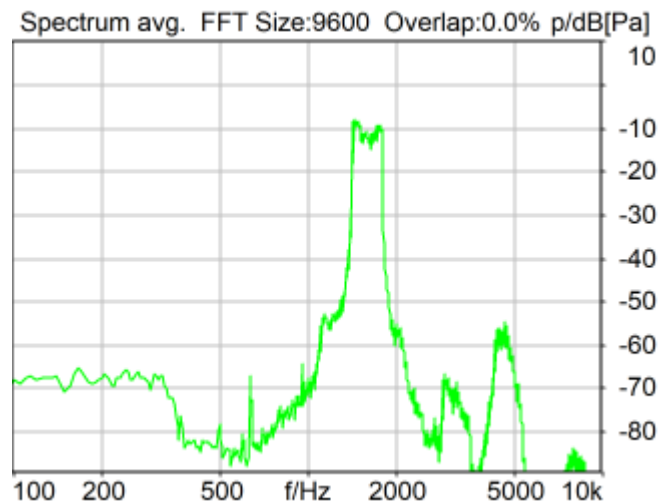
**Ok**

2023/11/13 3:25 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 36.41 dB (1.51%) Ok

**Ok**

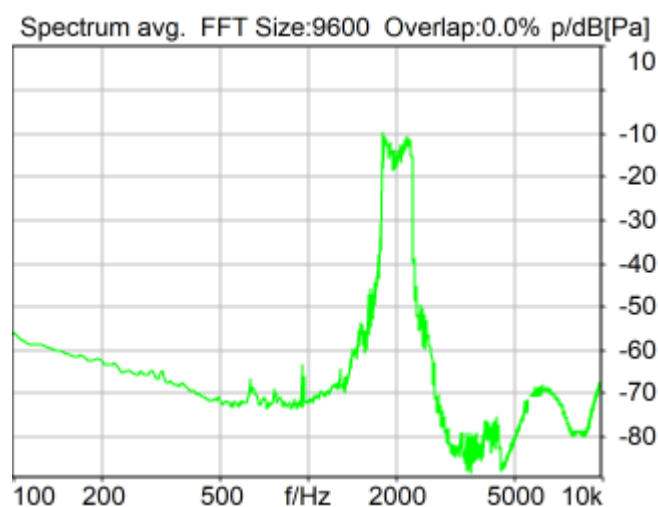
2023/11/13 3:25 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 33.92 dB (2.01%) Ok

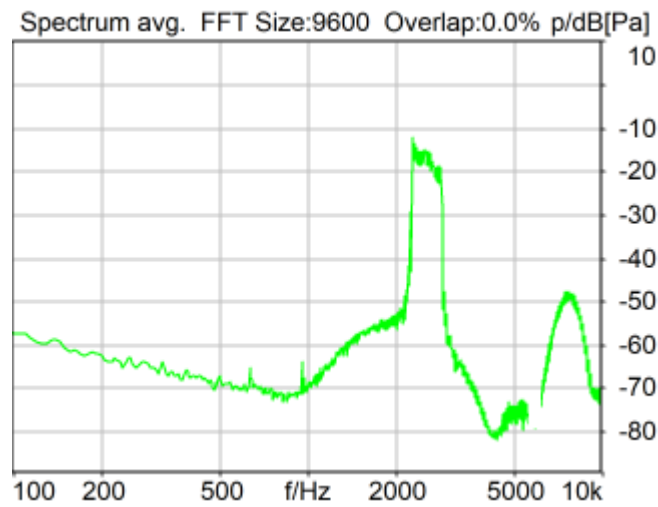
**Ok**

2023/11/13 3:25 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.33 dB (4.30%) Ok

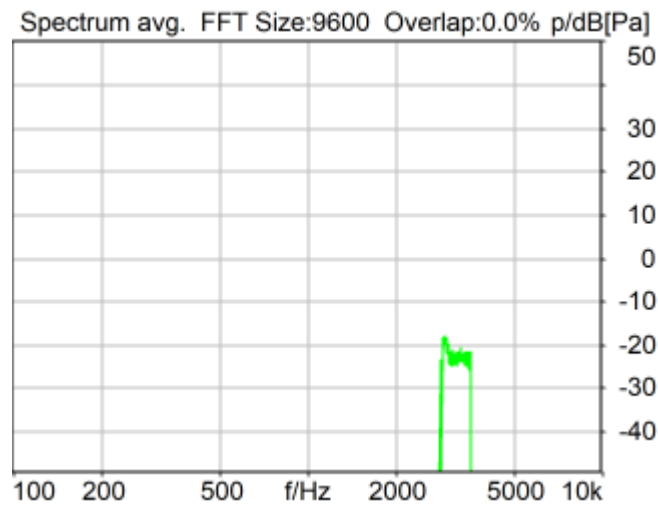
**Ok**

2023/11/13 3:26 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 37.20 dB (1.38%) Ok

**Ok**

2023/11/13 3:26 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 24.48 dB |
| 2      | 500Hz     | 27.19 dB |
| 3      | 630Hz     | 28.04 dB |
| 4      | 800Hz     | 26.27 dB |
| 5      | 1000Hz    | 28.21 dB |
| 6      | 1250Hz    | 26.01 dB |
| 7      | 1600Hz    | 36.41 dB |
| 8      | 2000Hz    | 33.92 dB |
| 9      | 2500Hz    | 27.33 dB |
| 10     | 3150Hz    | 37.20 dB |

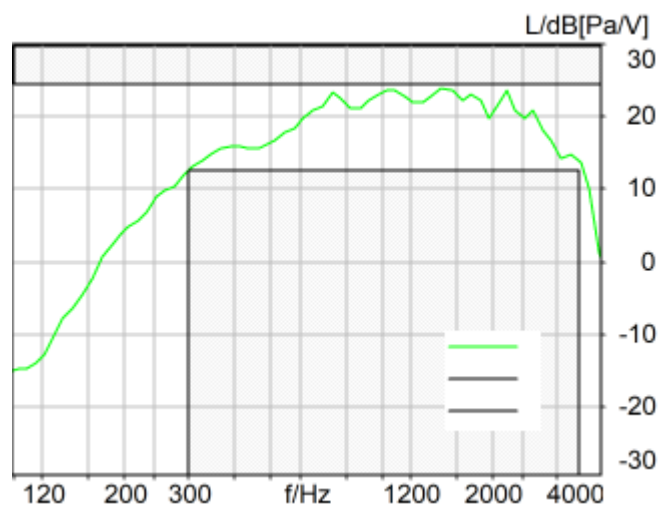
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 24.48dB at 400Hz.

2023/11/13 3:30 ACQUA

### 5.3 Frequency Response 8N FF HANB

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



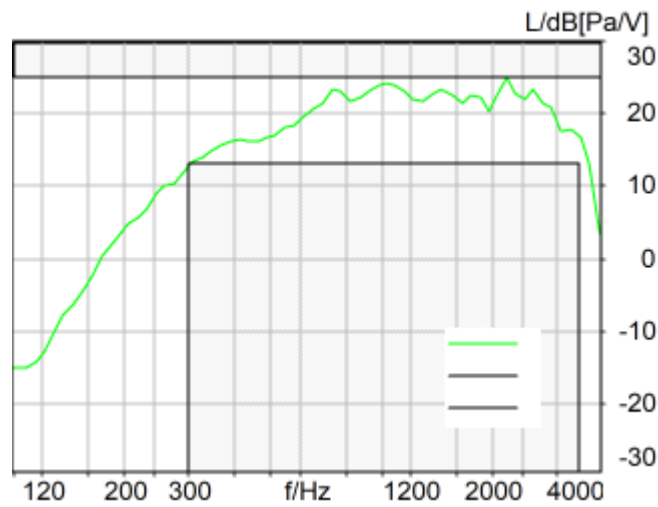
Absolute minimal distance  
0.65 dB at 1447.5 Hz Ok

Ok

2023/11/13 3:30 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 8N DF HANB

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



Absolute minimal distance  
0.23 dB at 2177.4 Hz Ok

Ok

2023/11/13 3:30 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Measurement Object | LTE Band 66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
|--------------------|--------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 2:31              |
|                        |                              |

## Status Overview

| SMD                                           | Status | Single Value Description        | Single Value | Object                                                          |
|-----------------------------------------------|--------|---------------------------------|--------------|-----------------------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]              | 198.5        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.1b Receive Volume Control Performance 2N WB | Ok     | Speech Level [dB[SPL]]          | 84.56        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 23.17        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 24.84        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 24.44        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 25.32        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 25.95        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 24.77        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 26.03        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 22.04        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.34        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.03        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 34.48        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 30.63        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 33.55        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 33.99        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR                    | 22.04        | LTE Band                                                        |



|                                 |    |                                                |      |                                                                 |
|---------------------------------|----|------------------------------------------------|------|-----------------------------------------------------------------|
| and Noise (Conversational Gain) |    | [dB], (occured at 1250Hz)                      |      | 66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N             |
| 5.3 Frequency Response 2N FF    | Ok | Min. dist. to tolerance scheme [dB], 217.7 Hz  | 1.07 | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |
| 5.3 Frequency Response 2N DF    | Ok | Min. dist. to tolerance scheme [dB], 2432.3 Hz | 0.61 | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_2N |

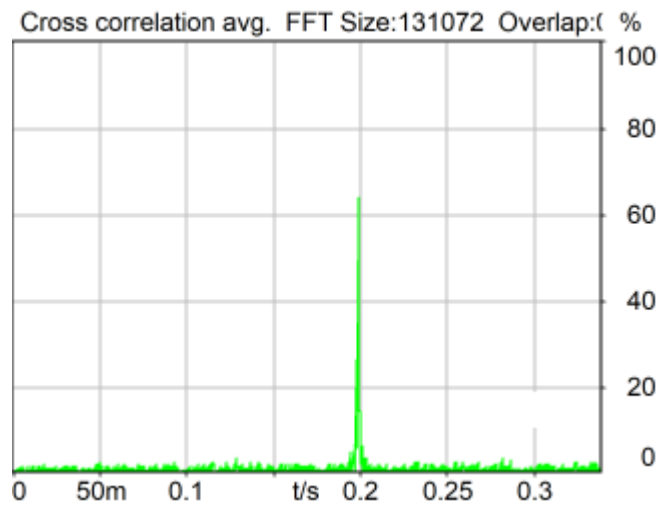
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1b Receive Volume Control Performance 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 |
| 5.3 Frequency Response 2N FF                                | 23 |
| 5.3 Frequency Response 2N DF                                | 24 |



## **Overall Receive Delay WB**

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



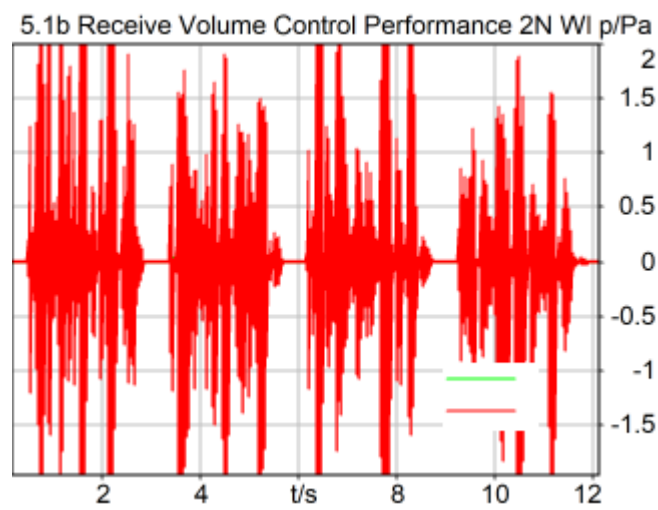
Delay (Cross): 198.5 ms

2023/11/13 2:18 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1b Receive Volume Control Performance 2N WB**

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



Speech Level RCV: 84.56 dB[SPL], Act.: 80.72% Ok

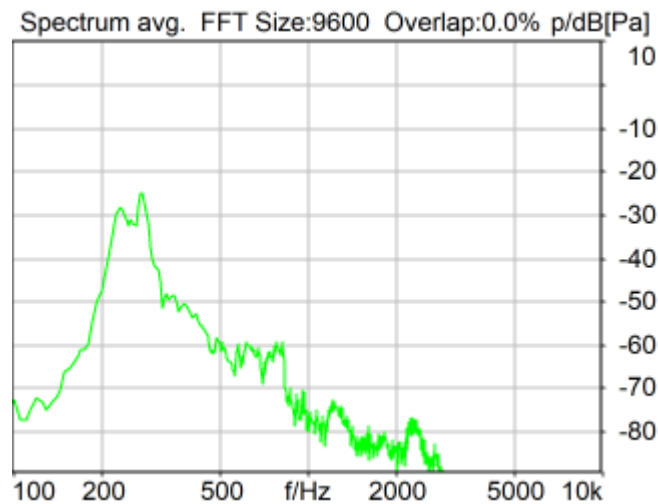
**Ok**

2023/11/13 2:19 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 23.17 dB (6.94%) Ok

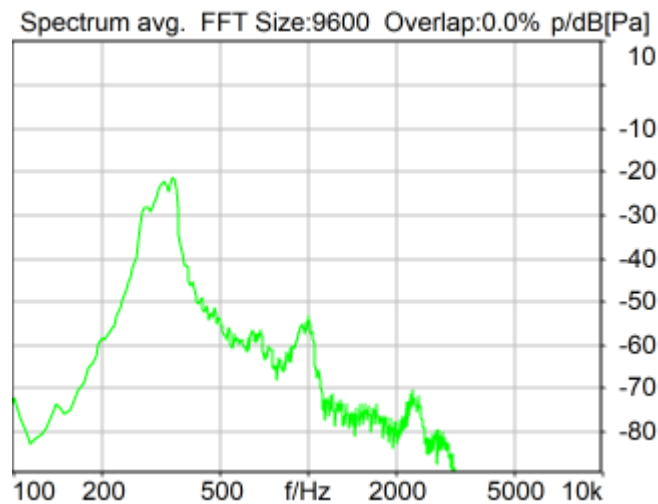
**Ok**

2023/11/13 2:19 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 24.84 dB (5.73%) Ok

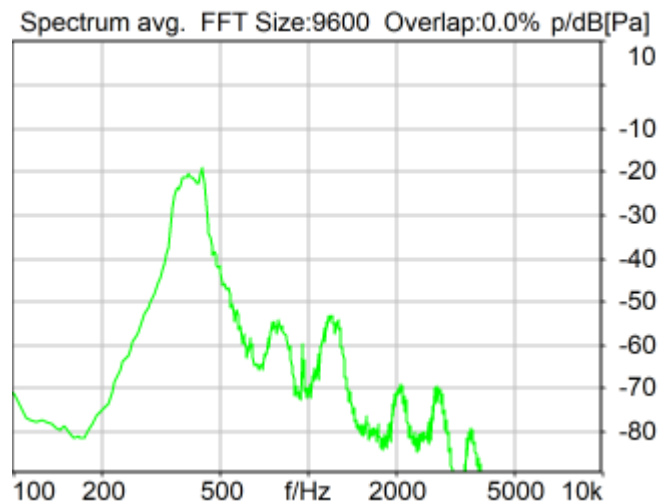
**Ok**

2023/11/13 2:19 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 24.44 dB (6.00%) Ok

**Ok**

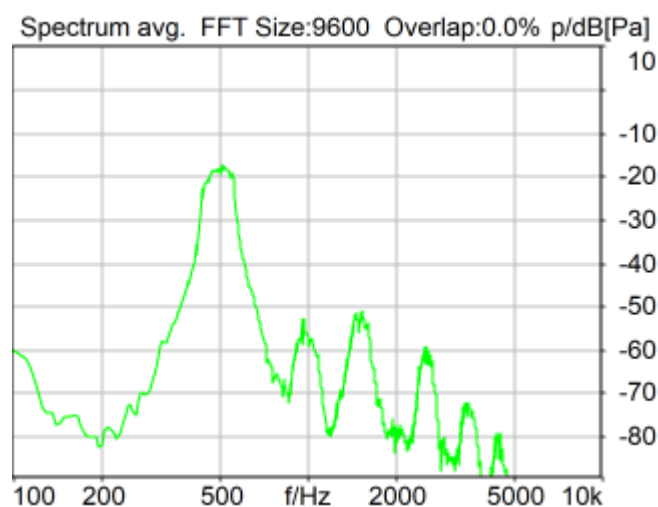
2023/11/13 2:20 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 25.32 dB (5.42%) Ok

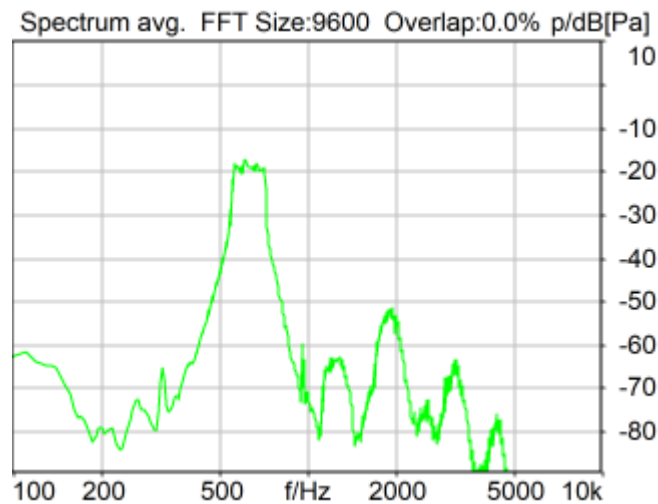
**Ok**

2023/11/13 2:20 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 25.95 dB (5.04%) Ok

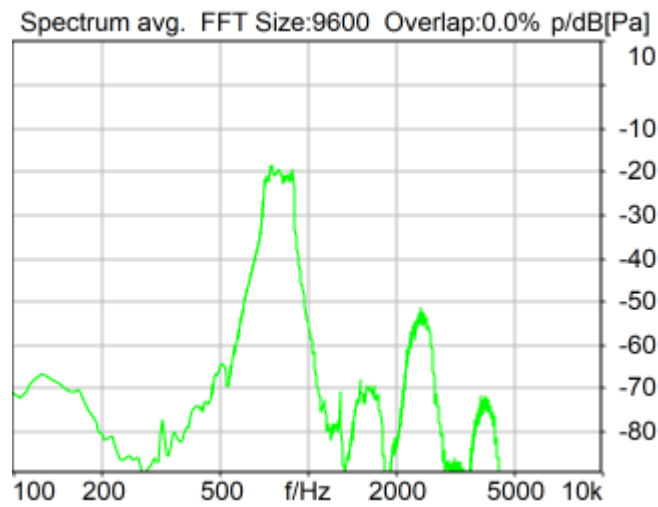
**Ok**

2023/11/13 2:21 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 24.77 dB (5.77%) Ok

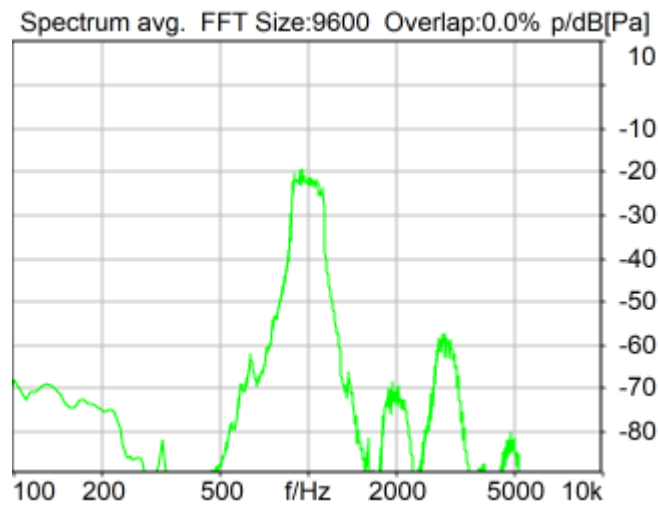
**Ok**

2023/11/13 2:21 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.03 dB (5.00%) Ok

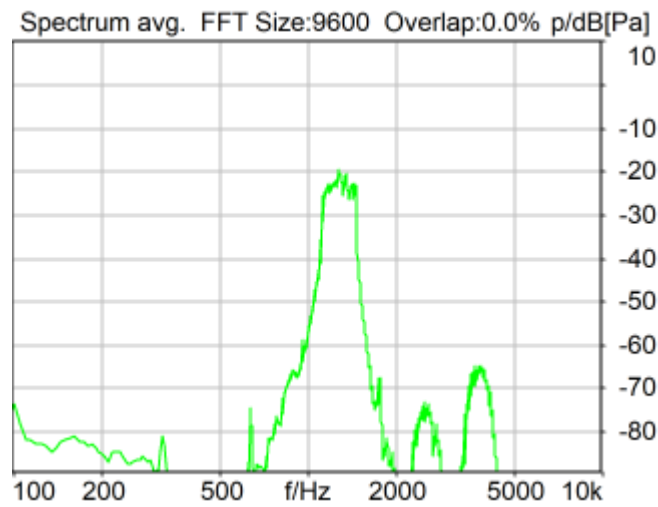
**Ok**

2023/11/13 2:21 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 22.04 dB (7.91%) Ok

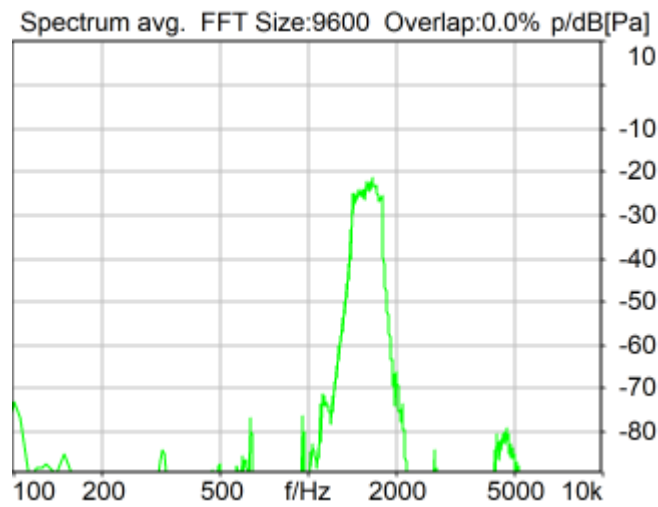
**Ok**

2023/11/13 2:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.34 dB (3.83%) Ok

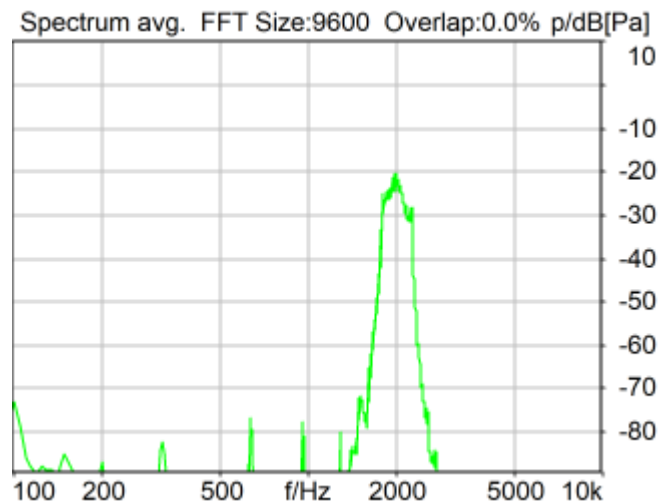
**Ok**

2023/11/13 2:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.03 dB (3.54%) Ok

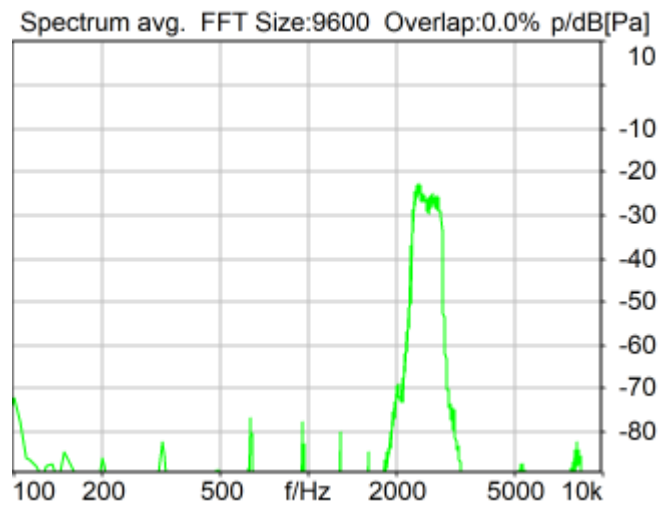
**Ok**

2023/11/13 2:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 34.48 dB (1.89%) Ok

**Ok**

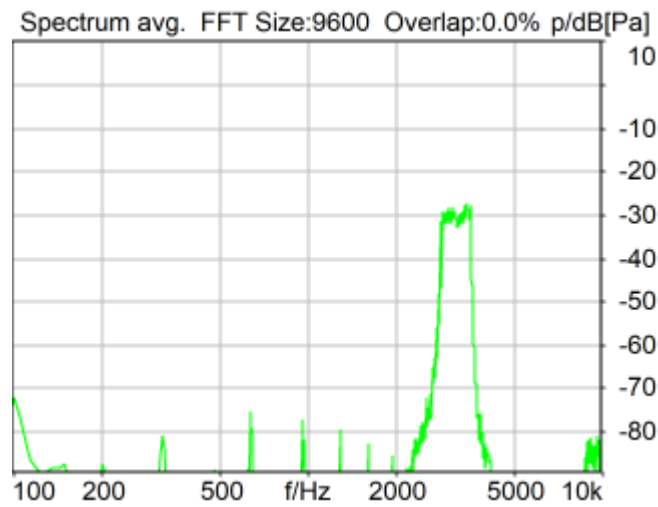
2023/11/13 2:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 30.63 dB (2.94%) Ok

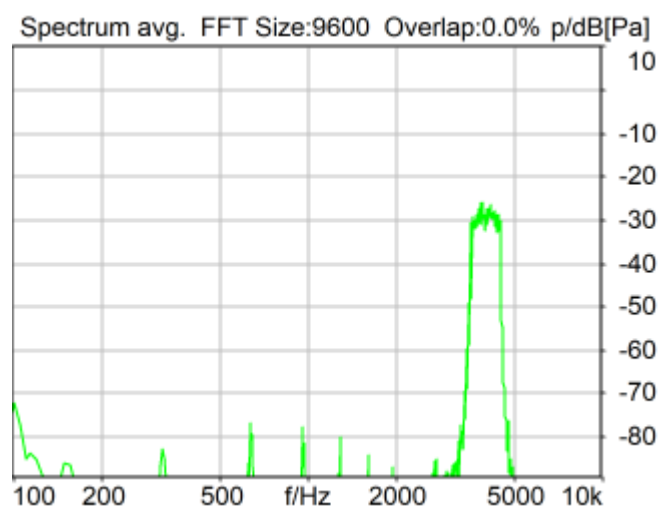
**Ok**

2023/11/13 2:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 33.55 dB (2.10%) Ok

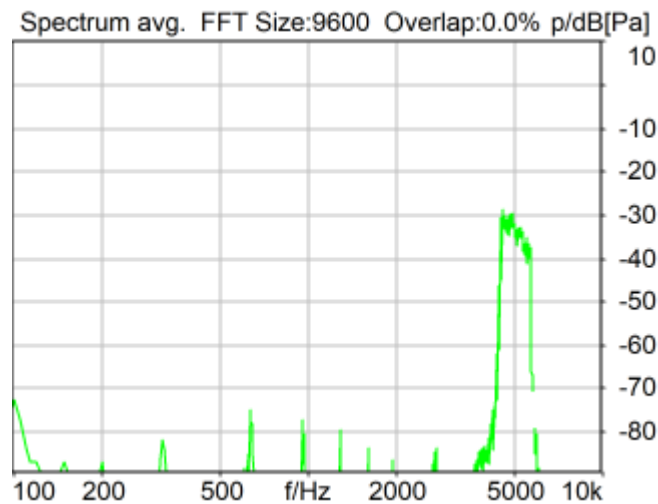
**Ok**

2023/11/13 2:24 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 33.99 dB (2.00%) Ok

**Ok**

2023/11/13 2:24 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 23.17 dB |
| 2      | 315Hz     | 24.84 dB |
| 3      | 400Hz     | 24.44 dB |
| 4      | 500Hz     | 25.32 dB |
| 5      | 630Hz     | 25.95 dB |
| 6      | 800Hz     | 24.77 dB |
| 7      | 1000Hz    | 26.03 dB |
| 8      | 1250Hz    | 22.04 dB |
| 9      | 1600Hz    | 28.34 dB |
| 10     | 2000Hz    | 29.03 dB |
| 11     | 2500Hz    | 34.48 dB |
| 12     | 3150Hz    | 30.63 dB |
| 13     | 4000Hz    | 33.55 dB |
| 14     | 5000Hz    | 33.99 dB |

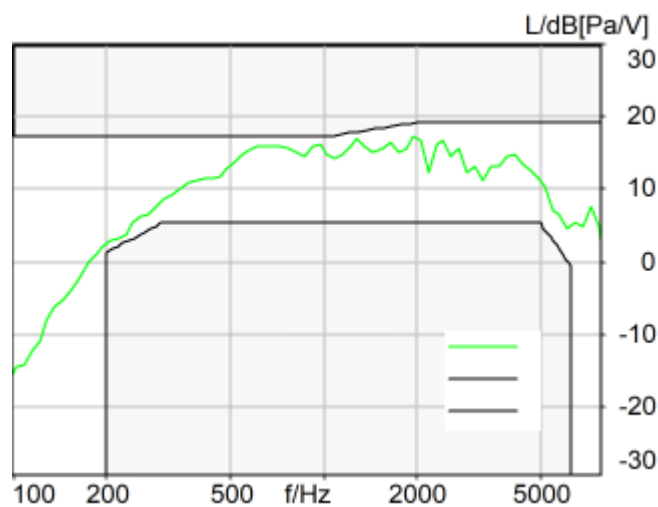
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 22.04dB at 1250Hz.

2023/11/13 2:30 ACQUA

## 5.3 Frequency Response 2N FF

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



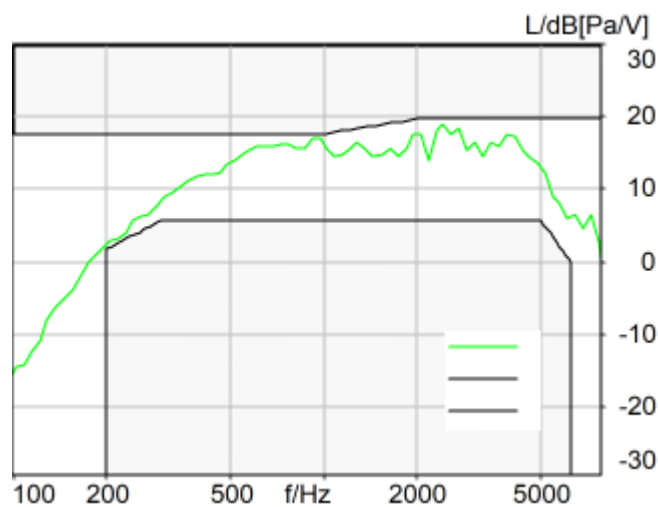
Absolute minimal distance  
1.07 dB at 217.7 Hz Ok

Ok

2023/11/13 2:30 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 2N DF

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



Absolute minimal distance  
0.61 dB at 2432.3 Hz Ok

Ok

2023/11/13 2:30 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Measurement Object | LTE Band 66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
|--------------------|--------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 2:10              |
|                        |                              |

## Status Overview

| SMD                                           | Status | Single Value Description        | Single Value | Object                                                          |
|-----------------------------------------------|--------|---------------------------------|--------------|-----------------------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]              | 118.2        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.1a Receive Volume Control Performance 8N WB | Ok     | Speech Level [dB[SPL]]          | 88.19        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 23.15        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 24.89        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 26.37        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.80        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.40        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.42        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 32.27        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 34.17        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 44.99        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 44.21        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.71        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 41.58        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 44.86        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 38.33        | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR                    | 23.15        | LTE Band                                                        |



|                                 |    |                                                |      |                                                                 |
|---------------------------------|----|------------------------------------------------|------|-----------------------------------------------------------------|
| and Noise (Conversational Gain) |    | [dB], (occured at 250Hz)                       |      | 66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N             |
| 5.3 Frequency Response 8N FF    | Ok | Min. dist. to tolerance scheme [dB], 1285.9 Hz | 1.29 | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |
| 5.3 Frequency Response 8N DF    | Ok | Min. dist. to tolerance scheme [dB], 924.0 Hz  | 0.91 | LTE Band<br>66_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch132322_8N |

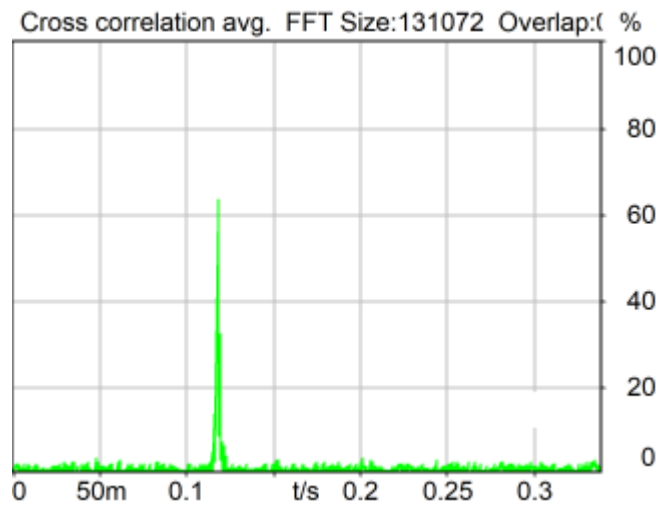
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1a Receive Volume Control Performance 8N 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 |
| 5.3 Frequency Response 8N FF                                | 23 |
| 5.3 Frequency Response 8N DF                                | 24 |



## Overall Receive Delay WB

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



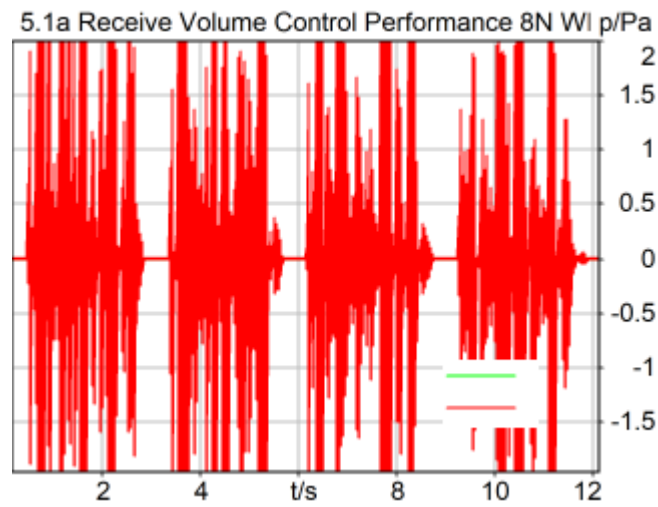
Delay (Cross): 118.2 ms

2023/11/13 2:01 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1a Receive Volume Control Performance 8N WB**

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



Speech Level RCV: 88.19 dB[SPL], Act.: 80.77% Ok

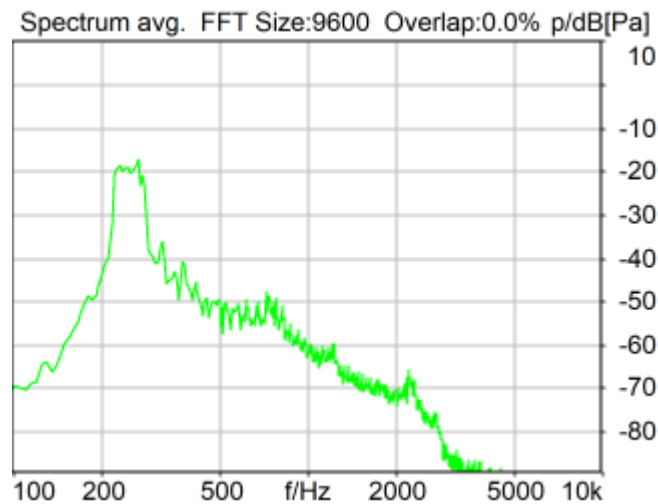
**Ok**

2023/11/13 2:01 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 23.15 dB (6.96%) Ok

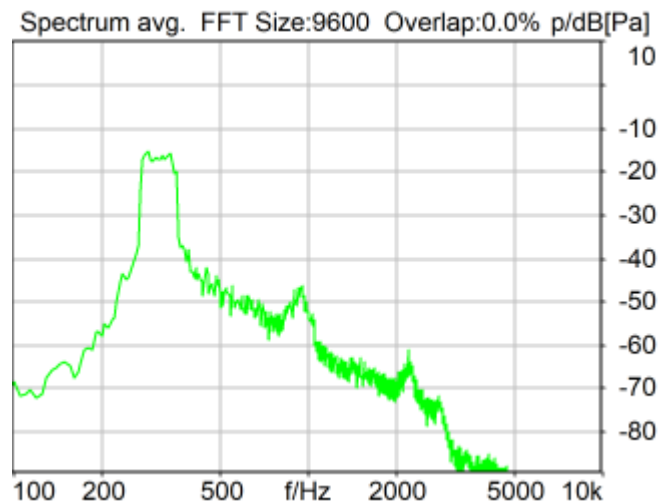
**Ok**

2023/11/13 2:02 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 24.89 dB (5.69%) Ok

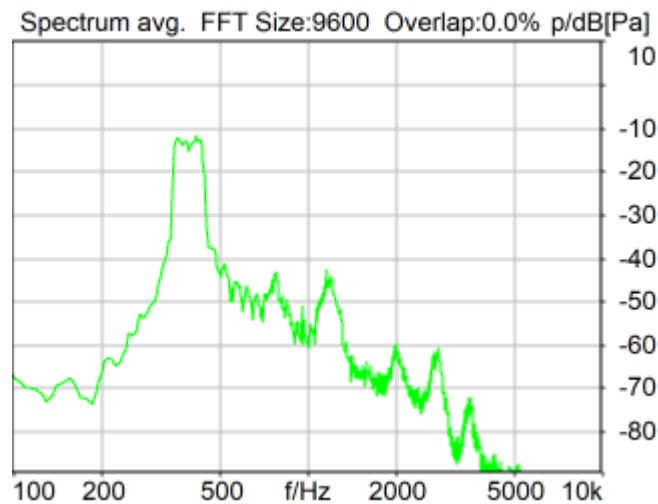
**Ok**

2023/11/13 2:02 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.37 dB (4.80%) Ok

**Ok**

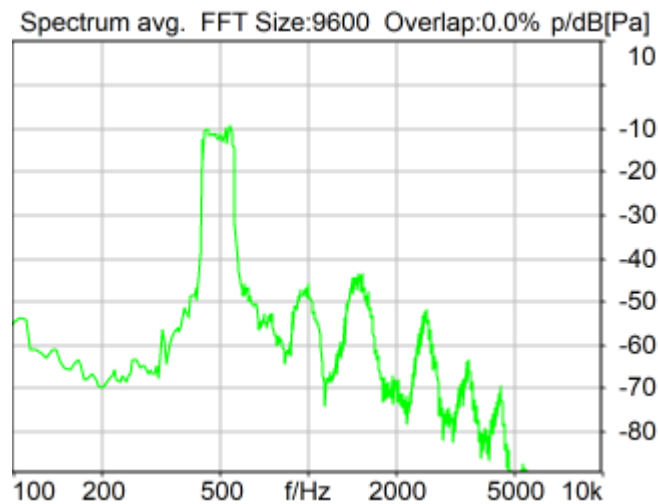
2023/11/13 2:03 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 28.80 dB (3.63%) Ok

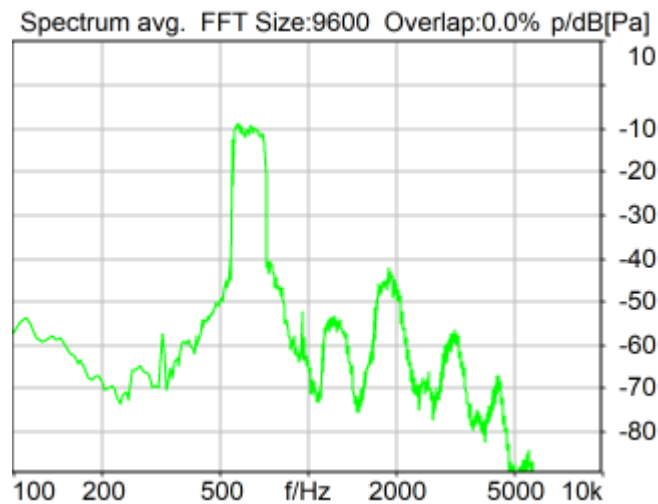
**Ok**

2023/11/13 2:03 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.40 dB (3.39%) Ok

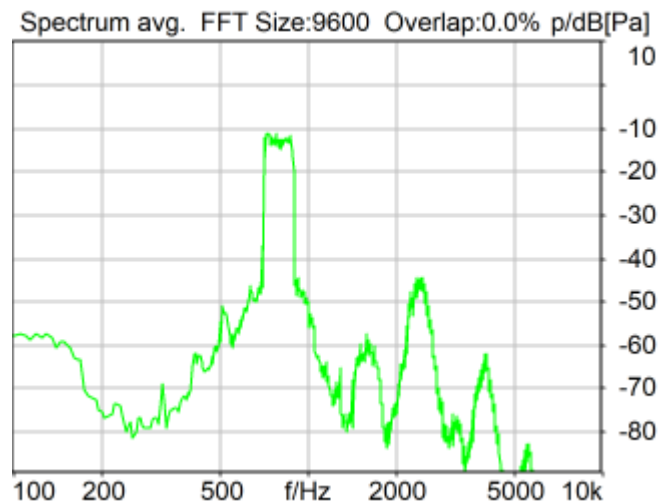
**Ok**

2023/11/13 2:03 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.42 dB (3.38%) Ok

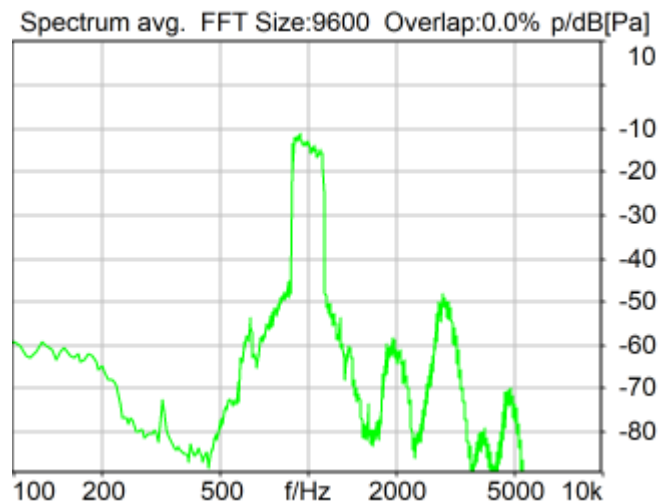
**Ok**

2023/11/13 2:04 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 32.27 dB (2.44%) Ok

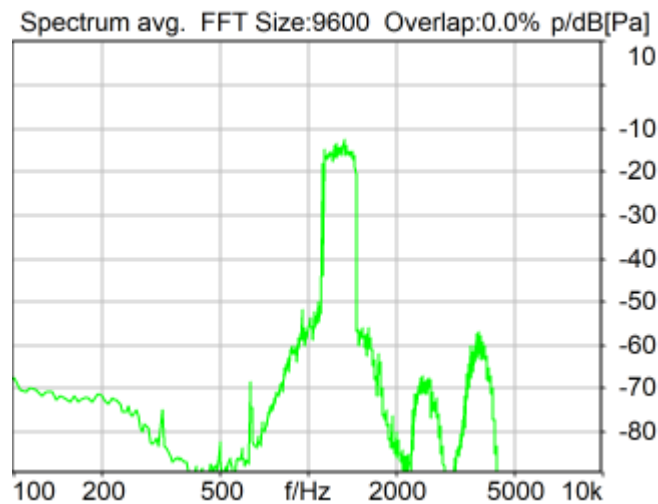
**Ok**

2023/11/13 2:04 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 34.17 dB (1.96%) Ok

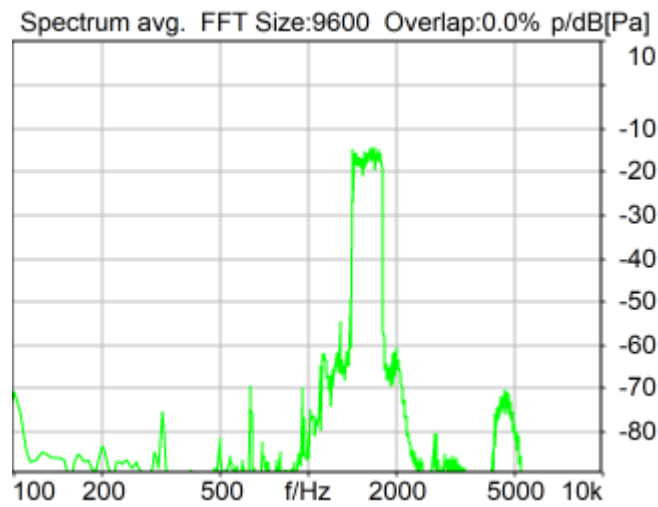
**Ok**

2023/11/13 2:05 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 44.99 dB (0.56%) Ok

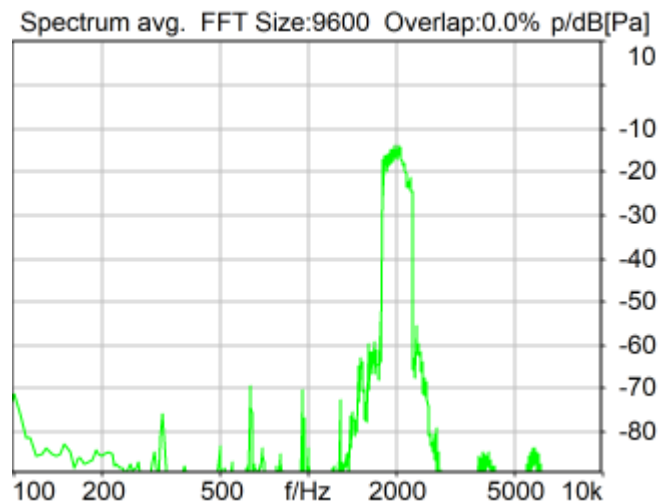
**Ok**

2023/11/13 2:05 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 44.21 dB (0.62%) Ok

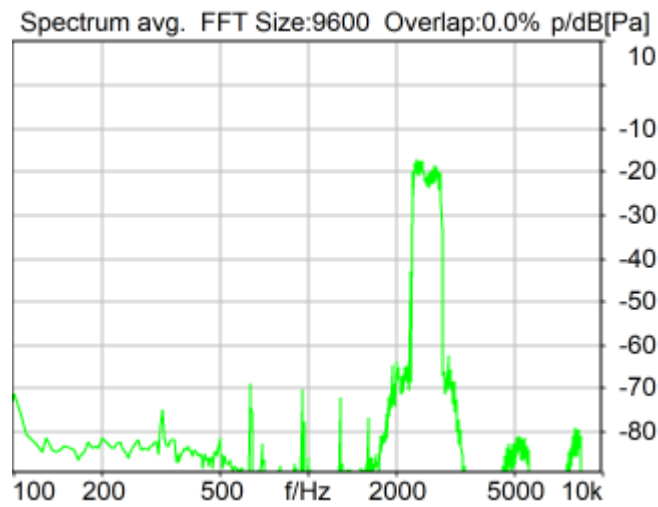
**Ok**

2023/11/13 2:05 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 45.71 dB (0.52%) Ok

**Ok**

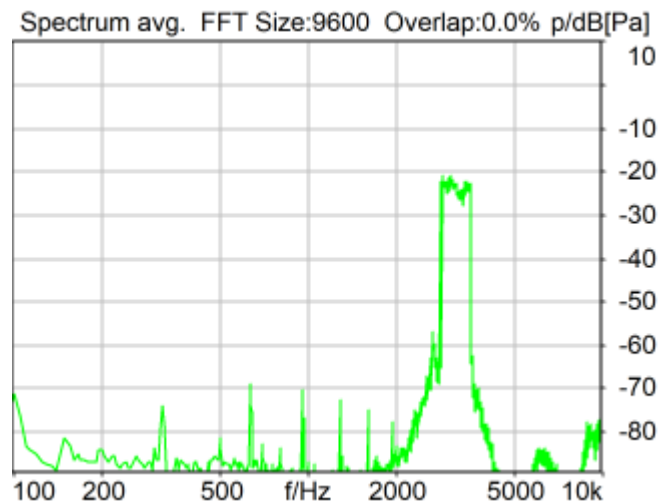
2023/11/13 2:06 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 41.58 dB (0.83%) Ok

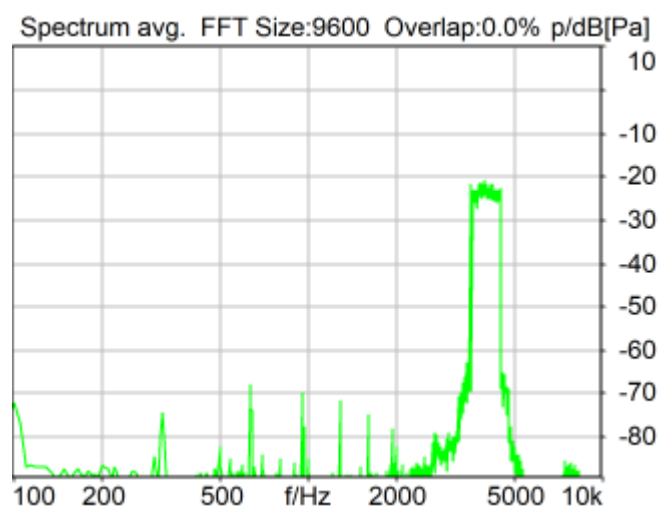
**Ok**

2023/11/13 2:06 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 44.86 dB (0.57%) Ok

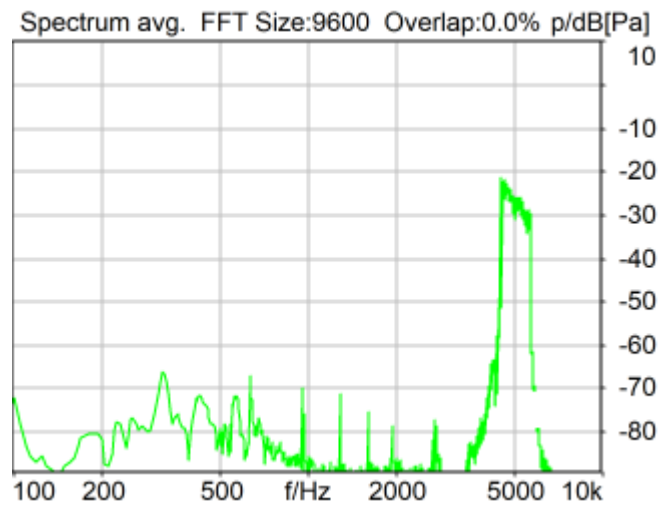
**Ok**

2023/11/13 2:07 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.33 dB (1.21%) Ok

**Ok**

2023/11/13 2:07 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 23.15 dB |
| 2      | 315Hz     | 24.89 dB |
| 3      | 400Hz     | 26.37 dB |
| 4      | 500Hz     | 28.80 dB |
| 5      | 630Hz     | 29.40 dB |
| 6      | 800Hz     | 29.42 dB |
| 7      | 1000Hz    | 32.27 dB |
| 8      | 1250Hz    | 34.17 dB |
| 9      | 1600Hz    | 44.99 dB |
| 10     | 2000Hz    | 44.21 dB |
| 11     | 2500Hz    | 45.71 dB |
| 12     | 3150Hz    | 41.58 dB |
| 13     | 4000Hz    | 44.86 dB |
| 14     | 5000Hz    | 38.33 dB |

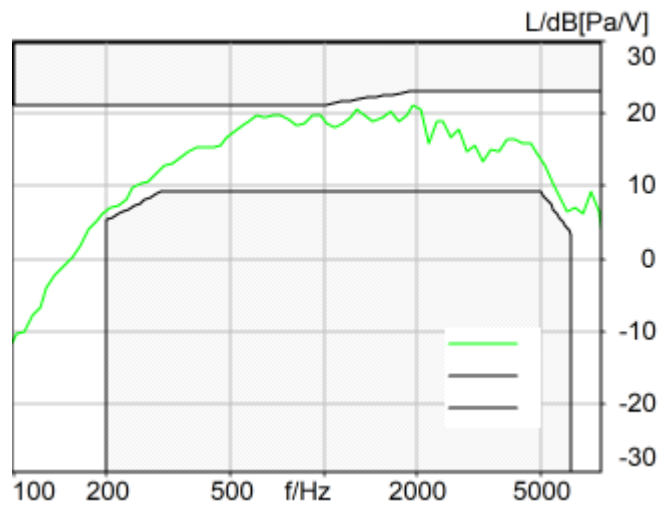
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 23.15dB at 250Hz.

2023/11/13 2:09 ACQUA

## 5.3 Frequency Response 8N FF

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



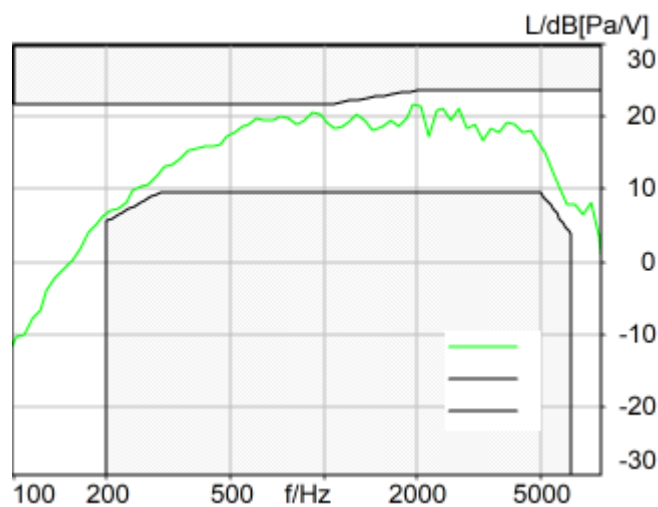
Absolute minimal distance  
1.29 dB at 1285.9 Hz Ok

Ok

2023/11/13 2:09 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 8N DF

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



Absolute minimal distance  
0.91 dB at 924.0 Hz Ok

Ok

2023/11/13 2:09 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

---

## **Measurement Protocol**

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Measurement Object | LTE Band 7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_2N |
|--------------------|--------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 3:44              |
|                        |                              |

## Status Overview

| SMD                                                         | Status | Single Value Description                       | Single Value | Object                                                              |
|-------------------------------------------------------------|--------|------------------------------------------------|--------------|---------------------------------------------------------------------|
| Overall Receive Delay NB                                    | Done   | Delay (Cross) [ms]                             | 100.3        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.1b Receive Volume Control Performance 2N NB               | Ok     | Speech Level [dB[SPL]]                         | 86.12        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 400 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 24.90        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 500 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 26.67        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 630 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.28        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 800 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 25.70        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 1000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.97        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 1250 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 29.96        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 1600 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 37.38        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 2000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 36.83        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 2500 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 41.07        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 3150 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 37.77        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| Report - Receive Distortion and Noise (Conversational Gain) | Ok     | Minimum SDNR [dB], (occured at 400Hz)          | 24.90        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.3 Frequency Response 2N FF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 2177.4 Hz | 0.31         | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |
| 5.3 Frequency Response 2N DF HANB                           | Not Ok | Min. dist. to tolerance scheme [dB], 2177.4 Hz | -0.24        | LTE Band<br>7_20M_QPSK_100RB_0Offset_E<br>VS NB 24.4Kbps_Ch21100_2N |



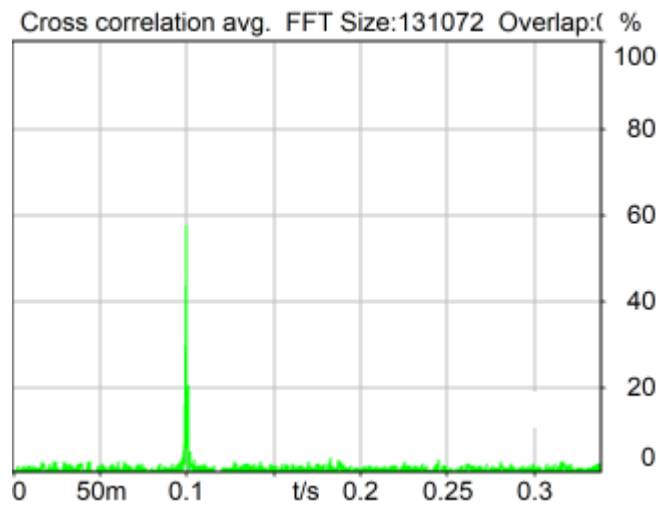
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay NB                                    | 5  |
| 5.1b Receive Volume Control Performance 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 |
| 5.3 Frequency Response 2N FF HANB                           | 18 |
| 5.3 Frequency Response 2N DF HANB                           | 19 |



## Overall Receive Delay NB

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



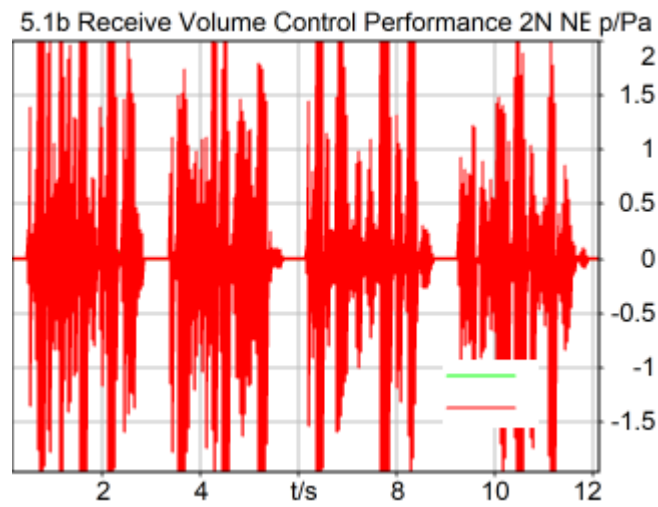
Delay (Cross): 100.3 ms

2023/11/13 3:38 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1b Receive Volume Control Performance 2N NB**

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



Speech Level RCV: 86.12 dB[SPL], Act.: 80.85% Ok

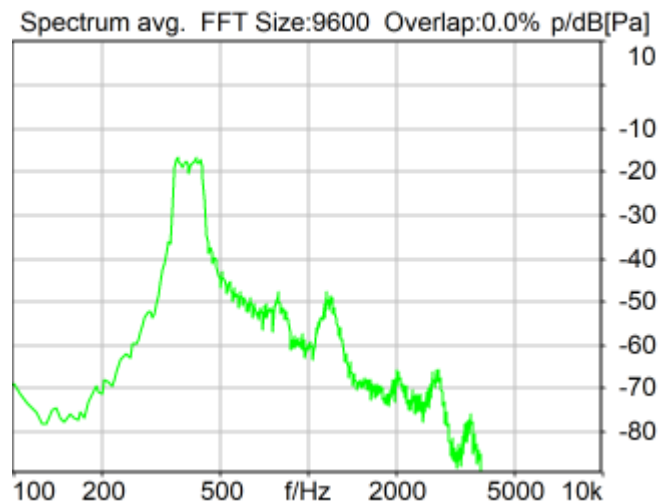
**Ok**

2023/11/13 3:38 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 24.90 dB (5.69%) Ok

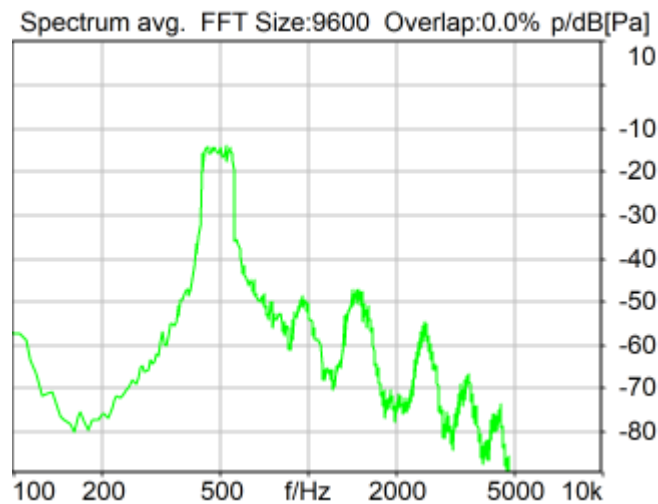
**Ok**

2023/11/13 3:39 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.67 dB (4.64%) Ok

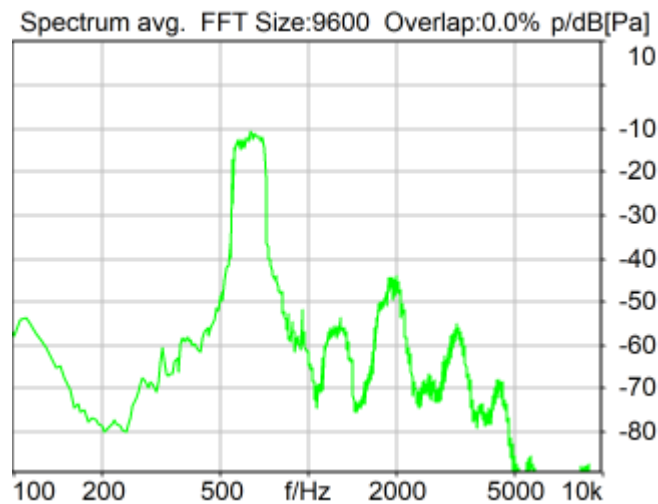
**Ok**

2023/11/13 3:39 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.28 dB (3.85%) Ok

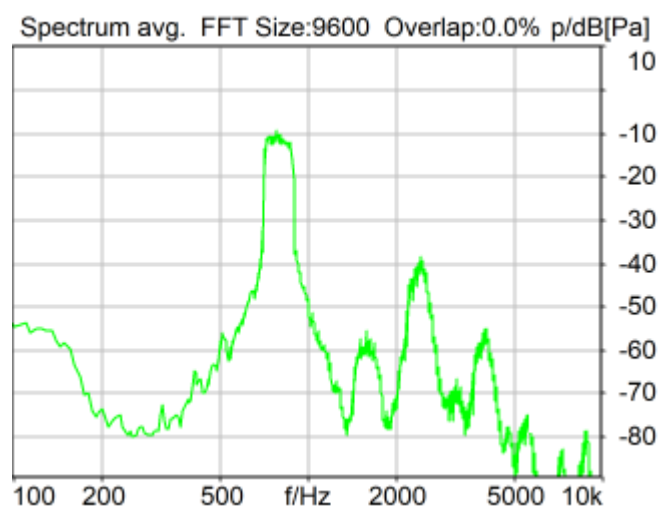
**Ok**

2023/11/13 3:40 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 25.70 dB (5.19%) Ok

**Ok**

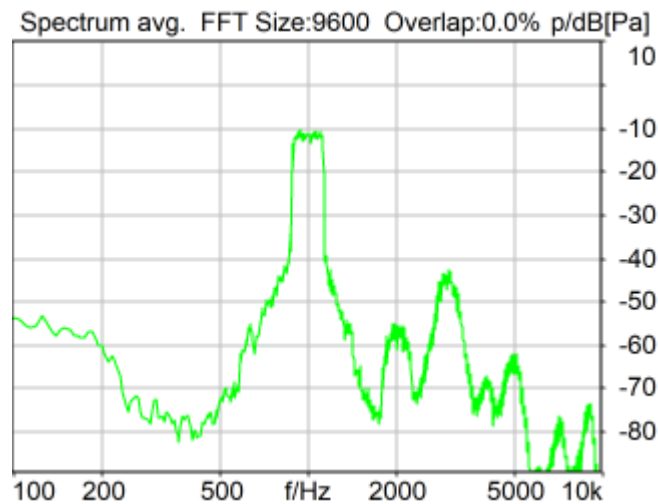
2023/11/13 3:40 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 27.97 dB (4.00%) Ok

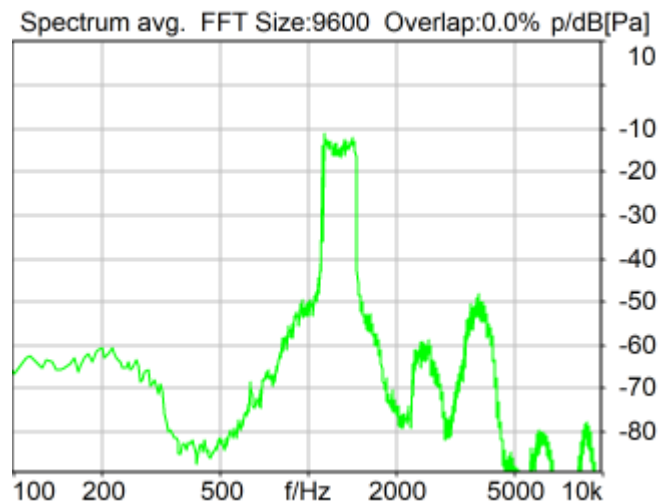
**Ok**

2023/11/13 3:40 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.96 dB (3.18%) Ok

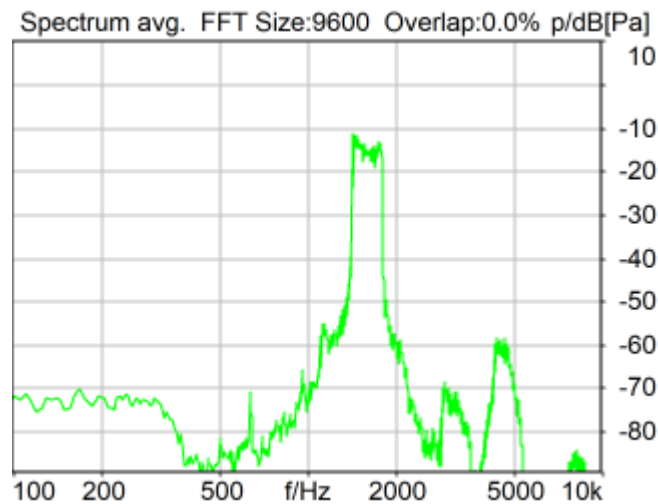
**Ok**

2023/11/13 3:41 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 37.38 dB (1.35%) Ok

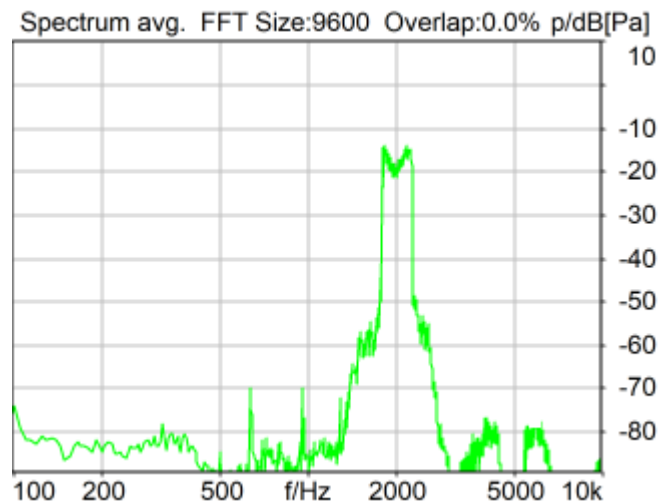
**Ok**

2023/11/13 3:41 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 36.83 dB (1.44%) Ok

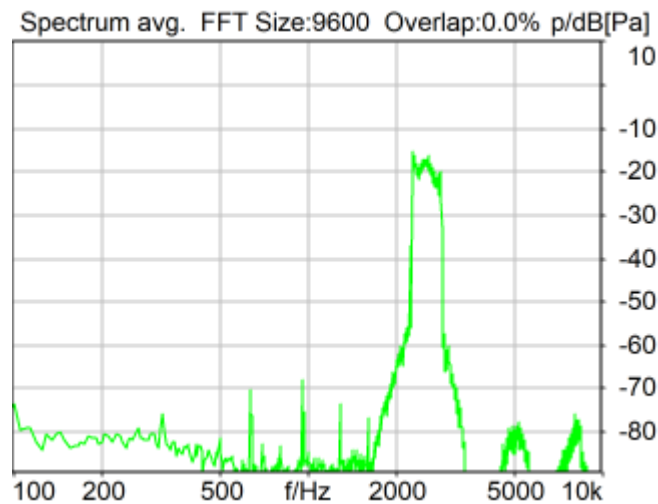
**Ok**

2023/11/13 3:42 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 41.07 dB (0.88%) Ok

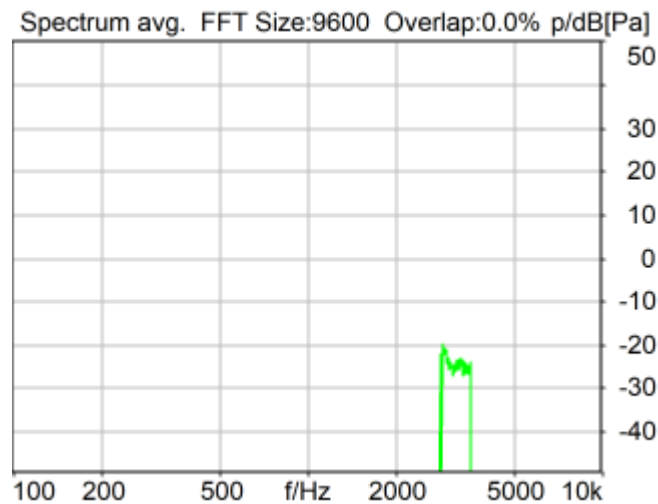
**Ok**

2023/11/13 3:42 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 37.77 dB (1.29%) Ok

**Ok**

2023/11/13 3:42 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **Report - Receive Distortion and Noise (Conversational Gain)**

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

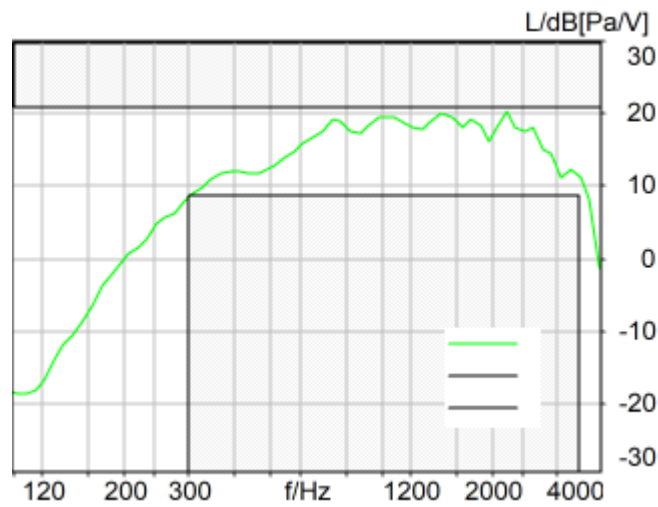
| Region | Frequency | SDNR     |
|--------|-----------|----------|
| 1      | 400Hz     | 24.90 dB |
| 2      | 500Hz     | 26.67 dB |
| 3      | 630Hz     | 28.28 dB |
| 4      | 800Hz     | 25.70 dB |
| 5      | 1000Hz    | 27.97 dB |
| 6      | 1250Hz    | 29.96 dB |
| 7      | 1600Hz    | 37.38 dB |
| 8      | 2000Hz    | 36.83 dB |
| 9      | 2500Hz    | 41.07 dB |
| 10     | 3150Hz    | 37.77 dB |

All SDNRs were greater than 20.0 dB, requirement was met.  
Smallest SDNR was 24.90dB at 400Hz.

2023/11/13 3:43 ACQUA

## 5.3 Frequency Response 2N FF HANB

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



Absolute minimal distance  
0.31 dB at 2177.4 Hz Ok

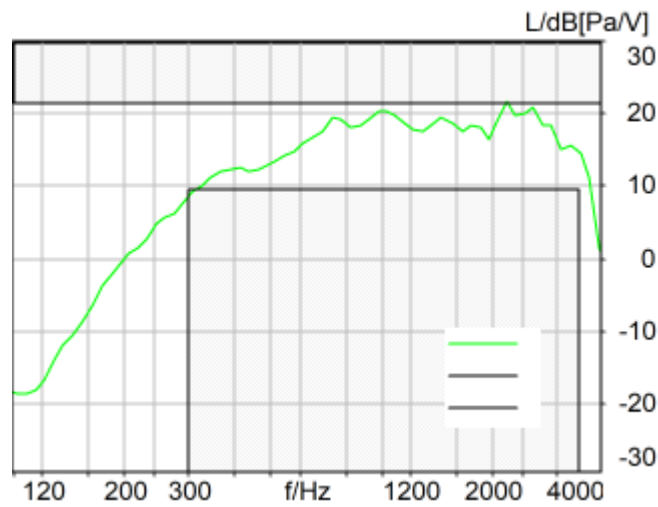
Ok

2023/11/13 3:43 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor



## 5.3 Frequency Response 2N DF HANB

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



Absolute minimal distance  
-0.24 dB at 2177.4 Hz Not Ok

**Not Ok**

2023/11/13 3:43 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Measurement Object | LTE Band 7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
|--------------------|--------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 3:56              |
|                        |                              |

## Status Overview

| SMD                                                         | Status | Single Value Description                       | Single Value | Object                                                          |
|-------------------------------------------------------------|--------|------------------------------------------------|--------------|-----------------------------------------------------------------|
| Overall Receive Delay NB                                    | Done   | Delay (Cross) [ms]                             | 140.7        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.1a Receive Volume Control Performance 8N NB               | Ok     | Speech Level [dB[SPL]]                         | 89.84        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 400 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 25.44        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 500 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.17        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 630 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.41        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 800 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 26.76        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 1000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.80        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 1250 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.03        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 1600 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 35.74        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 2000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 36.06        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 2500 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.07        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 3150 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 36.33        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| Report - Receive Distortion and Noise (Conversational Gain) | Ok     | Minimum SDNR [dB], (occured at 400Hz)          | 25.44        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.3 Frequency Response 8N FF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 305.9 Hz  | 0.50         | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |
| 5.3 Frequency Response 8N DF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 2177.4 Hz | 0.23         | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch21100_8N |

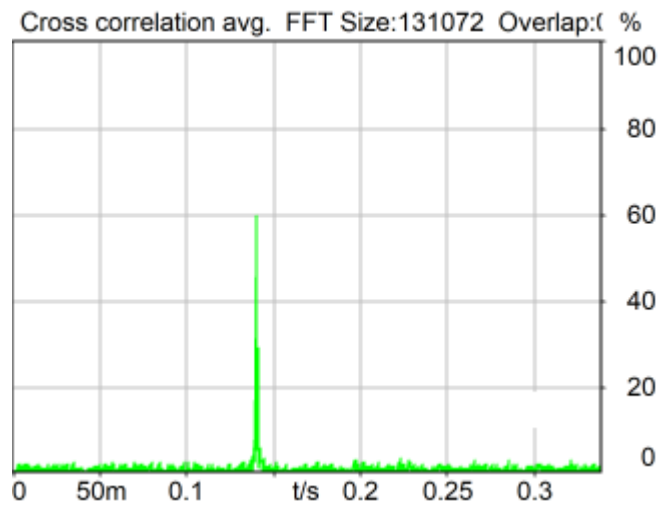
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay NB                                    | 5  |
| 5.1a Receive Volume Control Performance 8N 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 |
| 5.3 Frequency Response 8N FF HANB                           | 18 |
| 5.3 Frequency Response 8N DF HANB                           | 19 |



## Overall Receive Delay NB

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



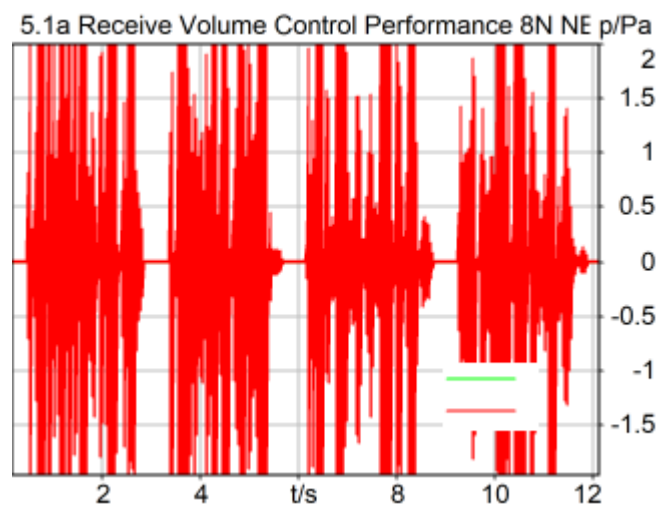
Delay (Cross): 140.7 ms

2023/11/13 3:49 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1a Receive Volume Control Performance 8N NB**

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



Speech Level RCV: 89.84 dB[SPL], Act.: 81.95% Ok

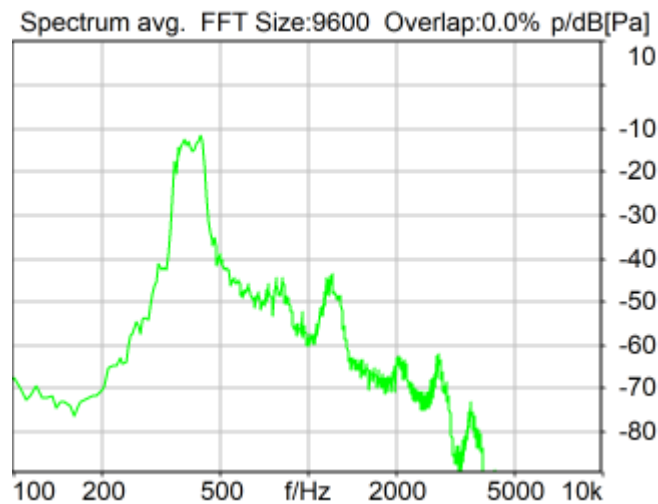
**Ok**

2023/11/13 3:49 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 25.44 dB (5.35%) Ok

**Ok**

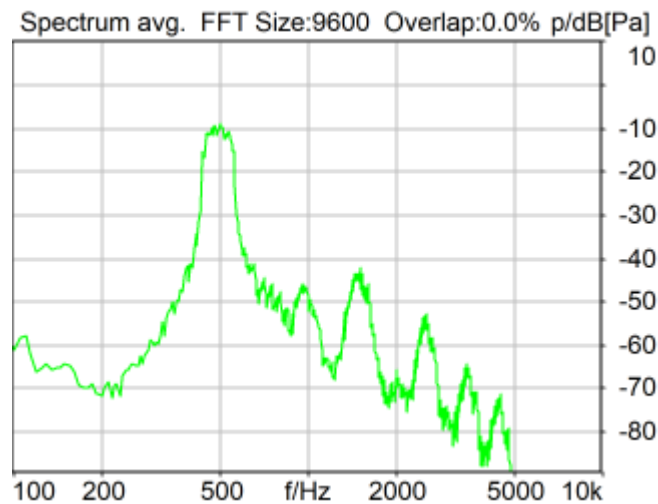
2023/11/13 3:49 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 27.17 dB (4.38%) Ok

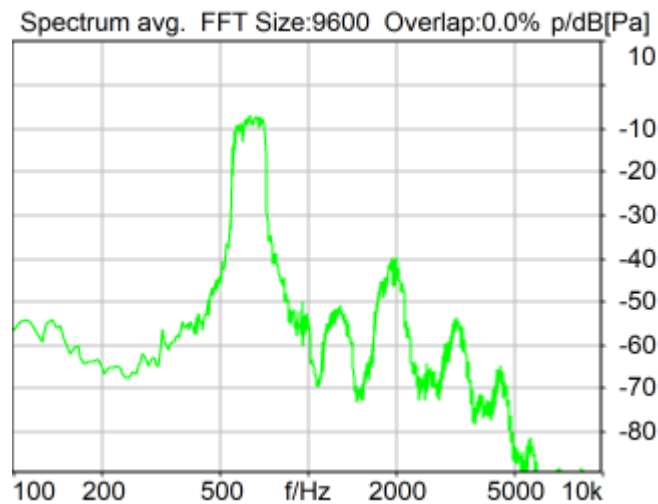
**Ok**

2023/11/13 3:50 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.41 dB (3.80%) Ok

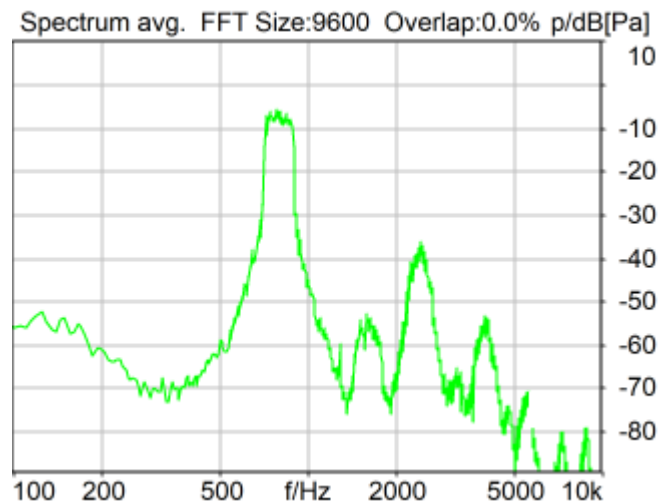
**Ok**

2023/11/13 3:50 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.76 dB (4.59%) Ok

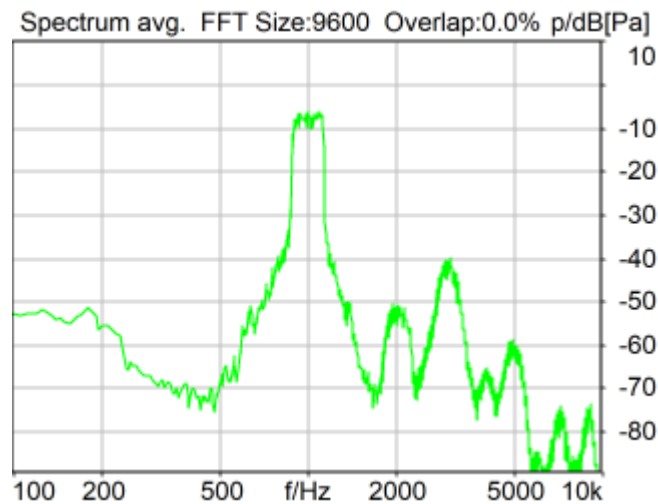
**Ok**

2023/11/13 3:51 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.80 dB (3.63%) Ok

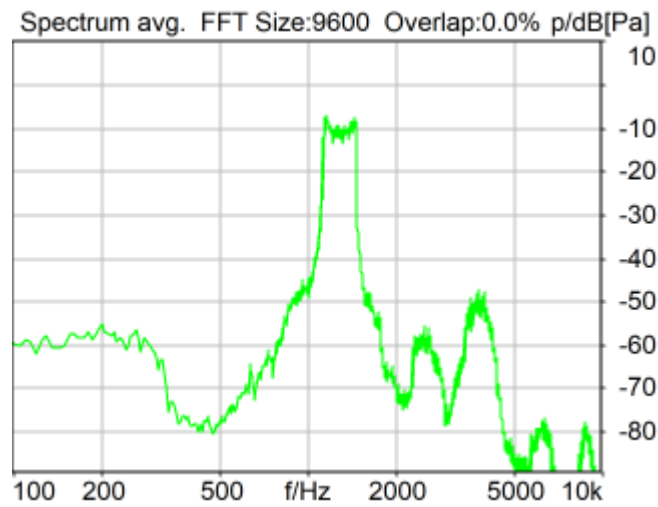
**Ok**

2023/11/13 3:51 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.03 dB (4.45%) Ok

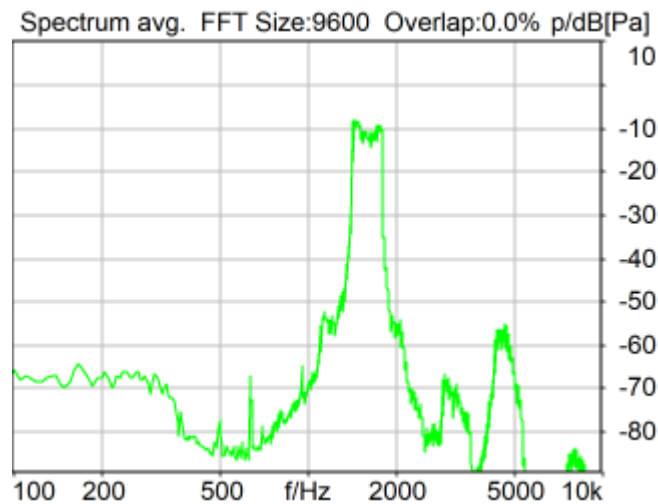
**Ok**

2023/11/13 3:51 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 35.74 dB (1.63%) Ok

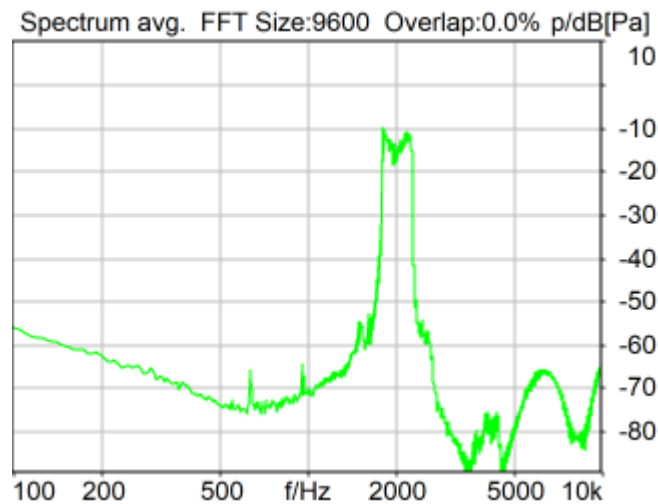
**Ok**

2023/11/13 3:52 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 36.06 dB (1.57%) Ok

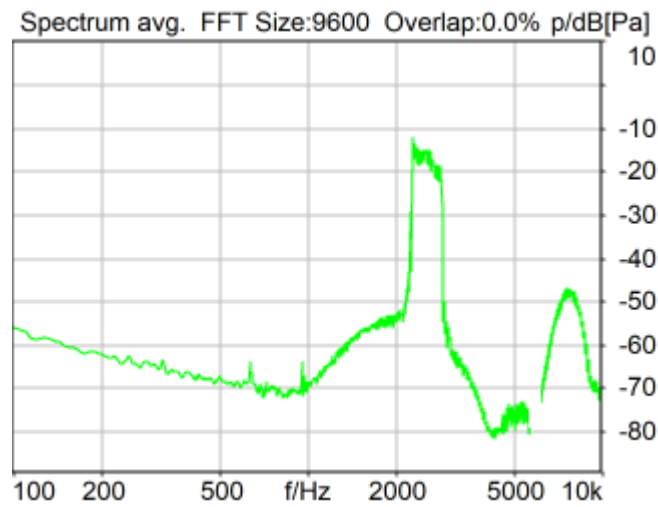
**Ok**

2023/11/13 3:52 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.07 dB (4.43%) Ok

**Ok**

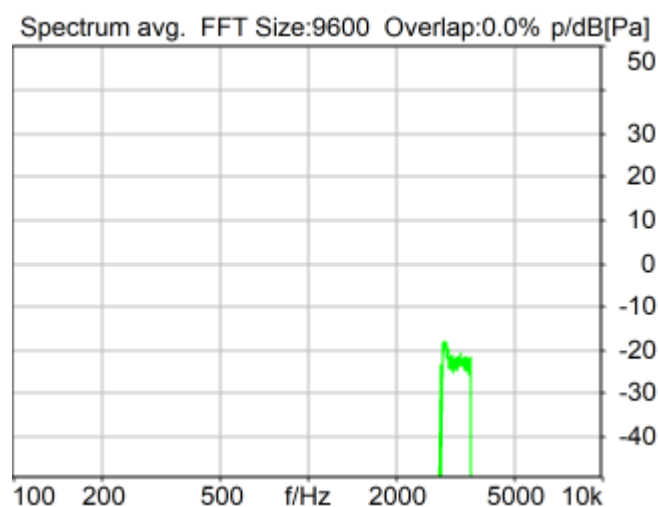
2023/11/13 3:53 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 36.33 dB (1.53%) Ok

**Ok**

2023/11/13 3:53 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 25.44 dB |
| 2      | 500Hz     | 27.17 dB |
| 3      | 630Hz     | 28.41 dB |
| 4      | 800Hz     | 26.76 dB |
| 5      | 1000Hz    | 28.80 dB |
| 6      | 1250Hz    | 27.03 dB |
| 7      | 1600Hz    | 35.74 dB |
| 8      | 2000Hz    | 36.06 dB |
| 9      | 2500Hz    | 27.07 dB |
| 10     | 3150Hz    | 36.33 dB |

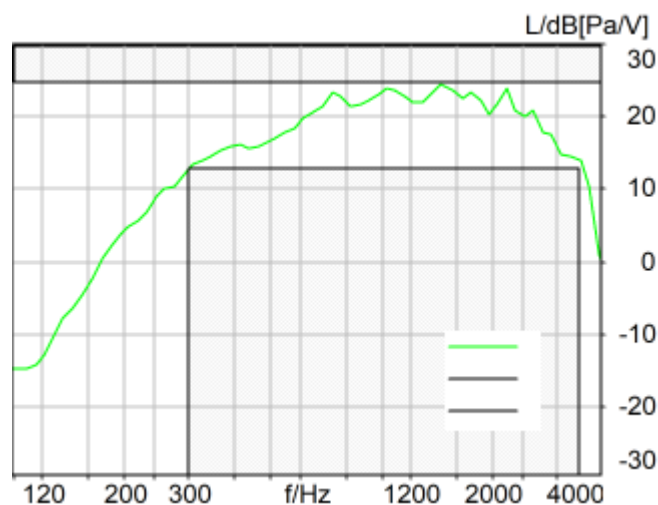
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 25.44dB at 400Hz.

2023/11/13 3:54 ACQUA

### 5.3 Frequency Response 8N FF HANB

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



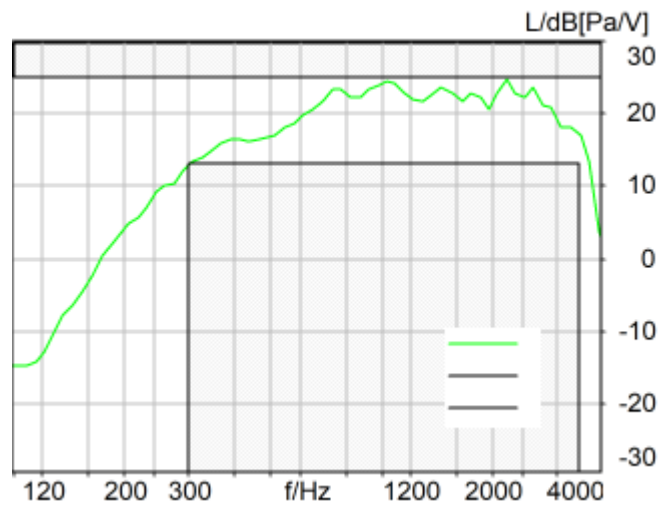
Absolute minimal distance  
0.50 dB at 305.9 Hz Ok

Ok

2023/11/13 3:54 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 8N DF HANB

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



Absolute minimal distance  
0.23 dB at 2177.4 Hz Ok

Ok

2023/11/13 3:54 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                            |
|--------------------|------------------------------------------------------------|
| Measurement Object | LTE Band 7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
|--------------------|------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 3:12              |
|                        |                              |

## Status Overview

| SMD                                           | Status | Single Value Description        | Single Value | Object                                                        |
|-----------------------------------------------|--------|---------------------------------|--------------|---------------------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]              | 139.4        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.1b Receive Volume Control Performance 2N WB | Ok     | Speech Level [dB[SPL]]          | 84.26        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 22.94        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 24.47        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 26.36        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.20        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.19        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.09        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 30.66        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 30.59        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 38.55        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 37.79        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 46.39        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 38.66        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 42.44        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 41.88        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR                    | 22.94        | LTE Band                                                      |

|                                 |    |                                                |      |                                                               |
|---------------------------------|----|------------------------------------------------|------|---------------------------------------------------------------|
| and Noise (Conversational Gain) |    | [dB], (occured at 250Hz)                       |      | 7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N             |
| 5.3 Frequency Response 2N FF    | Ok | Min. dist. to tolerance scheme [dB], 731.5 Hz  | 1.12 | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |
| 5.3 Frequency Response 2N DF    | Ok | Min. dist. to tolerance scheme [dB], 2432.3 Hz | 0.67 | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_2N |

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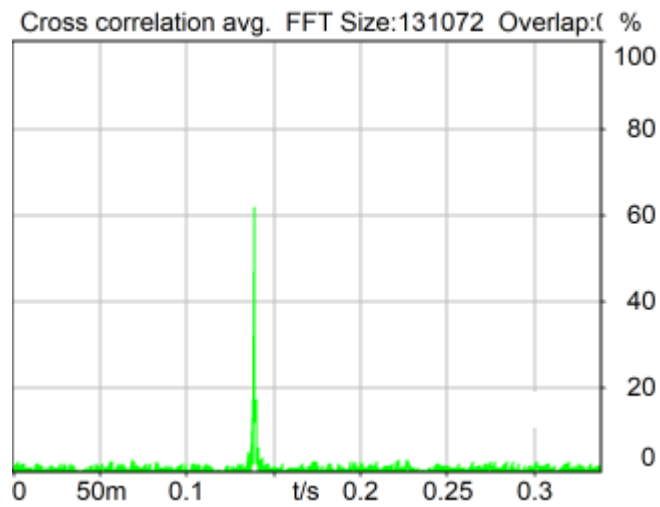
|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1b Receive Volume Control Performance 2N WB               | 7  |
| 5.2 RCV Distortion and 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 |
| 5.3 Frequency Response 2N FF                                | 23 |
| 5.3 Frequency Response 2N DF                                | 24 |





## Overall Receive Delay WB

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



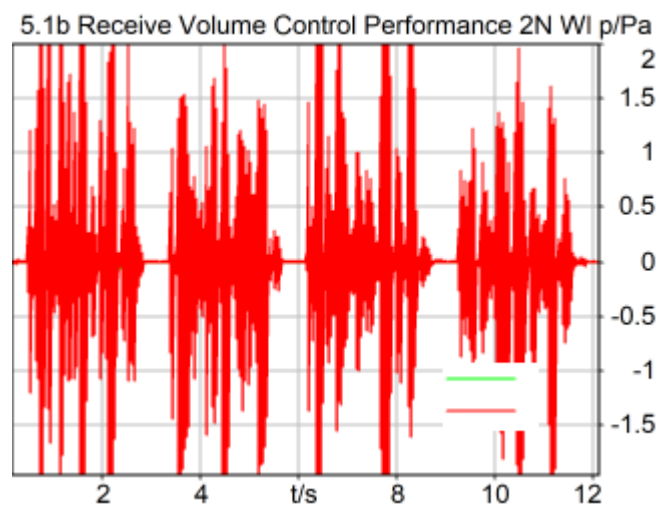
Delay (Cross): 139.4 ms

2023/11/13 2:43 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1b Receive Volume Control Performance 2N WB**

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



Speech Level RCV: 84.26 dB[SPL], Act.: 82.21% Ok

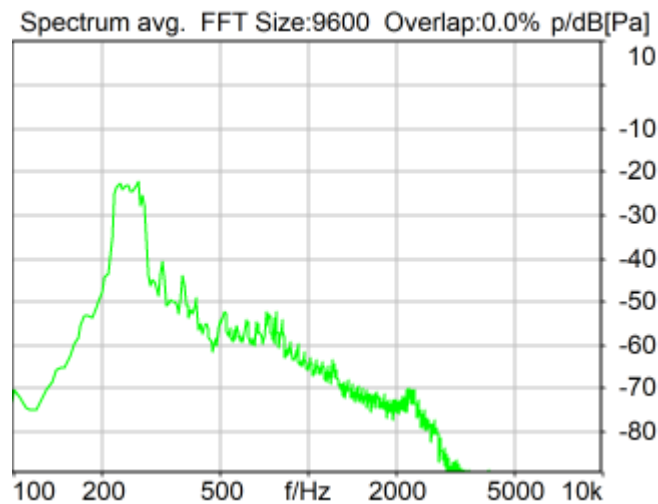
**Ok**

2023/11/13 2:43 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 22.94 dB (7.13%) Ok

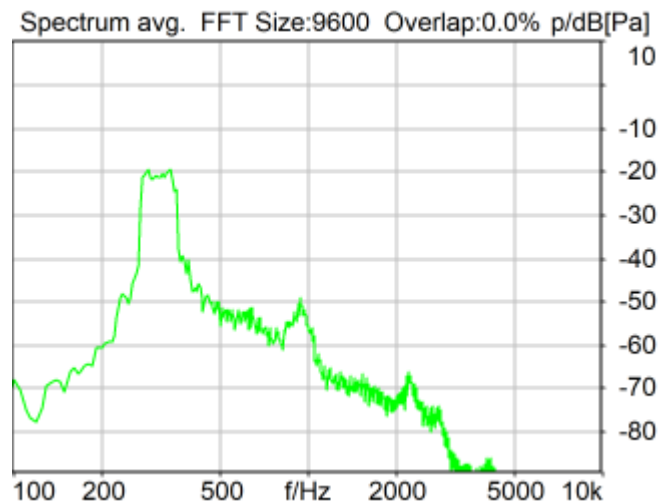
**Ok**

2023/11/13 2:43 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 24.47 dB (5.98%) Ok

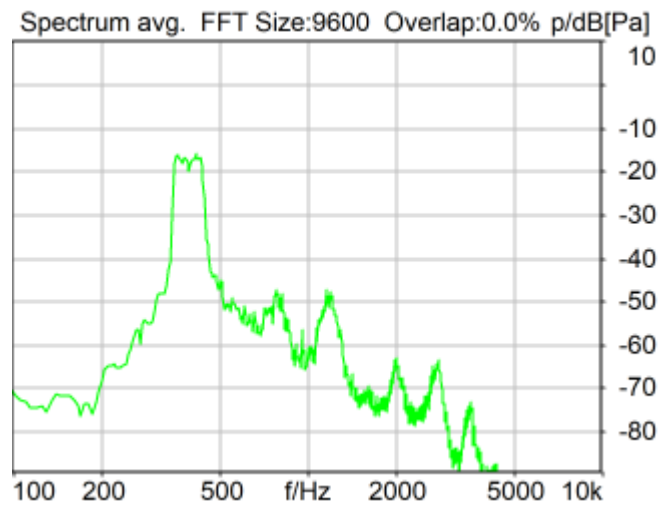
**Ok**

2023/11/13 2:44 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.36 dB (4.81%) Ok

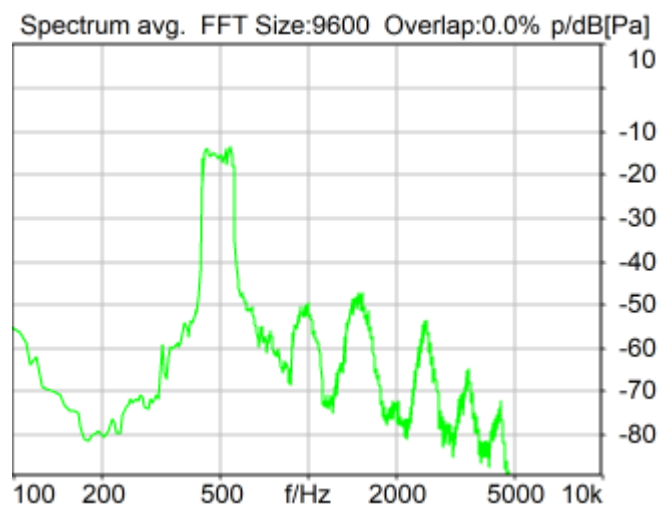
**Ok**

2023/11/13 2:44 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.20 dB (3.89%) Ok

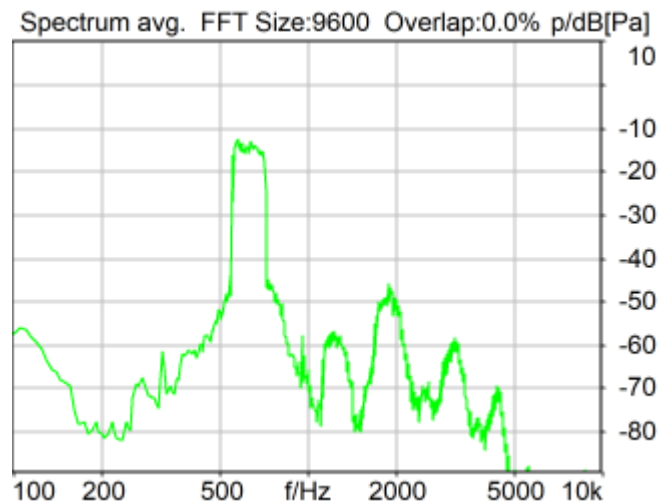
**Ok**

2023/11/13 2:44 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.19 dB (3.47%) Ok

**Ok**

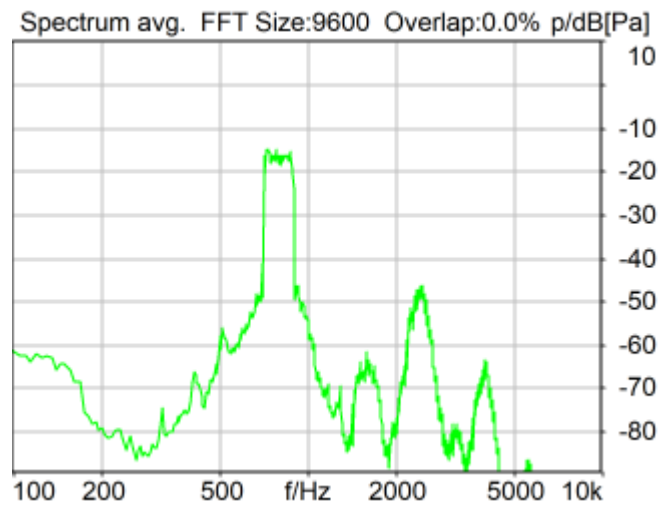
2023/11/13 2:45 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 28.09 dB (3.94%) Ok

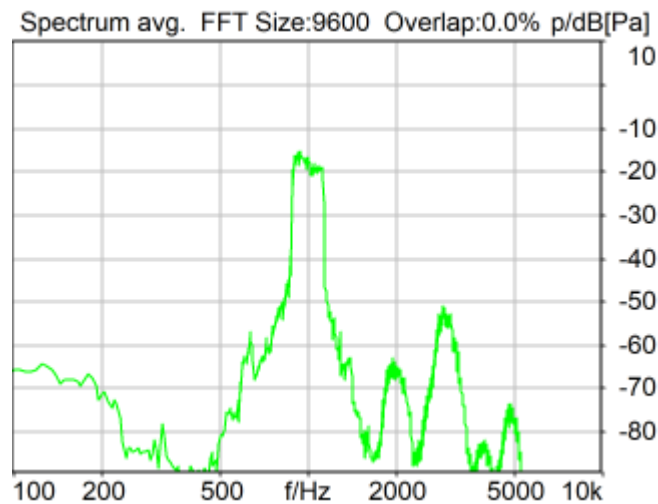
**Ok**

2023/11/13 2:45 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 30.66 dB (2.93%) Ok

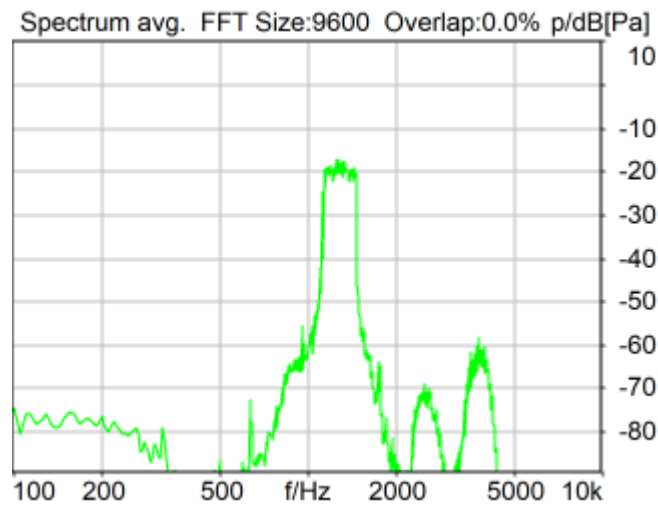
**Ok**

2023/11/13 2:46 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 30.59 dB (2.95%) Ok

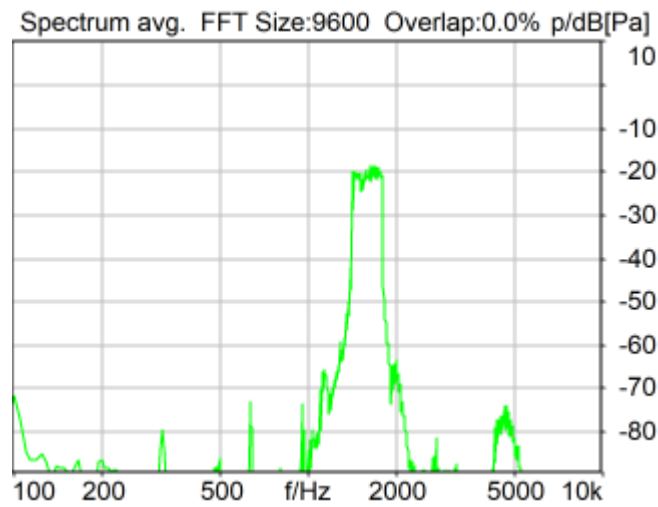
**Ok**

2023/11/13 2:46 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.55 dB (1.18%) Ok

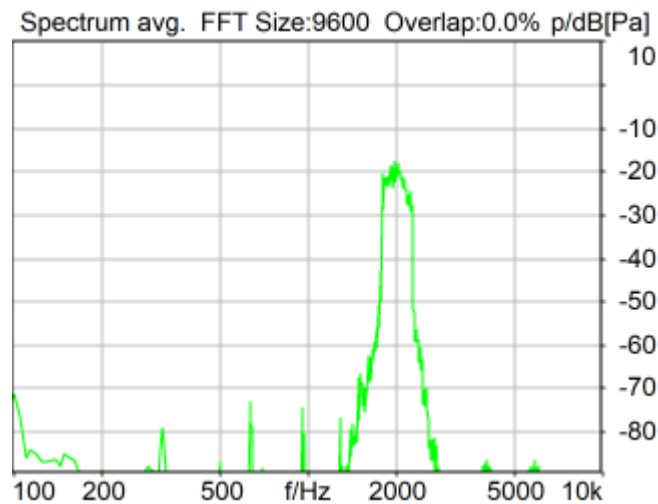
**Ok**

2023/11/13 2:46 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 37.79 dB (1.29%) Ok

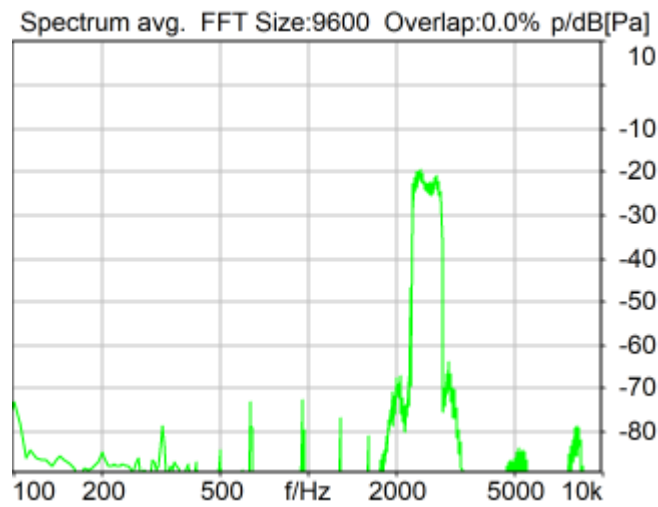
**Ok**

2023/11/13 2:47 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 46.39 dB (0.48%) Ok

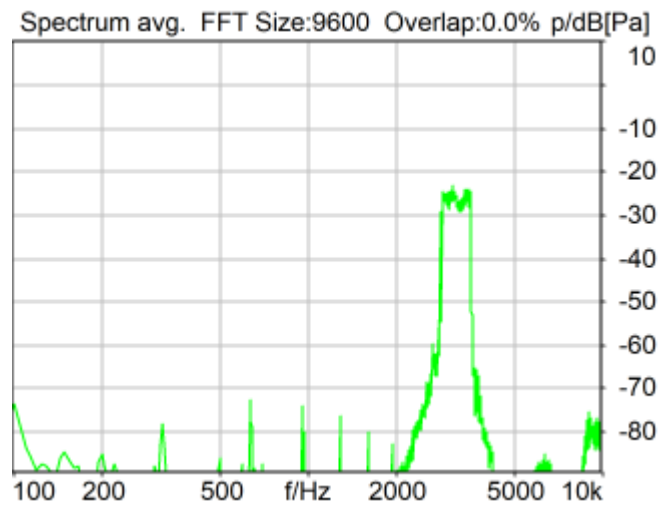
**Ok**

2023/11/13 2:47 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.66 dB (1.17%) Ok

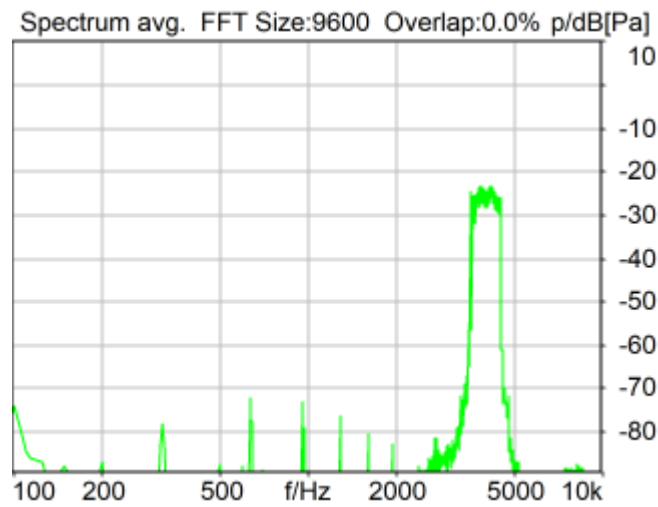
**Ok**

2023/11/13 2:48 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 42.44 dB (0.76%) Ok

**Ok**

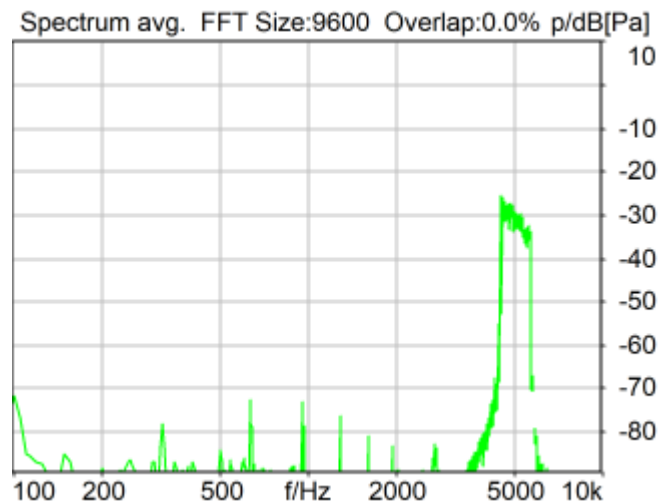
2023/11/13 2:48 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 41.88 dB (0.81%) Ok

**Ok**

2023/11/13 2:48 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 22.94 dB |
| 2      | 315Hz     | 24.47 dB |
| 3      | 400Hz     | 26.36 dB |
| 4      | 500Hz     | 28.20 dB |
| 5      | 630Hz     | 29.19 dB |
| 6      | 800Hz     | 28.09 dB |
| 7      | 1000Hz    | 30.66 dB |
| 8      | 1250Hz    | 30.59 dB |
| 9      | 1600Hz    | 38.55 dB |
| 10     | 2000Hz    | 37.79 dB |
| 11     | 2500Hz    | 46.39 dB |
| 12     | 3150Hz    | 38.66 dB |
| 13     | 4000Hz    | 42.44 dB |
| 14     | 5000Hz    | 41.88 dB |

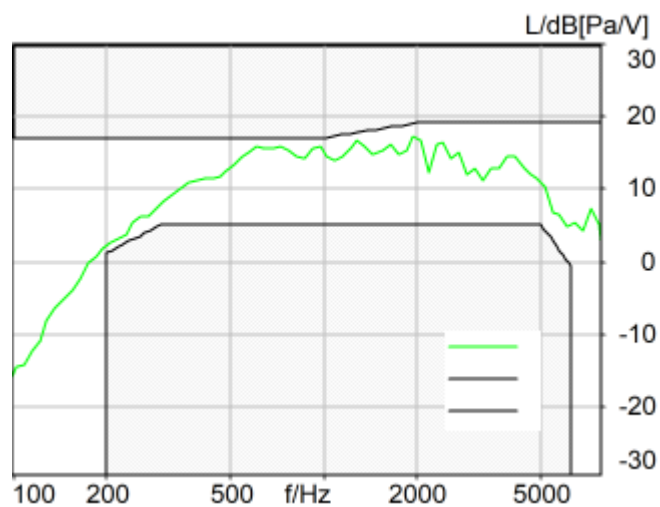
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 22.94dB at 250Hz.

2023/11/13 2:51 ACQUA

## 5.3 Frequency Response 2N FF

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



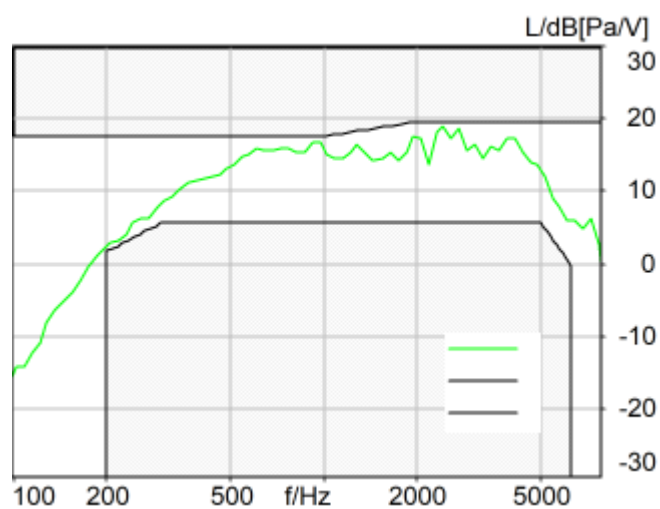
Absolute minimal distance  
1.12 dB at 731.5 Hz Ok

Ok

2023/11/13 2:51 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 2N DF

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



Absolute minimal distance  
0.67 dB at 2432.3 Hz Ok

Ok

2023/11/13 2:51 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                            |
|--------------------|------------------------------------------------------------|
| Measurement Object | LTE Band 7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
|--------------------|------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 3:11              |
|                        |                              |

## Status Overview

| SMD                                           | Status | Single Value Description        | Single Value | Object                                                        |
|-----------------------------------------------|--------|---------------------------------|--------------|---------------------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]              | 120.5        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.1a Receive Volume Control Performance 8N WB | Ok     | Speech Level [dB[SPL]]          | 88.23        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 22.85        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 23.49        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 26.16        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.65        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.42        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.37        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 32.25        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 34.32        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 44.92        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 43.76        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.20        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 41.29        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.26        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 43.12        | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR                    | 22.85        | LTE Band                                                      |

|                                 |    |                                               |      |                                                               |
|---------------------------------|----|-----------------------------------------------|------|---------------------------------------------------------------|
| and Noise (Conversational Gain) |    | [dB], (occured at 250Hz)                      |      | 7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N             |
| 5.3 Frequency Response 8N FF    | Ok | Min. dist. to tolerance scheme [dB], 731.5 Hz | 1.22 | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |
| 5.3 Frequency Response 8N DF    | Ok | Min. dist. to tolerance scheme [dB], 924.0 Hz | 0.92 | LTE Band<br>7_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch21100_8N |

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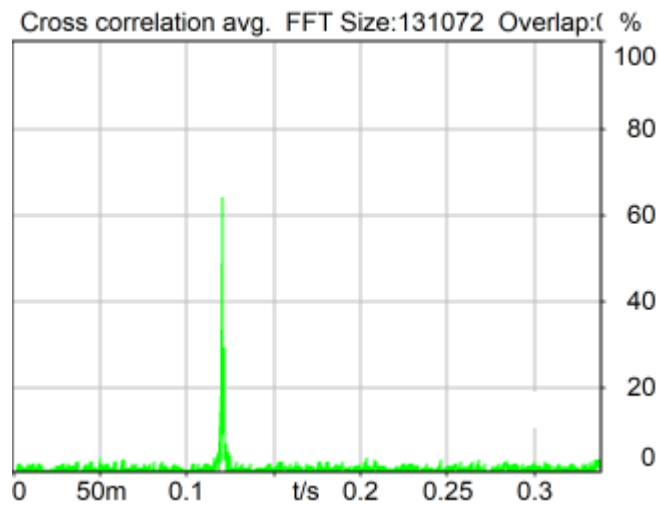
|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1a Receive Volume Control Performance 8N WB               | 7  |
| 5.2 RCV Distortion and 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 |
| 5.3 Frequency Response 8N FF                                | 23 |
| 5.3 Frequency Response 8N DF                                | 24 |





## Overall Receive Delay WB

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



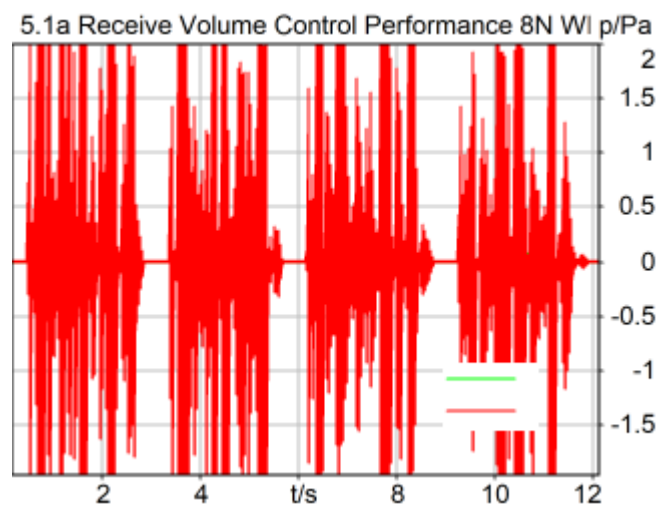
Delay (Cross): 120.5 ms

2023/11/13 2:56 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1a Receive Volume Control Performance 8N WB**

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



Speech Level RCV: 88.23 dB[SPL], Act.: 80.74% Ok

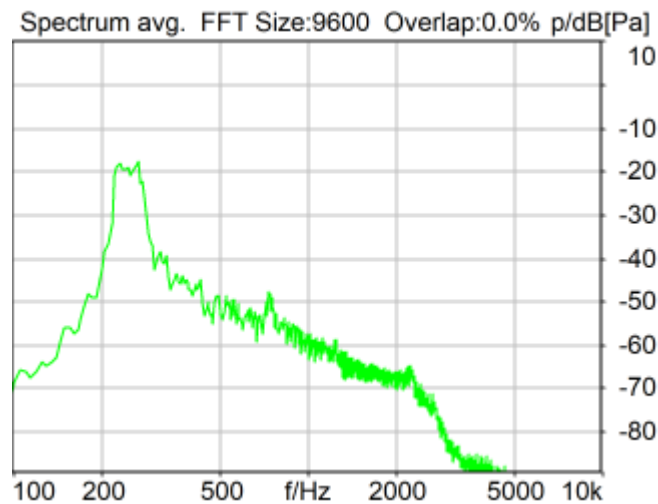
**Ok**

2023/11/13 2:56 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 22.85 dB (7.20%) Ok

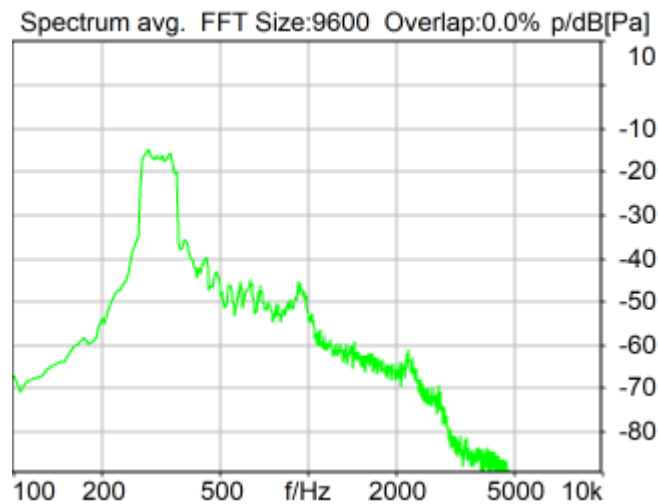
**Ok**

2023/11/13 2:56 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 23.49 dB (6.69%) Ok

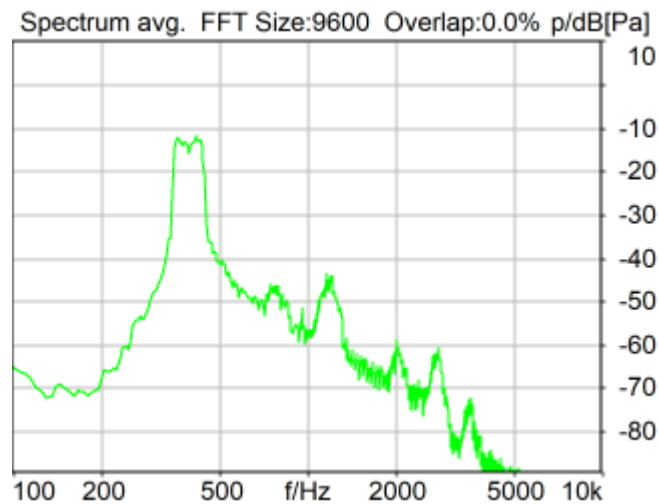
**Ok**

2023/11/13 2:57 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.16 dB (4.92%) Ok

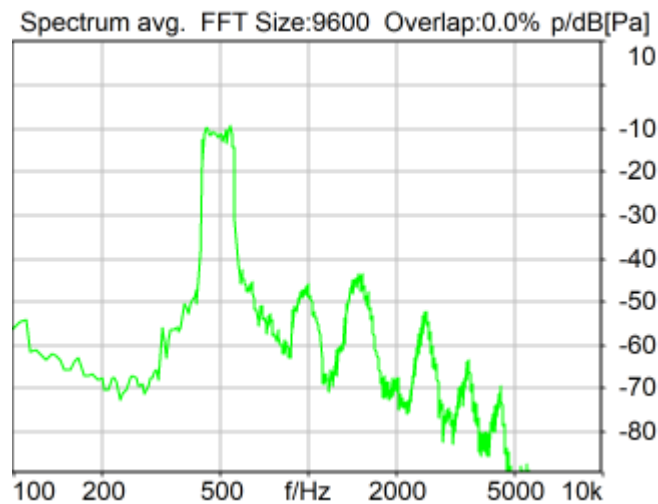
**Ok**

2023/11/13 2:57 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.65 dB (3.69%) Ok

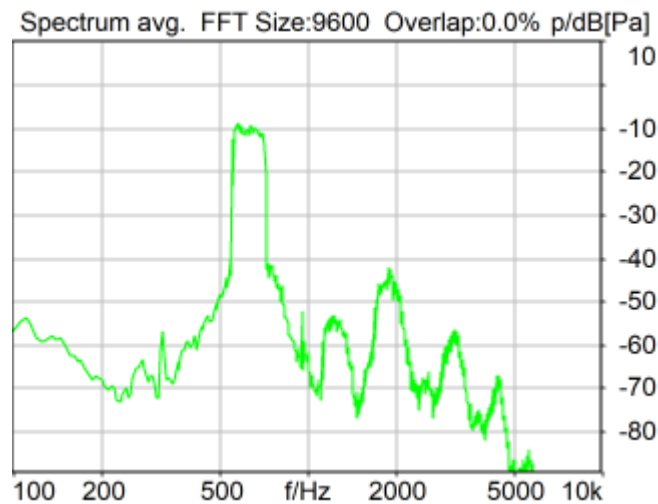
**Ok**

2023/11/13 2:57 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.42 dB (3.38%) Ok

**Ok**

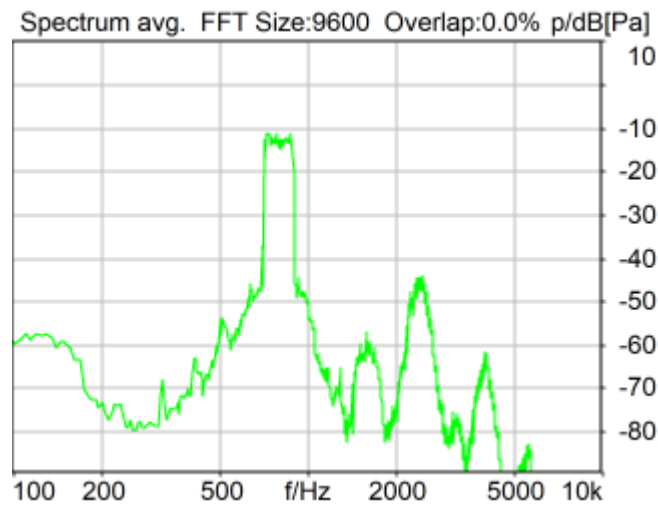
2023/11/13 2:58 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 29.37 dB (3.40%) Ok

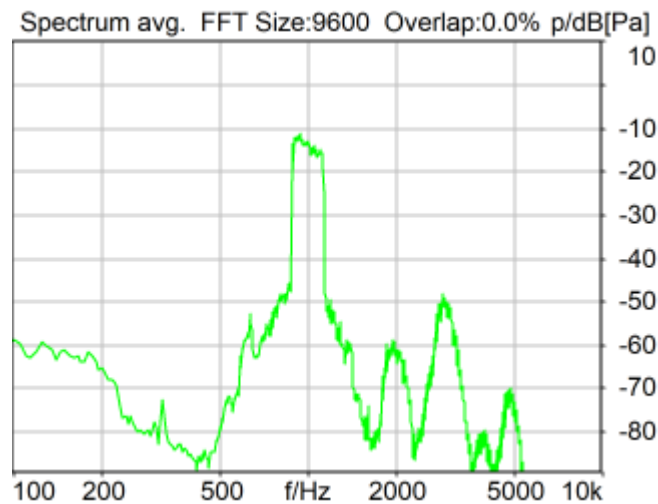
**Ok**

2023/11/13 2:58 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 32.25 dB (2.44%) Ok

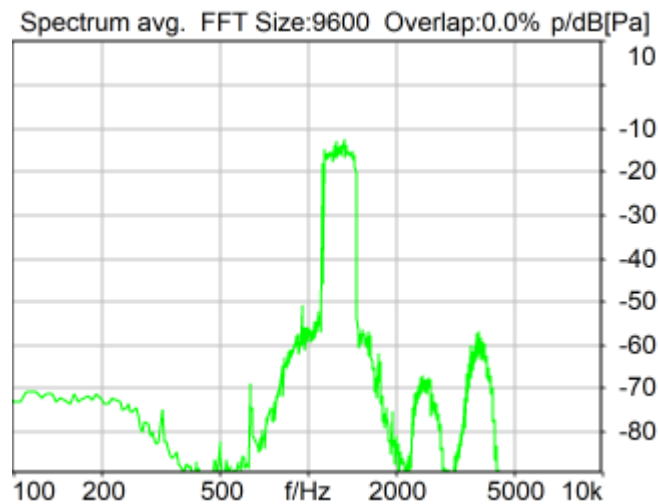
**Ok**

2023/11/13 2:59 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 34.32 dB (1.92%) Ok

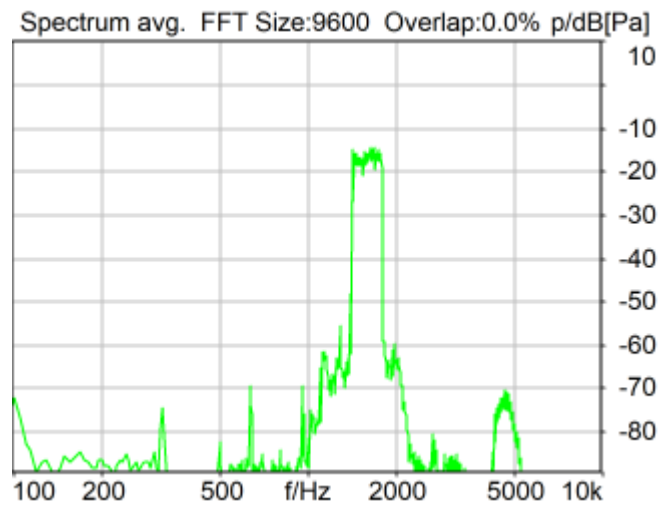
**Ok**

2023/11/13 2:59 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 44.92 dB (0.57%) Ok

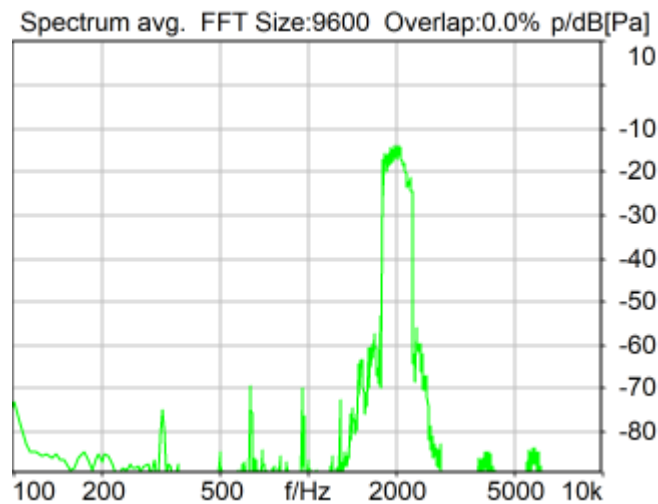
**Ok**

2023/11/13 3:00 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 43.76 dB (0.65%) Ok

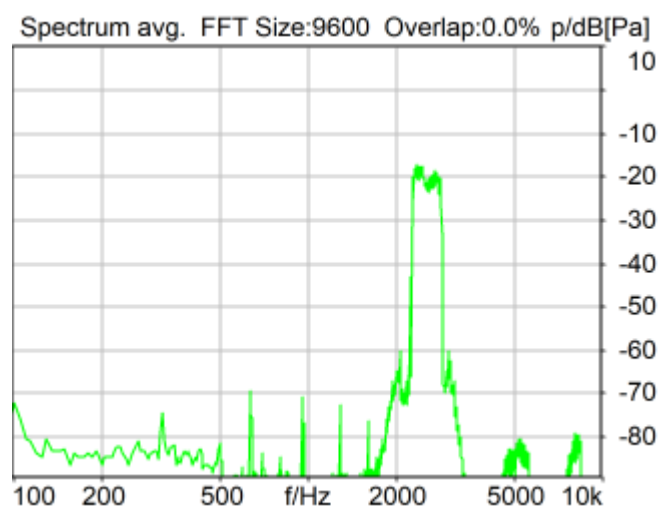
**Ok**

2023/11/13 3:00 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 45.20 dB (0.55%) Ok

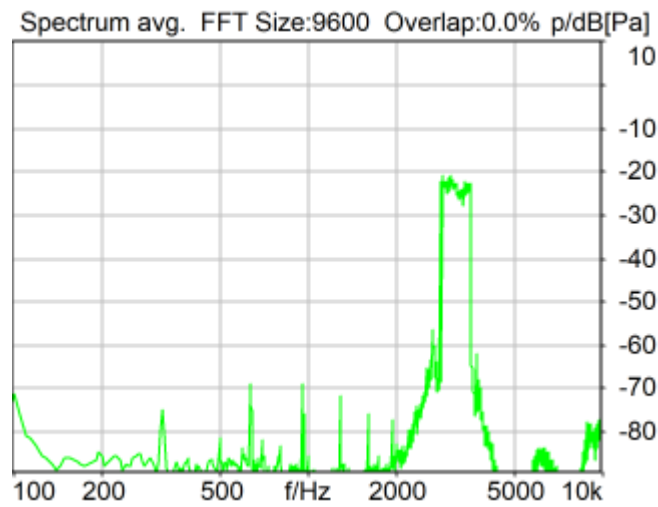
**Ok**

2023/11/13 3:00 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 41.29 dB (0.86%) Ok

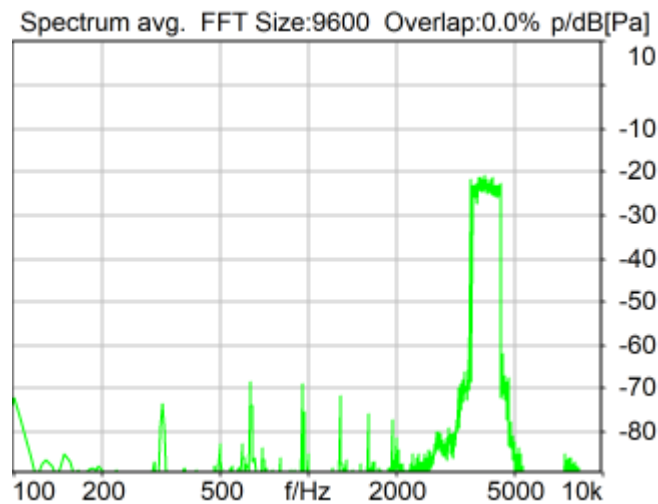
**Ok**

2023/11/13 3:01 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 45.26 dB (0.55%) Ok

**Ok**

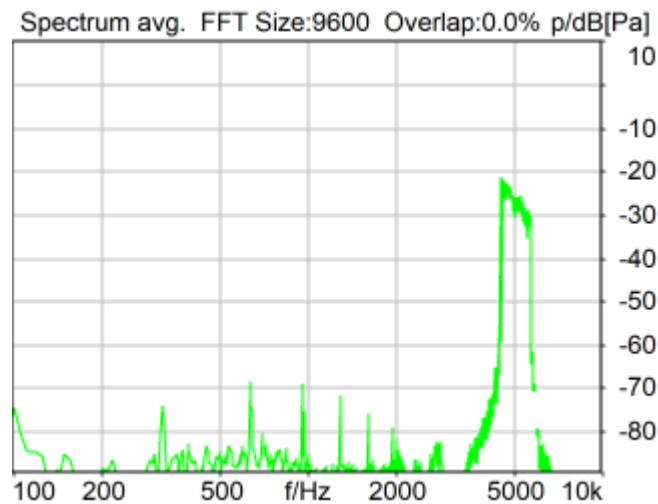
2023/11/13 3:01 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 43.12 dB (0.70%) Ok

**Ok**

2023/11/13 3:02 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 22.85 dB |
| 2      | 315Hz     | 23.49 dB |
| 3      | 400Hz     | 26.16 dB |
| 4      | 500Hz     | 28.65 dB |
| 5      | 630Hz     | 29.42 dB |
| 6      | 800Hz     | 29.37 dB |
| 7      | 1000Hz    | 32.25 dB |
| 8      | 1250Hz    | 34.32 dB |
| 9      | 1600Hz    | 44.92 dB |
| 10     | 2000Hz    | 43.76 dB |
| 11     | 2500Hz    | 45.20 dB |
| 12     | 3150Hz    | 41.29 dB |
| 13     | 4000Hz    | 45.26 dB |
| 14     | 5000Hz    | 43.12 dB |

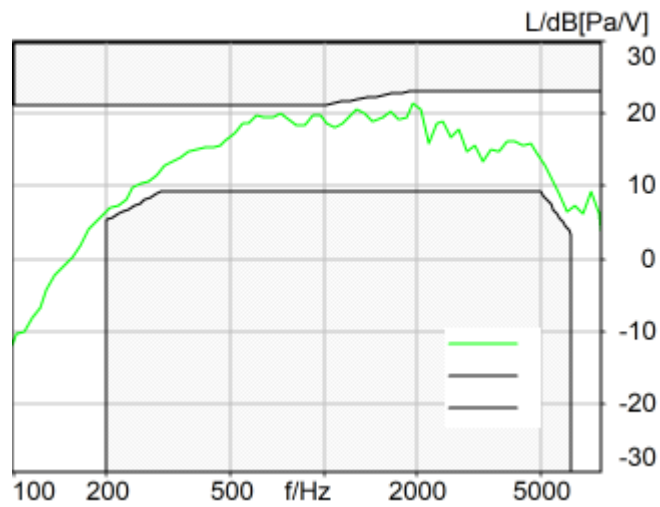
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 22.85dB at 250Hz.

2023/11/13 3:02 ACQUA

## 5.3 Frequency Response 8N FF

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



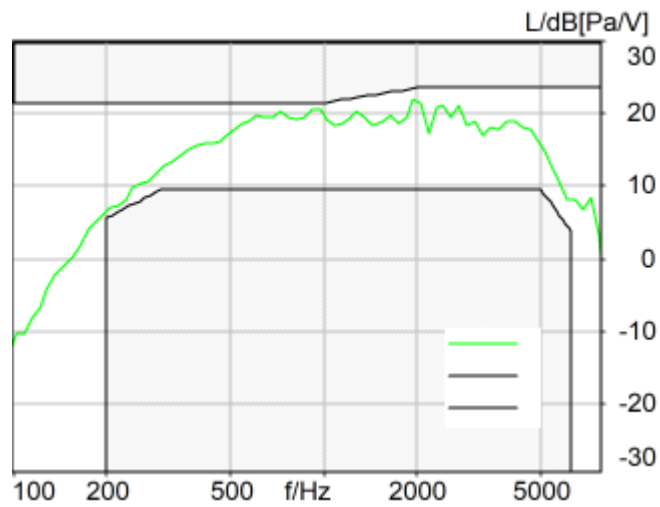
Absolute minimal distance  
1.22 dB at 731.5 Hz Ok

Ok

2023/11/13 3:02 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

### **5.3 Frequency Response 8N DF**

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



Absolute minimal distance  
0.92 dB at 924.0 Hz Ok

**Ok**

2023/11/13 3:02 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                                      |
|--------------------|----------------------------------------------------------------------|
| Measurement Object | LTE Band 41 PC2_20M_QPSK_100RB_0Offset_EVS NB<br>24.4Kbps_Ch40620_8N |
|--------------------|----------------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 6:13              |
|                        |                              |

## Status Overview

| SMD                                                         | Status | Single Value Description                       | Single Value | Object                                                               |
|-------------------------------------------------------------|--------|------------------------------------------------|--------------|----------------------------------------------------------------------|
| Overall Receive Delay NB                                    | Done   | Delay (Cross) [ms]                             | 96.5         | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.1a Receive Volume Control Performance 8N NB               | Ok     | Speech Level [dB[SPL]]                         | 90.15        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 400 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 25.03        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 500 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.55        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 630 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.86        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 800 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.04        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 1000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 29.12        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 1250 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 30.53        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 1600 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 37.47        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 2000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 37.52        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 2500 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 26.23        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 3150 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 37.76        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| Report - Receive Distortion and Noise (Conversational Gain) | Ok     | Minimum SDNR [dB], (occured at 400Hz)          | 25.03        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.3 Frequency Response 8N FF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 1447.5 Hz | 0.34         | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |
| 5.3 Frequency Response 8N DF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 2177.4 Hz | 0.14         | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS NB 24.4Kbps_Ch40620_8N |

---

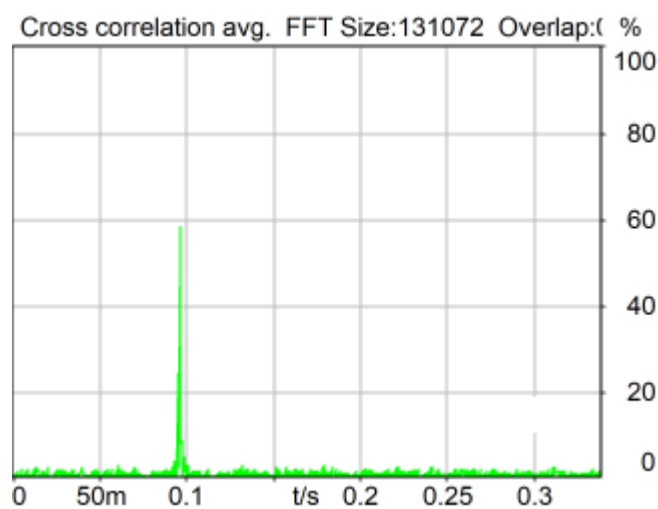
|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay NB                                    | 5  |
| 5.1a Receive Volume Control Performance 8N NB               | 6  |
| 5.2 RCV Distortion and 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 |
| 5.3 Frequency Response 8N FF HANB                           | 18 |
| 5.3 Frequency Response 8N DF HANB                           | 19 |





## **Overall Receive Delay NB**

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



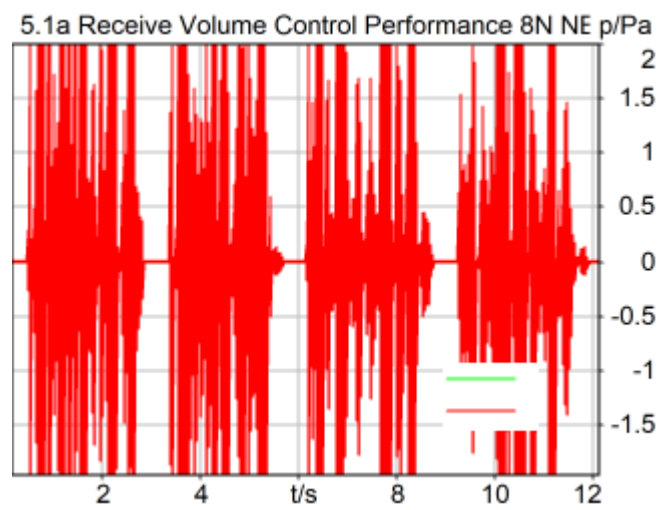
Delay (Cross): 96.5 ms

2023/11/13 6:07 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1a Receive Volume Control Performance 8N NB**

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



Speech Level RCV: 90.15 dB[SPL], Act.: 80.77% Ok

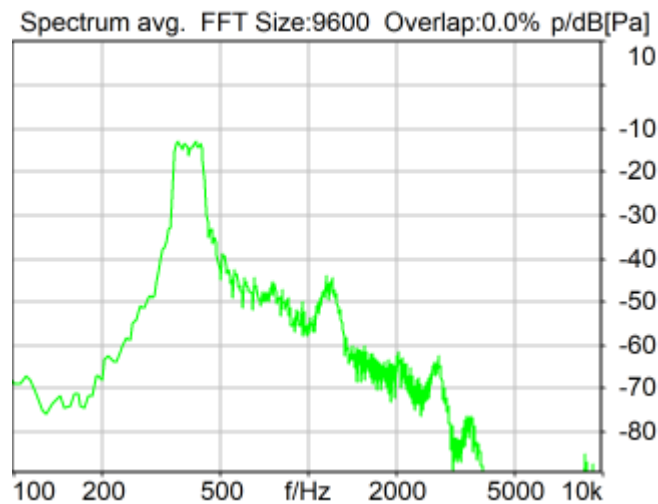
**Ok**

2023/11/13 6:07 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 25.03 dB (5.60%) Ok

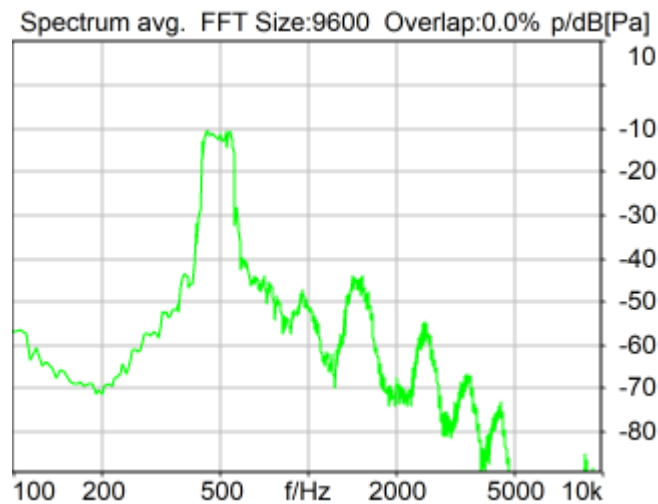
**Ok**

2023/11/13 6:07 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.55 dB (4.19%) Ok

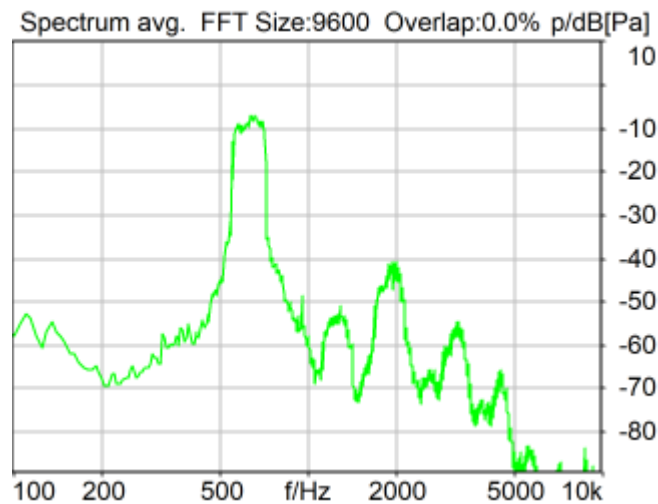
**Ok**

2023/11/13 6:08 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.86 dB (3.60%) Ok

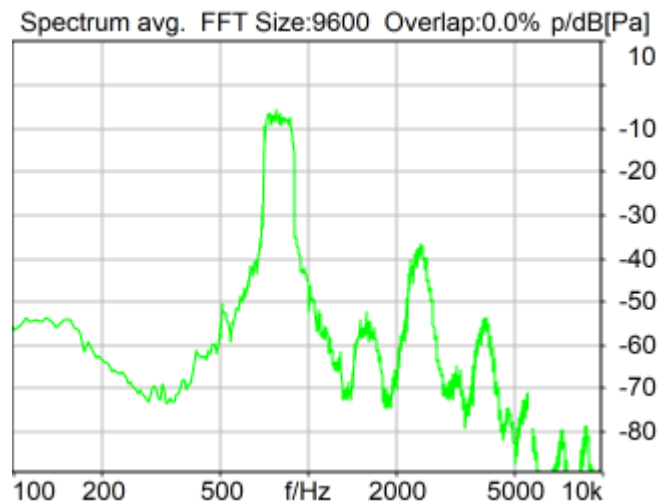
**Ok**

2023/11/13 6:08 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.04 dB (4.44%) Ok

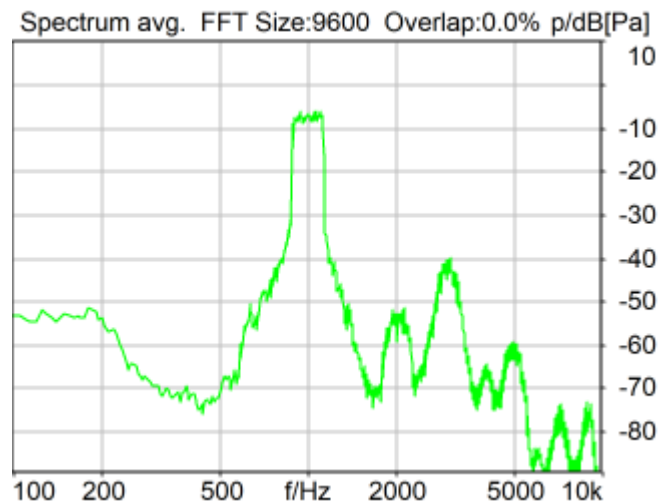
**Ok**

2023/11/13 6:09 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.12 dB (3.50%) Ok

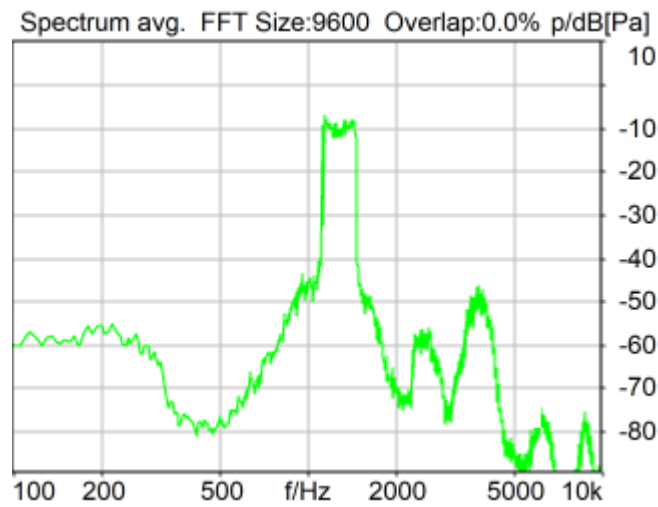
**Ok**

2023/11/13 6:09 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 30.53 dB (2.98%) Ok

**Ok**

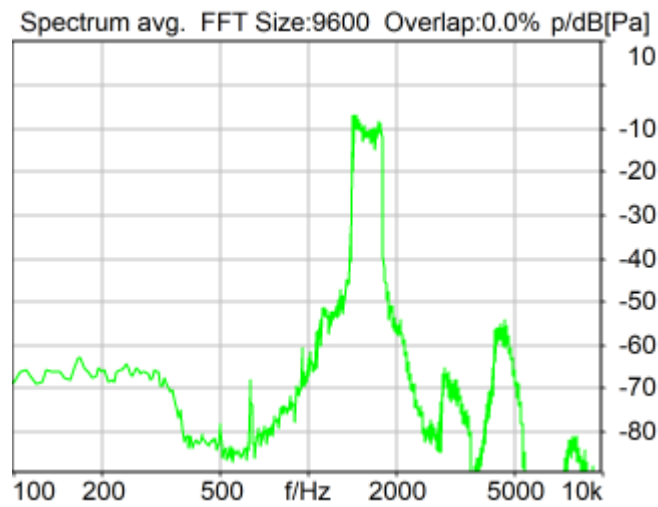
2023/11/13 6:09 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 37.47 dB (1.34%) Ok

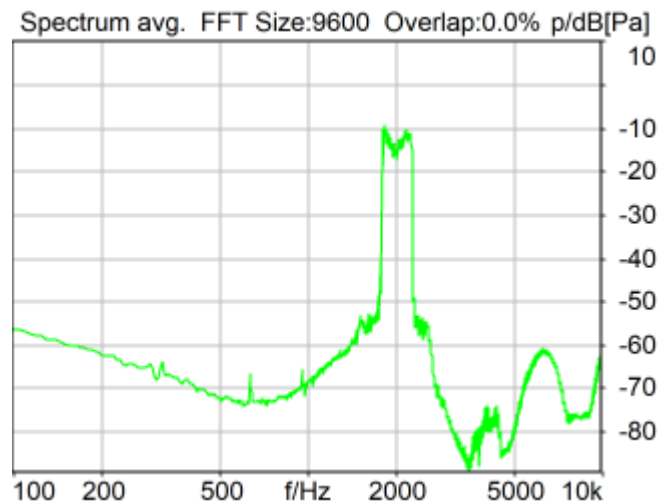
**Ok**

2023/11/13 6:10 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 37.52 dB (1.33%) Ok

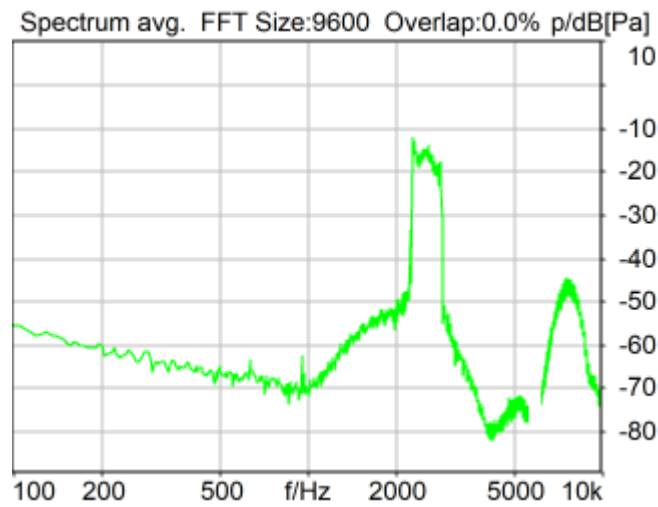
**Ok**

2023/11/13 6:10 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.23 dB (4.88%) Ok

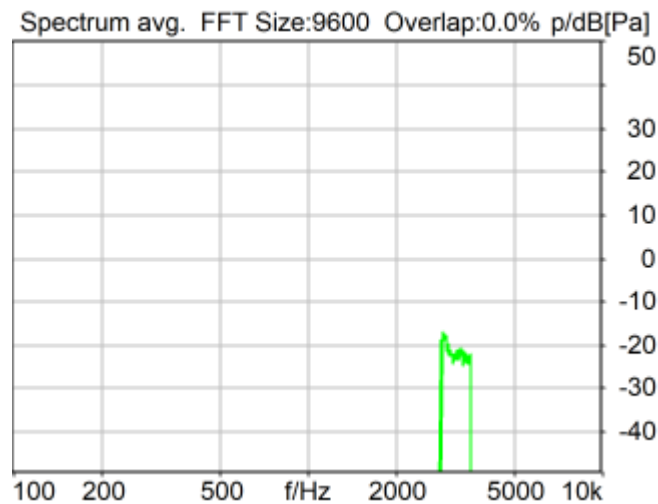
**Ok**

2023/11/13 6:11 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 37.76 dB (1.29%) Ok

**Ok**

2023/11/13 6:11 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **Report - Receive Distortion and Noise (Conversational Gain)**

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

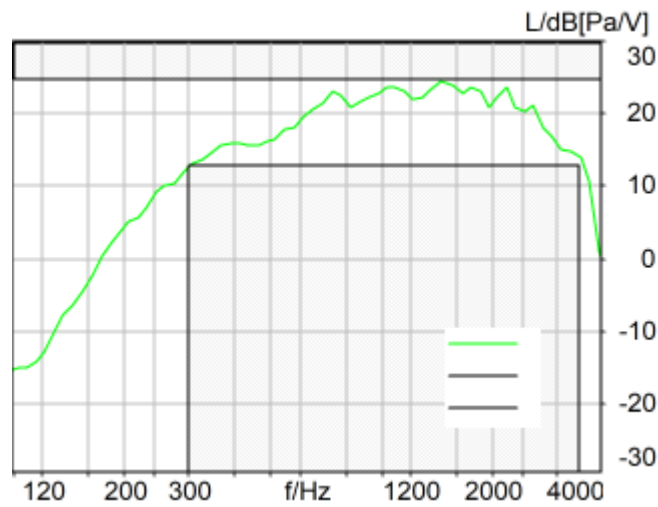
| Region | Frequency | SDNR     |
|--------|-----------|----------|
| 1      | 400Hz     | 25.03 dB |
| 2      | 500Hz     | 27.55 dB |
| 3      | 630Hz     | 28.86 dB |
| 4      | 800Hz     | 27.04 dB |
| 5      | 1000Hz    | 29.12 dB |
| 6      | 1250Hz    | 30.53 dB |
| 7      | 1600Hz    | 37.47 dB |
| 8      | 2000Hz    | 37.52 dB |
| 9      | 2500Hz    | 26.23 dB |
| 10     | 3150Hz    | 37.76 dB |

All SDNRs were greater than 20.0 dB, requirement was met.  
Smallest SDNR was 25.03dB at 400Hz.

2023/11/13 6:11 ACQUA

## 5.3 Frequency Response 8N FF HANB

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



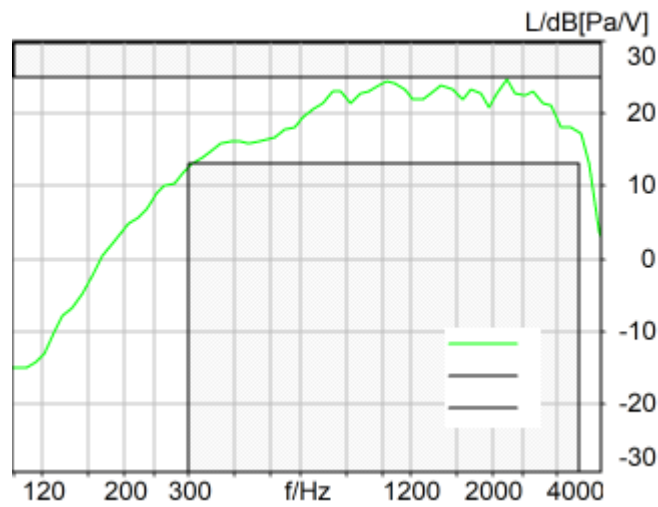
Absolute minimal distance  
0.34 dB at 1447.5 Hz Ok

Ok

2023/11/13 6:11 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 8N DF HANB

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



Absolute minimal distance  
0.14 dB at 2177.4 Hz Ok

Ok

2023/11/13 6:12 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                                    |
|--------------------|--------------------------------------------------------------------|
| Measurement Object | LTE Band 41 PC2_20M_QPSK_100RB_0Offset_EVS WB<br>64Kbps_Ch40620_2N |
|--------------------|--------------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 6:44              |
|                        |                              |



## Status Overview

| SMD                                           | Status | Single Value Description        | Single Value | Object                                                             |
|-----------------------------------------------|--------|---------------------------------|--------------|--------------------------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]              | 116.1        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.1b Receive Volume Control Performance 2N WB | Ok     | Speech Level [dB[SPL]]          | 84.37        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 22.54        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 23.60        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 25.89        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.22        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.45        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.15        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 31.52        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 33.71        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 44.59        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 42.15        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 46.21        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 41.53        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.81        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 34.72        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR                    | 22.54        | LTE Band 41                                                        |

| and Noise (Conversational Gain) |    | [dB], (occured at 250Hz)                       |      | PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N                |
|---------------------------------|----|------------------------------------------------|------|--------------------------------------------------------------------|
| 5.3 Frequency Response 2N FF    | Ok | Min. dist. to tolerance scheme [dB], 217.7 Hz  | 1.10 | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |
| 5.3 Frequency Response 2N DF    | Ok | Min. dist. to tolerance scheme [dB], 2432.3 Hz | 0.62 | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_2N |

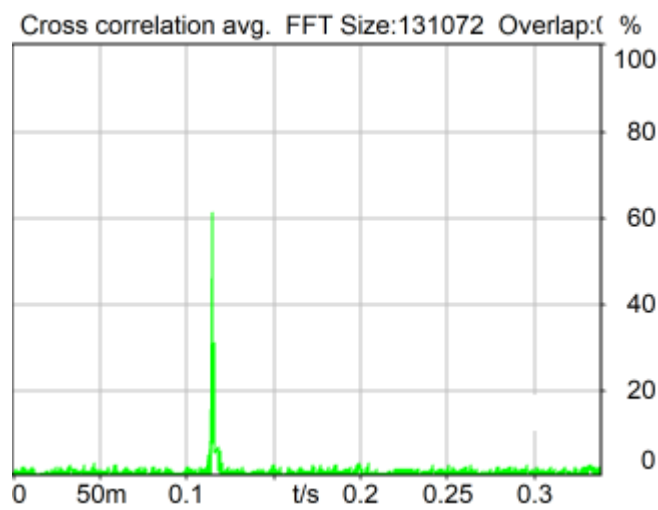
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1b Receive Volume Control Performance 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 |
| 5.3 Frequency Response 2N FF                                | 23 |
| 5.3 Frequency Response 2N DF                                | 24 |



## Overall Receive Delay WB

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



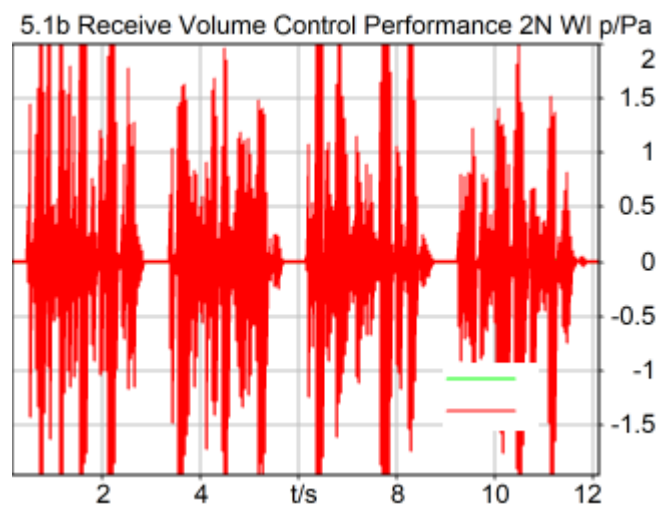
Delay (Cross): 116.1 ms

2023/11/13 6:37 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1b Receive Volume Control Performance 2N WB**

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



Speech Level RCV: 84.37 dB[SPL], Act.: 82.33% Ok

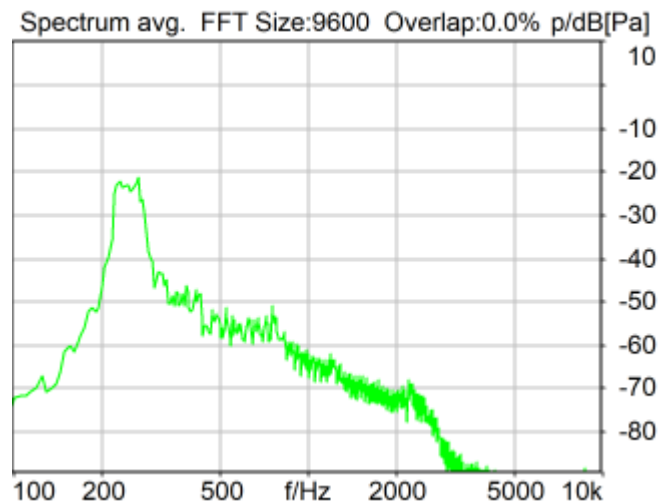
**Ok**

2023/11/13 6:37 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 22.54 dB (7.46%) Ok

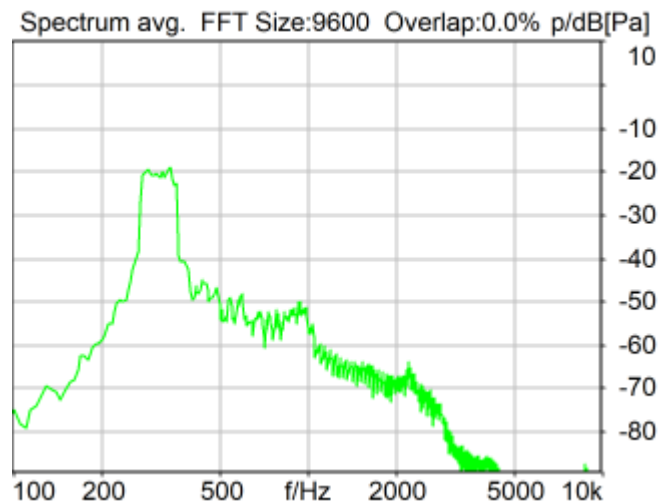
**Ok**

2023/11/13 6:37 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 23.60 dB (6.60%) Ok

**Ok**

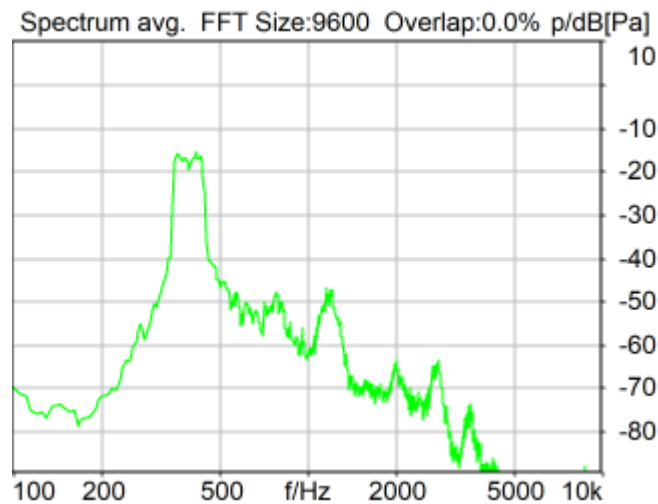
2023/11/13 6:38 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 25.89 dB (5.08%) Ok

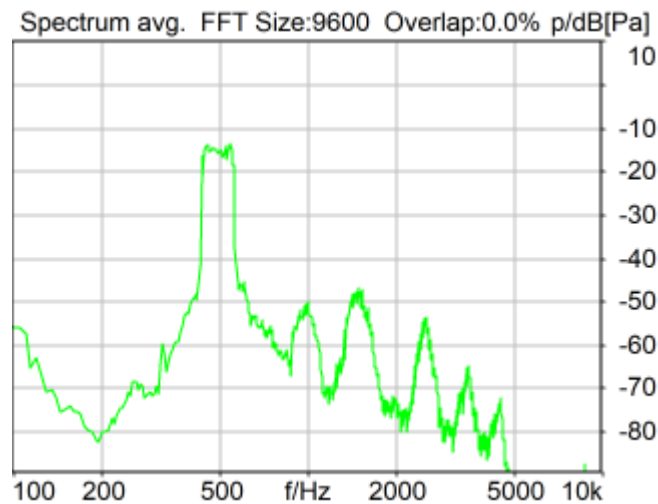
**Ok**

2023/11/13 6:38 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.22 dB (3.88%) Ok

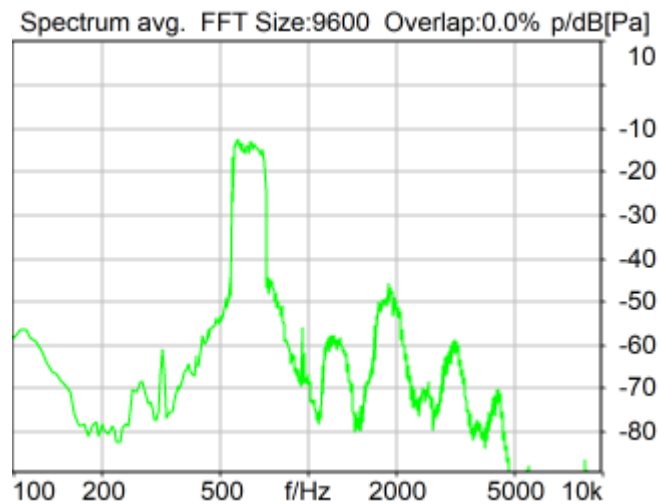
**Ok**

2023/11/13 6:39 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.45 dB (3.37%) Ok

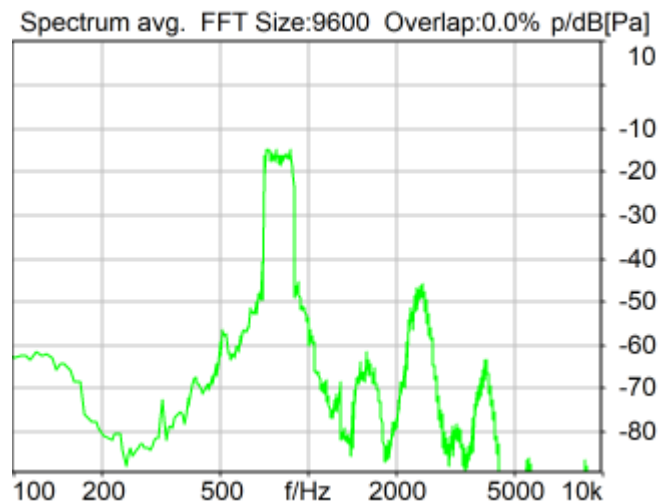
**Ok**

2023/11/13 6:39 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.15 dB (3.91%) Ok

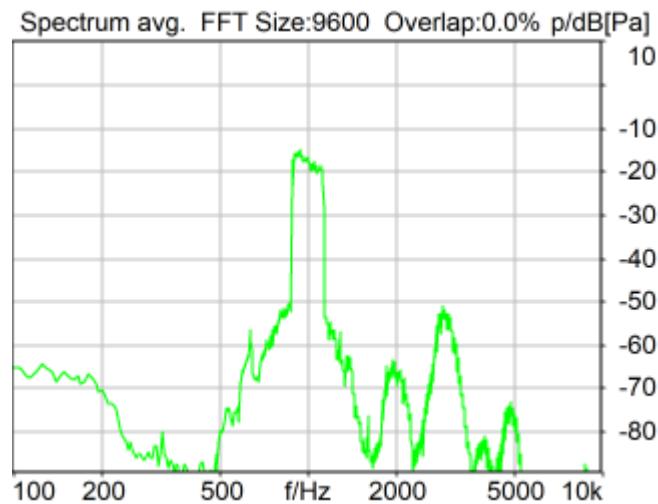
**Ok**

2023/11/13 6:39 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 31.52 dB (2.65%) Ok

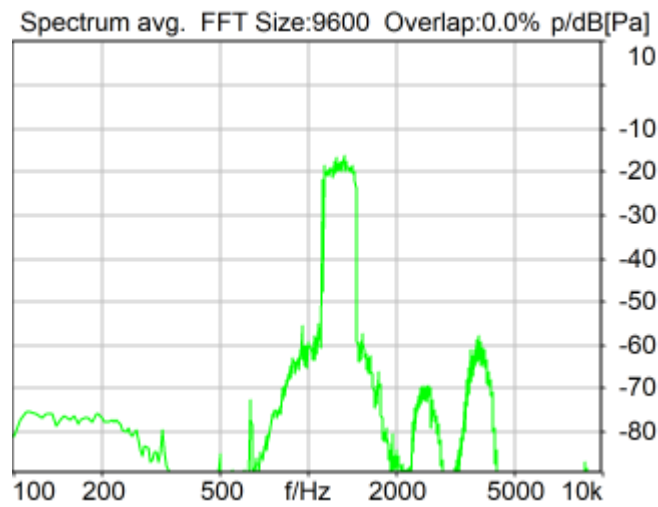
**Ok**

2023/11/13 6:40 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 33.71 dB (2.06%) Ok

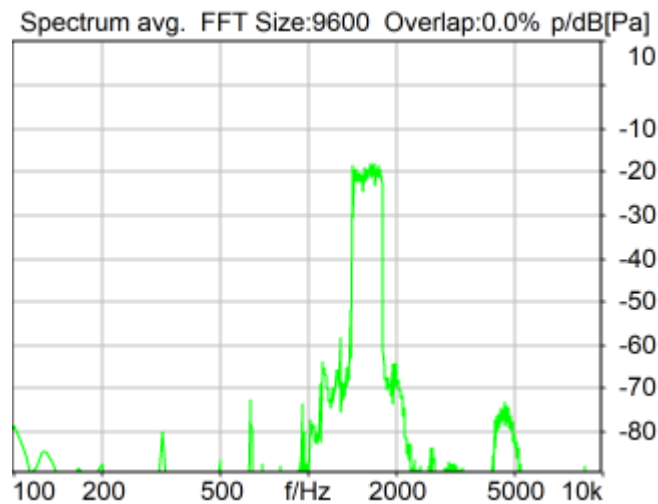
**Ok**

2023/11/13 6:40 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 44.59 dB (0.59%) Ok

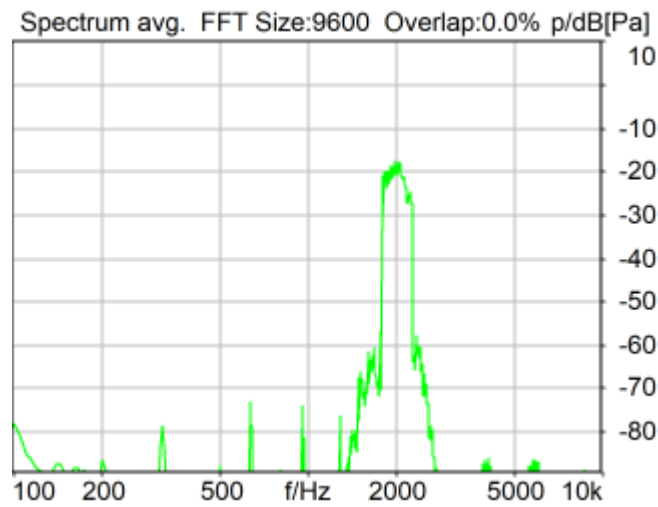
**Ok**

2023/11/13 6:41 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 42.15 dB (0.78%) Ok

**Ok**

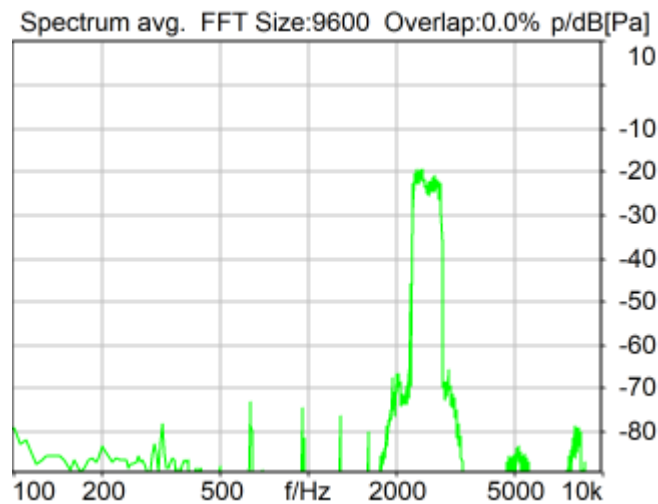
2023/11/13 6:41 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 46.21 dB (0.49%) Ok

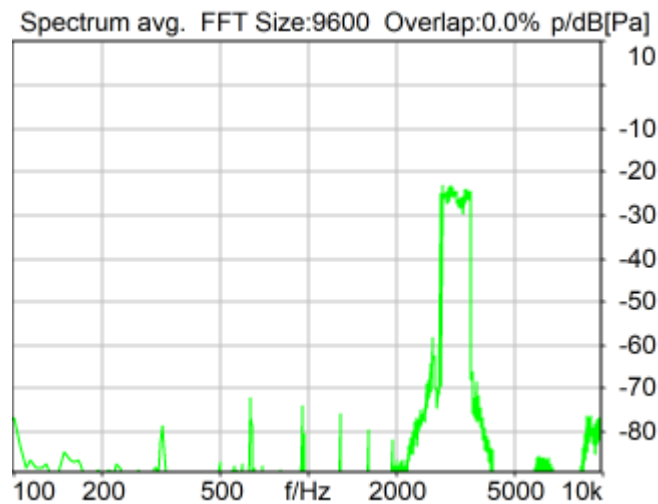
**Ok**

2023/11/13 6:41 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 41.53 dB (0.84%) Ok

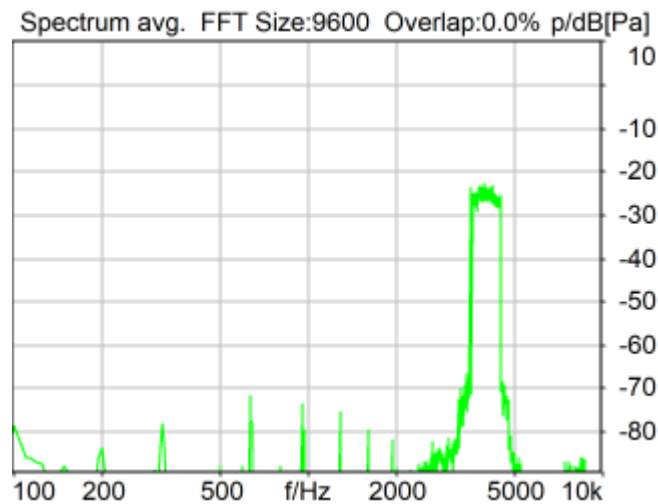
**Ok**

2023/11/13 6:42 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 45.81 dB (0.51%) Ok

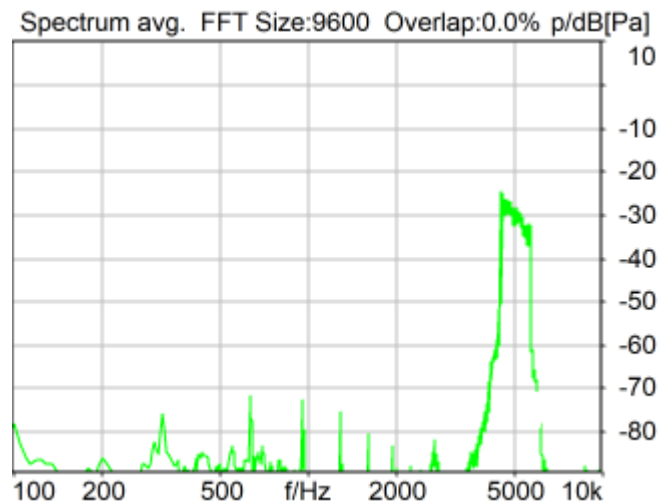
**Ok**

2023/11/13 6:42 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 34.72 dB (1.84%) Ok

**Ok**

2023/11/13 6:43 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 22.54 dB |
| 2      | 315Hz     | 23.60 dB |
| 3      | 400Hz     | 25.89 dB |
| 4      | 500Hz     | 28.22 dB |
| 5      | 630Hz     | 29.45 dB |
| 6      | 800Hz     | 28.15 dB |
| 7      | 1000Hz    | 31.52 dB |
| 8      | 1250Hz    | 33.71 dB |
| 9      | 1600Hz    | 44.59 dB |
| 10     | 2000Hz    | 42.15 dB |
| 11     | 2500Hz    | 46.21 dB |
| 12     | 3150Hz    | 41.53 dB |
| 13     | 4000Hz    | 45.81 dB |
| 14     | 5000Hz    | 34.72 dB |

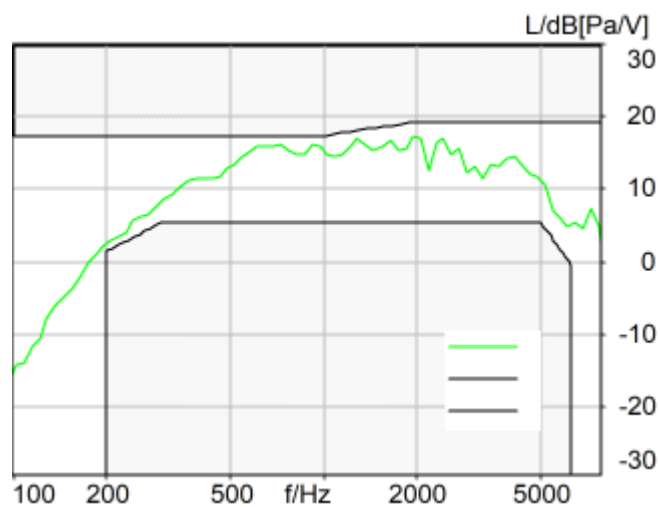
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 22.54dB at 250Hz.

2023/11/13 6:43 ACQUA

## 5.3 Frequency Response 2N FF

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



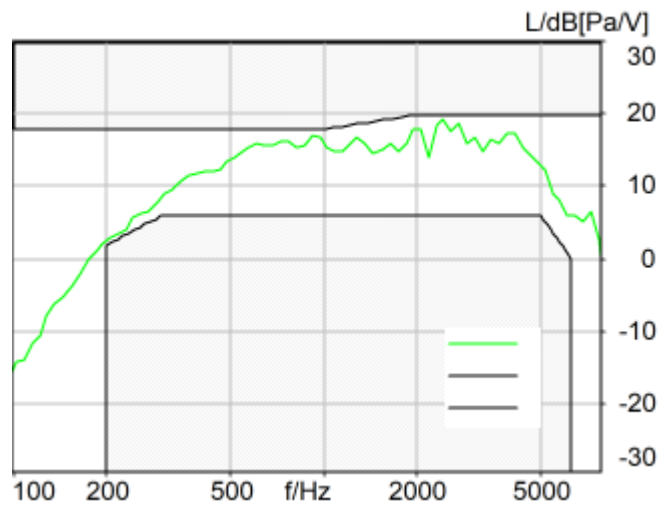
Absolute minimal distance  
1.10 dB at 217.7 Hz Ok

Ok

2023/11/13 6:43 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 2N DF

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



Absolute minimal distance  
0.62 dB at 2432.3 Hz Ok

Ok

2023/11/13 6:43 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                                    |
|--------------------|--------------------------------------------------------------------|
| Measurement Object | LTE Band 41 PC2_20M_QPSK_100RB_0Offset_EVS WB<br>64Kbps_Ch40620_8N |
|--------------------|--------------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 6:35              |
|                        |                              |



## Status Overview

| SMD                                           | Status | Single Value Description        | Single Value | Object                                                             |
|-----------------------------------------------|--------|---------------------------------|--------------|--------------------------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]              | 95.4         | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.1a Receive Volume Control Performance 8N WB | Ok     | Speech Level [dB[SPL]]          | 88.20        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 22.58        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 23.29        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 26.37        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 28.64        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.76        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB], 0.0 dB | 29.37        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 32.34        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 34.13        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 44.74        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 43.54        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.74        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 41.64        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 44.82        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB], 0.0 dB | 45.56        | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR                    | 22.58        | LTE Band 41                                                        |

| and Noise (Conversational Gain) |    | [dB], (occured at 250Hz)                       |      | PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N                |
|---------------------------------|----|------------------------------------------------|------|--------------------------------------------------------------------|
| 5.3 Frequency Response 8N FF    | Ok | Min. dist. to tolerance scheme [dB], 1285.9 Hz | 1.14 | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |
| 5.3 Frequency Response 8N DF    | Ok | Min. dist. to tolerance scheme [dB], 924.0 Hz  | 0.84 | LTE Band 41<br>PC2_20M_QPSK_100RB_0Offset_EVS WB 64Kbps_Ch40620_8N |

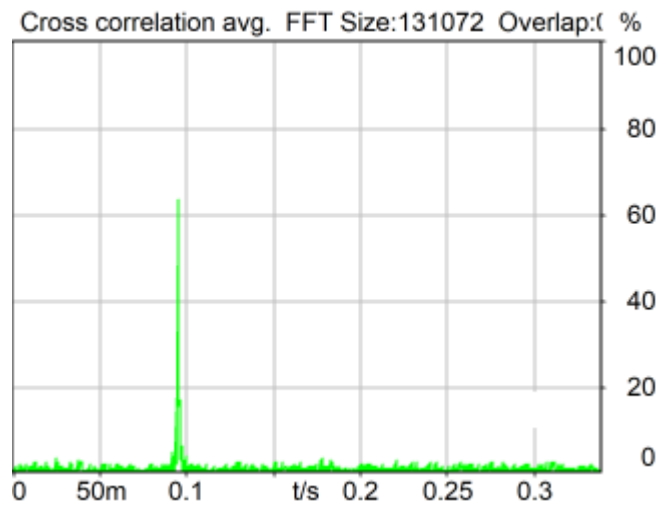
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1a Receive Volume Control Performance 8N 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 |
| 5.3 Frequency Response 8N FF                                | 23 |
| 5.3 Frequency Response 8N DF                                | 24 |



## Overall Receive Delay WB

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



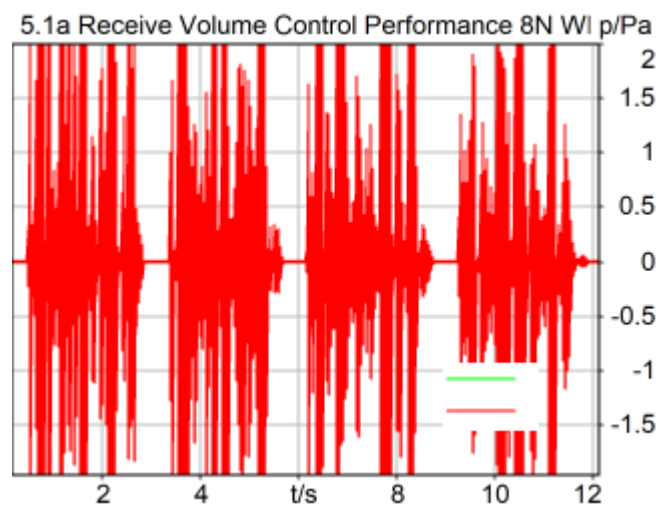
Delay (Cross): 95.4 ms

2023/11/13 6:17 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1a Receive Volume Control Performance 8N WB**

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



Speech Level RCV: 88.20 dB[SPL], Act.: 80.79% Ok

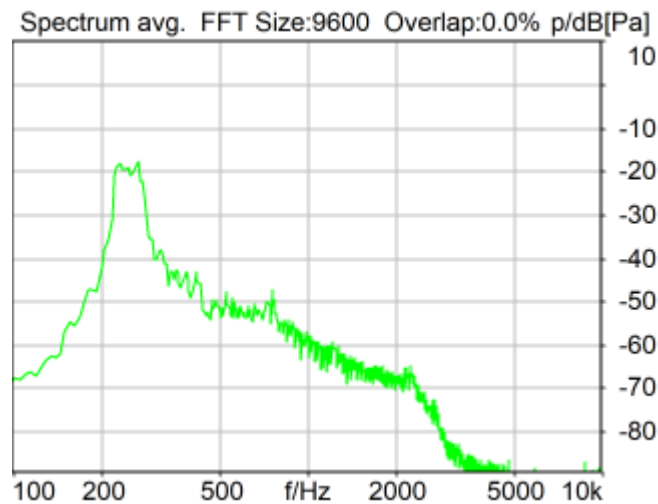
**Ok**

2023/11/13 6:18 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 22.58 dB (7.43%) Ok

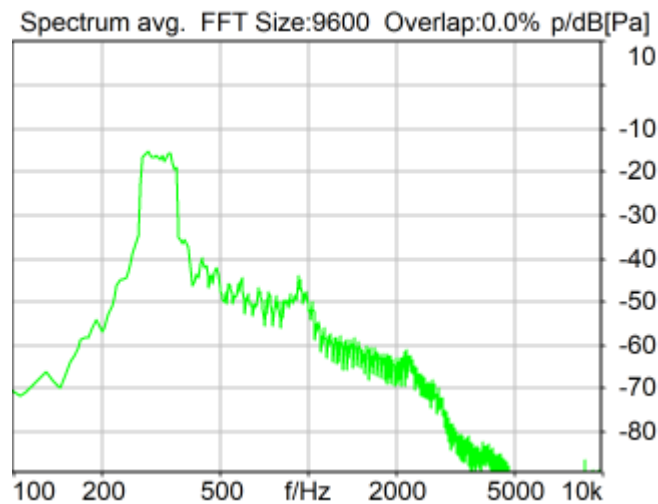
**Ok**

2023/11/13 6:18 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 23.29 dB (6.85%) Ok

**Ok**

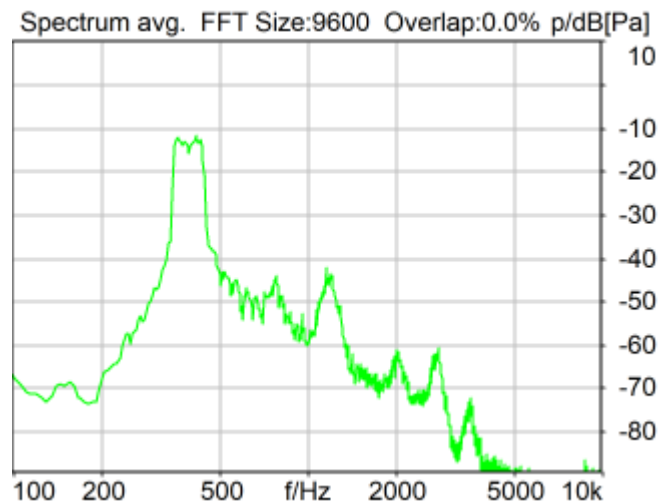
2023/11/13 6:18 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 26.37 dB (4.80%) Ok

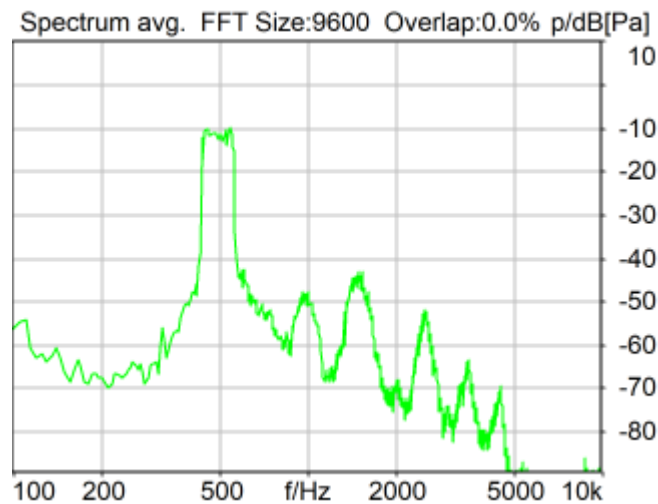
**Ok**

2023/11/13 6:19 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.64 dB (3.70%) Ok

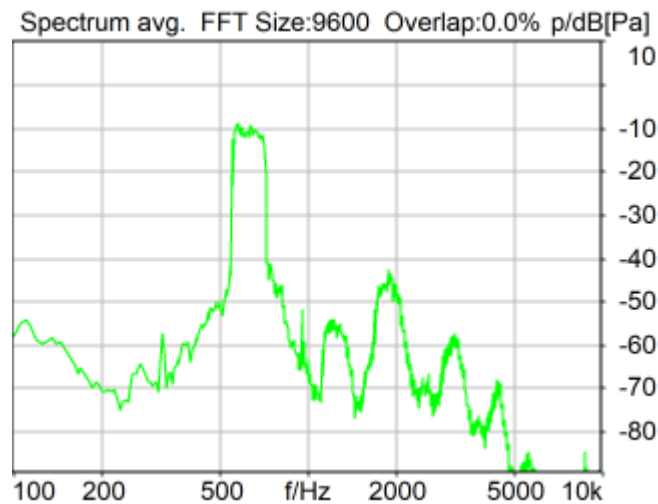
**Ok**

2023/11/13 6:19 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.76 dB (3.25%) Ok

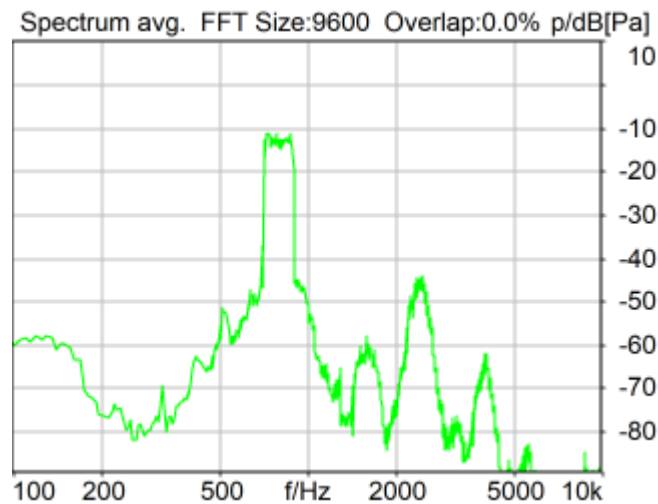
**Ok**

2023/11/13 6:20 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.37 dB (3.40%) Ok

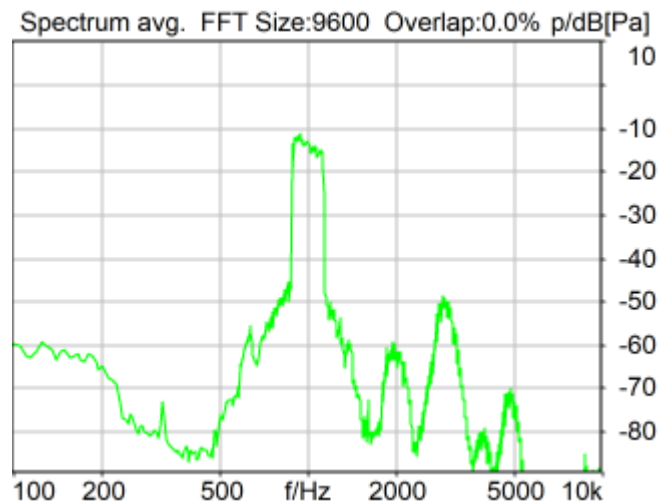
**Ok**

2023/11/13 6:20 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 32.34 dB (2.42%) Ok

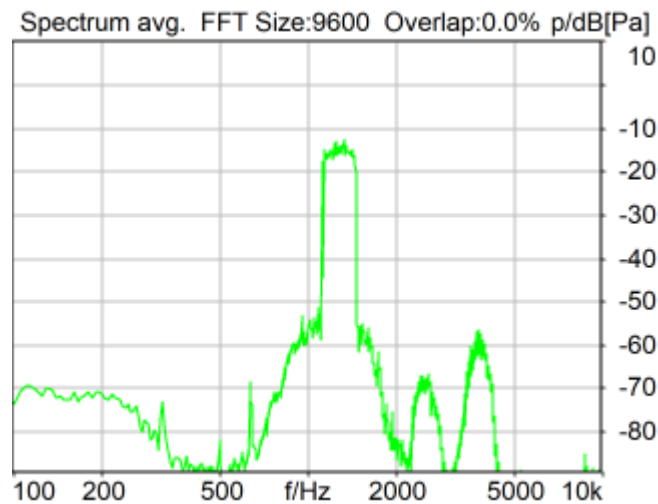
**Ok**

2023/11/13 6:20 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 34.13 dB (1.97%) Ok

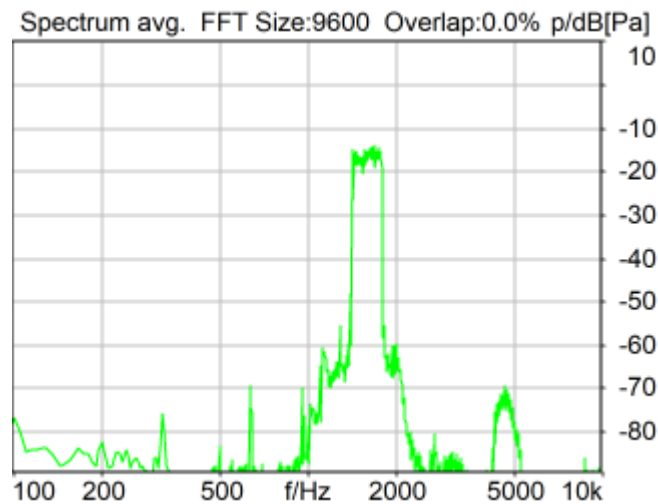
**Ok**

2023/11/13 6:21 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 44.74 dB (0.58%) Ok

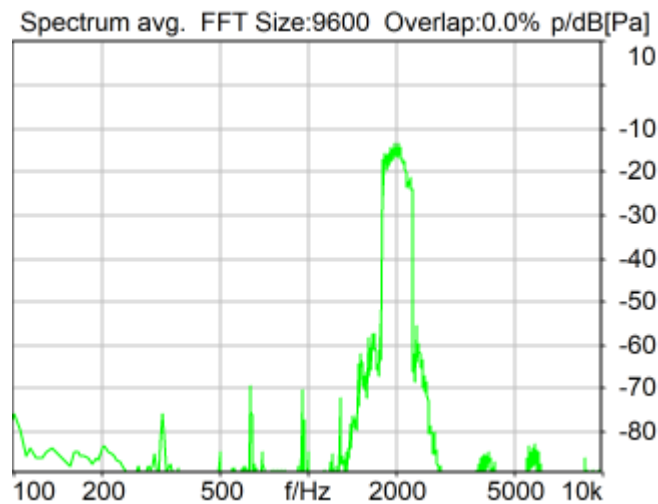
**Ok**

2023/11/13 6:21 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 43.54 dB (0.67%) Ok

**Ok**

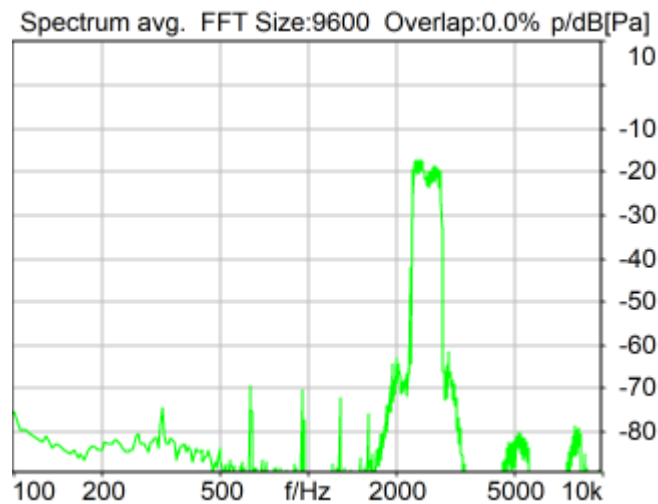
2023/11/13 6:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 45.74 dB (0.52%) Ok

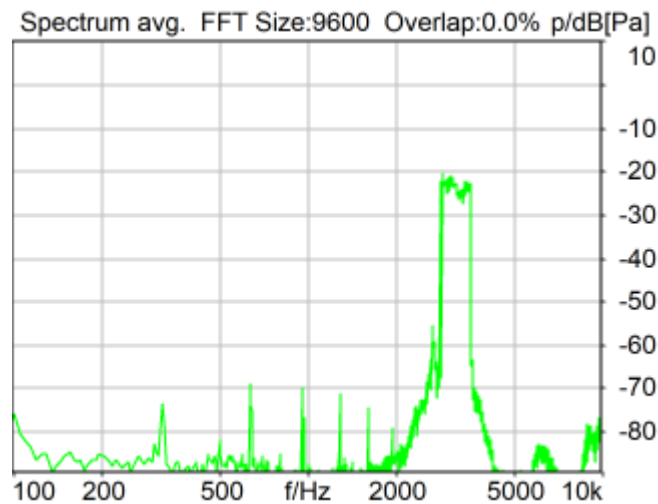
**Ok**

2023/11/13 6:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 41.64 dB (0.83%) Ok

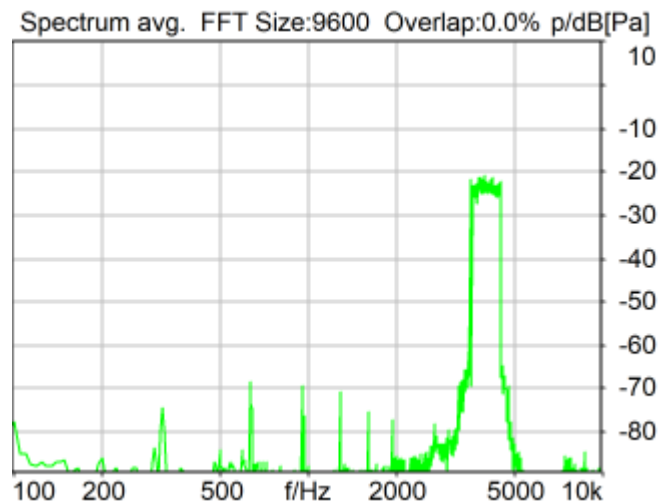
**Ok**

2023/11/13 6:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 44.82 dB (0.57%) Ok

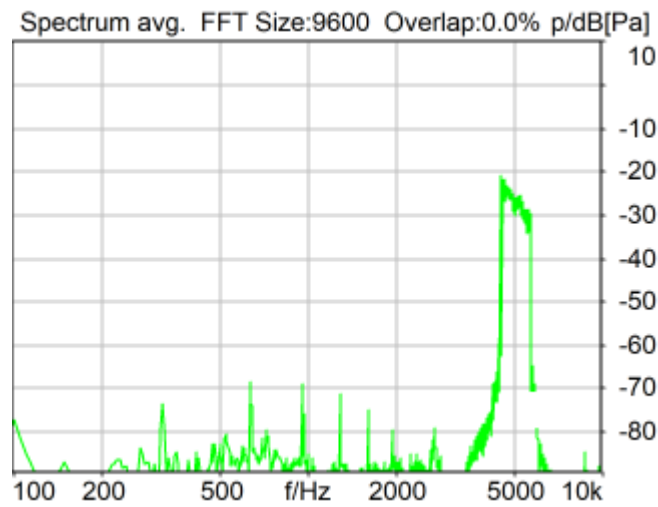
**Ok**

2023/11/13 6:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 45.56 dB (0.53%) Ok

**Ok**

2023/11/13 6:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 22.58 dB |
| 2      | 315Hz     | 23.29 dB |
| 3      | 400Hz     | 26.37 dB |
| 4      | 500Hz     | 28.64 dB |
| 5      | 630Hz     | 29.76 dB |
| 6      | 800Hz     | 29.37 dB |
| 7      | 1000Hz    | 32.34 dB |
| 8      | 1250Hz    | 34.13 dB |
| 9      | 1600Hz    | 44.74 dB |
| 10     | 2000Hz    | 43.54 dB |
| 11     | 2500Hz    | 45.74 dB |
| 12     | 3150Hz    | 41.64 dB |
| 13     | 4000Hz    | 44.82 dB |
| 14     | 5000Hz    | 45.56 dB |

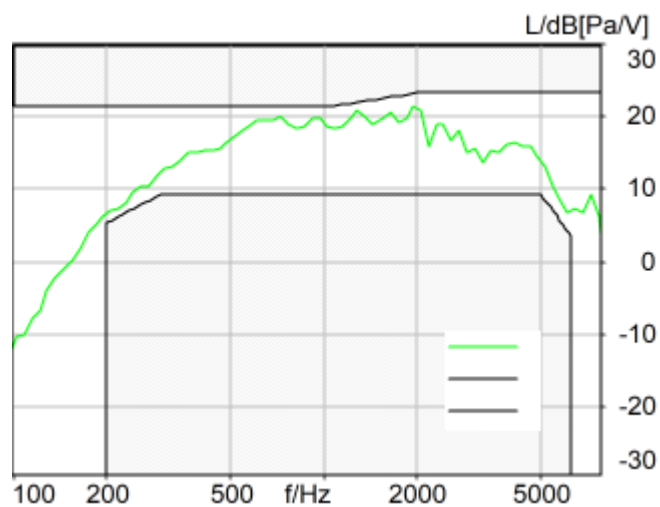
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 22.58dB at 250Hz.

2023/11/13 6:34 ACQUA

## 5.3 Frequency Response 8N FF

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



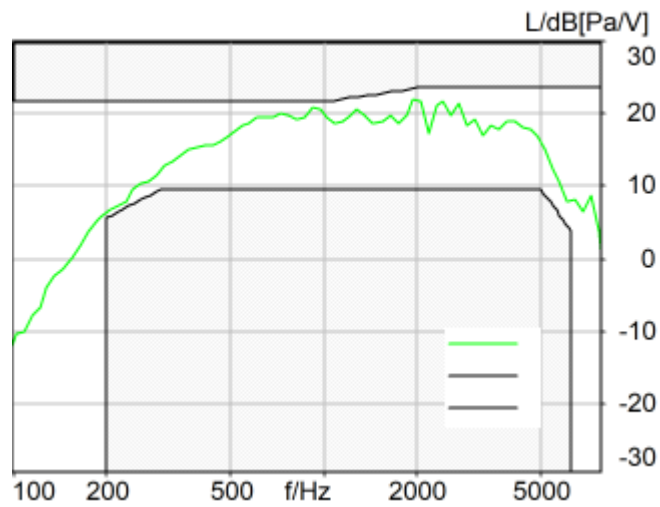
Absolute minimal distance  
1.14 dB at 1285.9 Hz Ok

Ok

2023/11/13 6:34 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 8N DF

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



Absolute minimal distance  
0.84 dB at 924.0 Hz Ok

Ok

2023/11/13 6:35 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                                      |
|--------------------|----------------------------------------------------------------------|
| Measurement Object | LTE Band 41-PC2_20M_QPSK_100RB_0Offset_EVS NB<br>24.4Kbps_Ch40620_2N |
|--------------------|----------------------------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/20 17:46             |
|                        |                              |



## Status Overview

| SMD                                           | Status | Single Value Description                       | Single Value | Object                                                                  |
|-----------------------------------------------|--------|------------------------------------------------|--------------|-------------------------------------------------------------------------|
| Overall Receive Delay NB                      | Done   | Delay (Cross) [ms]                             | 120.1        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.1b Receive Volume Control Performance 2N NB | Ok     | Speech Level [dB[SPL]]                         | 86.14        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 400 Hz NB      | Ok     | Distortion (Noise) [dB], 0.0 dB                | 24.71        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 500 Hz NB      | Ok     | Distortion (Noise) [dB], 0.0 dB                | 26.42        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 630 Hz NB      | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.42        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 800 Hz NB      | Ok     | Distortion (Noise) [dB], 0.0 dB                | 25.50        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 1000 Hz NB     | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.02        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 1250 Hz NB     | Ok     | Distortion (Noise) [dB], 0.0 dB                | 29.55        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 1600 Hz NB     | Ok     | Distortion (Noise) [dB], 0.0 dB                | 36.66        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 2000 Hz NB     | Ok     | Distortion (Noise) [dB], 0.0 dB                | 39.08        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 2500 Hz NB     | Ok     | Distortion (Noise) [dB], 0.0 dB                | 40.33        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.2 RCV Distortion and Noise - 3150 Hz NB     | Ok     | Distortion (Noise) [dB], 0.0 dB                | 37.77        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.3 Frequency Response 2N FF HANB             | Ok     | Min. dist. to tolerance scheme [dB], 1447.5 Hz | 0.13         | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |
| 5.3 Frequency Response 2N DF HANB             | Not Ok | Min. dist. to tolerance scheme [dB], 2177.4 Hz | -0.42        | LTE Band<br>41-PC2_20M_QPSK_100RB_0Offset<br>EVS NB 24.4Kbps_Ch40620_2N |

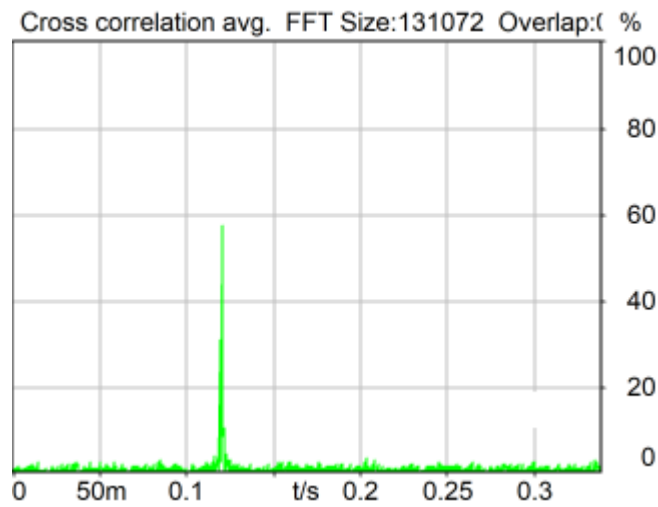
---

|                                               |    |
|-----------------------------------------------|----|
| Overall Receive Delay 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 |
| 5.3 Frequency Response 2N FF HANB             | 17 |
| 5.3 Frequency Response 2N DF HANB             | 18 |



## Overall Receive Delay NB

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



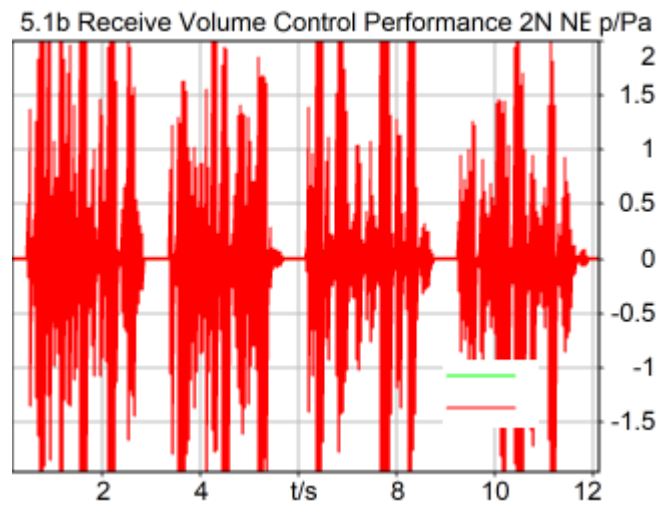
Delay (Cross): 120.1 ms

2023/11/10 14:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1b Receive Volume Control Performance 2N NB**

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



Speech Level RCV: 86.14 dB[SPL], Act.: 82.25% Ok

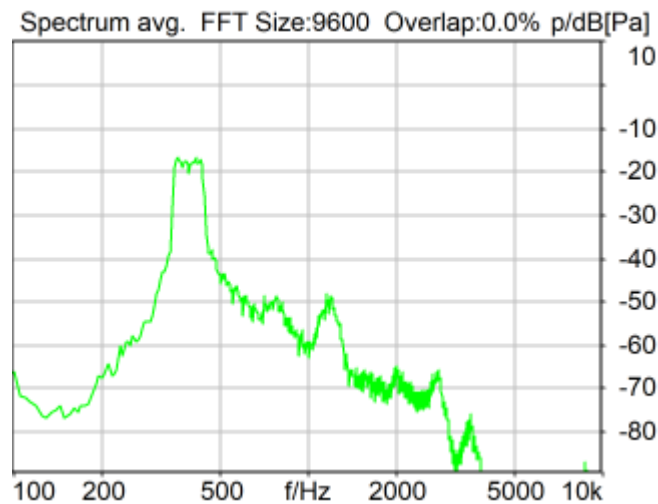
**Ok**

2023/11/10 14:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 24.71 dB (5.81%) Ok

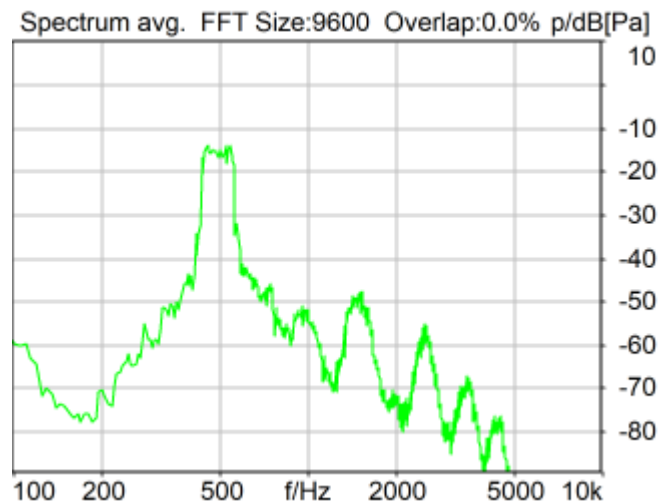
**Ok**

2023/11/10 14:22 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.42 dB (4.78%) Ok

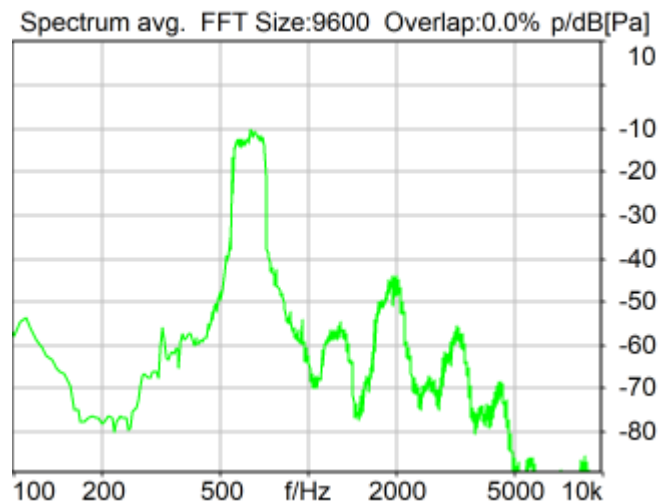
**Ok**

2023/11/10 14:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.42 dB (3.79%) Ok

**Ok**

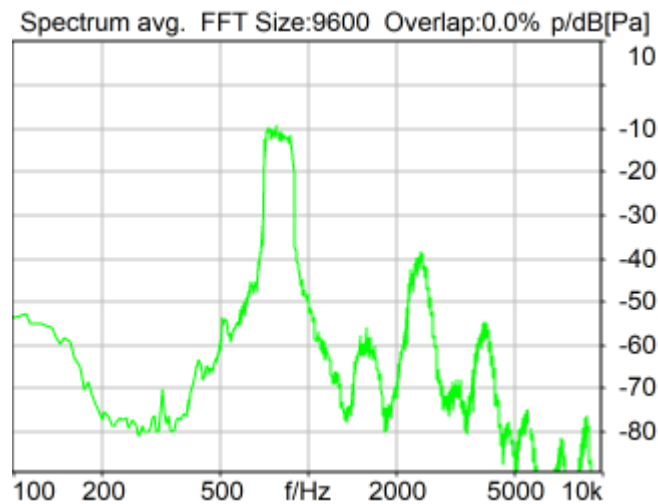
2023/11/10 14:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 25.50 dB (5.31%) Ok

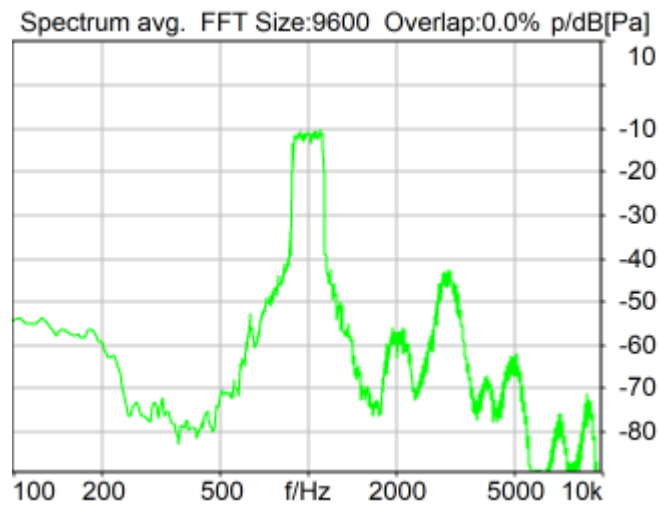
**Ok**

2023/11/10 14:23 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.02 dB (3.97%) Ok

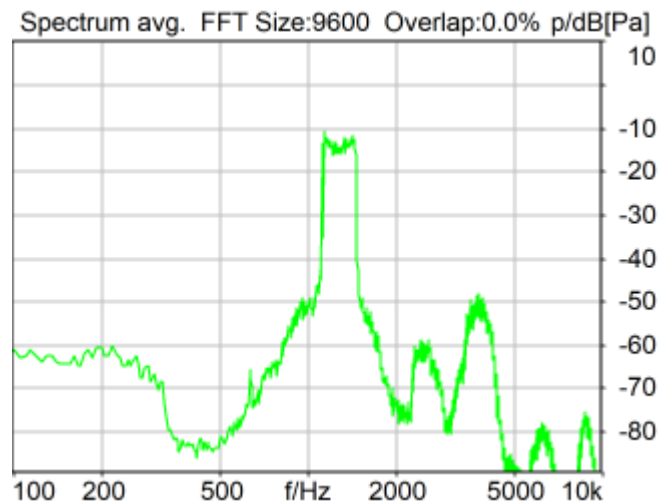
**Ok**

2023/11/10 14:24 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.55 dB (3.33%) Ok

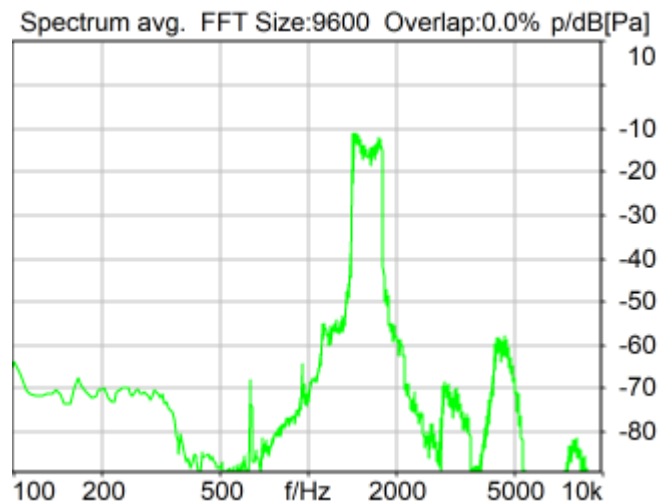
**Ok**

2023/11/10 14:24 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 36.66 dB (1.47%) Ok

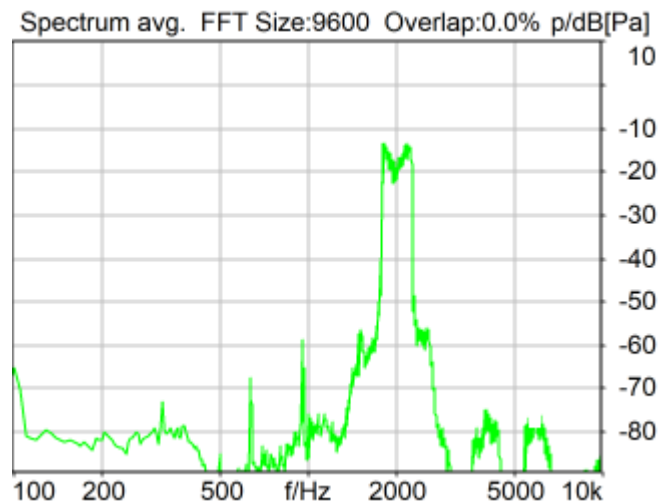
**Ok**

2023/11/10 14:25 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 39.08 dB (1.11%) Ok

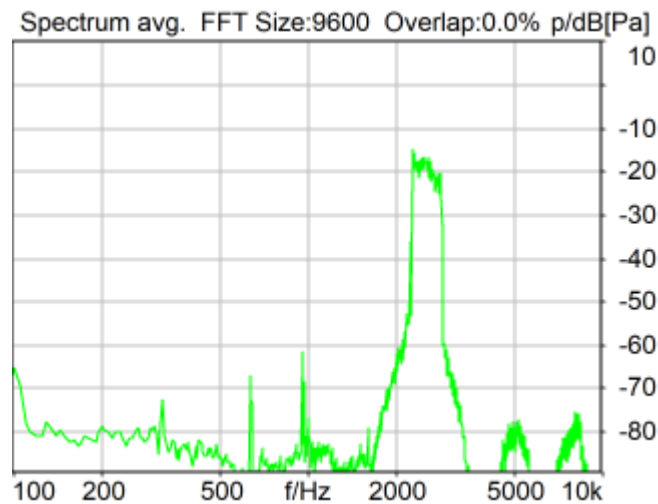
**Ok**

2023/11/10 14:25 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 40.33 dB (0.96%) Ok

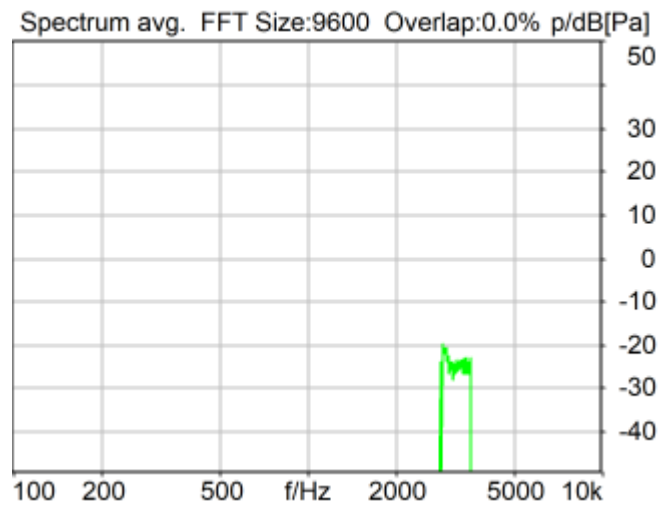
**Ok**

2023/11/10 14:26 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 37.77 dB (1.29%) Ok

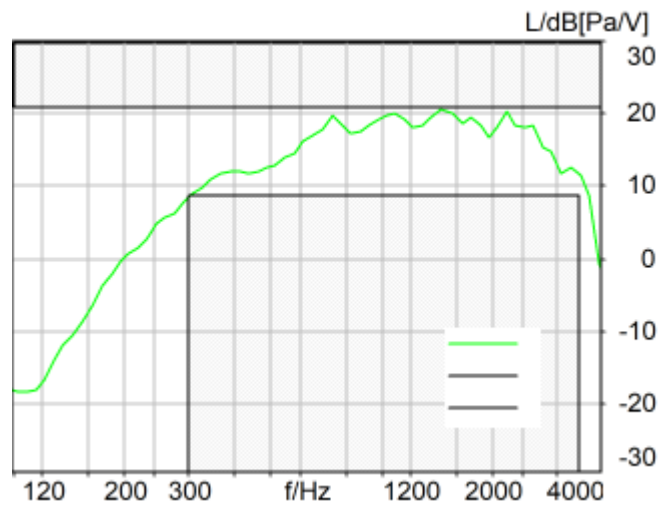
**Ok**

2023/11/10 14:26 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 2N FF HANB

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



Absolute minimal distance  
0.13 dB at 1447.5 Hz Ok

**Ok**

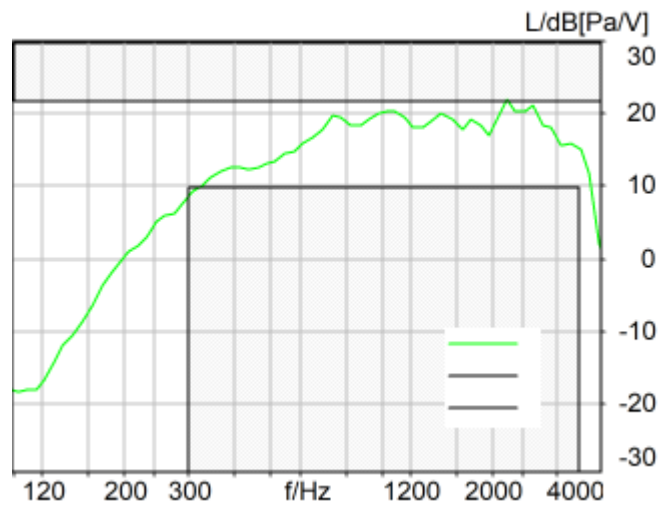
2023/11/10 14:26 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## 5.3 Frequency Response 2N DF HANB

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



Absolute minimal distance  
-0.42 dB at 2177.4 Hz Not Ok

**Not Ok**

2023/11/10 14:27 ACQUA 5.1.200  
Unmodified HEAD acoustics Measurement Descriptor

---

## **Measurement Protocol**

|                    |                                                   |
|--------------------|---------------------------------------------------|
| Measurement Object | WLAN2.4G_Voice_11b 1Mbps_EVS NB 24.4kbps_Ch6_2N-1 |
|--------------------|---------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 11:15             |
|                        |                              |

## Status Overview

| SMD                                                         | Status | Single Value Description                       | Single Value | Object                                                  |
|-------------------------------------------------------------|--------|------------------------------------------------|--------------|---------------------------------------------------------|
| Overall Receive Delay NB                                    | Done   | Delay (Cross) [ms]                             | 118.1        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.1b Receive Volume Control Performance 2N NB               | Ok     | Speech Level [dB[SPL]]                         | 86.31        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 400 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 25.84        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 500 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 23.87        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 630 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 29.37        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 800 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 24.95        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 1000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.48        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 1250 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.26        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 1600 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 38.11        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 2000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 38.53        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 2500 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 40.82        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.2 RCV Distortion and Noise - 3150 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 37.96        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| Report - Receive Distortion and Noise (Conversational Gain) | Ok     | Minimum SDNR [dB], (occured at 500Hz)          | 23.87        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.3 Frequency Response 2N FF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 1447.5 Hz | 0.34         | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |
| 5.3 Frequency Response 2N DF HANB                           | Not Ok | Min. dist. to tolerance scheme [dB], 2177.4 Hz | -0.05        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_2N-1 |

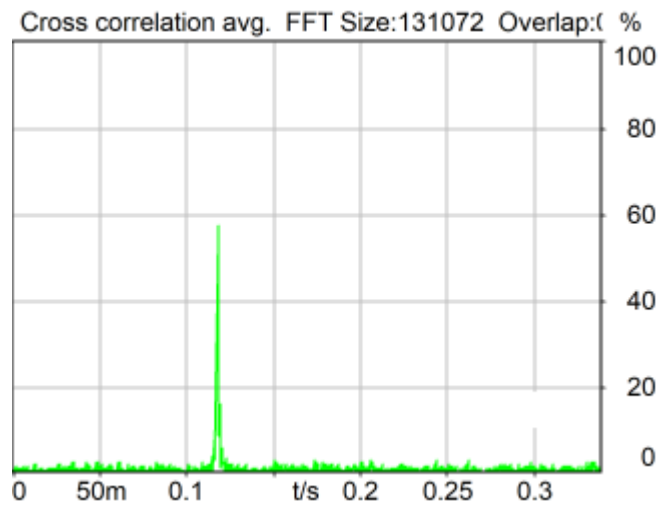
---

|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay 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 |
| 5.3 Frequency Response 2N FF HANB                           | 18 |
| 5.3 Frequency Response 2N DF HANB                           | 19 |



## Overall Receive Delay NB

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



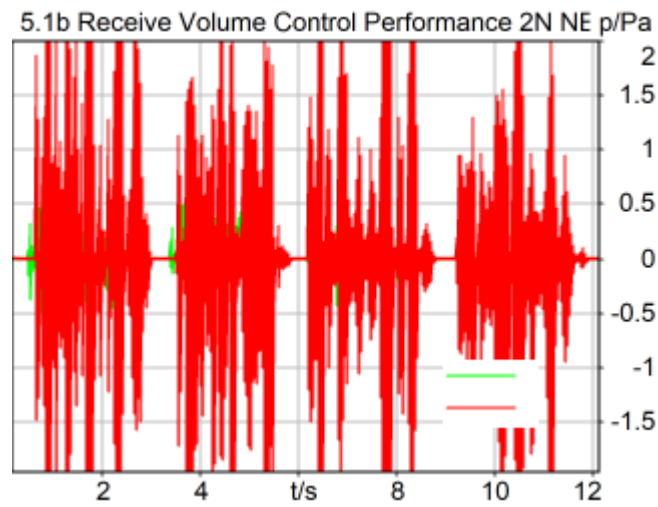
Delay (Cross): 118.1 ms

2023/11/13 11:08 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1b Receive Volume Control Performance 2N NB**

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



Speech Level RCV: 86.31 dB[SPL], Act.: 80.97% Ok

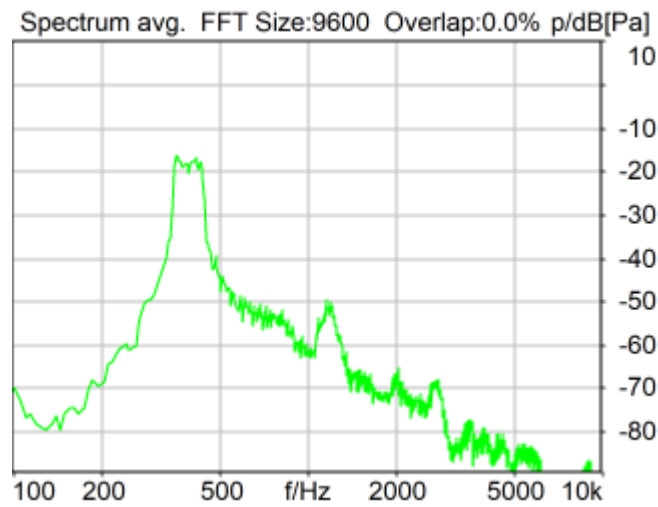
**Ok**

2023/11/13 11:09 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 25.84 dB (5.11%) Ok

**Ok**

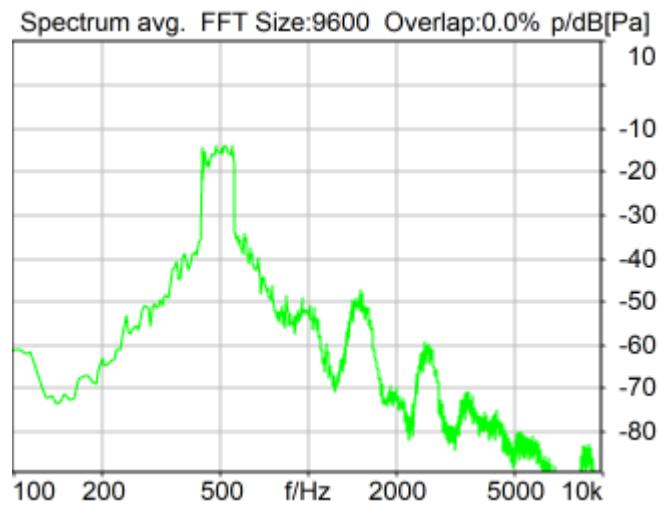
2023/11/13 11:09 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 23.87 dB (6.41%) Ok

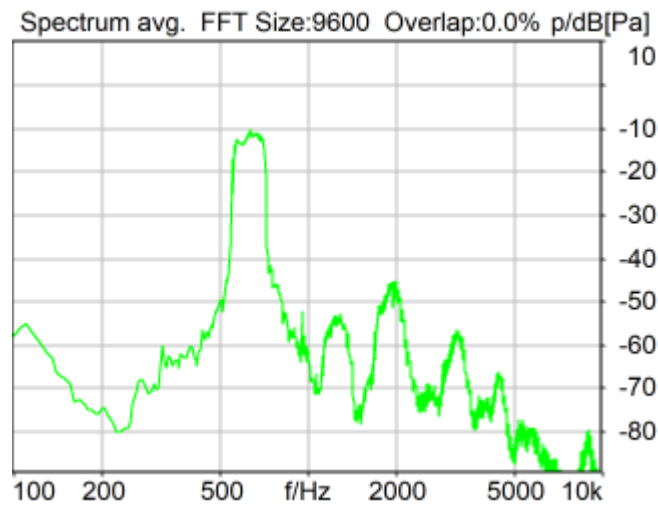
**Ok**

2023/11/13 11:10 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.37 dB (3.40%) Ok

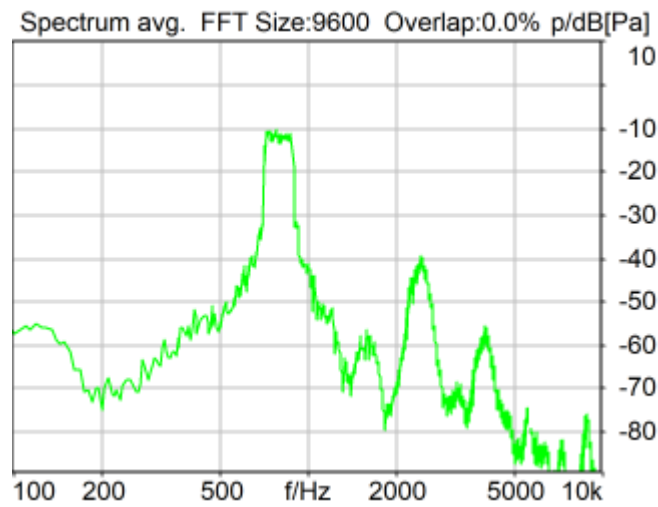
**Ok**

2023/11/13 11:10 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 24.95 dB (5.65%) Ok

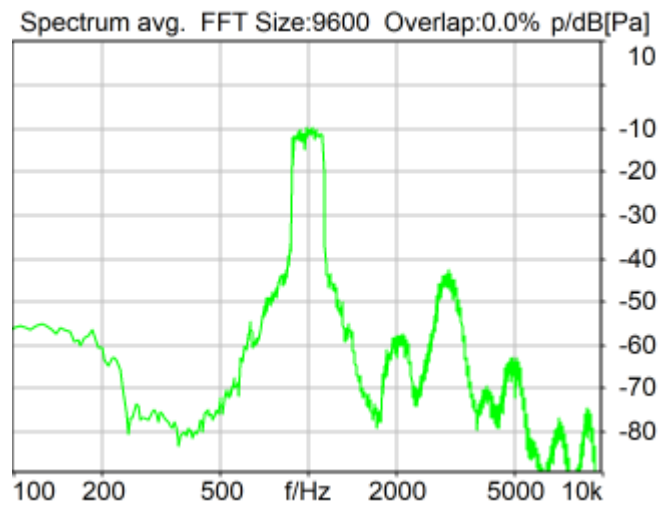
**Ok**

2023/11/13 11:10 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.48 dB (3.77%) Ok

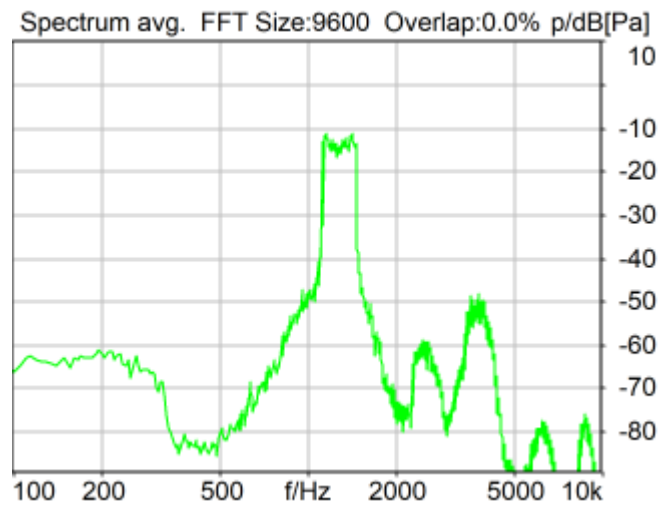
**Ok**

2023/11/13 11:11 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.26 dB (3.87%) Ok

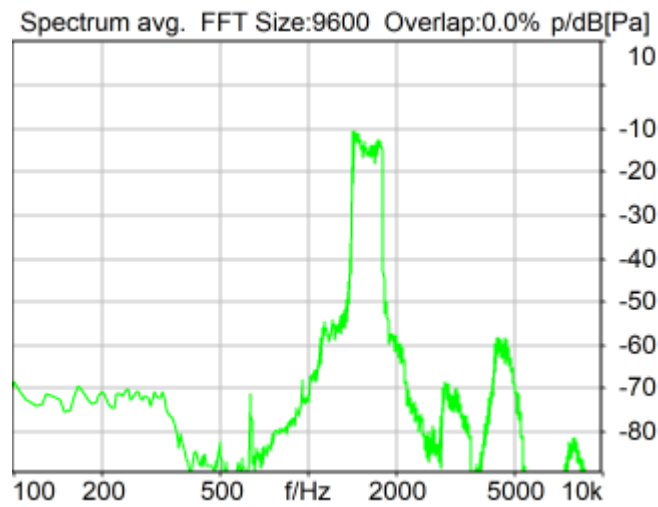
**Ok**

2023/11/13 11:11 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.11 dB (1.24%) Ok

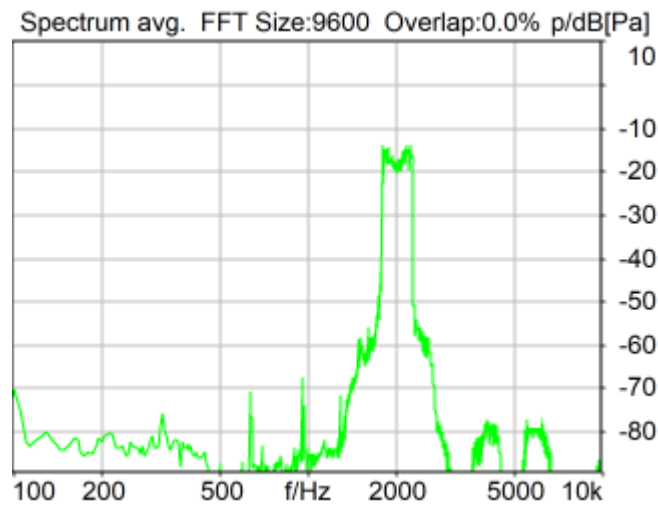
**Ok**

2023/11/13 11:12 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.53 dB (1.18%) Ok

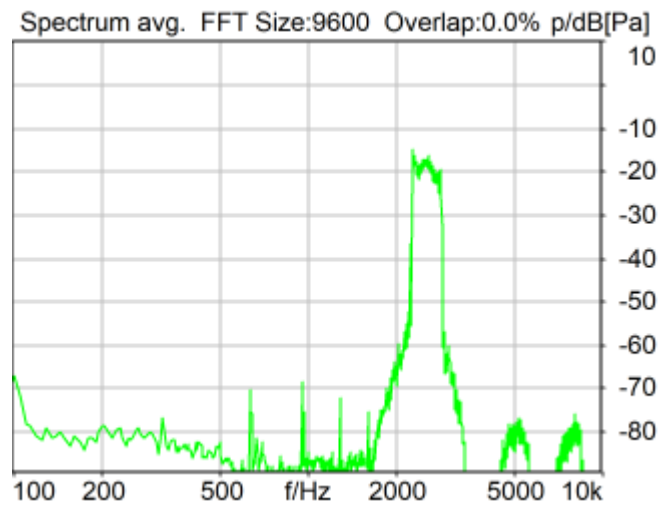
**Ok**

2023/11/13 11:12 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 40.82 dB (0.91%) Ok

**Ok**

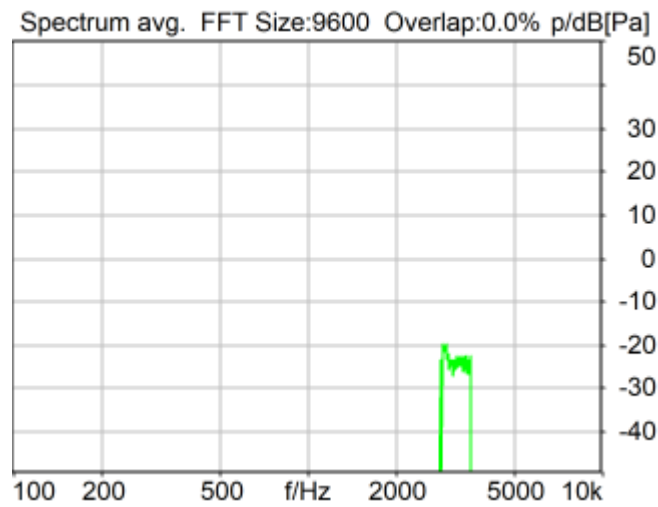
2023/11/13 11:12 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 37.96 dB (1.27%) Ok

**Ok**

2023/11/13 11:13 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

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## **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     | 25.84 dB |
| 2      | 500Hz     | 23.87 dB |
| 3      | 630Hz     | 29.37 dB |
| 4      | 800Hz     | 24.95 dB |
| 5      | 1000Hz    | 28.48 dB |
| 6      | 1250Hz    | 28.26 dB |
| 7      | 1600Hz    | 38.11 dB |
| 8      | 2000Hz    | 38.53 dB |
| 9      | 2500Hz    | 40.82 dB |
| 10     | 3150Hz    | 37.96 dB |

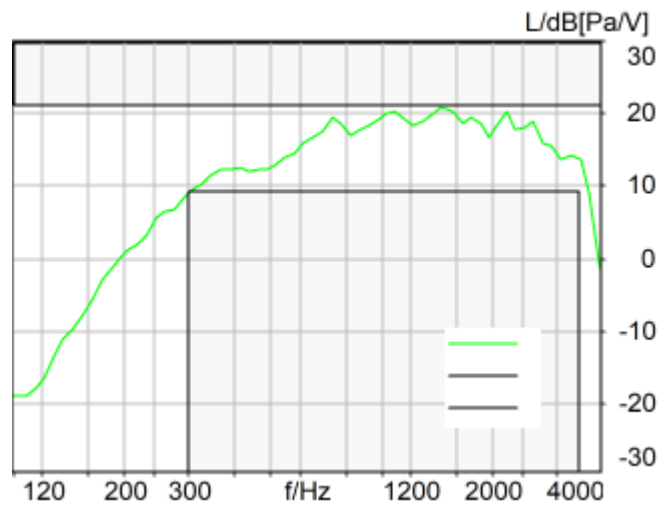
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 23.87dB at 500Hz.

2023/11/13 11:13 ACQUA

## 5.3 Frequency Response 2N FF HANB

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



Absolute minimal distance  
0.34 dB at 1447.5 Hz Ok

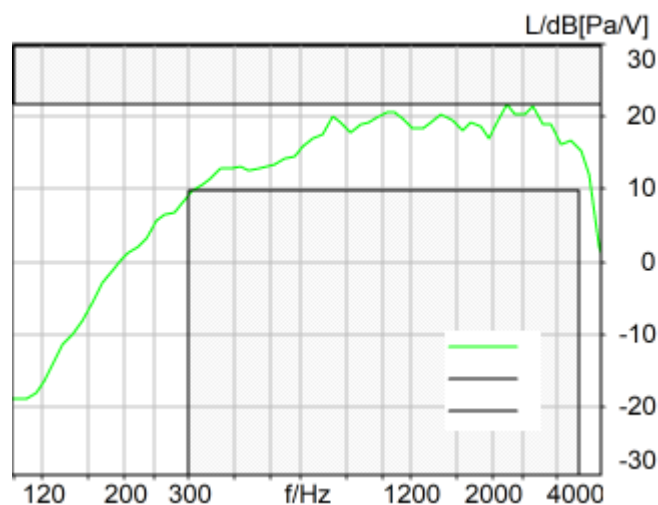
Ok

2023/11/13 11:13 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 2N DF HANB

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



Absolute minimal distance  
-0.05 dB at 2177.4 Hz Not Ok

**Not Ok**

2023/11/13 11:13 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                                   |
|--------------------|---------------------------------------------------|
| Measurement Object | WLAN2.4G_Voice_11b 1Mbps_EVS NB 24.4kbps_Ch6_8N-1 |
|--------------------|---------------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 14:48             |
|                        |                              |

## Status Overview

| SMD                                                         | Status | Single Value Description                       | Single Value | Object                                                  |
|-------------------------------------------------------------|--------|------------------------------------------------|--------------|---------------------------------------------------------|
| Overall Receive Delay NB                                    | Done   | Delay (Cross) [ms]                             | 157.8        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.1a Receive Volume Control Performance 8N NB               | Ok     | Speech Level [dB[SPL]]                         | 90.41        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 400 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 25.10        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 500 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.60        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 630 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 28.90        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 800 Hz NB                    | Ok     | Distortion (Noise) [dB], 0.0 dB                | 27.22        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 1000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 29.19        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 1250 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 30.47        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 1600 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 39.23        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 2000 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 37.01        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 2500 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 34.77        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.2 RCV Distortion and Noise - 3150 Hz NB                   | Ok     | Distortion (Noise) [dB], 0.0 dB                | 38.30        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| Report - Receive Distortion and Noise (Conversational Gain) | Ok     | Minimum SDNR [dB], (occured at 400Hz)          | 25.10        | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.3 Frequency Response 8N FF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 1447.5 Hz | 0.21         | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |
| 5.3 Frequency Response 8N DF HANB                           | Ok     | Min. dist. to tolerance scheme [dB], 2177.4 Hz | 0.00         | WLAN2.4G_Voice_11b<br>1Mbps_EVS NB<br>24.4kbps_Ch6_8N-1 |

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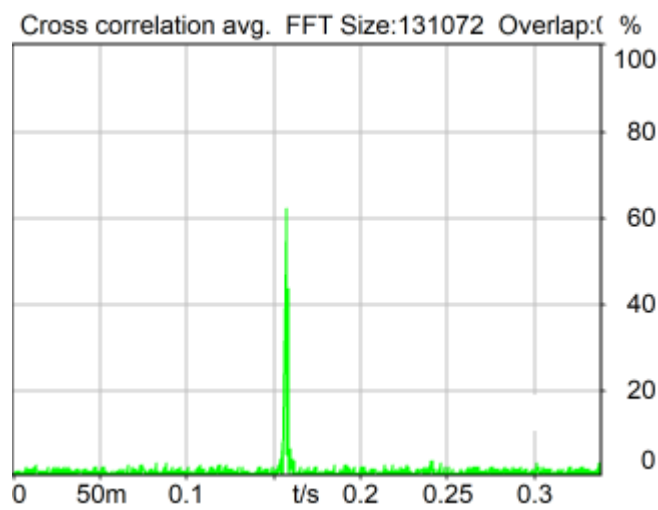
|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay NB                                    | 5  |
| 5.1a Receive Volume Control Performance 8N NB               | 6  |
| 5.2 RCV Distortion and 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 |
| 5.3 Frequency Response 8N FF HANB                           | 18 |
| 5.3 Frequency Response 8N DF HANB                           | 19 |





## Overall Receive Delay NB

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



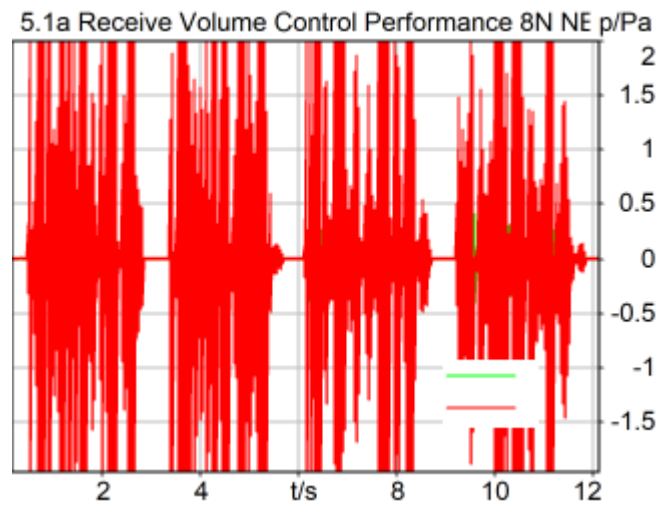
Delay (Cross): 157.8 ms

2023/11/13 14:28 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1a Receive Volume Control Performance 8N NB**

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



Speech Level RCV: 90.41 dB[SPL], Act.: 82.42% Ok

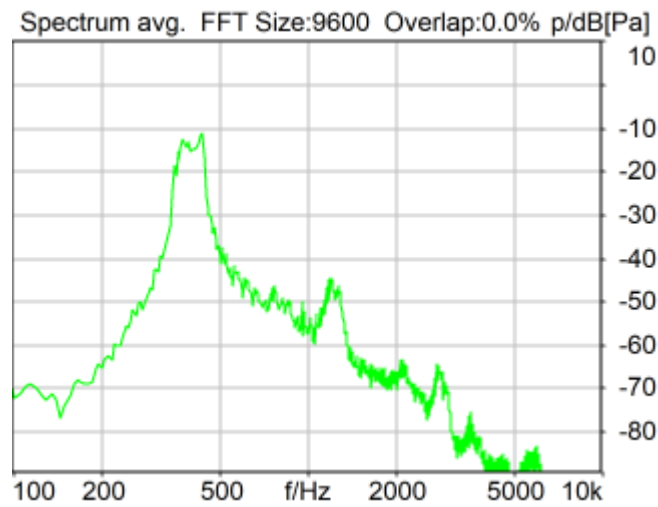
**Ok**

2023/11/13 14:28 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 25.10 dB (5.56%) Ok

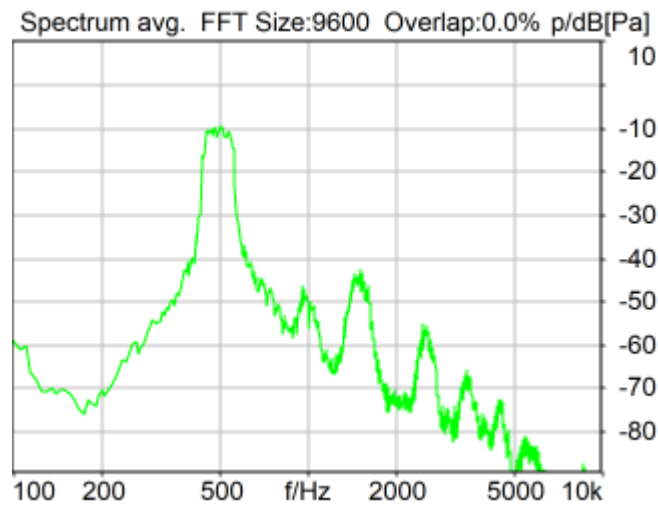
**Ok**

2023/11/13 14:29 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.60 dB (4.17%) Ok

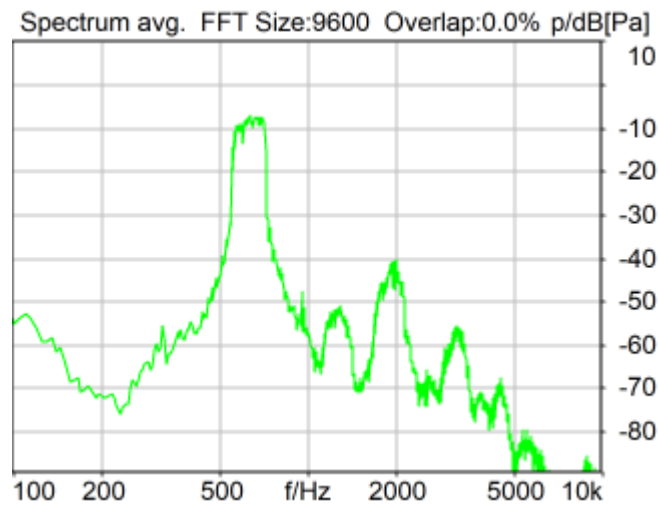
**Ok**

2023/11/13 14:29 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.90 dB (3.59%) Ok

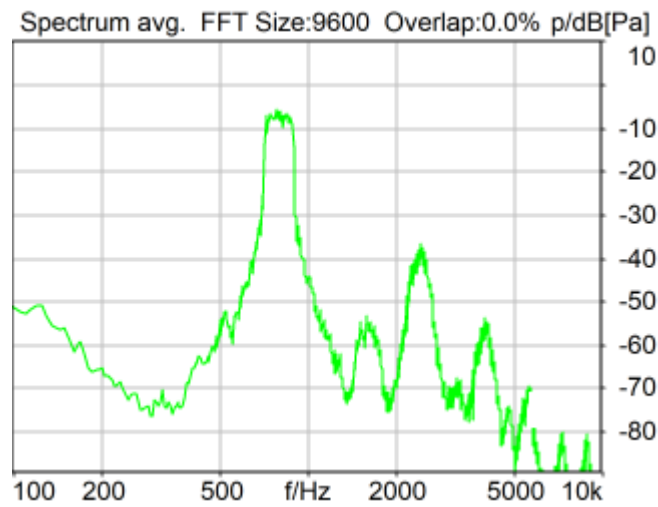
**Ok**

2023/11/13 14:30 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 27.22 dB (4.35%) Ok

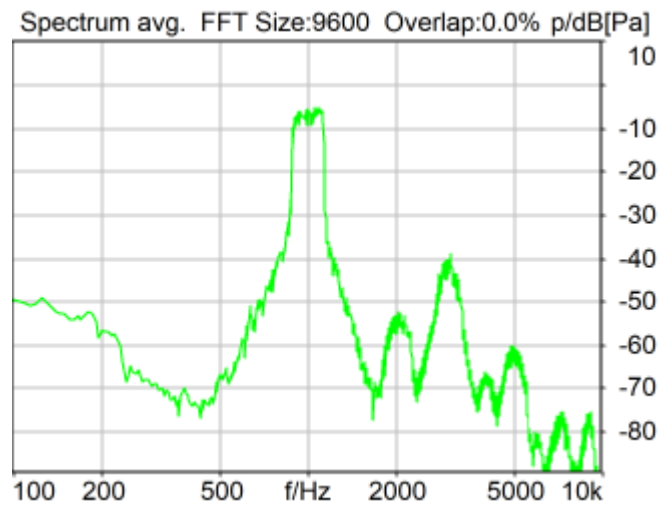
**Ok**

2023/11/13 14:30 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.19 dB (3.47%) Ok

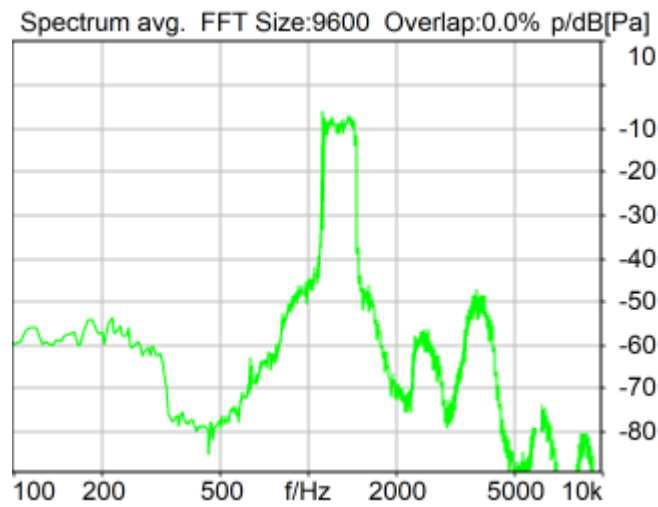
**Ok**

2023/11/13 14:30 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 30.47 dB (3.00%) Ok

**Ok**

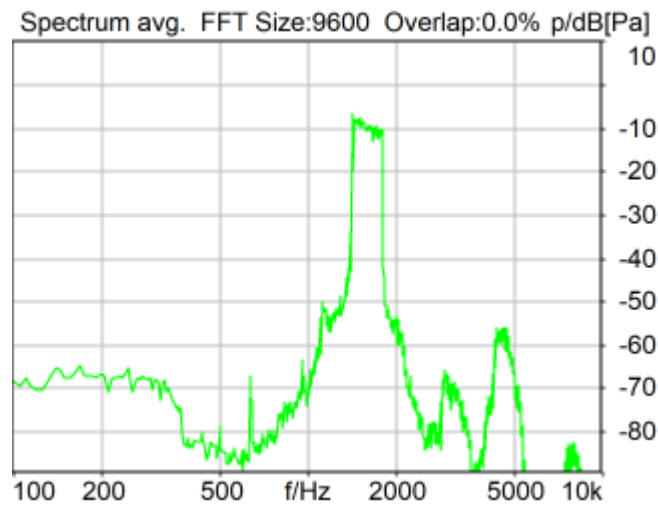
2023/11/13 14:31 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 39.23 dB (1.09%) Ok

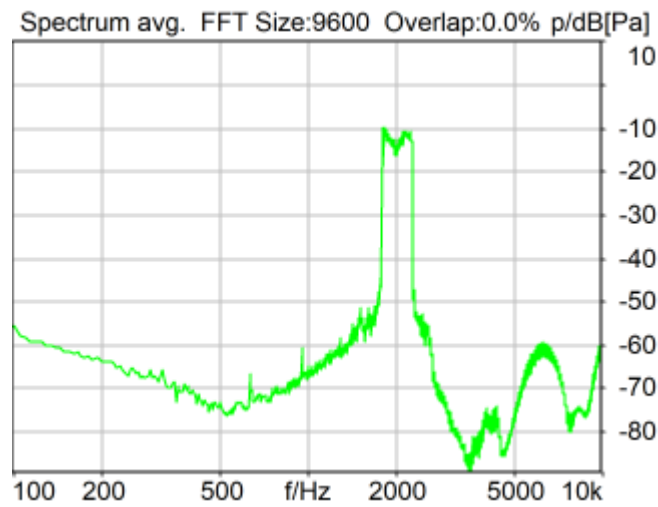
**Ok**

2023/11/13 14:31 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 37.01 dB (1.41%) Ok

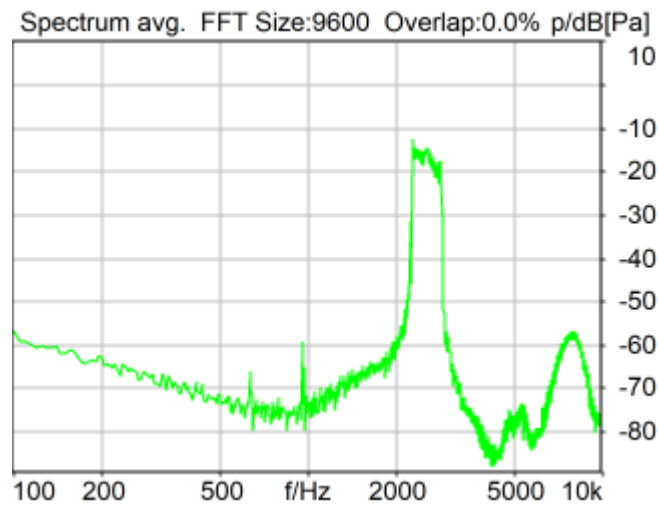
**Ok**

2023/11/13 14:32 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 34.77 dB (1.83%) Ok

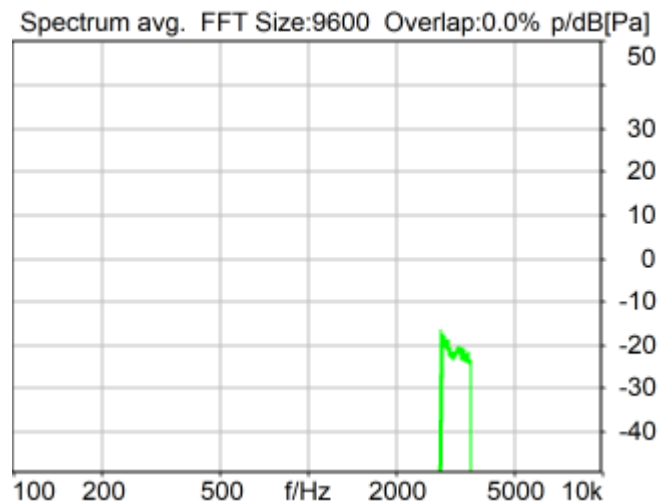
**Ok**

2023/11/13 14:32 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.30 dB (1.22%) Ok

**Ok**

2023/11/13 14:32 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

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## **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     | 25.10 dB |
| 2      | 500Hz     | 27.60 dB |
| 3      | 630Hz     | 28.90 dB |
| 4      | 800Hz     | 27.22 dB |
| 5      | 1000Hz    | 29.19 dB |
| 6      | 1250Hz    | 30.47 dB |
| 7      | 1600Hz    | 39.23 dB |
| 8      | 2000Hz    | 37.01 dB |
| 9      | 2500Hz    | 34.77 dB |
| 10     | 3150Hz    | 38.30 dB |

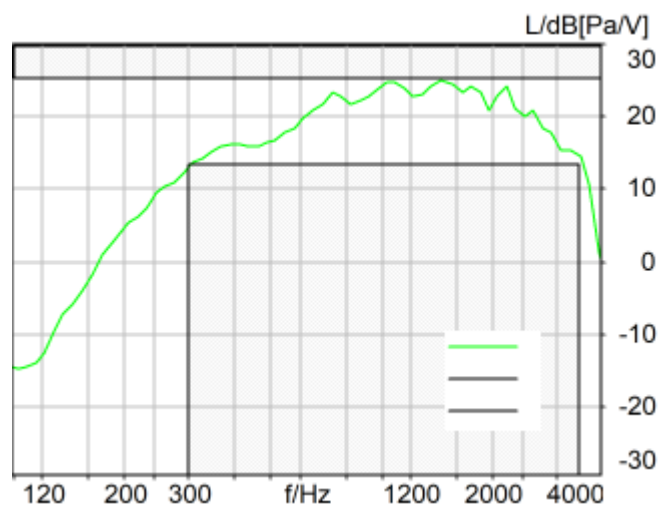
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 25.10dB at 400Hz.

2023/11/13 14:47 ACQUA

## 5.3 Frequency Response 8N FF HANB

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



Absolute minimal distance  
0.21 dB at 1447.5 Hz Ok

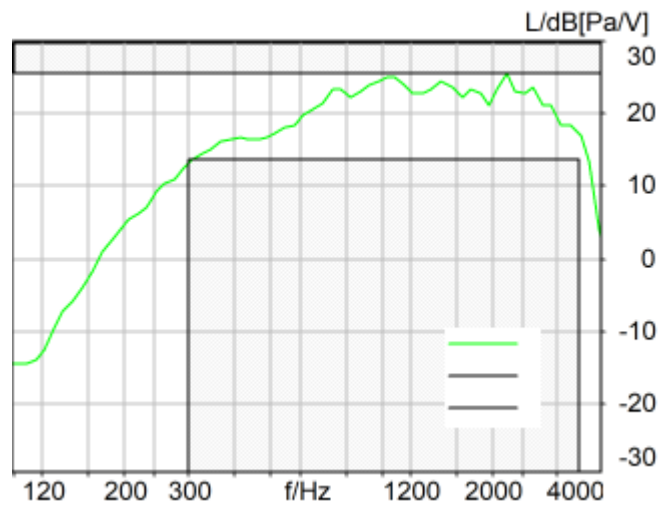
Ok

2023/11/13 14:47 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 8N DF HANB

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



Absolute minimal distance  
0.00 dB at 2177.4 Hz Ok

**Ok**

2023/11/13 14:48 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

---

## **Measurement Protocol**

|                    |                                               |
|--------------------|-----------------------------------------------|
| Measurement Object | WLAN2.4G_Voice_11b 1Mbps_EVS WB 64kbps_Ch6_2N |
|--------------------|-----------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 15:04             |
|                        |                              |



## Status Overview

| SMD                                           | Status | Single Value Description           | Single Value | Object                                              |
|-----------------------------------------------|--------|------------------------------------|--------------|-----------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]                 | 117.5        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.1b Receive Volume Control Performance 2N WB | Ok     | Speech Level [dB[SPL]]             | 84.66        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 22.89        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 25.45        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 27.68        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 29.10        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 30.13        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 28.78        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 31.97        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 33.72        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 43.85        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 38.81        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 45.84        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 41.49        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 41.32        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 43.82        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR [dB],                 | 22.89        | WLAN2.4G_Voice_11b                                  |

|                                 |    |                                                |      |                                                     |
|---------------------------------|----|------------------------------------------------|------|-----------------------------------------------------|
| and Noise (Conversational Gain) |    | (occured at 250Hz)                             |      | 1Mbps_EVS WB<br>64kbps_Ch6_2N                       |
| 5.3 Frequency Response 2N FF    | Ok | Min. dist. to tolerance scheme [dB], 1285.9 Hz | 1.02 | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |
| 5.3 Frequency Response 2N DF    | Ok | Min. dist. to tolerance scheme [dB], 2432.3 Hz | 0.75 | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_2N |

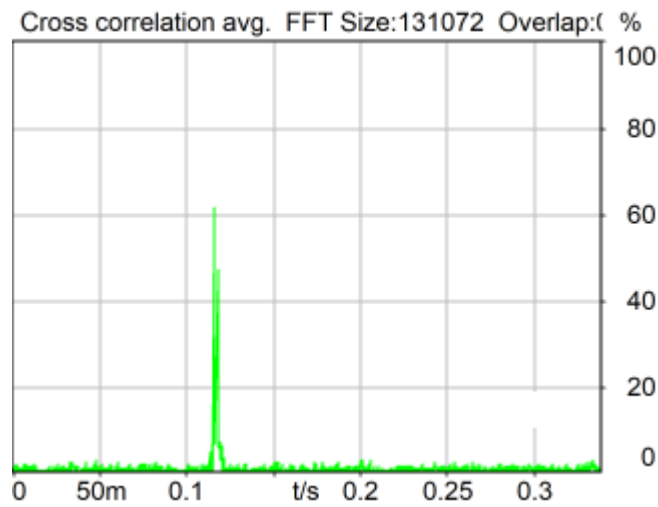
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1b Receive Volume Control Performance 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 |
| 5.3 Frequency Response 2N FF                                | 23 |
| 5.3 Frequency Response 2N DF                                | 24 |



## Overall Receive Delay WB

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



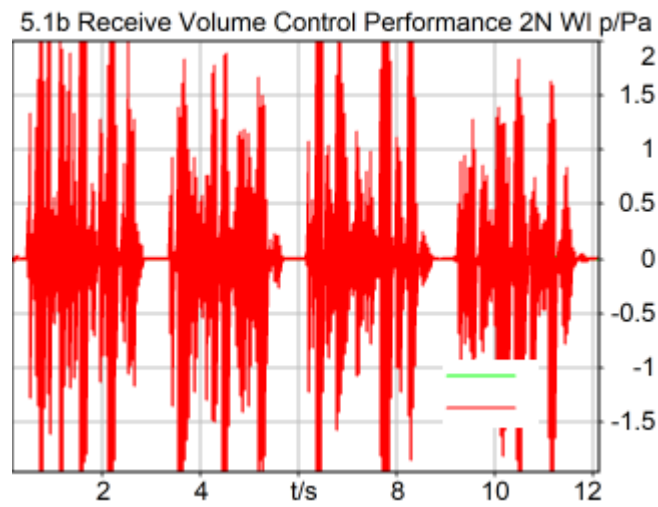
Delay (Cross): 117.5 ms

2023/11/13 14:51 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1b Receive Volume Control Performance 2N WB**

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



Speech Level RCV: 84.66 dB[SPL], Act.: 80.64% Ok

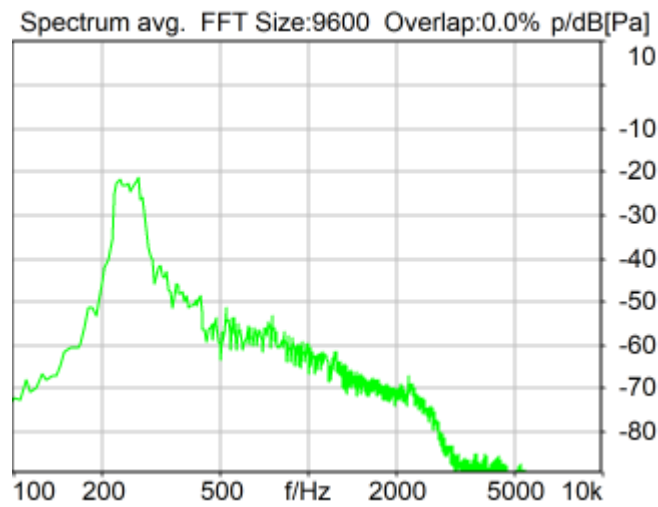
**Ok**

2023/11/13 14:51 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 22.89 dB (7.17%) Ok

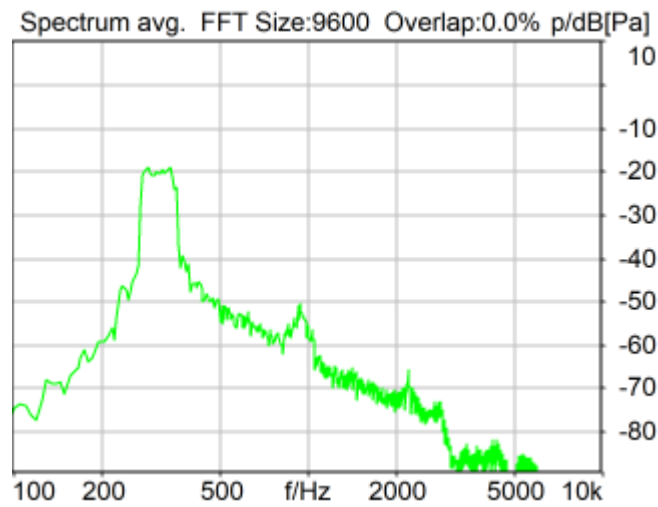
**Ok**

2023/11/13 14:51 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 25.45 dB (5.34%) Ok

**Ok**

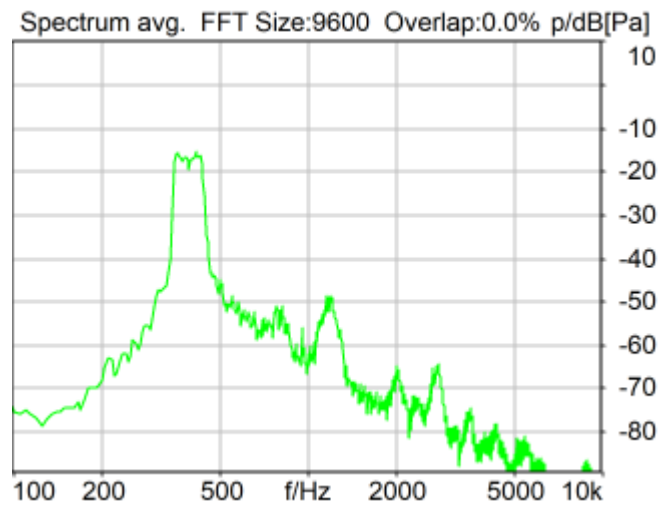
2023/11/13 14:52 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 27.68 dB (4.13%) Ok

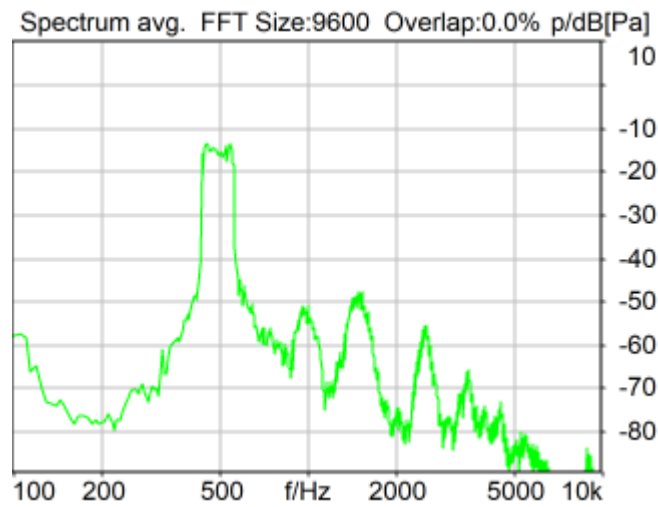
**Ok**

2023/11/13 14:52 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 29.10 dB (3.51%) Ok

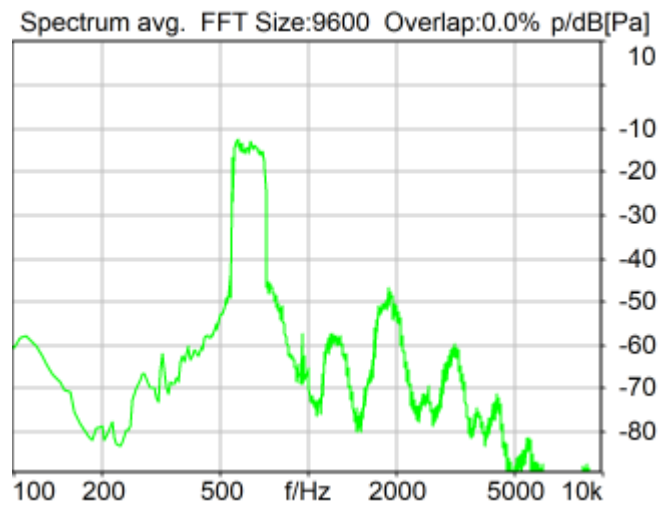
**Ok**

2023/11/13 14:53 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 30.13 dB (3.12%) Ok

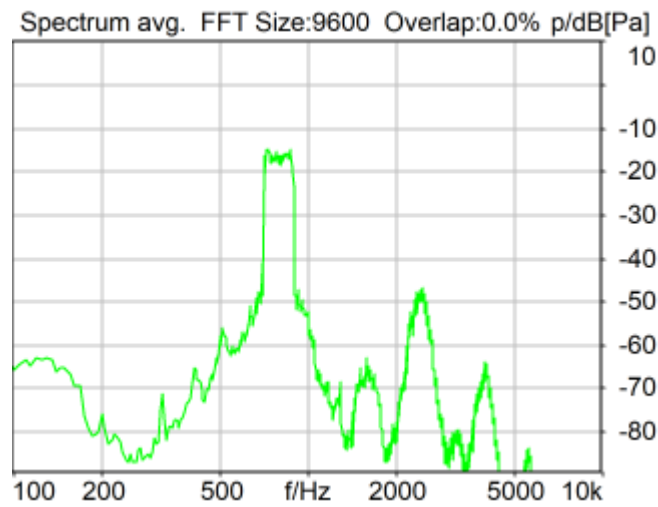
**Ok**

2023/11/13 14:53 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.78 dB (3.64%) Ok

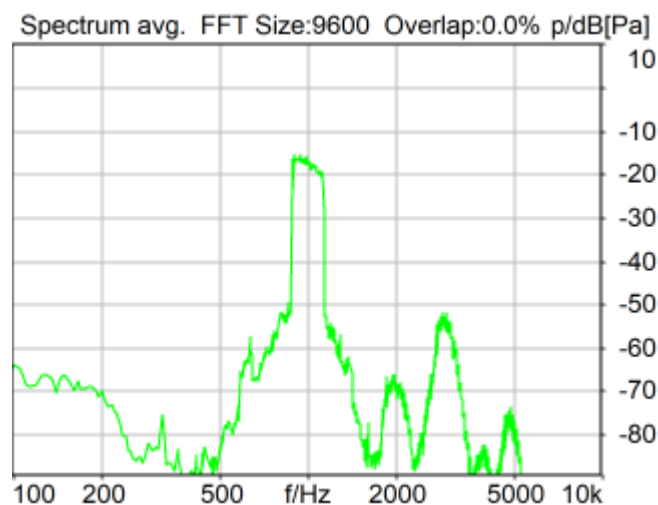
**Ok**

2023/11/13 14:53 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 31.97 dB (2.52%) Ok

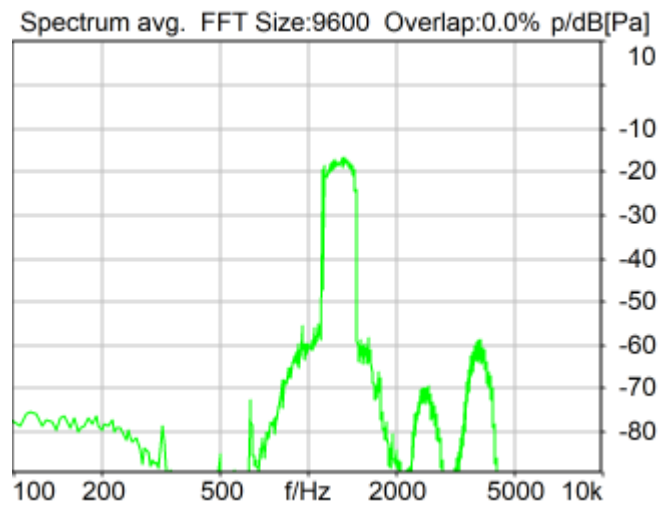
**Ok**

2023/11/13 14:54 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 33.72 dB (2.06%) Ok

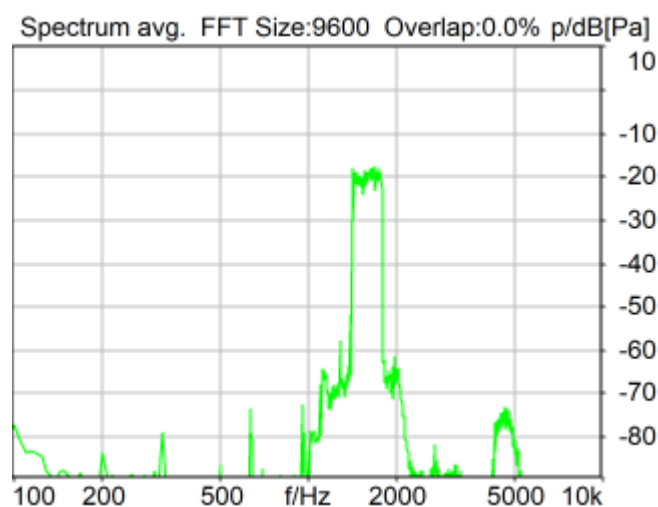
**Ok**

2023/11/13 14:54 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 43.85 dB (0.64%) Ok

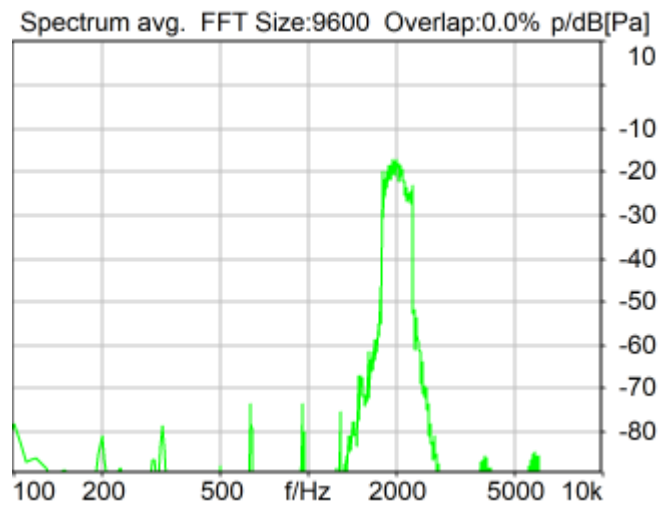
**Ok**

2023/11/13 14:55 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 38.81 dB (1.15%) Ok

**Ok**

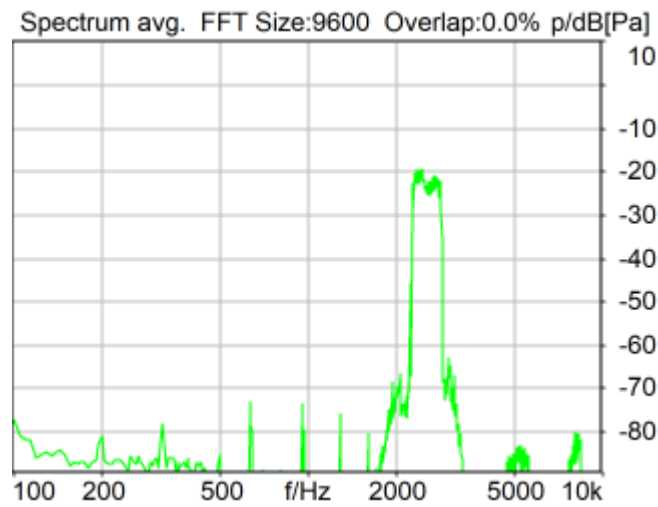
2023/11/13 14:55 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 45.84 dB (0.51%) Ok

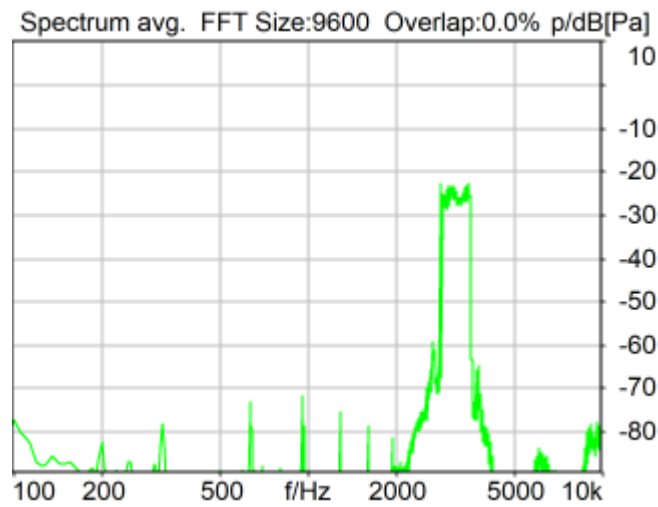
**Ok**

2023/11/13 14:55 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 41.49 dB (0.84%) Ok

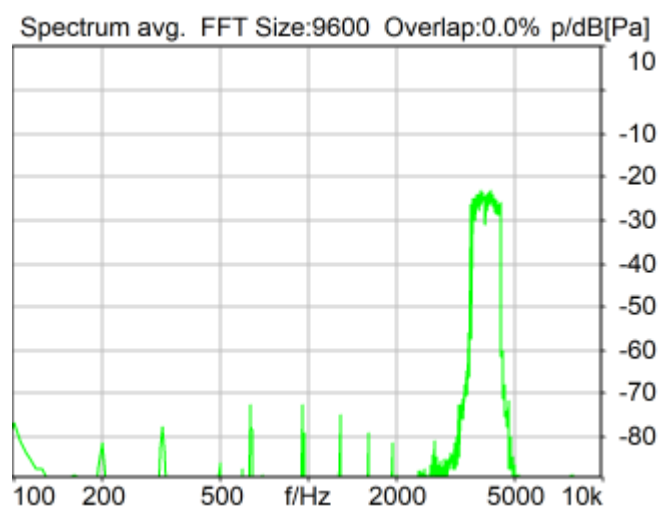
**Ok**

2023/11/13 14:56 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 41.32 dB (0.86%) Ok

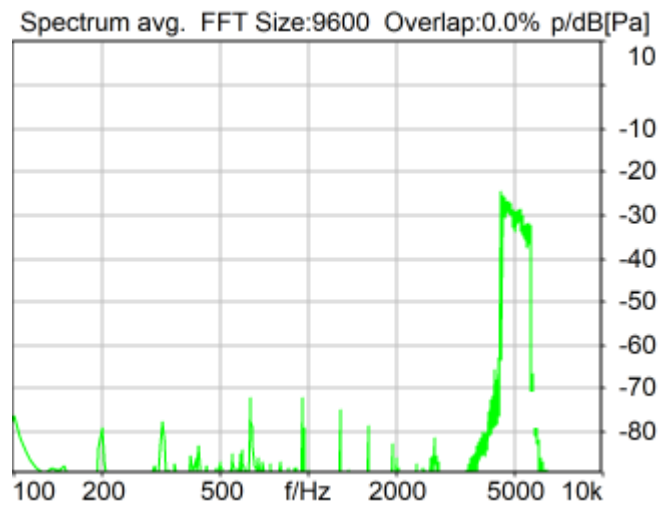
**Ok**

2023/11/13 14:56 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 43.82 dB (0.64%) Ok

**Ok**

2023/11/13 14:57 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 22.89 dB |
| 2      | 315Hz     | 25.45 dB |
| 3      | 400Hz     | 27.68 dB |
| 4      | 500Hz     | 29.10 dB |
| 5      | 630Hz     | 30.13 dB |
| 6      | 800Hz     | 28.78 dB |
| 7      | 1000Hz    | 31.97 dB |
| 8      | 1250Hz    | 33.72 dB |
| 9      | 1600Hz    | 43.85 dB |
| 10     | 2000Hz    | 38.81 dB |
| 11     | 2500Hz    | 45.84 dB |
| 12     | 3150Hz    | 41.49 dB |
| 13     | 4000Hz    | 41.32 dB |
| 14     | 5000Hz    | 43.82 dB |

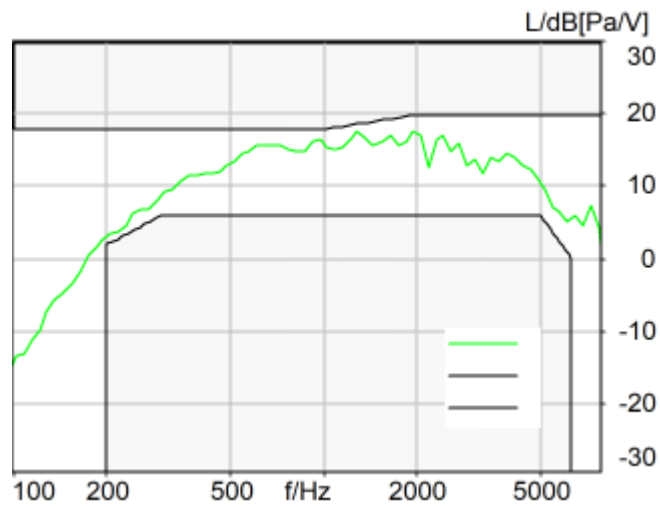
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 22.89dB at 250Hz.

2023/11/13 14:59 ACQUA

## 5.3 Frequency Response 2N FF

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



Absolute minimal distance  
1.02 dB at 1285.9 Hz Ok

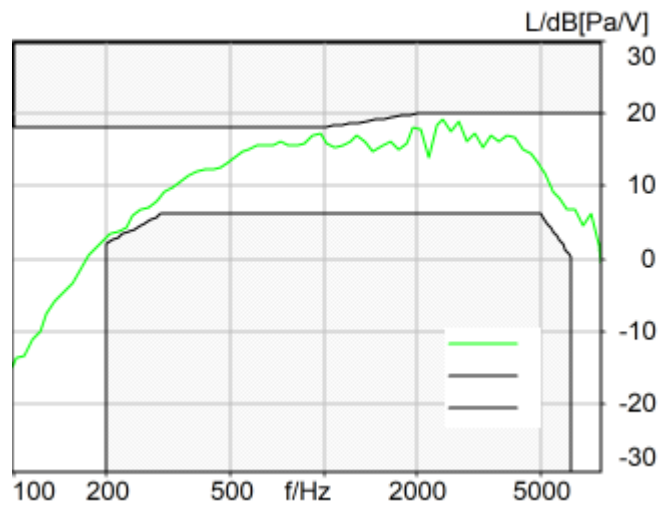
Ok

2023/11/13 14:59 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 2N DF

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



Absolute minimal distance  
0.75 dB at 2432.3 Hz Ok

Ok

2023/11/13 15:00 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

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## **Measurement Protocol**

|                    |                                               |
|--------------------|-----------------------------------------------|
| Measurement Object | WLAN2.4G_Voice_11b 1Mbps_EVS WB 64kbps_Ch6_8N |
|--------------------|-----------------------------------------------|

|                        |                              |
|------------------------|------------------------------|
| Project                | 3O1004 of TIA-5050 (2018-01) |
| Report Generation Date | 2023/11/13 15:20             |
|                        |                              |



## Status Overview

| SMD                                           | Status | Single Value Description           | Single Value | Object                                              |
|-----------------------------------------------|--------|------------------------------------|--------------|-----------------------------------------------------|
| Overall Receive Delay WB                      | Done   | Delay (Cross) [ms]                 | 197.2        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.1a Receive Volume Control Performance 8N WB | Ok     | Speech Level [dB[SPL]]             | 88.65        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 250 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 23.01        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 315 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 25.90        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 400 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 26.60        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 500 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 28.70        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 630 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 30.17        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 800 Hz WB      | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 30.06        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 1000 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 32.05        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 1250 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 26.94        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 1600 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 44.13        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 2000 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 42.15        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 2500 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 44.75        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 3150 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 41.47        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 4000 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 35.22        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.2 RCV Distortion and Noise - 5000 Hz WB     | Ok     | Distortion (Noise) [dB],<br>0.0 dB | 36.12        | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| Report - Receive Distortion                   | Ok     | Minimum SDNR [dB],                 | 23.01        | WLAN2.4G_Voice_11b                                  |

|                                 |    |                                                |      |                                                     |
|---------------------------------|----|------------------------------------------------|------|-----------------------------------------------------|
| and Noise (Conversational Gain) |    | (occured at 250Hz)                             |      | 1Mbps_EVS WB<br>64kbps_Ch6_8N                       |
| 5.3 Frequency Response 8N FF    | Ok | Min. dist. to tolerance scheme [dB], 1285.9 Hz | 1.01 | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |
| 5.3 Frequency Response 8N DF    | Ok | Min. dist. to tolerance scheme [dB], 217.7 Hz  | 0.89 | WLAN2.4G_Voice_11b<br>1Mbps_EVS WB<br>64kbps_Ch6_8N |

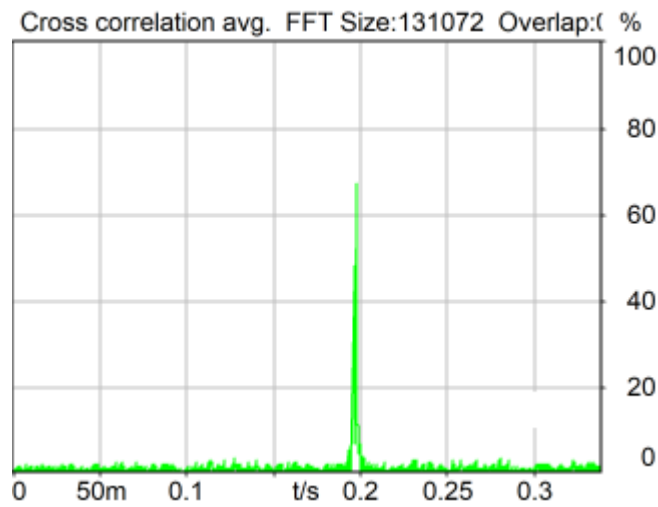
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|                                                             |    |
|-------------------------------------------------------------|----|
| Overall Receive Delay WB                                    | 6  |
| 5.1a Receive Volume Control Performance 8N 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 |
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## Overall Receive Delay WB

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



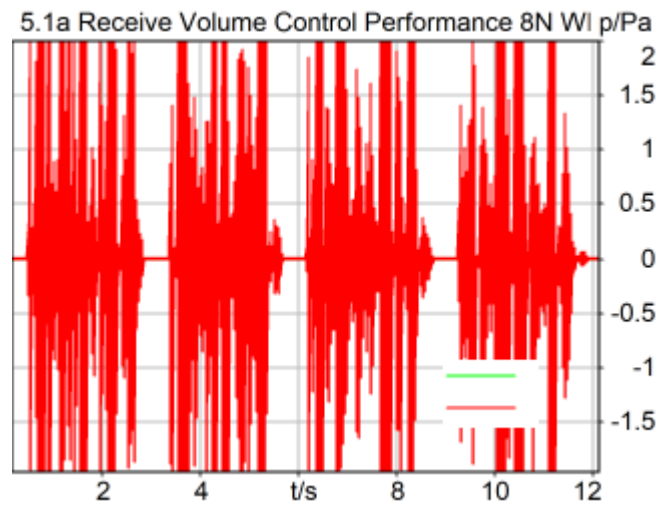
Delay (Cross): 197.2 ms

2023/11/13 15:05 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **5.1a Receive Volume Control Performance 8N WB**

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



Speech Level RCV: 88.65 dB[SPL], Act.: 80.88% Ok

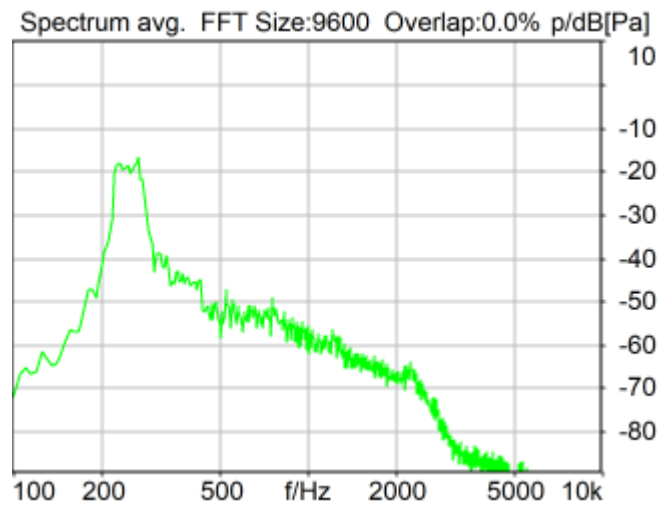
**Ok**

2023/11/13 15:06 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 23.01 dB (7.07%) Ok

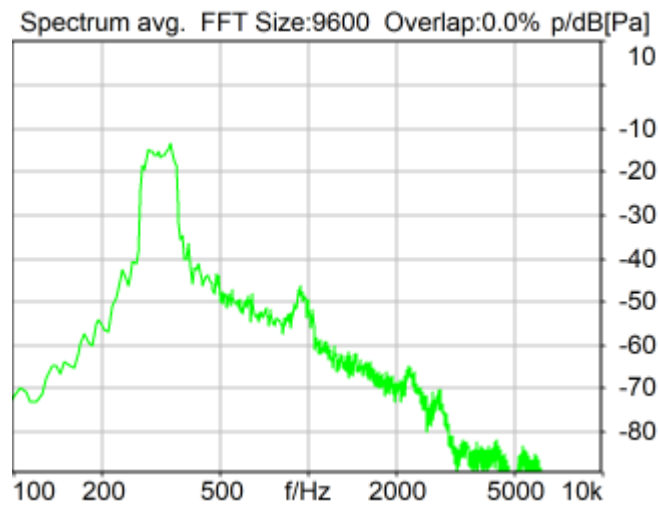
**Ok**

2023/11/13 15:06 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 25.90 dB (5.07%) Ok

**Ok**

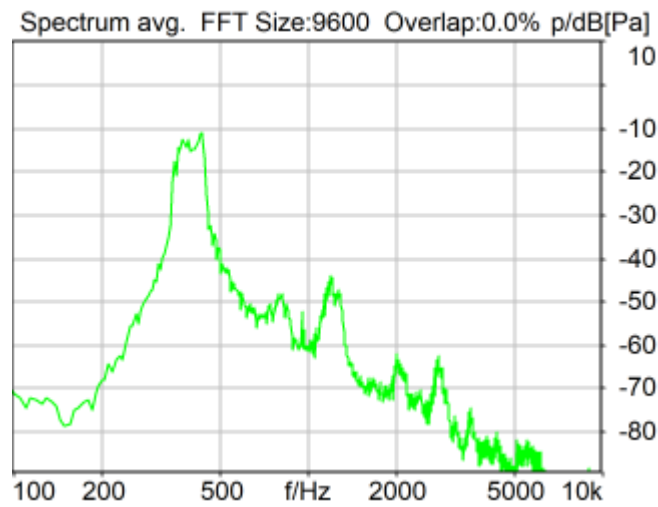
2023/11/13 15:06 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 26.60 dB (4.68%) Ok

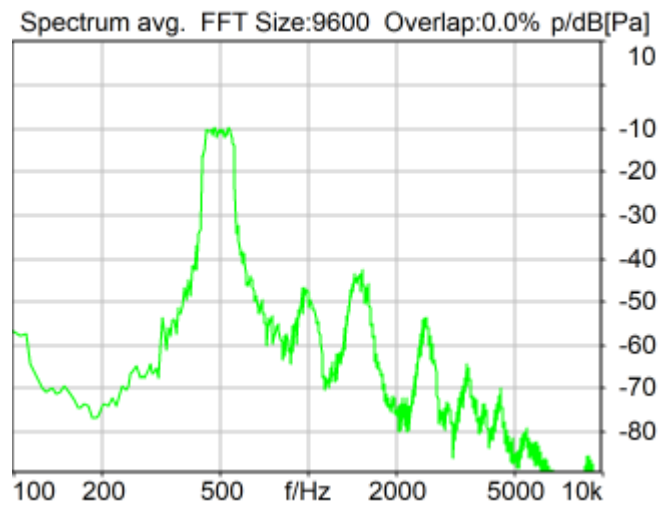
**Ok**

2023/11/13 15:07 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 28.70 dB (3.67%) Ok

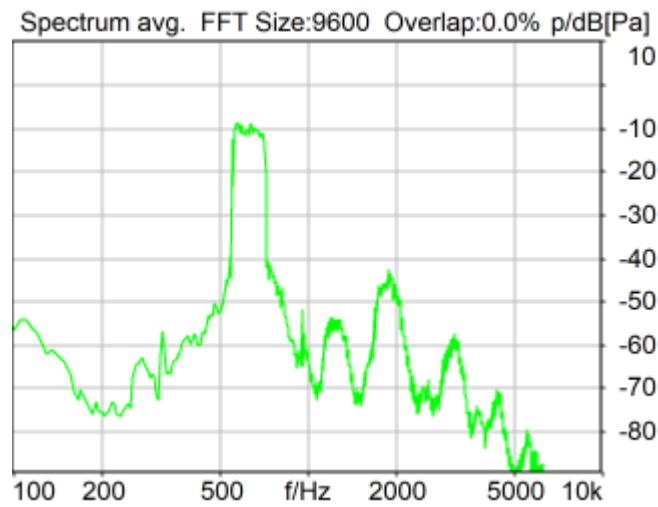
**Ok**

2023/11/13 15:07 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 30.17 dB (3.10%) Ok

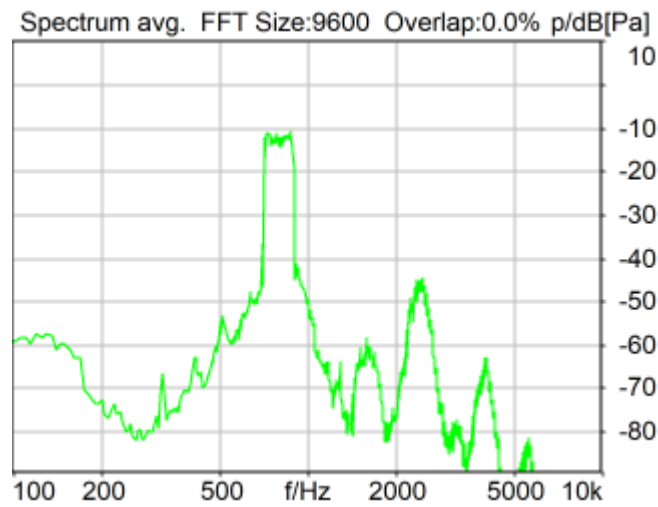
**Ok**

2023/11/13 15:08 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 30.06 dB (3.14%) Ok

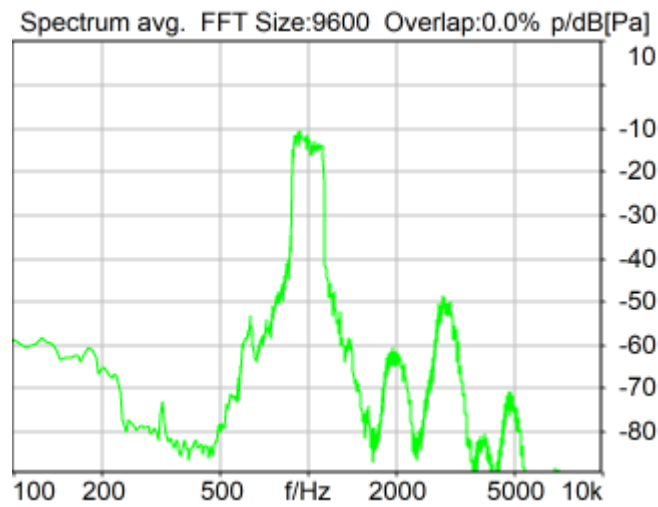
**Ok**

2023/11/13 15:08 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 32.05 dB (2.50%) Ok

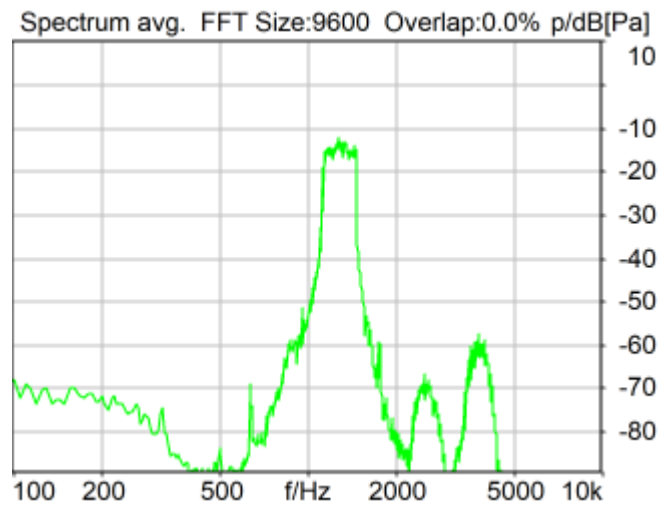
**Ok**

2023/11/13 15:08 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 26.94 dB (4.50%) Ok

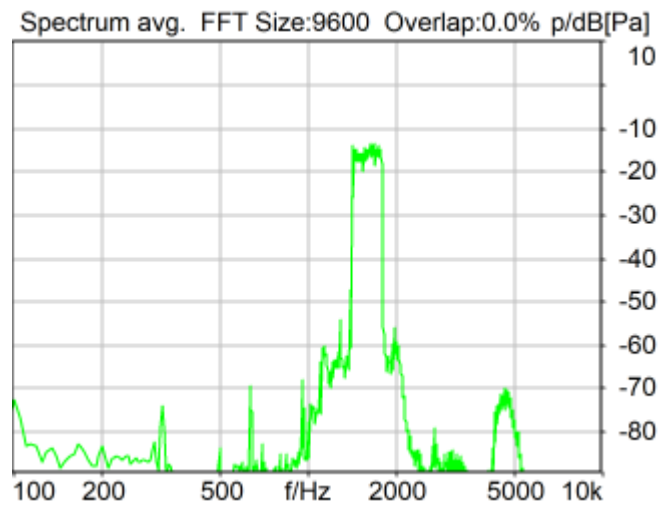
**Ok**

2023/11/13 15:09 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 44.13 dB (0.62%) Ok

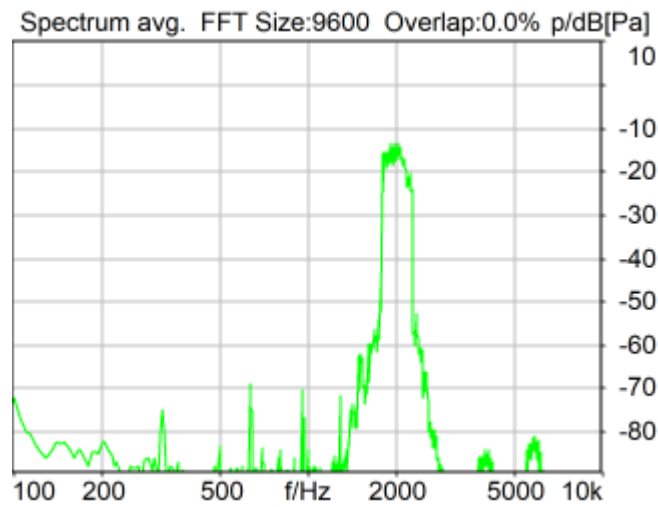
**Ok**

2023/11/13 15:09 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 42.15 dB (0.78%) Ok

**Ok**

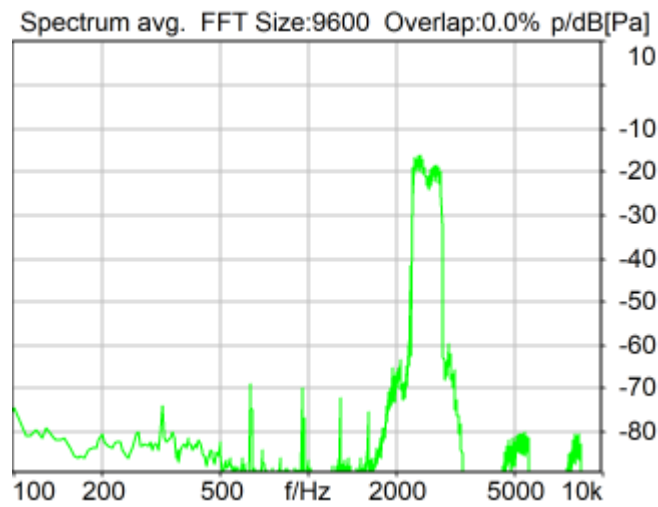
2023/11/13 15:10 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor



## **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): 44.75 dB (0.58%) Ok

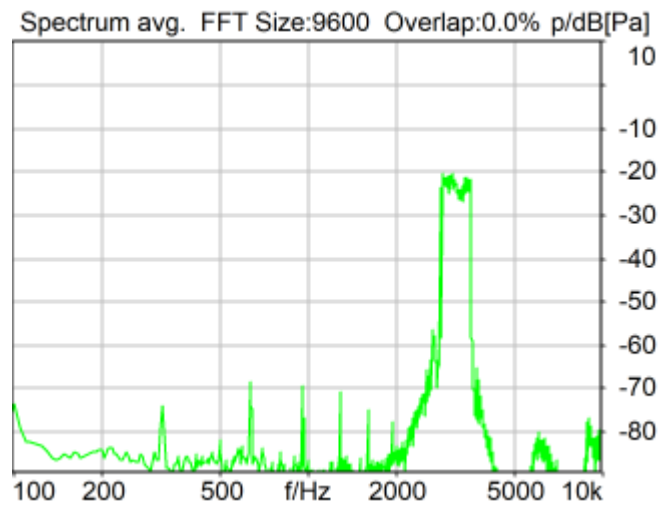
**Ok**

2023/11/13 15:10 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 41.47 dB (0.84%) Ok

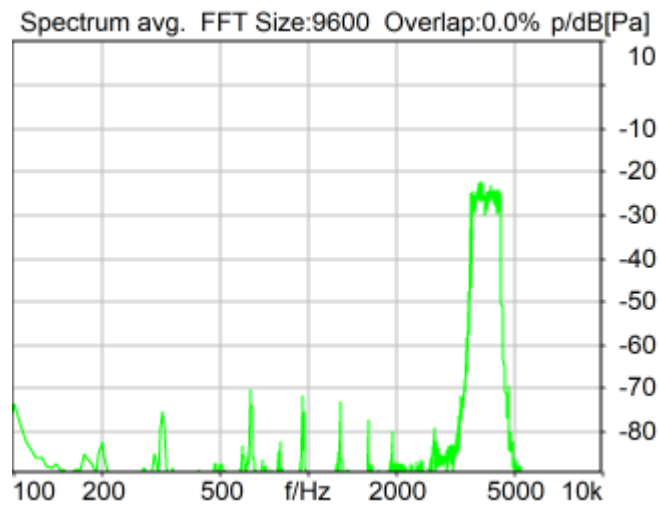
**Ok**

2023/11/13 15:10 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 35.22 dB (1.73%) Ok

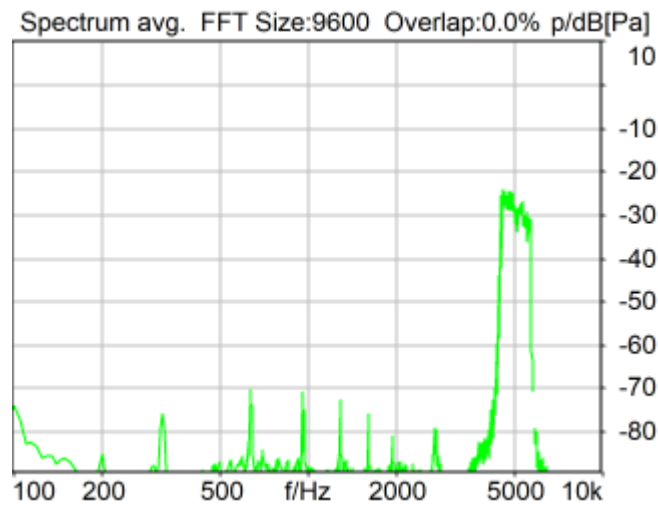
**Ok**

2023/11/13 15:11 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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): 36.12 dB (1.56%) Ok

**Ok**

2023/11/13 15:11 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## **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     | 23.01 dB |
| 2      | 315Hz     | 25.90 dB |
| 3      | 400Hz     | 26.60 dB |
| 4      | 500Hz     | 28.70 dB |
| 5      | 630Hz     | 30.17 dB |
| 6      | 800Hz     | 30.06 dB |
| 7      | 1000Hz    | 32.05 dB |
| 8      | 1250Hz    | 26.94 dB |
| 9      | 1600Hz    | 44.13 dB |
| 10     | 2000Hz    | 42.15 dB |
| 11     | 2500Hz    | 44.75 dB |
| 12     | 3150Hz    | 41.47 dB |
| 13     | 4000Hz    | 35.22 dB |
| 14     | 5000Hz    | 36.12 dB |

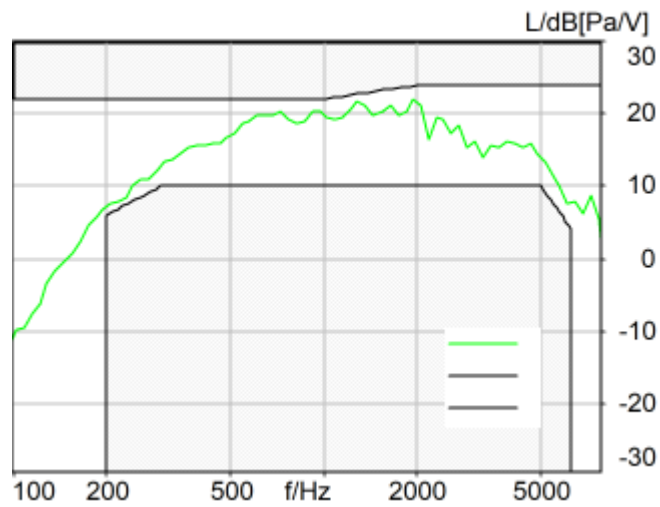
All SDNRs were greater than 20.0 dB, requirement was met.

Smallest SDNR was 23.01dB at 250Hz.

2023/11/13 15:13 ACQUA

### **5.3 Frequency Response 8N FF**

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



Absolute minimal distance  
1.01 dB at 1285.9 Hz Ok

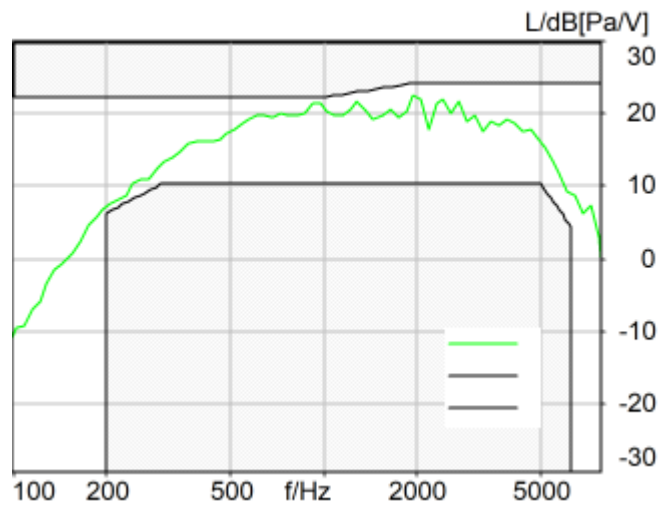
**Ok**

2023/11/13 15:13 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor

## 5.3 Frequency Response 8N DF

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



Absolute minimal distance  
0.89 dB at 217.7 Hz Ok

**Ok**

2023/11/13 15:13 ACQUA 5.1.200

Unmodified HEAD acoustics Measurement Descriptor