

# FCC SAR Exclusion Report

Report No. : SFBCEE-WTW-P22010433

Applicant : Sonova Consumer Hearing GmbH

Address : Am Labor 1, 30900 Wedemark, Germany

Product Name : MOMENTUM 4

Brand Name : SENNHEISER

FCC ID : 2A3UL-M4AEBT

Model No. : M4AEBT

Standards : FCC 47 CFR Part 2 (2.1093), IEEE C95.1:1992, IEEE Std 1528:2013  
KDB 865664 D01 v01r04, KDB 865664 D02 v01r02, FCC-19-126  
KDB 447498 D01 v06

Sample Received Date : Jan. 13, 2022

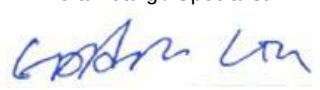
Date of Evaluation : May 05, 2022

Lab Address : No. 47-2, 14<sup>th</sup> Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location : No. 19, Hwa Ya 2<sup>nd</sup> Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City, Taiwan

**CERTIFICATION:** The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

Prepared By :   
Vera Huang / Specialist

Approved By :   
Gordon Lin / Manager



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### Annex A. Maximum Target Conducted Power



## Release Control Record

| Issue No.            | Reason for Change | Date Issued   |
|----------------------|-------------------|---------------|
| SFBCEE-WTW-P22010433 | Initial release   | Jun. 30, 2022 |
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## FCC SAR Exclusion Report

### 1. Summary of Maximum SAR Value

| Equipment Class | Mode      | Highest Reported SAR <sub>1g</sub> (W/kg) |
|-----------------|-----------|-------------------------------------------|
| DSS & DTS       | Bluetooth | Not Required                              |

**Note:**

1. The SAR limit (**Head & Body: SAR<sub>1g</sub> 1.6 W/kg**) for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

## FCC SAR Exclusion Report

### 2. Description of Equipment Under Test

|                                             |                                                                                              |
|---------------------------------------------|----------------------------------------------------------------------------------------------|
| Test item Description                       | Wireless Headphones                                                                          |
| Product Name                                | MOMENTUM 4                                                                                   |
| FCC ID                                      | 2A3UL-M4AEBT                                                                                 |
| Brand Name                                  | SENNHEISER                                                                                   |
| Model No.                                   | M4AEBT                                                                                       |
| Status of EUT                               | Engineering Sample                                                                           |
| Power Ratings                               | 5Vdc, 750mA (from Type-C USB interface)<br>3.7Vdc, 700mAh (from battery)                     |
| Power Supply (Nominal & Testing)            | 5Vdc, 750mA (from Type-C USB interface)                                                      |
| Operating Temperature range                 | 0°C ~ 40°C                                                                                   |
| Modulation Type                             | BDR & EDR: GFSK, $\pi/4$ DQPSK, 8DPSK<br>BLE: GFSK                                           |
| Transmission Technology                     | BDR & EDR: FHSS<br>BLE: DSSS                                                                 |
| Technology                                  | Bluetooth                                                                                    |
| Operating Frequency                         | 2402 - 2480MHz<br>(for Frequency Band: 2400-2483.5MHz)                                       |
| No. of channels                             | BDR & EDR: 79<br>BLE: 40                                                                     |
| Channel Spacing                             | BDR & EDR: 1MHz<br>BLE: 2MHz                                                                 |
| Channel Bandwidth                           | BDR & EDR: 79MHz<br>BLE: 80MHz                                                               |
| Data Transfer Rate                          | BDR: 1Mbps and EDR: 2Mbps/3Mbps<br>LE 4.0: 1Mbps and LE 5.2: 2Mbps                           |
| Maximum Tune-up Conducted Power (Unit: dBm) | Please refer to Annex A                                                                      |
| Antenna Type                                | FPC Antenna                                                                                  |
| Antenna Gain                                | 3.89 dBi                                                                                     |
| HW Version                                  | V01                                                                                          |
| SW Version                                  | V2.2.14                                                                                      |
| Cable supplied                              | (a) 1.2m shielded USB cable (without core)<br>(b) 1.2m unshielded audio cable (without core) |

#### Note:

- The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

## FCC SAR Exclusion Report

### 3. SAR Measurement Evaluation

#### 3.1 Maximum Output Power

##### 3.1.1 Maximum Target Conducted Power

Refer to Annex A.

#### 3.2 SAR Testing Exclusions

According to FCC-19-126, the SAR-based thresholds are derived based on the frequency, power, and separation distance of the RF source. The formula below is defined the thresholds in general for either available maximum time-averaged power or maximum time-averaged (ERP), whichever is greater. The SAR exclusion threshold is determined by the following formula.

1. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequency from 0.3 GHz to 6 GHz (inclusive).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

$d$  = the separation distance (cm);

| Mode      | Max. Tune-up Power (dBm) | Max. Tune-up Power (mW) | Max. Tune-up Effective Radiated Power (dBm) | Rear Face            |                         |                      |
|-----------|--------------------------|-------------------------|---------------------------------------------|----------------------|-------------------------|----------------------|
|           |                          |                         |                                             | Ant. to Surface (mm) | Calculated Result (dBm) | Require SAR Testing? |
| Bluetooth | 5                        | 3.16                    | 6.74                                        | 27                   | 18.29                   | No                   |

#### Note:

1. When the device output power is less than the power threshold shown in above table, the SAR testing exclusion is applied.
2. Units for  $d$  are cm and units for  $f$  are GHz.
3. The Calculated Result is scaling x2.5 for head exclusion threshold.

#### Summary:

Since the SAR testing for all device orientations apply SAR test exclusion per FCC-19-126, SAR testing for this device is not required.

#### **4. Construction Photos of EUT**

Please refer to the attached file (BCEE-WTW-P22010433 (EUT photo)).

## **5. Information on the Testing Laboratories**

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Taiwan Huaya Lab:**

Add: No. 19, Huaya 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan

Tel: +886-(0)3-318-3232

Fax: +886-(0)3-211-5834

**Taiwan Linkou Lab:**

Add: No. 47-2, Baodoucuokeng, Linkou Dist., New Taipei City 244, Taiwan

Tel: +886-(0)2-2605-2180

Fax: +886-(0)2-2605-2943

**Taiwan Hsinchu Lab1:**

Add: E-2, No. 1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan

Tel: +886-(0)3-666-8565

Fax: +886-(0)3-666-8323

**Taiwan Hsinchu Lab2:**

Add: No. 49, Ln. 206, Wende Rd., Qionglin Township, Hsinchu County 307, Taiwan

Tel: +886-(0)3-512-0595

Fax: +886-(0)3-512-0568

**Taiwan Xindian Lab:**

Add: B2F, No. 215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan

Tel: +886-(0)2-8914-5882

Fax: +886-(0)2-8914-5840

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** <https://ee.bureauveritas.com.tw/BVInternet/Default>

The road map of all our labs can be found in our web site also.

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