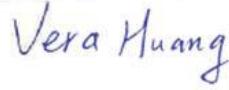


# FCC SAR Exclusion Report

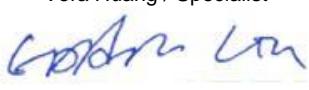
Report No. : SFBCEE-WTW-P21116046  
Applicant : Sennheiser Consumer Audio GmbH  
Address : Am Labor 1, 30900 Wedemark, Germany  
Product Name : MOMENTUM True Wireless 3 (MTW3)  
Brand Name : SENNHEISER  
FCC ID : 2A3ULMTW3L  
Model No. : MTW3 L  
Standards : FCC 47 CFR Part 2 (2.1093), IEEE C95.1:1992, IEEE Std 1528:2013  
KDB 865664 D01 v01r04, KDB 865664 D02 v01r02, KDB 447498 D01 v06  
Sample Received Date : Dec. 30, 2021  
Date of Evaluation : Jan. 04, 2022  
Lab Address : No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan  
Test Location : No. 19, Hwa Ya 2nd 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



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

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Annex A. Maximum Target Conducted Power

Annex B. Considerations Related to Bluetooth Duty Cycle Calculation

## Release Control Record

## 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.

## 2. Description of Equipment Under Test

<b>Test Item Description</b>	True Wireless Earphones
<b>Product Name</b>	MOMENTUM True Wireless 3 (MTW3)
<b>FCC ID</b>	2A3ULMTW3L
<b>Brand Name</b>	SENNHEISER
<b>Model No.</b>	MTW3 L
<b>Status of EUT</b>	Engineering Sample
<b>Power Ratings</b>	Left earbud& Right earbud: 3.7Vdc, 70mAh (from battery) Charging Case: 5Vdc, 1000mA (from Type-C USB interface) 3.6Vdc, 820mAh (from battery)
<b>Power Supply (Nominal &amp; Testing)</b>	5Vdc, 1000mA (from Type-C USB interface)
<b>Operating Temperature range</b>	0°C ~ 40°C
<b>Modulation Type</b>	BDR & EDR: GFSK, π/4 DQPSK, 8DPSK BLE: GFSK
<b>Transmission Technology</b>	BDR & EDR: FHSS BLE: DSSS
<b>Technology</b>	Bluetooth
<b>Operating Frequency</b>	2402 - 2480MHz (for Frequency Band: 2400-2483.5MHz)
<b>No. of channels</b>	BDR & EDR: 79 BLE: 40
<b>Channel Spacing</b>	BDR & EDR: 1MHz BLE: 2MHz
<b>Channel Bandwidth</b>	BDR & EDR: 79MHz BLE: 80MHz
<b>Data Transfer Rate</b>	BDR: 1Mbps and EDR: 2Mbps/3Mbps LE 4.0: 1Mbps and LE 5.2: 2Mbps
<b>Maximum Tune-up Conducted Power (Unit: dBm)</b>	Please refer to Annex A
<b>Antenna Type</b>	Monopole antenna
<b>Antenna Gain</b>	-4.8 dBi
<b>HW Version</b>	Earbuds: 5D Charging Case: 8B
<b>SW Version</b>	Earbuds: V1.11.24 Charging Case: V19
<b>Cable supplied</b>	0.4m shielded USB cable without core

**Note:**

1. 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.

### 3. SAR Measurement Evaluation

#### 3.1 Maximum Output Power

##### 3.1.1 Maximum Target Conducted Power

Refer to Annex A.

##### 3.1.2 Time-Avg. Power calculation.

The calculation of time-avg. power (Unit: dBm) Including duty cycle.

**<The calculated time-average power with duty cycle>**

Mode	Max Tune-up Power (Not include Duty Cycle)	Duty cycle (%)	Calculated Time-Avg. Power (Include Duty Cycle)
GFSK	8.5	29.87	3.25
$\pi/4$ DQPSK, 8DPSK	9.5	29.46	4.19
LE 4.0	2.0	61.98	-0.08
LE 5.2	2.0	32.64	-2.86

**<Considerations Related to Bluetooth Duty Cycle Calculation>**

Refer to Annex B.

### 3.2 SAR Testing Exclusions

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

1. For the test separation distance  $\leq 50$  mm

$$\frac{\text{Max. Tune up Power}_{(\text{mW})}}{\text{Min. Test Separation Distance}_{(\text{mm})}} \times \sqrt{f_{(\text{GHz})}} \leq 3.0$$

When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

2. For the test separation distance  $> 50$  mm, and the frequency at 100 MHz to 1500 MHz

$$\left[ (\text{Threshold at } 50 \text{ mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times \left( \frac{f_{(\text{MHz})}}{150} \right) \right]_{(\text{mW})}$$

3. For the test separation distance  $> 50$  mm, and the frequency at  $> 1500$  MHz to 6 GHz

$$[(\text{Threshold at } 50 \text{ mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times 10]_{(\text{mW})}$$

Mode	Time-Avg. Power (Include Duty Cycle) (dBm)	Time-Avg. Power (Include Duty Cycle) (mW)	Separation Distance (mm)	Calculated Result	Require SAR Testing?
GFSK	3.25	2.11	$\leq 5$	0.66	No
$\pi/4$ DQPSK, 8DPSK	4.19	2.62	$\leq 5$	0.83	No
LE 4.0	-0.08	0.98	$\leq 5$	0.31	No
LE 5.2	-2.86	0.52	$\leq 5$	0.16	No

**Note:**

1. When separation distance  $\leq 50$  mm and the calculated result shown in above table is  $\leq 3.0$ , the SAR testing exclusion is applied.
2. When separation distance  $> 50$  mm and the device output power is less than the calculated result (power threshold, mW) shown in above table, the SAR testing exclusion is applied.

**Summary:**

Since the SAR testing for all device orientations apply SAR test exclusion per KDB 447498, SAR testing for this device is not required.

## FCC SAR Exclusion Report

### 4. Construction Photos of EUT

Please refer to the attached file (BCEE-WTW-P21116046 (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

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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

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#### **Taiwan Xindian Lab:**

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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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