

# FCC SAR Exclusion Report

Report No. : SFCFQC-WTW-P22040277

Applicant : Sonova Consumer Hearing GmbH

Address : Am Labor 1, 30900 Wedemark, Germany

Product Name : Bluetooth USB Adapter (BTD 600)

Brand Name : SENNHEISER

FCC ID : 2A3ULBTD600

Model No. : BTD 600

FCC Rule Part : CFR §2.1093

Standards : IEEE Std 1528:2013, KDB 865664 D01 v01r04, KDB 865664 D02 v01r02, KDB 447498 D01 v06

Sample Received Date : Apr. 14, 2022

Date of Evaluation : Jun. 11, 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 :

  
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Annex A. Maximum Target Conducted Power

Annex B. Considerations Related to Bluetooth for Setup and Testing



## Release Control Record

| Issue No.            | Reason for Change | Date Issued   |
|----------------------|-------------------|---------------|
| SFCFQC-WTW-P22040277 | Initial release   | Jul. 10, 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.

**References Guidance :**

1. IEEE C95.1:1992, FCC-19-126

## FCC SAR Exclusion Report

### 2. Description of Equipment Under Test

|                                             |                                                                    |
|---------------------------------------------|--------------------------------------------------------------------|
| Test Item Description                       | Bluetooth USB Adapter                                              |
| Product Name                                | Bluetooth USB Adapter (BTD 600)                                    |
| FCC ID                                      | 2A3ULBTD600                                                        |
| Brand Name                                  | SENNHEISER                                                         |
| Model No.                                   | BTD 600                                                            |
| Status of EUT                               | Engineering Sample                                                 |
| Power Ratings                               | 5Vdc, 100mA                                                        |
| Power Supply (Nominal & Testing)            | 5Vdc, 100mA                                                        |
| 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                                | Monopole PCB antenna                                               |
| Antenna Gain                                | -3.83 dBi                                                          |
| HW Version                                  | R1                                                                 |
| SW Version                                  | 1.6.0                                                              |
| Cable supplied                              | NA                                                                 |

#### 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.

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### 3. SAR Measurement Evaluation

#### 3.1 Maximum Output Power

##### 3.1.1 Maximum Target Conducted Power

Refer to Annex A.

##### 3.1.2 Considerations Related to Bluetooth for Setup and Testing

Refer to Annex B.

##### 3.1.3 Time-Avg. Power Calculation

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

<The calculation average power with duty cycle>

| Mode   | Max Tune-up Power<br>(Not include Duty Cycle) | Duty Cycle (%) | Calculated Time-Avg. Power<br>(Include Duty Cycle) |
|--------|-----------------------------------------------|----------------|----------------------------------------------------|
| BR/EDR | 12.5                                          | 14.87          | 4.22                                               |
| LE     | 7.5                                           | 20.64          | 0.65                                               |

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### 3.2 SAR Testing Exclusions

According to FCC-19-126, 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. 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.<br>Tune-up<br>Power<br>(dBm) | Max.<br>Tune-up<br>Power<br>(mW) | Rear Face               |                            |                            |
|-----------|-----------------------------------|----------------------------------|-------------------------|----------------------------|----------------------------|
|           |                                   |                                  | Ant. to Surface<br>(mm) | Calculated<br>Result (dBm) | Require<br>SAR<br>Testing? |
| Bluetooth | 4.22                              | 2.64                             | 5                       | 4.34                       | 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 (CFQC-WTW-P22040277 (EUT photo)).

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### 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:**

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

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