

# FCC SAR Exclusion Report

Report No. : SA190523C04

Applicant : Sennheiser electronic GmbH & Co. KG

Address : Am Labor 1, D-30900 Wedemark, Germany

Product : Bluetooth ear-canal headphones (IE 80S BT)

Brand : SENNHEISER

FCC ID : DMOIENBT

Model No. : IEN BT (refer to item 2 for more details)

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

Sample Received Date : May 23, 2019

Date of Evaluation : May 23, 2019

Lab Address : No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

Test Location : No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)

**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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Approved By :



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## Table of Contents

|                                                  |   |
|--------------------------------------------------|---|
| Release Control Record .....                     | 3 |
| 1. Summary of Maximum SAR Value .....            | 4 |
| 2. Description of Equipment Under Test .....     | 5 |
| 3. SAR Measurement Evaluation .....              | 6 |
| 3.1 Maximum Output Power .....                   | 6 |
| 3.2 SAR Testing Exclusions .....                 | 6 |
| 4. Construction Photos of EUT .....              | 7 |
| 5. Information on the Testing Laboratories ..... | 8 |

### Appendix A. Photographs of EUT and Setup



## Release Control Record

| Issue No.   | Reason for Change | Date Issued   |
|-------------|-------------------|---------------|
| SA190523C04 | Initial release   | Jun. 17, 2019 |
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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             | 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

|                                                              |                                                |
|--------------------------------------------------------------|------------------------------------------------|
| EUT Type                                                     | Bluetooth ear-canal headphones (IE 80S BT)     |
| Brand Name                                                   | SENNHEISER                                     |
| FCC ID                                                       | DMOIENBT                                       |
| Model Name                                                   | IEN BT                                         |
| Tx Frequency Bands<br>(Unit: MHz)                            | Bluetooth : 2402 ~ 2480                        |
| Uplink Modulations                                           | Bluetooth : GFSK, $\pi/4$ -DQPSK, 8-DPSK       |
| Time Averaged Maximum Tune-up<br>Conducted Power (Unit: dBm) | Please refer to section 3.1 of this report     |
| Antenna Type                                                 | Chip Antenna<br>(Peak Antenna Gain : 3.16 dBi) |
| EUT Stage                                                    | Engineering Sample                             |

#### Note:

- The EUT system (IE 80S BT) contains the following devices.

| Brand      | Item                          | Model   |
|------------|-------------------------------|---------|
| SENNHEISER | Detachable Bluetooth Neckband | IEN BT  |
|            | Earphones                     | IE 80 S |

\* IEN BT is the device with Bluetooth function.

\* IE 80 S is an earphone with no electronic circuitry inside.

- 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.

#### The EUT uses following battery.

|         |        |                |
|---------|--------|----------------|
| Battery | Brand  | SENNHEISER     |
|         | Model  | AHB75310PAT    |
|         | Rating | 3.7Vdc, 120mAh |

## FCC SAR Exclusion Report

### 3. SAR Measurement Evaluation

#### 3.1 Maximum Output Power

The time averaged maximum conducted power (Unit: dBm) including tune-up tolerance is shown as below.

| Mode         | 2.4G Bluetooth |
|--------------|----------------|
| Bluetooth DH | 5.36           |

#### 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.

- For the test separation distance  $\leq 50$  mm

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

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

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

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

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

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

| Mode | Max. Tune-up<br>Time averaged Power<br>(dBm) | Max. Tune-up<br>Time averaged Power<br>(mW) | From of the Antenna to body |                      |                            |
|------|----------------------------------------------|---------------------------------------------|-----------------------------|----------------------|----------------------------|
|      |                                              |                                             | Ant. to Surface<br>(mm)     | Calculated<br>Result | Require<br>SAR<br>Testing? |
| BT   | 5.36                                         | 3.44                                        | 5.47                        | 0.99                 | No                         |

#### Note:

- When separation distance  $\leq 50$  mm and the calculated result shown in above table is  $\leq 3.0$ , the SAR testing exclusion is applied.
- 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.

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

Please refer to the attached file (190523C04 (EUT Photo)\_Ext and 190523C04 (EUT Photo)\_Int).

## **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 HwaYa EMC/RF/Safety/Telecom Lab:**

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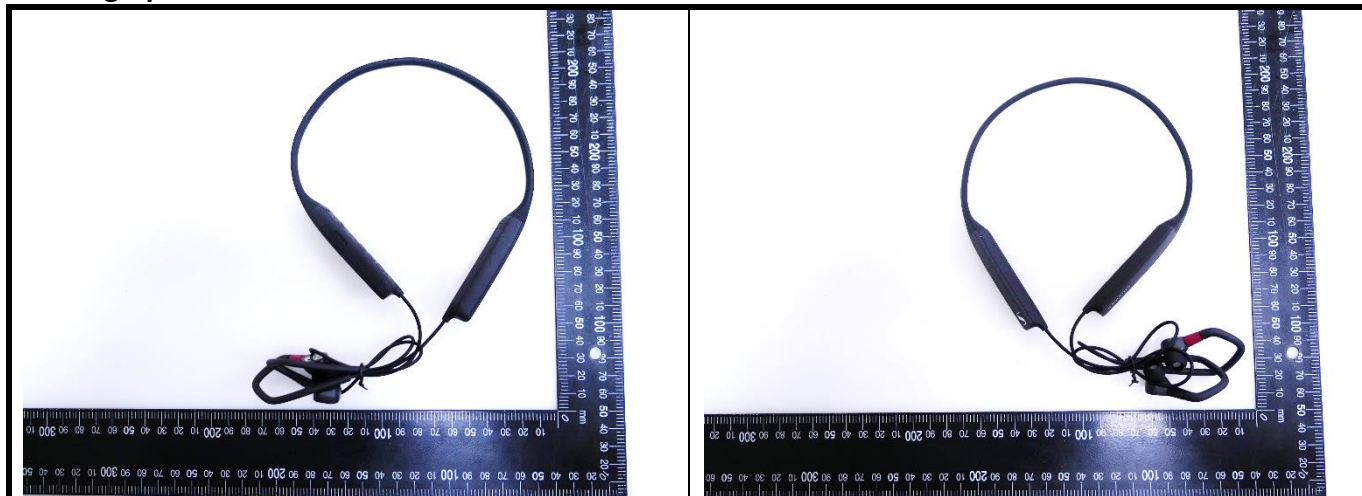
The road map of all our labs can be found in our web site also.

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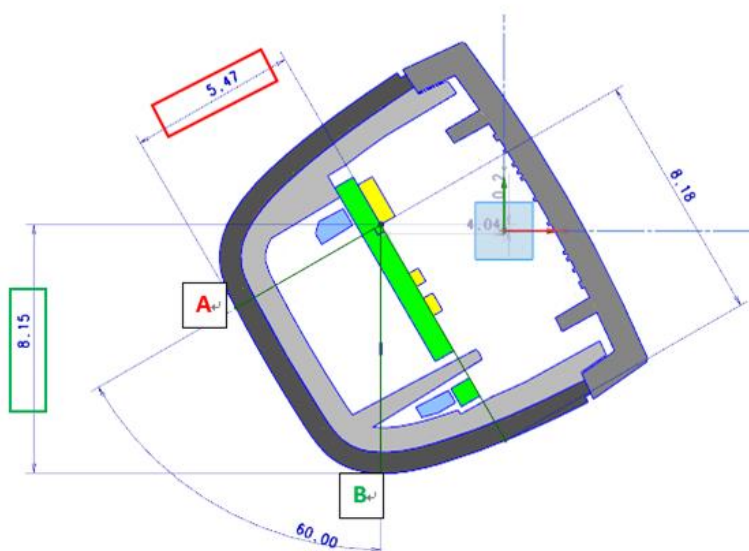
## Appendix A. Photographs of EUT

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## <Photographs of EUT>



## <Antenna Location>



The separation distance for antenna to edge:

| Antenna | Distance of Antenna to the body (mm) |
|---------|--------------------------------------|
| BT      | 5.47                                 |