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 : Gina Liu / Specialist

Approved By : Gordon Lin / Assistant Manager

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Release Control Record

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

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported SAR_{1g} (W/kg)
DSS	Bluetooth	Not Required

Note:

1. The SAR limit **(Head & Body: SAR_{1g} 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

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

Note:

1. 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.

2. 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

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.

1. For the test separation distance <= 50 mm

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

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

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

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

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

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

Note:

1. When separation distance <= 50 mm and the calculated result shown in above table is <= 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.

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:
Add: No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil., Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.
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The road map of all our labs can be found in our web site also.

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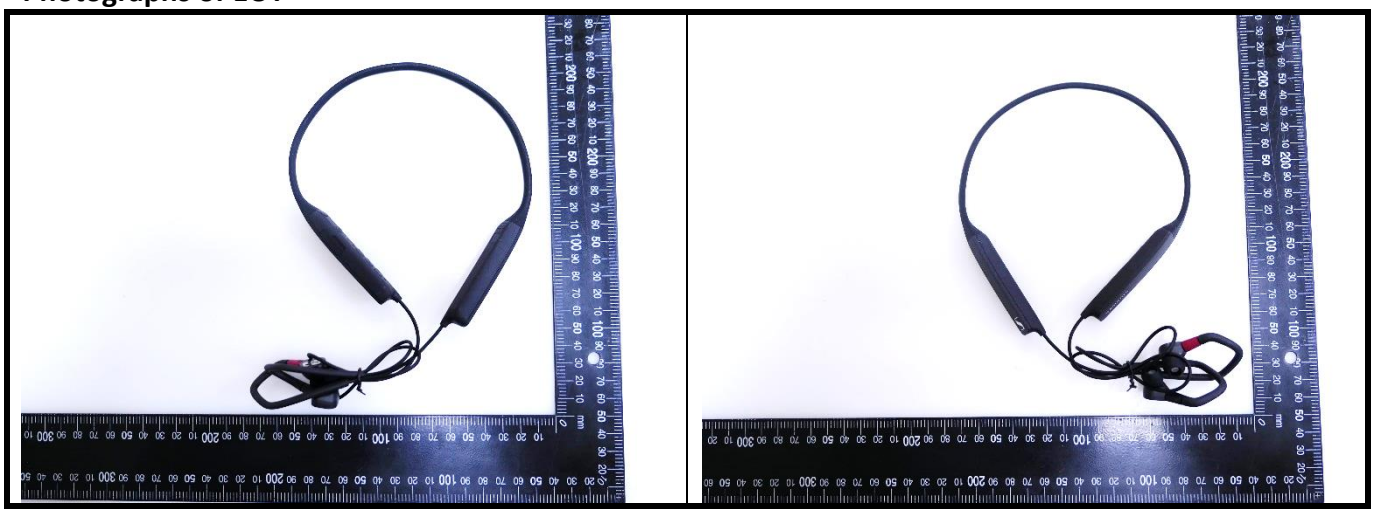
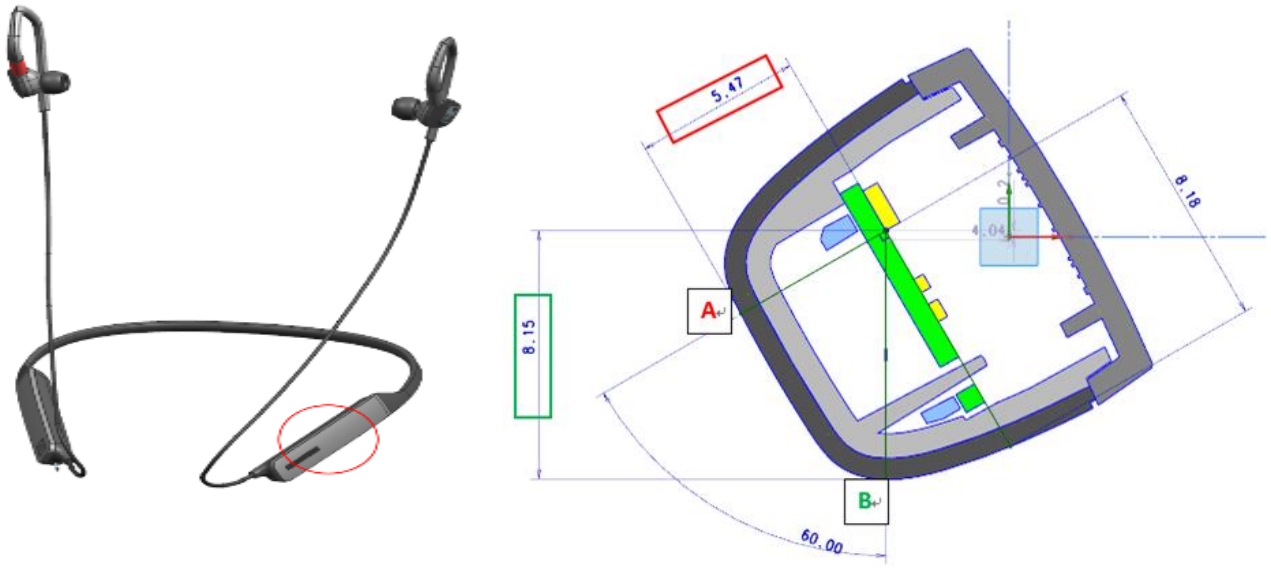
Appendix A. Photographs of EUT

<Photographs of EUT>



<Antenna Location>



The separation distance for antenna to edge:

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