

RF Exposure Report

Report No.: SABCEE-WTW-P21110658

FCC ID: 2A3ULTR120W

Model No.: TR 120-W

Received Date: Jan. 03, 2022

Date of Evaluation: May 03, 2022

Issued Date: Jun. 17, 2022

Applicant: Sonova Consumer Hearing GmbH

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
SABCEE-WTW-P21110658	Original Release	Jun. 17, 2022

1 Certificate of Conformity

Product Name: TV Headphones (RS 120-W)

Brand Name: SENNHEISER

Model No.: TR 120-W

Sample Status: Engineering Sample

Applicant: Sonova Consumer Hearing GmbH

Date of Evaluation: May 03, 2022

Standards: FCC Part 2 (Section 2.1091 & 2.1093)

KDB 447498 D04 Interim General RF Exposure Guidance v01

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, 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 EMC characteristics under the conditions specified in this report.

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Lena Wang / Specialist

Approved by : Jeremy Lin , **Date:** Jun. 17, 2022
Jeremy Lin / Project Engineer

2 Description of EUT

Test Item Description	TV Headphones
Product Name	TV Headphones (RS 120-W)
Brand Name	SENNHEISER
Model No.	TR 120-W
Status of EUT	Engineering Sample
Power Ratings	9Vdc, 0.3A max from adapter
Power Supply (Nominal & Testing)	9Vdc, 0.3A max
Operating Temperature range	0°C ~ +40°C
Modulation Type	GFSK
Transmission Technology	DSSS
Technology	Bluetooth
Operating Frequency	2402 - 2480MHz (for Frequency Band: 2400-2483.5MHz)
Channel Spacing	2MHz
Channel Bandwidth	80MHz
Data Transfer Rate	Bluetooth LE 5.2: 1Mbps at Channel No. 37-39 (LE 1M) Bluetooth LE 5.2: 2Mbps at Channel No. 0-36 (LE 2M)
Number of Channel	40
Maximum Output Power	Bluetooth LE 5.2 (1Mbps): 6.668 mW (8.24dBm) Bluetooth LE 5.2 (2Mbps): 6.653 mW (8.23dBm) From RF report no. RFBCEE-WTW-P21110658
Antenna Type	Planar Inverted-F Antennas (PIFA)
Antenna Gain	Antenna 1: 0.84dBi Antenna 2: 1.65dBi (two antennas, using only one at a time)
HW Version	V0.4
SW Version	V3.1.0
Antenna Connector	N/A
Cable Supplied	Non-detachable 2m shielded Stereo RCA audio cable (without core) at transmitter

Note:

1. The Transmitter of EUT use following devices: (Support unit)

Device Name	Headphones
Brand Name	SENNHEISER
Model No.	HDR 120-W

2. The Transmitter of EUT uses following adapter:

External power supply Type No.NT9-3AW	
Brand Name	SENNHEISER
Model No.	PSAC03R-090
Input Power	100-240Vac, 50-60Hz, 0.1A
Output Power	9Vdc, 0.3A max
Power Line	1.5m DC cable with core attached on adapter

3. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3 Applicable RF Exposure Limit

§ 1.1310 Radiofrequency radiation exposure limits.

(a) Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) of this part within the frequency range of 100 kHz to 6 GHz (inclusive).

(b) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube).

Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.

(c) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

(e) Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields

➤ Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	f/1500	30
1500-100,000	1.0	30

➤ Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6

4 Applicable Evaluation Criteria

1 mW Blanket Exemption – §1.1307(b)(3)(i)(A)

- The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A).

MPE-based Exemption – §1.1307(b)(3)(i)(C)

- The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. Table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits.

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R ² .
1.34-30	3,450 R ² /f ² .
30-300	3.83 R ² .
300-1,500	0.0128 R ² f.
1,500-100,000	19.2R ² .
R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.	

MPE-based Exemption – §1.1307(b)(3)(i)(B)

- For mobile devices that are not exempt per Table 1 of §1.1307(b)(1)(i)(C) and device at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz.

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

SAR-based Exemption - §1.1307(b)(3)(i)(B)

- The SAR-based exemption formula of §1.1307(b)(3)(i)(B), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW). This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz

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

where

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

and f is in GHz, d is the separation distance (cm)

When 10-g extremity SAR applies, SAR test exemption may be considered by applying a factor of 2.5 to the SAR-based exemption thresholds.

5 Test Result

MPE-based Exemption §1.1307(b)(3)(i)(C)							
Operation Mode	Frequency Band (MHz)	Maximum Power (mW)	Antenna Gain (dBi)	ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
Bluetooth	2402-2480	6.561	1.65	5.847	20	768	Pass

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible

6 Conclusion

Source-base time average power is below Exemption Criteria and/or MPE thresholds, therefore the device is compliant FCC RF exposure requirement.

7 Construction Photos of EUT

Please refer to the attached file (BCEE-WTW-P21110658 (EUT photo)).

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