RF Exposure Evaluation Report

Applicant:	Wavee Group Inc.
Address of Applicant:	232 Manning Avenue, Toronto, Ontario, M6J 2K7, Canada
Equipment Under Test (EUT)	
Product Name:	WAVEE W-1 Electric Toothbrush Speaker System
Model No.:	W1BTS
FCC ID:	2AW2XW1BTS
Applicable standards:	FCC CFR Title 47 Part 2 Subpart J Section 2.1091
Date of sample receipt:	13 Jul., 2020
Date of Test:	14 Jul., to 20 Aug., 2020
Date of report issue:	21 Aug., 2020
Test Result:	PASS*

Authorized Signature:

Bruce Zhang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*21 Aug., 2020*	*Original*

Tested by: YT Yang ***Date:*** *21 Aug., 2020*

Test Engineer

Reviewed by: Winner Zhang ***Date:*** *21 Aug., 2020*

Project Engineer

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4 General Information

4.1 Client Information

Applicant:	Wavee Group Inc.
Address:	232 Manning Avenue, Toronto, Ontario, M6J 2K7, Canada
Manufacturer:	Wavee Group Inc.
Address:	232 Manning Avenue, Toronto, Ontario, M6J 2K7, Canada
Factory:	SHENZHEN YINHONG ELECTRONICS CO., LTD
Address:	2nd floor 2# building Hongzhu Yongqi Techno park, lezhujiao village, xixiang Baoan district, Shenzhen

4.2 General Description of E.U.T.

Product Name:	WAVEE W-1 Electric Toothbrush Speaker System
Model No.:	W1BTS
Operation Frequency:	110kHz ~ 125kHz
Modulation technology:	PWM
Antenna Type:	Coil Antenna
AC Adapter:	Model: W&T-AD1812B050200UU Input: AC100-240V, 50/60Hz, 0.35A Output: DC 5.0V, 2A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

4.3 Operating Modes

Operating mode	Detail description
Full mode	Keep the EUT in Full mode

4.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
Wavee Group Inc.	electric toothbrush	W1ETB	N/A	N/A

4.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Field Strength (9kHz ~ 30MHz)	± 2% (k=2)

4.6 Additions to, deviations, or exclusions from the method

No

4.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1211**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

4.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
Address: No.110~116, Building B, Jinyuan Business Building, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

4.9 Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
Electromagnetic field strength analyzer	Coliy Technology GmbH	E300	13945	12-25-2019	12-24-2020

5 Technical Requirements Specification in FCC CFR Title 47 Part 2.1091

5.1 Limits

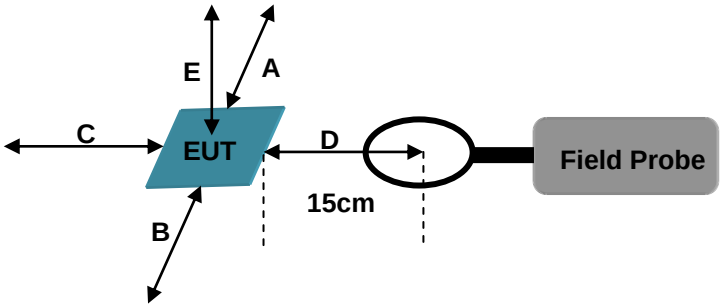
Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.
According to KDB 680106 D01 RF Exposure Wireless Charging Apps, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm for devices designed for typical desktop applications. E and H field strength measurements or numerical modelling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm measured from the center of the probe(s) to the edge of the device.

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
0.003-10[21]	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142f^{0.3417}$	$0.008335f^{0.3417}$	$0.02619f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158f^{0.5}$	$4.21 \times 10^{-4}f^{0.5}$	$6.67 \times 10^{-5}f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

5.2 Test Setup Block



Remrak: *The E300 probe antenna diameter is 11.5cm.*

5.3 Limits For General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm_2)	Averaging Time (minutes)
0.3 ~ 3.0	614	1.63	(100)*	30
3.0 ~ 30	824/f	2.19/f	$(180/f_2)$*	30
30 ~ 300	27.5	0.073	0.2	30
300~1500	-	-	f/1500	30
1500~100000	-	-	1.0	30

5.4 Test Procedure

KDB 680106 D01 Section 5(b):
(1) Power transfer frequency is less than 1 MHz. -- Yes, the device operate in the frequency 110kHz~125KHz. (2) Output power from each primary coil is less than or equal to 15 watts. -- Yes, the maximum output power of the primary coil is 10W. (3) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils. --Yes, the transfer system includes only single primary and secondary coils. (4) Client device is placed directly in contact with the transmitter. -- Yes, client device is placed directly in contact with the transmitter. (5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion). -- Yes, the DUT is a Wireless Charging mobile. (6) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit. --Yes the EUT field strength levels are less than 50% of the MPE limit.

1. Turn on the ELT-400 power switch, select the range of 320μT or 80mT (determined according to the actual radiation intensity of DUT), select the peak detection mode, select the Max-Hold display, and select the low sideband range at 30Hz.
2. Measured the ambient noise at this time and record.
3. During the measurement, the magnetic field probe centre of the ELT-400 is kept in 15cm distance from each test surface of the wireless charging base, and recorded the measured values of the A, B, C, D, and E side are separately.
4. After all the measured values of the A, B, C, D, and E side are subtracted the background noise separately, they are the true magnetic field strength values at that point.
5. The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.
6. The required magnetic field strength (unit: A/m) and electric field strength (unit: V/m) can be obtained by the following conversion formula:
   a) A/m =μT/1.25;
   b) dBμA/m = 20lg(A/m) + 120;

5.5 Result

a) Magnetic Field Strength Measurement

Measured Side	Distance (cm)	Measured Value (A/m)	50 % of Limit (A/m)	Limit (A/m)
A	15	0.198	0.815	1.63
B	15	0.186	0.815	1.63
C	15	0.174	0.815	1.63
D	15	0.163	0.815	1.63
E	20	0.167	0.815	1.63

Note: 1. We use the worst test distance with 15cm for all side.
2. For the top side, we test with distance 15cm and 20cm, cuz the test distance with 15cm is the worst mode, this report only shows the worst mode.