Test report

according to ISO/IEC 17025:2017

FCC
(Federal Communications Commission)
Test Firm Registration Number: 768032
Designation Number DE0022

RF Exposure

e-CFR Title 47 Chapter I Subchapter A
§1.1310

FCC KDB 680106 D01
RF Exposure Wireless Charging App v03

Deutsche
Akkreditierungsstelle
D-PL-17379-01-00
D-PL-17379-01-02
D-PL-17379-01-03

Bundesnetzagentur

BNetzA-CAB-18/21-19

TESTED IN GERMANY

STC Germany GmbH
Ohmstrasse 1
84160 Frontenhausen, Germany
Tel.: + 49 (0) 8732 6381
Fax: + 49 (0) 8732 2345
E-mail: grstc@stc.group

Test report no.: **20/04-0002**

Table of contents

Location of test facility:

STC Germany GmbH
Ohmstrasse 1
84160 Frontenhausen
Germany

1. Client information

Name:	V-Juice
Address:	Emil-Geis-Straße 33
Name of contact:	Tilman Roeder
Telephone:	+49 172 1083212
Fax:	-/-
E-mail:	E-Mail: tilman@v-juice.de

2. Equipment under test (EUT)

2.1 Identification of the EUT

Equipment:	Inductive Charger
Model:	1.0
Brand name:	V-Juice
Serial no.:	-/-
Manufacturer:	V-Juice
Country of origin:	Germany
Power rating:	5 V ⎓ ; min 0.8 A
Highest frequency generated or used in the device or on which the device operates or tunes:	205 kHz
Date Sample Received:	03.04.2020
Tests were performed:	15.06.2020

2.2 Additional information about the EUT:

-/-

To duplicate parts of this test report needs the written confirmation of the test laboratory.

The test results relate only to the above mentioned test sample(s).

3. Description of the Equipment under test and test conditions

FCC-ID:	2AV3O-V-JUICE1
Cables:	-/-
Approx. Size (l x w x h):	(41.5 x 6.0 x 1.0) cm
Test conditions:	The “Inductive Charger - 1.0” (=equipment under test – EUT) had been tested, with a host AC-Adaptor and an input voltage of 120 V / 60 Hz in the following modes: 1. EUT active – Output: with artificial max. load 500mA; direct contacted 2. EUT active – Output: with artificial max. load 500mA; with distance (2mm) contacted 3. EUT active – Output: with normal load (Battery Pack); direct contacted 4. EUT active – Output: with normal load (Battery Pack); with distance (2mm) contacted The tested configuration represents (based on the product specification) with the tested operation modes the worst case.
Additional information:	-/-
Operating frequencies:	110 kHz – 205 kHz
Max. field strength of fundamental:	QP 71.3 dBµV/m @ 3m
Spurious Emissions: (radiated lowest margin to limit)	QP 38.6 dBµV/m (1.4 dB) @ 3m
Environmental conditions during tests:	Ambient temperature: 20 °C Relative humitity 42 % Atmospheric pressure 955 mbar
Antenna Transmitter:	Model: Type: ☒ External (coil) fixed ☐ Internal

4. Performed measurements and results

The complete list of measurements required in e-CFR Title 47 Chapter I Subchapter A Part 1, § 1.1310 is given below.

Standard:	**Test Method:**		**Test requirements:**			
			applicable:		**fulfilled:**	
			Yes	**No**	**Yes**	**No**
§ 1.1310	KDB 680106	RF Exposure	☒	☐	☒	☐

All required / applicable tests according to the following standards were performed under Ref-No. 20/04-0002.

- e-CFR Title 47 Chapter I Subchapter A Part 1 Subpart I, § 1.1310
- e-CFR data is current as of August 12, 2020

Remark: -/-

5. RF Exposure

Applied standards
- e-CFR Title 47 Chapter I Subchapter A Part 1 Subpart I, § 1.1310
- FCC KDB 680106 D01 RF Exposure Wireless Charging Apps v03 Section 5 b)

Requirement
Inductive wireless power transfer applications with supporting field strength results and meeting all of the following requirements are not required to submit a KDB inquiry for devices approved using SDoC or a PAG for equipment approved using certification to address RF exposure compliance. However, the responsible party is required to keep a copy of the test report in accordance with KDB 865664 D02. A copy of the test report is to be submitted with the application if the device is approved using certification.

1) Power transfer frequency is less than 1 MHz.

2) Output power from each primary coil is less than or equal to 15 watts.

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.

4) Client device is placed directly in contact with the transmitter.

5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

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.

Limits

Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤ 6
3.0-30	1842/f	4.89/f	*(900/f²)	< 6
30-300	61.4	0.163	1.0	< 6
300-1500			f/300	< 6
1500-100000			5	< 6
(ii) Limits for General Population/Unontrolled Exposure				
0.3-1.34	614	1.63	*(100)	< 30
1.34-30	824/f	2.19/f	*(180/f²)	< 30
30-300	27.5	0.73	0.2	< 30
300-1500			f/1500	< 30
1500-100000			1.0	< 30
f = frequency in MHz. *Plane-wave equivalent power density.				

Note: Acc. to KDB 680106 Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz.

Measurement

Measurement performed on 15.06.2020

Fulfilled		Requirement	Comment
Yes	**No**		
X		Power transfer frequency is less than 1 MHz	-/-
X		Output power from each primary coil is less than or equal to 15 watts	-/-
X		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	-/-
X		Client device is placed directly in contact with the transmitter	-/-
X		Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion)	-/-
X		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.	See below

H-Field strengths

Test Position	Test Distance [cm]	Measured Value [µT]	H-Field [A/m]	Limit (50% of MPE-Limit) [A/m]	Result
Top	20	0.272	0.22	0.815	Pass
Front	15	0.267	0.21	0.815	Pass
Left	15	0.273	0.22	0.815	Pass
Rear	15	0.263	0.21	0.815	Pass
Right	15	0.265	0.21	0.815	Pass
Bottom *	15	-/-	-/-	-/-	-/-
* If applicable					
Operation mode: EUT active - Output: with artificial max. load 500mA; direct contacted					

Test Position	Test Distance [cm]	Measured Value [µT]	H-Field [A/m]	Limit (50% of MPE-Limit) [A/m]	Result
Top	20	0.273	0.22	0.815	Pass
Front	15	0.268	0.21	0.815	Pass
Left	15	0.282	0.22	0.815	Pass
Rear	15	0.261	0.21	0.815	Pass
Right	15	0.266	0.21	0.815	Pass
Bottom *	15	-/-	-/-	-/-	-/-
* If applicable					
Operation mode: EUT active - Output: with artificial max. load 500mA; with distance (2mm) contacted					

Test Position	Test Distance [cm]	Measured Value [µT]	H-Field [A/m]	Limit (50% of MPE-Limit) [A/m]	Result
Top	20	0.268	0.21	0.815	Pass
Front	15	0.268	0.21	0.815	Pass
Left	15	0.267	0.21	0.815	Pass
Rear	15	0.272	0.22	0.815	Pass
Right	15	0.278	0.22	0.815	Pass
Bottom *	15	-/-	-/-	-/-	-/-
* If applicable					
Operation mode: EUT active - Output: with normal load (Battery Pack); direct contacted					

Test Position	Test Distance [cm]	Measured Value [µT]	H-Field [A/m]	Limit (50% of MPE-Limit) [A/m]	Result
Top	20	0.265	0.21	0.815	Pass
Front	15	0.283	0.23	0.815	Pass
Left	15	0.291	0.23	0.815	Pass
Rear	15	0.271	0.22	0.815	Pass
Right	15	0.278	0.22	0.815	Pass
Bottom *	15	-/-	-/-	-/-	-/-
* If applicable					
Operation mode: EUT active - Output: with normal load (Battery Pack); with distance (2mm) contacted					

Results

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the **RF-Exposure**.

6. Test equipment

Test equipment used for RF-Exposure evaluation:

Kind of equipment	Manufacturer	Type	Ident no.	Serial no.	Calibrated on	Calibration interval
Isotropic field strength meter (H-Field)	Narda STS (via CMV Hoven GmbH)	ELT-400 + BN 2300/90.10	11228	C-0027	2019-Nov.	3 years

All measurements were made with measuring instruments, including any accessories that may affect test results, calibrated according to the requests of ISO/IEC 17025 according to which the test site is accredited from DAkkS. Measurement of conducted emissions was made with instruments conforming to American National Standard Specification, ANSI C63.4-2014.

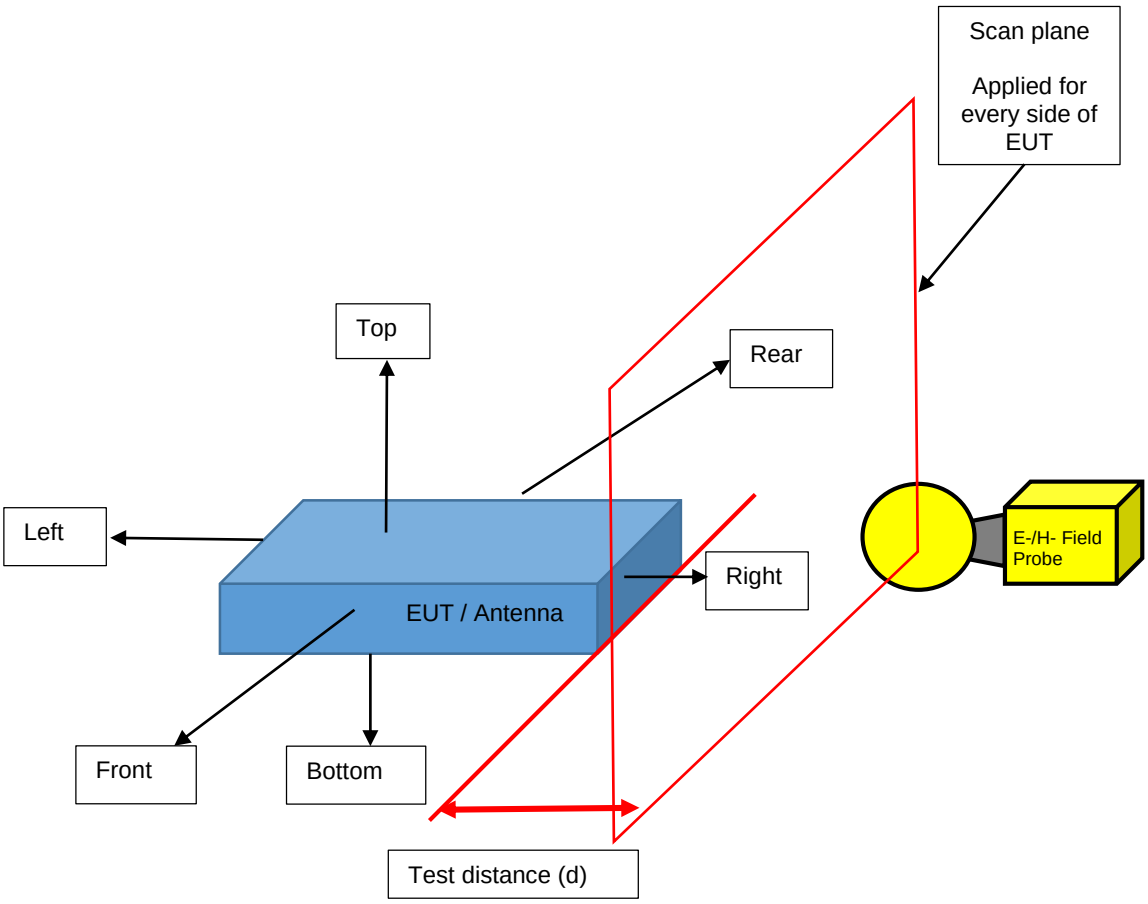
Test equipment to support EUT functions:

Kind of equipment	Manufacturer	Type	Ident no.
AC-Adaptor[1]	Qualcomm	GA-QC810	-/-
USB cable[1]	-/-	USB Typ A – Micro USB	-/-
USB Detector[1]	Keweisi	Voltage and Ampere meter	-/-
Artificial load[2]	TDK	EA02W122T	-/-
Battery Pack[1]	ZENS	ZEPPO4B	-/-

[1] Ancillary equipment, property of Test Laboratory
[2] Ancillary equipment, provided by applicant

7. Test Setups

Setup RF-Exposure



8. Measurement uncertainthy

Measurement	**calculated uncertainty U_{lab}**	**Maximum measurement uncertainty**
Electromagnetic field (10 Hz – 400 kHz)	±5 %	±30 %

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

The measurements uncertainty was calculated in accordance with CISPR 16-4-2 Edition 2.0 2011-06.

The measurement uncertainty was given with a confidence of 95 % (k = 2).

9. Photos setup

Refer to “0002-fcc-photos test setup.pdf” file

10. Conclusions

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the relevant §1.1310 Radiofrequency radiation exposure limits and KDB 680106 D01 RF Exposure Wireless Charging App v03.

Following specific modifications and/or special attributes are necessary to pass the above mentioned requirements:

none

19.08.2020	M. Beindl, Laboratory Engineer	
Erstellt am/*prepared on*	**(Name***/name* / **Stellung***/position***)**	**(Unterschrift/***signature***)**

19.08.2020	A. Tropmann, Head of Laboratory	
Freigabe am/released *on*	**(Name***/name* / **Stellung***/position***)**	**(Unterschrift/***signature***)**

11. Photos of tested sample

Refer to “0002-fcc-ext-photos.pdf” file

End of test report