



FCC Part 1 Subpart I
FCC Part 2 Subpart J

CERTIFICATION TEST REPORT

FOR

WIRELESS CHARGER

MODEL NO: 3768

FCC ID: USQ3768

REPORT NUMBER: 13003458-E2V2

ISSUE DATE: 12/12/2019

Prepared for
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KRONBERG TS, D-61476 DE

Prepared by
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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	10/25/2019	Initial Issue	--
V2	12/12/2019	Updated test dates, operating frequency	Tri Pham

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BRAUN GMBH
T-QTA FRANKFURTER STRASSE 145
KRONBERG TS, D-61476 DE

EUT DESCRIPTION: WIRELESS CHARGER

MODEL NUMBER: 3768

SERIAL NUMBER: 05679

DATE TESTED: JANUARY 29, 2019

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 1 SUBPART I & PART 2 SUBPART J	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:



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UL Verification Service Inc.

Prepared By:



Tri Pham
Project Engineer
UL Verification Services Inc.

2. TEST METHODOLOGY

All calculations were made in accordance with FCC KDB 447498 D01, KDB 447498 D03, and KDB 680106 D01 v03.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA.

The test sites and facilities are covered under FCC Test Firm Registration # 208313.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

4. EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF EUT

The EUT is wireless charging base. The device operates from 80kHz – 96kHz. Testing was performed on the observed fundamental frequency of 88 kHz.

4.2. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

SUPPORT EQUIPMENT & PERIPHERALS LIST			
Description	Manufacturer	Model	Serial Number
Toothbrush	Braun GMBH	3758	W477

I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Unshield	1.5	

TEST SETUP

The following three configurations are tested:

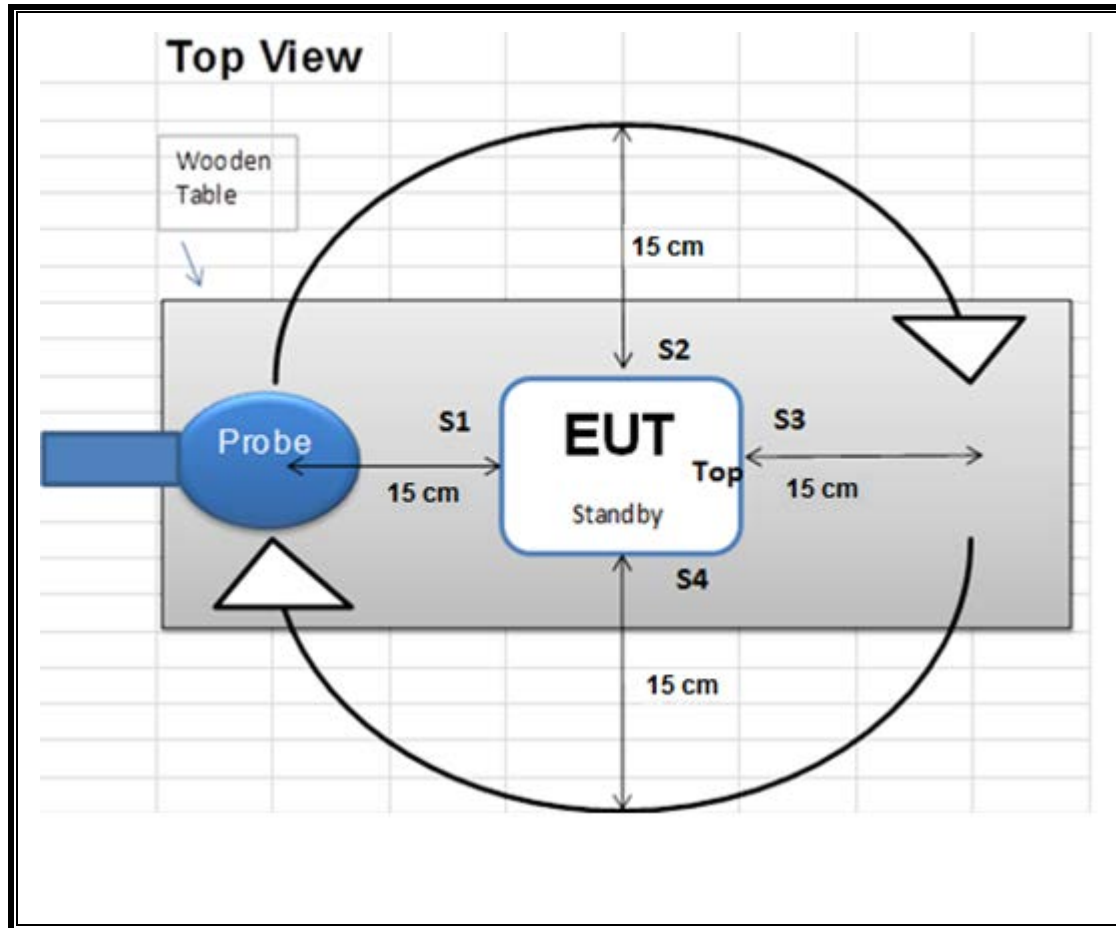
Configuration	Mode	Descriptions
1	Standby (< 10% Power Detecting)	EUT Alone powered by AC/DC adapter
2	Operating (With toothbrush charging) Note: Measurements were made when the battery level of the toothbrush was at a state of <10%, 50%, and 100%.	EUT and toothbrush powered by AC/DC adapter

MEASUREMENT SETUP

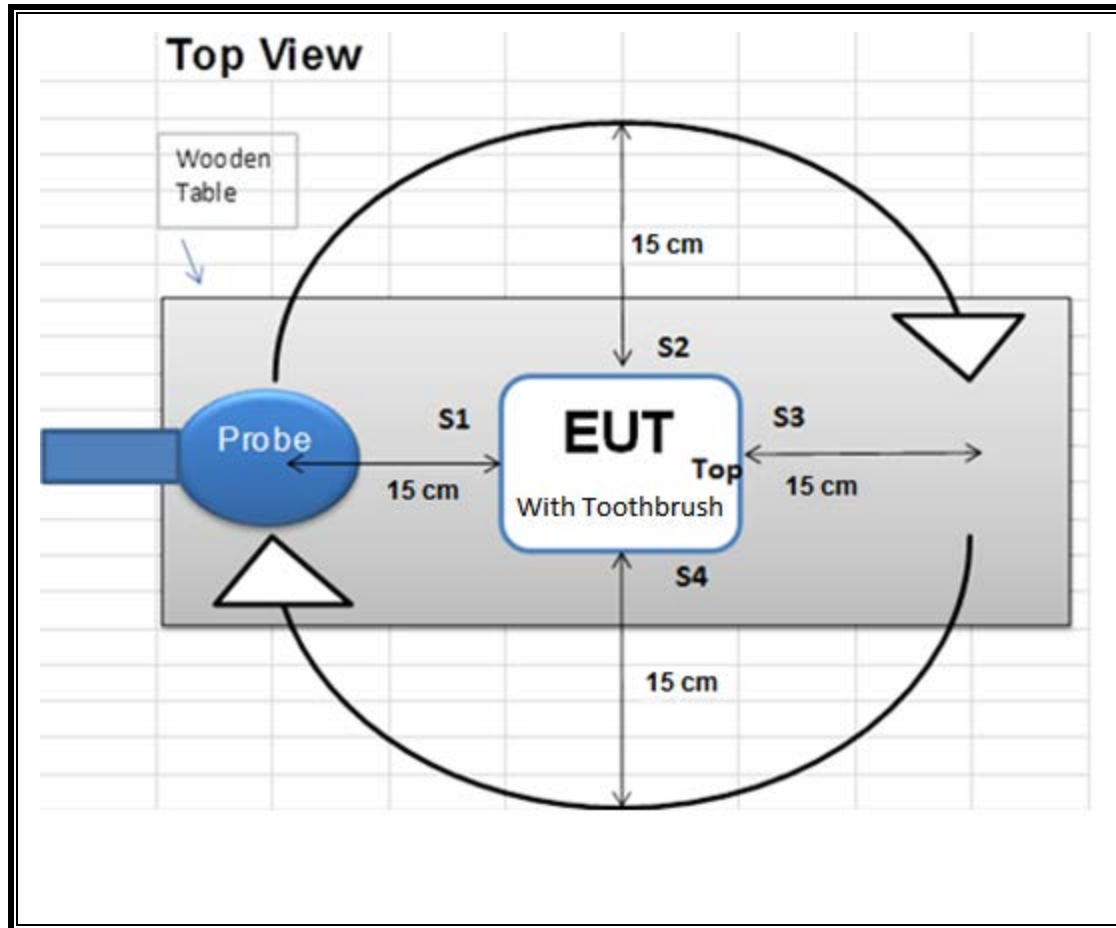
The measurement was taken using a probe placed 15cm surrounding the device and 20cm above the top surface of the EUT.

Measurements were taken from the top and all sides of the EUT per KDB 680106 D01 v03.

CONFIGURATION 1



CONFIGURATIONS 2



5. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment were used for the tests documented in this report:

Test Equipment List					
Description	Manufacturer	Model	S/N	Cal Date	Cal Due
Electric and Magnetic Field Probe	Narda	EHP-200A	170WX80318	10/24/2018	10/24/2019
Spectrum Analyzer	Agilent	E4446A	MY43360112	01/28/2019	01/28/2020

6. DUTY CYCLE

LIMITS

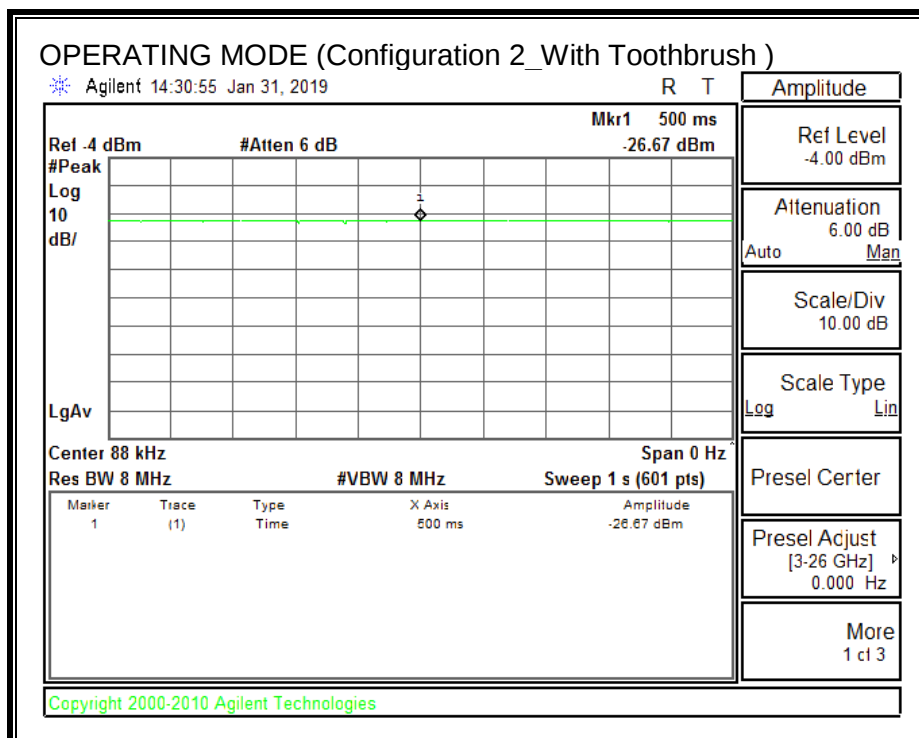
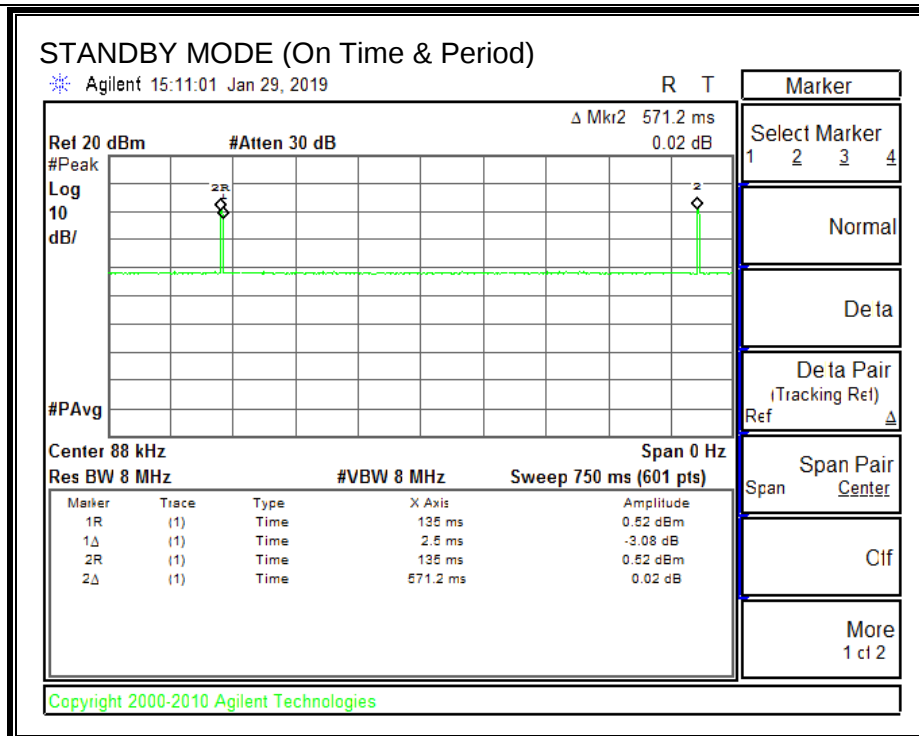
None; for reporting purposes only.

PROCEDURE

Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)
Standby (Config 1)	2.50	571.20	0.0044	0.44%
Operating(Config 2)	100.00	100.00	1.00	100.00%



7. MAXIMUM PERMISSIBLE RF EXPOSURE TEST RESULTS

7.1. FCC LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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
300–1500			f/300	6
1500–100,000			5	6
(B) 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

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

Note: The limit at 300 kHz was used for this device based on KDB enquiry

7.2. SUMMARY OF TEST RESULTS

RESULTS

ID:	29435	Date:	1/29/2019
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Note: Both magnetic and electric field strengths have been investigated from 9 kHz to 30 MHz at 15cm surrounding the device and 20cm above the top surface of the EUT operation frequency is at 88 kHz.

The inductive wireless power transfer device meets all of the following requirements:

- ☒ Power transfer frequency is less than 1 MHz
- ☒ Output power from each primary coil is less than or equal to 15 watts.
- ☒ 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.
- ☒ Client device is placed directly in contact with the transmitter.
- ☒ Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
- ☒ 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.

FCC RF Exposure Summary of Results

Electric Field			Magnetic Field		
FCC Limit (V/m)	Maximum Average Reading (V/m)	Percentage (%)	FCC Limit (A/m)	Maximum Average Reading (A/m)	Percentage (%)
614	1.881	0.31%	1.63	0.173	10.61%

Note: since the E and H field are lower than the limit by more than 50% of the limit then a PAG is not required.

7.3. DETAILED TEST RESULTS

E- FIELD AND H- FIELD MEASUREMENTS

Note: Peak measurements were performed. RMS values were calculated from the peak measurement. Please refer to the formula for calculating the RMS values: [Field Strength x $\sqrt{\text{Duty Cycle}}$].

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit	Electric Field Reading				Magnetic Field Limit	Magnetic Field Reading			
			(V/m)	(V/m)				(A/m)	(A/m)			
			FCC	Location	Peak	Duty Cycle %	FCC Average	FCC	Location	Peak	Duty Cycle %	FCC Average
1	Standby	15 cm surrounding the device (S1-S4) and 20 cm above the top surface of the EUT	614	S1	0.862	0.44	0.057	1.63	S1	0.041	0.44	0.003
				S2	0.292		0.019		S2	0.043		0.003
				S3	0.267		0.018		S3	0.035		0.002
				S4	0.269		0.018		S4	0.035		0.002
				Top	0.378		0.025		Top	0.076		0.005
				Max	0.862		0.057		Max	0.076		0.005
				2	Operating Power ~ 0% Charging	S1	1.451		100.00	1.451	S1	0.115
S2	1.472					1.472	S2			0.151	0.151	
S3	1.411					1.411	S3			0.164	0.164	
S4	1.531					1.531	S4			0.128	0.128	
Top	0.901					0.901	Top			0.069	0.069	
Max	1.532					1.532	Max			0.164	0.164	
Operating Power 50% Charging	S1				1.625	100.00	1.625		S1	0.154	100	0.154
	S2				1.600		1.600		S2	0.168		0.168
	S3				1.648		1.648		S3	0.173		0.173
	S4				1.813		1.813		S4	0.159		0.159
	Top				0.842		0.842		Top	0.063		0.063
	Max				1.815		1.815		Max	0.173		0.173
Operating Power 100 % Charged	S1				1.751	100.00	1.751		S1	0.098	100	0.098
	S2				1.854		1.854		S2	0.097		0.097
	S3				1.881		1.881		S3	0.093		0.093
	S4				1.843		1.843		S4	0.066		0.066
	Top				0.453		0.453		Top	0.040		0.040
	Max			1.881	1.881		Max		0.098	0.098		