



FCC Part 1 Subpart I
FCC Part 2 Subpart J

TEST REPORT

FOR

TOOTHBRUSH CHARGING BASE

MODEL NUMBER: 3783

FCC ID: 2AG9A51910

REPORT NUMBER: R13158070-E9

ISSUE DATE: 2020-10-30

Prepared for
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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2020-09-16	Initial Issue	--
V2	2020-10-30	Added notes about WPT state and battery charge state to Section 4.1	Richard Jankovics

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Braun GMBH
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Germany

EUT DESCRIPTION: Wireless Toothbrush Charging Base

MODEL NUMBER: 3783

SERIAL NUMBER: BW01296900025

DATE TESTED: 2020-07-13 – 2020-07-30

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

UL LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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.

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2. TEST METHODOLOGY

All testing/ 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 2800 Perimeter Park Dr., Suite B, Morrisville, NC 27560, USA.

UL LLC is accredited by NVLAP, Laboratory Code 200246-0

4. EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF EUT

The EUT is a wireless toothbrush charging base with a BT/BLE/2.4/5GHz WLAN radio and supports wireless power transfer (WPT). This report covers the RF Exposure of the WPT function of the device. WPT field is always present while base is powered, however the field strength and duty cycle vary with the presence of the load, and with the battery's charge state. Testing performed across various states to ensure worst case emissions is captured.

4.2. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Toothbrush	Braun	3765	BC811081910	USQ3765
Toothbrush	Braun	3765	BC811081911	USQ3765
Toothbrush	Braun	3765	BC811081913	USQ3765
Power Supply	Braun	3780	N/A	N/A

I/O CABLES

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	1	1	Proprietary 2 prong	2 conductor wire	<3	none

TEST SETUP

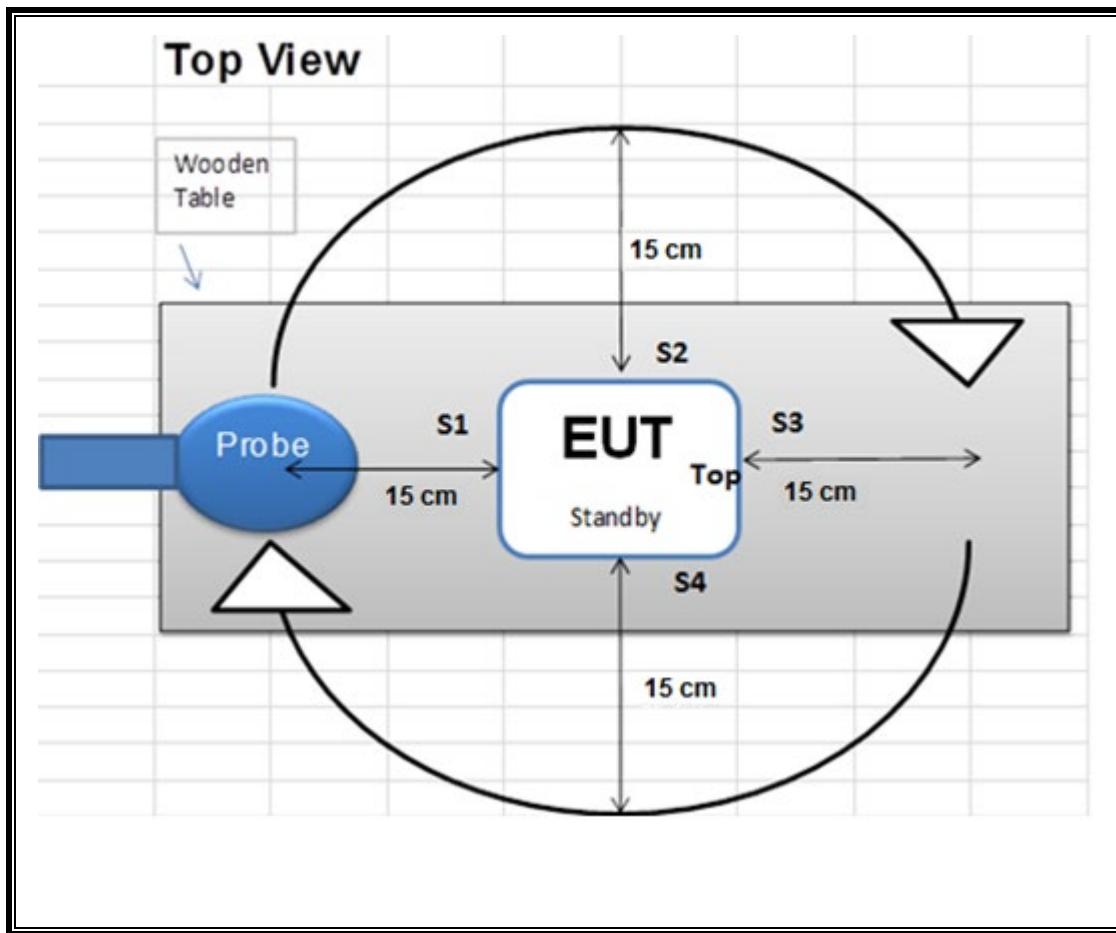
The following two configurations are tested:

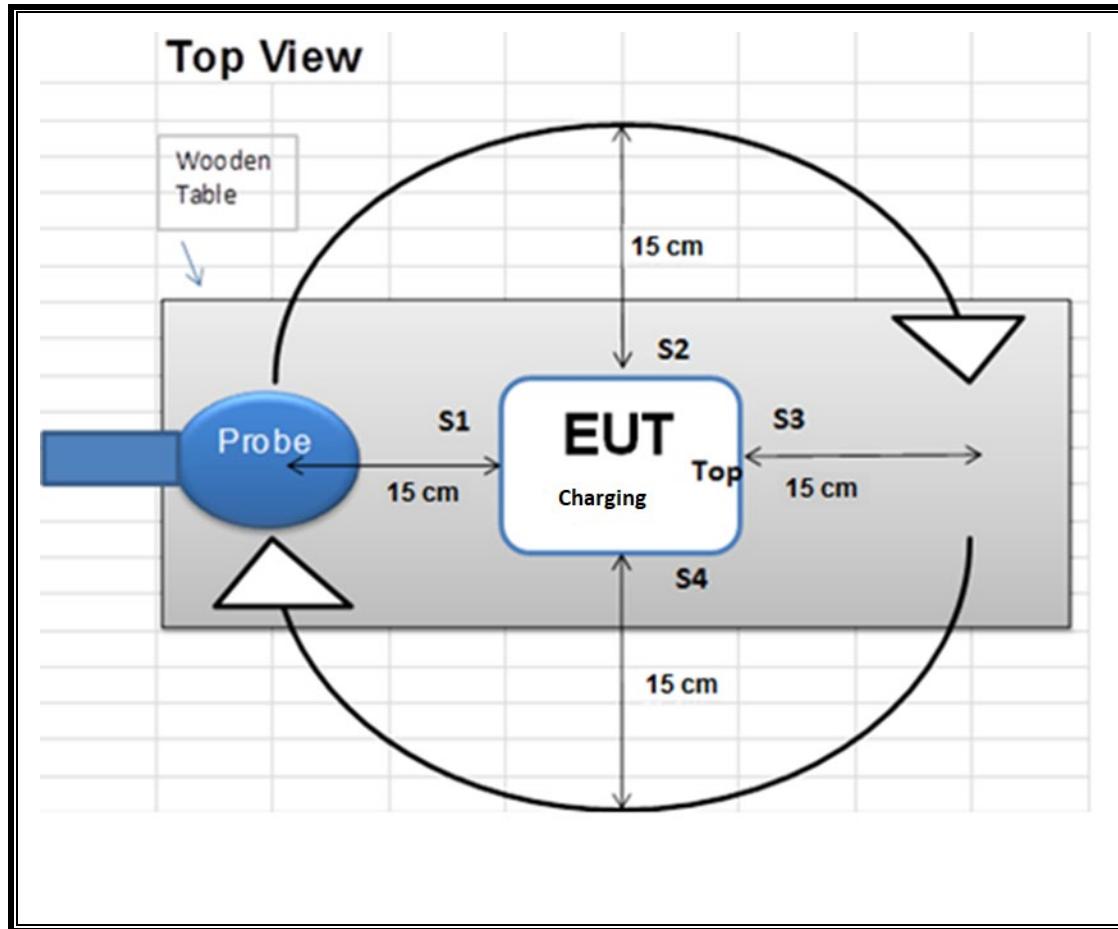
Configuration	Mode	Descriptions
1	Standby (< 10% Power Detecting)	EUT Alone powered by AC/DC adapter
2	Operating (With EUT charging) Note: Measurements were made when the battery level of the EUT was at a state of <10%, 50%, and 100%.	EUT powered by AC/DC adapter

MEASUREMENT SETUP

The measurement was taken using a probe placed 15 cm surrounding the device and 20 cm above the top surface of the EUT, per KDB 680106 D01 v03, Clause 3 c) for desktop applications.

CONFIGURATION 1





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	160WX41008	2019-11-25	2020-11-25
Electric and Magnetic Field Probe	Narda	EHP-200AC	170WX80318	2020-07-14	2021-07-14
Spectrum Analyzer	Agilent	N9030A	MY54490254	2020-06-10	2021-06-10

6. DUTY CYCLE

LIMITS

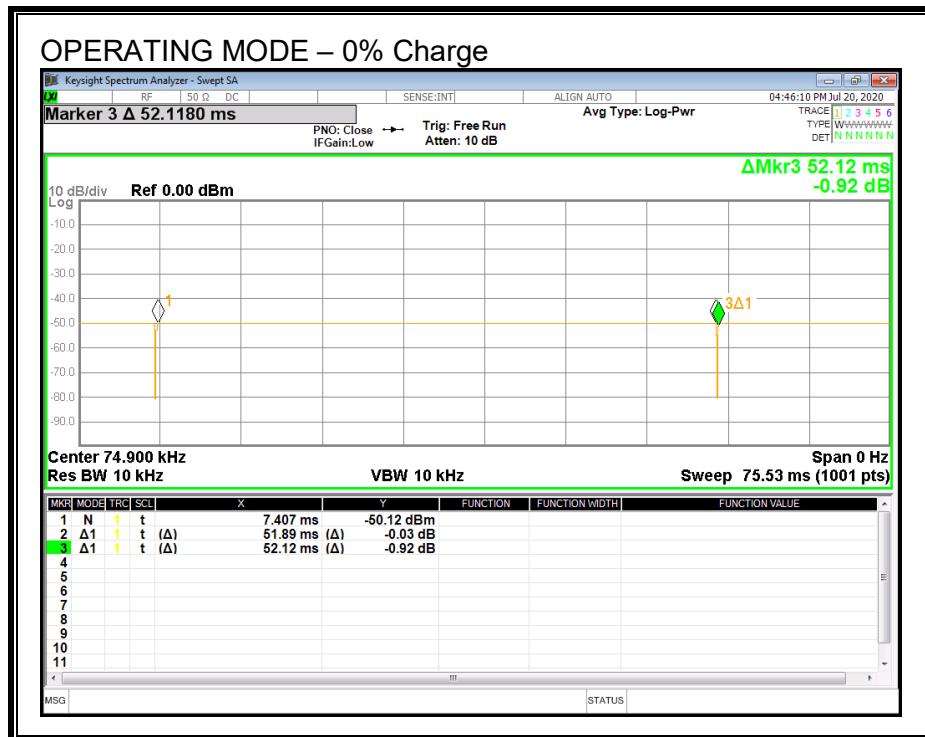
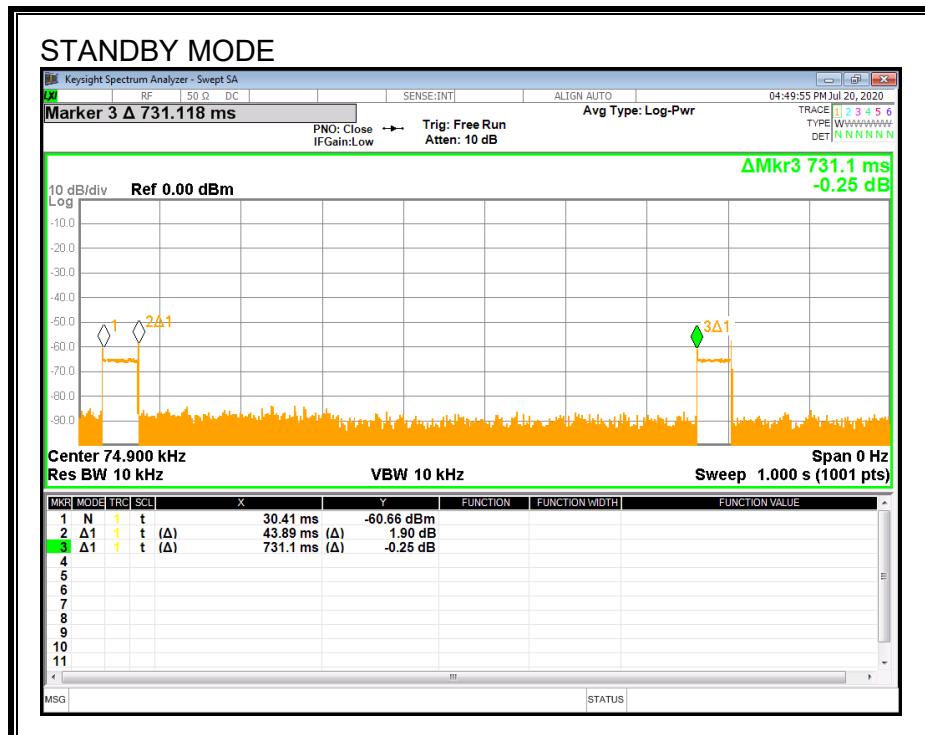
None; for reporting purposes only.

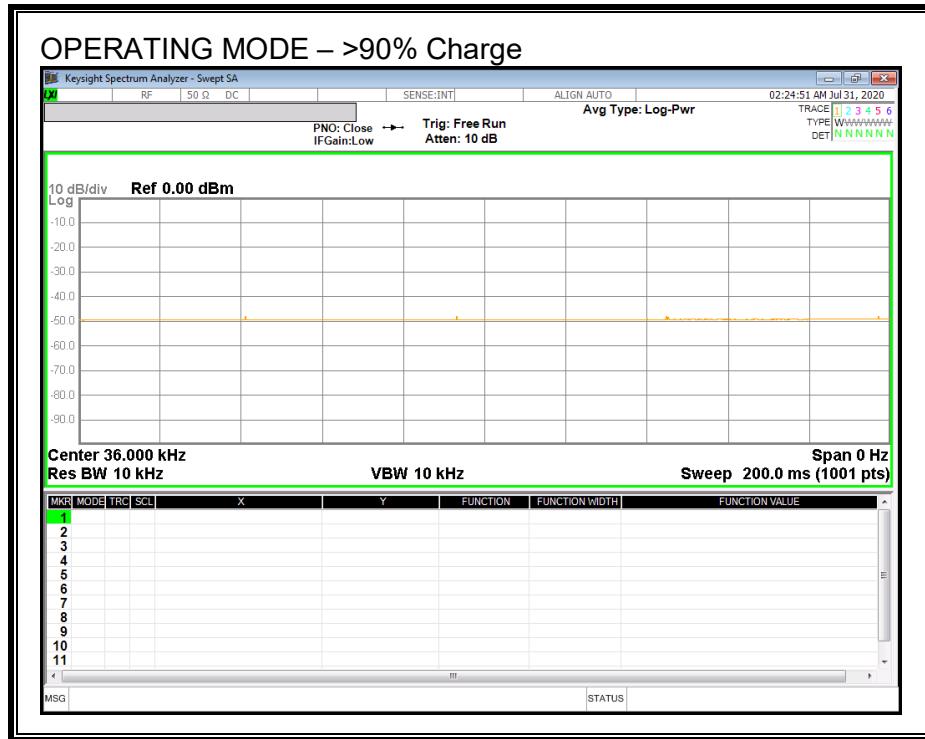
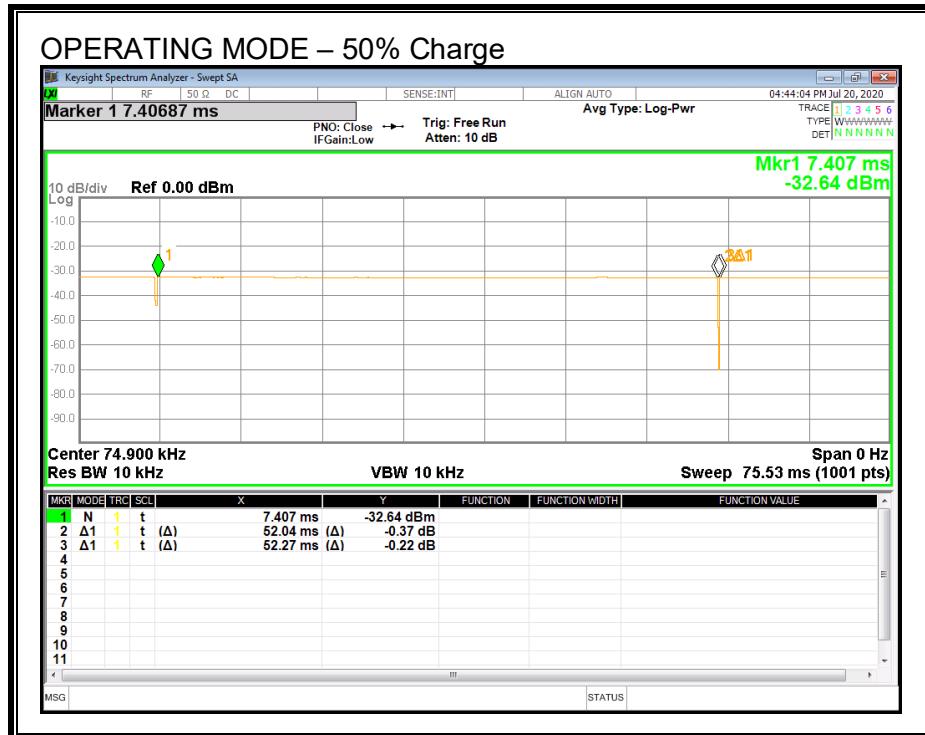
PROCEDURE

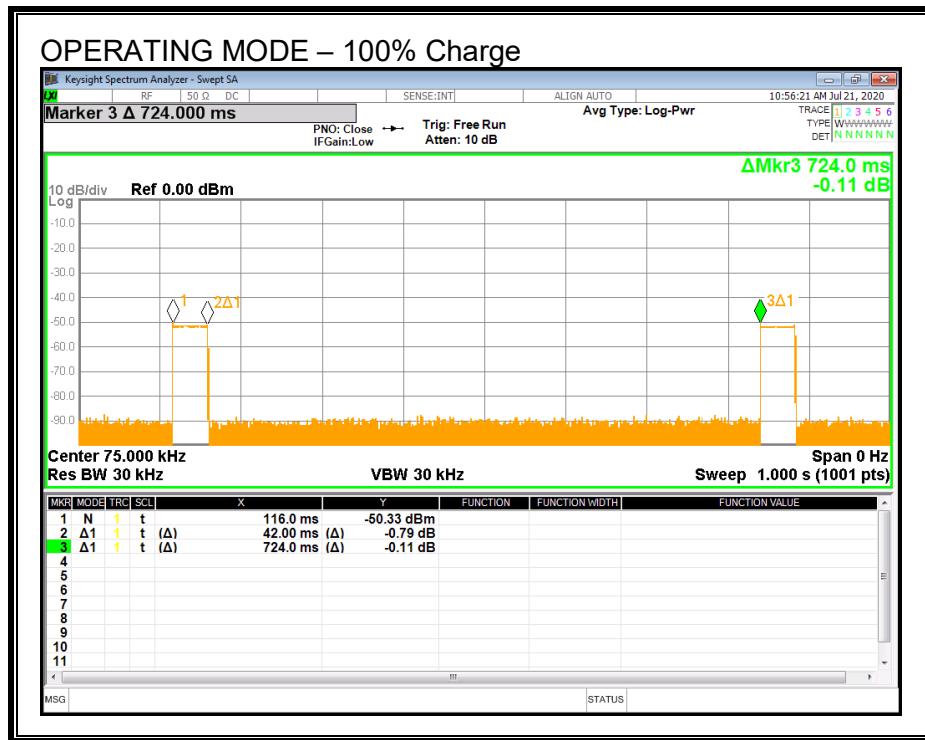
Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)
Standby	43.89	731.10	0.060	6.00%
Operating - 0% Charge	51.89	52.12	0.996	99.56%
Operating - 50% Charge	52.04	52.27	0.996	99.56%
Operating - >90% Charge	-	-	1.000	100.00%
Operating - 100% Charge	42.00	724.00	0.058	5.80%







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 below 100 kHz was used for this device based on KDB enquiry. The reference levels specified were E_{max} = 83 V/m and H_{max} = 90 A/m.

7.2. SUMMARY OF TEST RESULTS

RESULTS

ID:	21193/84740	Date:	2020-07-13 – 2020-07-30
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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 at 30-47 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 (%)
83	13.928	16.78%	90	0.524	0.58%

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 $\sqrt{\text{Duty Cycle}}$].

Config	Test Mode	Meas Dist (cm)	E field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading					
				(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	83	S1	3.155	6.00	0.773	90	S1	0.486	6.00	0.119		
				S2	3.119		0.764		S2	0.487		0.119		
				S3	3.146		0.771		S3	0.507		0.124		
				S4	3.066		0.751		S4	0.486		0.119		
				Top	3.216		0.788		Top	0.494		0.121		
				Max	3.216		0.788		Max	0.507		0.124		
2	Operating Power ~0% Charging	15 cm surrounding the device (S1 - S4) and 20 cm above the top surface of the EUT	83	S1	3.274	99.56	3.266	90	S1	0.492	99.56	0.490		
				S2	3.222		3.215		S2	0.501		0.500		
				S3	3.395		3.388		S3	0.489		0.488		
				S4	3.276		3.269		S4	0.500		0.499		
	Operating Power 50% Charging			Top	7.136		7.121		Top	0.517		0.516		
				Max	7.136		7.121		Max	0.517		0.516		
				S1	3.182	99.56	3.175		S1	0.500	99.56	0.498		
				S2	3.198		3.190		S2	0.500		0.499		
	Operating Power >90% Charging			S3	3.324		3.317		S3	0.505		0.504		
				S4	3.256		3.249		S4	0.512		0.511		
				Top	7.430		7.414		Top	0.525		0.524		
				Max	7.430		7.414		Max	0.525		0.524		
	Operating Power 100 % Charged	15 cm surrounding the device (S1 - S4) and 20 cm above the top surface of the EUT	83	S1	5.638	100.00	5.638	100	S1	0.469	100	0.469		
				S2	5.515		5.515		S2	0.478		0.478		
				S3	5.504		5.504		S3	0.491		0.491		
				S4	5.496		5.496		S4	0.462		0.462		
				Top	13.928		13.928		Top	0.484		0.484		
				Max	13.928		13.928		Max	0.491		0.491		
				S1	3.173	5.80	0.764		S1	0.500	5.8	0.120		
				S2	3.172		0.764		S2	0.496		0.120		
				S3	3.166		0.762		S3	0.492		0.118		
				S4	4.026		0.970		S4	0.495		0.119		
				Top	4.809		1.158		Top	0.523		0.126		
				Max	4.809		1.158		Max	0.523		0.126		