FCC Part 1 Subpart I
FCC Part 2 Subpart J

TEST REPORT

FOR

AMBULATORY ELECTROCARDIOGRAM CHARGING BASE & GATEWAY

MODEL NO: MOME ARC CHARGER, MOME ARC GATEWAY

FCC ID: 2AHLC01858 (Charger), 2AHLC01856 (Gateway)

REPORT NUMBER: R14275554-E10 v5

ISSUE DATE: 2024-01-08

Prepared for
INFOBIONIC, INC
400 TOTTEN POND RD STE 315
WALTHAM, MA 02451, U.S.A.

Prepared by
UL LLC
12 LABORATORY DR.
RESEARCH TRIANGLE PARK, NC 27709 USA
TEL: (919) 549-1400

CERT #0751.06

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-10-03	Initial Issue	Niklas Haydon
V2	2023-10-13	Added E-Field measurements for configuration 4 to §8.3.	Richard Jankovics
V3	2023-11-21	Removed setup photos Added setup photos exhibit reference.	Brian Kiewra
V4	2024-01-02	§5.2 Added diagram for the device separation under the Measurement Setup. §8.3 Updated data and explanation of duty cycle for Configuration 4 – Portable use RF Exposure.	Richard Jankovics
V5	2024-01-08	§8.2 Added clarification of probe distances for portable configuration. §8.3 Added clarification of test conditions. Updated measurement data for Configuration 4 – Portable use RF Exposure.	Richard Jankovics

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: InfoBionic, Inc
400 Totten Pond Rd STE 315
Waltham, MA 02451, U.S.A

EUT DESCRIPTION: Ambulatory Electrocardiogram Charging Base & Gateway

MODEL NUMBER: MoMe ARC Charger, MoMe ARC Gateway

SERIAL NUMBER: Charger (MIB2007), Gateway(MIB2008)

DATE TESTED: 2022-11-14 to 2022-11-30, 2023-06-06

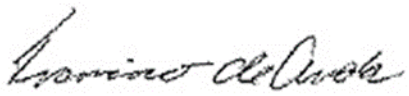
APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 1 SUBPART I & PART 2 SUBPART J	Complies

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.

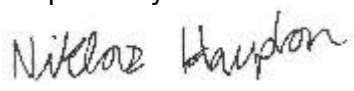
This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released For
UL LLC By:



Francisco de Anda
Staff Engineer
Consumer Technology Division
UL LLC

Prepared By:



Niklas Haydon
Operations Leader
Consumer Technology Division
UL LLC

2. TEST METHODOLOGY

All testing / calculations were made in accordance with FCC KDB 447498 D01, KDB 447498 D03, KDB 680106 D01 v03 and FCC OET Bulletin 65 Edition 97-01.

3. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, Certificate Number 0751.06, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
☒	Building 2800 Suite Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. DECISION RULES

For all tests where the applicable U_{LAB} <= U_{MAX} the Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2, where U_{MAX} = 30% (0.3) for RF Exposure evaluations. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

For all tests where the applicable U_{LAB} > U_{MAX} the Decision Rule is based on Guarded Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.3.2, with a guard band equal to (U_{LAB} – U_{MAX}), where U_{MAX} = 30% (0.3) for RF Exposure evaluations. (Test results are adjusted by the value of the guard band to determine conformity with a specified requirement.)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Magnetic Field using Exposure Level Meter	+/- 0.80 dB
Electric Field using Exposure Level Meter	+/- 0.91 dB
Time	3.39%

Uncertainty figures are valid to a confidence level of 95%, k = 2.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is made up of three devices. The base charges the gateway and the gateway charges the sensor. The operating frequencies for the sources and loads are as follows:

- Base is a source at 110kHz-200kHz
- Gateway is a load at 110kHz-200kHz
- Gateway is a source at 1MHz
- Sensor is a load at 1MHz

5.2. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	HDP	HDP12-MD05024U	N/A	N/A
Terminated Lead Set	Infobionic	N/A	N/A	N/A
Sensor	Infobionic	MoMe ARC Sensor	IB1033	2AHLC01857

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USB	1	USB	Shielded	<3m	Power Cable
2	N/A	3	Leads	Shielded	<3m	Lead Cables

TEST SETUP

The following two configurations are tested:

Configuration	Mode	Descriptions
1	Standby Note: < 10% Power Detecting	Charger alone powered by AC/DC adapter in desktop configuration
2	Operating (Charger) Note: Measurements were made when the battery level of the load was at a state of <10%, 50%, >90% and 100%. Standby (Gateway) Note: < 10% Power Detecting	Charger powered by AC/DC adapter charging Gateway in desktop configuration
3	Operating Note: Measurements were made when the battery level of the load was at a state of <10%, 50%, >90% and 100%.	Charger powered by AC/DC adapter charging Gateway power by battery charging Sensor in desktop configuration
4	Operating Note: Measurements were made when the battery level of the load was at worst-case found in Config 3 (>90%).	Gateway powered by battery charging Sensor in portable configuration

MEASUREMENT SETUP

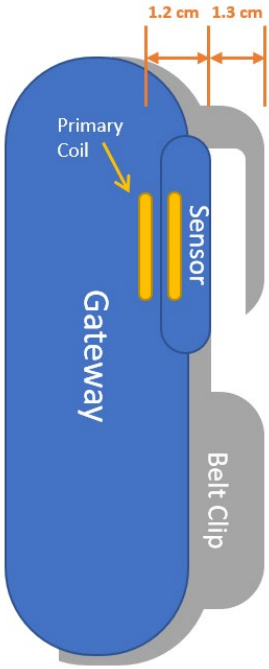
For desktop configuration, the measurement was taken using a probe placed 15cm surrounding the device and 20cm above the top surface of the EUT.

For portable configuration, the measurement was taken using a probe placed 0cm surrounding the device including front and back of the EUT.

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

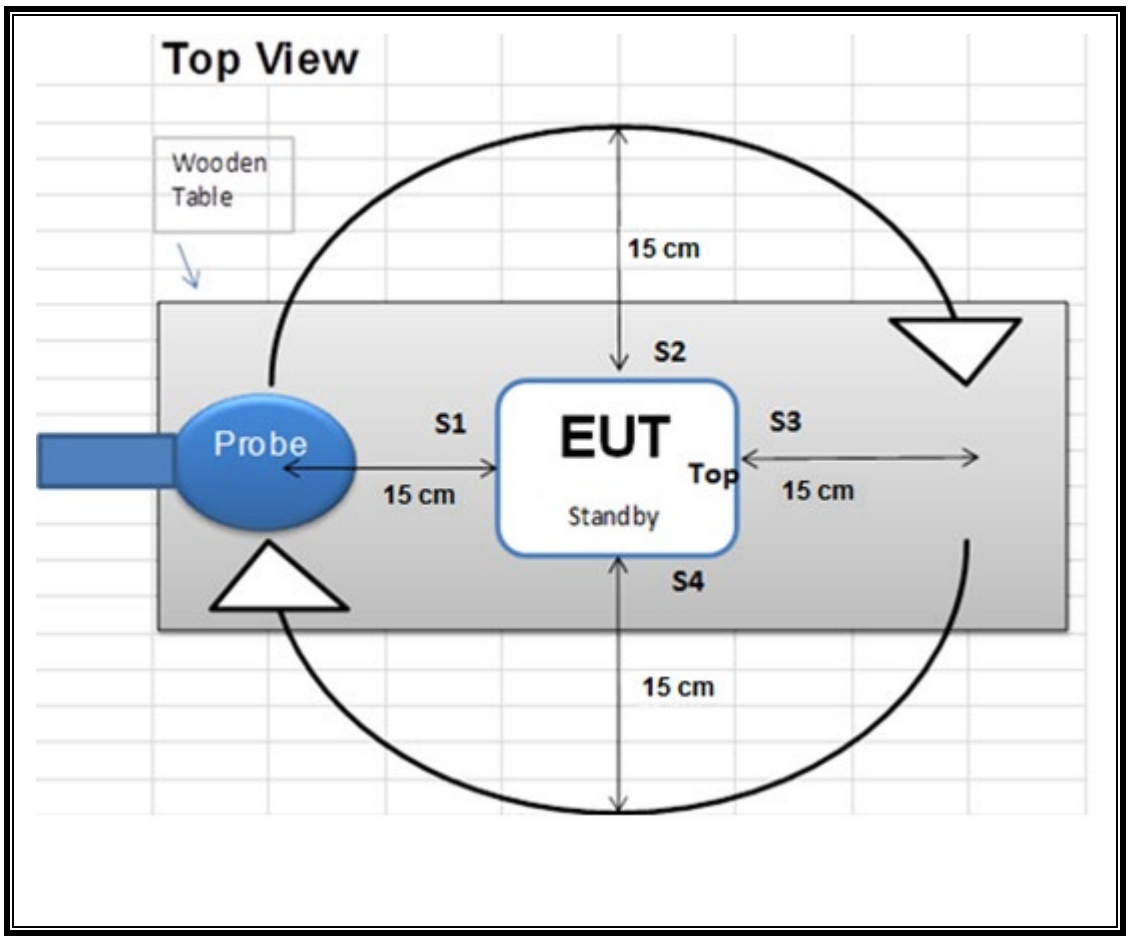
For Portable configuration, measurements were made from the back surface with the worst-case battery charge state from configuration 3 (>90%). Measurement sensor could not be placed at 0 cm separation distance for all axis. Pursuant to FCC guidance in the TCBC Workshop April 2022 WPT Updates presentation, measurements were made as close to device as possible (probe radius = 4.6 cm), and out at 2 cm steps from device. The field is determined through numerical calculation based on the distance from the transmitting coil, which is 1.2 cm within the device. The calculated field is then validated to be within 30% of the measured values for the two closed points measured. Once validated, the numerical calculation can be used to report the field at the actual use.

Please note: the Gateway's belt clip provides 1.3 cm of separation distance to the surface of the Gateway. Testing was performed with the clip removed to allow probe placement as close as possible to the surface of the Gateway. The total distance between the transmitting coil and the user would be 1.2 cm (coil to surface) + 1.3 (surface to user) = 2.5 cm. This value is used in the numerical calculation of the field strength.



Note: Duty cycle for portable use is reduced to 50%. Testing was performed at 100% and corrected down.

CONFIGURATIONS 1-3



6. 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**	**Equip. ID**	**Cal Date**	**Cal Due**
Exposure Level Meter	Narda	EHP-200AC	170WX80318	2022-07-20	2023-07-20
Exposure Level Meter	Narda	EHP-200AC	170WX80318	2023-07-31	2024-07-31
Spectrum Analyzer	Agilent	N9030A	MY54410168	2022-05-02	2023-05-02

Note: Test equipment was only used within calibration dates.

7. DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

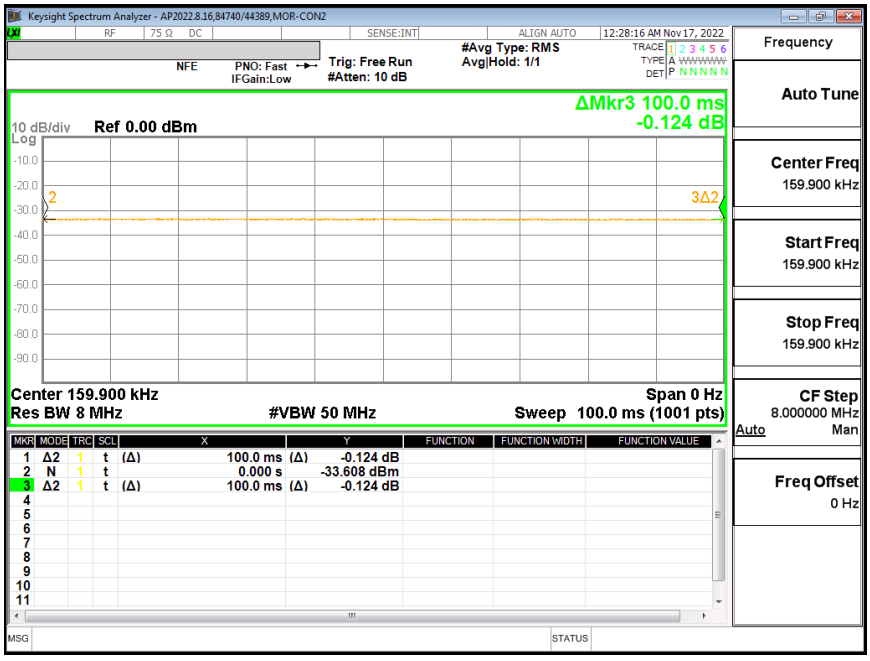
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)
Charger Standby (Config 1)	171.00	903.00	0.1894	18.94%
Charger Operating (Config 2 & 3)	100.00	100.00	1.00	100.00%
Gateway Standby (Config 2)	44.00	620.00	0.0710	7.10%
Gateway Operating (Config 3 & 4)	100.00	100.00	1.00	100.00%

Note: Duty cycle for charger standby is worst

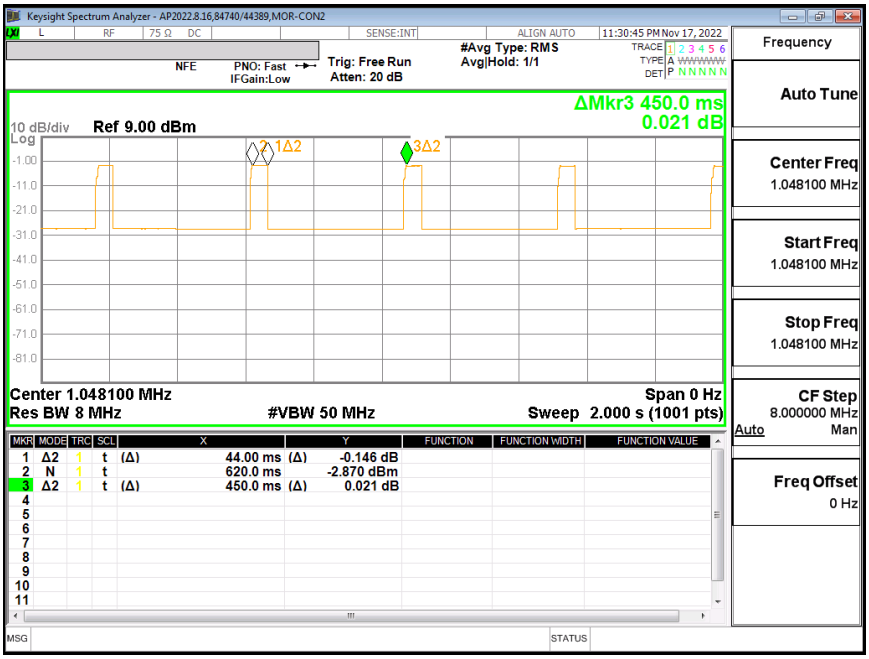
Note: Duty cycle for portable use is reduced to 50%. Measurements taken at 100%.

CHARGER STANDBY MODE

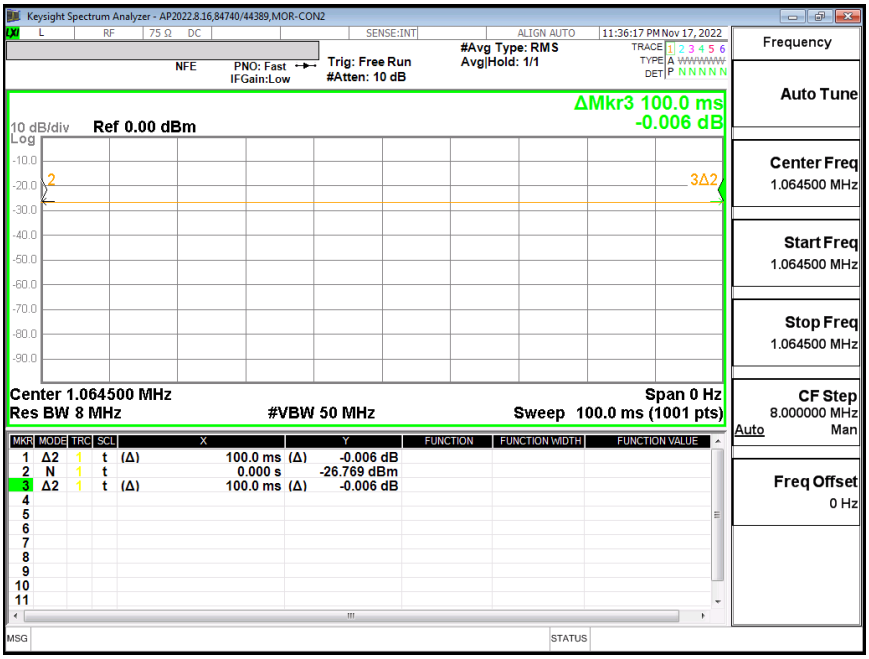
CHARGER OPERATING MODE



GATEWAY STANDBY MODE



GATEWAY OPERATING MODE



8. MAXIMUM PERMISSIBLE RF EXPOSURE TEST RESULTS

8.1. FCC LIMITS

Per KDB 680106 D01 v03r01, 3. a) (2) Evaluation of RF Exposure test data for determining compliance of wireless power transfer (WPT) systems (both portable and not) operating at frequencies below 100 kHz is provided on a case-by-case basis. In these situations, a WPT system will not require additional RF exposure testing when supporting data from measurements and/or numerical simulations show that, for all the positions of space relevant for the body exposure, the external (unperturbed) temporal peak field strengths do not exceed the following reference levels:

- 83 V/m for the electric field
and
- 90 A/m for the magnetic field.

8.2. SUMMARY OF TEST RESULTS

This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.

RESULTS

ID:	84740/21193	**Date:**	2022-11-14 to 2022-11-30, 2023-06-06

Note:
Both magnetic and electric field strengths have been investigated from 9 kHz to 30 MHz.

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

For portable configuration, the measurement was taken using a probe placed 0cm from the back of the EUT, moving out in 2 cm steps. The resulting measurements were extrapolated to the surface of the EUT to account for the distance of the probe measuring elements being 4.6 cm from the EUT surface when the probe is in contact with the EUT.

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

Desktop Application

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	2.032	2.45%	90	0.489	0.54%

Portable Application

At 2.5 cm from the coil, the field is calculated at 2.23 A/m. Given a 50% duty cycle, the time-averaged field would be **1.115 A/m**. The limit is 1.63 A/m, there the EUT is found to meet the RF Exposure guidelines.

8.3. 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 √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)			
			FCC	Location	Value	Duty Cycle %	FCC Average	FCC	Location	Value	Duty Cycle %	FCC Average
1	Standby	15 cm from edges and 20 cm from top surface	83	1	0.760	18.2	0.324	90	1	0.031	18.2	**0.013**
				2	0.785		0.335		2	0.031		**0.013**
				3	0.822		**0.351**		3	0.031		**0.013**
				4	0.732		0.312		4	0.022		**0.009**
				Top	0.395		0.169		Top	0.055		**0.023**
				Max	0.822		**0.351**		Max	0.055		**0.023**

Note for Configuration 1: Charger alone.

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)			
			FCC	Location	Value	Duty Cycle %	FCC Average	FCC	Location	Value	Duty Cycle %	FCC Average
2	Operating Power ~ 0% Charging	15 cm from edges and 20 cm from top surface	83	1	0.782	100.0	0.782	90	1	0.028	100.0	0.028
				2	0.794		0.794		2	0.020		0.020
				3	0.944		0.944		3	0.050		**0.050**
				4	0.674		0.674		4	0.022		0.022
				Top	0.783		0.783		Top	0.023		0.023
				Max	0.944		0.944		Max	0.050		**0.050**
	Operating Power 50% Charging			1	0.815	100.0	0.815		1	0.025	100.0	0.025
				2	0.819		0.819		2	0.023		0.023
				3	0.921		0.921		3	0.047		**0.047**
				4	0.743		0.743		4	0.019		0.019
				Top	0.711		0.711		Top	0.022		0.022
				Max	0.921		0.921		Max	0.047		**0.047**
	Operating Power >90% Charging			S1	0.720	100.0	0.720		S1	0.022	100.0	0.022
				S2	0.835		0.835		S2	0.020		0.020
				S3	0.842		0.842		S3	0.046		0.046
				S4	0.631		0.631		S4	0.021		0.021
				Top	0.700		0.700		Top	0.447		**0.447**
				Max	0.842		0.842		Max	0.447		**0.447**
	Operating Power 100 % Charged			S1	0.626	100.0	0.626		S1	0.019	100.0	0.019
				S2	0.761		0.761		S2	0.023		0.023
				S3	0.997		**0.997**		S3	0.045		0.045
				S4	0.609		0.609		S4	0.021		0.021
				Top	0.587		0.587		Top	0.020		0.020
				Max	0.997		**0.997**		Max	0.045		0.045

Note for Configuration 2: Charger and Gateway. Span of the meter was set to capture both charging sources

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)			
			FCC	Location	Value	Duty Cycle %	FCC Average	FCC	Location	Value	Duty Cycle %	FCC Average
3	Operating Power ~ 0% Charging	15 cm from edges and 20 cm from top surface	83	1	1.192	100.0	1.192	90	1	0.024	100.0	0.024
				2	1.225		1.225		2	0.024		0.024
				3	1.724		1.724		3	0.054		**0.054**
				4	2.032		**2.032**		4	0.022		0.022
				Top	0.920		0.920		Top	0.023		0.023
				Max	2.032		**2.032**		Max	0.054		**0.054**
	Operating Power 50% Charging			1	1.976	100.0	1.976		1	0.026	100.0	0.026
				2	1.013		1.013		2	0.019		0.019
				3	1.132		1.132		3	0.045		**0.045**
				4	1.093		1.093		4	0.018		0.018
				Top	0.904		0.904		Top	0.022		0.022
				Max	1.976		1.976		Max	0.045		**0.045**
	Operating Power >90% Charging			S1	1.303	100.0	1.303		S1	0.023	100.0	0.023
				S2	1.161		1.161		S2	0.022		0.022
				S3	1.113		1.113		S3	0.050		**0.050**
				S4	0.791		0.791		S4	0.019		0.019
				Top	0.835		0.835		Top	0.489		**0.489**
				Max	1.303		1.303		Max	0.489		**0.489**
	Operating Power 100 % Charged			S1	1.303	100.0	1.303		S1	0.023	100.0	0.023
				S2	1.055		1.055		S2	0.020		0.020
				S3	1.320		1.320		S3	0.045		0.045
				S4	0.825		0.825		S4	0.017		0.017
				Top	0.829		0.829		Top	0.022		0.022
				Max	1.320		1.320		Max	0.045		0.045

Note for Configuration 3: Charger and Gateway, with Sensor. Span of the meter was set to capture both charging sources

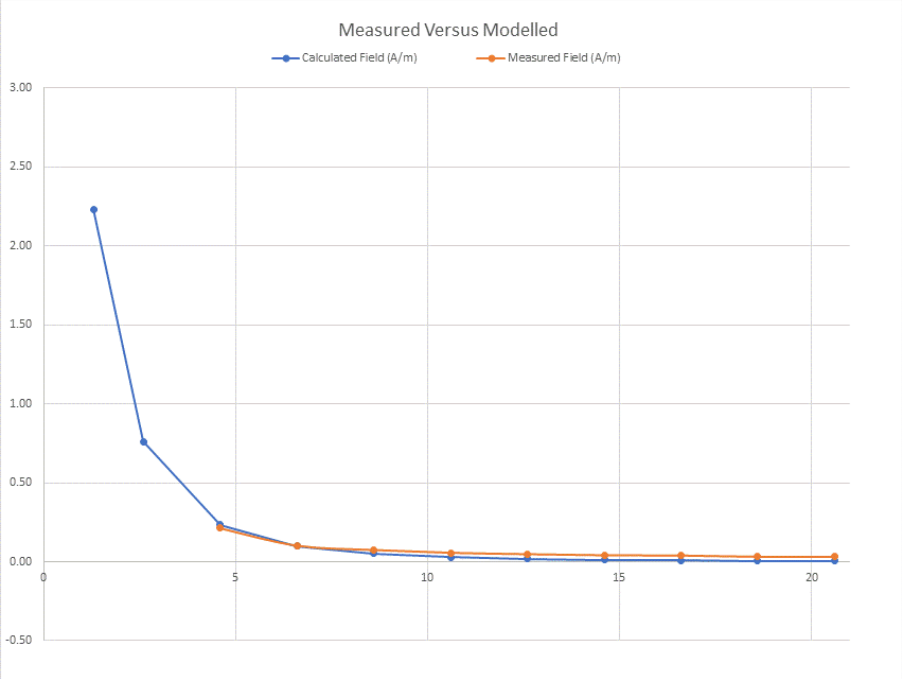
Configuration 4 – Portable use RF exposure

In accordance with FCC guidance, only H-Field was measured for portable use.
Note for Configuration 4: Charger with Sensor.

H-Field Data

Probe coil distance from EUT surface (cm)	EUT Tx coil distance to EUT surface (cm)	Total Field Distance (cm)	Estimated Field		Measured		Deviation
			Tesla	Calculated Field (A/m)	Measured Field (A/m)	Limit (A/m)	
1.3	1.2	2.5	2.80E-06	2.23		1.63	
2.6	1.2	3.8	9.56E-07	0.76		1.63	
4.6	1.2	5.8	2.93E-07	0.23	0.21	1.63	-8%
6.6	1.2	7.8	1.24E-07	0.10	0.10	1.63	3%
8.6	1.2	9.8	6.34E-08	0.05	0.07	1.63	
10.6	1.2	11.8	3.66E-08	0.03	0.06	1.63	
12.6	1.2	13.8	2.30E-08	0.02	0.05	1.63	
14.6	1.2	15.8	1.54E-08	0.01	0.04	1.63	
16.6	1.2	17.8	1.08E-08	0.01	0.04	1.63	
18.6	1.2	19.8	7.83E-09	0.01	0.03	1.63	
20.6	1.2	21.8	5.88E-09	0.00	0.03	1.63	

Note: Calculated and measured fields are at 100%. Real-world duty cycle for portable use RF Exposure is 50%. Calculated field at 2.5 cm is 2.23 A/m for 100% duty cycle, which corresponds to 1.115 A/m corrected to 50%.



Calculated field based on the following (source: [Magnetic Field of a Current Loop (gsu.edu)])

$$B_z = \frac{\mu_0}{4\pi}\frac{2\pi R^2 I}{\left(z^2+R^2\right)^{3/2}} \qquad \mu_0 = 4\pi \ x \ 10^{-7} T\cdot m/A$$

I = Current in amperes
R = radius of loop in meters
z = distance in meters along centerline of loop

9. SETUP PHOTO

Refer to R1427554-EP6 for setup photos.

END OF REPORT