



**FCC Part 1 Subpart I
FCC Part 2 Subpart J**

CERTIFICATION TEST REPORT

FOR

Radiant Wireless Charger

MODEL NO: RWC826USBV2

FCC ID: YV8-RWC826USBV2

REPORT NUMBER: 12516531-E1V4

ISSUE DATE: NOVEMBER 2, 2018

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	10/05/2018	Initial Issue	Chin Pang
V2	10/19/2018	Address FCC Question, Add Coil1 Data	Chin Pang
V3	10/24/2018	Address TCB's Questions Section 7.2	Chin Pang
V4	10/29/2018	Address TCB's Questions Section 4.3	Chin Pang
V5	11/02/2018	Update Model Number	Chin Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Pass & Seymour Inc., d/b/a Legrand
EUT DESCRIPTION: Radiant Wireless Charger
MODEL NUMBER: RWC826USBV2
SERIAL NUMBER: 1827136
DATE TESTED: SEPTEMBER 24 - 25, 2018 and OCTOBER 18, 2018

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.

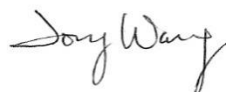
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Reviewed By:



Chin Pang
Senior Engineer
UL Verification Service Inc.

Prepared By:



Tony Wang
Test Engineer
UL Verification Services Inc.

2. TEST METHODOLOGY

All calculations were made in accordance with FCC OET Bulletin 65 Edition 97-01.

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. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
<input type="checkbox"/> Chamber A (IC:2324B-1)	<input type="checkbox"/> Chamber D (IC:22541-1)
<input type="checkbox"/> Chamber B (IC:2324B-2)	<input type="checkbox"/> Chamber E (IC:22541-2)
<input type="checkbox"/> Chamber C (IC:2324B-3)	<input type="checkbox"/> Chamber F (IC:22541-3)
<input type="checkbox"/> Immunity Area	<input type="checkbox"/> Chamber G (IC:22541-4)
	<input type="checkbox"/> Chamber H (IC:22541-5)
	<input checked="" type="checkbox"/> Temperature B Room

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address and respective code.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at [NVLAP Lab Search](#).

4. EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF EUT

The EUT is a wireless charger which has a multiple inductive charging coil to charge phone. The charging frequency is 110KHz – 148KHz, and the maximum power consumption is 5 W in charging status.

4.2. WORST-CASE CONFIGURATION AND MODE

The EUT is a wireless charger enclosed in plastic case with two different coils, Coil1 and Coil2. For operation mode, Coil1 and Coil2 were investigated with phone.

Config	Mode	Descriptions
1	Standby	EUT alone powered by 115Vac
2	Operating	EUT and phone powered by 115Vac

Note that the EUT was tested as standby and operation modes.

4.3. KDB 680106 D01 SECTION 5b EQUIPMENT APPROVAL CONSIDERATIONS

Requirement	Device
(1) Power transfer frequency is less than 1 MHz	Yes. The switching frequency is 110kHz – 148kHz, and the operating frequency at Coil1 is 115KHz and at Coil2, operating frequency is 145.4kHz
(2) Output power from each primary coil is less than or equal to 15 watts	Yes. The maximum power is 5 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.	Yes. The device has two coils. These coils do not simultaneous charge the device, only one coil active at a time.
(4) Client device is placed directly in contact with the transmitter.	Yes. The 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. Mobile exposure condition apply.
(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 aggregate fields at 15cm from the device was 47.24% and 13.5% on Coil1 & Coil2 respectively of the FCC H field limit.

4.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

SUPPORT EQUIPMENT & PERIPHERALS LIST			
Description	Manufacturer	Model	Serial Number
Phone	Samsung	Galaxy S7	SM-G930U

I/O CABLES

N/A

TEST SETUP

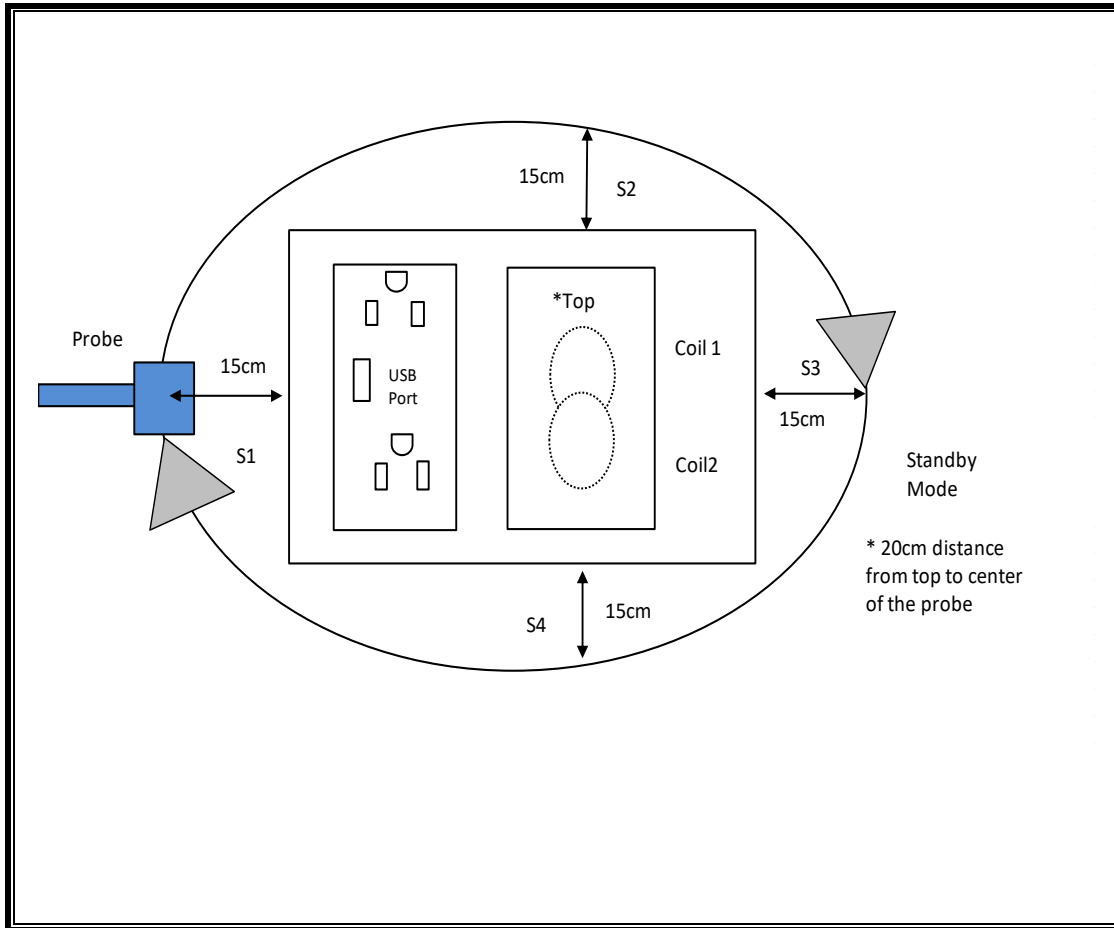
The following two configurations on Coil1 and Coil2 are tested:

Configuration	Mode	Descriptions
1	Standby	EUT Alone powered by AC/DC adapter
2	Operating (Phone ~10% Power Charging)	EUT and Phone powered by AC/DC Adapter
	Operating (Phone ~50% Power Charging) Note: For the configuration 2 operating with Phone, battery level of the Phone was a state of 20 - 50%	EUT and Phone powered by AC/DC adapter
	Operating (Phone >90% Power Charging)	EUT and Phone powered by AC/DC Adapter

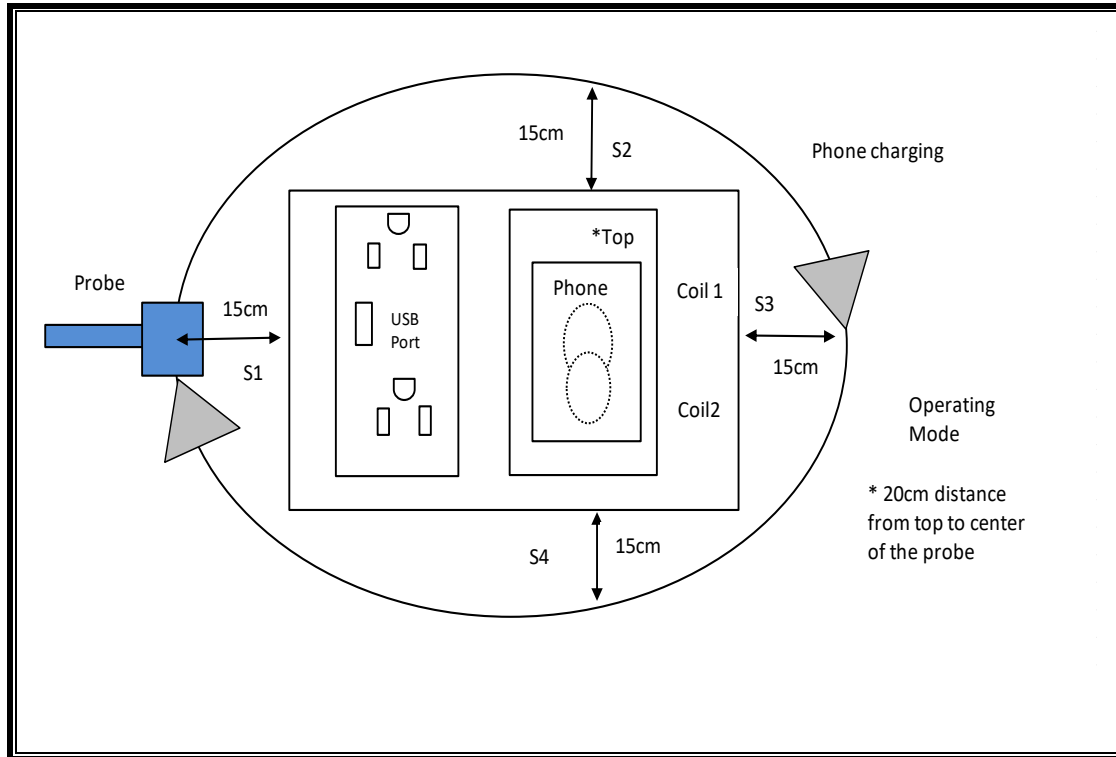
MEASUREMENT SETUP

The measurement was taken using a probe placed 15 cm surrounding the device and 20 cm above the top surface of the EUT. Measurements were taken from the top and all sides of the EUT per KDB680106 D01 v03.

CONFIGURATION 1, STANDBY MODE



CONFIGURATION 2, OPERATING MODE



5. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was 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	04/06/2018	04/06/19

6. DUTY CYCLE

LIMITS

None; for reporting purposes only.

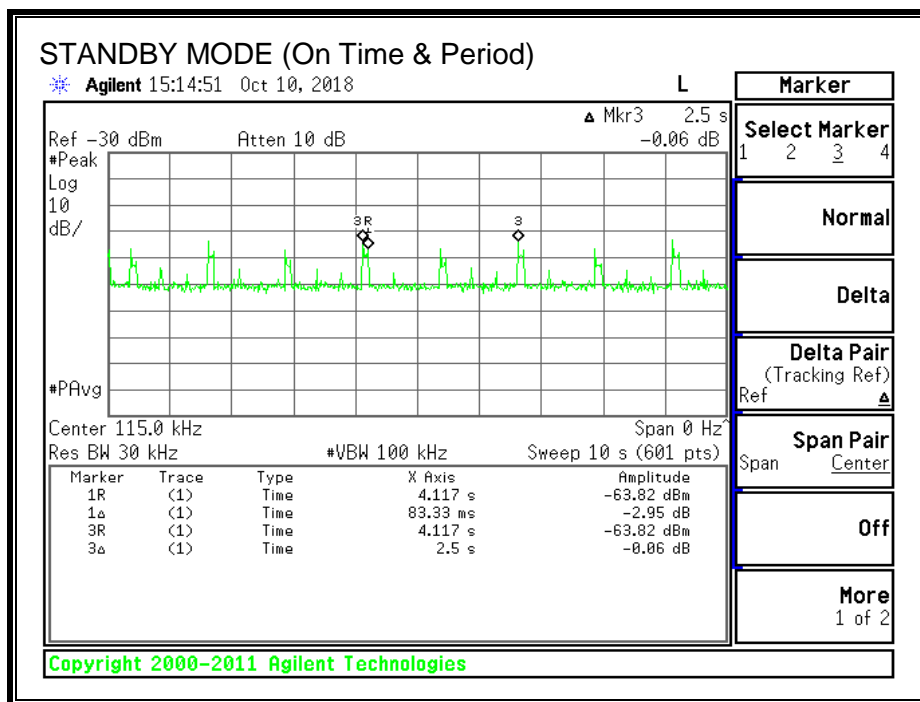
PROCEDURE

Zero-Span Spectrum Analyzer Method.

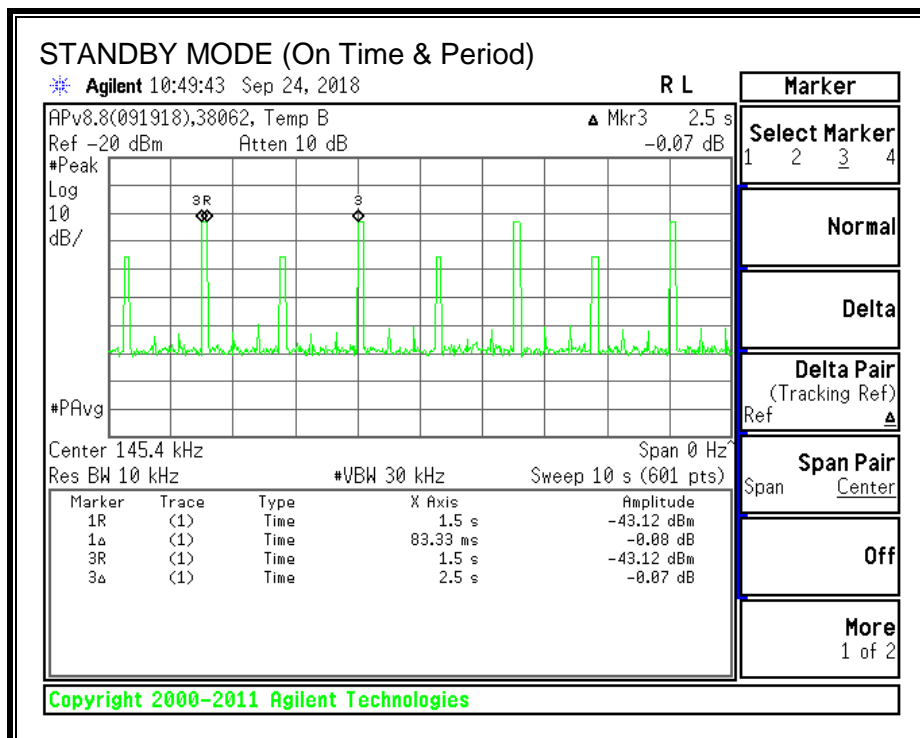
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
Standby	83.33	2500.00	0.03	3.33%	14.77
Operating	100.00	100.00	1.00	100.00%	0.00

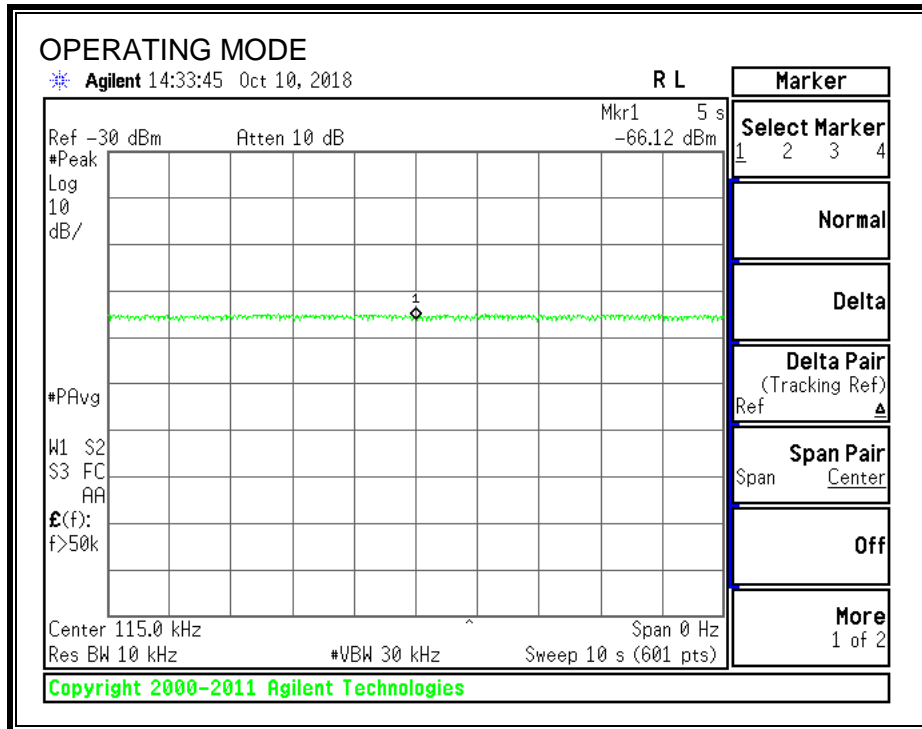
Coil 1



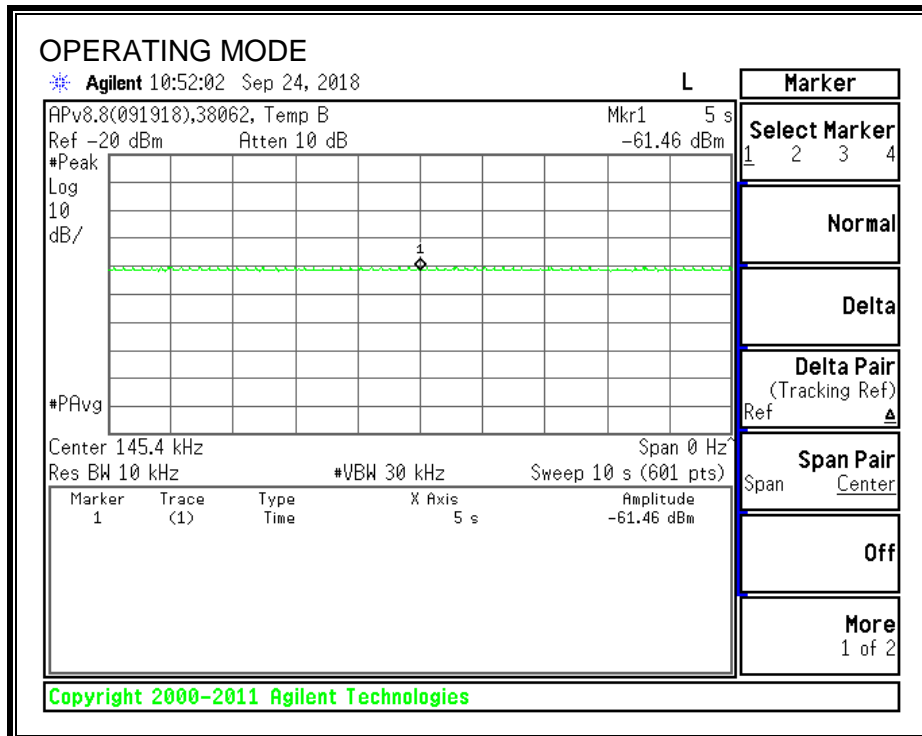
Coil2



Coil1



Coil2



7. MAXIMUM PERMISSIBLE RF EXPOSURE

7.1. FCC LIMITS AND SUMMARY

7.1.1. 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.

7.1.2. FCC SUMMARY OF RESULTS

RESULTS

ID:	38602	Date:	9/24/2018 & 10/18/2018
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Coil 1,

FCC RF EXPOSURE SUMMARY OF RESULTS

Electric Field Limit			Magnetic Field Limit		
FCC	Maximum Average (V/m)	Percentage (%)	FCC	Maximum Average (A/m)	Percentage (%)
614	0.950	0.155%	1.63	0.770	47.24%

Coil 2

FCC RF EXPOSURE SUMMARY OF RESULTS

Electric Field Limit			Magnetic Field Limit		
FCC	Maximum Average (V/m)	Percentage (%)	FCC	Maximum Average (A/m)	Percentage (%)
614	0.670	0.109%	1.63	0.220	13.50%

7.2. TEST RESULTS

7.2.1. FCC RF EXPOSURE

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].

Coil 1, FCC Limit

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	0.530	3.33		0.018	1.63	S1	0.346	3.33		0.012				
				S2	0.320			0.011		S2	0.140			0.005				
				S3	0.320			0.011		S3	0.150			0.005				
				S4	0.390			0.013		S4	0.341			0.011				
				Top	0.720			0.024		Top	0.571			0.019				
				Max	0.770			0.026		Max	0.653			0.022				
				S1	0.850			0.875		S1	0.649			0.649				
				S2	0.875			0.850		S2	0.350			0.350				
				S3	0.760			0.760		S3	0.250			0.250				
				S4	0.860			0.860		S4	0.240			0.240				
2	Operating Real Product (Power <10% Charging)	15 cm surrounding the device (S1 - S4) and 20 cm above the top surface of the EUT	614	Top	0.890	100		0.890	1.63	Top	0.753	100		0.753				
				Max	0.950			0.950		Max	0.770			0.770				
				S1	0.850			0.850		S1	0.625			0.625				
				S2	0.750			0.750		S2	0.520			0.520				
				S3	0.780			0.780		S3	0.470			0.470				
				S4	0.800			0.800		S4	0.480			0.480				
	Operating Real Product (Power ~ 20% - 50% Charging)						Top	0.820		100		0.820		Top	0.520	100		0.520
							Max	0.890				0.890		Max	0.725			0.725
							S1	0.825				0.825		S1	0.631			0.631
							S2	0.750				0.750		S2	0.550			0.550
							S3	0.830				0.830		S3	0.620			0.620
							S4	0.870				0.870		S4	0.650			0.650
	Operating Real Product (Power >90% Charging)						Top	0.910		100		0.910		Top	0.660	100		0.660
							Max	0.930				0.930		Max	0.730			0.730

Coil 2

FCC Limit

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	0.530	3.33		0.018	1.63	S1	0.346	3.33		0.012				
				S2	0.320			0.011		S2	0.140			0.005				
				S3	0.320			0.011		S3	0.150			0.005				
				S4	0.390			0.013		S4	0.341			0.011				
				Top	0.720			0.024		Top	0.571			0.019				
				Max	0.770			0.026		Max	0.653			0.022				
				S1	0.240			0.240		S1	0.180			0.180				
				S2	0.190			0.190		S2	0.050			0.050				
				S3	0.160			0.160		S3	0.070			0.070				
				S4	0.420			0.420		S4	0.080			0.080				
2	Operating Real Product (Power <10% Charging)	15 cm surrounding the device (S1 - S4) and 20 cm above the top surface of the EUT	614	Top	0.380	100		0.380	1.63	Top	0.050	100		0.050				
				Max	0.430			0.430		Max	0.220			0.220				
				S1	0.220			0.220		S1	0.090			0.090				
				S2	0.176			0.176		S2	0.080			0.080				
				S3	0.135			0.135		S3	0.070			0.070				
				S4	0.230			0.230		S4	0.100			0.100				
	Operating Real Product (Power ~ 20% - 50% Charging)						Top	0.260		100		0.260		Top	0.080	100		0.080
							Max	0.300				0.300		Max	0.110			0.110
							S1	0.398				0.398		S1	0.150			0.150
							S2	0.344				0.344		S2	0.040			0.040
							S3	0.345				0.345		S3	0.050			0.050
							S4	0.440				0.440		S4	0.050			0.050
	Operating Real Product (Power >90% Charging)						Top	0.630		100		0.630		Top	0.040	100		0.040
							Max	0.670				0.670		Max	0.160			0.160