



FCC Part 1 Subpart I
FCC Part 2 Subpart J
INDUSTRY CANADA RSS 102 ISSUE 5

CERTIFICATION TEST REPORT

FOR

MOPHIE WIRELESS CHARGING BASE

MODEL NO: WRLS-CHGPAD-AC

FCC ID: 2ACWB-W15M

IC: 10465A-W15M

REPORT NUMBER: 11904745-E2V3

ISSUE DATE: SEPTEMBER 19, 2017

Prepared for
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NVLAP[®]
TESTING
NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	08/30/2017	Initial Issue	Eric Yu
V2	09/07/2017	Added Both IC Magnetic Field Test Results	Thu Chan
V3	09/19/2017	Added Charging Conditions in Sections 5.2 & 8.3	Thu Chan

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MOPHIE LLC
6244 TECHNOLOGY AVE
KALAMAZOO, MI 49009 USA

EUT DESCRIPTION: MOPHIE WIRELESS CHARGING BASE

MODEL NUMBER: WRLS-CHGPAD-AC

SERIAL NUMBER: 920-04692-01

DATE TESTED: AUGUST 17 – AUGUST 24, 2017

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 1 SUBPART I & PART 2 SUBPART J	Pass
INDUSTRY CANADA RSS 102 ISSUE 5	Pass

UL Verification Services Inc. calculated the RF Exposure of the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. 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 any government.

Approved & Released For
UL Verification Services Inc. By:

Prepared By:



THU CHAN
WISE PROGRAM MANAGER
UL VERIFICATION SERVICES INC.

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LAB ENGINEER
UL VERIFICATION SERVICES INC.

2. TEST METHODOLOGY

All calculations were made in accordance with FCC OET Bulletin 65 Edition 97-01 and IC Safety Code 6.

3. REFERENCES

All measurements were made as documented in test report UL Verification Services Inc. Document 11904745-E1V1 for operation in the 127.7 KHz band.

Output power data is excerpted from the applicable test reports.

4. 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 checked="" type="checkbox"/> Immunity Area	<input type="checkbox"/> Chamber G (IC:22541-4)
	<input type="checkbox"/> Chamber H (IC:22541-5)

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is wireless charging base capable of up to 15 watt power transfer.

5.2. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

SUPPORT EQUIPMENT & PERIPHERALS LIST			
Description	Manufacturer	Model	Serial Number
Phone	Samsung	Galaxy S8+	R28J40SRS7N
QI Receiver Simulator	AVID Technologies, Inc.	102-03	00001413
AC Adapter	Mophie	DOE3	133117001X01
Resistor Load	N/A	N/A	151733

I/O CABLES

N/A

TEST SETUP

The following three configurations are tested:

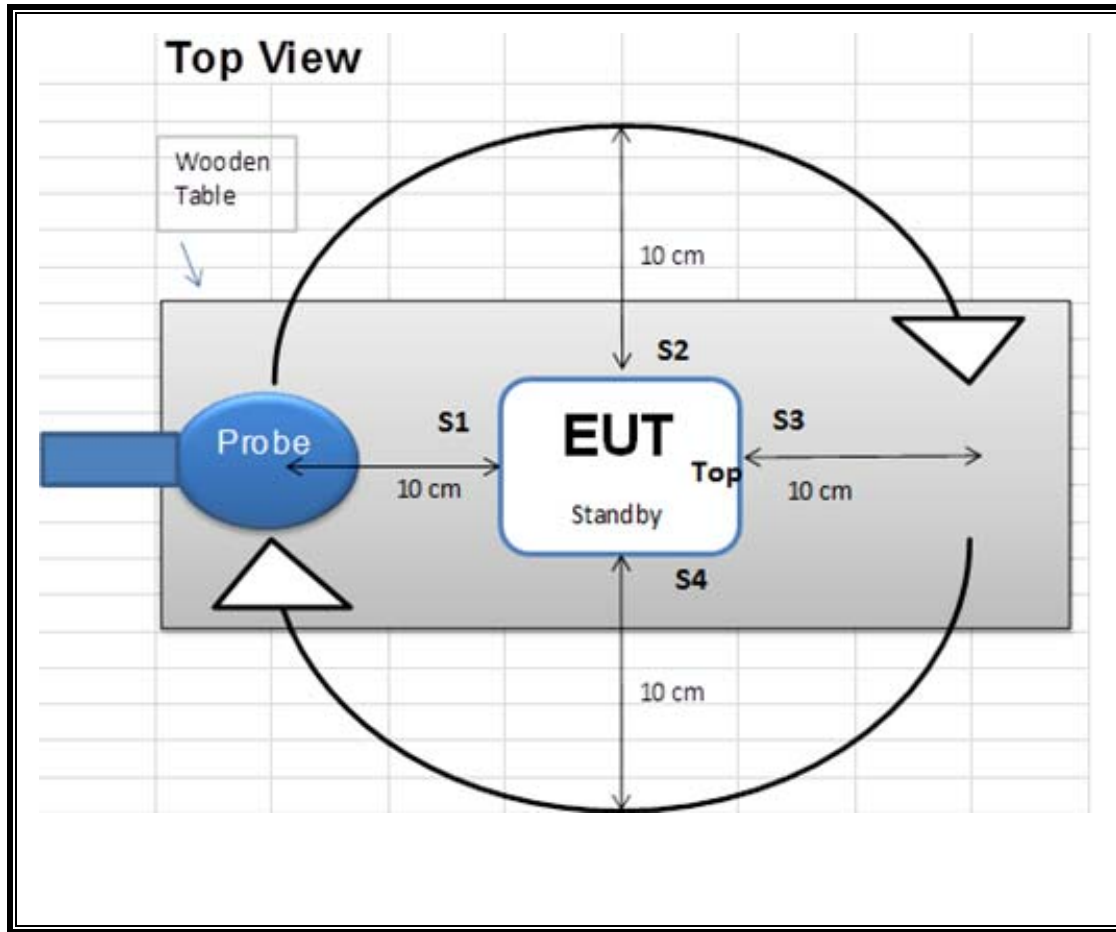
Configuration	Mode	Descriptions
1	Standby (< 10% Power Detecting)	EUT Alone powered by AC/DC adapter
2	Operating (Real Phone 7W, ~50% Power Charging)	EUT and real phone powered by AC/DC adapter
3	Operating (15W Load, >90% Power Charging)	EUT and 15W load powered by AC/DC adapter

Note: on configuration 2, operating with real phone, battery level of the phone was at a state of 20 – 50%.

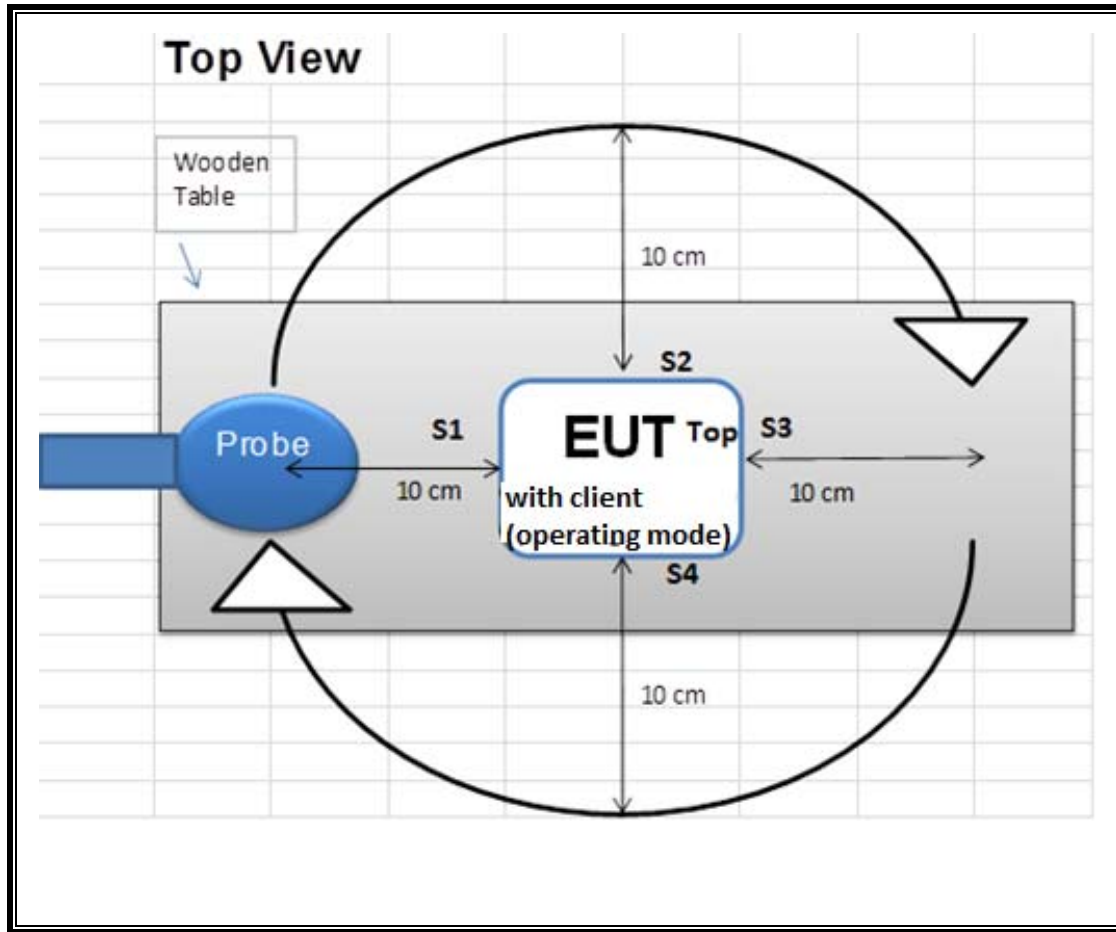
MEASUREMENT SETUP

The measurement was taken using a probe placed 10 cm from the center of the probe to the edge of the EUT. Measurements were taken from the top and all sides of the EUT per KDB 680106 D01

CONFIGURATION 1



CONFIGURATION 2



6. 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	Local ID (T No.)	Cal Date	Cal Due
Electric and Magnetic Field Probe	Narda	EHP-200A	170WX60227	03/17/2017	03/17/2018

7. DUTY CYCLE

LIMITS

None; for reporting purposes only.

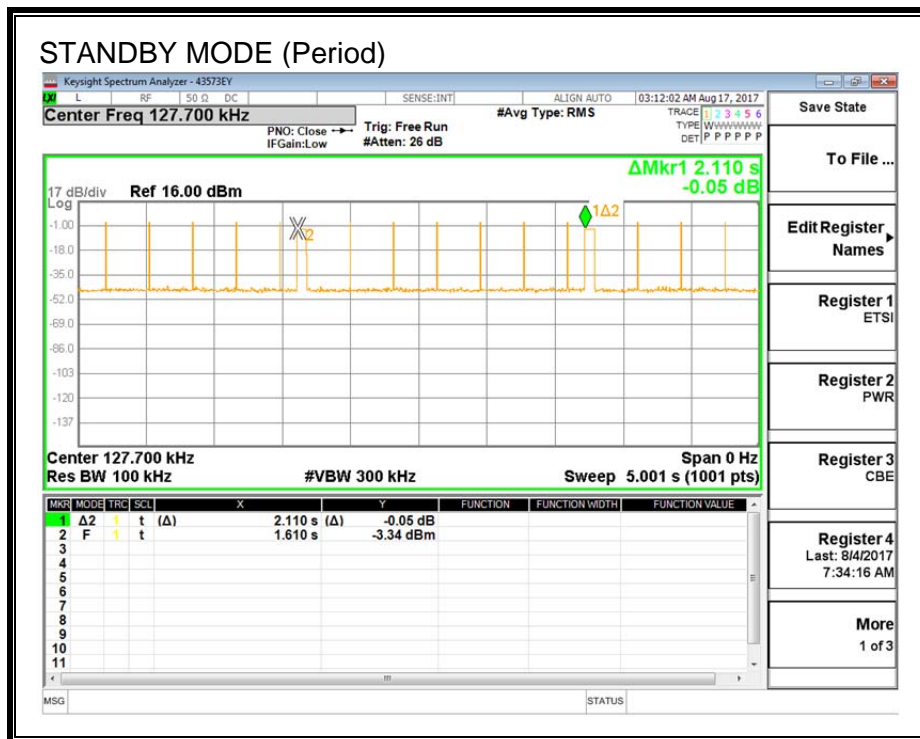
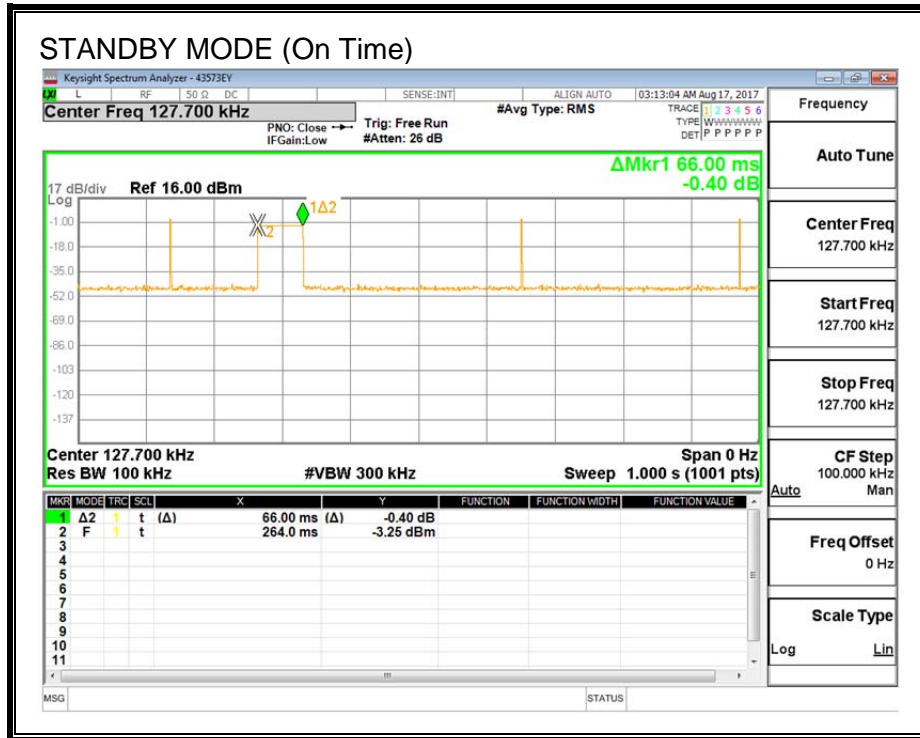
PROCEDURE

Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
Standby	66.00	2110.00	0.031	3%	15.05
Operating	100.000	100.000	1.000	100.00%	0.00

STANDBY MODE



OPERATING MODE

100% Duty Cycle.

8. MAXIMUM PERMISSIBLE RF EXPOSURE

8.1. FCC RULES

§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.

8.2. IC RULES

Radio Standards Specification 102, Issue 5 Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands), sets out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radio communication apparatus designed to be used within the vicinity of the human body

Table 2: Internal Electric Field Strength Basic Restrictions (3 kHz-10 MHz)

Condition	Internal Electric Field Strength* (V/m) (any part of the body)
Controlled Environment	$2.7 \times 10^{-4} f$
Uncontrolled Environment	$1.35 \times 10^{-4} f$

Note: f is frequency in Hz.
 * Instantaneous, RMS values apply.

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	-2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
 * Based on nerve stimulation (NS).
 ** Based on specific absorption rate (SAR).

8.3. MEASUREMENTS RESULTS

RESULTS

ID:	43573	Date:	8/23/17
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Note: Both magnetic and electric field strengths have been investigated from 9 KHz to 30 MHz at 10cm to find that the EUT operation frequency is at 127.7 KHz. Since 127.7 KHz is within the frequency range of 0.1-10MHz, The Industry Canada both magnetic field limits of 90 A/m (NS) and $0.73/f$ A/m (SAR) are applied.

Test Mode	Distance (cm)	Limit Electric Field Limit (V/m)		Reading Electric Field (V/m)		Limit Magnetic Field (A/m)		Reading Magnetic Field (A/m)	
		FCC	IC	Location	Peak	FCC	IC (NS)	Location	Peak
Standby (<10% Power Detecting)	10	614	83	S1	0.3887	1.63	90.00	S1	0.2401
				S2	0.3808			S2	0.2312
				S3	0.3808			S3	0.1917
				S4	0.3808			S4	0.2224
				Top	1.1501			Top	4.4701
				Max	1.1525			Max	4.4712
Operating - Real Phone 7W (~50% Power Charging)	10	614	83	S1	0.9445	1.63	90.00	S1	0.1593
				S2	0.9982			S2	0.1134
				S3	1.031			S3	0.0702
				S4	1.0242			S4	0.1047
				Top	2.4735			Top	0.2348
				Max	2.4742			Max	0.2353
Operating - 15W Load (>90% Power Charging)	10	614	83	S1	4.2232	1.63	90.00	S1	0.1373
				S2	2.9888			S2	0.218
				S3	3.1921			S3	0.57
				S4	3.2078			S4	0.136
				Top	8.1605			Top	0.8724
				Max	8.1609			Max	1.2704

Test Mode	Distance (cm)	Limit Electric Field Limit (V/m)		Reading Electric Field (V/m)		Limit Magnetic Field (A/m)		Reading Magnetic Field (A/m)			
		FCC	IC	Location	Peak	FCC	IC (SAR)	Location	Peak	Duty Cycle %	RMS
Standby (<10% Power Detecting)	10	614	83	S1	0.3887	1.63	5.72	S1	0.2401	3	0.0416
				S2	0.3808			S2	0.2312		0.0400
				S3	0.3808			S3	0.1917		0.0332
				S4	0.3808			S4	0.2224		0.0385
				Top	1.1501			Top	4.4701		0.7742
				Max	1.1525			Max	4.4712		0.7744
				6 Mins	0.315			6 Mins	0.8332		0.8332
Operating - Real Phone 7W (~50% Power Charging)	10	614	83	S1	0.9445	1.63	5.72	S1	0.1593	100	0.1593
				S2	0.9982			S2	0.1134		0.1134
				S3	1.031			S3	0.0702		0.0702
				S4	1.0242			S4	0.1047		0.1047
				Top	2.4735			Top	0.2348		0.2348
				Max	2.4742			Max	0.2353		0.2353
				Operating - 15W Load (>90% Power Charging)	10			614	83		S1
S2	2.9888	S2	0.218			0.2180					
S3	3.1921	S3	0.57			0.5700					
S4	3.2078	S4	0.136			0.1360					
Top	8.1605	Top	0.8724			0.8724					
Max	8.1609	Max	1.2704			1.2704					

Note: on configuration 2, operating with real phone, battery level of the phone was at a state of 20 – 50%.