FCC Part 1 Subpart I
FCC Part 2 Subpart J

CERTIFICATION TEST REPORT

FOR

MAGNETIC CHARGING BRACELET

MODEL NO: A2002

FCC ID: BCGA2002

REPORT NUMBER: 12488666 - E2V3

ISSUE DATE: SEPTEMBER 07, 2018

Prepared for
APPLE INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	08/30/2018	Initial Issue	Chin Pang
V2	9/05/2018	Address TCB Questions	Tony Li
V3	9/07/2018	Correction on page 6, 13, 15 & 16	Chin Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A

EUT DESCRIPTION: MAGNETIC CHARGING BRACELET

MODEL NUMBER: A2002

SERIAL NUMBER: DLCWQ09QJTN7

DATE TESTED: AUGUST 17–22, 2018

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

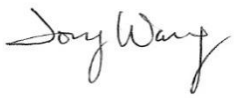
UL Verification Services Inc. calculated the RF Exposure of the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail 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.

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
☐ Chamber A (IC:2324B-1)	☐ Chamber D (IC:22541-1)
☐ Chamber B (IC:2324B-2)	☐ Chamber E (IC:22541-2)
☐ Chamber C (IC:2324B-3)	☐ Chamber F (IC:22541-3)
☐ Immunity Area	☐ Chamber G (IC:22541-4)
	☐ Chamber H (IC:22541-5)
	☒ 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 code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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 magnetic charging bracelet which has a single inductive charging coil to charge Apple Watch. The charging frequency is 326.5 kHz, and the maximum power consumption is 5W in charging status.

4.2. WORST-CASE CONFIGURATION AND MODE

The EUT is a single frequency magnetic charger enclosed in stainless steel case with a 2 pin cable bracelet. For operation mode, it was tested with small and big watches to find the worst case. Both small and big watches were investigated and no significant different in reading was found between both watches. The big watch was chosen to test as the worst case condition since it has max load overall, hence all final data for operational mode represents EUT with the big watch.

Config	Mode	Descriptions
1	Standby	EUT Alone powered by AC/DC adapter
2	Operating	EUT and Watch (big) powered by AC/DC adapter

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

4.3. KDB 680106 D01 v03 SECTION 5b EQUIPMENT APPROVAL CONSIDERATIONS

Requirement	Device
(1) Power transfer frequency is less than 1 MHz.	Yes. Operating Frequency is 326.5KHz.
(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 system includes one single primary and secondary coil and the device is designed to charge a single client.
(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 15 cm from the device are 1.10% of the FCC H field limit.

4.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

SUPPORT EQUIPMENT & PERIPHERALS LIST				
Description	**Housing/Watch Band**	**Manufacturer**	**Model**	**Serial Number**
Watch (big)	Stainless Steel/Milanese Loop	Apple	A1976	D92WV001K47J
Watch (small)	Stainless Steel/Milanese Loop	Apple	A1975	D92X2006KNWV
AC/DC Adapter	N/A	Apple	A1385	N/A
Cable (2 pin) Bracelet	N/A	Apple	N/A	N/A

I/O CABLES

N/A

TEST SETUP

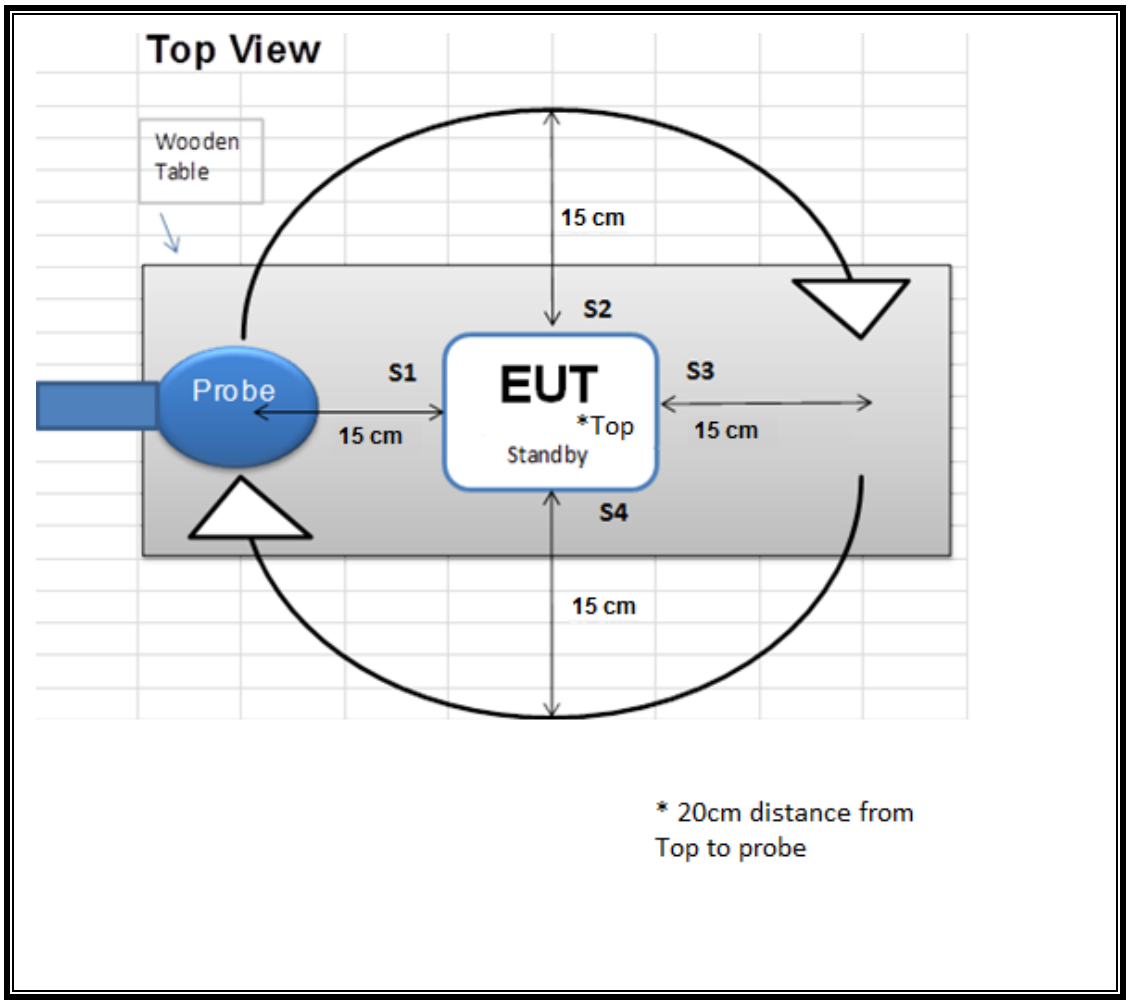
The following two configurations are tested:

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

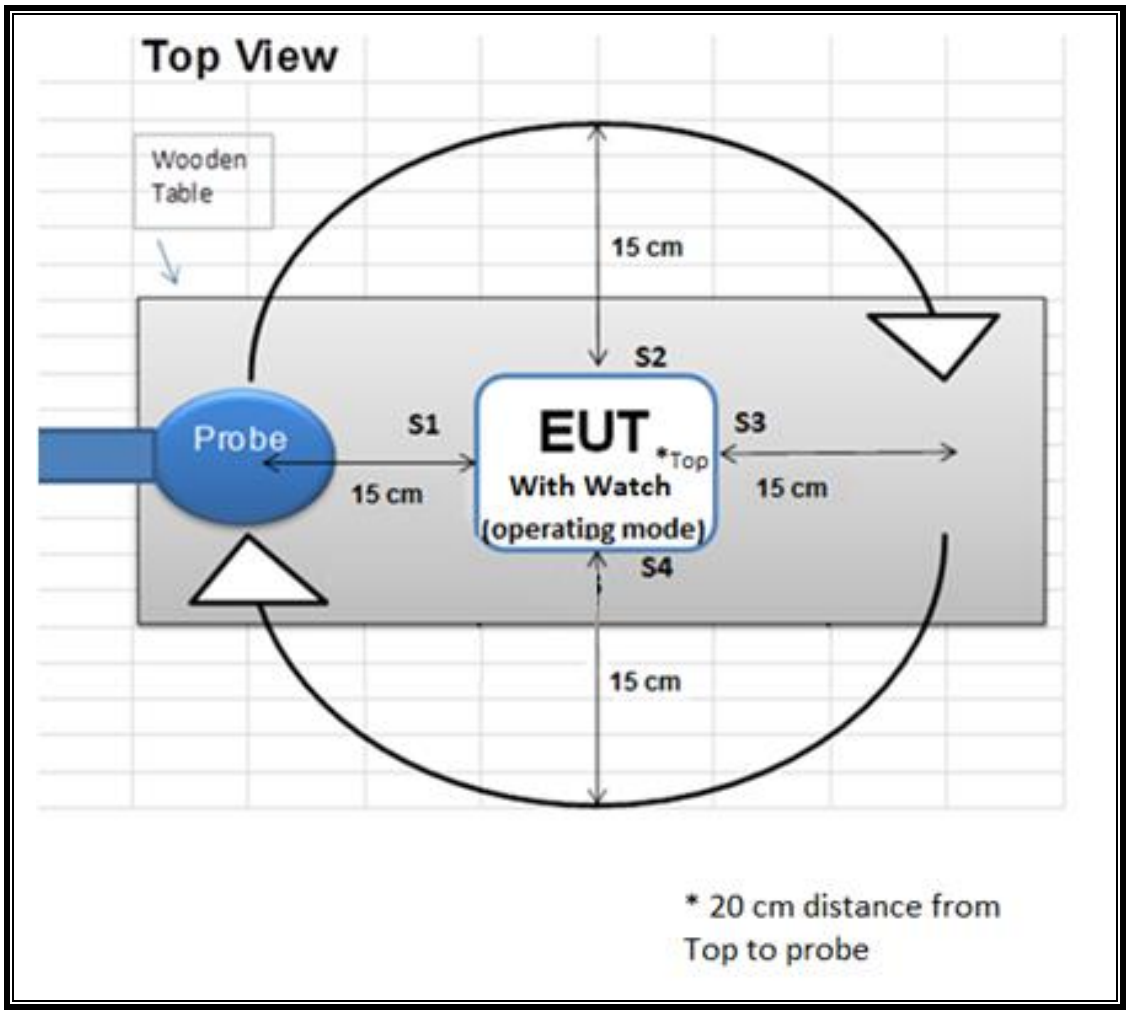
MEASUREMENT SETUP

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



CONFIGURATION 2



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.

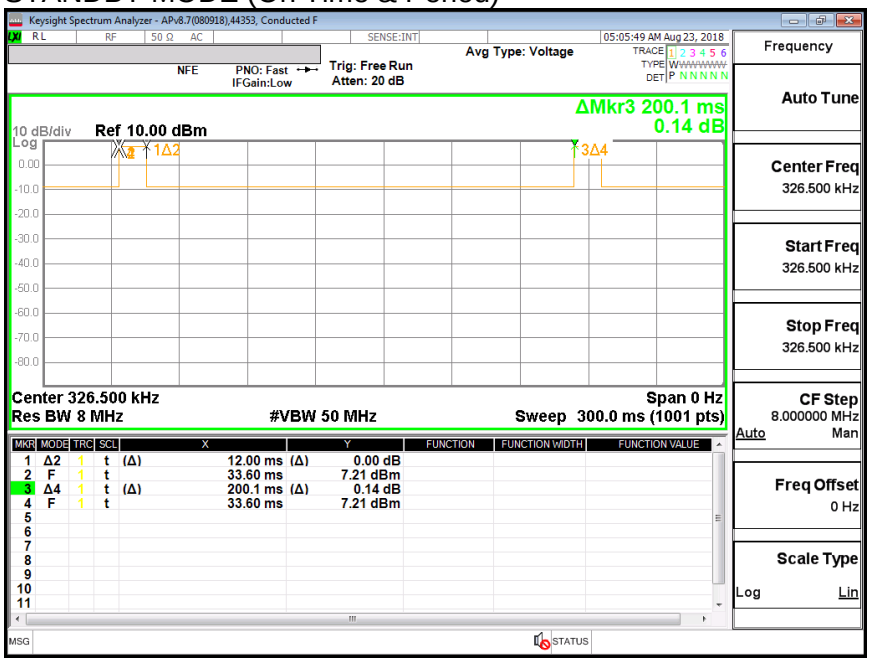
PROCEDURE

Zero-Span Spectrum Analyzer Method.

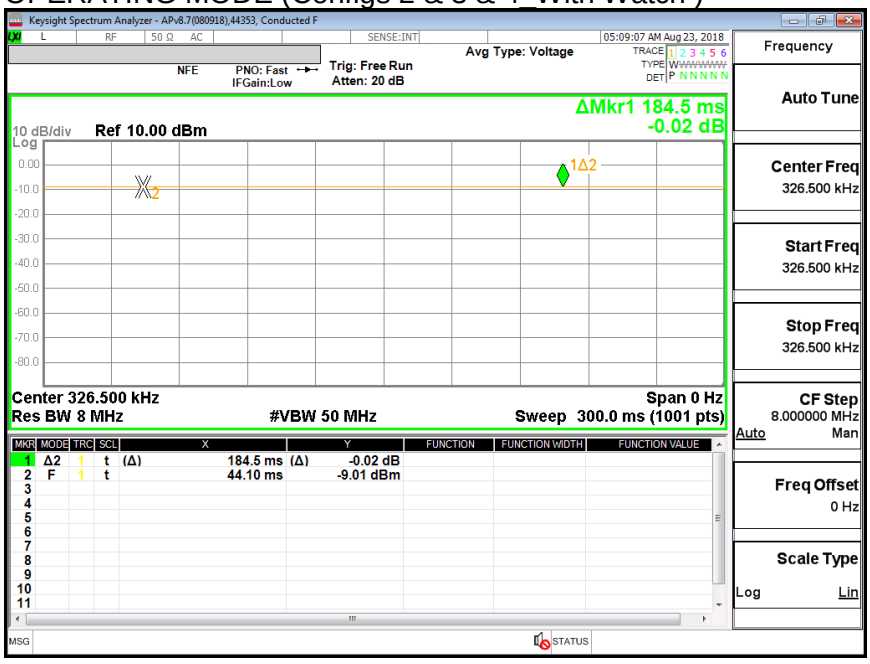
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
Standby (Config 1)	12.00	200.10	0.06	6.00%	12.22
Operating(Config 2)	100.00	100.00	1.00	100.00%	0.00

STANDBY MODE (On Time & Period)



OPERATING MODE (Configs 2 & 3 & 4_With Watch)



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:	8/23/18

FCC RF Exposure Summary of Results

A2002, A1385, Bracelet 2-pin USB AND MODEL A1976 WATCH

Electric Field Limit			Magnetic Field Limit		
FCC RF Exposure	Maximum Average (V/m)	Percentage (%)	FCC RF Exposure	Maximum Average (A/m)	Percentage (%)
614	0.388	0.06%	1.63	0.018	1.10%

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].

A1385 2-pin USB Model A1976 Watch

FCC RF Exposure Result

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (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	0.299	6	0.018	1.63	S1	0.014	6	0.001
				S2	0.344		0.021		S2	0.014		0.001
				S3	0.299		0.018		S3	0.014		0.014
				S4	0.321		0.019		S4	0.015		0.001
				Top	0.308		0.018		Top	0.015		0.001
				Max	0.346		0.021		Max	0.018		0.001
2	Operating Real Product (Power <10% Charging)			S1	0.345	100	0.345		S1	0.015	100	0.015
				S2	0.353		0.353		S2	0.016		0.016
				S3	0.354		0.354		S3	0.016		0.016
				S4	0.353		0.353		S4	0.016		0.016
				Top	0.370		0.370		Top	0.016		0.016
				Max	0.388		**0.388**		Max	0.017		0.017
	Operating Real Product (Power ~ 20% - 50% Charging)			S1	0.353	100	0.353		S1	0.016	100	0.016
				S2	0.353		0.353		S2	0.015		0.015
				S3	0.354		0.354		S3	0.016		0.016
				S4	0.353		0.353		S4	0.016		0.016
				Top	0.371		0.371		Top	0.016		0.016
				Max	0.388		**0.388**		Max	0.018		**0.018**
	Operating Real Product (Power >90% Charging)			S1	0.371	100	0.371		S1	0.016	100	0.016
				S2	0.371		0.371		S2	0.017		0.017
				S3	0.370		0.370		S3	0.017		0.017
				S4	0.371		0.371		S4	0.016		0.016
				Top	0.362		0.362		Top	0.017		0.017
				Max	0.388		**0.388**		Max	0.018		**0.018**