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

RF EXPOSURE REPORT

FOR

MAGNETIC CHARGING CABLE

MODEL NUMBER: A1768

FCC ID: BCGA1768
IC: 579C-A1768

REPORT NUMBER: 16U23041-E3V9

ISSUE DATE: AUGUST 24, 2016

Prepared for
APPLE, INC.
1 INFINITE LOOP
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	08/02/2016	Initial Issue	Chin Pang
V2	08/03/2016	Address TCB's Questions	Chin Pang
V3	08/03/2016	Address TCB's Questions	Chin Pang
V4	08/04/2016	Address TCB's Questions	Chin Pang
V5	08/16/2016	Address TCB's Questions	Chin Pang
V6	08/18/2016	Address TCB's Questions	Chin Pang
V7	08/22/12016	Address TCB's Questions	Chin Pang
V8	08/23/2016	Update setup photo	Chin Pang
V8	08/24/2016	Update setup photo	Chin Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: MAGNETIC CHARGING CABLE

MODEL: A1768

SERIAL NUMBER: DLC616200ZYHE1Y835

DATE TESTED: JULY 05, 2016 and AUGUST 23, 2016

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:

CHIN PANG
SENIOR ENGINEER
UL VERIFICATION SERVICES INC.

Prepared By:

TOM CHEN
TEST 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 15U19950-E1 for operation in the 326 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 Benicia Street, Fremont, California, USA.

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 with 326.5 KHz operating frequency is a magnetic charging cable which includes an inductive charging coil to charge Apple Watch.

5.2. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC adapter	Apple	A1385	D293154U2DTDHLHCW	N/A
Watch	Apple	A1803	FH7RM066H91N	BCG-E3103
Watch	Apple	A1802	F9W6166320HHCM56E	BCG-E3102

I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	USB	Un-shielded	2.0	N/A

TEST SETUP

The following two configurations are tested:

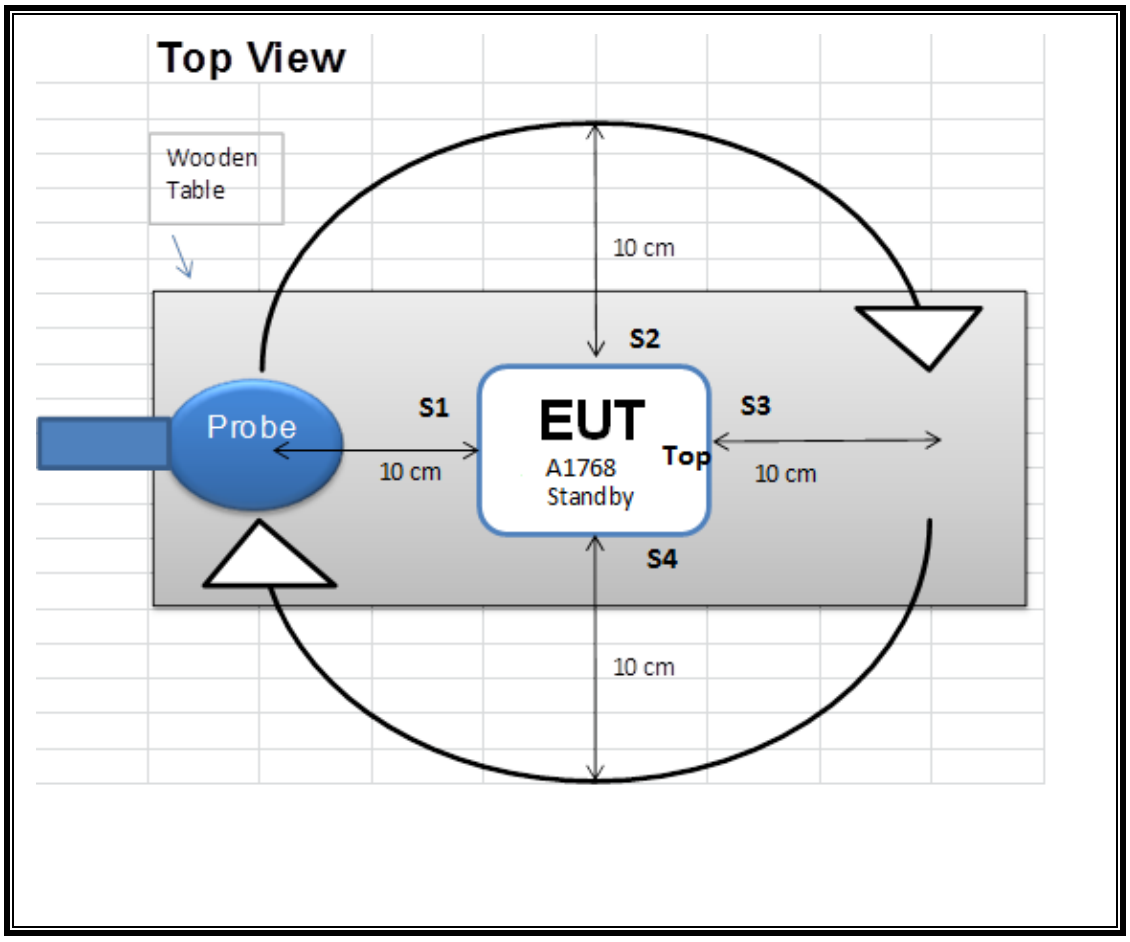
Configuration	Test Mode	Descriptions
1	Standby	EUT without supporting device, continue transmitting
2	Operating	EUT with Client Big Watch(A1803) paired and in use
3	Operating	EUT with Client Small Watch(A1802) paired and in use

Note that the EUT was tested as standby and operation modes. During operational mode, EUT was tested with two different sizes of watches of having similar mechanical structure. One of the watches was smaller and the other one was bigger. During the charging process, the watch actively indicates the status of the charging process. device being charges was at a state of 20 – 50% charged.

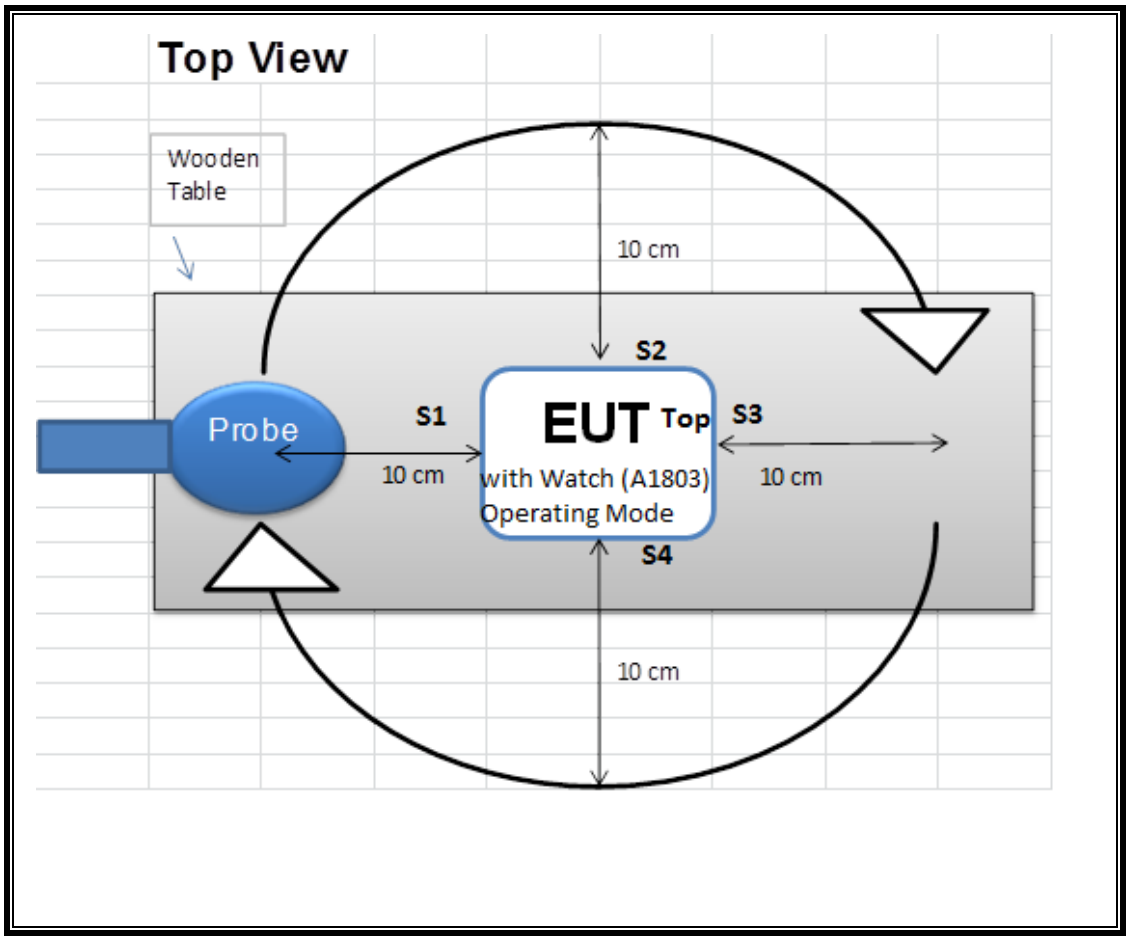
MEASUREMENT SETUP

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

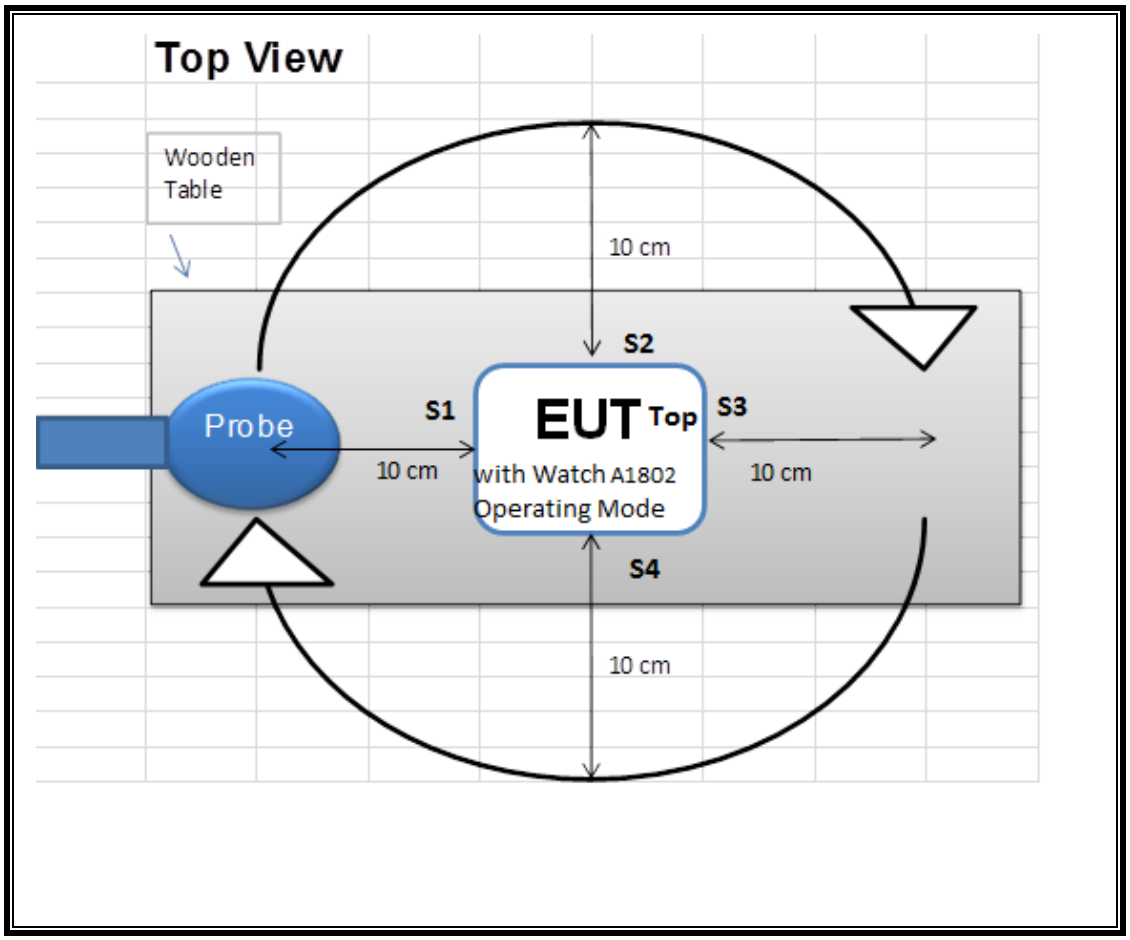
CONFIGURATION 1



CONFIGURATION 2



CONFIGURATION 3



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	1085	01/7/2016	01/07/2017

7. MAXIMUM PERMISSIBLE RF EXPOSURE

7.1. 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.

7.2. 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 Dentisty (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).

7.3. MEASUREMENTS RESULTS

RESULTS

ID:	29435	Date:	8/23/16

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 326.5 KHz. Since 326.5 KHz is within the frequency range of 0.1-10MHz, a limit of 0.73/ f is applied.

Configuration	Test Mode	Measuring Distance (cm)	Reading Magnetic Field (A/m)		FCC Magnetic Limit(A/m)	IC Limit Magnetic Field (A/m)	Reading Electric Field (V/m)		FCC Limit Electric Field (V/m)	IC Limit Electric Field (V/m)
1	Standby	10	S1	0.0206	1.63	2.235	S1	0.1269	614	83
			S2	0.0392			S2	0.1098		
			S3	0.0210			S3	0.1307		
			S4	0.0264			S4	0.0336		
			Top	**0.3098**			**Top**	**0.2619**		
2	Operating (Big Watch A1803)		S1	0.0229			S1	0.1371		
			S2	0.0093			S2	0.1531		
			S3	**0.6130**			S3	0.1406		
			S4	0.0095			S4	0.1482		
			Top	0.0099			**Top**	**0.2586**		
3	Operating (Small Watch, A1802)		S1	0.0303			S1	0.1449		
			S2	0.0200			S2	0.1482		
			S3	**0.0688**			S3	0.1406		
			S4	0.0290			S4	0.1482		
			Top	0.0188			**Top**	**0.2370**		

Please see section 5.2 for configuration details

Note: Battery is 20-50 % charged status during operating mode, small and big watch.