

RF Exposure Report

Report No.: SAAQOT-WTW-P21080810

FCC ID: 2AEEV-OBFTC-0089-A

Test Model: OBFTC-0089-A

Received Date: Aug. 20, 2021

Test Date: Aug. 26 ~ Aug. 27, 2021

Issued Date: Nov. 11, 2021

Applicant: Otter Products, LLC.

Address: 209 South Meldrum Street, Fort Collins, CO 80521

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, TAIWAN

FCC Registration / 788550 / TW0003
Designation Number:



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 General Information	5
2.1 General Description of EUT	5
3 RF Exposure	6
3.1 Description of Support Units	6
3.1.1 Configuration of System under Test	6
3.2 Test Setup	7
3.3 Test Instruments	8
3.4 Limits for Maximum Permissible Exposure (MPE)	9
3.5 Test Point Description	9
4. Calculation Result of Maximum Conducted Power	10
5. Photographs of the Test Configuration	30

Release Control Record

Issue No.	Description	Date Issued
SAAQOT-WTW-P21080810	Original release	Nov. 11, 2021

1 Certificate of Conformity

Product: Wireless Power Bank for MagSafe

Brand: OTTERBOX

Test Model: OBFTC-0089-A

Sample Status: Engineering sample

Applicant: Otter Products, LLC.

Test Date: Aug. 26 ~ Aug. 27, 2021

Standards: FCC Part 1 (Section 1.1307(b), Section 1.1310)
FCC Part 2 (Section 2.1091)

References Test Guidance: KDB 680106 D01 RF Exposure Wireless Charging Apps v03r01

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Celine Chou , **Date:** Nov. 11, 2021
Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Nov. 11, 2021
Bruce Chen / Senior Engineer

2 General Information

2.1 General Description of EUT

Product	Wireless Power Bank for MagSafe
Brand	OTTERBOX
Test Model	OBFTC-0089-A
Sample Status	Engineering sample
Power Supply Rating	5Vdc (adapter or host equipment) 3.8Vdc (battery)
Modulation Type	FSK + ASK
Operating Frequency	112-205kHz
Antenna Type	Coil antenna (The Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible)
Field Strength	-13.55dBuV/m
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below
Maximum Power Output for charging coil	7.5W

Note: The EUT contains following accessory devices.

Item	Brand	Model	Description
Battery	DONGGUAN GANFENG	755772	3.8Vdc, 5000mAh
USB type C to type C Cable	-	-	0.15m shielded USB type C to type C Cable

3 RF Exposure

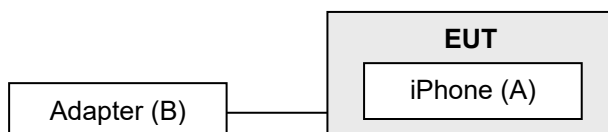
3.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

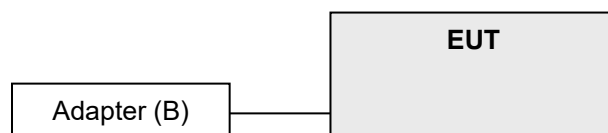
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	iPhone	APPLE	A2215	C39ZC1YEN6YC	BCG-E3307A	-
B.	Adapter	ASUS	AD827M	NA	NA	-

3.1.1 Configuration of System under Test

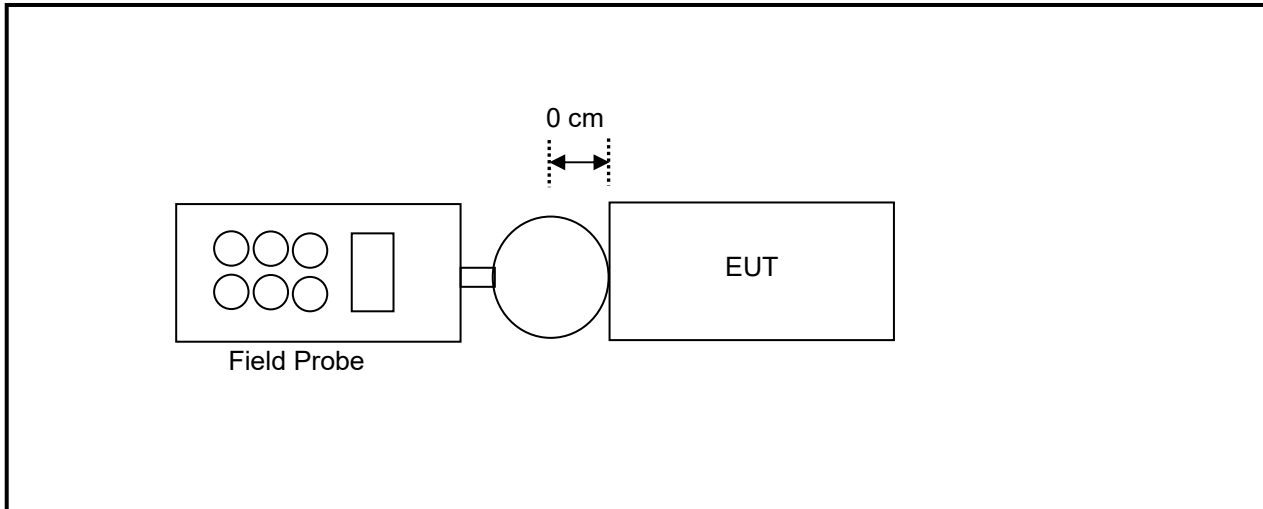
Charging Mode:



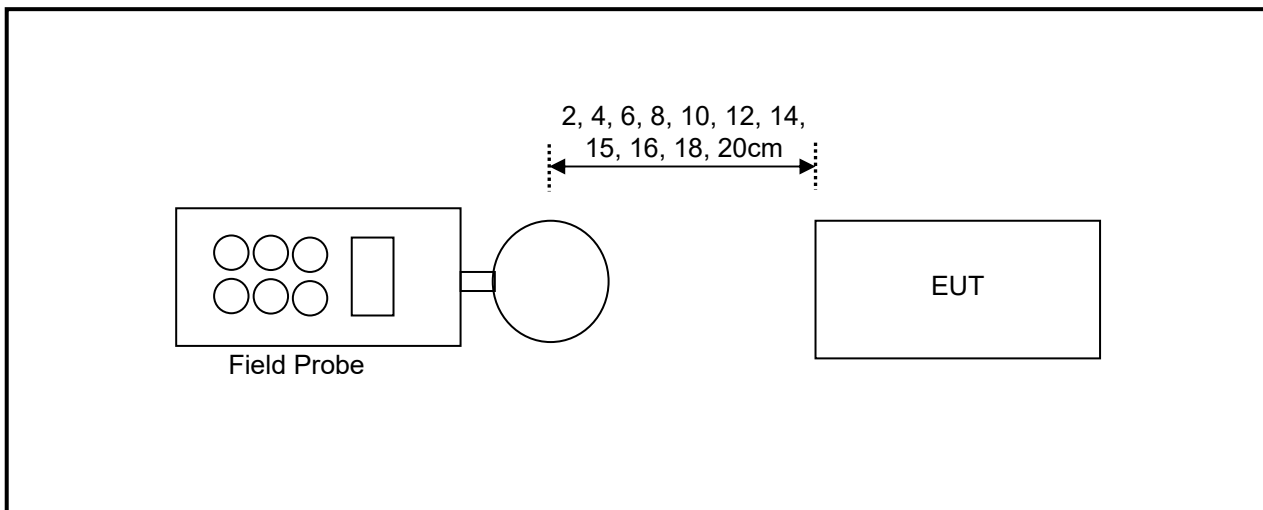
Standby Mode:



3.2 Test Setup



Note: Measurements should be made from all sides and the top of the primary/client pair, with the 0 cm measured from the center of the probe(s) to the edge of the device.



Note: Measurements were made from all sides and the top of the primary/client pair, with the 2, 4, 6, 8, 10, 12, 14, 15, 16, 18, 20cm cm measured from the center of the probe(s) to the edge of the device.

3.3 Test Instruments

Description	Brand	Model No.	Frequency Range	Calibrated Date	Calibrated Until
Broadband Field Meter	NARDA	NBM-550	-	Mar. 25, 2020	Mar. 24, 2022
Magnetic Field Meter	NARDA	ELT-400	1Hz – 400MHz	Apr. 17, 2020	Apr. 16, 2022
Magnetic Probe	NARDA	HF-3061	300kHz – 30MHz	Apr. 16, 2020	Apr. 15, 2022
Magnetic Probe	NARDA	HF-0191	27 – 1000MHz	Apr. 21, 2020	Apr. 20, 2022
Broadband Field Meter	NARDA	NBM-550	-	Mar. 25, 2020	Mar. 24, 2022
Electric Field Meter	COMBINOVA	EFM 200	5Hz – 400kHz	Dec. 06, 2019	Dec. 05, 2021
E-Field Probe	NARDA	EF-0391	100kHz – 3GHz	Mar. 25, 2020	Mar. 24, 2022
E-Field Probe	NARDA	EF-6091	100MHz – 60GHz	Mar. 25, 2020	Mar. 24, 2022

Note: 1. The calibration interval of the above test instruments is 12/24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa RF Chamber

3.4 Limits for Maximum Permissible Exposure (MPE)

§ 1.1310 The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (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
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

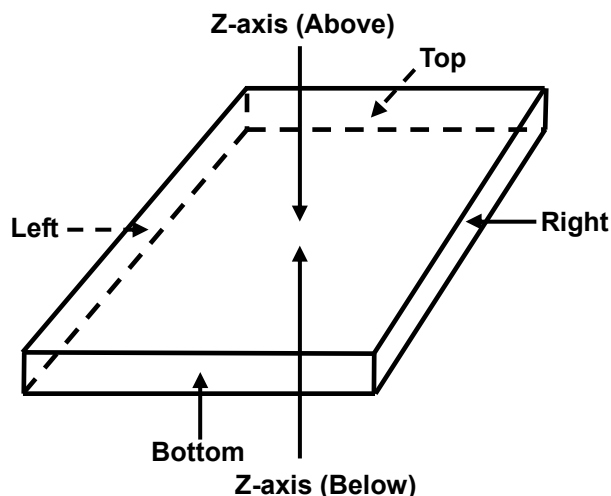
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply 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.

680106 D01 RF Exposure Wireless Charging Apps v03r01

The aggregate H-fields strengths at 15 cm surrounding the device and 20cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

3.5 Test Point Description



4. Calculation Result of Maximum Conducted Power

Charging Mode

Charging Mode with iPhone, battery 10% Charge

E-Field (15cm)								E-Field (20cm)
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)	Z-axis (Above)
128	Max E-field (V/m)	0.9400	0.9300	1.0500	0.9200	1.3900	0.8500	0.7900
128	Limit (V/m)	614	614	614	614	614	614	614
128	Margin (V/m)	-613.0600	-613.0700	-612.9500	-613.0800	-612.6100	-613.1500	-613.2100
128	50 % Limit (V/m)	307	307	307	307	307	307	307
128	50 % Margin (V/m)	-306.0600	-306.0700	-305.9500	-306.0800	-305.6100	-306.1500	-306.2100

H-Field (15cm)								H-Field (20cm)
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)	Z-axis (Above)
128	Max H-field (uT)	0.1320	0.1340	0.1390	0.1230	0.1720	0.1080	0.1180
128	Max H-field (A/m)	0.1056	0.1072	0.1112	0.0984	0.1376	0.0864	0.0944
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5244	-1.5228	-1.5188	-1.5316	-1.4924	-1.5436	-1.5356
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7094	-0.7078	-0.7038	-0.7166	-0.6774	-0.7286	-0.7206

Measurements were made from all sides and the top of the primary/client pair, with the 15/20cm measured from the center of the probe(s) to the edge of the device. The highest emission level was recorded.

Portable Mode

H-Field (0cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2360	0.2320	0.2470	0.2290	0.2840	0.2210
128	Max H-field (A/m)	0.1888	0.1856	0.1976	0.1832	0.2272	0.1768
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4412	-1.4444	-1.4324	-1.4468	-1.4028	-1.4532
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6262	-0.6294	-0.6174	-0.6318	-0.5878	-0.6382

H-Field (2cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2330	0.2310	0.2450	0.2280	0.2820	0.2200
128	Max H-field (A/m)	0.1864	0.1848	0.1960	0.1824	0.2256	0.1760
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4436	-1.4452	-1.4340	-1.4476	-1.4044	-1.4540
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6286	-0.6302	-0.6190	-0.6326	-0.5894	-0.6390

H-Field (4cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2290	0.2250	0.2350	0.2200	0.2750	0.2140
128	Max H-field (A/m)	0.1832	0.1800	0.1880	0.1760	0.2200	0.1712
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4468	-1.4500	-1.4420	-1.4540	-1.4100	-1.4588
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6318	-0.6350	-0.6270	-0.6390	-0.5950	-0.6438

H-Field (6cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2180	0.2180	0.2250	0.2140	0.2580	0.2010
128	Max H-field (A/m)	0.1744	0.1744	0.1800	0.1712	0.2064	0.1608
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4556	-1.4556	-1.4500	-1.4588	-1.4236	-1.4692
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6406	-0.6406	-0.6350	-0.6438	-0.6086	-0.6542

H-Field (8cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2110	0.2050	0.2140	0.2060	0.2520	0.1940
128	Max H-field (A/m)	0.1688	0.1640	0.1712	0.1648	0.2016	0.1552
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4612	-1.4660	-1.4588	-1.4652	-1.4284	-1.4748
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6462	-0.6510	-0.6438	-0.6502	-0.6134	-0.6598

H-Field (10cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1380	0.1390	0.1500	0.1290	0.1820	0.1170
128	Max H-field (A/m)	0.1104	0.1112	0.1200	0.1032	0.1456	0.0936
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5196	-1.5188	-1.5100	-1.5268	-1.4844	-1.5364
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7046	-0.7038	-0.6950	-0.7118	-0.6694	-0.7214

H-Field (12cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1380	0.1390	0.1460	0.1320	0.1830	0.1340
128	Max H-field (A/m)	0.1104	0.1112	0.1168	0.1056	0.1464	0.1072
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5196	-1.5188	-1.5132	-1.5244	-1.4836	-1.5228
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7046	-0.7038	-0.6982	-0.7094	-0.6686	-0.7078

H-Field (14cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1340	0.1360	0.1400	0.1280	0.1780	0.1250
128	Max H-field (A/m)	0.1072	0.1088	0.1120	0.1024	0.1424	0.1000
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5228	-1.5212	-1.5180	-1.5276	-1.4876	-1.5300
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7078	-0.7062	-0.7030	-0.7126	-0.6726	-0.7150

H-Field (16cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1310	0.1330	0.1350	0.1240	0.1720	0.1150
128	Max H-field (A/m)	0.1048	0.1064	0.1080	0.0992	0.1376	0.0920
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5252	-1.5236	-1.5220	-1.5308	-1.4924	-1.5380
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7102	-0.7086	-0.7070	-0.7158	-0.6774	-0.7230

H-Field (18cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1250	0.1250	0.1290	0.1170	0.1620	0.1090
128	Max H-field (A/m)	0.1000	0.1000	0.1032	0.0936	0.1296	0.0872
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5300	-1.5300	-1.5268	-1.5364	-1.5004	-1.5428
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7150	-0.7150	-0.7118	-0.7214	-0.6854	-0.7278

H-Field (20cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.0990	0.0970	0.1020	0.0920	0.1250	0.0820
128	Max H-field (A/m)	0.0792	0.0776	0.0816	0.0736	0.1000	0.0656
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5508	-1.5524	-1.5484	-1.5564	-1.5300	-1.5644
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7358	-0.7374	-0.7334	-0.7414	-0.7150	-0.7494

Charging Mode with iPhone, battery 50% Charge

E-Field (15cm)								E-Field (20cm)
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)	Z-axis (Above)
128	Max E-field (V/m)	1.0400	1.0200	1.1200	0.9400	1.4400	0.8800	0.8300
128	Limit (V/m)	614	614	614	614	614	614	614
128	Margin (V/m)	-612.9600	-612.9800	-612.8800	-613.0600	-612.5600	-613.1200	-613.1700
128	50 % Limit (V/m)	307	307	307	307	307	307.0000	307
128	50 % Margin (V/m)	-305.9600	-305.9800	-305.8800	-306.0600	-305.5600	-306.1200	-306.1700

H-Field (15cm)								H-Field (20cm)
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)	Z-axis (Above)
128	Max H-field (uT)	0.1380	0.1380	0.1460	0.1290	0.1780	0.1130	0.1240
128	Max H-field (A/m)	0.1104	0.1104	0.1168	0.1032	0.1424	0.0904	0.0992
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5196	-1.5196	-1.5132	-1.5268	-1.4876	-1.5396	-1.5308
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7046	-0.7046	-0.6982	-0.7118	-0.6726	-0.7246	-0.7158

Measurements were made from all sides and the top of the primary/client pair, with the 15/20cm measured from the center of the probe(s) to the edge of the device. The highest emission level was recorded.

Portable Mode

H-Field (0cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2390	0.2380	0.2470	0.2280	0.2810	0.2140
128	Max H-field (A/m)	0.1912	0.1904	0.1976	0.1824	0.2248	0.1712
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4388	-1.4396	-1.4324	-1.4476	-1.4052	-1.4588
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6238	-0.6246	-0.6174	-0.6326	-0.5902	-0.6438

H-Field (2cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2400	0.2440	0.2480	0.2310	0.2850	0.2210
128	Max H-field (A/m)	0.1920	0.1952	0.1984	0.1848	0.2280	0.1768
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4380	-1.4348	-1.4316	-1.4452	-1.4020	-1.4532
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6230	-0.6198	-0.6166	-0.6302	-0.5870	-0.6382

H-Field (4cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2380	0.2410	0.2440	0.2260	0.2790	0.2160
128	Max H-field (A/m)	0.1904	0.1928	0.1952	0.1808	0.2232	0.1728
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4396	-1.4372	-1.4348	-1.4492	-1.4068	-1.4572
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6246	-0.6222	-0.6198	-0.6342	-0.5918	-0.6422

H-Field (6cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2290	0.2250	0.2300	0.2170	0.2630	0.2110
128	Max H-field (A/m)	0.1832	0.1800	0.1840	0.1736	0.2104	0.1688
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4468	-1.4500	-1.4460	-1.4564	-1.4196	-1.4612
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6318	-0.6350	-0.6310	-0.6414	-0.6046	-0.6462

H-Field (8cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2200	0.2130	0.2210	0.2120	0.2570	0.2050
128	Max H-field (A/m)	0.1760	0.1704	0.1768	0.1696	0.2056	0.1640
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4540	-1.4596	-1.4532	-1.4604	-1.4244	-1.4660
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6390	-0.6446	-0.6382	-0.6454	-0.6094	-0.6510

H-Field (10cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1490	0.1490	0.1510	0.1340	0.1880	0.1180
128	Max H-field (A/m)	0.1192	0.1192	0.1208	0.1072	0.1504	0.0944
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5108	-1.5108	-1.5092	-1.5228	-1.4796	-1.5356
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6958	-0.6958	-0.6942	-0.7078	-0.6646	-0.7206

H-Field (12cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1460	0.1460	0.1510	0.1350	0.1880	0.1370
128	Max H-field (A/m)	0.1168	0.1168	0.1208	0.1080	0.1504	0.1096
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5132	-1.5132	-1.5092	-1.5220	-1.4796	-1.5204
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6982	-0.6982	-0.6942	-0.7070	-0.6646	-0.7054

H-Field (14cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1380	0.1410	0.1450	0.1320	0.1840	0.1300
128	Max H-field (A/m)	0.1104	0.1128	0.1160	0.1056	0.1472	0.1040
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5196	-1.5172	-1.5140	-1.5244	-1.4828	-1.5260
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7046	-0.7022	-0.6990	-0.7094	-0.6678	-0.7110

H-Field (16cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1320	0.1350	0.1360	0.1260	0.1750	0.1240
128	Max H-field (A/m)	0.1056	0.1080	0.1088	0.1008	0.1400	0.0992
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5244	-1.5220	-1.5212	-1.5292	-1.4900	-1.5308
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7094	-0.7070	-0.7062	-0.7142	-0.6750	-0.7158

H-Field (18cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1280	0.1270	0.1320	0.1220	0.1660	0.1110
128	Max H-field (A/m)	0.1024	0.1016	0.1056	0.0976	0.1328	0.0888
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5276	-1.5284	-1.5244	-1.5324	-1.4972	-1.5412
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7126	-0.7134	-0.7094	-0.7174	-0.6822	-0.7262

H-Field (20cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1010	0.1020	0.1130	0.0970	0.1310	0.0840
128	Max H-field (A/m)	0.0808	0.0816	0.0904	0.0776	0.1048	0.0672
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5492	-1.5484	-1.5396	-1.5524	-1.5252	-1.5628
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7342	-0.7334	-0.7246	-0.7374	-0.7102	-0.7478

Charging Mode with iPhone, battery Max Charge

E-Field (15cm)								E-Field (20cm)
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)	Z-axis (Above)
128	Max E-field (V/m)	1.1200	1.1100	1.2100	1.0300	1.5200	0.9300	0.8900
128	Limit (V/m)	614	614	614	614	614	614	614
128	Margin (V/m)	-612.8800	-612.8900	-612.7900	-612.9700	-612.4800	-613.0700	-613.1100
128	50 % Limit (V/m)	307	307	307	307	307	307	307
128	50 % Margin (V/m)	-305.8800	-305.8900	-305.7900	-305.9700	-305.4800	-306.0700	-306.1100

H-Field (15cm)								H-Field (20cm)
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)	Z-axis (Above)
128	Max H-field (uT)	0.1430	0.1440	0.1530	0.1350	0.1830	0.1220	0.1310
128	Max H-field (A/m)	0.1144	0.1152	0.1224	0.1080	0.1464	0.0976	0.1048
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5156	-1.5148	-1.5076	-1.5220	-1.4836	-1.5324	-1.5252
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7006	-0.6998	-0.6926	-0.7070	-0.6686	-0.7174	-0.7102

Measurements were made from all sides and the top of the primary/client pair, with the 15/20cm measured from the center of the probe(s) to the edge of the device. The highest emission level was recorded.

Portable Mode

H-Field (0cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2440	0.2460	0.2580	0.2370	0.2860	0.2240
128	Max H-field (A/m)	0.1952	0.1968	0.2064	0.1896	0.2288	0.1792
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4348	-1.4332	-1.4236	-1.4404	-1.4012	-1.4508
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6198	-0.6182	-0.6086	-0.6254	-0.5862	-0.6358

H-Field (2cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2460	0.2480	0.2540	0.2340	0.2860	0.2260
128	Max H-field (A/m)	0.1968	0.1984	0.2032	0.1872	0.2288	0.1808
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4332	-1.4316	-1.4268	-1.4428	-1.4012	-1.4492
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6182	-0.6166	-0.6118	-0.6278	-0.5862	-0.6342

H-Field (4cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2400	0.2440	0.2460	0.2290	0.2810	0.2230
128	Max H-field (A/m)	0.1920	0.1952	0.1968	0.1832	0.2248	0.1784
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4380	-1.4348	-1.4332	-1.4468	-1.4052	-1.4516
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6230	-0.6198	-0.6182	-0.6318	-0.5902	-0.6366

H-Field (6cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2330	0.2340	0.2350	0.2210	0.2720	0.2190
128	Max H-field (A/m)	0.1864	0.1872	0.1880	0.1768	0.2176	0.1752
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4436	-1.4428	-1.4420	-1.4532	-1.4124	-1.4548
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6286	-0.6278	-0.6270	-0.6382	-0.5974	-0.6398

H-Field (8cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.2240	0.2260	0.2250	0.2160	0.2640	0.2140
128	Max H-field (A/m)	0.1792	0.1808	0.1800	0.1728	0.2112	0.1712
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.4508	-1.4492	-1.4500	-1.4572	-1.4188	-1.4588
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6358	-0.6342	-0.6350	-0.6422	-0.6038	-0.6438

H-Field (10cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1480	0.1520	0.1550	0.1430	0.1900	0.1260
128	Max H-field (A/m)	0.1184	0.1216	0.1240	0.1144	0.1520	0.1008
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5116	-1.5084	-1.5060	-1.5156	-1.4780	-1.5292
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6966	-0.6934	-0.6910	-0.7006	-0.6630	-0.7142

H-Field (12cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1480	0.1470	0.1520	0.1360	0.1920	0.1410
128	Max H-field (A/m)	0.1184	0.1176	0.1216	0.1088	0.1536	0.1128
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5116	-1.5124	-1.5084	-1.5212	-1.4764	-1.5172
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.6966	-0.6974	-0.6934	-0.7062	-0.6614	-0.7022

H-Field (14cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1400	0.1430	0.1470	0.1340	0.1860	0.1340
128	Max H-field (A/m)	0.1120	0.1144	0.1176	0.1072	0.1488	0.1072
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5180	-1.5156	-1.5124	-1.5228	-1.4812	-1.5228
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7030	-0.7006	-0.6974	-0.7078	-0.6662	-0.7078

H-Field (16cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1350	0.1360	0.1400	0.1300	0.1820	0.1260
128	Max H-field (A/m)	0.1080	0.1088	0.1120	0.1040	0.1456	0.1008
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5220	-1.5212	-1.5180	-1.5260	-1.4844	-1.5292
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7070	-0.7062	-0.7030	-0.7110	-0.6694	-0.7142

H-Field (18cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1320	0.1340	0.1350	0.1250	0.1710	0.1140
128	Max H-field (A/m)	0.1056	0.1072	0.1080	0.1000	0.1368	0.0912
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5244	-1.5228	-1.5220	-1.5300	-1.4932	-1.5388
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7094	-0.7078	-0.7070	-0.7150	-0.6782	-0.7238

H-Field (20cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1130	0.1120	0.1190	0.1040	0.1340	0.0920
128	Max H-field (A/m)	0.0904	0.0896	0.0952	0.0832	0.1072	0.0736
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5396	-1.5404	-1.5348	-1.5468	-1.5228	-1.5564
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7246	-0.7254	-0.7198	-0.7318	-0.7078	-0.7414

Standby Mode

E-Field (15cm)								E-Field (20cm)
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)	Z-axis (Above)
128	Max E-field (V/m)	0.4100	0.4200	0.3800	0.3600	0.6600	0.3800	0.3600
128	Limit (V/m)	614	614	614	614	614	614	614
128	Margin (V/m)	-613.5900	-613.5800	-613.6200	-613.6400	-613.3400	-613.6200	-613.6400
128	50 % Limit (V/m)	307	307	307	307	307	307	307
128	50 % Margin (V/m)	-306.5900	-306.5800	-306.6200	-306.6400	-306.3400	-306.6200	-306.6400

H-Field (15cm)								H-Field (20cm)
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)	Z-axis (Above)
128	Max H-field (uT)	0.0340	0.0350	0.0430	0.0330	0.0620	0.0310	0.0320
128	Max H-field (A/m)	0.0272	0.0280	0.0344	0.0264	0.0496	0.0248	0.0256
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.6028	-1.6020	-1.5956	-1.6036	-1.5804	-1.6052	-1.6044
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7878	-0.7870	-0.7806	-0.7886	-0.7654	-0.7902	-0.7894

Measurements were made from all sides and the top of the primary/client pair, with the 15/20cm measured from the center of the probe(s) to the edge of the device. The highest emission level was recorded.

Portable Mode

H-Field (0cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1320	0.1330	0.1440	0.1350	0.1680	0.1270
128	Max H-field (A/m)	0.1056	0.1064	0.1152	0.1080	0.1344	0.1016
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5244	-1.5236	-1.5148	-1.5220	-1.4956	-1.5284
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7094	-0.7086	-0.6998	-0.7070	-0.6806	-0.7134

H-Field (2cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1250	0.1270	0.1320	0.1220	0.1550	0.1230
128	Max H-field (A/m)	0.1000	0.1016	0.1056	0.0976	0.1240	0.0984
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5300	-1.5284	-1.5244	-1.5324	-1.5060	-1.5316
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7150	-0.7134	-0.7094	-0.7174	-0.6910	-0.7166

H-Field (4cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1230	0.1250	0.1250	0.1180	0.1530	0.1190
128	Max H-field (A/m)	0.0984	0.1000	0.1000	0.0944	0.1224	0.0952
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5316	-1.5300	-1.5300	-1.5356	-1.5076	-1.5348
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7166	-0.7150	-0.7150	-0.7206	-0.6926	-0.7198

H-Field (6cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.1150	0.1160	0.1180	0.1150	0.1490	0.1130
128	Max H-field (A/m)	0.0920	0.0928	0.0944	0.0920	0.1192	0.0904
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5380	-1.5372	-1.5356	-1.5380	-1.5108	-1.5396
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7230	-0.7222	-0.7206	-0.7230	-0.6958	-0.7246

H-Field (8cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.0950	0.1010	0.1020	0.0960	0.1110	0.1010
128	Max H-field (A/m)	0.0760	0.0808	0.0816	0.0768	0.0888	0.0808
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5540	-1.5492	-1.5484	-1.5532	-1.5412	-1.5492
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7390	-0.7342	-0.7334	-0.7382	-0.7262	-0.7342

H-Field (10cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.0440	0.0450	0.0480	0.0420	0.0670	0.0390
128	Max H-field (A/m)	0.0352	0.0360	0.0384	0.0336	0.0536	0.0312
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5948	-1.5940	-1.5916	-1.5964	-1.5764	-1.5988
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7798	-0.7790	-0.7766	-0.7814	-0.7614	-0.7838

H-Field (12cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.0640	0.0630	0.0640	0.0570	0.0620	0.0580
128	Max H-field (A/m)	0.0512	0.0504	0.0512	0.0456	0.0496	0.0464
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5788	-1.5796	-1.5788	-1.5844	-1.5804	-1.5836
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7638	-0.7646	-0.7638	-0.7694	-0.7654	-0.7686

H-Field (14cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.0500	0.0510	0.0530	0.0470	0.0580	0.0480
128	Max H-field (A/m)	0.0400	0.0408	0.0424	0.0376	0.0464	0.0384
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5900	-1.5892	-1.5876	-1.5924	-1.5836	-1.5916
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7750	-0.7742	-0.7726	-0.7774	-0.7686	-0.7766

H-Field (16cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.0440	0.0420	0.0460	0.0400	0.0560	0.0390
128	Max H-field (A/m)	0.0352	0.0336	0.0368	0.0320	0.0448	0.0312
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.5948	-1.5964	-1.5932	-1.5980	-1.5852	-1.5988
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7798	-0.7814	-0.7782	-0.7830	-0.7702	-0.7838

H-Field (18cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.0360	0.0340	0.0350	0.0310	0.0440	0.0300
128	Max H-field (A/m)	0.0288	0.0272	0.0280	0.0248	0.0352	0.0240
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.6012	-1.6028	-1.6020	-1.6052	-1.5948	-1.6060
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7862	-0.7878	-0.7870	-0.7902	-0.7798	-0.7910

H-Field (20cm)							
Frequency (kHz)	EUT Side	Left	Right	Top	Bottom	Z-axis (Above)	Z-axis (Below)
128	Max H-field (uT)	0.0260	0.0270	0.0320	0.0260	0.0340	0.0240
128	Max H-field (A/m)	0.0208	0.0216	0.0256	0.0208	0.0272	0.0192
128	Limit (A/m)	1.63	1.63	1.63	1.63	1.63	1.63
128	Margin (A/m)	-1.6092	-1.6084	-1.6044	-1.6092	-1.6028	-1.6108
128	50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815	0.815
128	50 % Margin (A/m)	-0.7942	-0.7934	-0.7894	-0.7942	-0.7878	-0.7958

5. Photographs of the Test Configuration

Please refer to the attached file (Test Setup Photo).

--- END ---