

RF EXPOSURE REPORT

According to : FCC 47CFR part 1 subpart I and part 2 subpart J

Test Report No. : CTK-2017-02001
Date of Issue : 2017-12-28
FCC ID : 2AN8I-PWC-WT508
Equipment Under Test : PWC-WT508
Kind of Product : Wireless Charger
Applicant : Pincraft Enginnering INC
Applicant Address : 2nd floor, Artview BLD, Pyoungchon Smart Squire, 170beon-gil
44, burim-ro, Dongan-gu Anyang-si, Gyeonggi-do, Korea
Manufacturer : Pincraft Enginnering INC
Manufacturer Address : 2nd floor, Artview BLD, Pyoungchon Smart Squire, 170beon-gil
44, burim-ro, Dongan-gu Anyang-si, Gyeonggi-do, Korea
Contact Person : Kim, Jeong Woong
Telephone : +82-31-423-3077
Received Date : 2017-09-06
Test period : Start : December 27, 2017 End : December 27, 2017
Test Results : In Compliance Not in Compliance

The test results presented in this report relate only to the object tested.

Affirmation	Tested by Bongjun, Jang: (Signature)	Technical Manager Young-taek, Lee: (Signature)
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REPORT REVISION HISTORY

Date	Revision	Page No
2017-12-28	Issued (CTK-2017-02001)	All

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1.0 General Product Description

Type of equipment	Wireless Charger
Equipment model name	PWC-WT508
Frequency Range	112 kHz – 205 kHz
Antenna type	Coil antenna
Coil Specification	Outer diameter : 43.0±0.5 mm Inner diameter : 20.7±0.5 mm
Power Source	TRAVEL ADAPTER Input : AC 100-240 V, 50/60 Hz Output : DC 5 V Test Voltage and Frequency : AC 120 V, 60 Hz

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
TRAVEL ADAPTER	RF Tech(Tianjin) Electronics Co., Ltd.	ETA-U90KWK	RT4D420LV/B-E	Verification
Mobile phone (Qi Charger)	SAMSUNG Electronics Co., Ltd.	SM-930K (SAMSUNG Galaxy S7)	-	A3LSMG930KOR

1.4 EUT Operating Modes

Equipment under test was operated during the measurement under the following conditions:

- Charging

Modulation Type : CW (Continuous Wave)

Output Power : Max. 9.49 dBuV/m (Frequency 115.59 kHz, Test Distance 3 m)

TX Duty Cycle : 100 % by measurement

1.5 Test Modes

This device has been tested below conditions:

E and H Field measurements were performed at a distance of 10 cm laterally from the edges of the EUT.

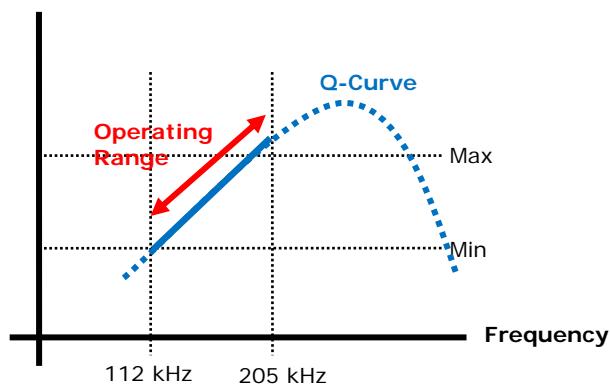
The tests were performed by configuring the test settings on the remaining charge of the rechargeable battery to charge the client device for various loading conditions.

The following modes were investigated with the Mobile phone(Qi Charger) under the following conditions:

- Mobile phone(Qi Charger) at 1% charge state.(Test Frequency 112 kHz)
- Mobile phone(Qi Charger) at 50% charge state.(Test Frequency 157.5 kHz)
- Mobile phone(Qi Charger) at 99% charge state.(Test Frequency 205 kHz)

Frequency	Battery Charge	Note
112 kHz	Min	Low Frequency
157.5 kHz	Medium	Middle Frequency
205 kHz	Max	High Frequency

Battery charge



1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.7 Test Facility

The measurement facility is located at (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea

1.8 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Registration Number	Logo
USA	FCC	FCC Part 15 & 18 EMI (Electromagnetic Interference / Emission)	805871	
CANADA	IC	IC EMI (3/10m test site)	8737A-2	
JAPAN	VCCI	VCCI V-3 EMI (Electromagnetic Interference / Emission)	C-986 T-1843 R-3627 G-387	
KOREA	MSIP	EMI (Electromagnetic Interference / Emission) EMS (Electromagnetic Susceptibility / Immunity)	KR0025	

2.0 Summary of tests

FCC Part Section(s)	Parameter	Status (note 1)
1.1307(b), 1.1310	Radio frequency radiation exposure limits	Complies

2.1 Test Setup

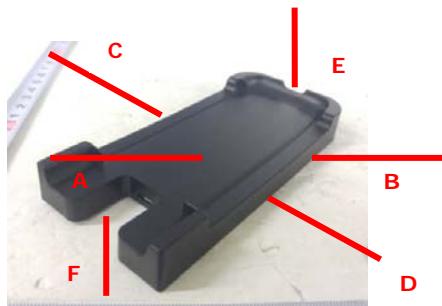
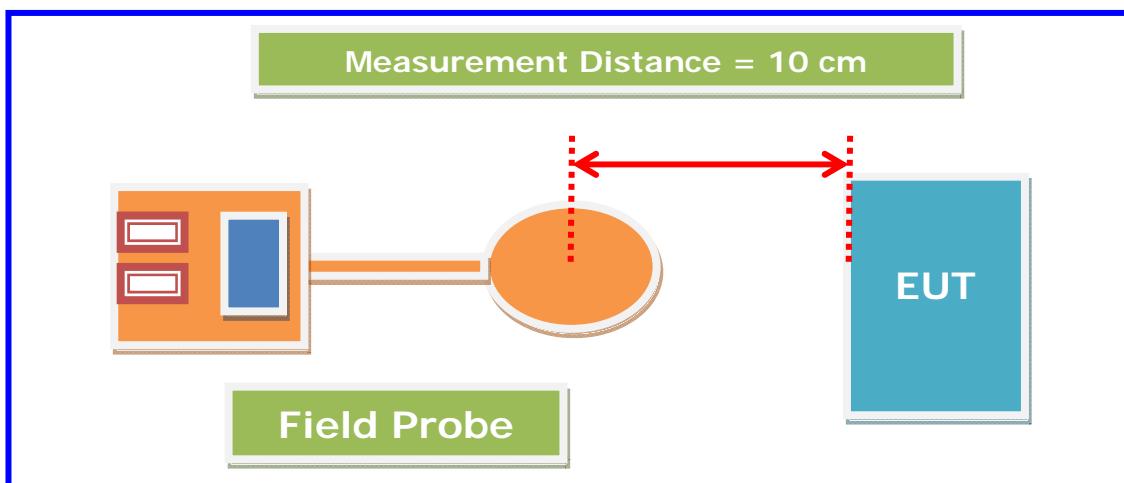
Test Location

Anechoic Chamber

Measurement distance information

Measurement distance = 10 cm

From EUT edge to the center of probe.



Measurements should be made from all sides and the top of the primary/client pair, with the 10 cm measured from the center of the probe(s) to the edge of the device.

- The RF exposure test was performed on 360 degree turn table in anechoic chamber.
- The measurement probe was placed at test distance (10cm) which is between the edge of the charger and the geometric centre of probe.
- The turn table was rotated 360 degree to search of highest strength.
- The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E, F) were completed.
- The EUT were measured according to the dictates of KDB 680106D01v02.

2.2 Equipment Approval Considerations:

The EUT does comply with item 5.2 of KDB 680106 D01v02

- a) Power transfer frequency is less than 1MHz.
 - The device operate in the frequency range from 112kHz~205kHz
- b) Output power from each primary coil is less than 5 watts.
 - The maximum output power of the primary coil is 5W.
- c) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that able to detect and allow coupling only between individual pair of coils.
 - The DUT(Device Under Test) are consist of one charging coil use. So the DUT can detect and allow coupling only between TX and RX Coil.
- d) Client device is inserted in or placed directly in contact with the transmitter.
 - Client device is placed directly in contact with the transmitter.
- e) The maximum coupling surface area of the transmit (charging) device:
 - The EUT coupling surface area : $4.7 \text{ cm(W)} \times 4.7 \text{ cm(D)} = 22.09 \text{ cm}^2 < 60 \text{ cm}^2$
- f) Aggregate leakage fields at 10cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 30% of the MPE limit.
 - The EUT field strength levels $< 30\%$ of the MPE limit 1.63 A/m
(0.268 A/m (Max.) $< 0.489 \text{ A/m}$)

2.3 Radio frequency radiation exposure limits

§ 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.

2.4 Test Results

EUT	Wireless Charger	Model	PWC-WT508
Frequency Range	112 kHz – 205 kHz	Test mode	TX

The requirements are:

Complies

Test Data (E-Field)

- Exposure with Mobile phone(Qi Charger) at 1% charge

Frequency Range (kHz)	Position	Lateral Distance from EUT (cm)	E-Field Limit (V/m)	Electric Field Strength (V/m)
112 - 205 Test Frequency 112 kHz	A	10	614	3.06
	B	10	614	3.24
	C	10	614	2.74
	D	10	614	2.16
	E	10	614	1.53
	F	10	614	1.62

- Exposure with Mobile phone(Qi Charger) at 50% charge

Frequency Range (kHz)	Position	Lateral Distance from EUT (cm)	E-Field Limit (V/m)	Electric Field Strength (V/m)
112 - 205 Test Frequency 157.5 kHz	A	10	614	2.91
	B	10	614	2.99
	C	10	614	2.51
	D	10	614	2.11
	E	10	614	1.41
	F	10	614	1.33

- Exposure with Mobile phone(Qi Charger) at 99% charge

Frequency Range (kHz)	Position	Lateral Distance from EUT (cm)	E-Field Limit (V/m)	Electric Field Strength (V/m)
112 - 205 Test Frequency 205 kHz	A	10	614	2.63
	B	10	614	2.78
	C	10	614	2.13
	D	10	614	1.94
	E	10	614	1.07
	F	10	614	0.97

Test Data (H-Field)

- Exposure with Mobile phone(Qi Charger) at 1% charge

Frequency Range (kHz)	Position	Lateral Distance from EUT(cm)	H-Field Limit (A/m)	Magnetic Field Strength(A/m)
112 - 205 Test Frequency 112 kHz	A	10	1.63	0.175
	B	10	1.63	0.268
	C	10	1.63	0.136
	D	10	1.63	0.142
	E	10	1.63	0.099
	F	10	1.63	0.084

- Exposure with Mobile phone(Qi Charger) at 50% charge

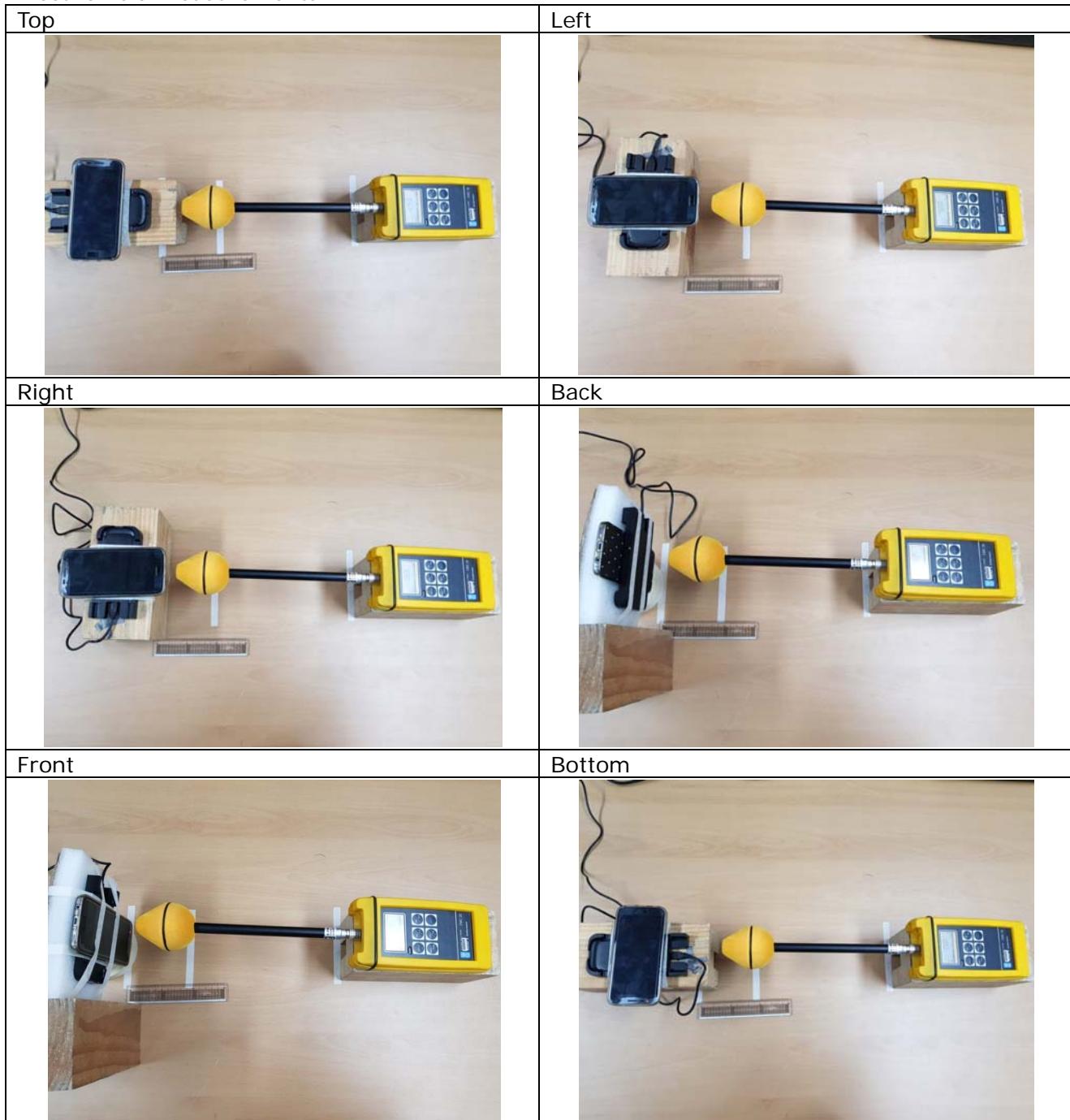
Frequency Range (kHz)	Position	Lateral Distance from EUT(cm)	H-Field Limit (A/m)	Magnetic Field Strength(A/m)
112 - 205 Test Frequency 157.5 kHz	A	10	1.63	0.143
	B	10	1.63	0.208
	C	10	1.63	0.118
	D	10	1.63	0.135
	E	10	1.63	0.078
	F	10	1.63	0.058

- Exposure with Mobile phone(Qi Charger) at 99% charge

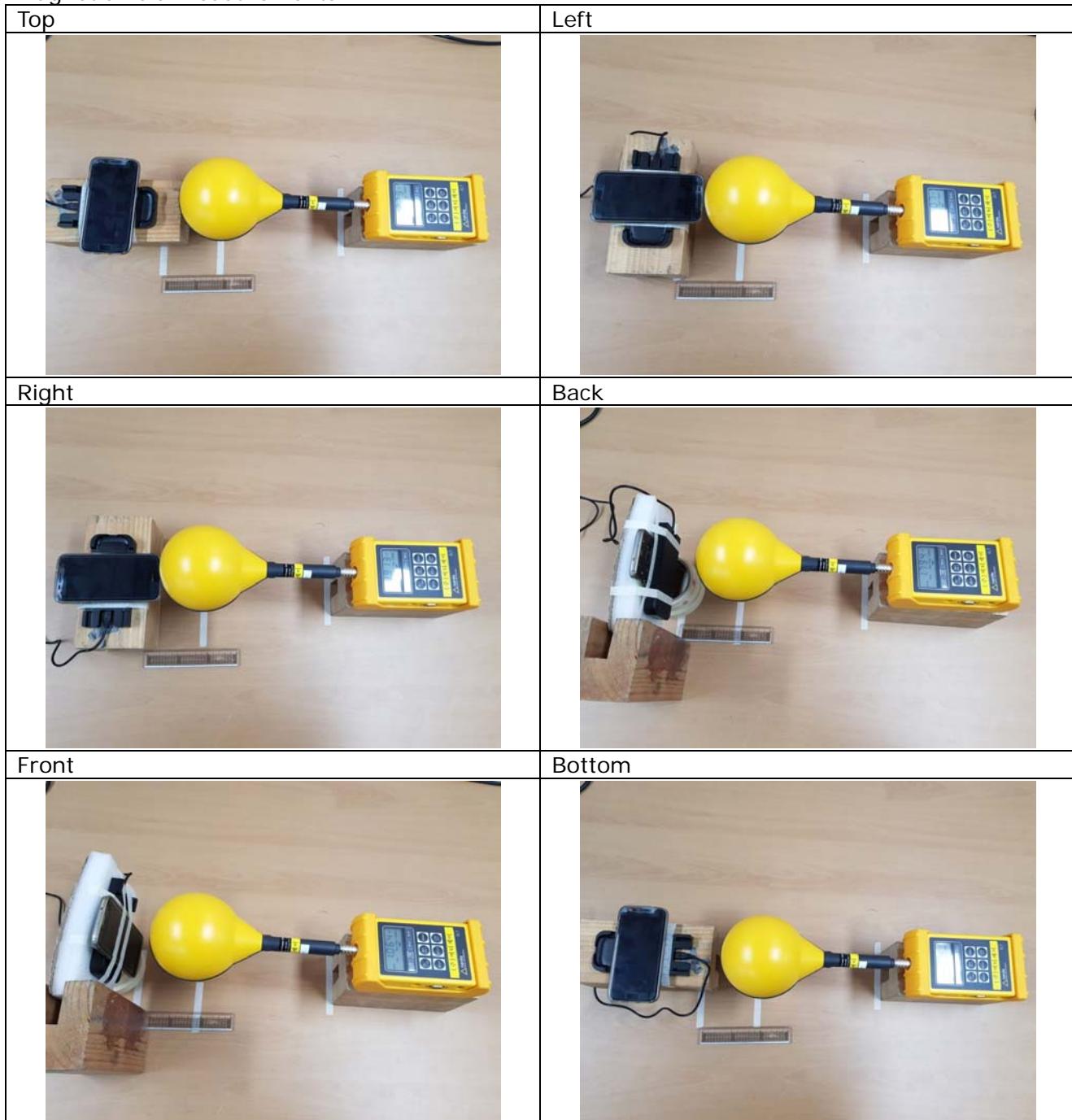
Frequency Range (kHz)	Position	Lateral Distance from EUT(cm)	H-Field Limit (A/m)	Magnetic Field Strength(A/m)
112 - 205 Test Frequency 205 kHz	A	10	1.63	0.135
	B	10	1.63	0.202
	C	10	1.63	0.103
	D	10	1.63	0.126
	E	10	1.63	0.077
	F	10	1.63	0.042

2.5 Test Setup Photos

Electric field measurements



Magnetic field measurements





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APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (yy/mm/dd)	Next Cal.Date (yy/mm/dd)	Cal. Interval
1	E-Field Probe	Schaffner	2244/90.20	R-0029	17-06-22	18-06-22	1 year
2	EM Radiation Meter	Schaffner	EMC-20	R-0029	17-06-22	18-06-22	1 year
3	B-Field Probe	Narda	2300/90.10	M-0626	17-06-09	18-06-09	1 year
4	Exposure Level Meter	Narda	ELT-400	N-0181	17-06-09	18-06-09	1 year