RF Exposure Evaluation Report

1. Product Information

FCC ID:	2ADK3XO-9672
Product Name	Bluetooth Speaker with Wireless Charging
Model Number	XO-9672
Power Supply	Input: DC 5V
Modulation Type	WPT: CW (Continuous Wave)
Frequency Range	WPT: 110 – 205 KHz
WPC Operation Frequency	150.0 KHz
Antenna Type	WPT: Coil Antenna
Hardware version	/
Software version	/
Accessories	iPhone X
Exposure category	General population/uncontrolled environment
EUT Type	Production Unit
Device Type	Mobile device

2. Evaluation Method

According to KDB447498 D01 General RF Exposure Guidance v06Section 4.3.1 Standalone SAR test exclusion considerations: "Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc."
[(max. power of channel, including tune-up tolerance, mW)/ (min. test separation distance, mm)] · [√f (GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation

distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

When one of the following test exclusion conditions is satisfied for all combinations of simultaneous transmission configurations, further equipment approval is not required to incorporate transmitter modules in host devices that operate in the mixed mobile and portable host platform exposure conditions. The grantee is responsible for documenting this according to Class I permissive change requirements. Antennas that qualify for standalone SAR test exclusion must apply the estimated standalone SAR to determine simultaneous transmission test exclusion.

a) The [∑ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg] + [∑ of MPE ratios] is ≤ 1.0.
b) The SAR to peak location separation ratios of all simultaneously transmitting antenna pairs operating in portable device exposure conditions are all ≤ 0.04, and the [∑ of MPE ratios] is ≤ 1.0.

3. Evaluation Limit

3.1 Refer evaluation method

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 447498 D01 General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2.1093: Radiofrequency radiation exposure evaluation: portable devices

3.2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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
300-1,500	/	/	f/300	6
1,500-100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
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
300-1,500	/	/	f/1500	30
1,500-100,000	/	/	1.0	30

F=frequency in MHz

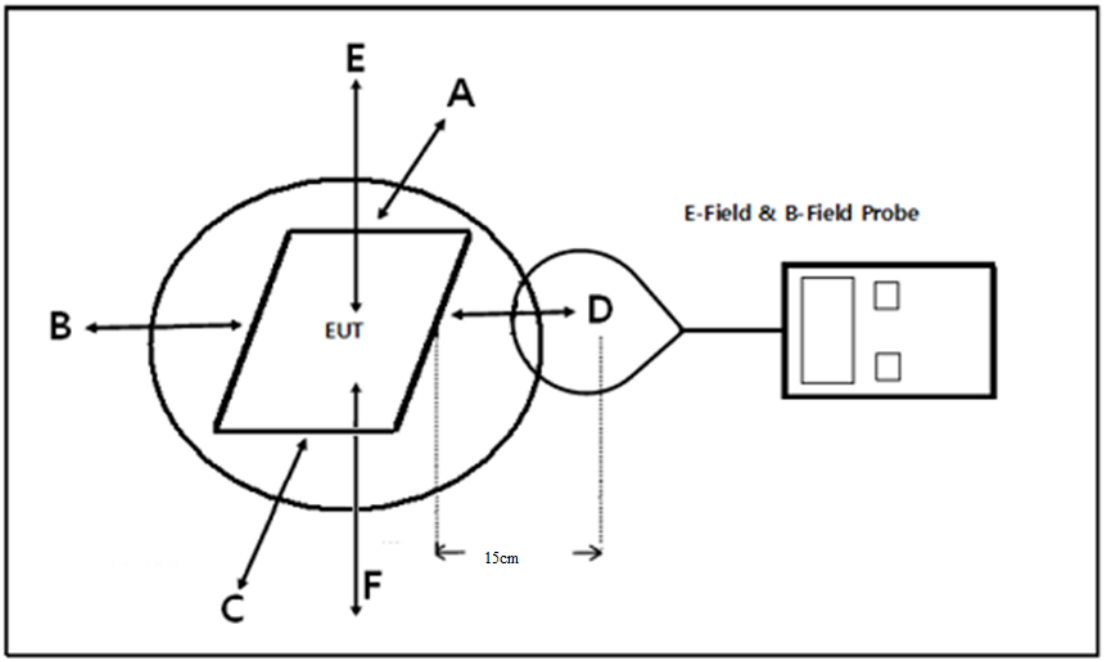
*=Plane-wave equivalent power density

According to FCC KDB 680106 D01 Section 3. RF Exposure Requirements clause 3 the Emission-Limits in the frequency range from 100 KHz to 300 KHz should be assessed versus the limits at 300 KHz in Table 1 of CFR 47 – Section1.310 as following (measured distance shall be 15cm from the center of the probe to the edge of the device):

	E-Field	*/*	B-Field
Frequency	V/m	A/m	uT
0.3 MHz – 3.0 MHz	614	1.613	2.0
3.0 MHz – 30 MHz	824/f (=27.5_{30MHz})	2.19/f (=0.073_{30MHz})	--

A KDB inquire was required to determine/confirm the applicable limits below 100 KHz.

4. Test Setup Diagram



5. Test Equipment

Equipment	Manufacturer	Model	Serial no.	Calibrated date	Calibrated Due
Exposure Level Tester	Narda	ELT-400	N-0713	2019-04-02	2020-04-01
B-Field Probe	Narda	ELT-400	M-1154	2019-04-11	2020-04-10

6. RF Exposure Evaluation

6.1 Standalone WPC Evaluation

6.1.1 Measurement Procedure

a) The RF exposure test was performed on 360 degree turn table in anechoic chamber.

b) The measurement probe was placed at test distance (15cm) which is between the edge of the charger and the geometric center of probe.

c) The turn table was rotated 360d degree to search of highest strength.

d) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E) were completed.

e) The EUT were measured according to the dictates of KDB 680106D01v03.

6.1.2 Equipment Approval Considerations

The EUT does comply with item 5.2 of KDB 680106 D01v02 as follows table;

Requirements of KDB 680106 D01	Yes / No	Description
Power transfer frequency is less than 1 MHz	Yes	The device operate in the frequency range 110.0 KHz - 205.0 KHz
Output power from each primary coil is less than 15 watts	Yes	The maximum output power of the primary coil is less than 15W.
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 transfer system includes one primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.
Client device is placed directly in contact with the transmitter.	Yes	Client device is placed directly in contact with the transmitter.
Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	Yes	Mobile exposure conditions only
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 H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are less than 50% the MPE limit.

In all other cases, unless excluded above, an RF exposure evaluation report must be reviewed and accepted through a KDB or PBA inquiry to enable authorization of the equipment. When evaluation is required to show compliance; for example, using field strength, power density, SAR measurements or computational modeling etc., the specific authorization requirements will be determined based on the results of the RF exposure evaluation.

6.1.3 E and H field Strength

Operate mode:

Test Modes:		
TM1	AC/DC Adapter + EUT + Electric Silicone Cleansing Instrument (Battery Status: <1%)	Record
TM2	AC/DC Adapter + EUT + Electric Silicone Cleansing Instrument (Battery Status: <50%)	Pre-tested
TM3	AC/DC Adapter + EUT + Electric Silicone Cleansing Instrument (Battery Status: 100%)	Pre-tested
TM4	EUT + Electric Silicone Cleansing Instrument (Battery Status: <1%)	Record
TM5	EUT + Electric Silicone Cleansing Instrument (Battery Status: <50%)	Pre-tested
TM6	EUT + Electric Silicone Cleansing Instrument (Battery Status: 100%)	Pre-tested
Note: All test modes were pre-tested, but we only recorded the worst case in this report.		

E-Field Strength at 15 cm from the edges surrounding the EUT and 15cm from the top surface of the EUT

Operate mode	Charging Battery Level	Frequency Range (MHz)	Measured E-Field Strength Values (V/m)					FCC E-Field Strength 50% Limits (V/m)	FCC E-Field Strength Limits(V/m)
			Test Position A	Test Position B	Test Position C	Test Position D	Test Position E		
TM1	1%	0.150	5.83	5.17	5.52	5.33	6.42	307.0	614.0
	50%	0.150	5.48	5.25	5.46	4.67	5.65	307.0	614.0
	99%	0.150	5.37	4.61	5.38	4.59	5.72	307.0	614.0
TM4	1%	0.150	5.57	5.38	5.74	5.42	6.62	307.0	614.0
	50%	0.150	5.48	5.29	5.61	5.14	5.78	307.0	614.0
	99%	0.150	5.27	5.67	5.15	4.96	5.54	307.0	614.0

H-Field Strength at 15 cm from the edges surrounding the EUT and 15cm from the top surface of the EUT

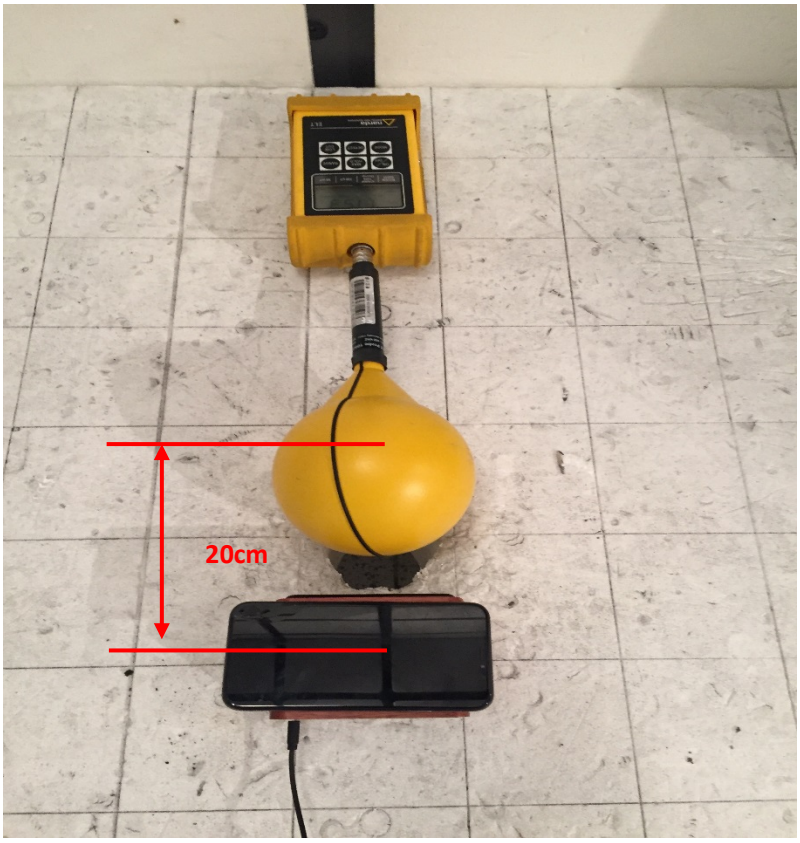
Operate mode	Charging Battery Level	Frequency Range (MHz)	Measured H-Field Strength Values (A/m)					FCC H-Field Strength 50% Limits (A/m)	FCC H-Field Strength Limits (A/m)
			Test Position A	Test Position B	Test Position C	Test Position D	Test Position E		
TM1	1%	0.150	0.107	0.092	0.106	0.114	0.123	0.815	1.63
	50%	0.150	0.096	0.094	0.103	0.096	0.128	0.815	1.63
	99%	0.150	0.081	0.085	0.074	0.078	0.113	0.815	1.63
TM4	1%	0.150	0.109	0.092	0.112	0.113	0.155	0.815	1.63
	50%	0.150	0.104	0.089	0.104	0.103	0.164	0.815	1.63
	99%	0.150	0.092	0.079	0.076	0.084	0.132	0.815	1.63

H-Field Strength at 20cm from the top surface of the EUT

Operate mode	Charging Battery Level	Frequency Range (MHz)	Measured H-Field Strength Values (A/m)	FCC H-Field Strength 50% Limits (A/m)	FCC H-Field Strength Limits (A/m)
			Test Position E		
TM1	1%	0.150	0.097	0.815	1.63
	50%	0.150	0.092	0.815	1.63
	99%	0.150	0.088	0.815	1.63
TM4	1%	0.150	0.097	0.815	1.63
	50%	0.150	0.112	0.815	1.63
	99%	0.150	0.083	0.815	1.63

6.1.4 Test Setup Photos

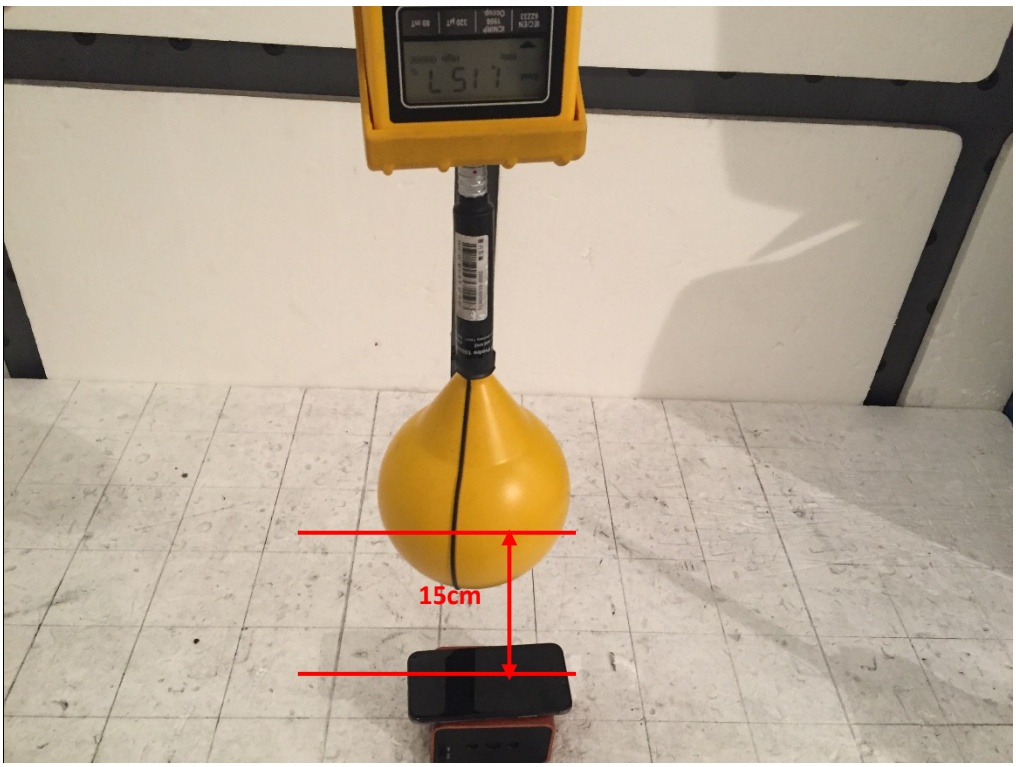
6.1.4.1 Test Position E-Exposure photo from top surface(20cm)



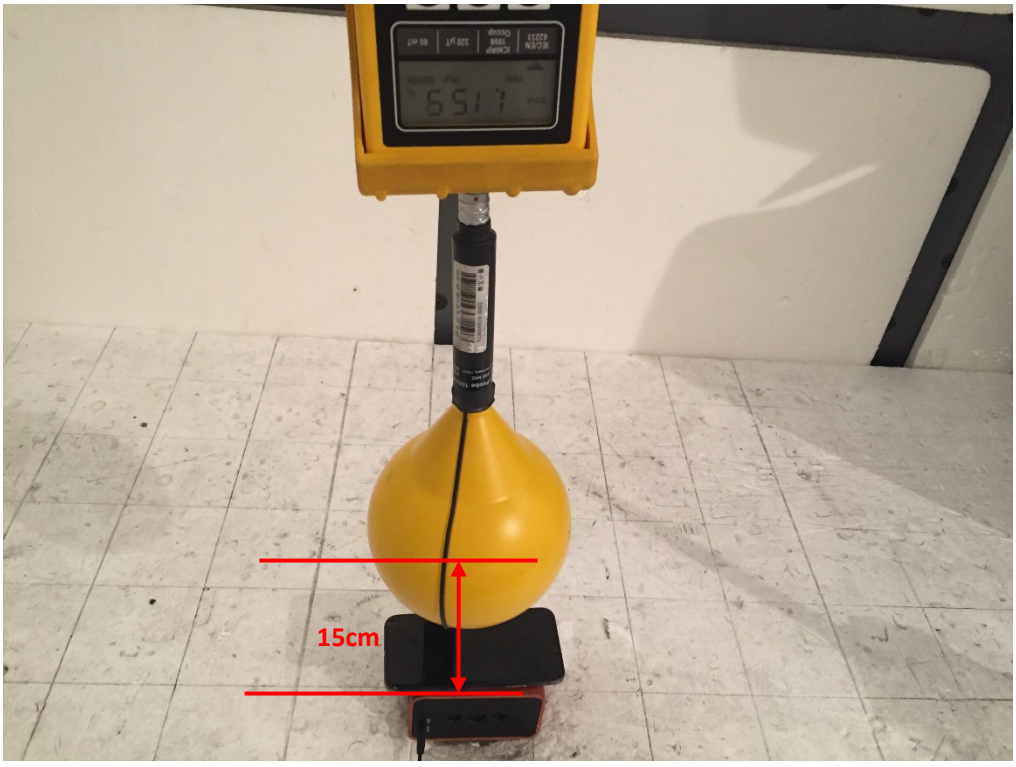
(TM1)

(TM4)

6.1.4.2 Test Position E-Exposure photo from top surface (15cm)

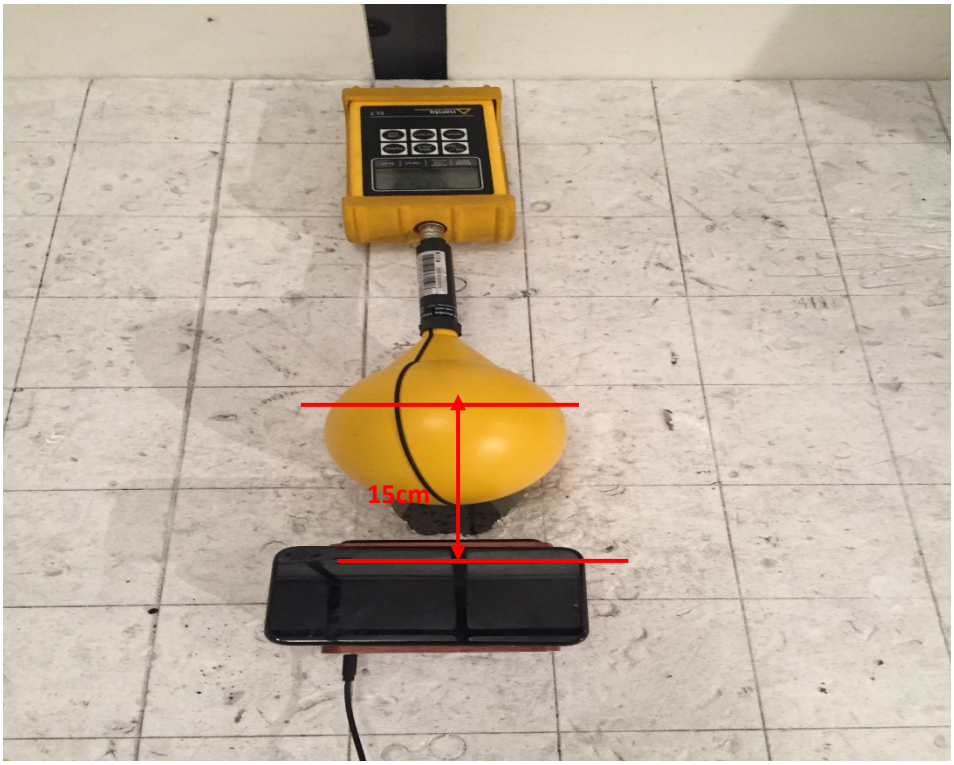


(TM1)



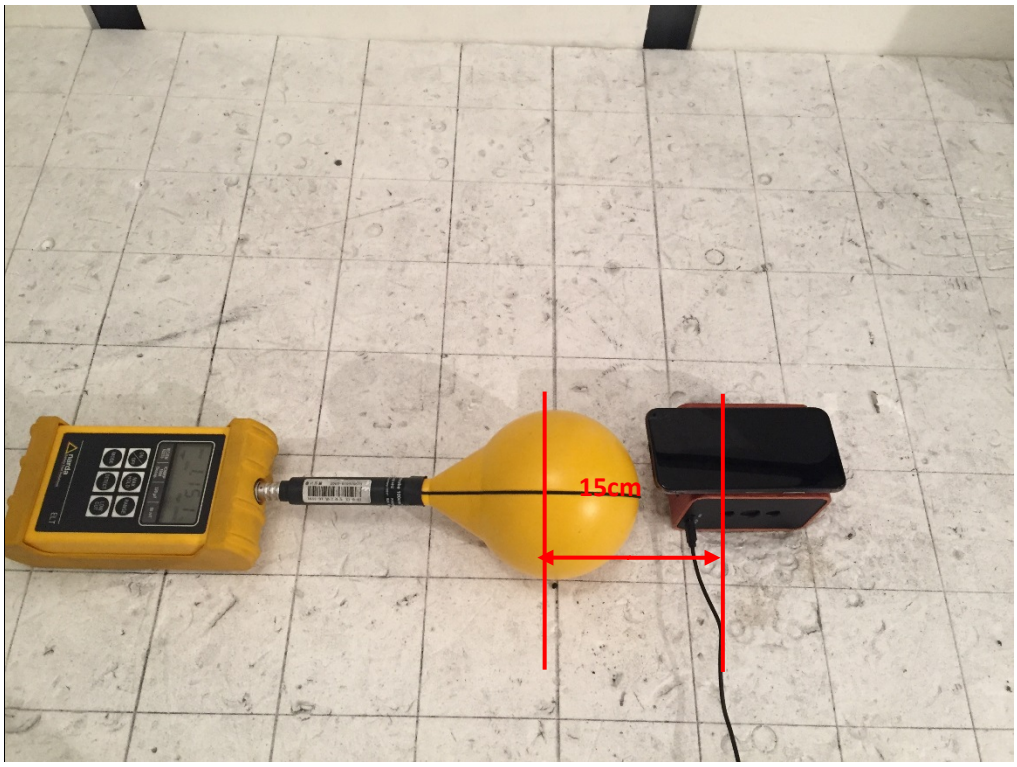
(TM4)

6.1.4.3 Test Position A-Exposure photo from side edge surface-Rear



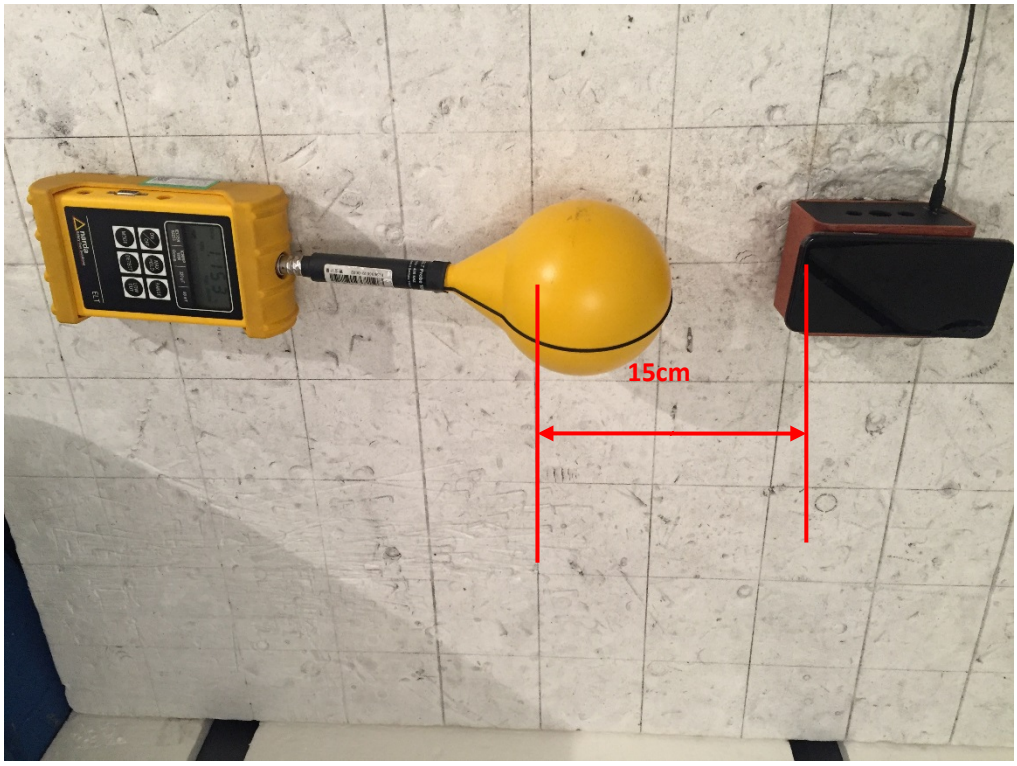
(TM1)

(TM4)



(TM1)

6.1.4.4 Test Position C-Exposure photo from side edge surface-Front

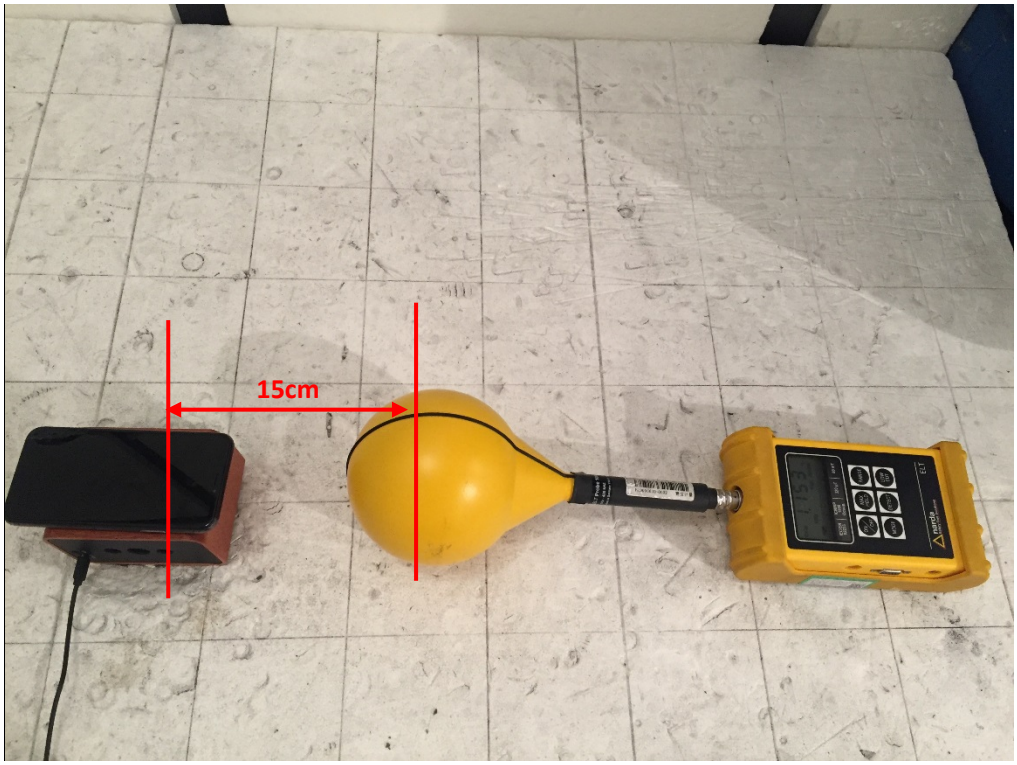


(TM4)

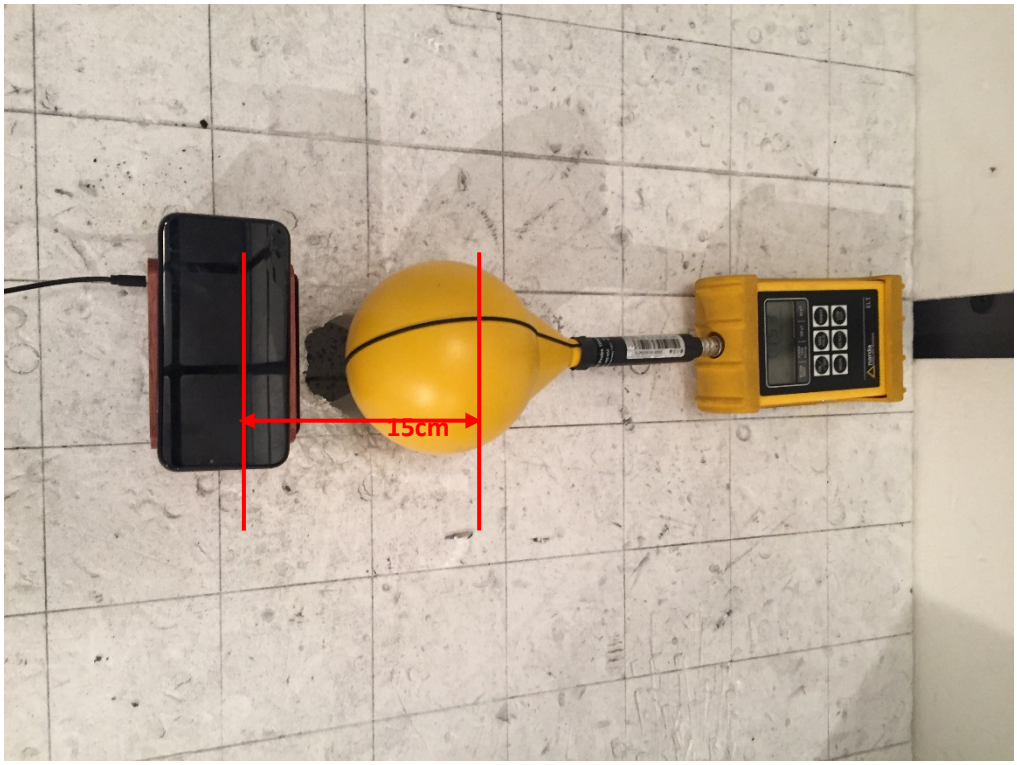
(TM1)

(TM4)

6.1.4.5 Test Position D-Exposure photo from side edge surface-Right



(TM1)



(TM4)

Revision History

Revision	Issue Date	Revisions	Revised By
000	Aug 27, 2019	Initial Issue	Gavin Liang

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