



FCC TEST REPORT

FCC ID: 2ANJPAFCC01-10W

Product Name:	Wireless charging
Trademark:	N/A
Model Number:	AFCC01-10W
Prepared For :	SHENZHEN AVATARCONTROLS CO., LTD.
Address :	Room 502, 5F, W1-A Block, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, China
Prepared By :	Shenzhen BCTC Testing Co., Ltd.
Address :	BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Test Date:	Dec. 20, 2018 – Jan. 02, 2019
Date of Report :	Jan. 02, 2019
Report No.:	BCTC-FY181206917E

TABLE OF CONTENTS

TEST REPORT DECLARATION	3
1.GENERAL INFORMATION	4
1.1. Report information	4
1.2. Measurement Uncertainty	4
1.3. Test Facility	4
1.4. Test Uncertainty	4
2.PRODUCT DESCRIPTION	5
2.1. EUT Description	5
2.2. Test mode	5
2.3. Block Diagram of EUT Configuration	5
2.4. Test Conditions	6
2.5. Description Of Support Units (Conducted Mode)	7
3.TEST RESULTS SUMMARY	7
4. TEST EQUIPMENT USED	8
4.1. For Conducted Emission Test	8
4.2. For Radiated Emission Measurement	8
5.CONDUCTED EMISSION TEST	9
5.1. Block Diagram of Test Setup	9
5.2. Test Standard	9
5.3. Conducted Emission Limit	9
5.4. EUT Configuration on Test	9
5.5. Operating Condition of EUT	10
5.6. Test Procedure	10
5.7. Test Result	10
6.RADIATED EMISSION MEASUREMENT	13
6.1. Block Diagram of Test Setup	13
6.2. Test Standard and Limit	14
6.3. EMI Test Receiver Setup	15
6.4. Test Procedure	15
6.5. Test Result	15
7.BANDWIDTH TEST	19
8.EUT TEST PHOTOS	21
9.EUT PHOTOS	23

TEST REPORT DECLARATION

Applicant : SHENZHEN AVATARCONTROLS CO., LTD.
Address : Room 502, 5F, W1-A Block, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, China
EUT Description : Wireless charging
Model Number : AFCC01-10W
Serial Model : N/A

Test Standards:

FCC Part 15 C

This device described above has been tested by BCTC, and the test results show that the equipment under And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of BCTC, this document may be altered or revised by BCTC, personal only, and shall be noted in the revision of the document.

Prepared by(Engineer): Lake Xie

Reviewer(Supervisor): Eric Yang

Approved(Manager): Carson Zhang

Lake Xie
Eric Yang
Carson Zhang

A blue circular stamp with the text "BCTC APPROVED" in the center. The outer ring contains the text "SHENZHEN BCTC TESTING CO., LTD." and "倍测检测".

1. GENERAL INFORMATION

1.1. Report information

- 1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BCTC approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BCTC in any way guarantees the later performance of the product/equipment.
- 1.1.2. The sample/s mentioned in this report is/are supplied by Applicant, BCTC therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.
- 1.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through BCTC, unless the applicant has authorized BCTC in writing to do so.

1.2. Measurement Uncertainty

Available upon request.

1.3. Test Facility

Site Description
Name of Firm : Shenzhen BCTC Testing Co., Ltd.

Site Location : BCTC Building & 1-2F, East of B Building,
Pengzhou Industrial, Fuyuan 1st Road, Qiaotou
Community, Fuyong Street, Bao'an District,
Shenzhen, China

1.4. Test Uncertainty

Conducted Emission = $\pm 2.66\text{dB}$
Uncertainty
Radiated Emission Uncertainty = $\pm 4.15\text{dB}$

2. PRODUCT DESCRIPTION

2.1.EUT Description

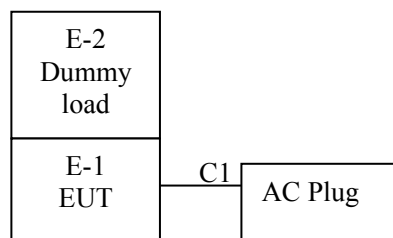
Description	: Wireless charging
Applicant	: SHENZHEN AVATARCONTROLS CO., LTD. Room 502, 5F, W1-A Block, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, China
Manufacturer	: SHENZHEN AVATARCONTROLS CO., LTD. Room 502, 5F, W1-A Block, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, China
Model Number	: AFCC01-10W
Serial Model	: N/A
Model Difference	: N/A
Ratings	: Input: 24V/0.5A Output: 5*2A
Work Frequency	: 120-205KHz

2.2.Test mode

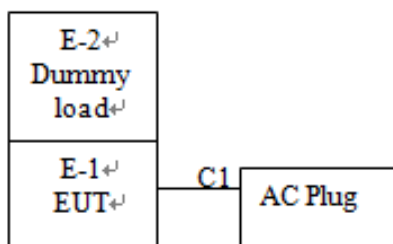
Test Mode 1	Charging in AC Main Conducted Emissions
Test Mode 2	Radiated Emissions

2.3.Block Diagram of EUT Configuration

Conducted Emission Test



Radiated Spurious Emission Test





2.4. Test Conditions

Temperature: 23~26℃

Relative Humidity: 54~63 %



2.5. Description Of Support Units (Conducted Mode)

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.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E1	Wireless charging	N/A	AFCC01-10W	N/A	EUT
E2	Dummy load	N/A	DL01	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
C1	NO	NO	1.0M	DC cable unshielded

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

3. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Conducted disturbance	Pass
Radiated disturbance	Pass

Remark: “N/A” means “Not applicable.”

4. TEST EQUIPMENT USED

4.1. For Conducted Emission Test

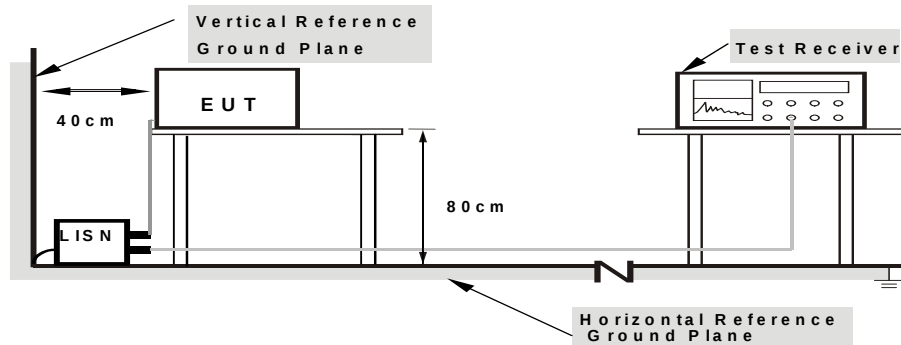
Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESCI	1166.5950K03-1 01165-ha	2018. 06.19	2019.06.18
2	LISN	SCHWARZBECK	NSLK8127	8127739	2018.06.19	2019.06.18
3	LISN	R&S	NSLK8126	8126487	2018.08.06	2019.08.05
4	RF cables	R&S	R204	R20X	2018.08.06	2019.08.05
5	Attenuator	R&S	ESH3-Z2	143206	2018.08.06	2019.08.05

4.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
6	Horn Antenna (14GHz-40GHz)	SCHWARZBECK	BBHA 9170	9170-181	2018.08.06	2019.08.05
7	Amplifier (9KHz-6GHz)	SCHWARZBECK	BBV9744	9744-0037	2018.06.20	2019.06.19
8	Amplifier (1GHz-18GHz)	SCHWARZBECK	BBV9718	9718-309	2018.06.20	2019.06.19
9	Amplifier (18GHz-40GHz)	SCHWARZBECK	BBV 9721	9721-205	2018.08.06	2019.08.05
10	Loop Antenna (9KHz-30MHz)	SCHWARZBECK	FMZB1519B	00014	2018.06.23	2019.06.22
11	Bilog Antenna (30MHz-3GHz)	SCHWARZBECK	VULB9163	VULB9163-942	2018.06.23	2019.06.23
12	Horn Antenna (1GHz-18GHz)	SCHWARZBECK	BBHA9120D	1541	2018.06.23	2019.06.22
13	RF cables1 (9kHz-1GHz)	R&S	R203	R20X	2018.08.06	2019.08.05
14	RF cables2 (1GHz-40GHz)	R&S	R204	R21X	2018.08.06	2019.08.05
15	Antenna connector	Florida RF Labs	N/A	RF 01#	2018.08.06	2019.08.05
16	Power Metter	Keysight	E4419	\	2018.04.15	2019.04.15
17	Power Sensor (AV)	Keysight	E9 300A	\	2018.04.15	2019.04.15
18	Signal Analyzer 9kHz-26.5GHz	Agilent	N9010A	MY48030494	2018.08.06	2019.08.05
19	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	2018.08.06	2019.08.05
20	D.C. Power Supply	LongWei	PS-305D	010964729	2018.08.06	2019.08.05

5. CONDUCTED EMISSION TEST

5.1. Block Diagram of Test Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure.
The specification used was with the FCC Part 15.207 limits.

5.2. Test Standard

FCC§15.207

5.3. Conducted Emission Limit

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.

5.4. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet FCC Part 15.207 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

5.5. Operating Condition of EUT

5.5.1. Setup the EUT and simulators as shown in Section 5.1.

5.5.2. Turn on the power of all equipments.

5.5.3. Let the EUT work in test modes (EUT Working) and test it.

5.6. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESHS30) is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

The bandwidth of the test receiver (R&S Test Receiver ESHS30) is set at 10KHz.

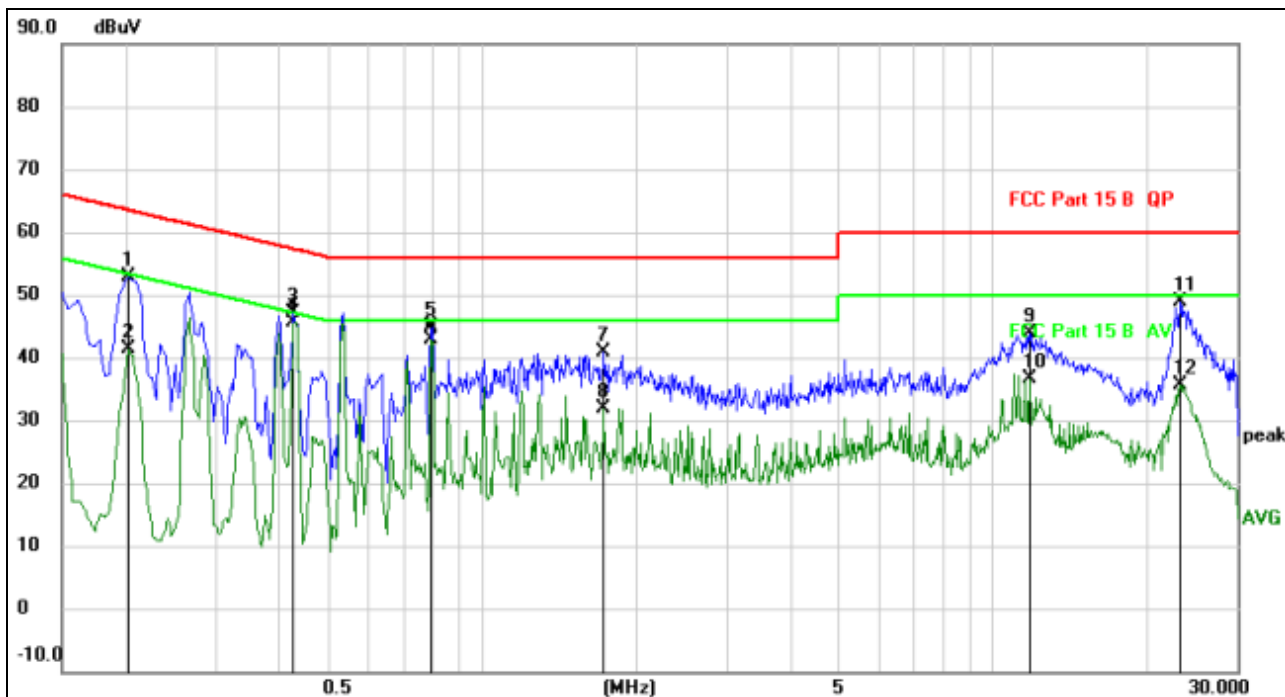
We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

5.7. Test Result

PASS



EUT:	Wireless charging	Model Name :	AFCC01-10W
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Voltage :	AC120V/60Hz	Test Mode:	1



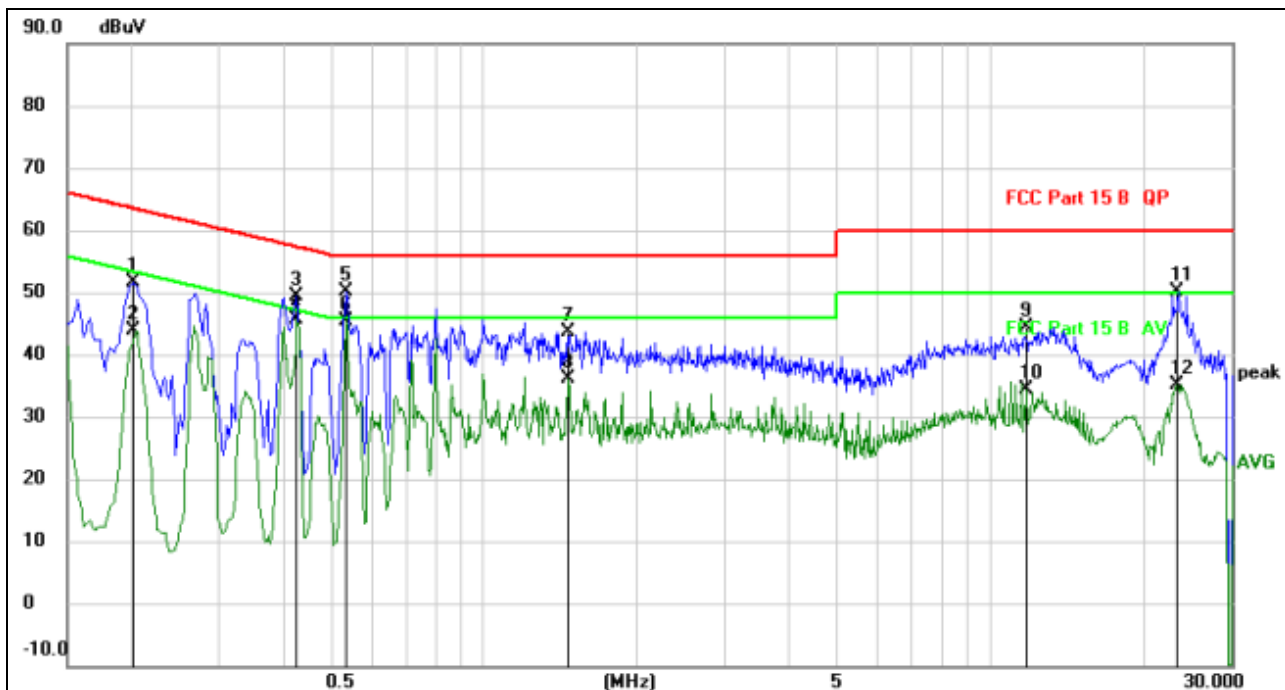
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2020	43.51	9.46	52.97	63.53	-10.56	QP	
2		0.2020	32.01	9.46	41.47	53.53	-12.06	AVG	
3		0.4260	37.69	9.52	47.21	57.33	-10.12	QP	
4	*	0.4260	36.19	9.52	45.71	47.33	-1.62	AVG	
5		0.7940	35.25	9.63	44.88	56.00	-11.12	QP	
6		0.7940	33.19	9.63	42.82	46.00	-3.18	AVG	
7		1.7260	31.29	9.58	40.87	56.00	-15.13	QP	
8		1.7260	22.32	9.58	31.90	46.00	-14.10	AVG	
9		11.7980	34.26	9.69	43.95	60.00	-16.05	QP	
10		11.7980	26.92	9.69	36.61	50.00	-13.39	AVG	
11		23.1620	39.06	9.76	48.82	60.00	-11.18	QP	
12		23.1620	25.92	9.76	35.68	50.00	-14.32	AVG	



EUT:	Wireless charging	Model Name :	AFCC01-10W
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Voltage :	AC120V/60Hz	Test Mode:	1



Remark:

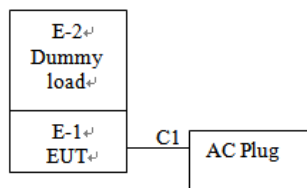
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2020	42.10	9.46	51.56	63.53	-11.97	QP	
2		0.2020	34.33	9.46	43.79	53.53	-9.74	AVG	
3		0.4260	39.96	9.52	49.48	57.33	-7.85	QP	
4		0.4260	36.11	9.52	45.63	47.33	-1.70	AVG	
5		0.5340	40.50	9.73	50.23	56.00	-5.77	QP	
6	*	0.5340	35.71	9.73	45.44	46.00	-0.56	AVG	
7		1.4700	34.00	9.58	43.58	56.00	-12.42	QP	
8		1.4700	26.61	9.58	36.19	46.00	-9.81	AVG	
9		11.8020	34.74	9.69	44.43	60.00	-15.57	QP	
10		11.8020	24.79	9.69	34.48	50.00	-15.52	AVG	
11		23.3500	40.36	9.76	50.12	60.00	-9.88	QP	
12		23.3500	25.44	9.76	35.20	50.00	-14.80	AVG	

6. RADIATED EMISSION MEASUREMENT

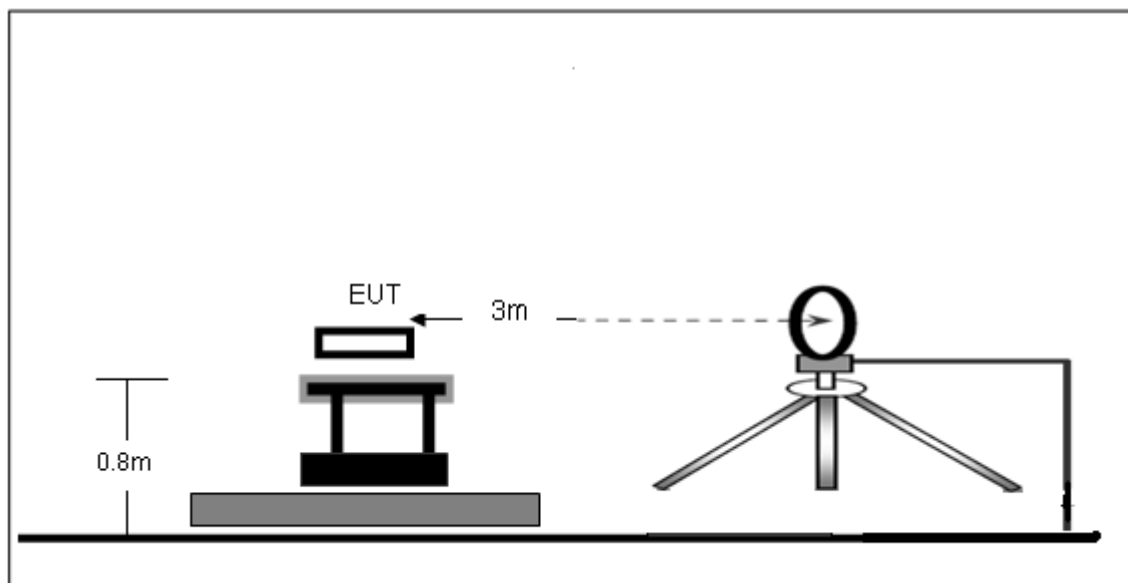
6.1. Block Diagram of Test Setup

6.1.1. Block Diagram of connection between the EUT and the simulators

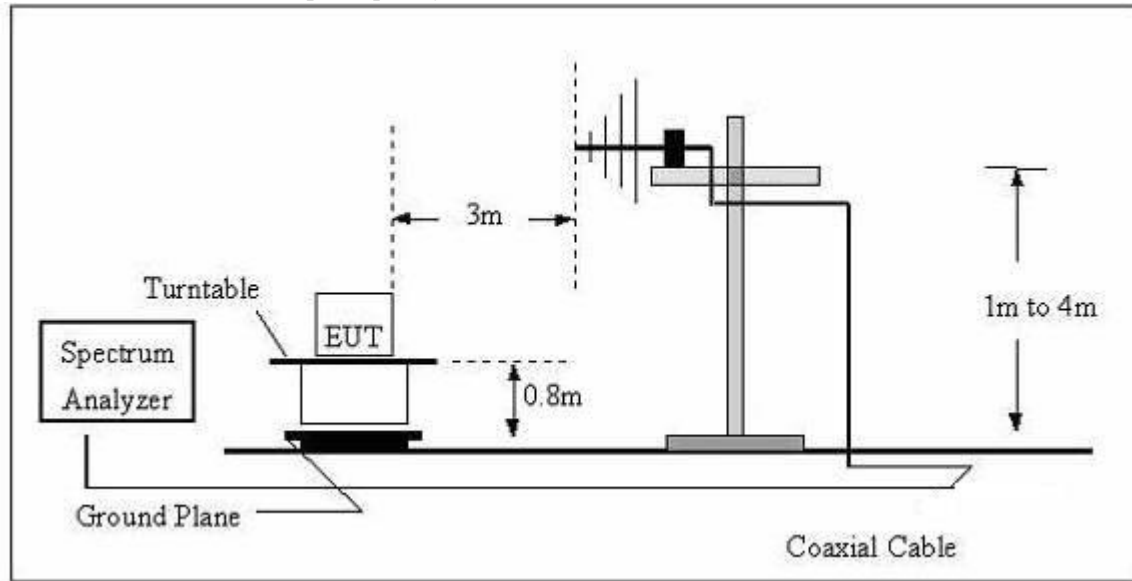


6.1.2. Anechoic Chamber Test Setup Diagram

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limits.

6.2. Test Standard and Limit

FCC §15.209; §15.205

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz~1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz~30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3



6.3.EMI Test Receiver Setup

The system was investigated from 9kHz to1GHz.

During the radiated emission test, the EMI test receiver setup was set with the following configurations:

Frequency Range	RBW	Video B/W	Detector
9 kHz – 150 kHz	200 kHz	1 kHz	QP
150 kHz – 30MHz	9kHz	30kHz	QP
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

Note: For the frequency bands 9-90 kHz and 110-490 kHz, the test was based on average detector.

6.4.Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement.

6.5.Test Result

PASS



9kHz-30MHz

EUT:	Wireless charging	Model Name :	AFCC01-10W
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Horizontal
Test Voltage :	AC120V/60Hz		
Test Mode :	2		

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(kHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
29.7000	36.18	20.15	56.33	138.15	-81.82	PK
29.7000	32.58	20.15	52.73	118.15	-65.42	AV
57.5000	49.82	20.33	70.15	132.41	-62.26	PK
57.5000	44.13	20.33	64.46	112.41	-47.95	AV
121.6000	58.71	20.55	79.26	124.22	-44.96	PK
121.6000	54.15	20.55	74.7	104.22	-29.52	AV
780.5000	32.41	20.64	53.05	69.76	-16.71	QP
941.5000	35.68	21.26	56.94	68.13	-11.19	QP
1320.5000	26.33	22.32	48.65	65.19	-16.54	QP

Note:

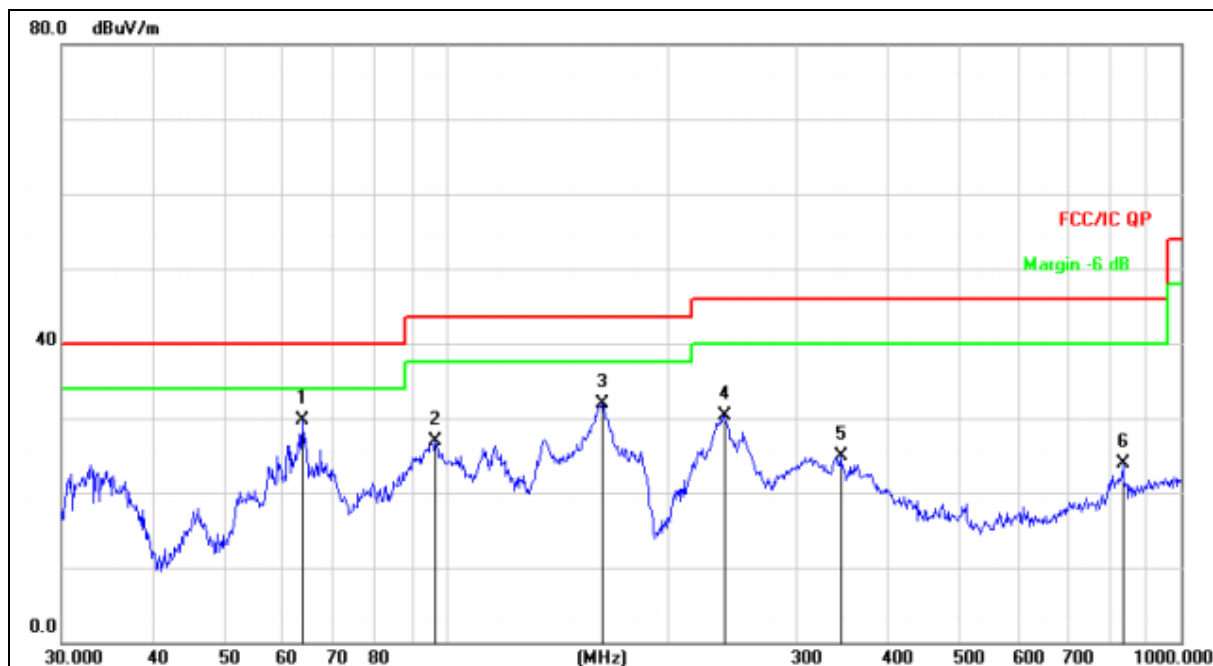
Factor = antenna factor + cable loss – pre-amplifier.

Margin = Emission Level- Limit.



30MHz-1GHz

EUT:	Wireless charging	Model Name :	AFCC01-10W
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Horizontal
Test Voltage :	AC120V/60Hz		
Test Mode :	2		



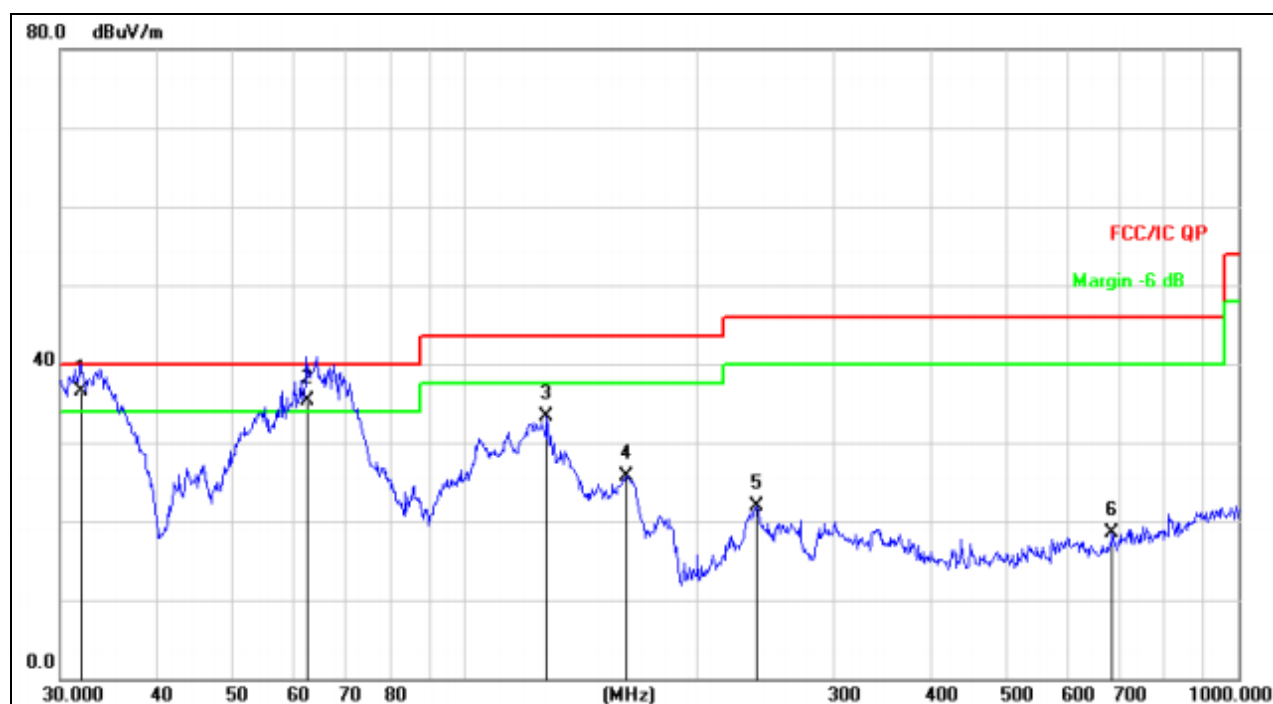
Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		63.7588	46.41	-16.77	29.64	40.00	-10.36	QP
2		96.7749	43.86	-16.87	26.99	43.50	-16.51	QP
3		163.1818	50.58	-18.66	31.92	43.50	-11.58	QP
4		239.1473	45.78	-15.40	30.38	46.00	-15.62	QP
5		344.3855	37.21	-12.38	24.83	46.00	-21.17	QP
6		833.3171	26.73	-2.89	23.84	46.00	-22.16	QP



EUT:	Wireless charging	Model Name :	AFCC01-10W
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Polarization :	Vertical
Test Voltage :	AC120V/60Hz		
Test Mode :	2		



Remark:

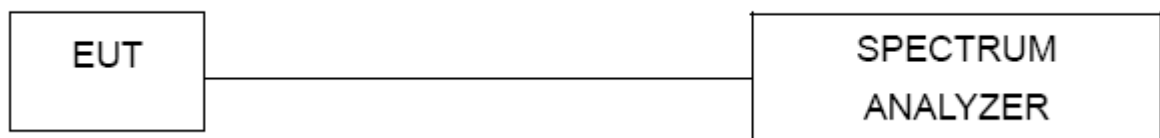
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		31.9546	53.50	-16.91	36.59	40.00	-3.41	QP
2		62.7781	51.93	-16.54	35.39	40.00	-4.61	QP
3		127.6645	51.32	-18.06	33.26	43.50	-10.24	QP
4		161.4740	44.50	-18.77	25.73	43.50	-17.77	QP
5		238.3102	37.29	-15.42	21.87	46.00	-24.13	QP
6		687.1507	24.17	-5.57	18.60	46.00	-27.40	QP

7. BANDWIDTH TEST

1. Set RBW = 3 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

TEST SETUP





EUT:	Wireless charging	Model Name :	AFCC01-10W
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa		

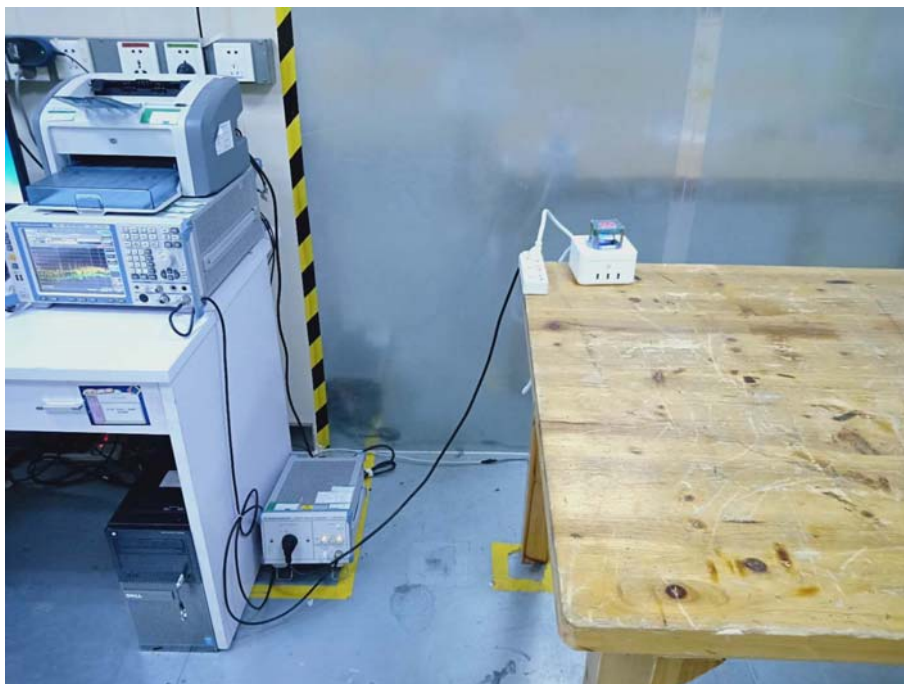
Frequency (KHz)	20dB bandwidth (KHz)	99% bandwidth (KHz)	Result
121	9.506	9.360	Pass





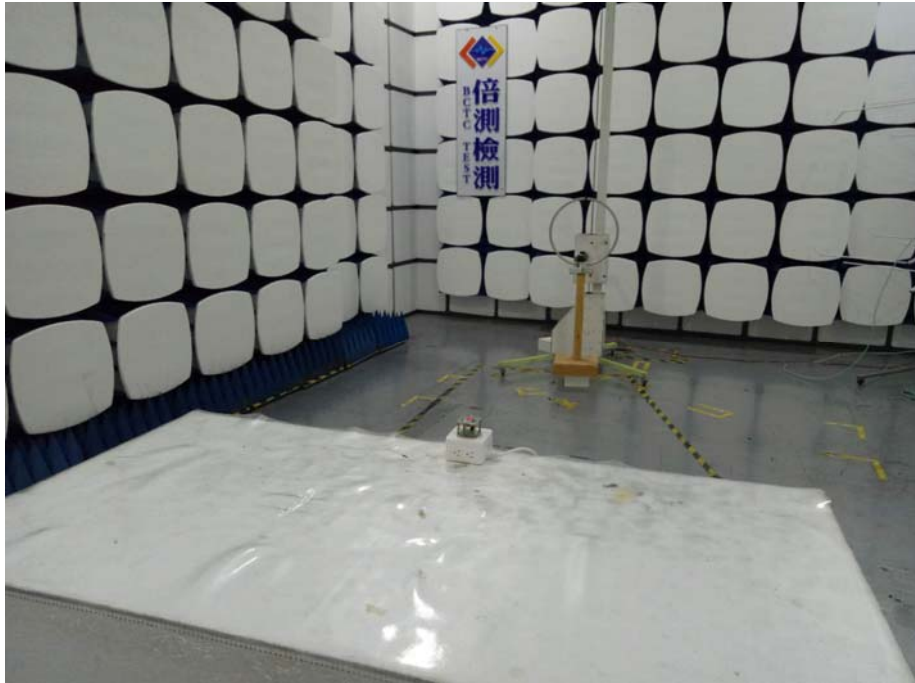
8. EUT TEST PHOTOS

Conducted Measurement Photos





Radiated Measurement Photos
9KHz-30MHz

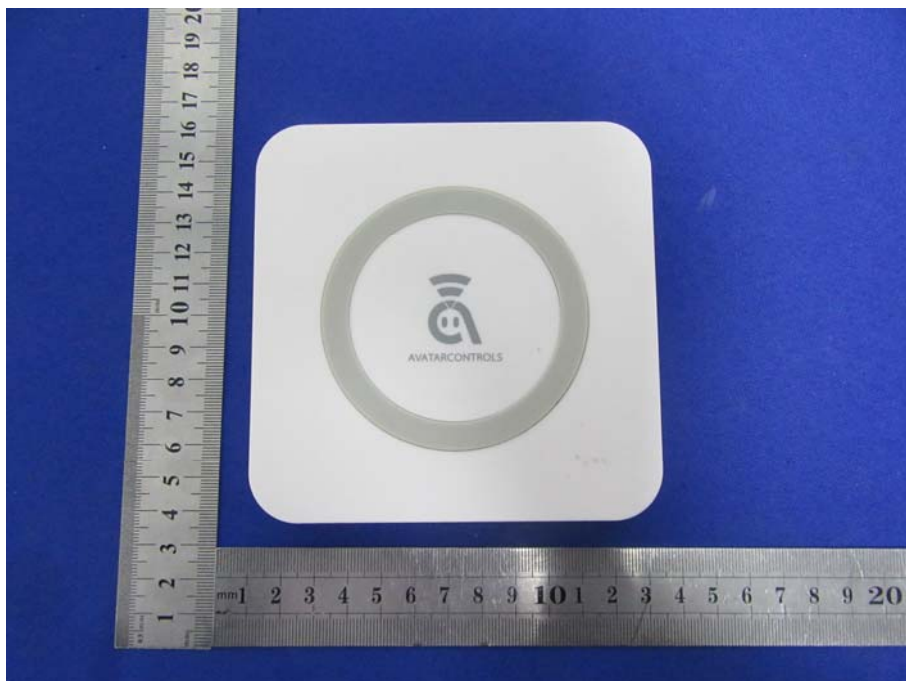


30MHz-1GHz





9. EUT PHOTOS





***** END OF REPORT *****