

TEST REPORT

Reference No. : WTS16S1267535-2E
FCC ID : 2AEHND100
Applicant..... : Azpen Shenzhen MingTel Digital Technology CO., LTD.
Address..... : 2nd F, 9th Building, DeTai Industrial Park, Longhua
District, Shenzhen, China
Manufacturer : Shenzhen Mingtel Digital Technology CO.,Ltd
Address..... : 2nd F, 9th Building, DeTai Industrial Park, Longhua
District, Shenzhen, China
Product Name..... : DOCKALL
Model No..... : D100, D200, D300
Brand Name..... : 
Standards..... : FCC CFR47 Part 15.209: 2016
Date of Receipt sample : Dec. 08, 2016
Date of Test : Dec. 09, 2016 – Feb. 05, 2017
Date of Issue..... : Mar. 30, 2017
Test Result..... : **Pass**
Note : This report is for Wireless Charging function.

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

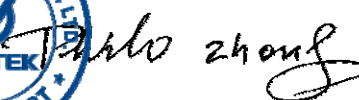
Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen,
Guangdong, China
Tel :+86-755-83551033
Fax:+86-755-83552400

Compiled by:



Zero Zhou / Test Engineer

Approved by:



Philo Zhong / Manager

2 Contents

	Page
1 COVER PAGE.....	1
2 CONTENTS	2
3 REVISION HISTORY	3
4 GENERAL INFORMATION.....	4
4.1 GENERAL DESCRIPTION OF E.U.T.....	4
4.2 DETAILS OF E.U.T.....	4
4.3 TEST MODE	4
4.4 TEST FACILITY	5
5 EQUIPMENT USED DURING TEST	6
5.1 EQUIPMENT LIST.....	6
5.2 MEASUREMENT UNCERTAINTY.....	7
5.3 TEST EQUIPMENT CALIBRATION	7
6 TEST SUMMARY	8
7 CONDUCTED EMISSION	9
7.1 E.U.T. OPERATION	9
7.2 EUT SETUP	9
7.3 MEASUREMENT DESCRIPTION	9
7.4 CONDUCTED EMISSION TEST RESULT	10
8 RADIATED SPURIOUS EMISSIONS.....	12
8.1 EUT OPERATION.....	12
8.2 TEST SETUP	13
8.3 SPECTRUM ANALYZER SETUP	14
8.4 TEST PROCEDURE.....	15
8.5 SUMMARY OF TEST RESULTS	16
9 BANDWIDTH MEASUREMENT.....	17
9.1 TEST PROCEDURE.....	17
9.2 TEST RESULT	17
10 ANTENNA REQUIREMENT	18
11 MODEL D100 PHOTOGRAPHS OF TESTING FOR WIRELESS CHARGING	19
11.1 PHOTOGRAPH – CONDUCTED EMISSION TEST SETUP AT TEST SITE 1#	19
11.2 RADIATION EMISSION TEST SETUP.....	19
12 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS	21
12.1 MODEL D100 – EXTERNAL PHOTOS	21
12.2 MODEL D100 – INTERNAL PHOTOS.....	26

3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS16S1267535-2E	Dec. 08, 2016	Dec. 09, 2016 – Feb. 05, 2017	Mar. 02, 2017	original	N/A	Replaced
WTS16S1267535-2E	Dec. 08, 2016	Dec. 09, 2016 – Feb. 05, 2017	Mar. 30, 2017	revision1	Revised Wireless Charging Lowest Frequency	Valid

4 General Information

4.1 General Description of E.U.T.

Product Name:	DOCKALL
Model No.:	D100, D200, D300
Model Description:	Only the model name and appearance are different. The D100 is the test sample.
Operation Frequency:	Bluetooth 2402MHz ~ 2480MHz, 79 channels in total Wireless Charging 116.25~205KHz
Type of Modulation:	Bluetooth GFSK, Pi/4DQPSK, 8DPSK Wireless Charging ASK
The lowest Radio Frequency:	116.25 KHz
Antenna installation:	Bluetooth PCB printed antenna Wireless Charging Coil antenna
Antenna Gain:	Bluetooth 0dBi

4.2 Details of E.U.T.

Technical Data: Input: 12.0V  2.0A Powered by Power Supply
Power Supply by ShenZhen Xinspower Technology Co., Ltd
(Input: AC 100-240V, 50/60Hz, 0.8A; Model: A241-1202000U)
Output current: 3A Max.

4.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Table 1 Tests carried out under FCC part 15.207

Test Item	Test Mode
Conducted Emissions	transmitting

Table 2 Tests carried out under FCC part 15.209

Test Item	Test Mode
Radiated Emissions	transmitting

4.4 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A-1**

Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A-1, October 15, 2015

- **FCC Test Site 1#– Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

5 Equipment Used during Test

5.1 Equipment List

Conducted Emissions Test Site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.12, 2016	Sep.11, 2017
2.	LISN	R&S	ENV216	100115	Sep.12, 2016	Sep.11, 2017
3.	Cable	Top	TYPE16(3.5M)	-	Sep.12, 2016	Sep.11, 2017
Conducted Emissions Test Site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.12, 2016	Sep.11, 2017
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.12, 2016	Sep.11, 2017
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.12, 2016	Sep.11, 2017
4.	Cable	Laplace	RF300	-	Sep.12, 2016	Sep.11, 2017
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP	100091	Apr.29, 2016	Apr.28, 2017
2	Amplifier	Agilent	8447D	2944A10178	Apr.29, 2016	Apr.28, 2017
3	Active Loop Antenna	Beijing Dazhi	ZN30900A	0703	Oct.17, 2016	Oct.16, 2017
4	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.09, 2016	Apr.08, 2017
5	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.12, 2016	Sep.11, 2017
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.09, 2016	Apr.08, 2017
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.13, 2016	Apr.12, 2017
8	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	Apr.13, 2016	Apr.12, 2017
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	Apr.13, 2016	Apr.12, 2017
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Apr.09, 2016	Apr.08, 2017
3	Amplifier	ANRITSU	MH648A	M43381	Apr.13, 2016	Apr.12, 2017
4	Cable	HUBER+SUHNER	CBL2	525178	Apr.13, 2016	Apr.12, 2017

RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.12, 2016	Sep.11, 2017
2.	Spectrum Analyzer (9k~6GHz)	R&S	FSL6	100959	Sep.12, 2016	Sep.11, 2017
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.12, 2016	Sep.11, 2017

5.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiated Spurious Emissions	26KHz~30MHz	$\pm 3.03\text{dB}$	(1)
Radiated Spurious Emissions	30MHz~1GHz	$\pm 5.03\text{dB}$	(1)
Conducted Spurious Emissions test	150KHz~30MHz	$\pm 3.64\text{ dB}$	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207	C
Radiated Spurious Emissions	15.205(a) 15.209	C
Bandwidth Measurement	15.205(a) 15.215(c)	C
Antenna Requirement	15.203	C
Note: C=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable.		

7 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.10:2013
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

7.1 E.U.T. Operation

Operating Environment :

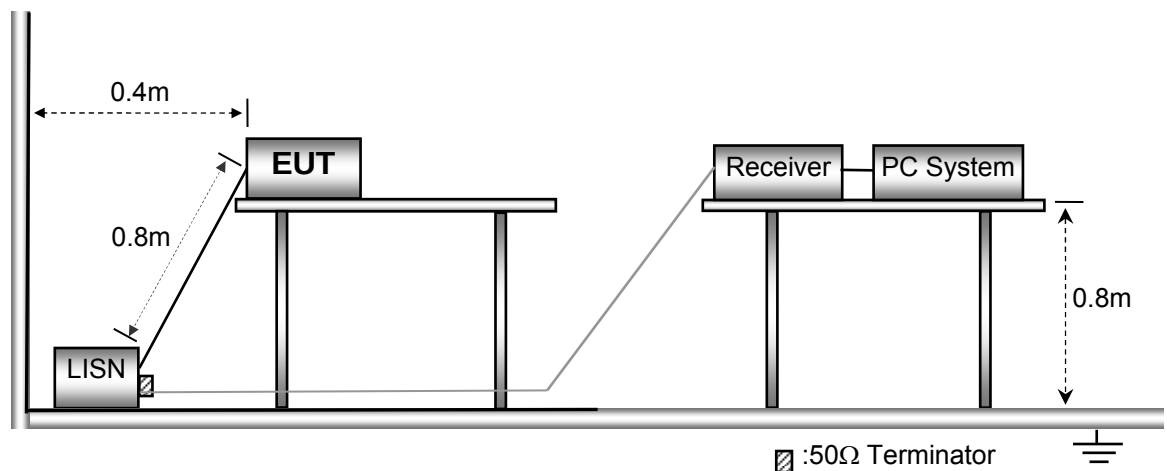
Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation :

The test was performed in transmitting mode, the test data were shown in the report.

7.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.

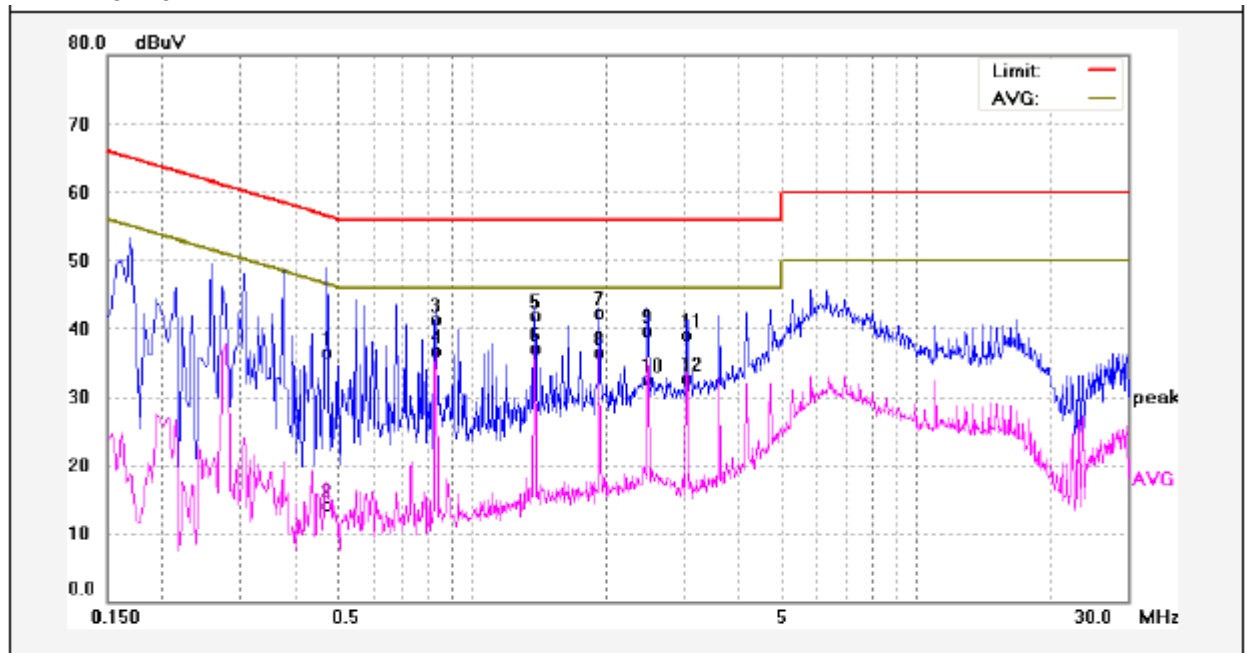


7.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

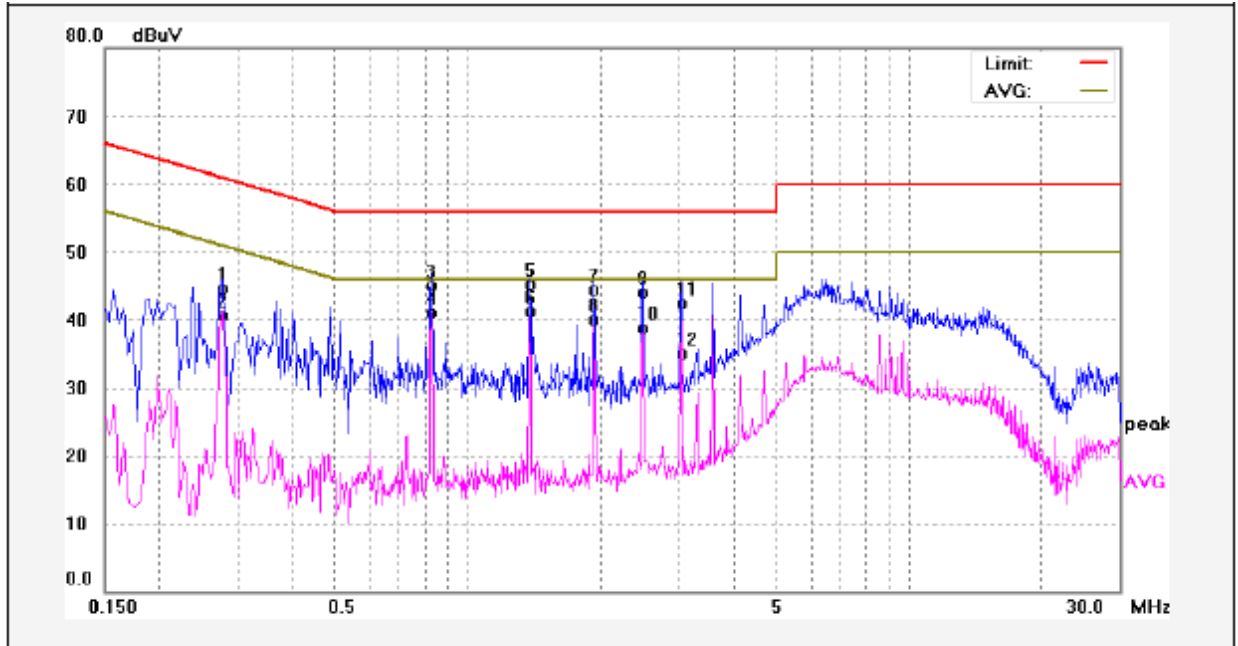
7.4 Conducted Emission Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.4700	26.92	9.65	36.57	56.51	-19.94	QP	
2	0.4700	4.39	9.65	14.04	46.51	-32.47	AVG	
3	0.8300	31.61	9.79	41.40	56.00	-14.60	QP	
4	0.8300	26.98	9.79	36.77	46.00	-9.23	AVG	
5	1.3820	32.09	9.89	41.98	56.00	-14.02	QP	
6	1.3820	27.14	9.89	37.03	46.00	-8.97	AVG	
7	1.9340	32.28	9.94	42.22	56.00	-13.78	QP	
8	1.9340	26.65	9.94	36.59	46.00	-9.41	AVG	
9	2.4860	29.79	9.94	39.73	56.00	-16.27	QP	
10	2.4860	22.64	9.94	32.58	46.00	-13.42	AVG	
11	3.0420	29.23	9.93	39.16	56.00	-16.84	QP	
12	3.0420	22.69	9.93	32.62	46.00	-13.38	AVG	

Live N:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2779	35.00	9.64	44.64	60.88	-16.24	QP	
2	0.2779	31.07	9.64	40.71	50.88	-10.17	AVG	
3	0.8300	35.34	9.79	45.13	56.00	-10.87	QP	
4	0.8300	31.32	9.79	41.11	46.00	-4.89	AVG	
5	1.3820	35.45	9.89	45.34	56.00	-10.66	QP	
6	1.3820	31.38	9.89	41.27	46.00	-4.73	AVG	
7	1.9340	34.65	9.94	44.59	56.00	-11.41	QP	
8	1.9340	30.18	9.94	40.12	46.00	-5.88	AVG	
9	2.4900	34.10	9.94	44.04	56.00	-11.96	QP	
10	2.4900	28.98	9.94	38.92	46.00	-7.08	AVG	
11	3.0420	32.64	9.93	42.57	56.00	-13.43	QP	
12	3.0420	25.16	9.93	35.09	46.00	-10.91	AVG	

8 Radiated Spurious Emissions

Test Requirement: FCC Part15 Paragraph 15.209

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

FCC Part15 Paragraph 15.209

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

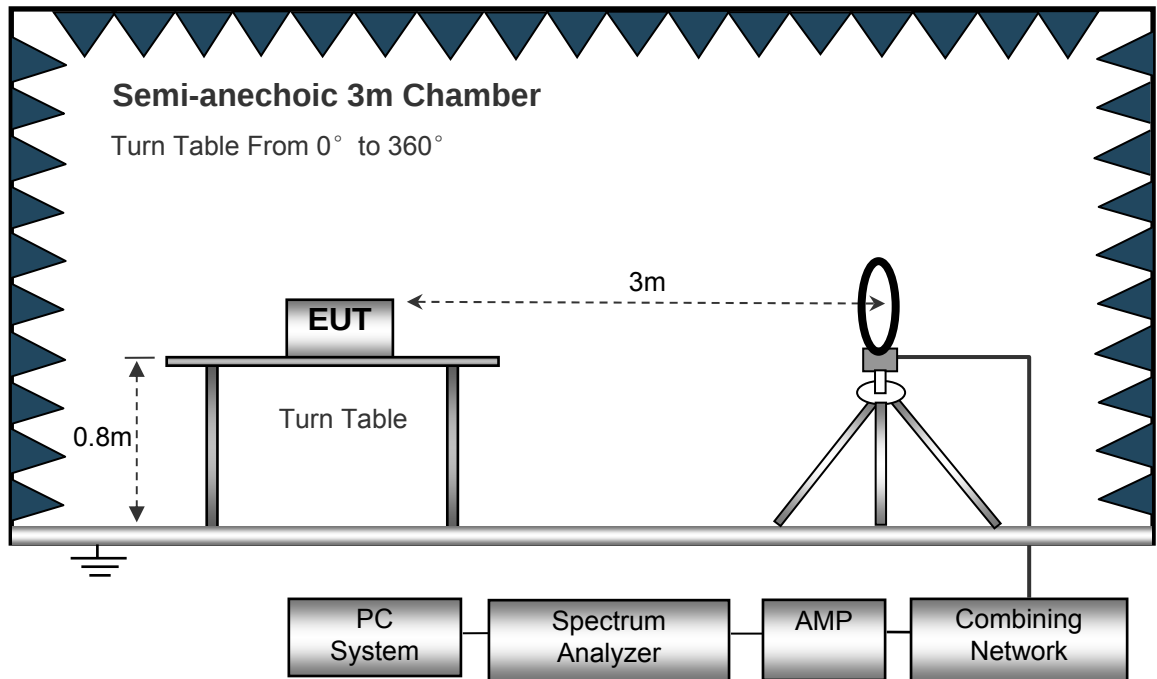
EUT Operation :

The test was performed in Transmitting mode, the test data were shown in the report.

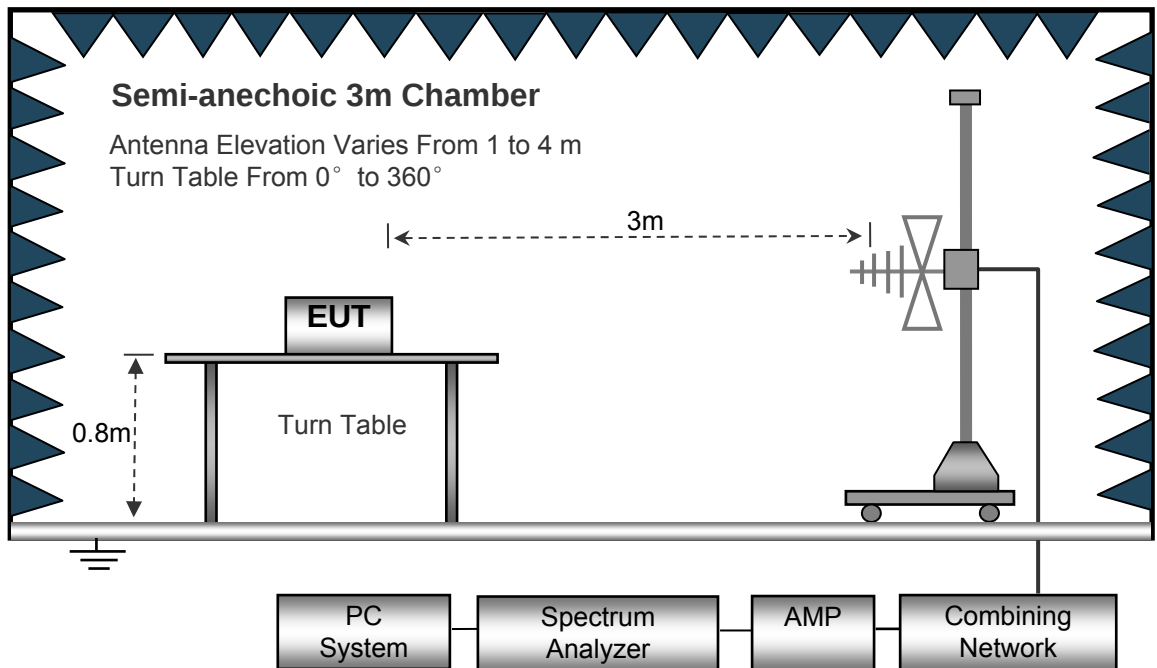
8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10

The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz	
Sweep Speed	Auto
IF Bandwidth.....	10kHz
Video Bandwidth.....	10kHz
Resolution Bandwidth.....	10kHz
30MHz ~ 1GHz	
Sweep Speed	Auto
Detector	PK
Resolution Bandwidth.....	100kHz
Video Bandwidth.....	300kHz

8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X, Y, Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand). After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
8. New battery was used during test.

8.5 Summary of Test Results

Test Frequency: 9 KHz ~ 30 MHz Note: Correct factor = Cable loss + Antenna factor

Frequency	Receiver Reading (AV)	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude (AV)	FCC Part 15.209	
			Height	Polar			Limit	Margin
(MHz)	(dBμV@3m)	Degree	(m)	(H/V)	(dB/m)	(dBμV/m)	(dBμV/m)@3m	(dB)
0.11625	54.27	126	1.8	H	19.58	73.85	106.30	-32.45
0.11625	38.69	241	2.0	V	29.73	68.42	106.30	-37.88

Frequency (MHz)	Receiver Reading	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	FCC Part 15.209	
	dBμV@3m	QP	dB/m	dB	dBμV/m @3m	Limits	Margin
3.620	21.99	QP	20.20	40.00	2.19	29.54	-27.35
10.340	22.56	QP	19.90	40.00	2.46	29.54	-27.08

Test Frequency: 30 MHz ~ 1 GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.209	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	QP	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
34.22	33.66	QP	147	1.2	H	-14.30	19.36	40.00	-20.64
34.22	35.12	QP	65	1.9	V	-14.30	20.82	40.00	-19.18
220.34	34.88	QP	185	1.2	H	-13.58	21.30	46.00	-24.70
220.34	40.22	QP	261	1.0	V	-13.58	26.64	46.00	-19.36
519.67	36.44	QP	252	1.6	H	-5.63	30.81	46.00	-15.19
519.67	37.58	QP	281	1.1	V	-5.63	31.95	46.00	-14.05

9 Bandwidth Measurement

Test Requirement: FCC Part15.215(C), Part15.205 (a)

Test Method: ANSI C63.10: 2013

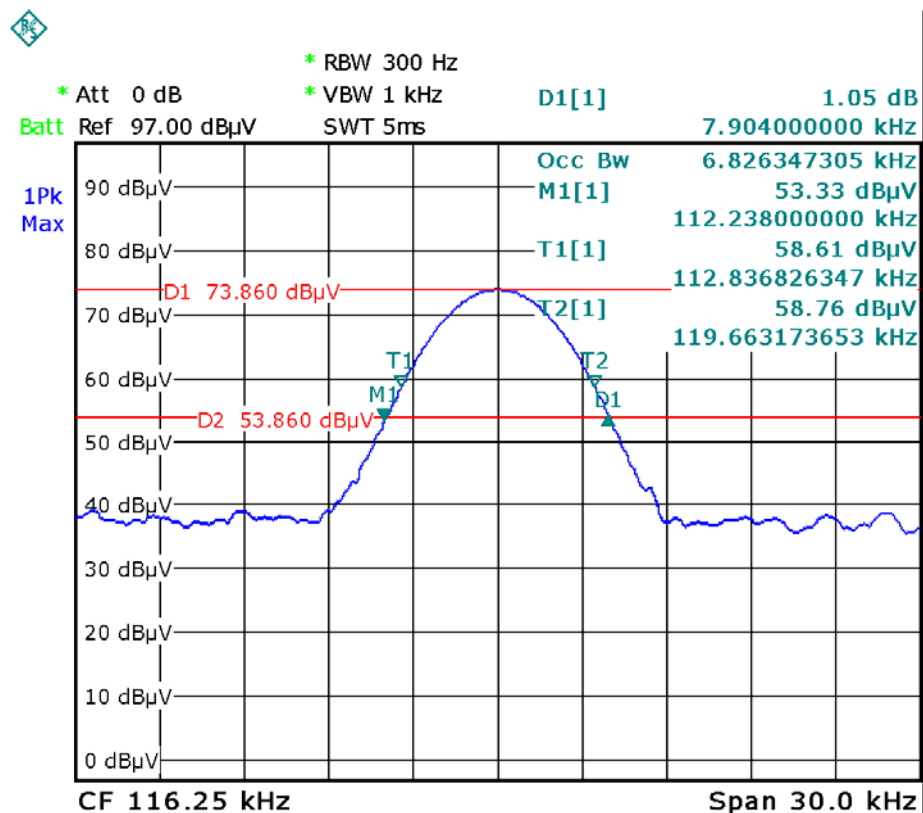
9.1 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.
2. Bandwidth Measure the resolution bandwidth of 300 Hz and the video bandwidth of 1 KHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier and 99% Bandwidth.

9.2 Test Result

Frequency(KHz)	20dB Bandwidth Emission(KHz)	99% Bandwidth Emission(KHz)
116.25	7.904	6.826

Test Plot



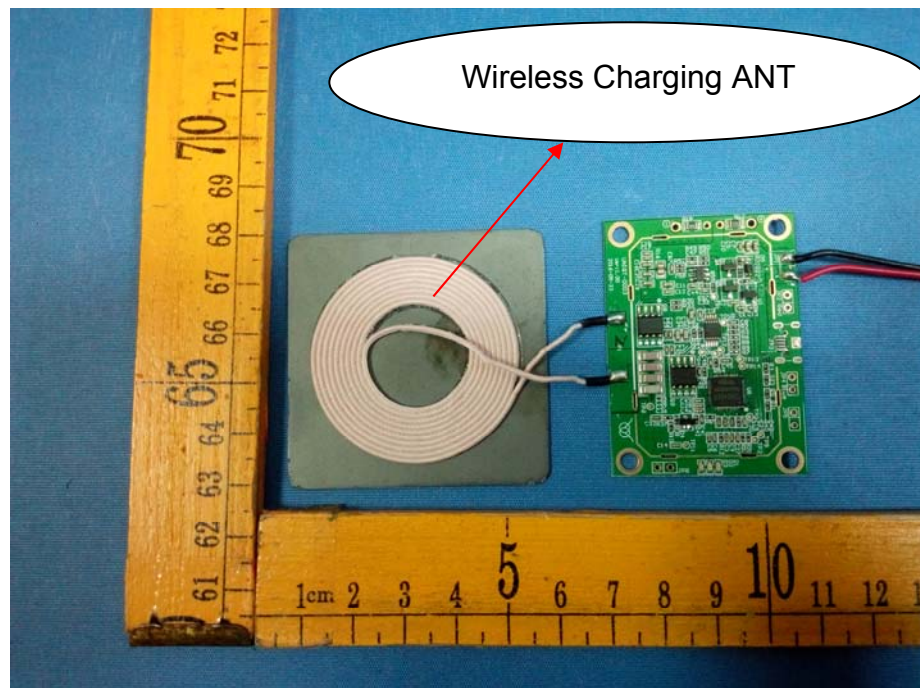
10 Antenna Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 15 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Result:

The EUT has one Coil antenna for Wireless Charging, Meets the requirements of FCC 15.203.



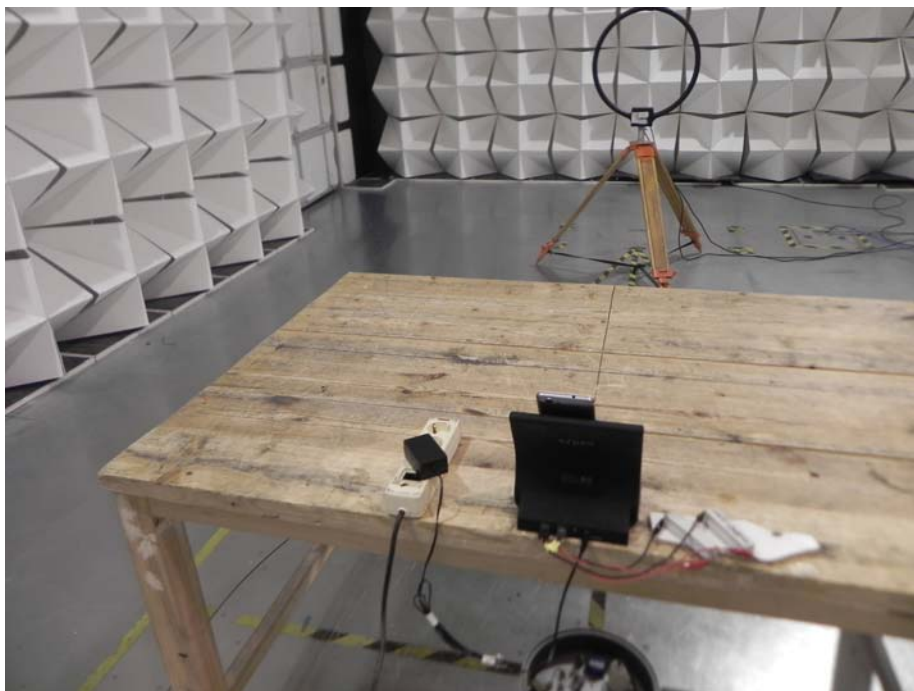
11 Model D100 Photographs of Testing for Wireless Charging

11.1 Photograph – Conducted Emission Test Setup at Test Site 1#

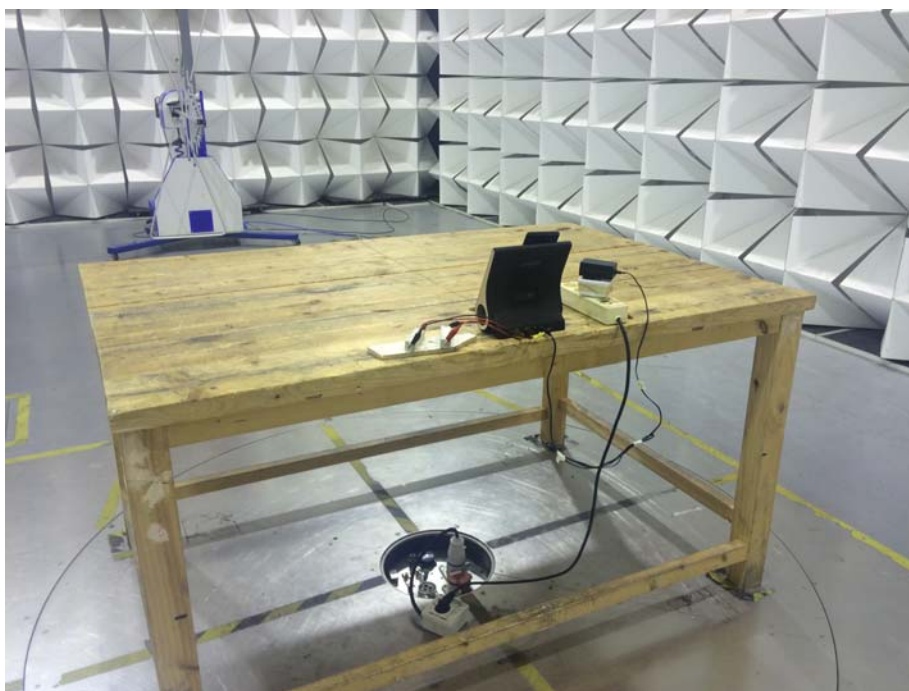


11.2 Radiation Emission Test Setup

9 KHz to 30 MHz at Test Site 2#



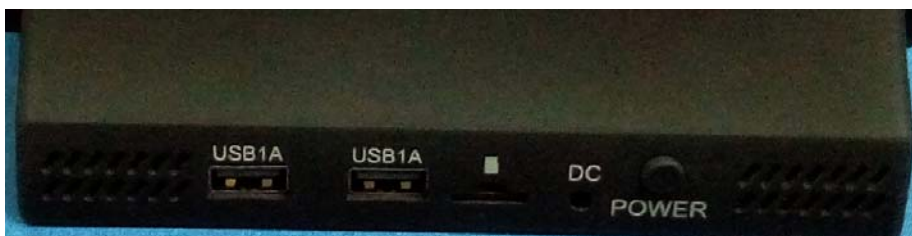
30MHz to 1GHz at Test Site 2#

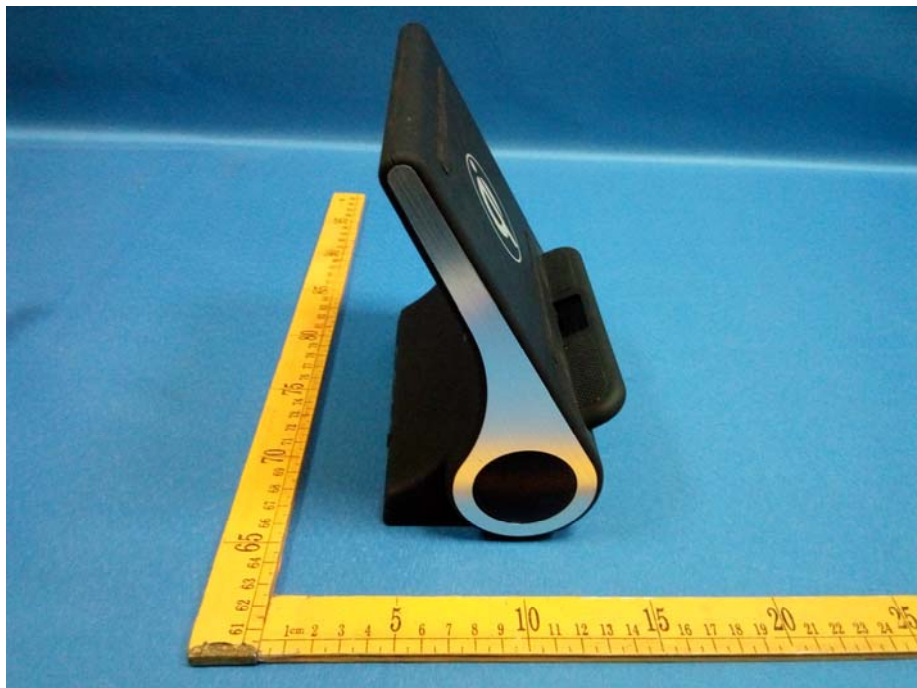
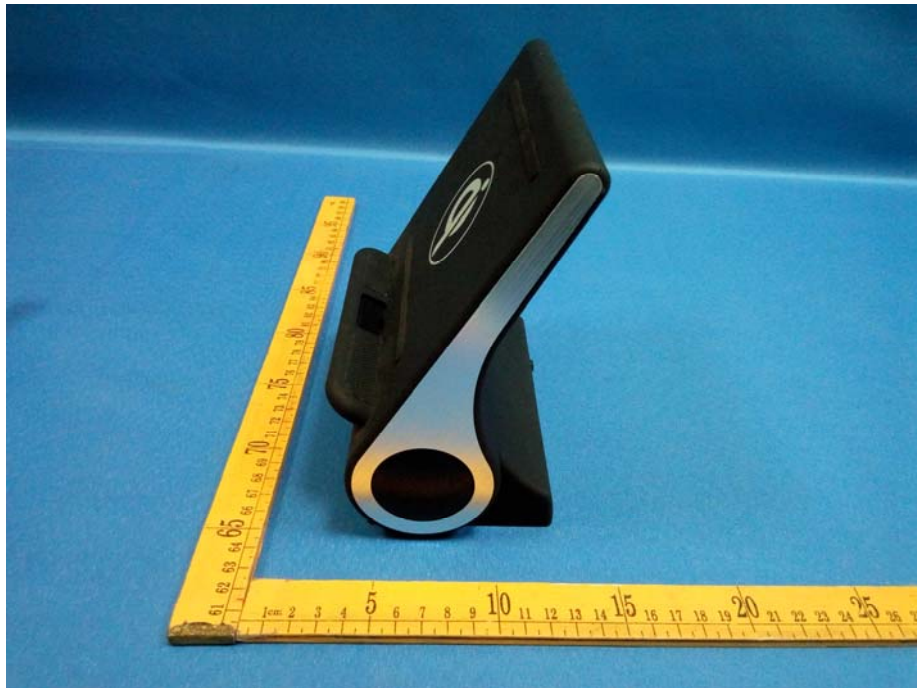


12 Photographs - Constructional Details

12.1 Model D100 – External Photos



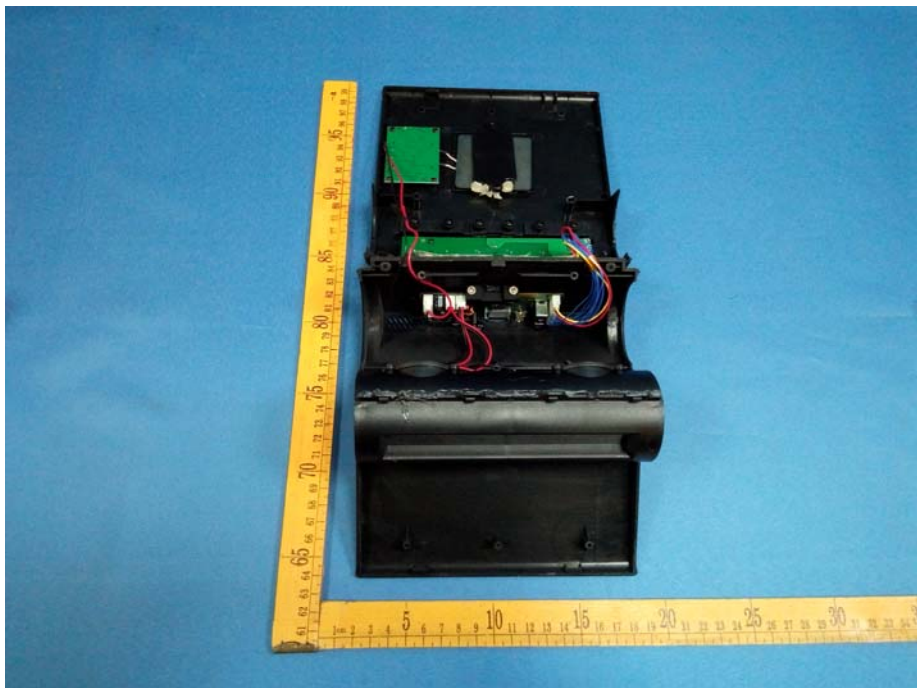
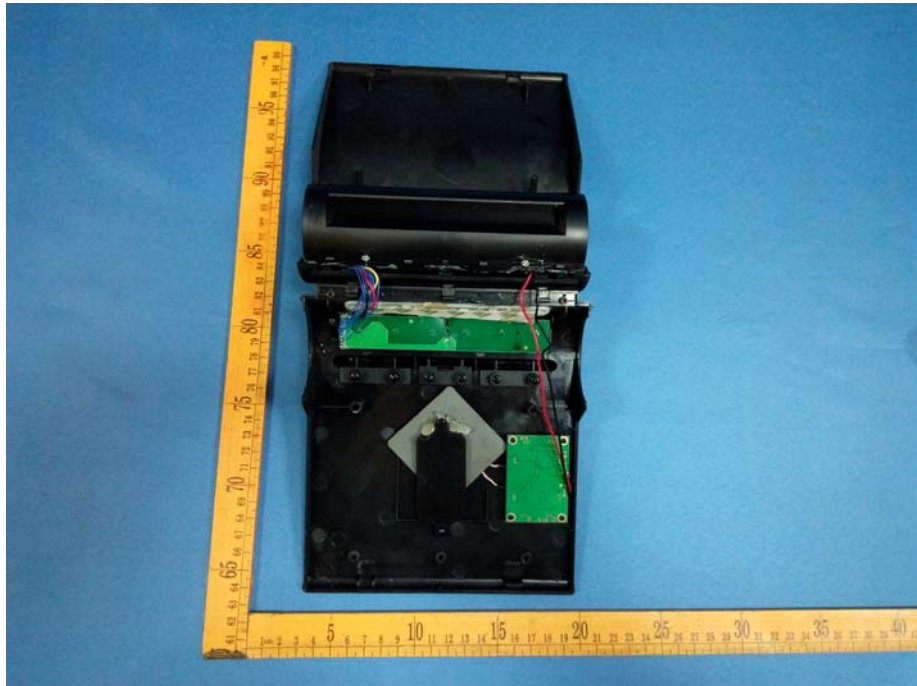


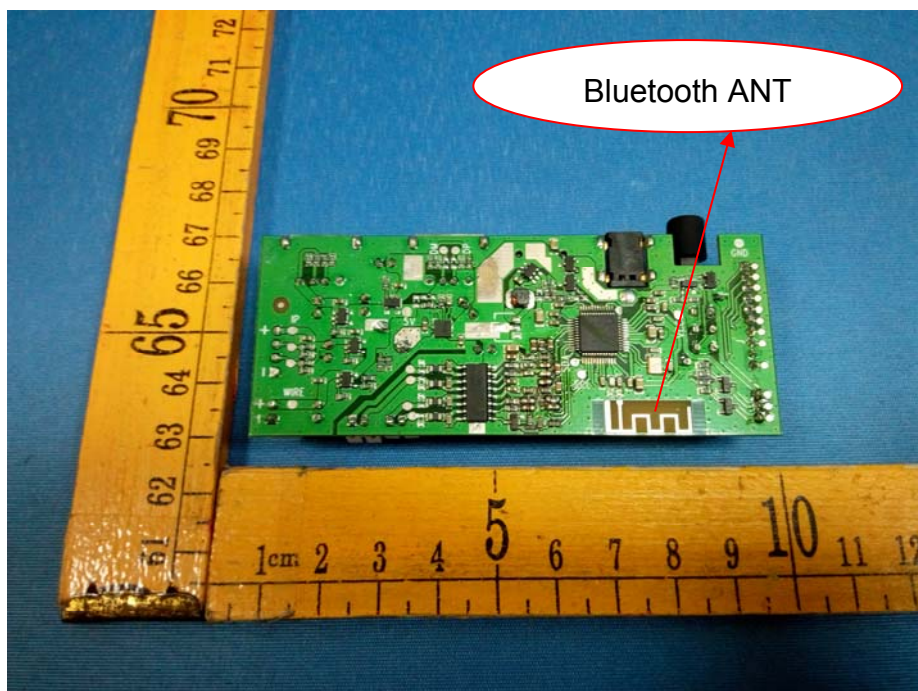
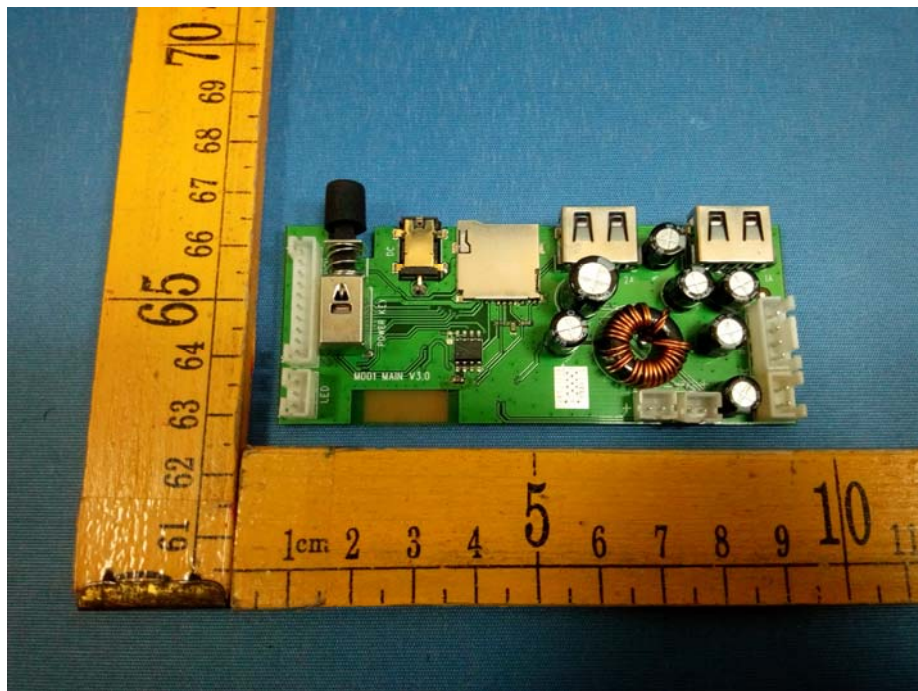




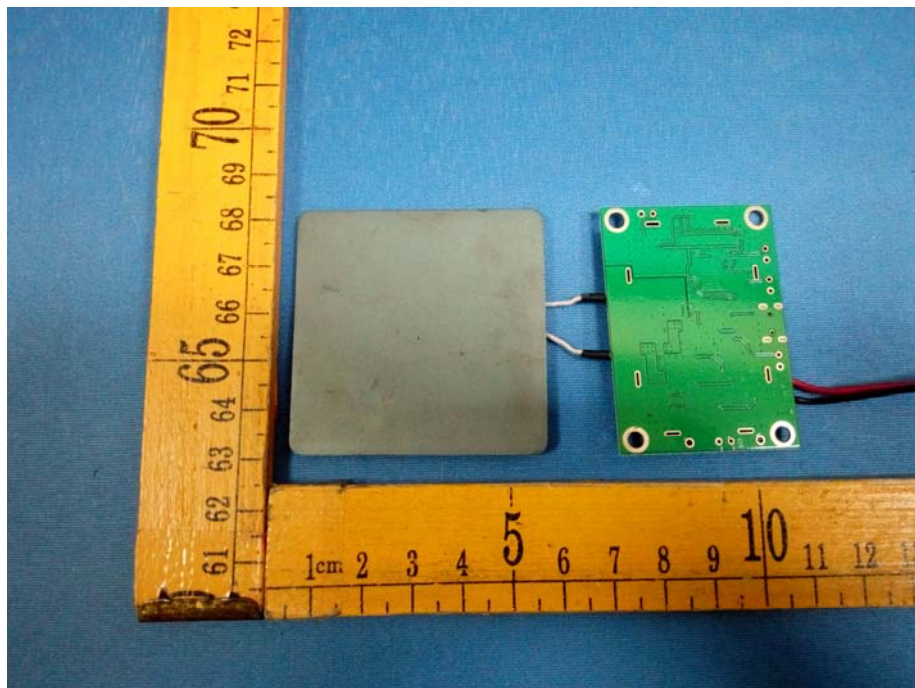
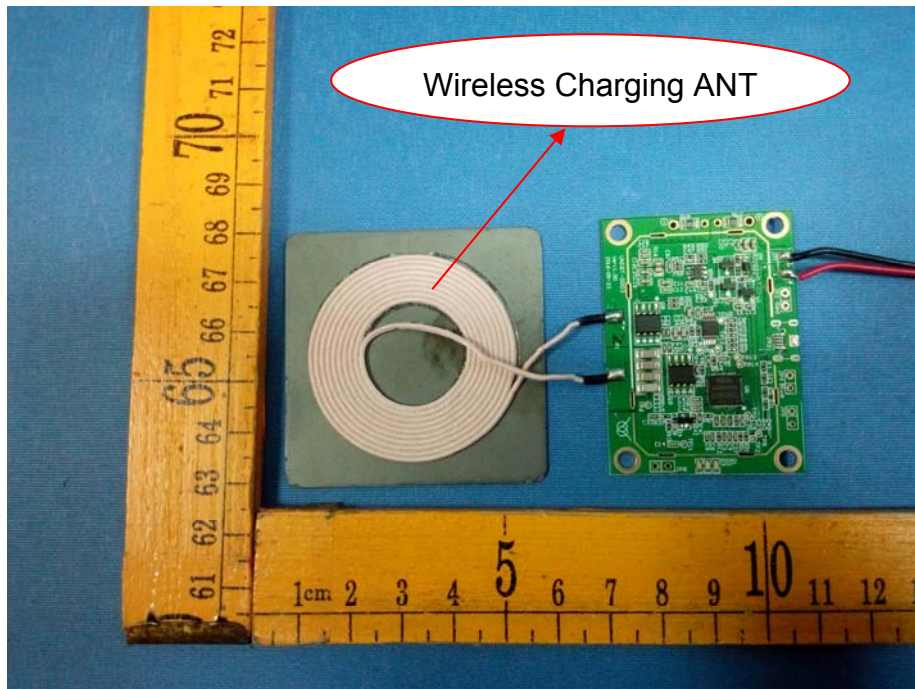


12.2 Model D100 – Internal Photos









=====End of Report=====