TEST REPORT

Reference No.	:	WTS19S01005979-1W
FCC ID	:	X2F-X8W
Applicant	:	GaoYi Tech Limited
Address	:	5th Floor, Building F2, Huafeng Industrial Zone, Hangcheng Road Xixiang Town, Bao An District, Shenzhen, China
Manufacturer	:	Gaoyi Tech Limited
Address	:	Chang sheng Street, No.4, Tian mei Village, Huang jiang Town, Dong guan City, China
Product	:	Fast car wireless charger
Model(s)	:	HC86a-X8W, HC86a-X8Wi, HC86a-X7i, HC86a-X6i, HC86a-X5i, HC86a-WX-05
Standards	:	FCC Part 15 subpart C
Date of Receipt sample	:	2019-01-28
Date of Test	:	2019-01-28 to 2019-02-14
Date of Issue	:	2019-02-14
Test Result	:	**Pass**

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:
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Compiled by:

Jack Wen / Test Engineer

Approved by:

Philo Zhong / Manager

2 Laboratories Introduction

Waltek Services (Shenzhen) Co., Ltd is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation, the certification number is 4243.01) of USA, CNAS (China National Accreditation Service for Conformity Assessment, the registration number is L3110) of China.Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CEC(California energy efficiency), ISED (Innovation, Science and Economic Development Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek(ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.

Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. ElectroMagnetic Compatibility(EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

2.1 Test Facility

A. Accreditations for Conformity Assessment (International)

Country/Region	Scope Covered By	Scope	Note
USA	ISO/IEC 17025	FCC ID \ DOC \ VOC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India		WPC	-
Thailand		NTC	-
Singapore		IDA	-

Note:

1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476.
2. ISED CAB identifier: CN0013.

B.TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of …	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd.	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

3 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207	N/A
Radiated Spurious Emissions	15.209	PASS
Occupied Bandwidth	15.215	PASS
Antenna Requirement	15.203	PASS

Remark: Conducted Emissions testing are inapplicable for EUT powered by battery.

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5 General Information

5.1 General Description of E.U.T

Product:	Fast car wireless charger
Model(s):	HC86a-X8W, HC86a-X8Wi, HC86a-X7i, HC86a-X6i, HC86a-X5i, HC86a-WX-05
Model Difference:	Only the model names and colors are different, the others are all the same. The model HC86a-X8W is the tested sample.
Frequency Range:	112-205kHz
Antenna installation:	Coil Antenna

5.2 Details of EUT

Ratings:	Input: 12-24V DC Output: USB1+USB2: 5V DC 2100mA, USB3: 3.6-6.5V DC 2000mA /6.5-9V DC 2000mA /9-12V DC 1500mA Wireless transfer Power: 5W/7.5W/10W

5.3 Test mode

Test Item	Test mode	Test channel
Radiated Spurious Emissions	DC 12V: Transmitting + Empty load	174.28kHz
	DC 12V: Transmitting + Half load	
	DC 12V: Transmitting + Full load	
	DC 24V: Transmitting + Empty load	
	DC 24V: Transmitting + Half load	
	DC 24V: Transmitting + Full load *	
All test mode were tested and passed, “*” show the worst case mode which were record in the report.		

6 Equipment Used during Test

6.1 Equipments List

3m Semi-anechoic Chamber for Radiation(TDK)						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Valid**
1	Test Receiver	R&S	ESCI	101296	2018-04-20	1Year
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2018-04-19	1Year
3	Active Loop Antenna	Com-Power Corp.	AL-130R	10160007	2018-04-17	1Year
4	Amplifier	ANRITSU	MH648A	M43381	2018-04-20	1Year
5	Cable	HUBER+SUHNER	CBL2	525178	2018-04-20	1Year
RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Valid**
1	Spectrum Analyzer	Agilent	N9020A	MY49100060	2018-09-21	1Year
2	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	2018-09-10	1Year
3	Humidity Chamber	GF	GTH-225-40-1P	IAA061213	2018-08-12	1Year
4	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2018-04-06	1Year
5	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2018-09-10	1Year
3m Semi-anechoic Chamber for Radiation						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Valid**
1	Spectrum Analyzer	R&S	FSP	100091	2018-04-20	1Year
2	Amplifier	Agilent	8447D	2944A10178	2019-01-09	1Year
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2018-05-18	1Year
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2018-10-15	1Year

5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2018-05-18	1Year
6	Broad-band Horn Antenna (FCC/IC ID 才放)	SCHWARZBECK	BBHA 9170	335	2018-10-24	1Year
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2018-04-07	1Year
8	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	2018-04-07	1Year
9	Signal Generater	R&S	SMP22	100102	2018-09-15	1Year

6.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
Mophie juice pack	Mophie	JP-SGN8	-

6.3 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emissions	150kHz~30MHz	±3.64dB	(1)
Radiated Spurious Emissions	26KHz~30MHz	±3.03dB	(1)
Radiated Spurious Emissions	30MHz~1000MHz	±5.03dB	(1)

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

6.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TES T CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave,Tianhe District, Guangzhou, Guangdong, China.

7 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 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(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
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	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

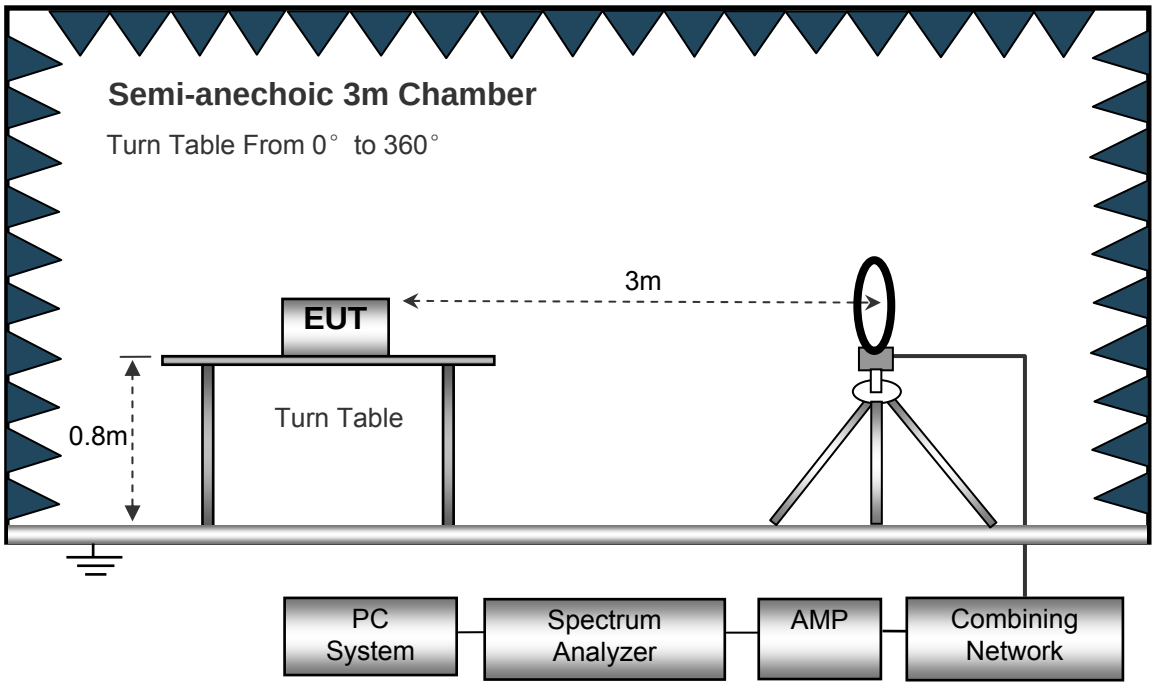
EUT Operation : Refer to 5.3

Only the worst case transmitting mode were record in the report.

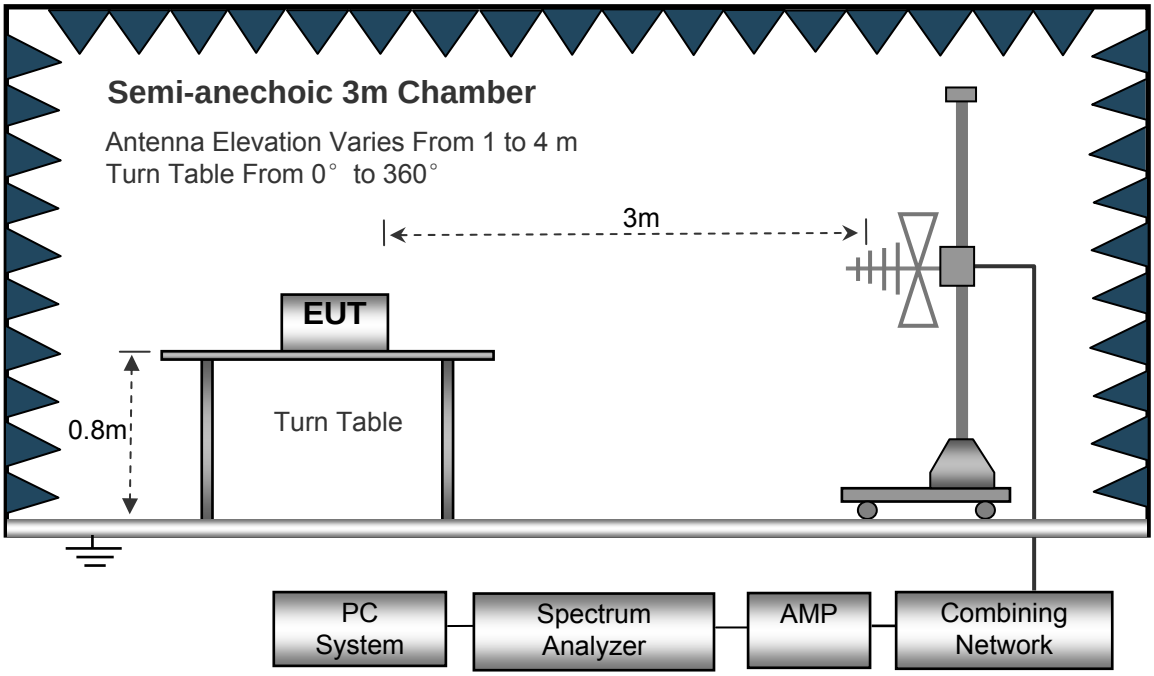
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.

The test setup for emission measurement below 30MHz.



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



7.3 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

7.4 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.

7.5 Summary of Test Results

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

Frequency (MHz)	Measurement results	Detector	Correct factor	Measurement results (calculated)	Limits	Margin
	dBμV @3m	PK/QP	dB/m	dBμV/m @3m	dBμV/m @3m	dB
0.174	51.25	QP	18.49	69.74	102.79	-33.05
0.322	4.05	QP	28.14	32.19	97.44	-65.25
4.661	11.21	QP	23.73	34.94	69.50	-34.56

Test Frequency: 30MHz ~ 1GHz

Frequency (MHz)	Measurement results (dBμV @3m)	Detector (PK/QP /Ave)	Degree	Height (m)	Polar (H/V)	Correct factor (dB)	Measurement results (calculated) (dBμV/m)	Limit (dBμV /m)	Margin (dB)
34.62	33.14	QP	121	1.6	H	-13.90	19.24	40	-20.76
34.62	33.73	QP	200	1.8	V	-13.90	19.83	40	-20.17
220.42	34.08	QP	71	1.8	H	-13.17	20.91	46.5	-25.59
220.42	36.84	QP	242	2.0	V	-13.17	23.68	46.5	-22.82
520.59	36.43	QP	306	1.5	H	-5.38	31.06	46.5	-15.44
520.59	37.69	QP	27	1.4	V	-5.38	32.32	46.5	-14.18

8 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215

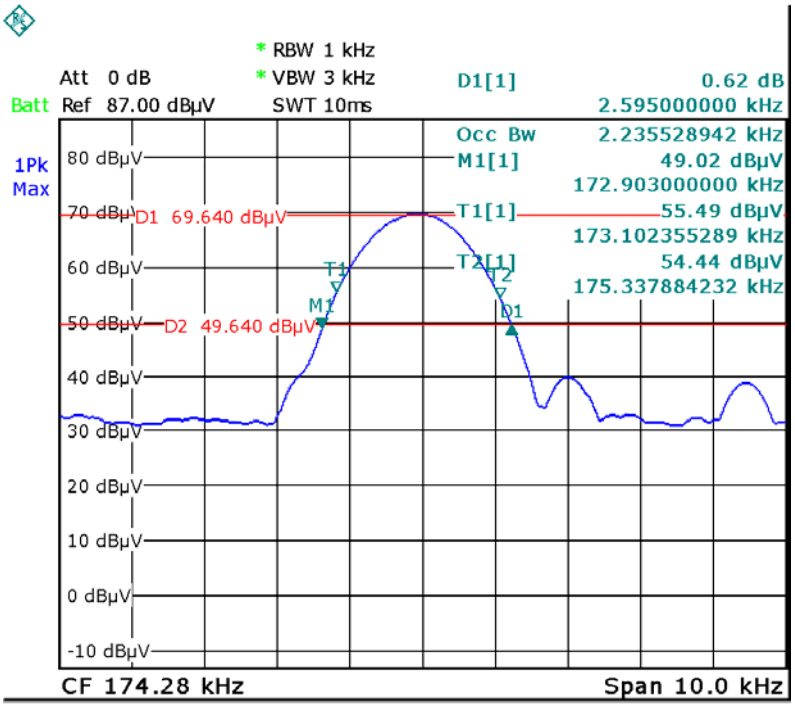
8.1 Test Procedure

1. The transmitter shall be operated at its maximum carrier power measured under normal test conditions;
2. The span of the analyzer shall be set to capture all products of the modulation process,including the emission skirts.
3. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

8.2 Test Result Plot:

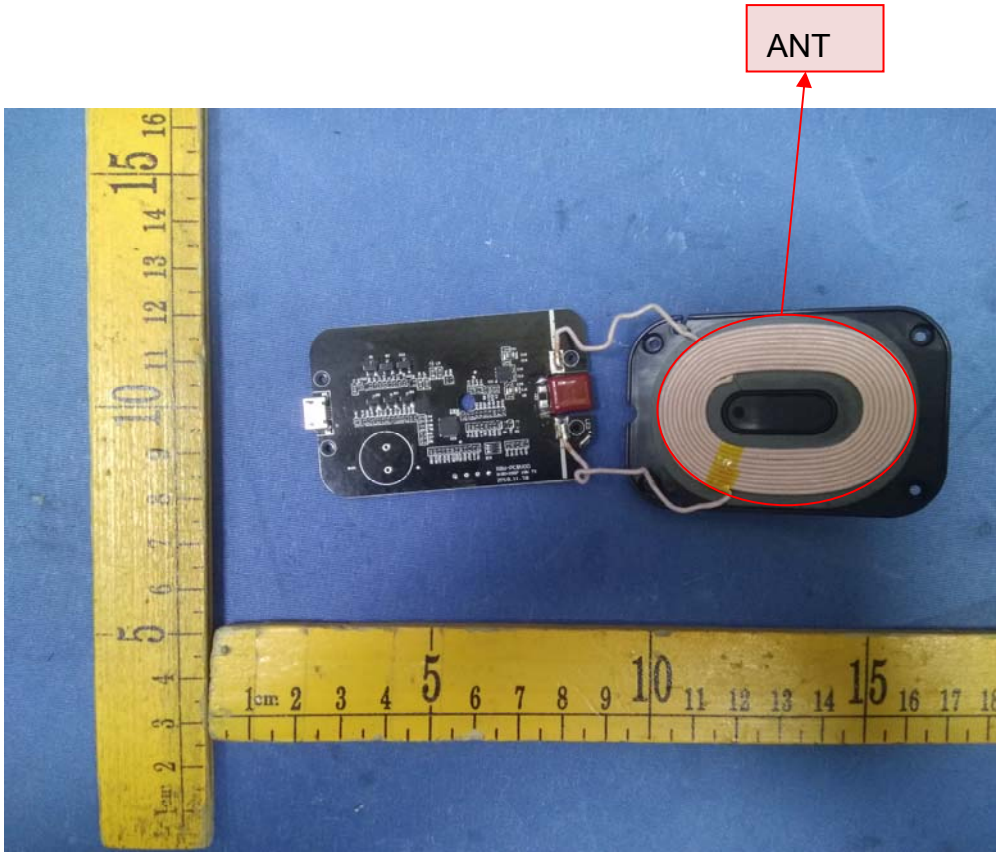
Test Channel(kHz)	99% Bandwidth(kHz)	20dB Bandwidth Emission(KHz)
174.28	2.236	2.595

Test result plot as follows:



9 Antenna Requirement

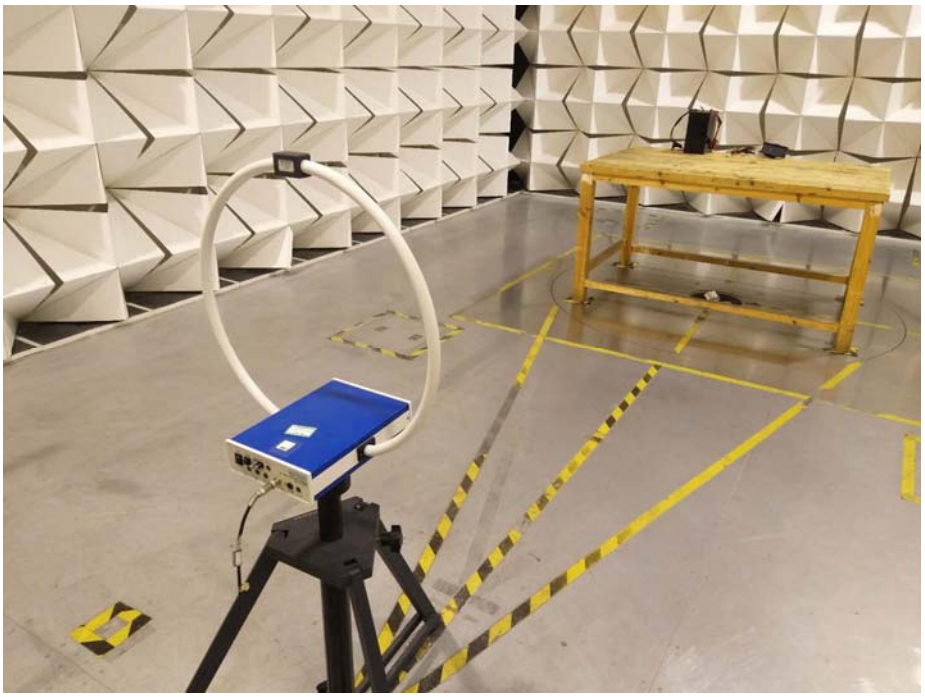
According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product has a Coil antenna, fulfill the requirement of this section.



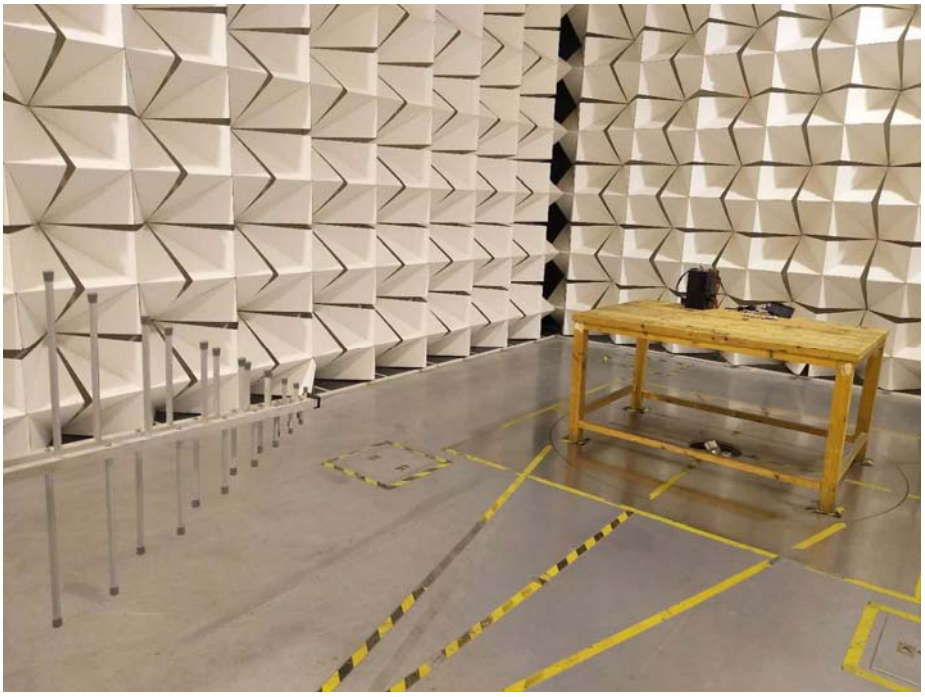
10 Photographs-Test Setup

10.1 Radiation Emission Test Setup

Below 30MHz

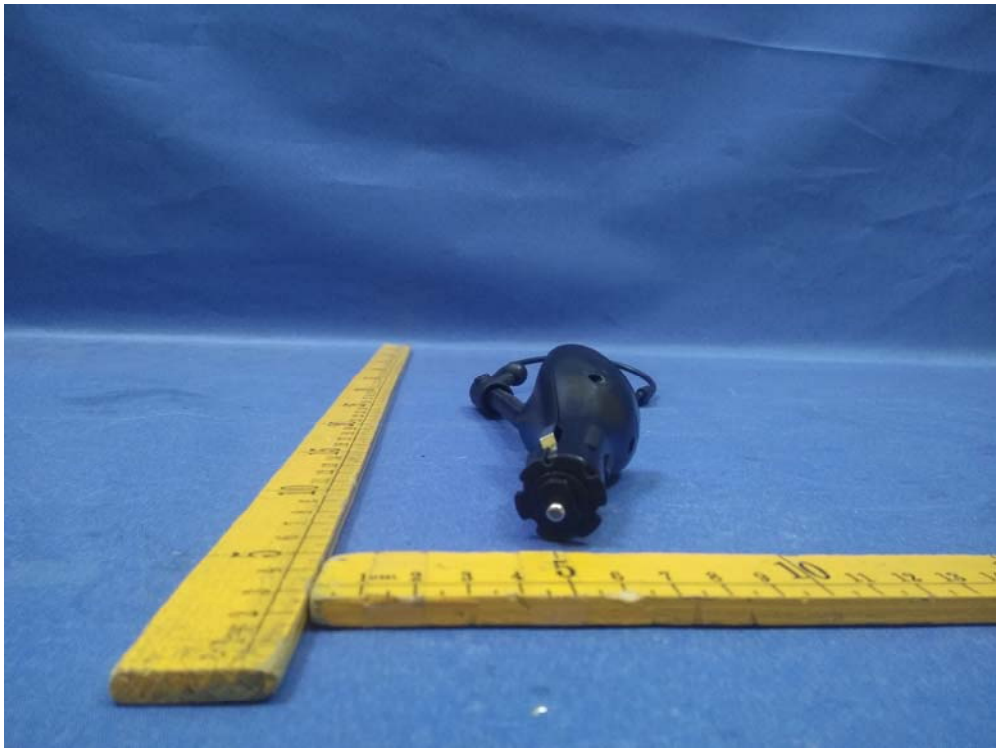


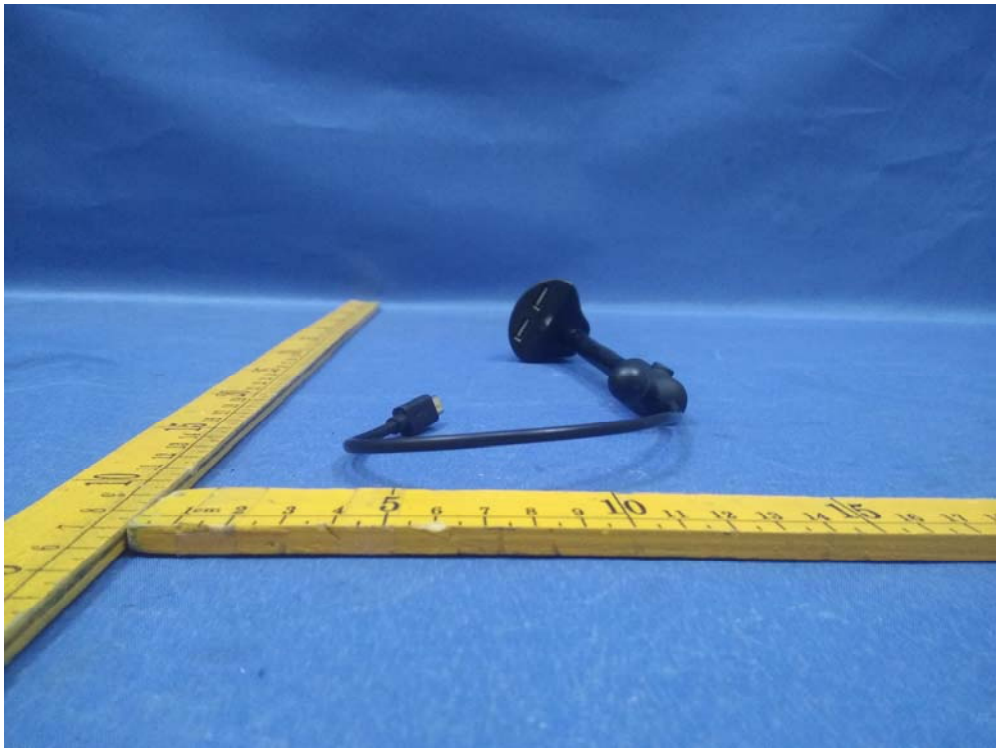
From 30MHz to 1GHz

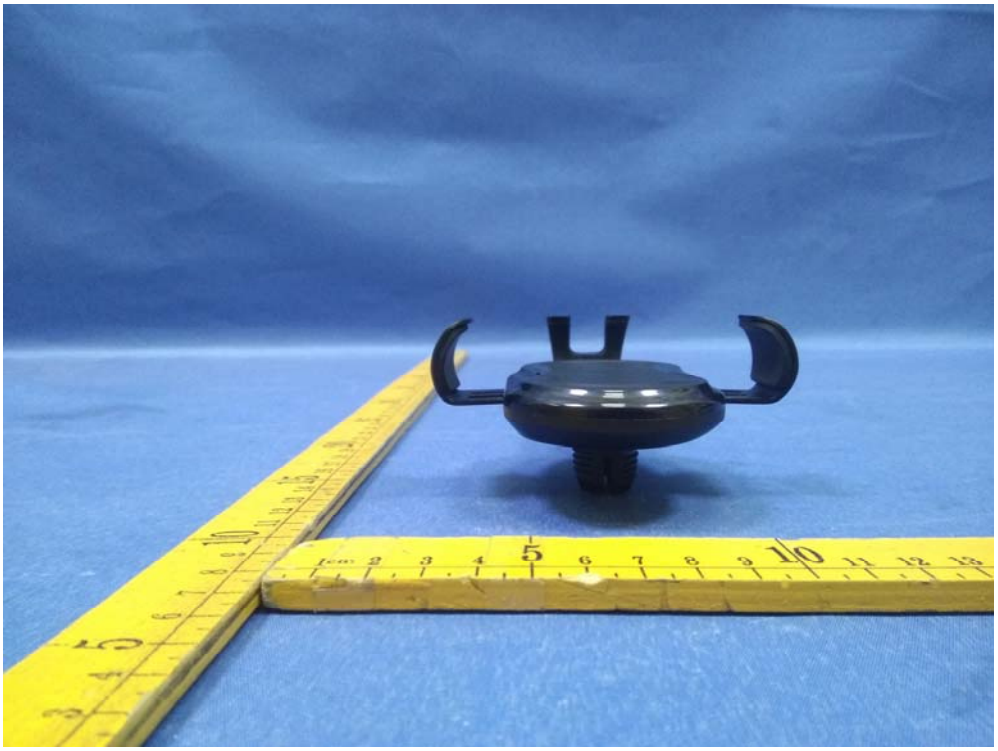


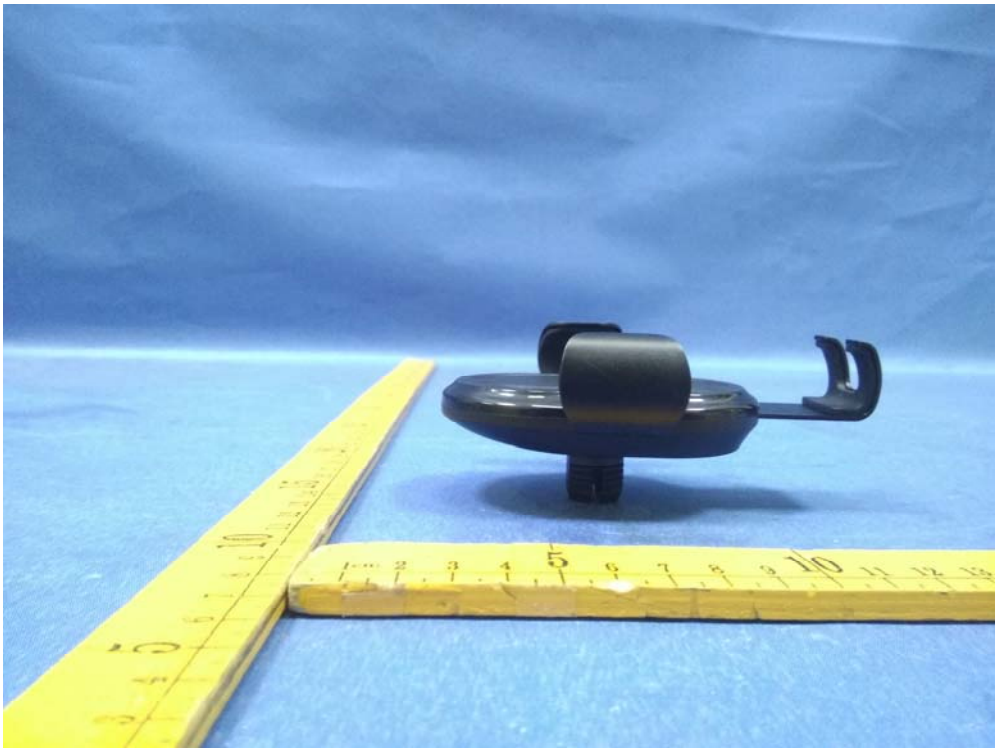
11 Photographs – Constructional Details

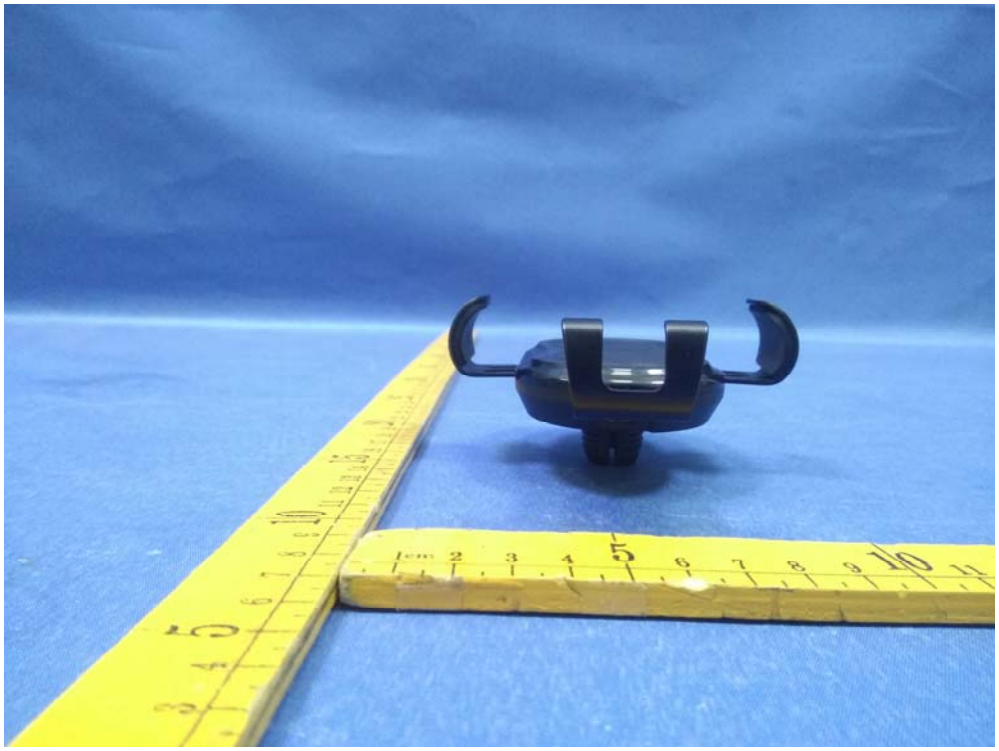
11.1 External Photos

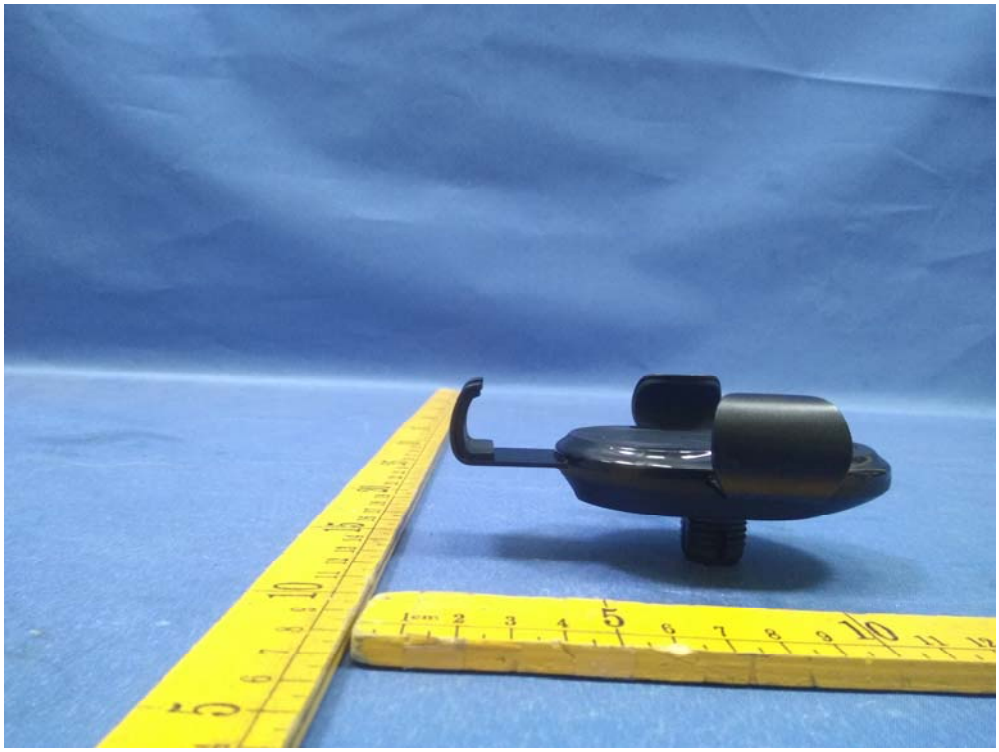




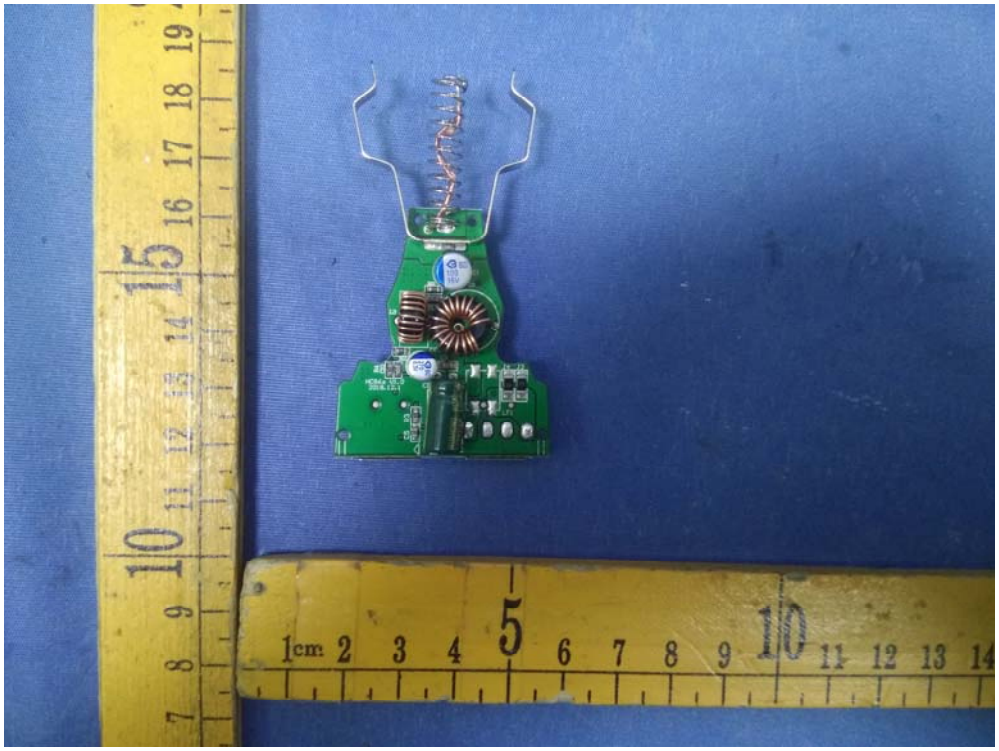


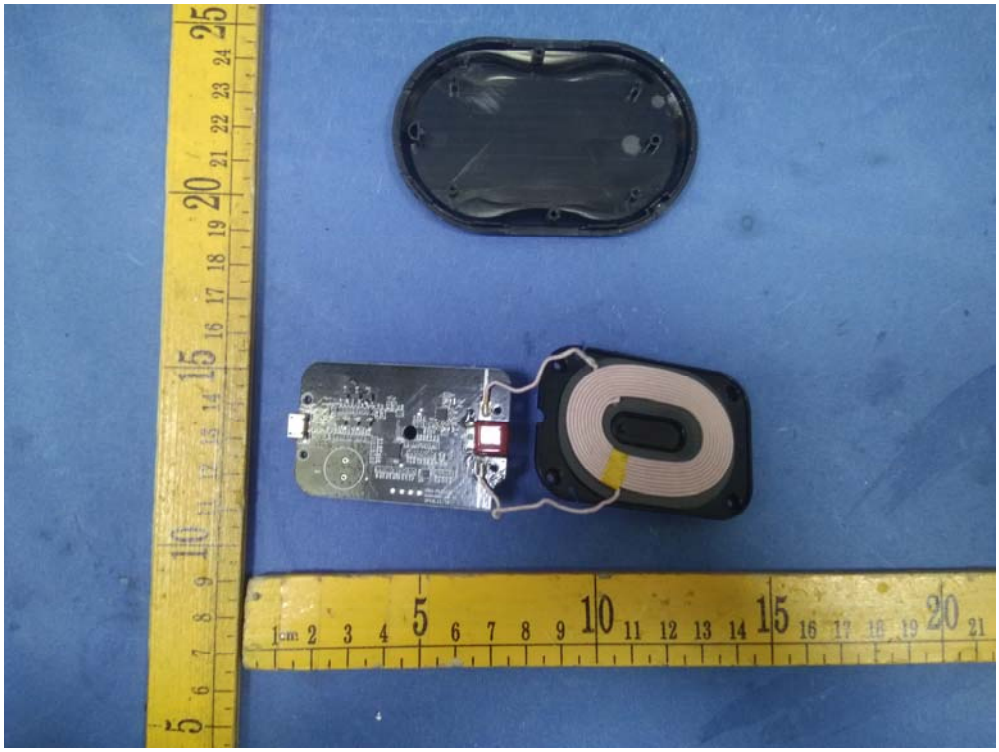


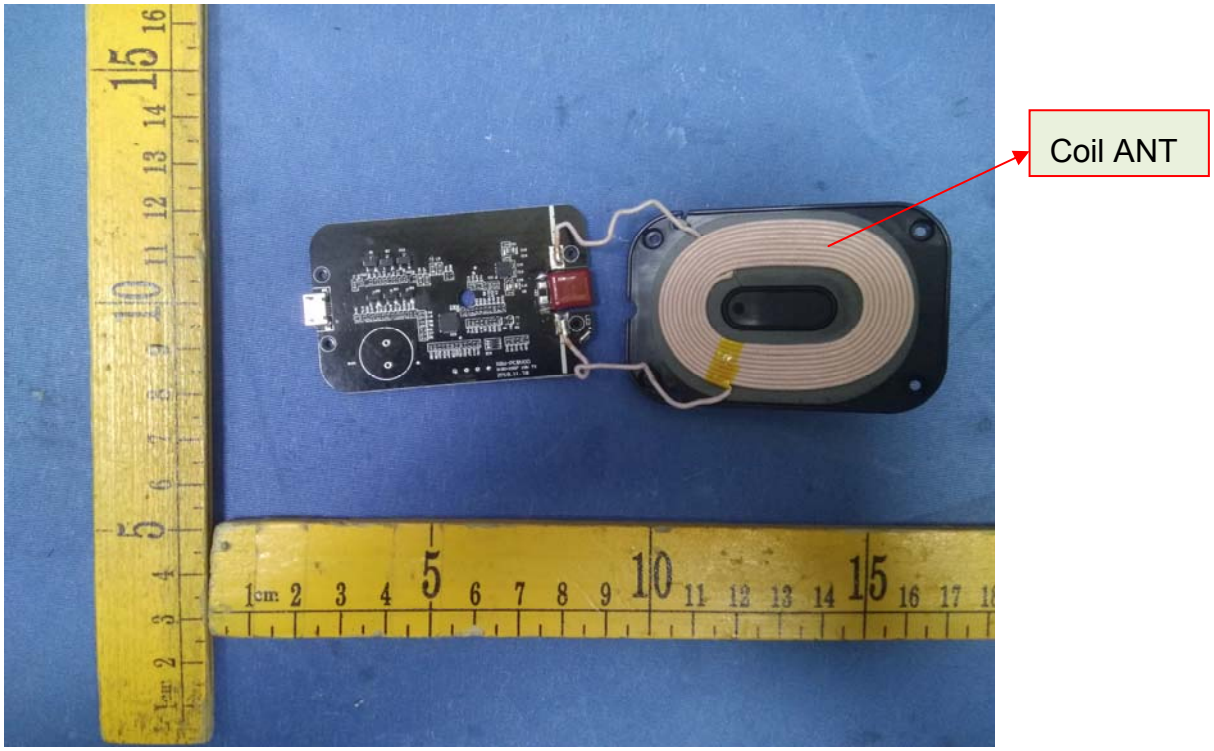


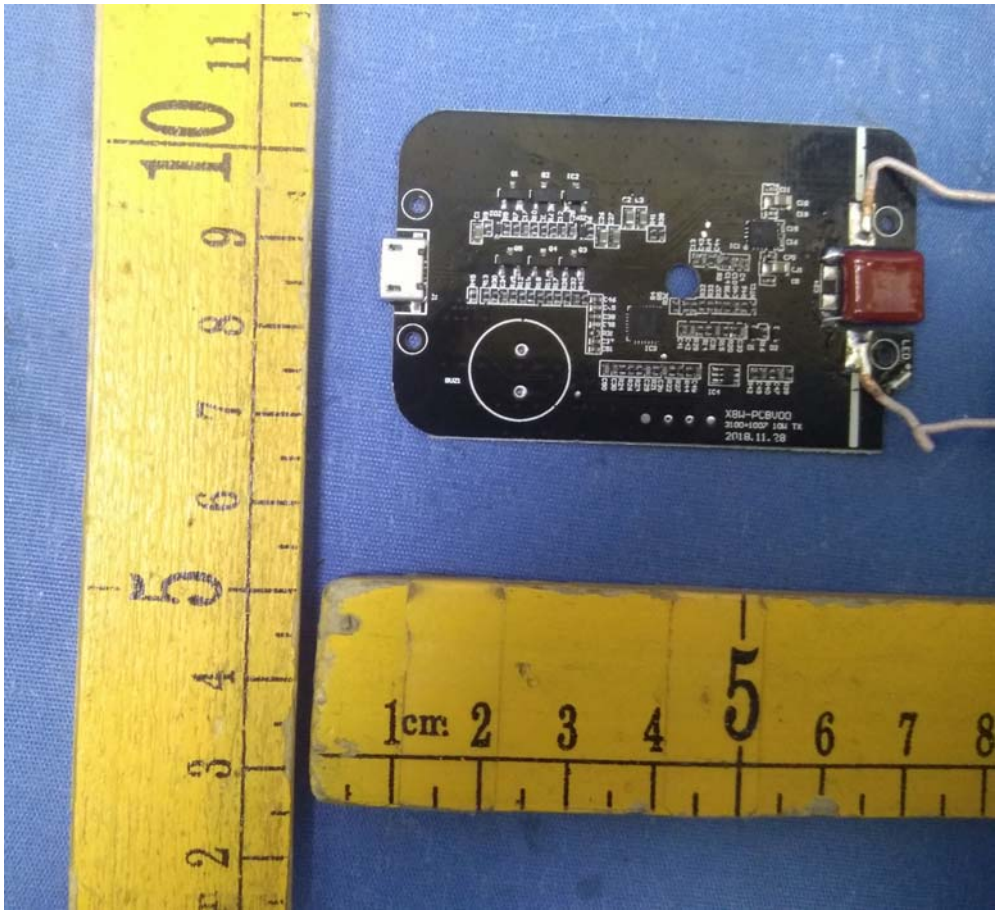


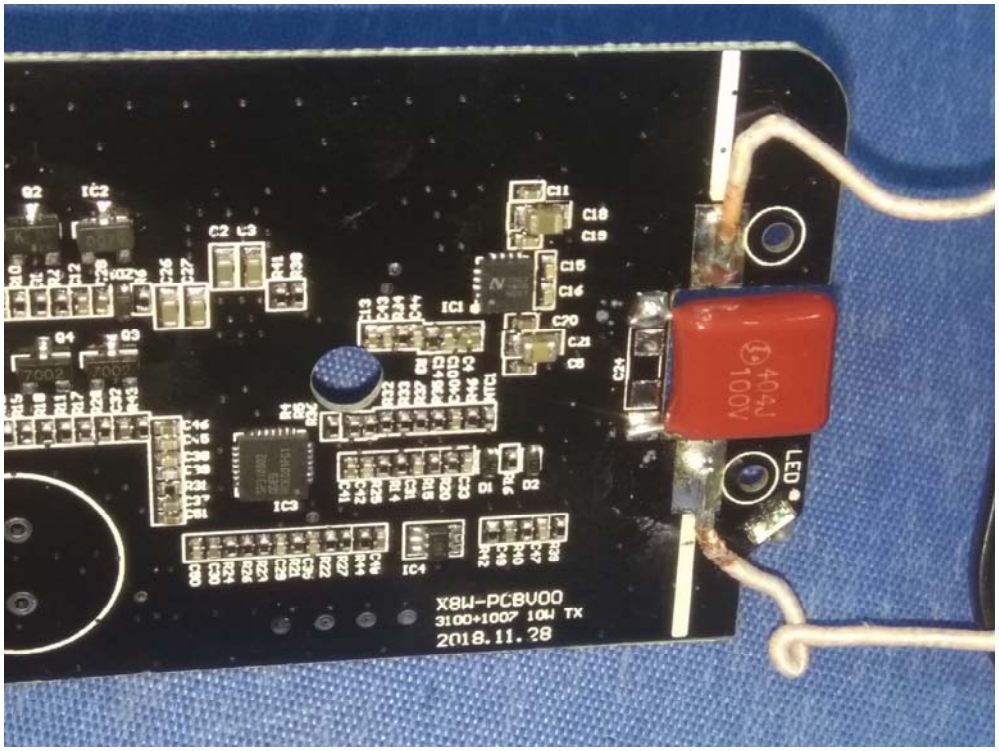
11.2 Internal Photos






Coil ANT





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