

FCC TEST REPORT

Client Name : Shenzhen Three Bees E-Commerce Co., Ltd.
Address : Building A, Jianjin Industrial Park Donghuan 2nd Road,
Longhua Street Shenzhen China 518000
Product Name : Wireless Car Charger
Date : Feb. 26, 2021



Shenzhen Anbotek Compliance Laboratory Limited

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TEST REPORT

Applicant : Shenzhen Three Bees E-Commerce Co., Ltd.
Manufacturer : Shenzhen Three Bees E-Commerce Co., Ltd.
Product Name : Wireless Car Charger
Model No. : X5, X5S, X6S, C1S
Trade Mark : NANAMI
Rating(s) : Input: DC 5V-2A, 9V-1.67A
Output : 5W, 7.5W, 10W

Test Standard(s) : FCC Part15 Subpart C 2019, Paragraph 15.209

Test Method(s) : ANSI C63.10: 2013

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt

Jan. 27, 2021

Date of Test

Jan. 27~Feb. 22, 2021

Prepared By

Yilia Zhong

(Engineer / Yilia Zhong)

Reviewer

Bibo Zhang

(Supervisor / Bibo Zhang)

Approved & Authorized Signer

Kingkong Jin

(Manager / Kingkong Jin)

1. General Information

1.1. Client Information

Applicant	:	Shenzhen Three Bees E-Commerce Co., Ltd.
Address	:	Building A, Jianjin Industrial Park Donghuan 2nd Road, Longhua Street Shenzhen China 518000
Manufacturer	:	Shenzhen Three Bees E-Commerce Co., Ltd.
Address	:	Building A, Jianjin Industrial Park Donghuan 2nd Road, Longhua Street Shenzhen China 518000
Factory	:	Shenzhen Three Bees E-Commerce Co., Ltd.
Address	:	Building A, Jianjin Industrial Park Donghuan 2nd Road, Longhua Street Shenzhen China 518000

1.2. Description of Device (EUT)

Product Name	:	Wireless Car Charger	
Model No.	:	X5, X5S, X6S, C1S (Note: All samples are the same except the model number, so we prepare "X5" for test only.)	
Trade Mark	:	NANAMI	
Test Power Supply	:	DC 12V	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-1(Engineering Sample)	
Product Description	:	Operation Frequency:	110.1-205KHz
	:	Modulation Type:	FSK
	:	Antenna Type:	Inductive loop coil Antenna
	:	Antenna Gain(Peak):	0 dBi
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

1.3. Auxiliary Equipment Used During Test

Car charger	:	M/N: R5115 Input: 12-24V \equiv 3AMAX USB-A Output: 5V \equiv 2.4A; USB-C Output: 5V \equiv 3A, 9V \equiv 2A
Mobile phone	:	iPhone 12

1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

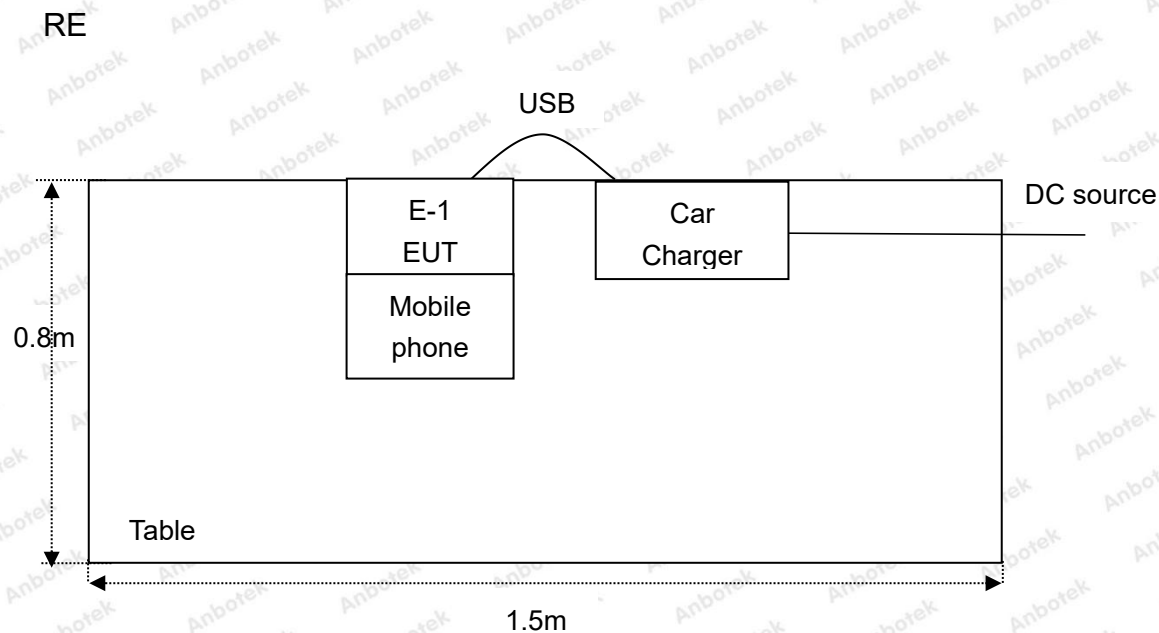
Pretest Mode	Description
Mode 1	Wireless charging Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	Wireless charging Mode

Note: (1)Test channel is 0.1189MHz.

(2)All the situation(full load, half load and empty load) has been tested,only the worst situation (full load, Wireless Output: 15W) was recorded in the report.

1.5. Description Of Test Setup



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 26, 2020	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESPI3	101604	Oct. 26, 2020	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 26, 2020	1 Year
4.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
5.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	Oct. 26, 2020	1 Year
6.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 02, 2020	2 Year
7.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 02, 2020	2 Year
8.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 02, 2020	2 Year
9.	Horn Antenna	A-INFO	LB-180400- KF	J211060628	Nov. 02, 2020	2 Year
10.	Pre-amplifier	SONOMA	310N	186860	Oct. 26, 2020	1 Year
11.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
12.	RF Test Control System	YIHENG	YH3000	2017430	Oct. 26, 2020	1 Year
13.	Power Sensor	DAER	RPR3006W	15100041SN045	Oct. 26, 2020	1 Year
14.	Power Sensor	DAER	RPR3006W	15100041SN046	Oct. 26, 2020	1 Year
15.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
16.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 26, 2020	1 Year
17.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 26, 2020	1 Year
18.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 26, 2020	1 Year
19.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80 B	N/A	Oct. 26, 2020	1 Year

1.7. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 3.9 dB (Horizontal)
		Ur = 3.8 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB

1.8. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, 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 No. 184111, September 30, 2020.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A, September 30, 2020.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

2. Summary of Test Results

Standard Section	Test Item	Result
FCC Part 15, Paragraph 15.207	Conducted Emission Test	N/A
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS
Part 15.203	Antenna Requirement	PASS

3. Radiation Spurious Emission and Band Edge

3.1. Test Standard and Limit

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	

Remark:

(1)The lower limit shall apply at the transition frequency.

(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

3.2. Test Setup

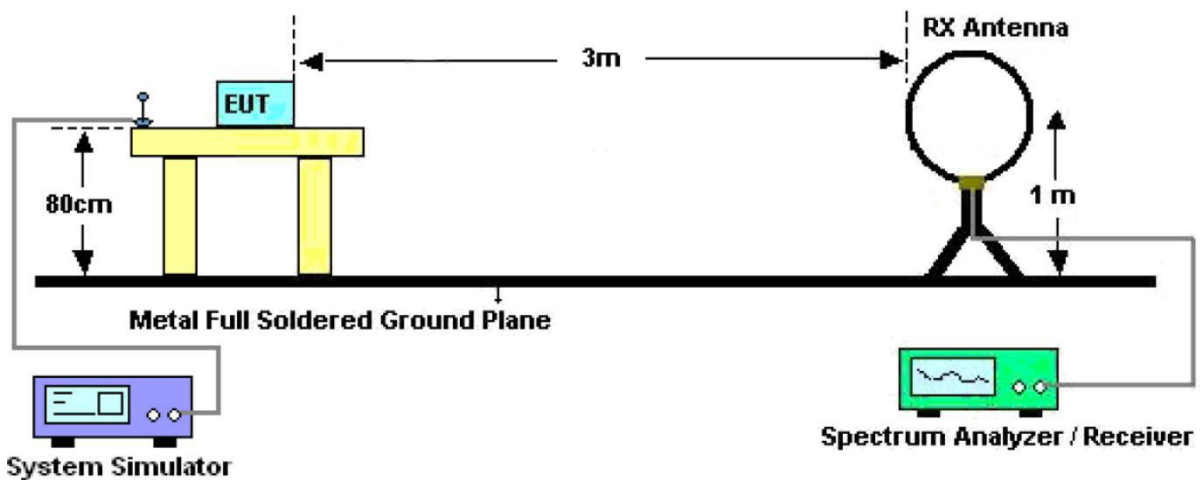


Figure 1. Below 30MHz

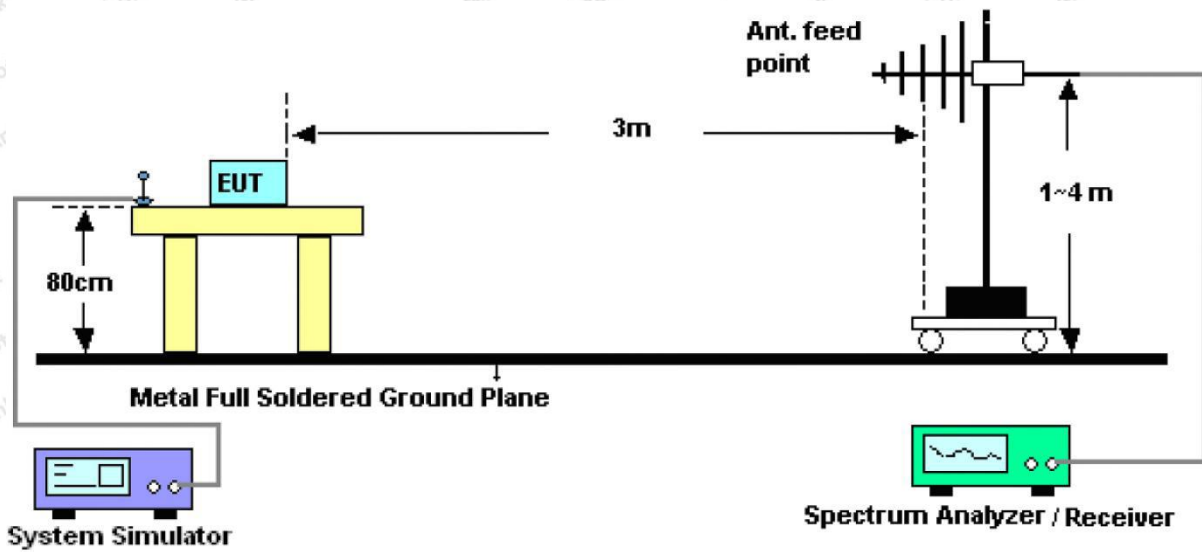


Figure 2. 30MHz to 1GHz

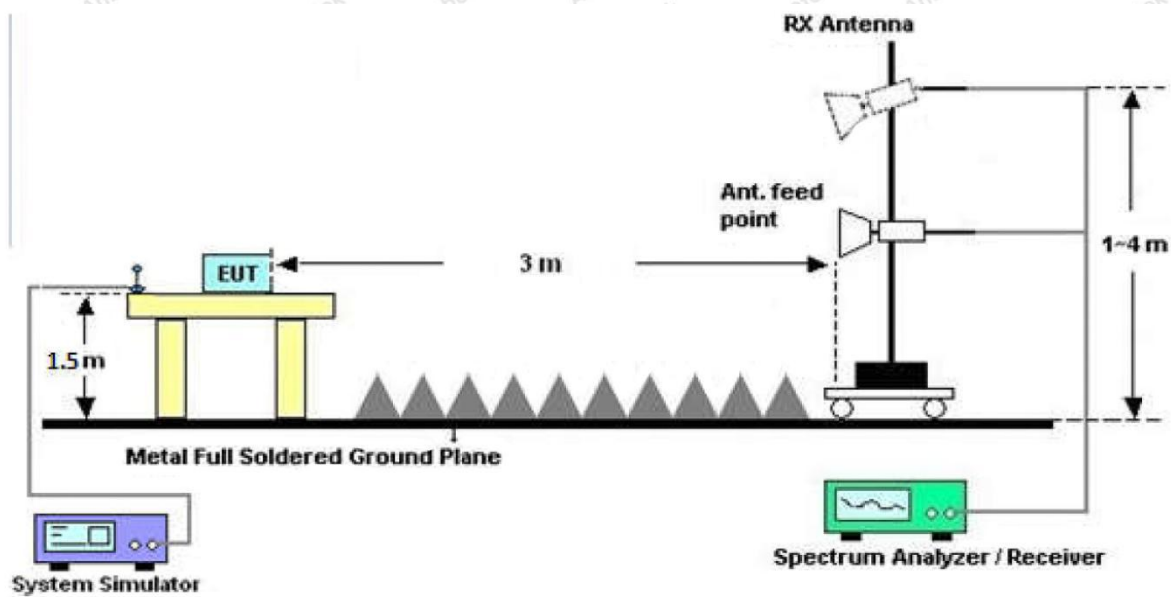


Figure 3. Above 1 GHz

3.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

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 be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For 9kHz to 150kHz, Set the spectrum analyzer as:

RBW = 200Hz, VBW = 1kHz, Detector = Quasi-Peak, Trace mode = Max hold, Sweep = auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:

RBW = 9kHz, VBW = 30kHz, Detector = Quasi-Peak, Trace mode = Max hold, Sweep = auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:

RBW = 100kHz, VBW = 300kHz, Detector = Quasi-Peak, Trace mode = Max hold, Sweep = auto couple.

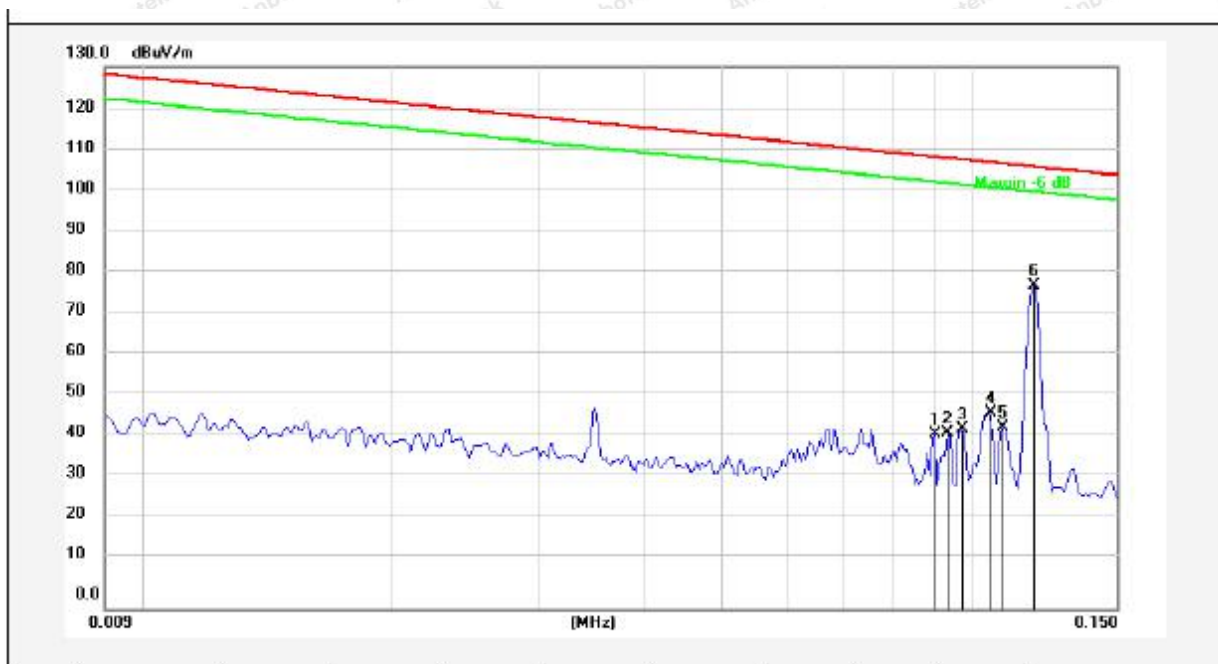
3.4. Test Data

PASS

Note: The data is in TX mode, and this is the worst mode.

Test Results (9K~0.15MHz)

Test Mode: Mode 1
 Power Source: DC 12V
 Temp.(°C)/Hum.(%RH): 20.4°C/50%RH
 Distance: 3m

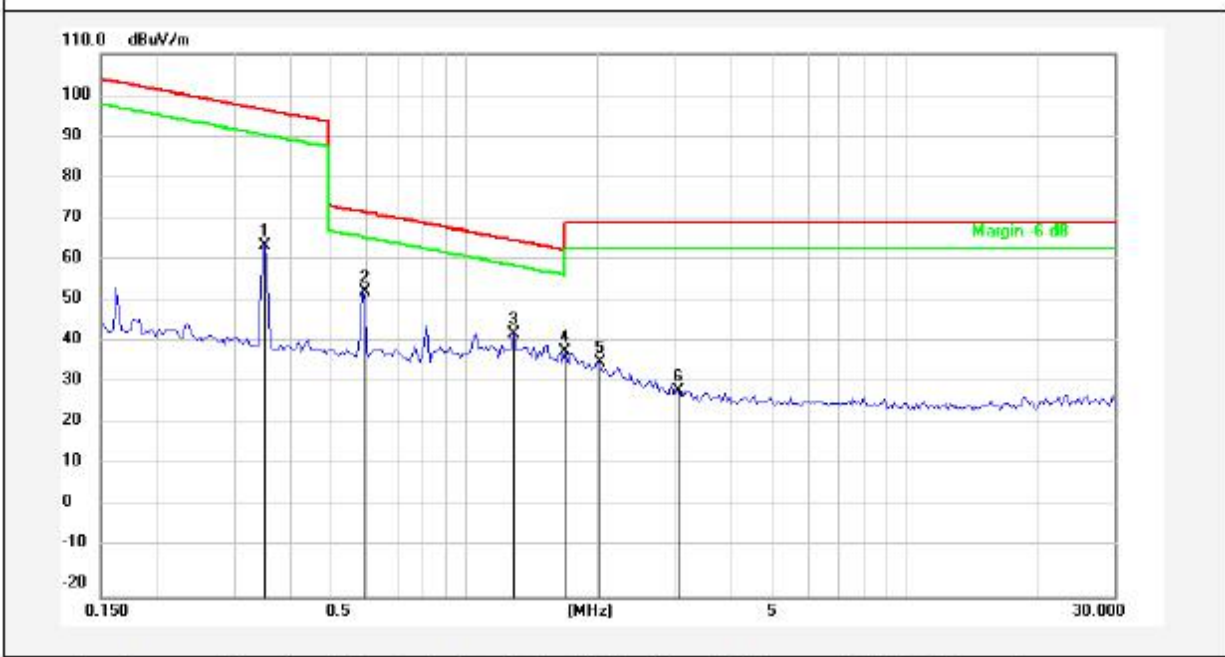


No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.0904	21.49	20.36	41.85	108.39	-66.54	peak			
2	0.0936	21.75	20.31	42.06	108.09	-66.03	peak			
3	0.0970	22.66	20.29	42.95	107.78	-64.83	peak			
4	0.1048	26.65	20.29	46.94	107.11	-60.17	peak			
5	0.1093	23.26	20.28	43.54	106.75	-63.21	peak			
6	0.1189	57.24	20.33	77.57	106.02	-28.45	peak			

Remark: According to FCC PART 15.209 (d), the emission limits for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Results (0.15~30MHz)

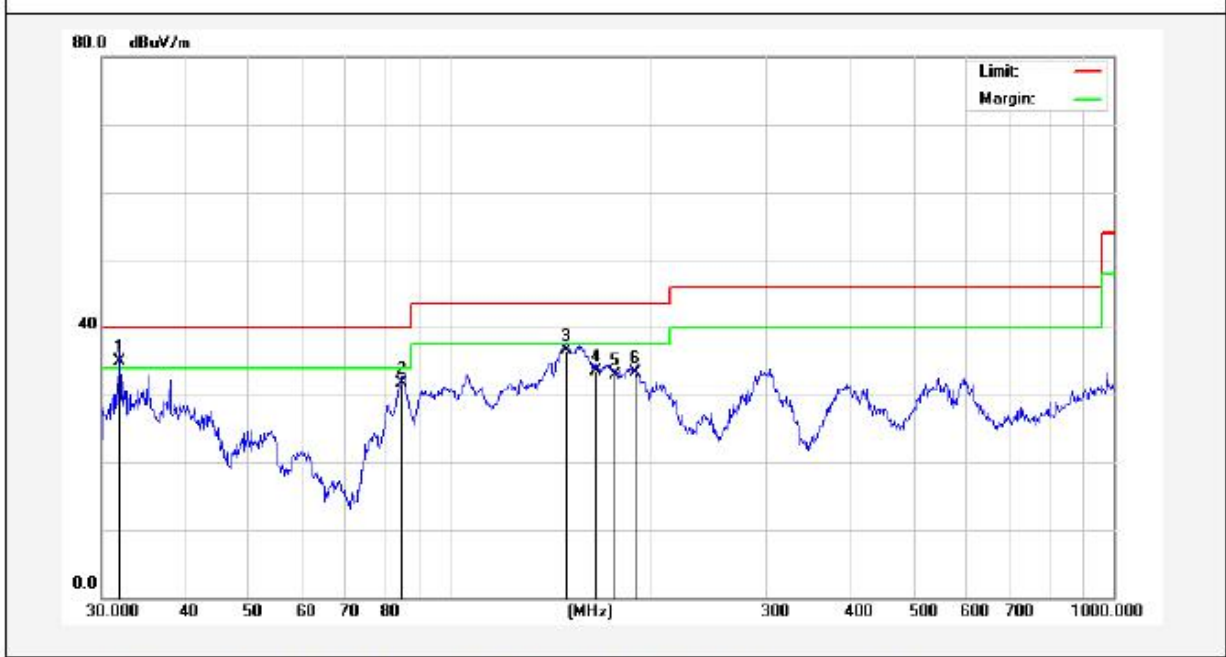
Test Mode: Mode 1
 Power Source: DC 12V
 Temp.(°C)/Hum.(%RH): 20.4°C/50%RH
 Distance: 3m



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.3548	43.63	20.28	63.91	96.59	-32.68	peak			
2	0.5870	32.57	20.27	52.84	72.24	-19.40	peak			
3	1.2994	22.61	20.26	42.87	65.35	-22.48	peak			
4	1.6936	18.40	20.27	38.67	63.06	-24.39	peak			
5	2.0119	15.90	20.28	36.18	69.50	-33.32	peak			
6	3.0738	8.99	20.31	29.30	69.50	-40.20	peak			

Test Results (30~1000MHz)

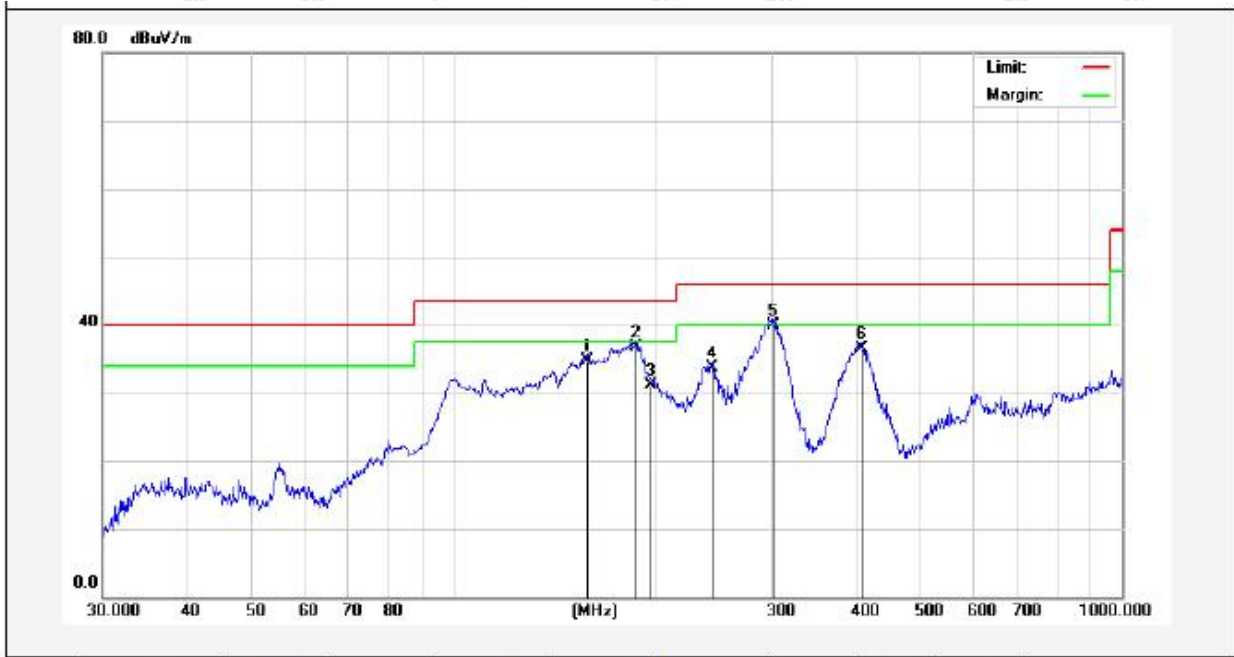
Test Mode: Mode 1
 Power Source: DC 12V
 Polarization: Vertical
 Temp.(°C)/Hum.(%RH): 20.4°C/50%RH
 Distance: 3m



No.	Freq. (MHz)	Reading (dBUV)	Factor (dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	31.9546	51.83	-16.83	35.00	40.00	-5.00	QP	100	0	
2	84.7019	48.59	-16.88	31.71	40.00	-8.29	QP	100	360	
3	150.0108	56.49	-19.91	36.58	43.50	-6.92	QP	100	0	
4	166.6514	52.61	-19.02	33.59	43.50	-9.91	QP	100	360	
5	177.5092	51.34	-18.40	32.94	43.50	-10.56	QP	100	0	
6	190.4050	51.09	-17.71	33.38	43.50	-10.12	QP	100	360	

Test Results (30~1000MHz)

Test Mode: Mode 1
 Power Source: DC 12V
 Polarization: Horizontal
 Temp.(°C)/Hum.(%RH): 20.4°C/50%RH
 Distance: 3m



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	158.6677	56.25	-21.64	34.61	43.50	-8.89	QP	100	0	
2	187.7530	57.10	-20.46	36.64	43.50	-6.86	QP	100	360	
3	197.8928	51.12	-19.97	31.15	43.50	-12.35	QP	100	0	
4	244.2321	52.70	-18.95	33.75	46.00	-12.25	QP	100	360	
5	301.4224	54.15	-14.25	39.90	46.00	-6.10	QP	100	0	
6	408.9460	49.29	-12.81	36.48	46.00	-9.52	QP	100	360	

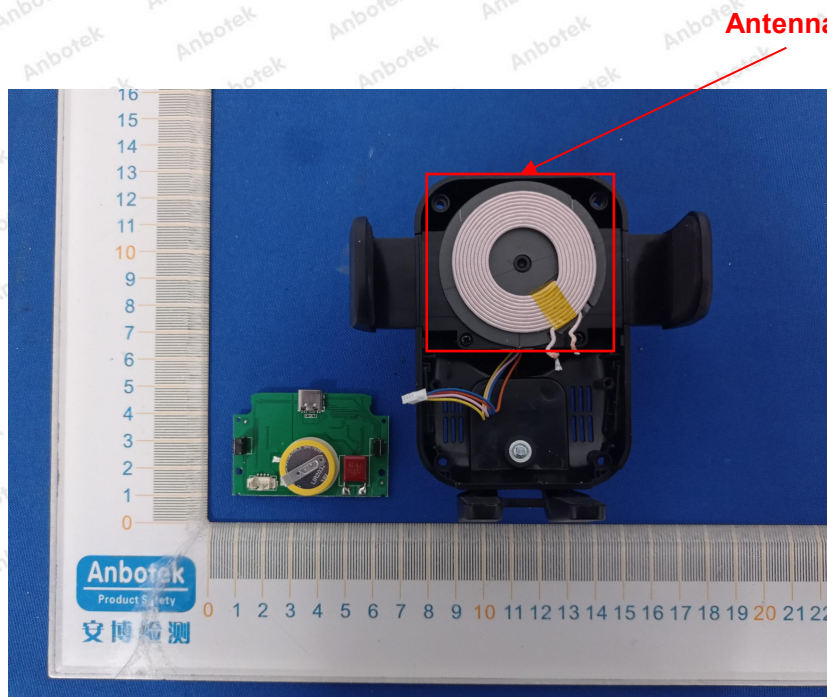
4. Antenna Requirement

5.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
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, 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.

4.2. Antenna Connected Construction

The antenna is a Inductive loop coil Antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.



Antenna

APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Radiation Emission Test

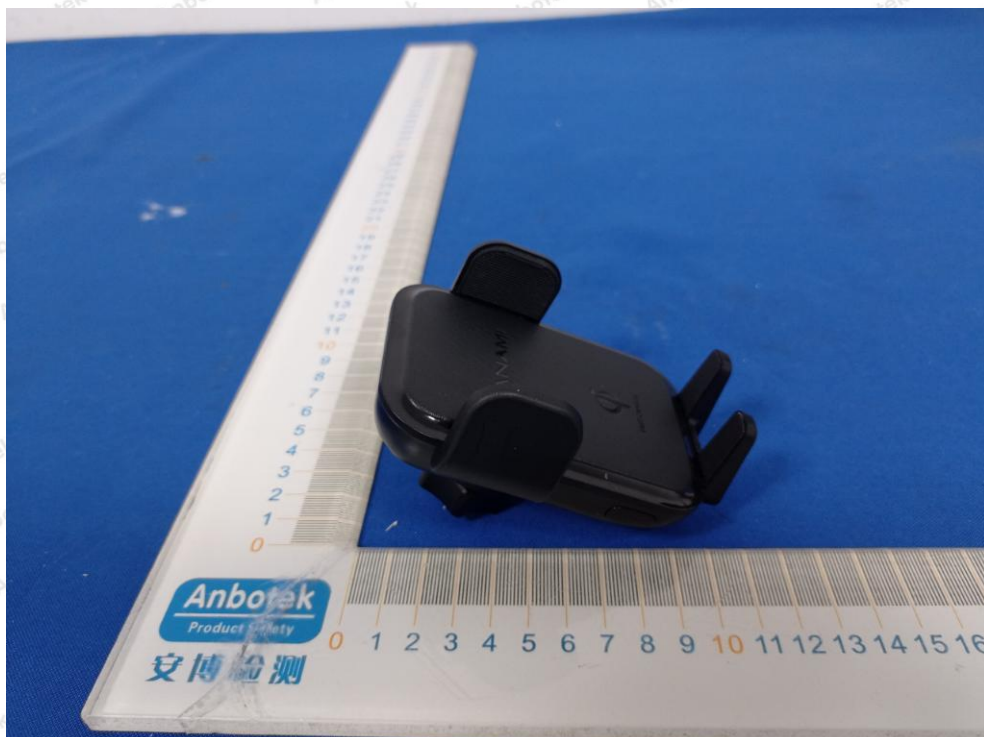
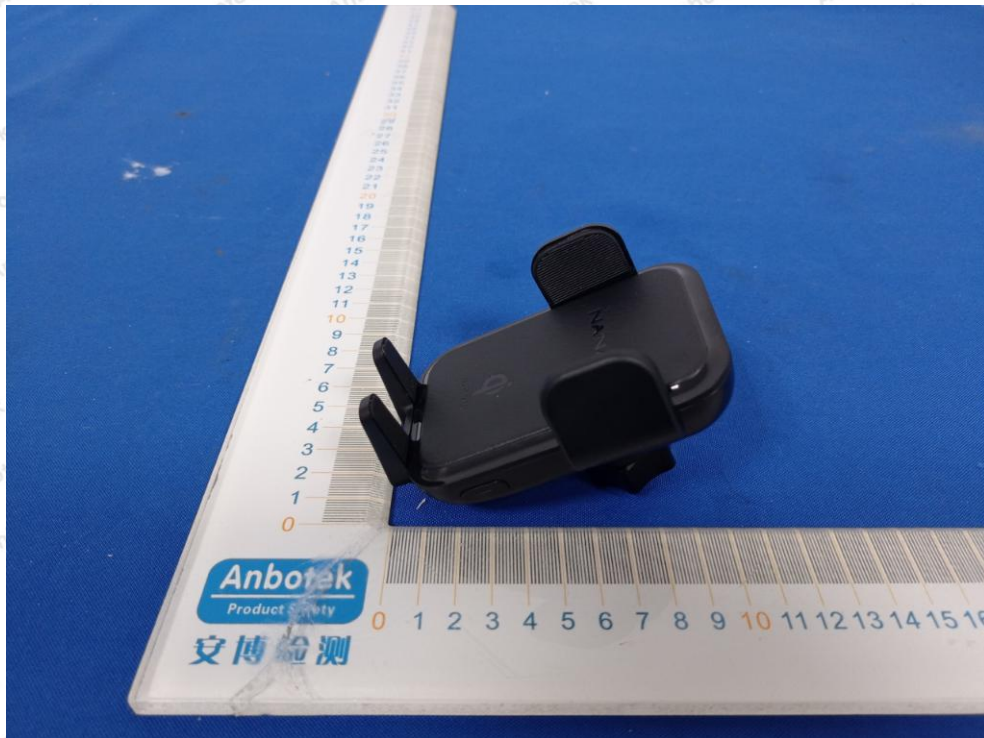




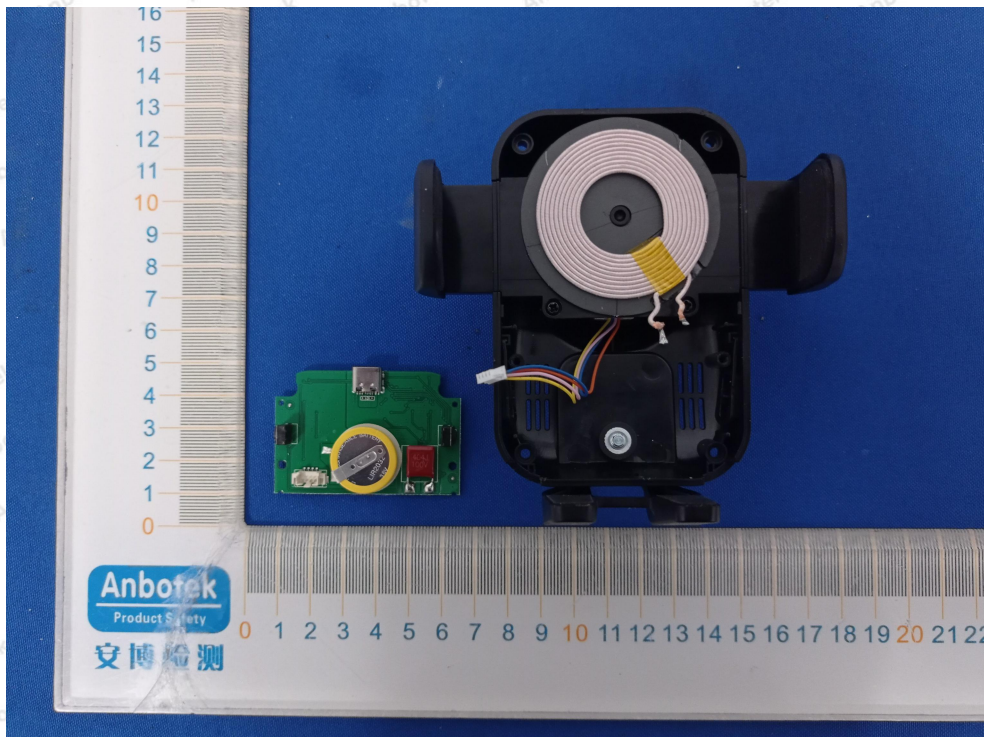
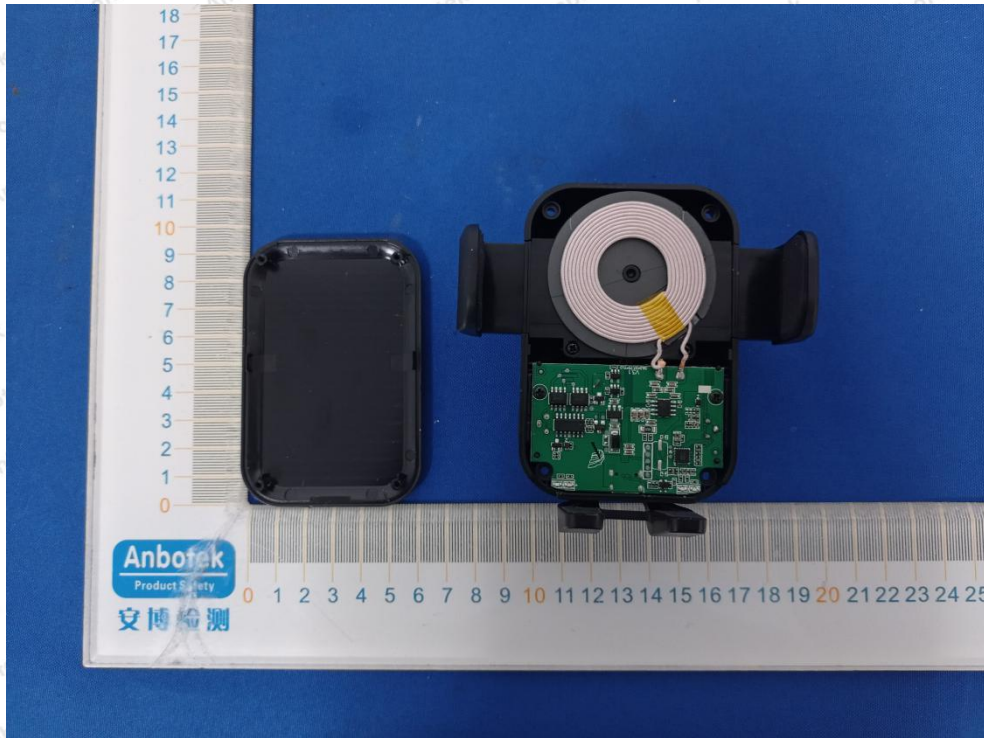
APPENDIX II -- EXTERNAL PHOTOGRAPH

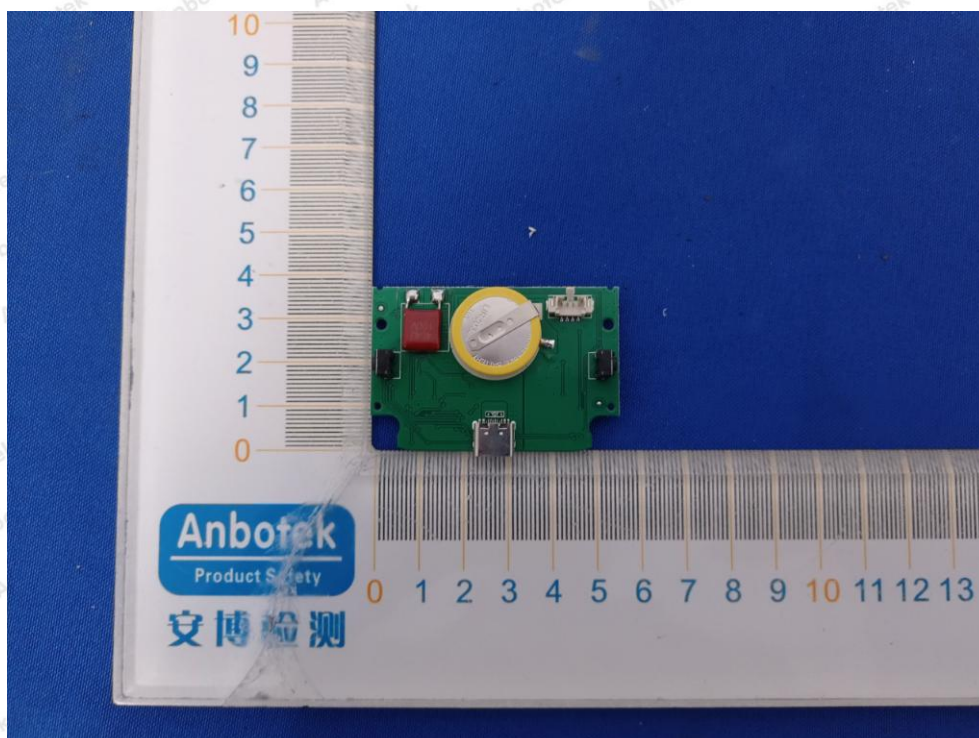
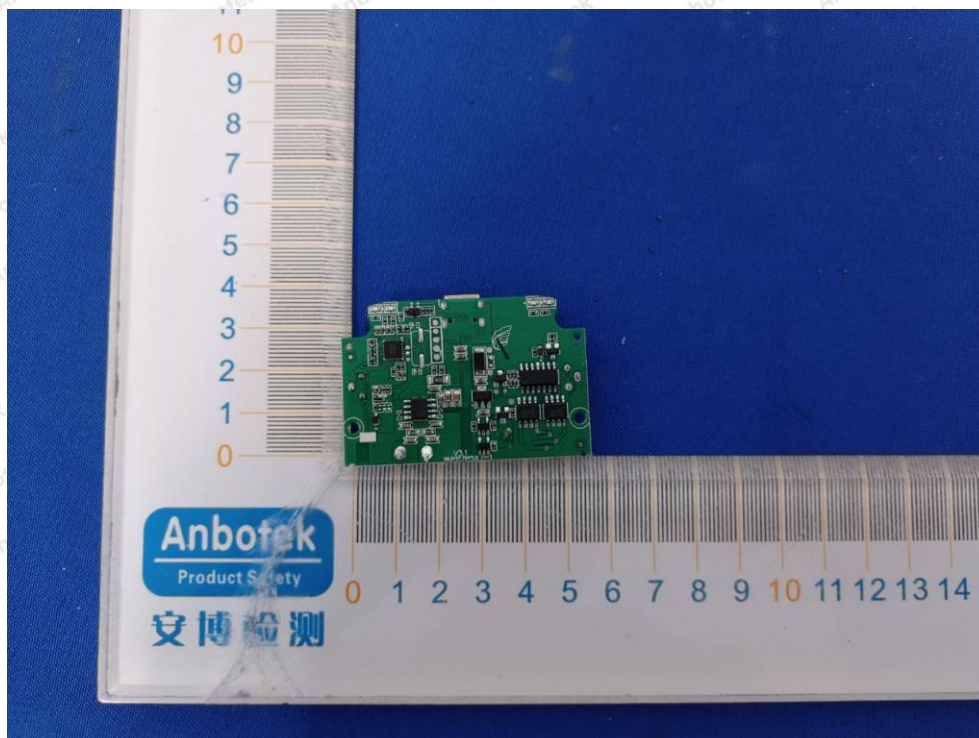


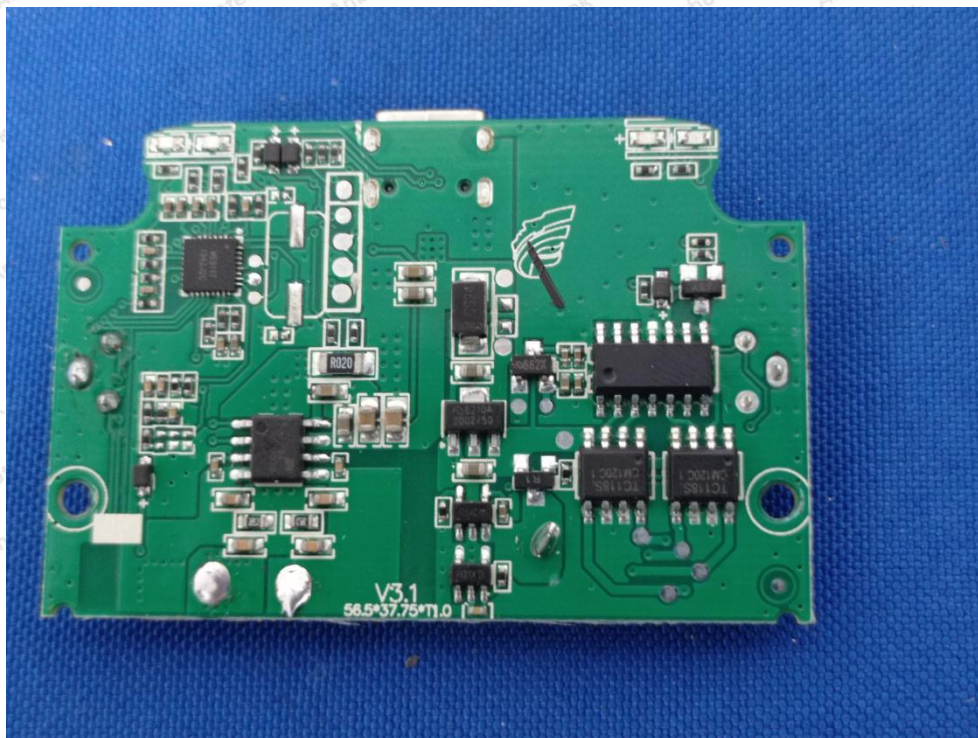




APPENDIX III -- INTERNAL PHOTOGRAPH







----- End of Report -----

Shenzhen Anbotek Compliance Laboratory Limited

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