

FCC TEST REPORT

For

SHENZHEN HOTA TECHNOLOGY CO.,LTD

Dual Channel Smart Charger

Model No.: D6

Prepared For : SHENZHEN HOTA TECHNOLOGY CO.,LTD
Address : A, Floor 2, Building 2, Guorun Industrial Park, Min Zhi, Longhua District,
Shenzhen, China

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Report Number : SZAWW180517003-01

Date of Test : May 18~23, 2018

Date of Report : May 23, 2018

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TEST REPORT

Applicant : SHENZHEN HOTA TECHNOLOGY CO.,LTD

Manufacturer : SHENZHEN HOTA TECHNOLOGY CO.,LTD

Product Name : Dual Channel Smart Charger

Model No. : D6

Trade Mark : N.A.

Rating(s) : Input: DC 6.5~30v, 0~30A;
Output: 0~30V, 0.1~15AX2, 650W;
USB Output: DC 5V, 2.1A;
Wireless Charging output: DC 5V, 1A

Test Standard(s) : FCC Part15 Subpart C 2017, Paragraph 15.209

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

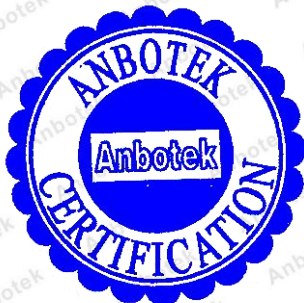
The device described above is tested by Shenzhen Anbotech Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotech 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 Anbotech Compliance Laboratory Limited.

Date of Test :

May 18~23, 2018

Prepared by :



(Tested Engineer / Winkey Wang)

Reviewer :

(Project Manager / Tangcy. T)

Approved & Authorized Signer :

(Manager / Tom Chen)

1. General Information

1.1. Client Information

Applicant	:	SHENZHEN HOTA TECHNOLOGY CO.,LTD
Address	:	A, Floor 2, Building 2, Guorun Industrial Park, Min Zhi, Longhua District, Shenzhen, China
Manufacturer	:	SHENZHEN HOTA TECHNOLOGY CO.,LTD
Address	:	A, Floor 2, Building 2, Guorun Industrial Park, Min Zhi, Longhua District, Shenzhen, China

1.2. Description of Device (EUT)

Product Name	:	Dual Channel Smart Charger
Model No.	:	D6
Trade Mark	:	N.A.
Test Power Supply	:	DC 12V by battery /DC 24V by battery
Product Description	Operation Frequency:	110-205KHz
	Number of Channel:	20 Channels
	Modulation Type:	MSK
	Antenna Type:	Loop 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

Mobile Phone	:	Manufacturer: NOKIA
		M/N: N920 S/N: 356355051634804 CE , FCC, DOC

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	CH01
Mode 2	CH10
Mode 3	CH20
Mode 4	Keeping TX+Charging mode

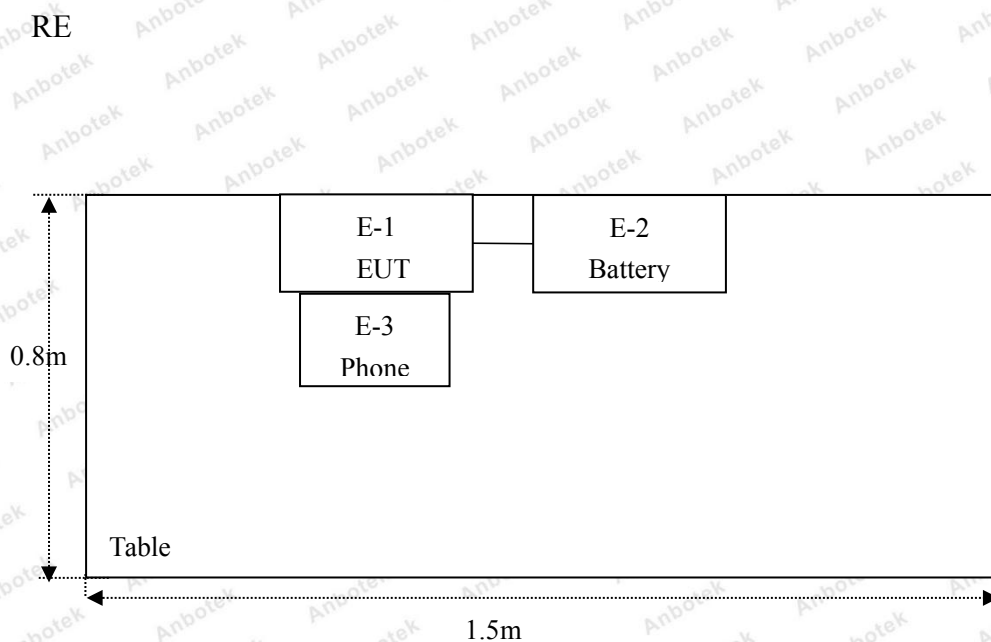
For Conducted Emission	
Final Test Mode	Description
Mode 4	Keeping TX+Charging mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH10
Mode 3	CH20
Mode 4	Keeping TX+Charging mode

1.5. List of channels

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	0.110	6	0.135	11	0.160	16	0.185
2	0.115	7	0.140	12	0.165	17	0.190
3	0.120	8	0.145	13	0.170	18	0.195
4	0.125	9	0.150	14	0.175	19	0.200
5	0.130	10	0.155	15	0.180	20	0.205

1.6. Description Of Test Setup



1.7. 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	Nov. 17, 2017	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 17, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 17, 2017	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	Nov. 17, 2017	1 Year
5.	Spectrum Analysis	Agilent	N9038A	MY53227295	Nov. 17, 2017	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	Nov. 17, 2017	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Nov. 17, 2017	1 Year
8.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 20, 2017	1 Year
9.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 20, 2017	1 Year
10.	Loop Antenna	Schwarzbeck	HFH2-Z2	100047	Nov. 17, 2017	1 Year
11.	Horn Antenna	Schwarzbeck	BBHA9170	9170-375	Nov. 17, 2017	1 Year
12.	Pre-amplifier	SONOMA	310N	186860	Nov. 17, 2017	1 Year
13.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
14.	RF Test Control System	YIHENG	YH3000	2017430	Nov. 18, 2017	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN045	Nov. 17, 2017	1 Year
16.	Power Sensor	DAER	RPR3006W	15I00041SN046	Nov. 17, 2017	1 Year
17.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 18, 2017	1 Year
18.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Nov. 18, 2017	1 Year
19.	Signal Generator	Agilent	E4421B	MY41000743	Nov. 18, 2017	1 Year
20.	DC Power Supply	LW	TPR-6410D	349315	Nov. 01, 2017	1 Year
21.	Constant Temperature Humidity Chamber	Sertep	ZJ-HWHS80 B	ZJ-17042804	Nov. 01, 2017	1 Year

1.8. Measurement Uncertainty

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

1.9. Description of Test Facility

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

FCC-Registration No.: 184111

Shenzhen Anbotech 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, July 31, 2017.

ISED-Registration No.: 8058A-1

Shenzhen Anbotech 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-1, June 13, 2016.

Test Location

All Emissions tests were performed at Shenzhen Anbotech Compliance Laboratory Limited. at 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

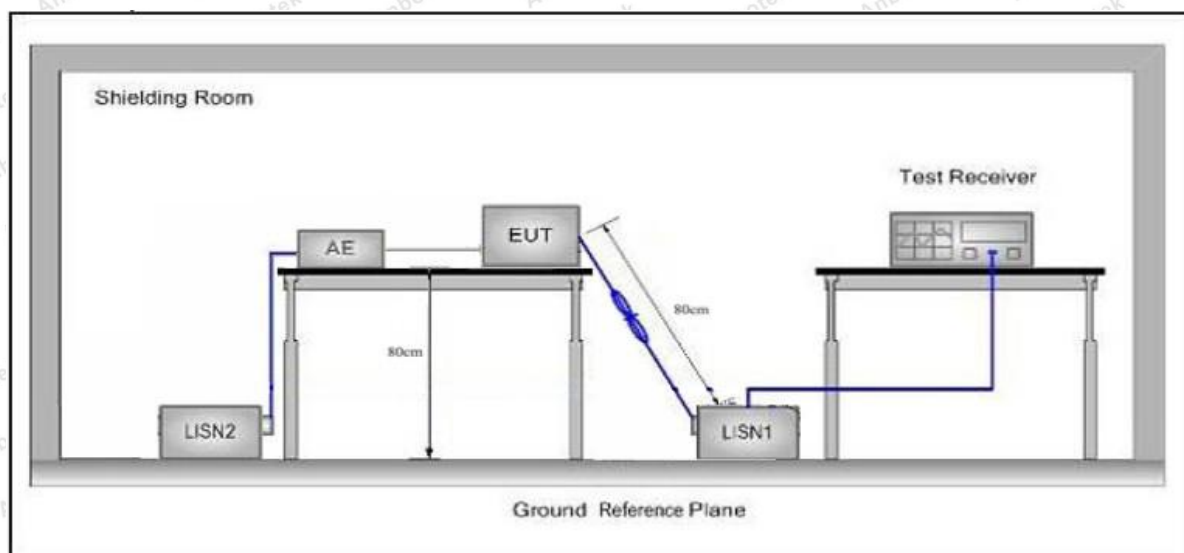
3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50

Remark: (1) *Decreasing linearly with logarithm of the frequency.
(2) The lower limit shall apply at the transition frequency.

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

The EUT is powered by DC 12/24V battery, so there is no need to conduct this test.

4. Radiation Spurious Emission and Band Edge

4.1. 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.

4.2. Test Setup

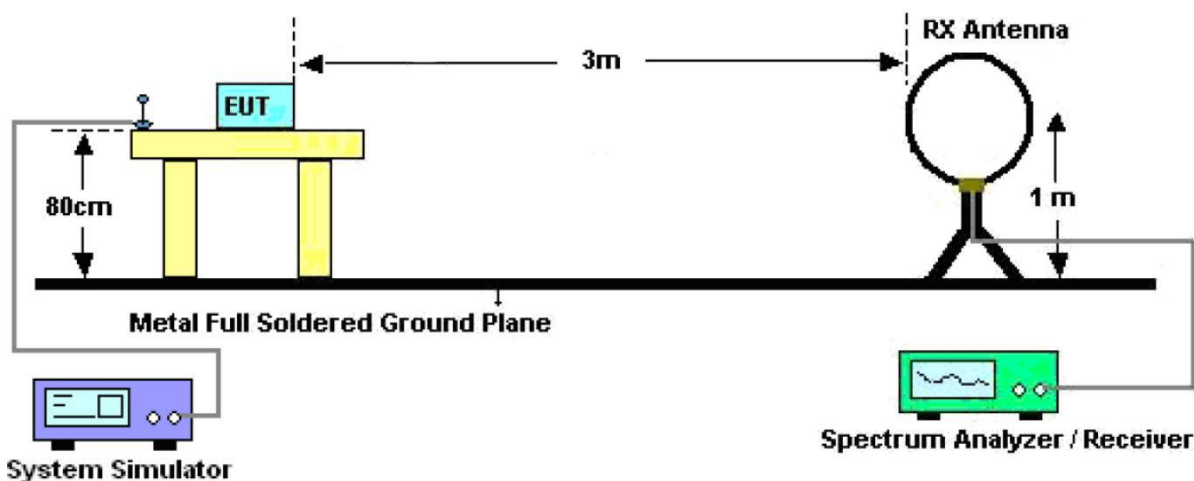


Figure 1. Below 30MHz

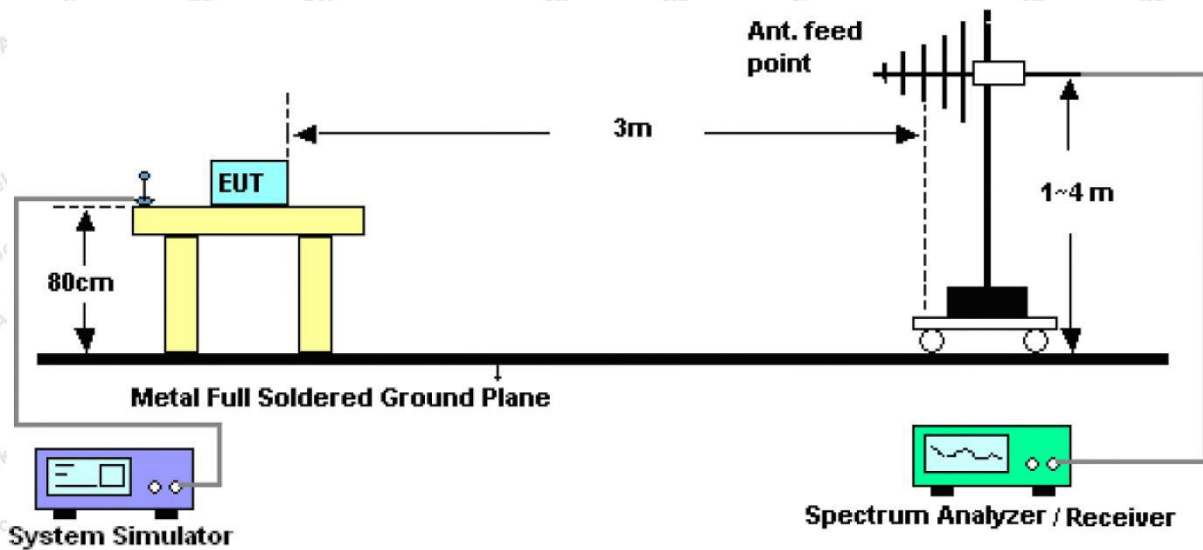


Figure 2. 30MHz to 1GHz

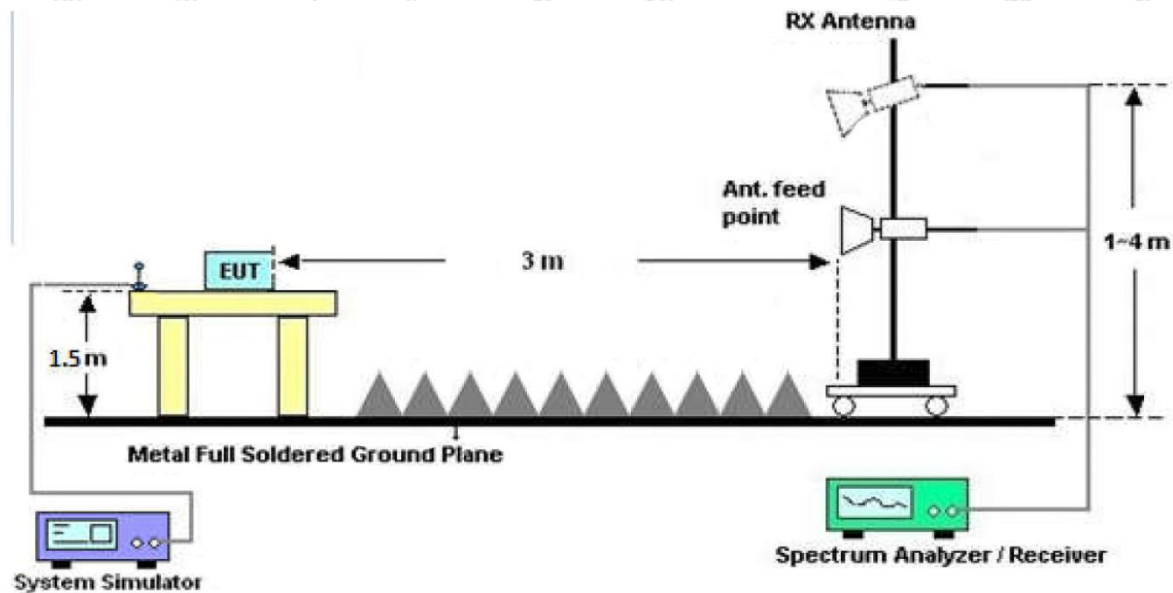


Figure 3. Above 1 GHz

4.3. 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.

4.4. Test Data

PASS

Test Results

(Between 9KHz – 30MHz)

Job No.: SZAWW180517003-01

Standard: FCC PART15 C_3m

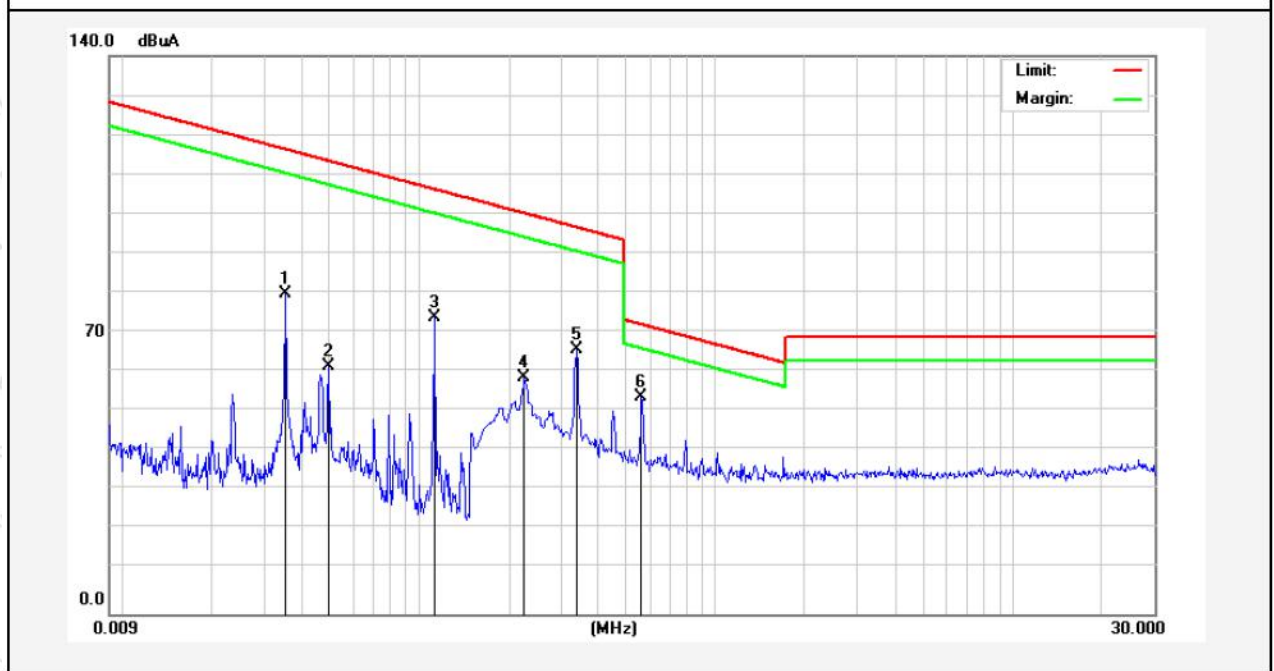
Power Source: DC 12V by battery

Test item: Radiation Test

Temp.(C)/Hum.(%RH): 24.4(C)/50%RH

Test Mode: Mode 4

Distance: 3m

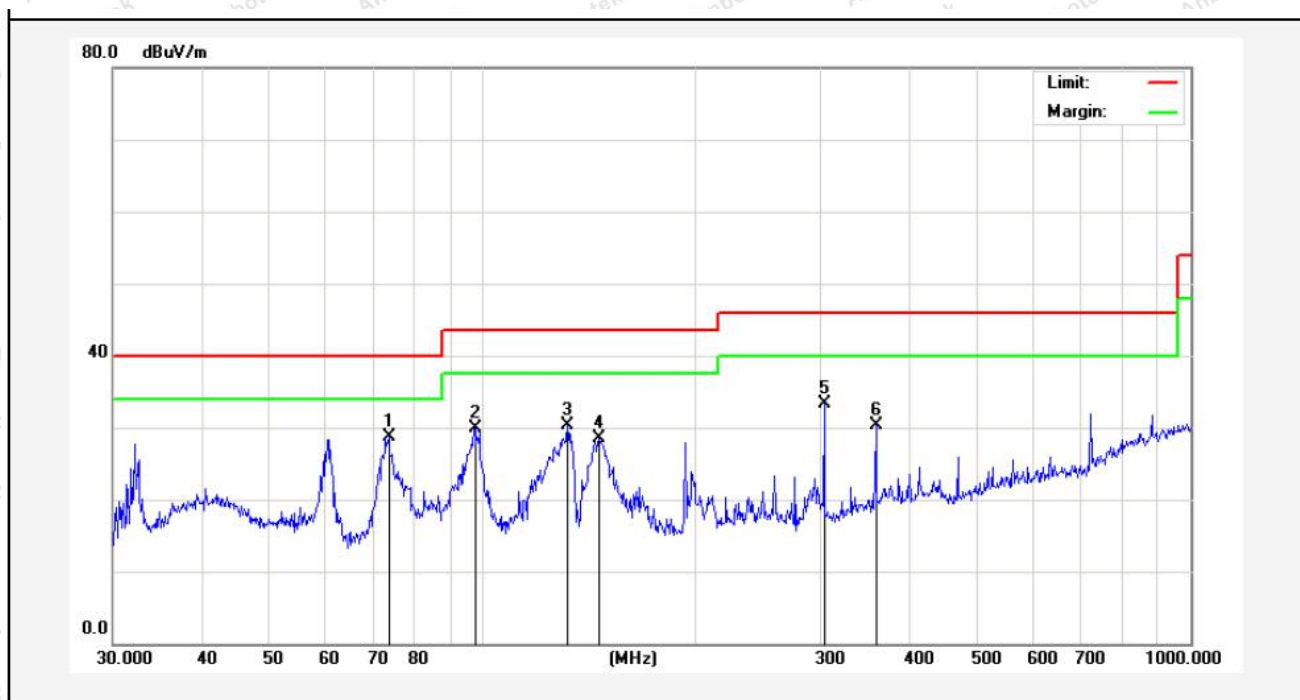


Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	degree (dgc)
0.0355	61.02	19.28	2.53	0	82.83	136.54	-53.71	Peak	10
0.0355	58.66	19.28	2.53	0	80.47	116.54	-36.07	AV	10
0.0495	41.74	19.28	2.53	0	63.55	133.66	-70.11	Peak	41
0.0495	40.36	19.28	2.53	0	62.17	113.66	-51.49	AV	41
0.1127	55.02	19.30	2.54	0	76.86	126.53	-49.67	Peak	114
0.1127	52.68	19.30	2.54	0	74.52	106.53	-32.01	AV	114
0.2260	39.31	19.38	2.55	0	61.24	100.50	-39.26	Peak	98
0.2260	37.50	19.38	2.55	0	59.43	100.50	-41.07	AV	98
0.3379	46.79	19.53	2.59	0	68.91	117.02	-48.11	Peak	321
0.3379	44.07	19.53	2.59	0	66.19	97.02	-30.83	AV	321
0.5620	31.61	20.34	2.60	0	54.55	72.61	-18.06	QP	360

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.

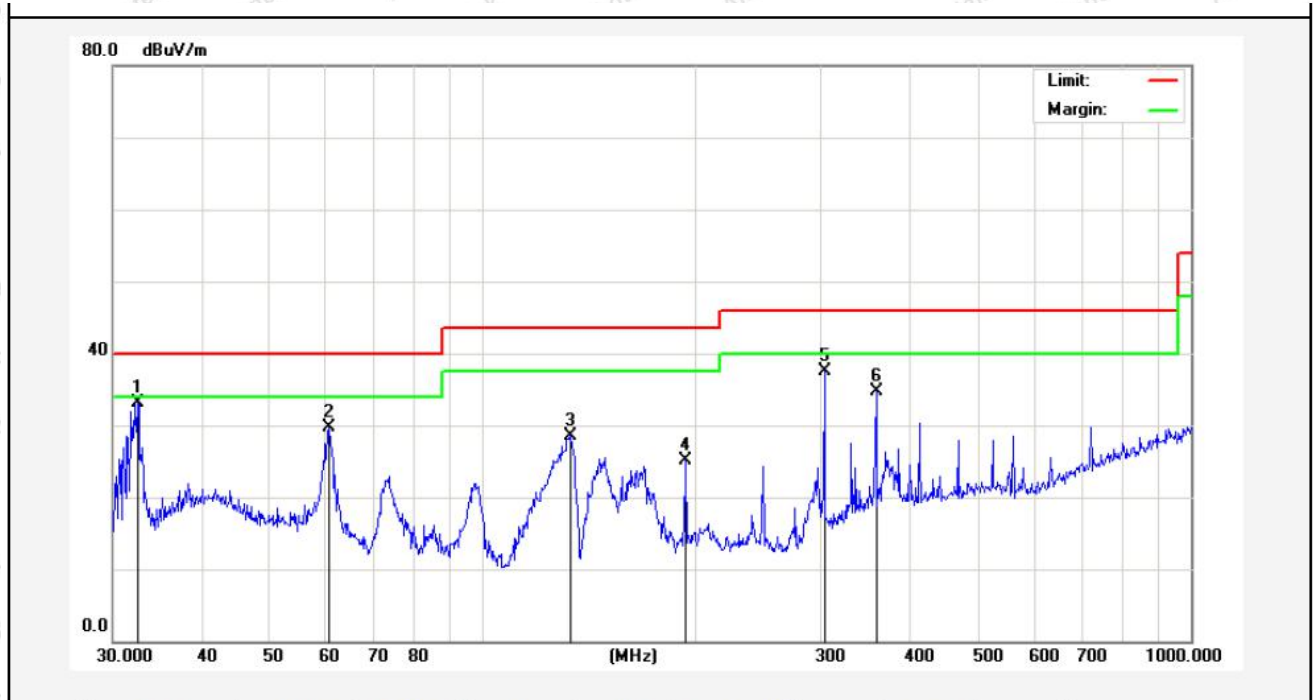
(Between 30MHz –1000 MHz)

Job No.: SZAWW180517003-01 **Polarization:** Horizontal
Standard: FCC PART15 C _3m **Power Source:** DC 12V by battery
Test item: Radiation Test **Temp.(C)/Hum.(%RH):** 24.4(C)/50%RH
Test Mode: Mode 4 **Distance:** 3m



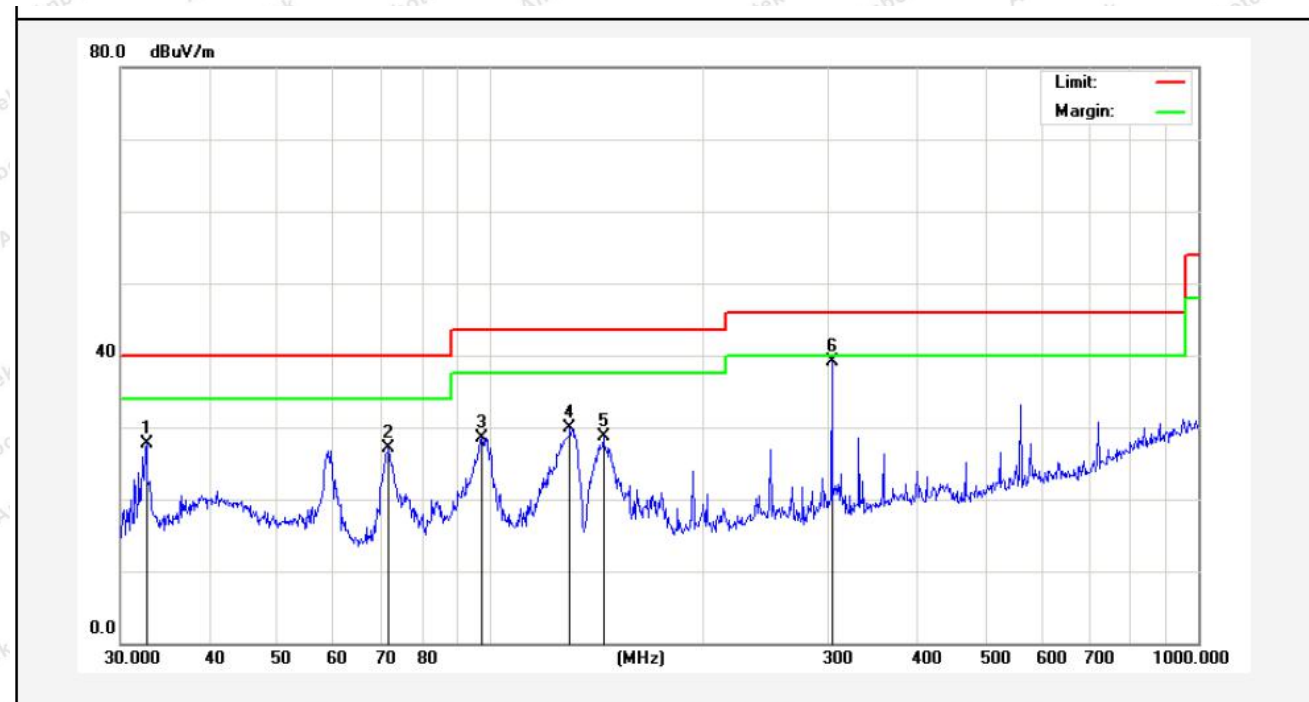
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	73.6170	48.97	-20.32	28.65	40.00	-11.35	QP	300	67	
2	97.4560	50.71	-20.89	29.82	43.50	-13.68	QP	300	89	
3	131.7577	53.24	-22.93	30.31	43.50	-13.19	QP	300	156	
4	145.8611	51.90	-23.40	28.50	43.50	-15.00	QP	300	215	
5	303.5437	50.48	-17.26	33.22	46.00	-12.78	QP	300	266	
6	359.1860	44.05	-13.70	30.35	46.00	-15.65	QP	300	360	

Job No.:	SZAWW180517003-01	Plarization:	Vertical
Standard:	FCC PART15 C_3m	Power Source:	DC 12V by battery
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.4(C)/50%RH
Test Mode:	Mode 4	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	32.5198	48.82	-15.74	33.08	40.00	-6.92	QP	300	63	
2	60.7044	45.45	-15.69	29.76	40.00	-10.24	QP	300	153	
3	133.1511	46.53	-18.02	28.51	43.50	-14.99	QP	300	215	
4	193.0945	41.06	-15.91	25.15	43.50	-18.35	QP	300	242	
5	303.5437	52.08	-14.61	37.47	46.00	-8.53	QP	300	326	
6	359.1860	47.49	-12.70	34.79	46.00	-11.21	QP	300	360	

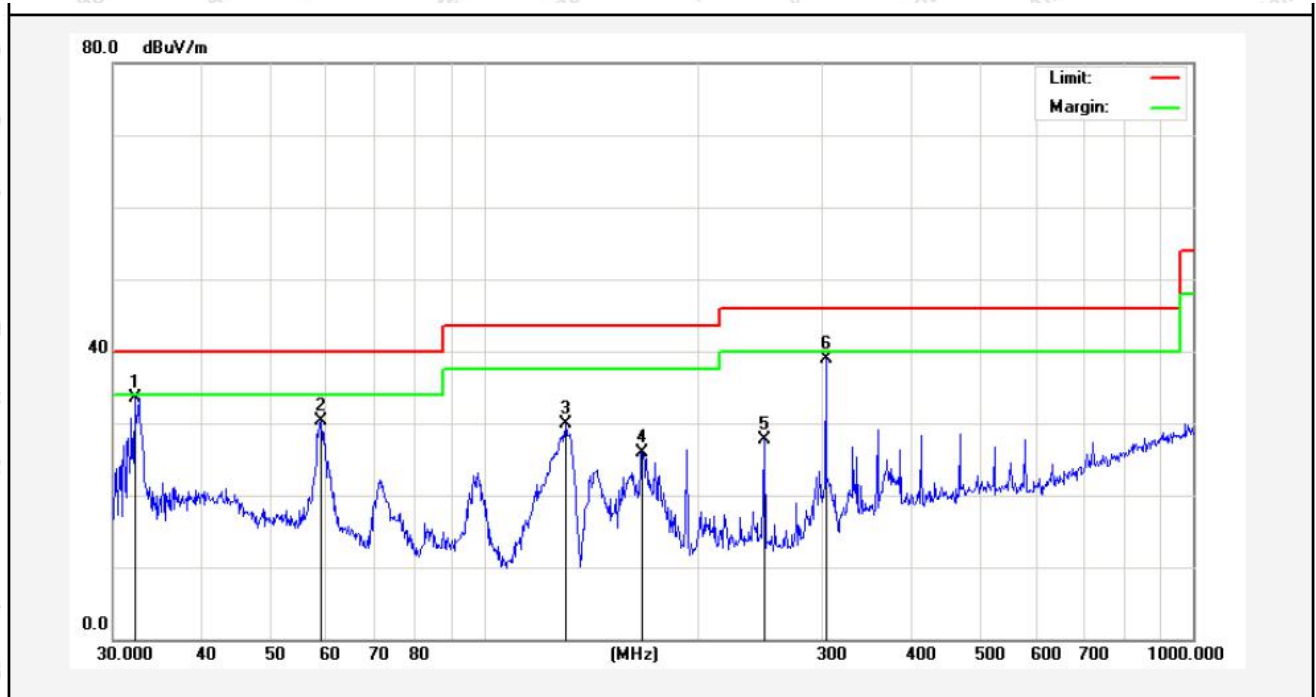
Job No.: SZAWW180517003-01 **Polarization:** Horizontal
Standard: FCC PART15 C _3m **Power Source:** DC 24V by battery
Test item: Radiation Test **Temp.(C)/Hum.(%RH):** 24.4(C)/50%RH
Test Mode: Mode 4 **Distance:** 3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	32.6340	43.44	-15.68	27.76	40.00	-12.24	QP	300	67	
2	71.8320	47.12	-19.98	27.14	40.00	-12.86	QP	300	129	
3	97.1148	49.39	-20.91	28.48	43.50	-15.02	QP	300	258	
4	129.4677	52.69	-22.73	29.96	43.50	-13.54	QP	300	293	
5	144.3348	52.10	-23.43	28.67	43.50	-14.83	QP	300	302	
6	303.5437	56.34	-17.26	39.08	46.00	-6.92	QP	300	360	

Job No.: SZAWW180517003-01
Standard: FCC PART15 C_3m
Test item: Radiation Test
Test Mode: Mode 4

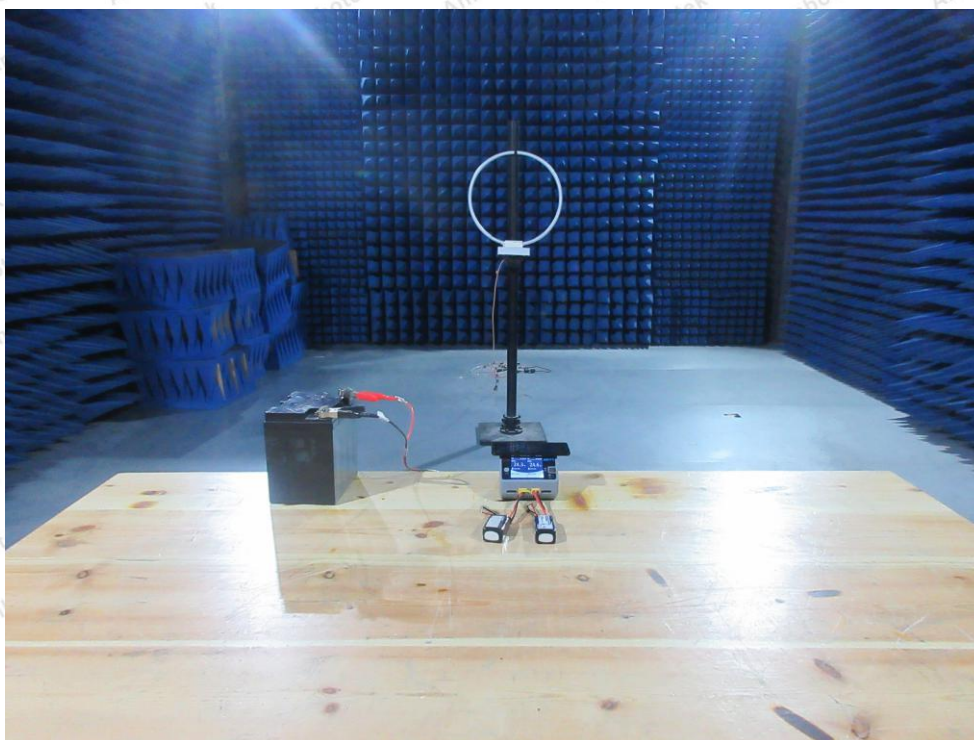
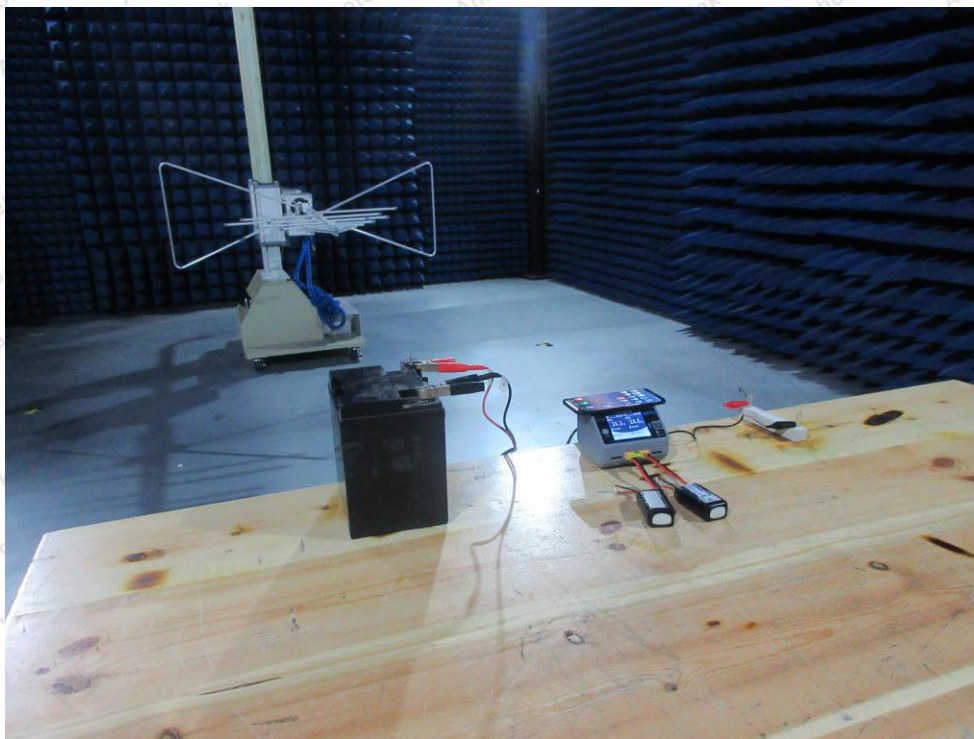
Plarization: Vertical
Power Source: DC 24V by battery
Temp.(C)/Hum.(%RH): 24.4(C)/50%RH
Distance: 3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	32.1795	49.39	-15.90	33.49	40.00	-6.51	QP	300	39	
2	59.0251	45.69	-15.31	30.38	40.00	-9.62	QP	300	76	
3	130.3789	47.68	-17.84	29.84	43.50	-13.66	QP	300	134	
4	167.2368	43.58	-17.64	25.94	43.50	-17.56	QP	300	268	
5	248.5519	41.76	-14.06	27.70	46.00	-18.30	QP	300	319	
6	303.5437	53.47	-14.61	38.86	46.00	-7.14	QP	300	360	

APPENDIX I-- TEST SETUP PHOTOGRAPH

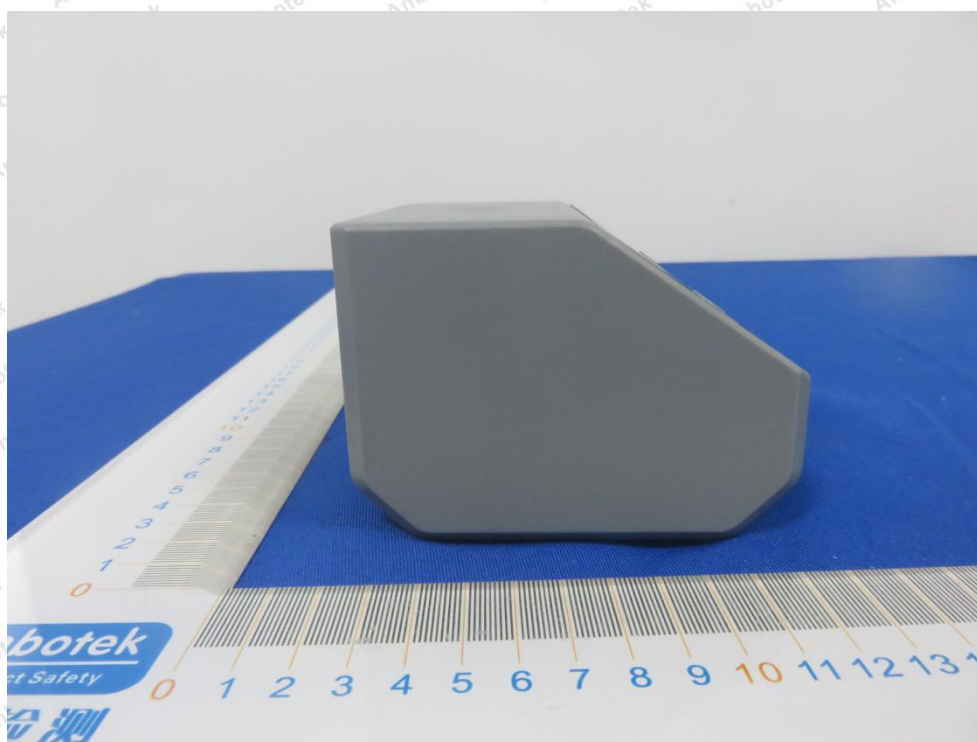
Photo of Radiation Emission Test



APPENDIX II -- EXTERNAL PHOTOGRAPH

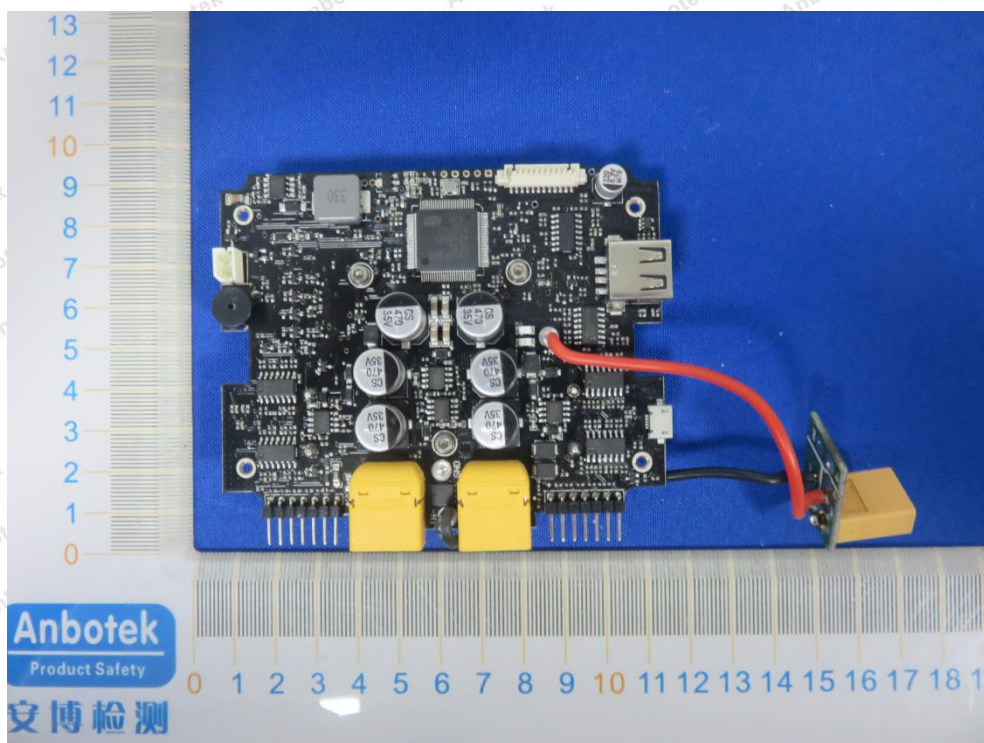
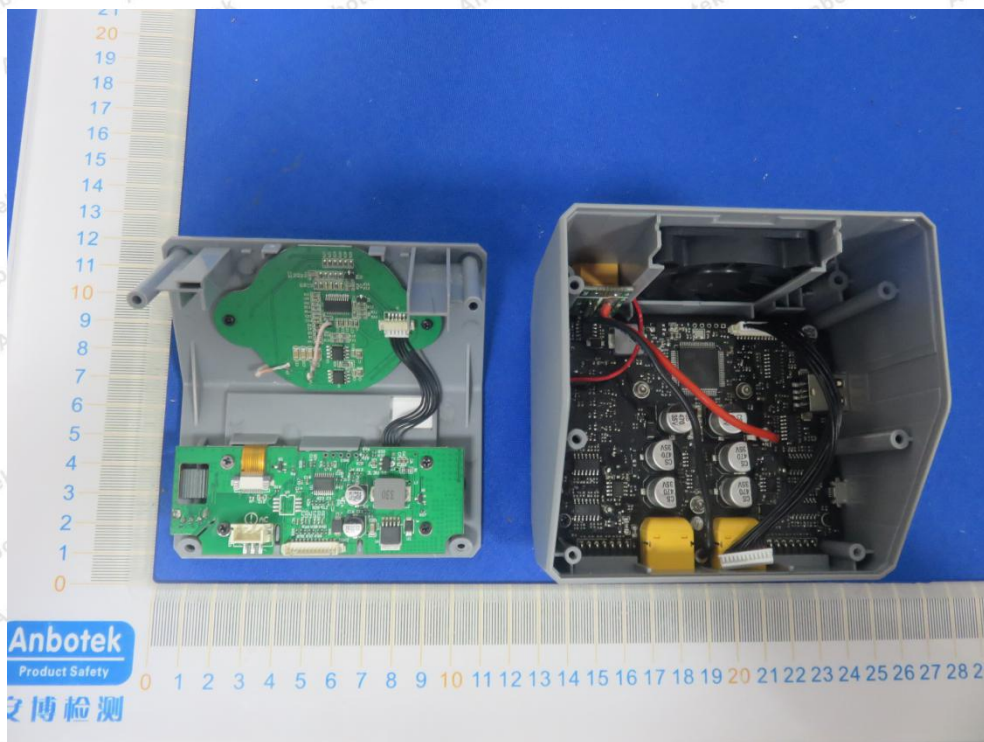


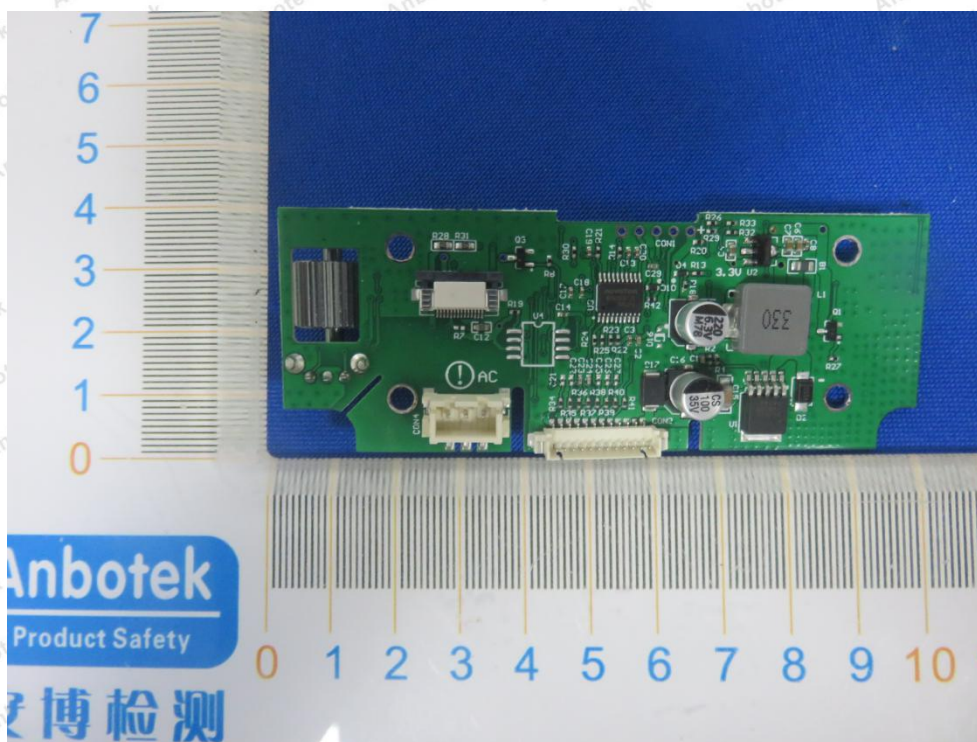
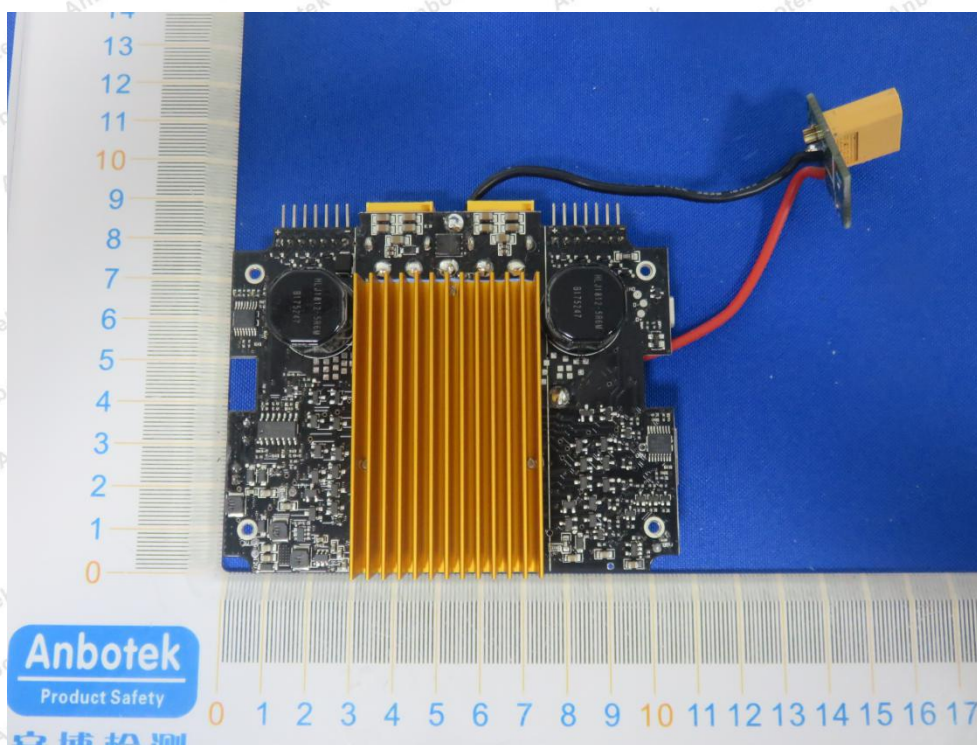


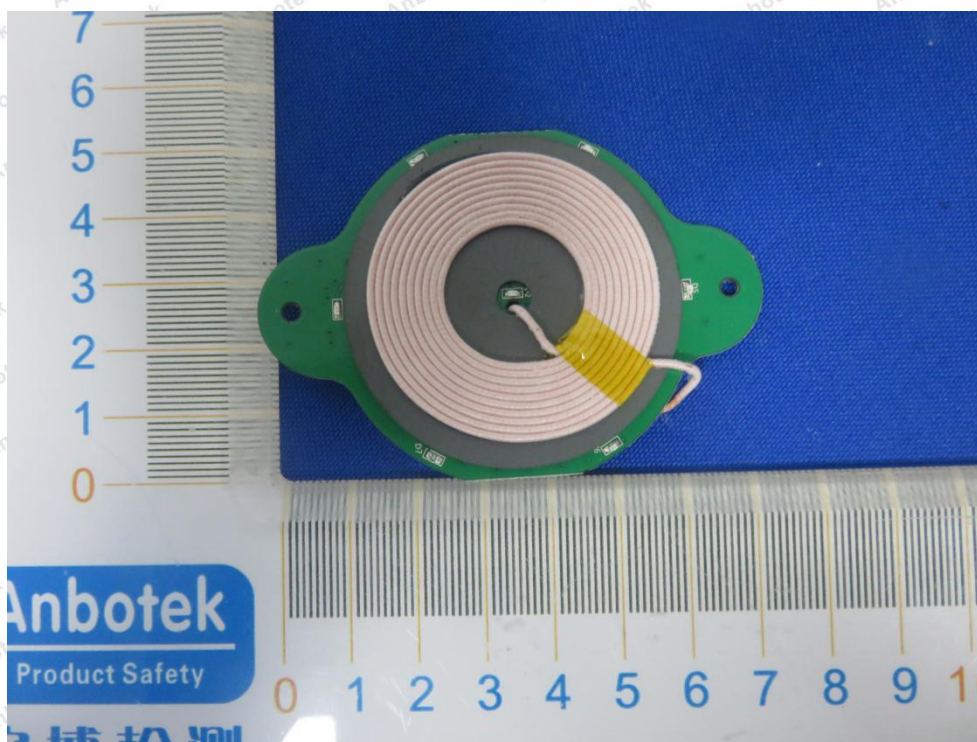
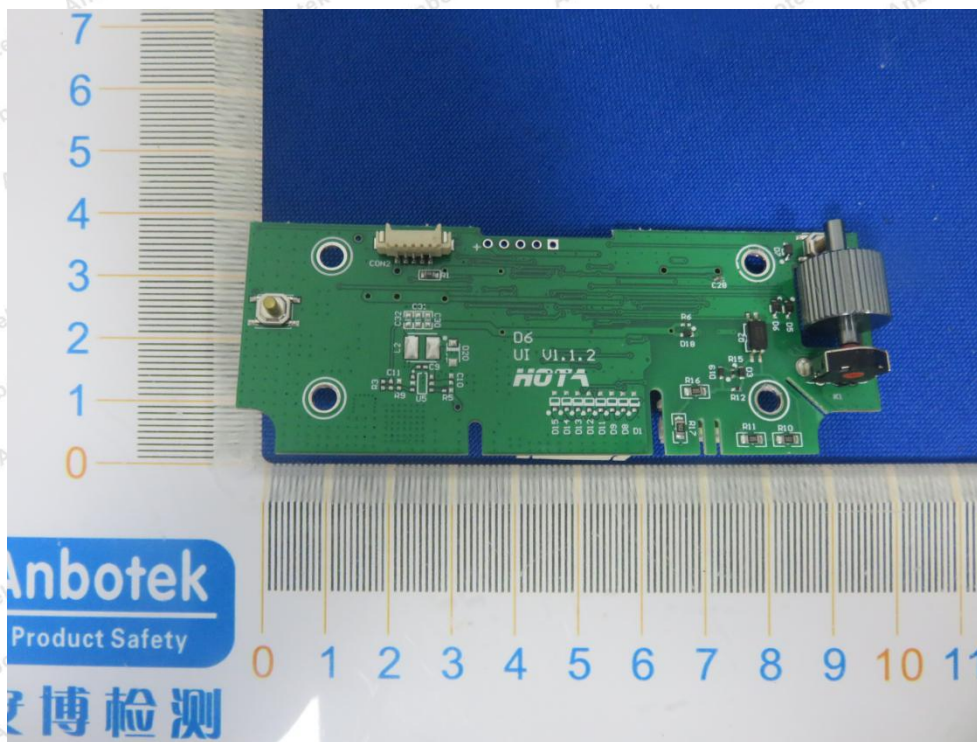


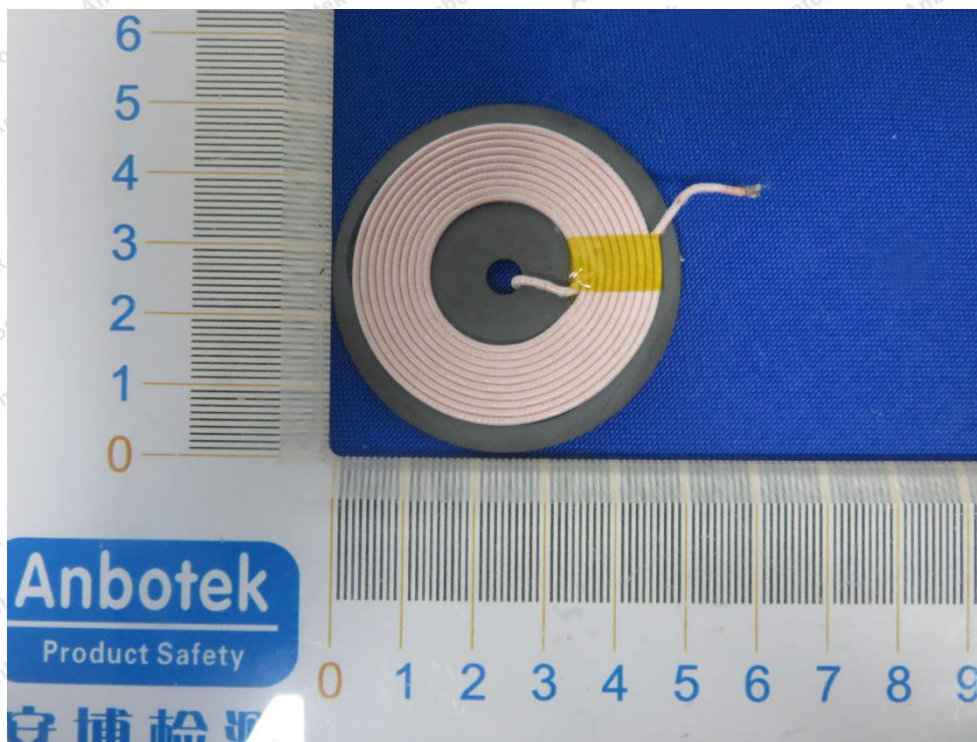
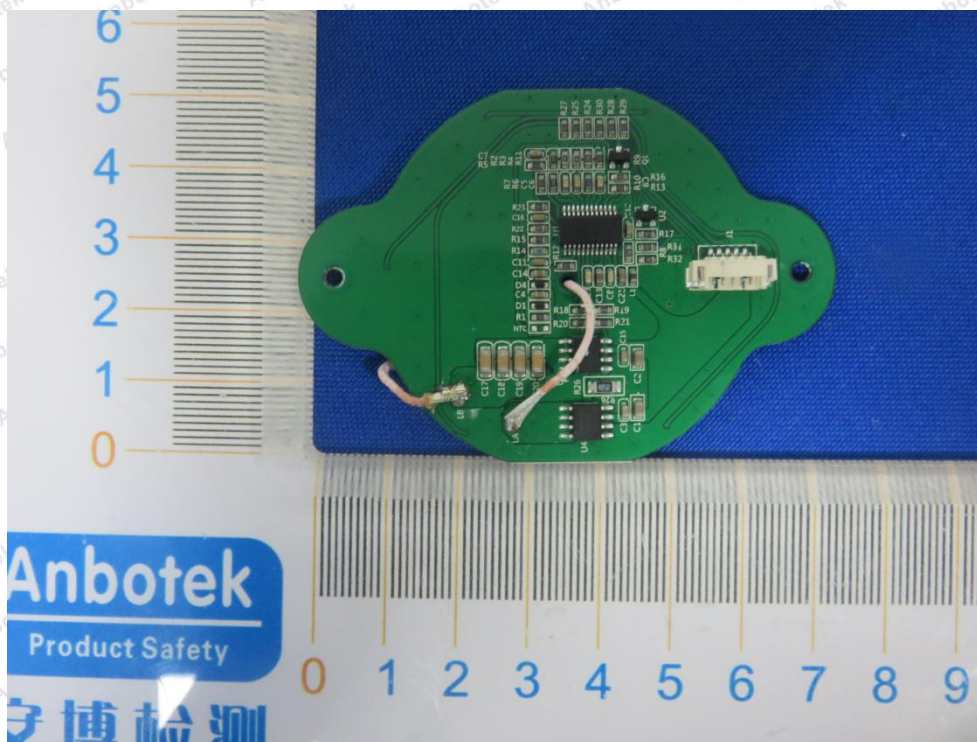


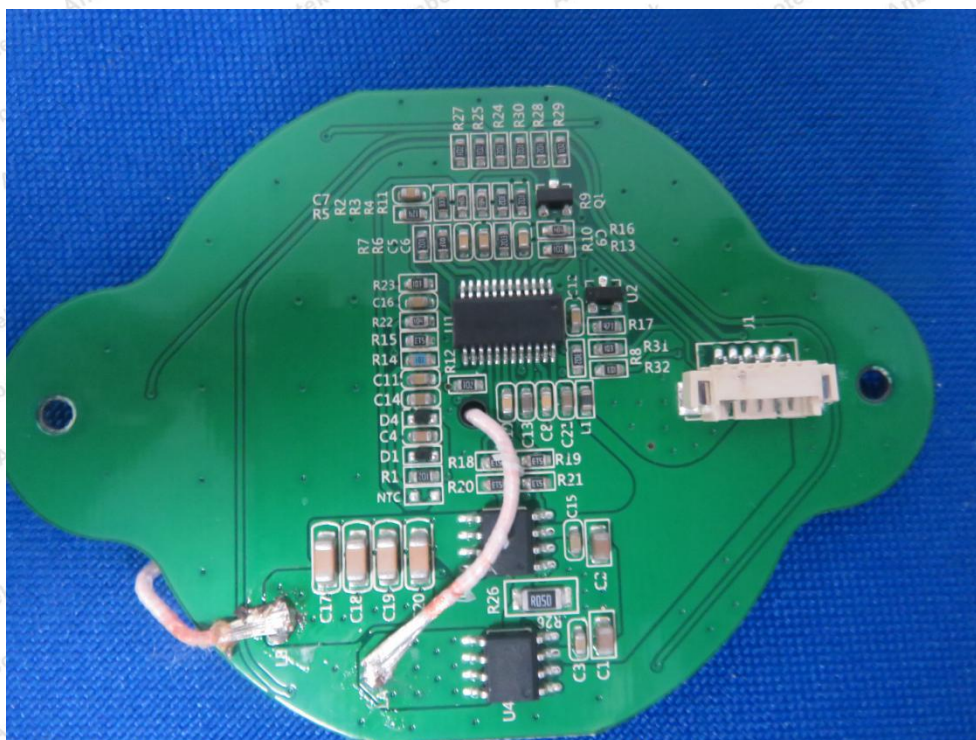
APPENDIX III -- INTERNAL PHOTOGRAPH











End of Report