

TEST REPORT

FCC ID: 2AJN9-UBA12000P

Product: Scorpion Air Pro

Model No.: UBA12000P

Additional Model: N/A

Trade Mark: iWALK

Report No.: TCT190702E020

Issued Date: Jul. 09, 2019

Issued for:

U2O GLOBAL CO., LTD.

Huanzhu Road No.385, 4 Floor, Jimei District, Xiamen, China

Issued By:

Shenzhen Tongce Testing Lab.

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TABLE OF CONTENTS

1. Test Certification..... 3

2. Test Result Summary 4

3. EUT Description..... 5

4. General Information..... 6

 4.1. Test environment and mode..... 6

 4.2. Description of Support Units..... 6

5. Facilities and Accreditations 7

 5.1. Facilities 7

 5.2. Location 7

 5.3. Measurement Uncertainty..... 7

6. Test Results and Measurement Data 8

 6.1. Antenna requirement 8

 6.2. Conducted Emission..... 9

 6.3. Radiated Spurious Emission Measurement..... 13

Appendix A: Photographs of Test Setup

Appendix B: Photographs of EUT

1. Test Certification

Product:	Scorpion Air Pro
Model No.:	UBA12000P
Additional Model No.:	N/A
Trade Mark:	iWALK
Applicant:	U2O GLOBAL CO., LTD.
Address:	Huanzhu Road No.385, 4 Floor, Jimei District, Xiamen, China
Manufacturer:	U2O GLOBAL CO.,LTD.
Address:	Huanzhu Road No.385, 4 Floor, Jimei District, Xiamen, China
Date of Test:	Jul. 03, 2019 - Jul. 08, 2019
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:



Rleo

Date:

Jul. 08, 2019

Reviewed By:



Beryl Zhao

Date:

Jul. 09, 2019

Approved By:



Tomsin

Date:

Jul. 09, 2019

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Spurious Emission	§15.209(a)(f)	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. EUT Description

Product:	Scorpion Air Pro
Model No.:	UBA12000P
Additional Model No.:	N/A
Trade Mark:	iWALK
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	113.94 - 177.88kHz
Modulation Technology:	Load modulation
Antenna Type:	Inductive loop coil Antenna
Power Supply:	Rechargeable Li-ion battery DC 3.7V



4. General Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%) with Fully-charged battery.
<p>The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.</p>	

4.2. Description of Support Units

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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Mobile Phone	SM-G9350	R28HA2ER3GT	/	SAMSUNG
Adapter	EP-TA20CBC	R37HAEY0DT1RT3	/	SAMSUNG
Adapter	HW059200CHQ	K68249FAR13681	/	HUAWEI

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

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

- FCC - Registration No.: 645098

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

5.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$

6. Test Results and Measurement Data

6.1. Antenna requirement

Standard requirement:

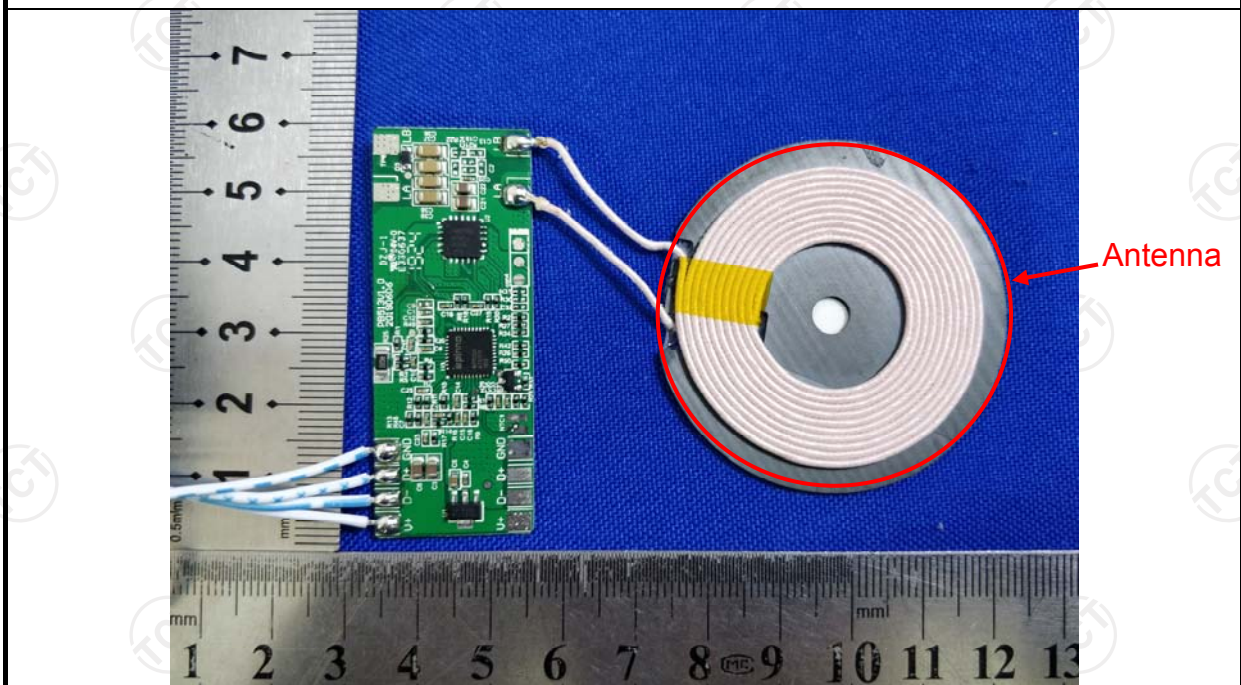
FCC Part15 C Section 15.203

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.

E.U.T Antenna:

The antenna is inductive loop coil antenna which permanently attached.



6.2. Conducted Emission

6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test Setup:	<p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
Test Mode:	Charging + Transmitting Mode														
Test Procedure:	<ol style="list-style-type: none"> 1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 														
Test Result:	PASS														

6.2.2. Test Instruments

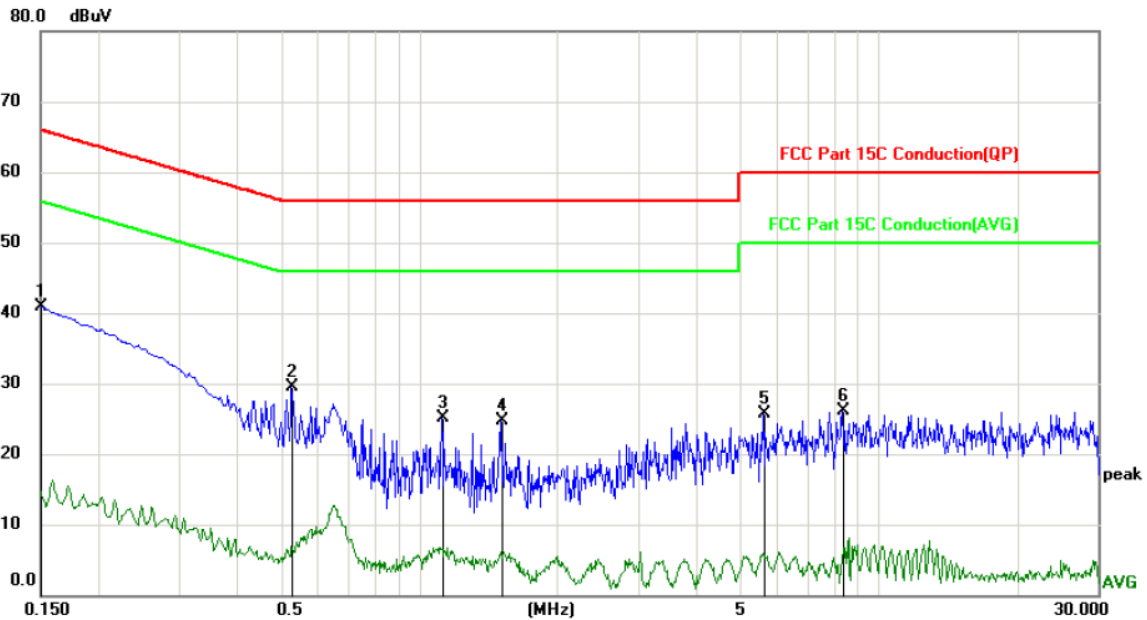
Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	R&S	ESPI	101402	Sep. 17, 2019
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 20, 2019
Coax cable (9KHz-30MHz)	TCT	CE-05	N/A	Sep. 16, 2019
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



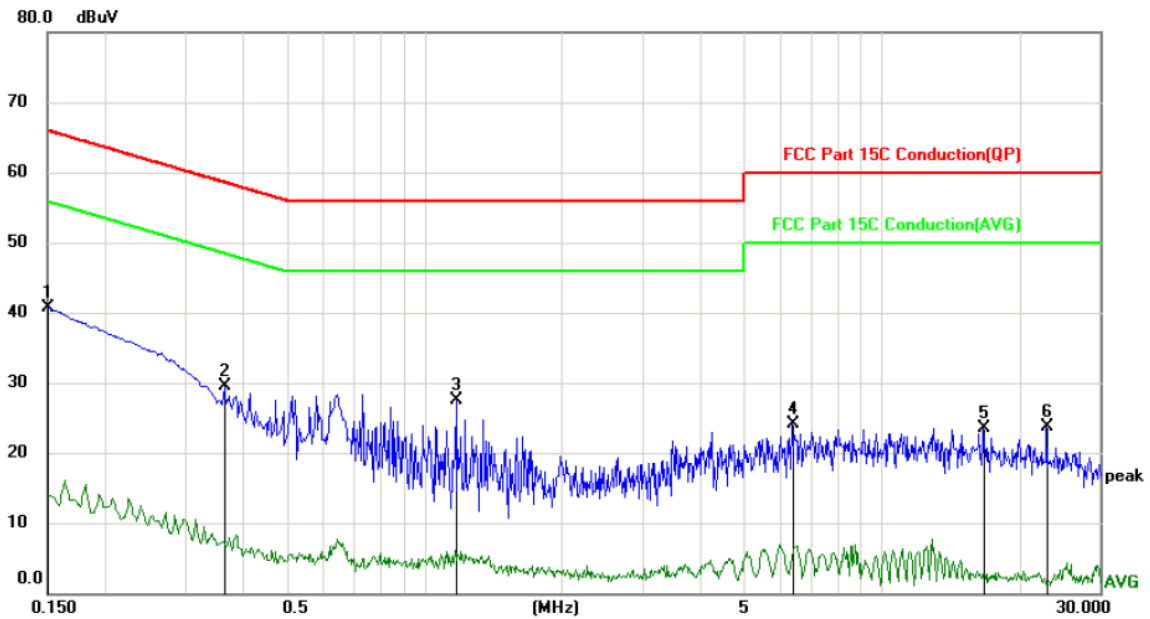
Site: Phase: **L1** Temperature: 25
Limit: FCC Part 15C Conduction(QP) Power: Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1500	30.73	10.23	40.96	66.00	-25.04	peak	
2		0.5280	19.19	10.22	29.41	56.00	-26.59	peak	
3		1.1174	14.74	10.37	25.11	56.00	-30.89	peak	
4		1.5090	14.20	10.41	24.61	56.00	-31.39	peak	
5		5.6220	15.15	10.49	25.64	60.00	-34.36	peak	
6		8.3490	15.64	10.53	26.17	60.00	-33.83	peak	

Note:

- Freq. = Emission frequency in MHz
- Reading level (dBuV) = Receiver reading
- Corr. Factor (dB) = LISN factor + Cable loss
- Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)
- Limit (dBuV) = Limit stated in standard
- Margin (dB) = Measurement (dBuV) – Limits (dBuV)
- Q.P. =Quasi-Peak
- AVG =average
- * is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site: _____ Phase: **N** Temperature: 25
Limit: FCC Part 15C Conduction(QP) Power: _____ Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	30.52	10.23	40.75	66.00	-25.25	peak	
2		0.3660	19.24	10.22	29.46	58.59	-29.13	peak	
3		1.1760	17.20	10.38	27.58	56.00	-28.42	peak	
4		6.3825	13.68	10.50	24.18	60.00	-35.82	peak	
5		16.6920	12.63	10.88	23.51	60.00	-36.49	peak	
6		22.9335	12.59	11.10	23.69	60.00	-36.31	peak	

Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

Margin (dB) = Measurement (dBuV) – Limits (dBuV)

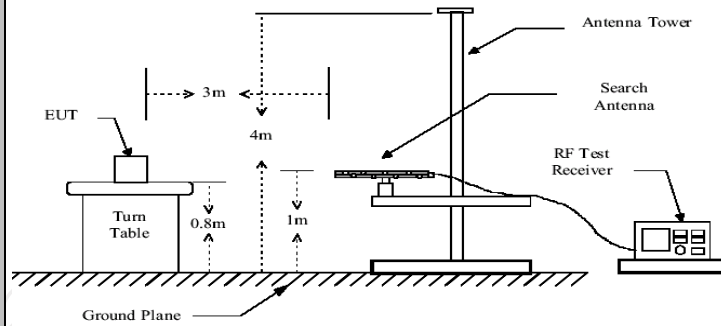
Q.P. =Quasi-Peak AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

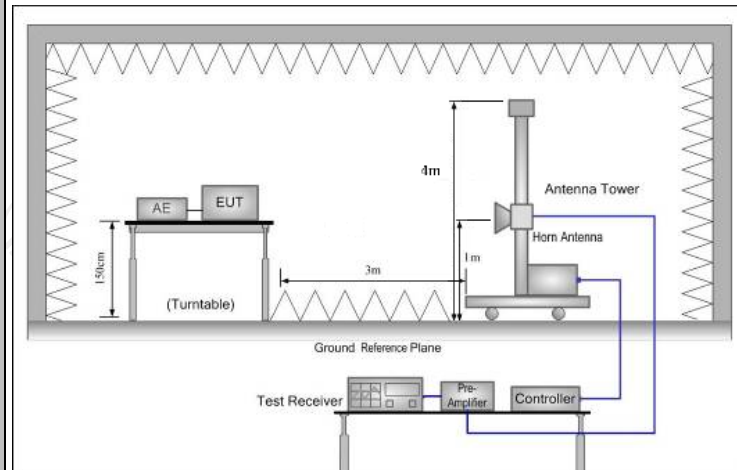
6.3. Radiated Spurious Emission Measurement

6.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10: 2013				
Frequency Range:	9 kHz to 25 GHz				
Measurement Distance:	3 m				
Antenna Polarization:	Horizontal & Vertical				
Operation mode:	Refer to item 4.1				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
Limit:	Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)		
	0.009-0.490	2400/F(KHz)	300		
	0.490-1.705	24000/F(KHz)	30		
	1.705-30	30	30		
	30-88	100	3		
	88-216	150	3		
	216-960	200	3		
	Above 960	500	3		
Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)	Detector		
Above 1GHz	500	3	Average		
	5000	3	Peak		
Test setup:	For radiated emissions below 30MHz				
	<p>Distance = 3m</p> <p>0.8m</p> <p>Turn table</p> <p>1m</p> <p>Ground Plane</p> <p>Computer</p> <p>Pre -Amplifier</p> <p>Receiver</p>				
	30MHz to 1GHz				



Above 1GHz



Test Procedure:

1. For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.

For the radiated emission test above 1GHz:
Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be

	<p>restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.</p> <p>2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</p> <p>3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.</p> <p>4. Use the following spectrum analyzer settings:</p> <p>(1) Span shall wide enough to fully capture the emission being measured;</p> <p>(2) Set RBW=120 kHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;</p> <p>(3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.</p> <p>For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</p>
Test mode:	Refer to section 4.1 for details
Test results:	PASS

6.3.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	ROHDE&SCHW ARZ	ESIB7	100197	Sep. 17, 2019
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ40	200061	Sep. 20, 2019
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 16, 2019
Pre-amplifier	HP	8447D	2727A05017	Sep. 16, 2019
Loop antenna	ZHINAN	ZN30900A	12024	Oct. 20, 2019
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 02, 2019
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Oct. 20, 2019
Antenna Mast	Keleto	RE-AM	N/A	N/A
Coax cable (9KHz-1GHz)	TCT	RE-low-01	N/A	Sep. 16, 2019
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 16, 2019
Coax cable (9KHz-1GHz)	TCT	RE-low-03	N/A	Sep. 16, 2019
Coax cable (9KHz-40GHz)	TCT	RE-high-04	N/A	Sep. 16, 2019
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

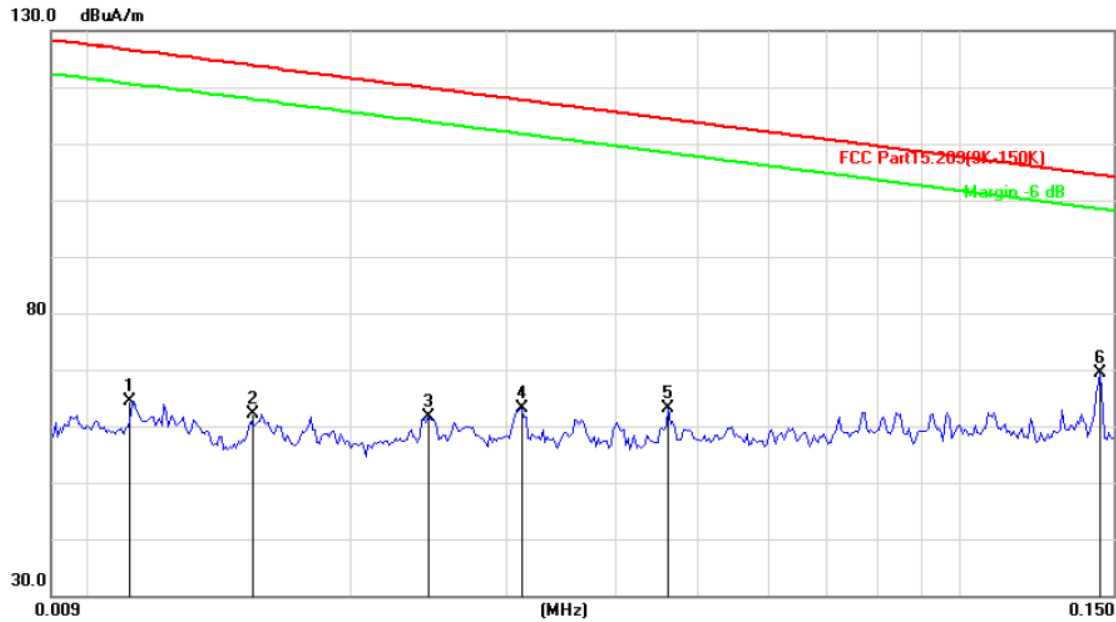
Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.3.3. Test Data

Please refer to following diagram for individual

9KHz-30MHz

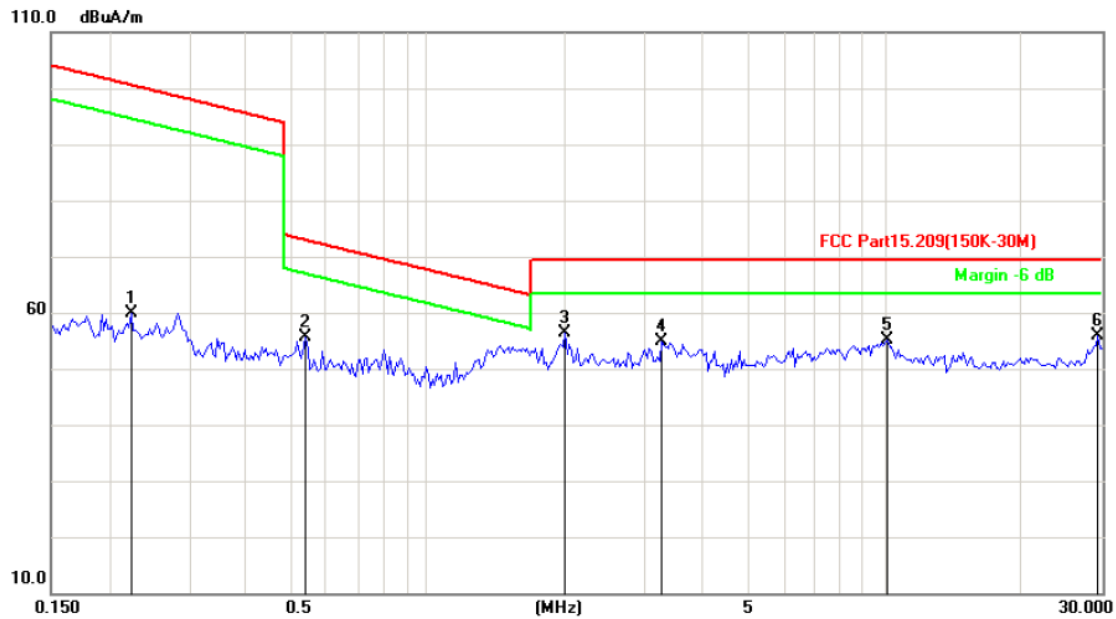
9KHz-150KHz:



Site: Polarization: *Horizontal* Temperature: 25
Limit: FCC Part15.209(9K-150K) Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuA	Correct Factor dB	Measure- ment dBuA/m	Limit dB/m	Over dB	Detector
1		0.0111	41.11	23.26	64.37	126.6	-62.32	peak
2		0.0154	41.05	20.98	62.03	123.8	-61.82	peak
3		0.0244	42.76	18.83	61.59	119.8	-58.27	peak
4		0.0313	43.84	19.29	63.13	117.7	-54.57	peak
5		0.0461	42.73	20.29	63.02	114.3	-51.32	peak
6	*	0.1449	43.23	26.13	69.36	104.4	-35.04	peak

150KHz-30MHz:

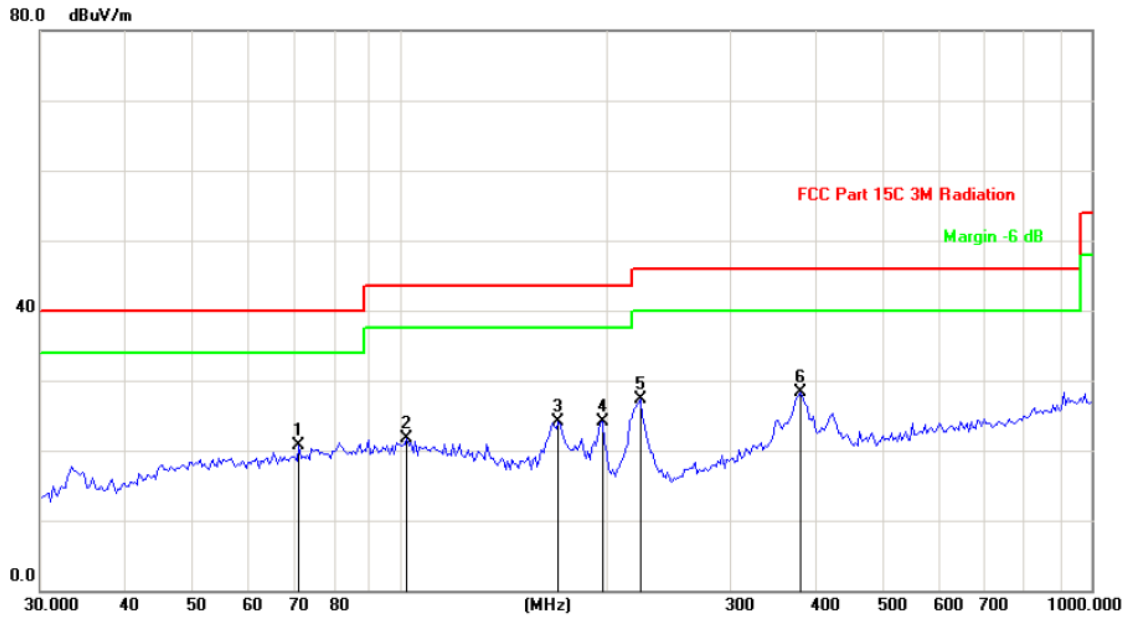


Site: Polarization: *Horizontal* Temperature: 25
 Limit: FCC Part15.209(150K-30M) Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuA	Correct Factor dB	Measure- ment dBuA/m	Limit dB/m	Over dB	Detector
1		0.2245	33.97	25.93	59.90	100.5	-40.69	peak
2		0.5421	30.09	25.44	55.53	72.92	-17.39	peak
3	*	2.0009	31.12	25.16	56.28	69.50	-13.22	peak
4		3.2610	29.87	25.08	54.95	69.50	-14.55	peak
5		10.1570	28.52	26.56	55.08	69.50	-14.42	peak
6		29.3689	31.04	24.79	55.83	69.50	-13.67	peak

30MHz-1GHz

Horizontal:

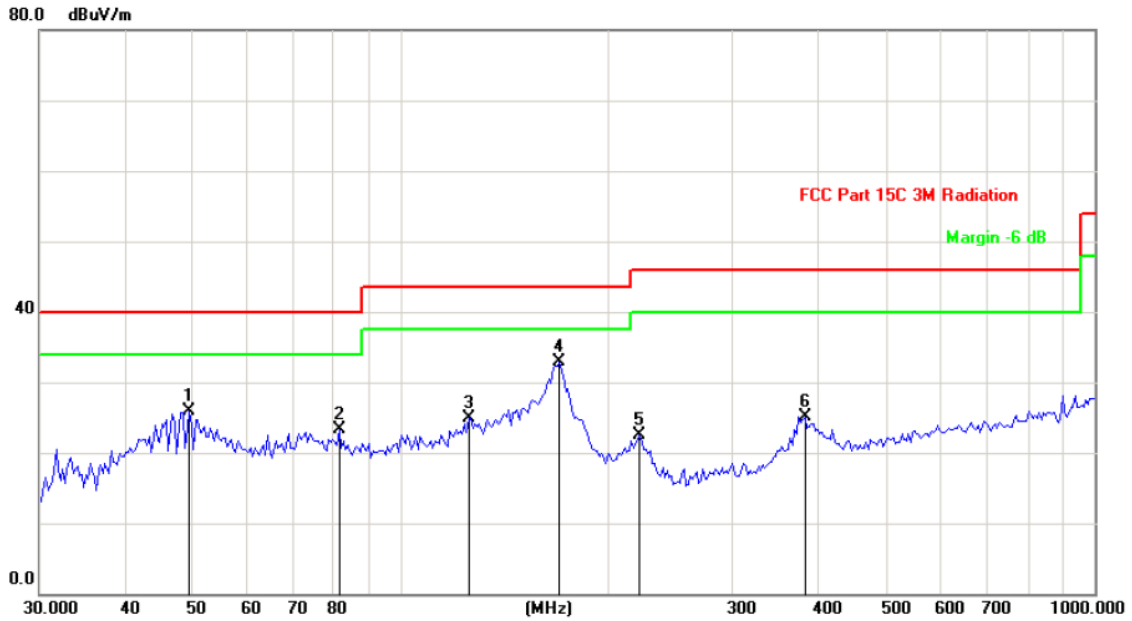


Site: Polarization: *Horizontal* Temperature: 25
Limit: FCC Part 15C 3M Radiation Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		71.2033	36.37	-15.76	20.61	40.00	-19.39	peak
2		101.8932	29.86	-8.17	21.69	43.50	-21.81	peak
3		168.9970	39.59	-15.41	24.18	43.50	-19.32	peak
4		195.8701	38.35	-14.19	24.16	43.50	-19.34	peak
5		222.2807	40.61	-13.37	27.24	46.00	-18.76	peak
6	*	379.1780	37.50	-9.25	28.25	46.00	-17.75	peak



Vertical:



Site: Polarization: **Vertical** Temperature: 25
 Limit: FCC Part 15C 3M Radiation Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		49.4087	35.88	-10.07	25.81	40.00	-14.19	peak
2		81.3740	39.12	-15.84	23.28	40.00	-16.72	peak
3		124.9249	38.42	-13.45	24.97	43.50	-18.53	peak
4	*	168.9970	48.36	-15.41	32.95	43.50	-10.55	peak
5		220.7241	36.00	-13.41	22.59	46.00	-23.41	peak
6		381.8520	34.31	-9.21	25.10	46.00	-20.90	peak

Note:

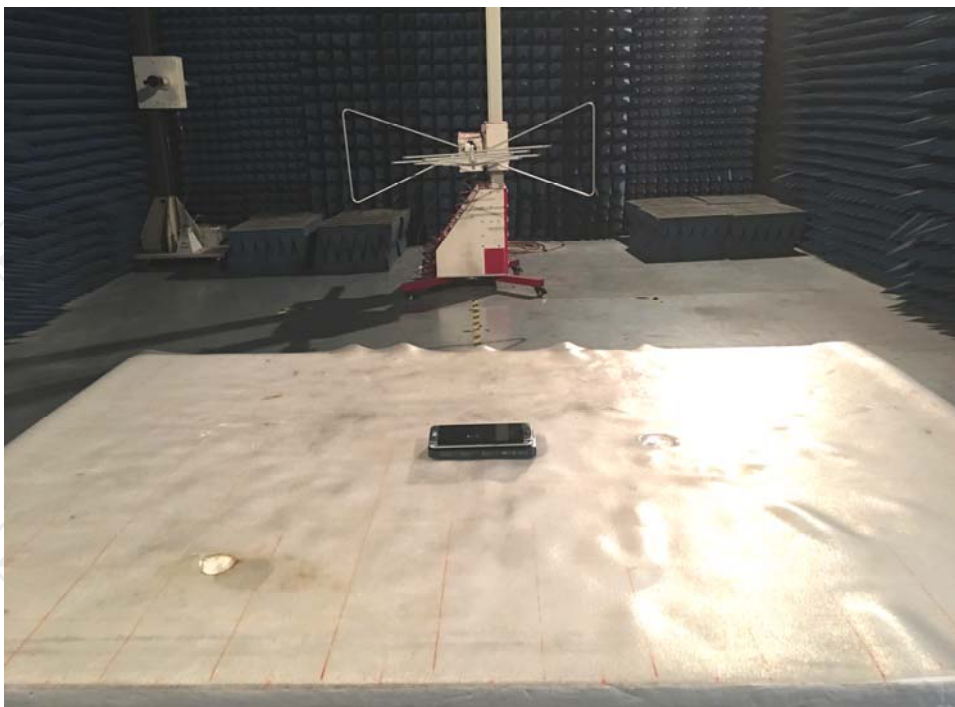
Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

Appendix A: Photographs of Test Setup

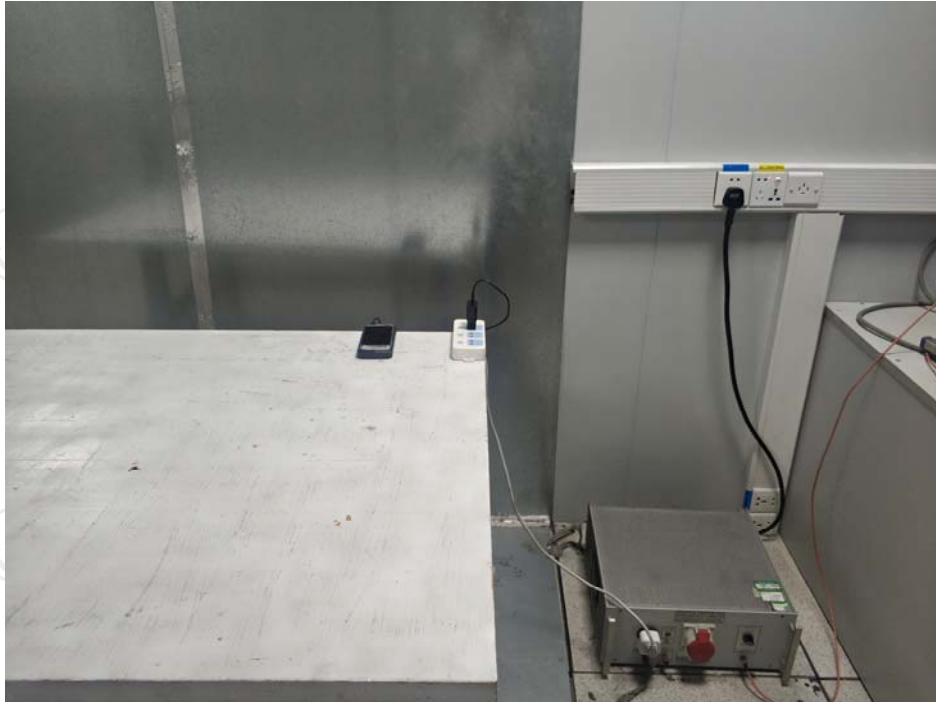
Product: Scorpion Air Pro

Model: UBA12000P

Radiated Emission



Conducted Emission



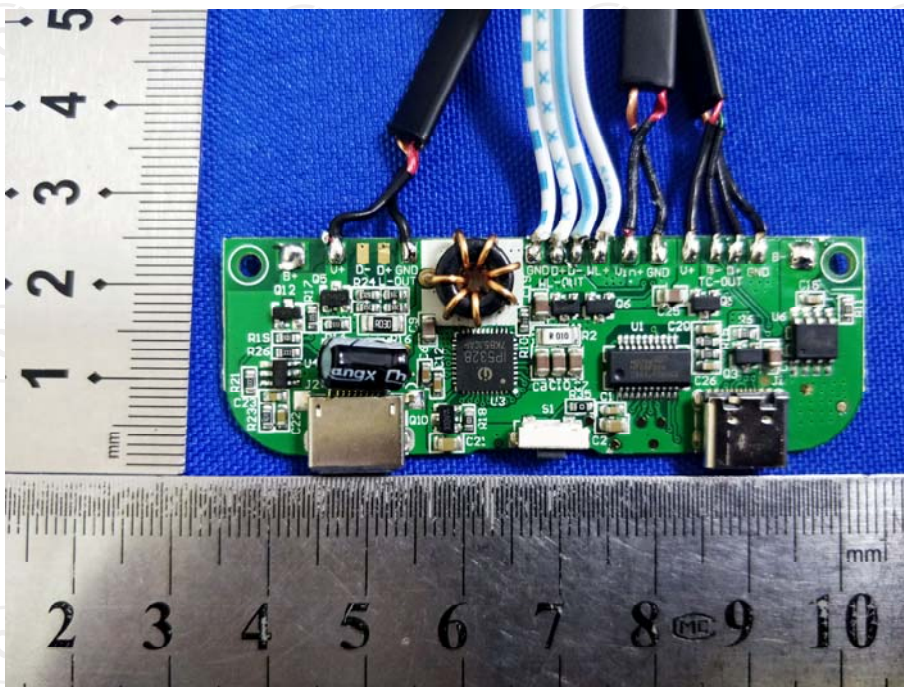
Appendix B: Photographs of EUT
Product: Scorpion Air Pro
Model: UBA12000P
External Photos

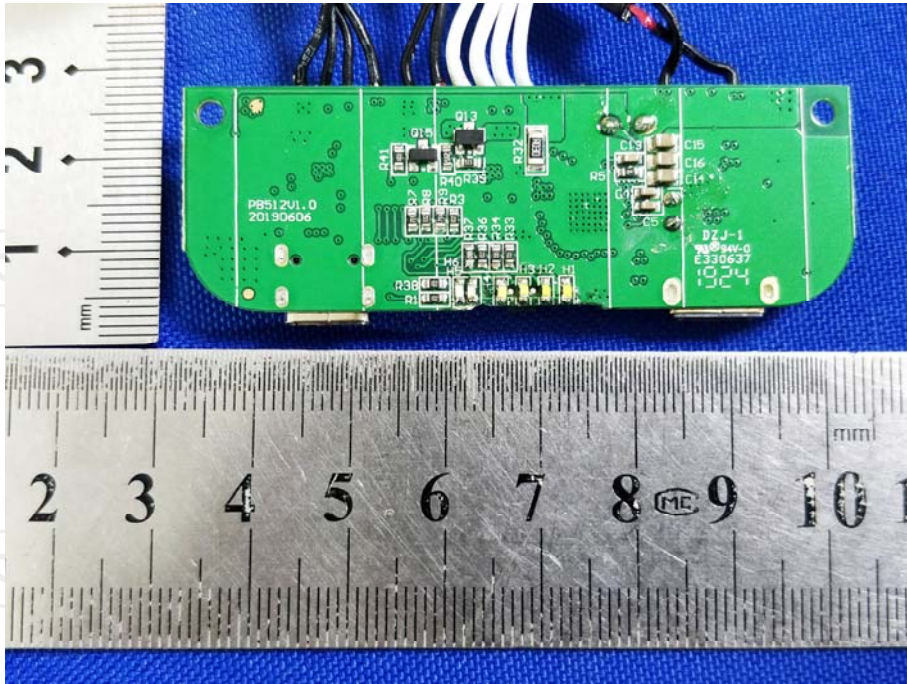


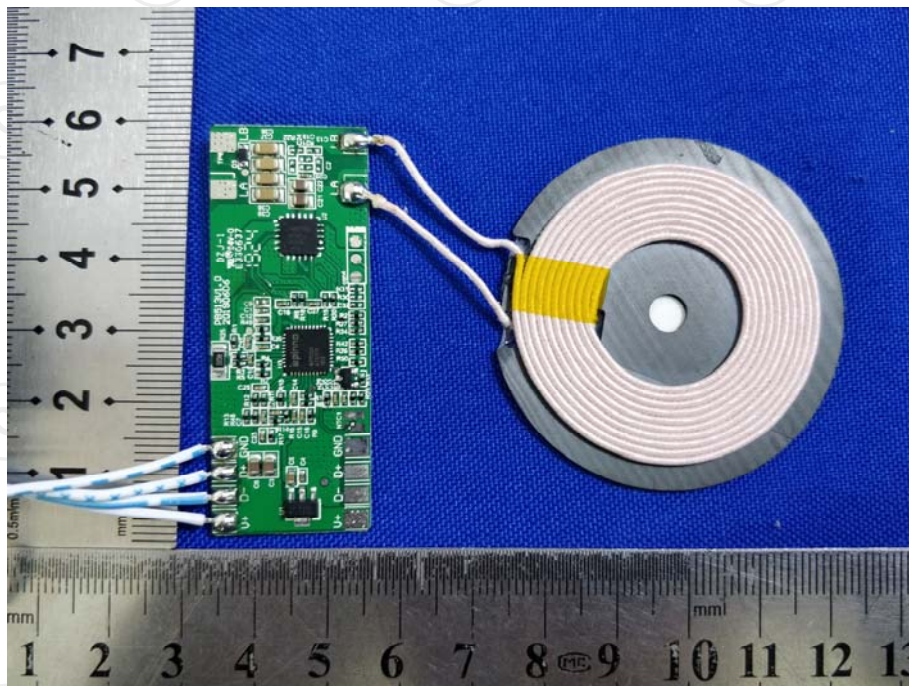
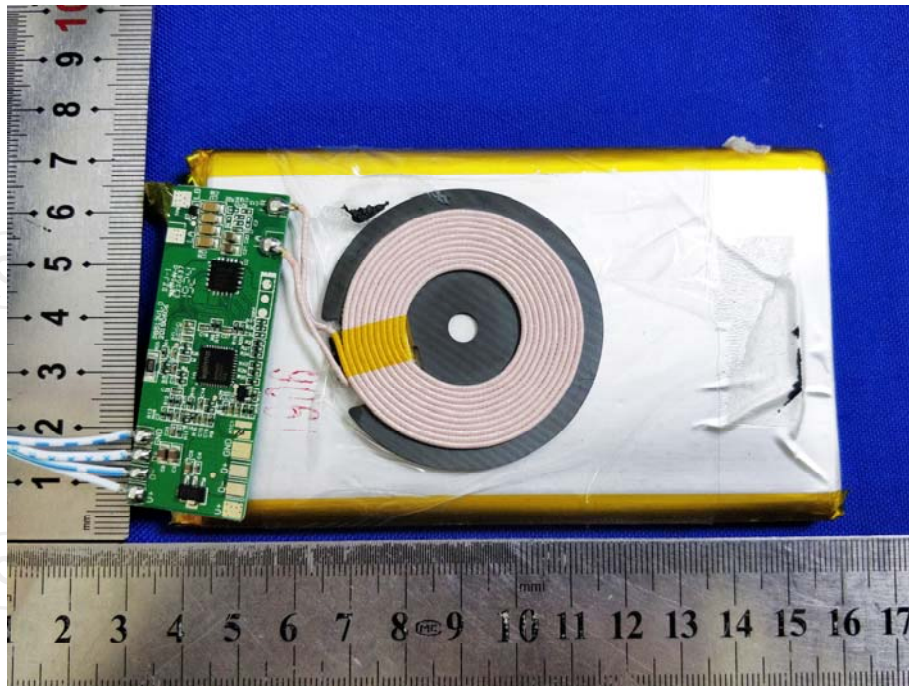


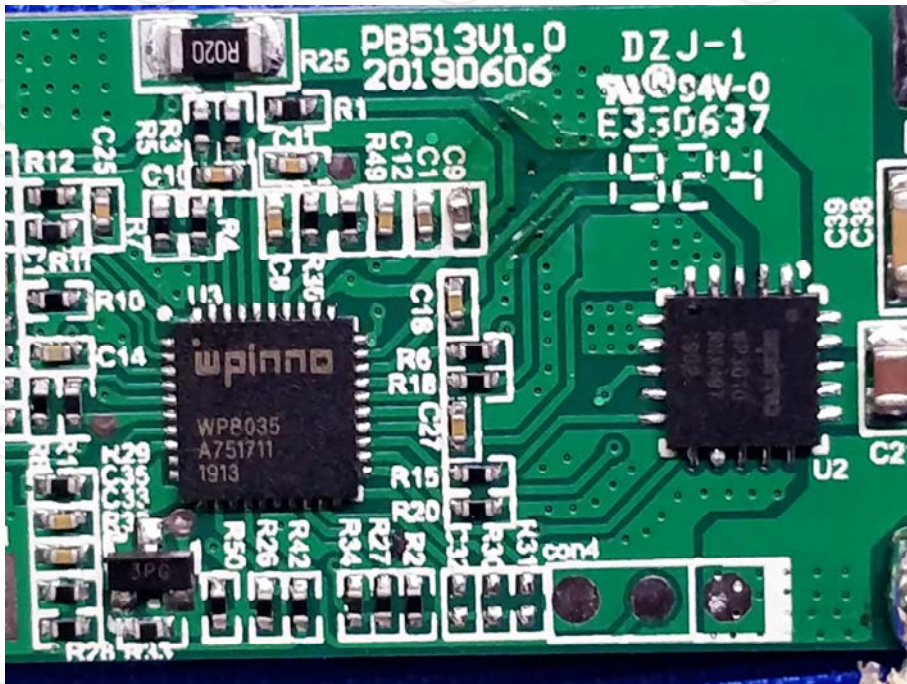
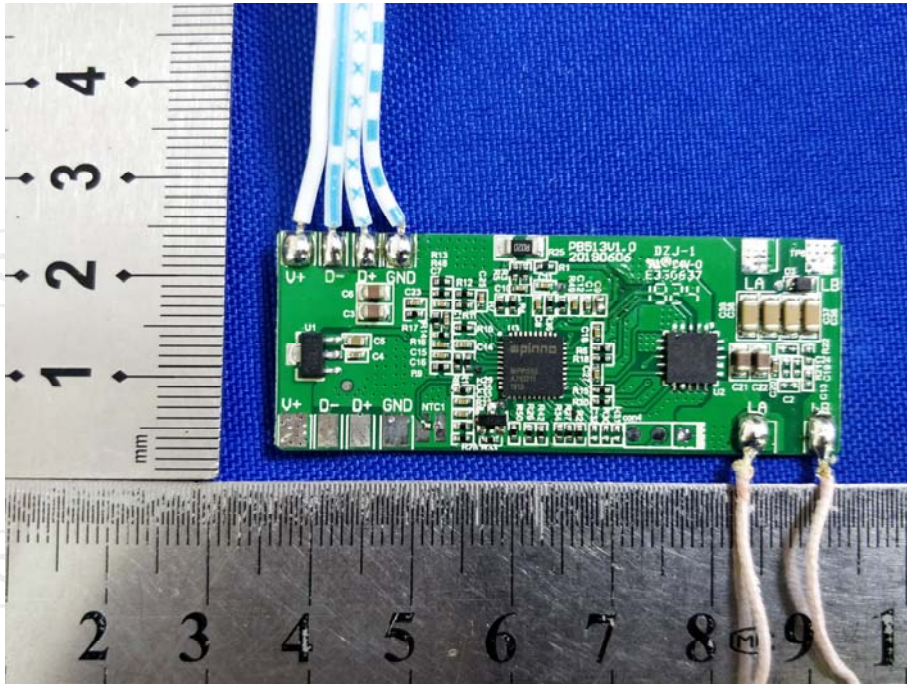


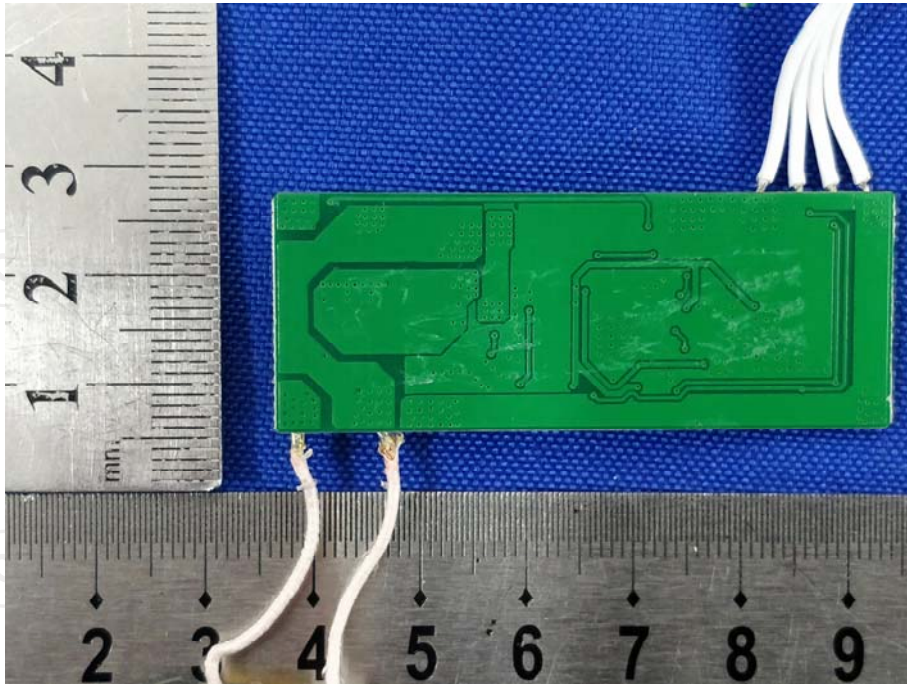
Product: Scorpion Air Pro
Model: UBA12000P
Internal Photos

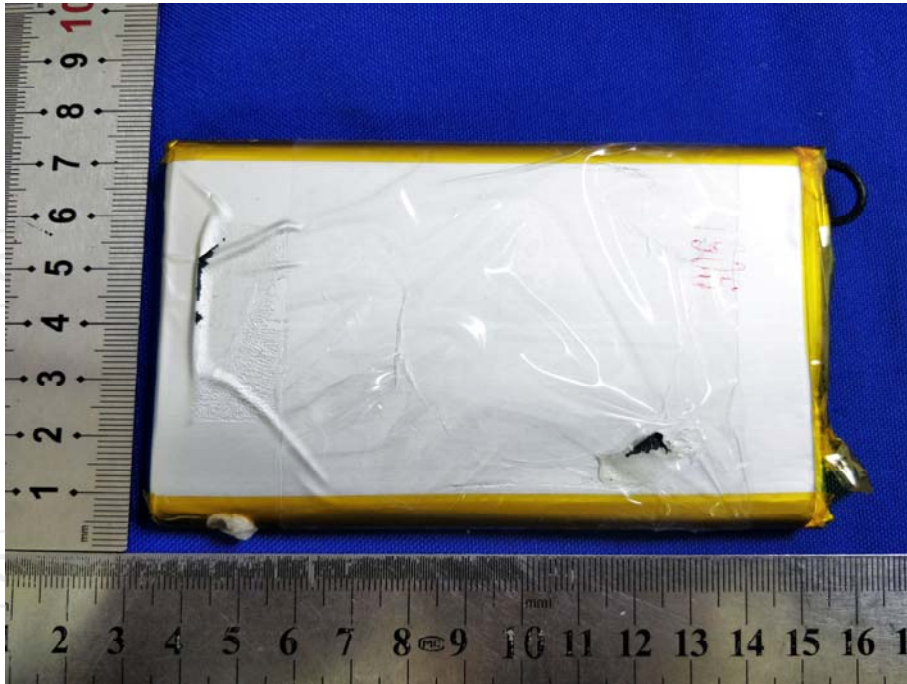












*******END OF REPORT*******