

FCC

MPE

TEST REPORT

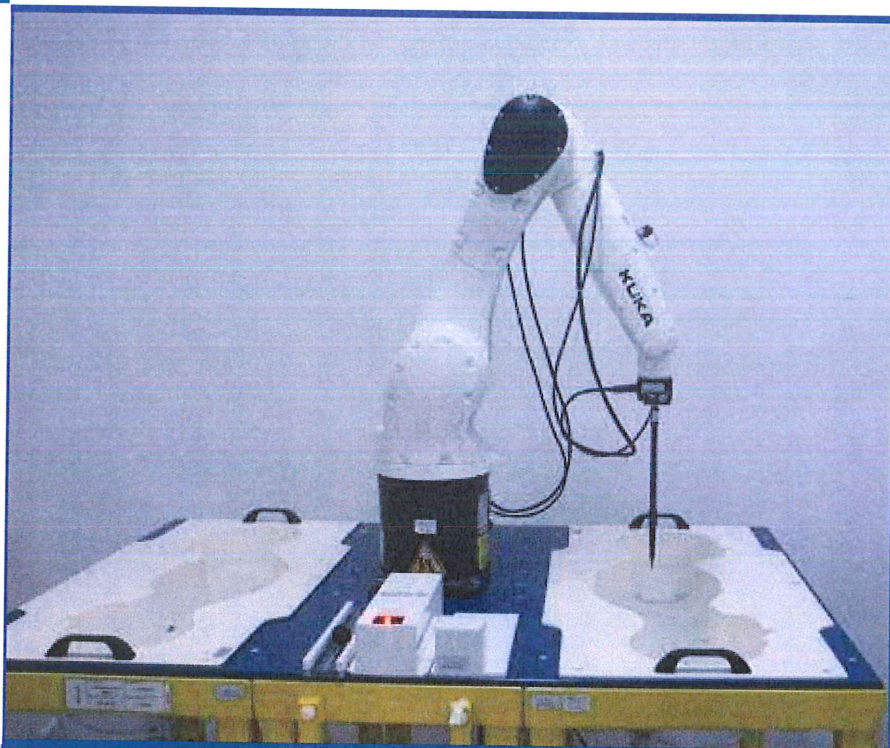
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR
Aivo Connect

ISSUED TO
iOttie, Inc.

20W 37th street 6 floor, New York, NY, 10018



Tested by: Zong Liyao

Date Jul. 17, 2020

Approved by: Liao Jianming

(Technical Director)

Date Jul. 17, 2020

Report No.: BL-SZ2060184-701
EUT Name: Aivo Connect
Model Name: HLCRIO204
Brand Name: iOttie
Test Standard: 47 CFR Part 1.1307
47 CFR Part 1.1310
FCC ID: 2AMRO- HLCRIO204

Test Conclusion: Pass
Test Date: Jul. 10, 2020
Date of Issue: Jul. 17, 2020

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Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions Content</u>
<u>Rev. 01</u>	<u>Jul. 17, 2020</u>	<u>Initial Issue</u>

TABLE OF CONTENTS

1	GENERAL INFORMATION	4
1.1	Identification of the Testing Laboratory	4
1.2	Identification of the Responsible Testing Location	4
1.3	Test Environment Condition	4
1.4	Announce	5
2	PRODUCT INFORMATION.....	6
2.1	Applicant Information.....	6
2.2	Manufacturer Information	6
2.3	Factory Information	6
2.4	General Description for Equipment under Test (EUT)	6
2.5	Ancillary Equipment.....	6
2.6	Technical Information	7
3	STANDARD INFORMATION	8
3.1	Test Standard.....	8
3.2	Radiofrequency Radiation Exposure Limit	8
3.3	Measurement Uncertainly	9
4	TEST SETUP.....	10
4.1	Test Setup Photo.....	10
4.2	Measurement procedure	10
4.3	Mobile Condition.....	10
4.4	Equipment Approval Considerations item 5.2 of KDB 680106 D01 v03.	11
4.5	Test Equipment	11
4.6	Test Configuration	11
5	TEST RESULT	12
5.1	H-field	12
5.2	E-field	12
6	Test Conclusion	12

6.1 H-field	12
6.2 E-field	12

1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China.
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China.
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Test Environment Condition

Ambient Temperature	21 to 23 °C
Ambient Relative Humidity	40 to 50%
Ambient Pressure	100 to 102 KPa

1.4 Announce

- (1) The test report reference to the report template version v1.2.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (7) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	iOttie, Inc.
Address	20W 37th street 6 floor, New York, NY, 10018

2.2 Manufacturer Information

Manufacturer	iOttie, Inc.
Address	20W 37th street 6 floor, New York, NY, 10018

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	Aivo Connect
Model Name Under Test	HLCRIO204
Series Model Name	N/A
Description of Model name differentiation	N/A
Serial Number	N/A
Hardware Version	IVY2_V3.1
Software Version	SSQ21-11.108.0.13.999_0603_1128
Dimensions (Approx.)	N/A

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	N/A
	Model No.	LIR2032
	Serial No.	N/A
	Capacity	45 mAh
	Rated Voltage	3.6 V
	Limit Charge Voltage	4.2 V

2.6 Technical Information

Network and Wireless connectivity	Bluetooth 5.0 (BR+EDR+BLE) QI
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The requirement for the following technical information of the EUT was tested in this report:

Operating Frequency	110~205 kHz	
Antenna Type	Coil Antenna	
About Product	The EUT only support the QI technology.	
Exposure Category	General Population/Uncontrolled exposure	
EUT Stage	Mobile Device	
Product	Type	
	☒ Production unit	☐ Identical prototype

3 STANDARD INFORMATION

3.1 Test Standard

No.	Identity	Document Title
1	47 CFR Part 1	Practice and Procedure
2	KDB 680106 D01	RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications

3.2 Radiofrequency Radiation Exposure Limit

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW / cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30
<i>f = frequency in MHz * = Plane-wave equivalent power density</i>				

NOTE:

Limits: According KDB 680106 D01, emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m.

General Population/Uncontrolled Exposure: Locations where there is the exposure of individuals who have no knowledge or control of their exposure. General population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Occupational/Controlled Exposure: Locations where there is exposure that may be incurred by persons who are aware of the potential for exposure. In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

3.3 Measurement Uncertainty

Measurement uncertainty evaluation for electric filed strength and magnetic filed strength test

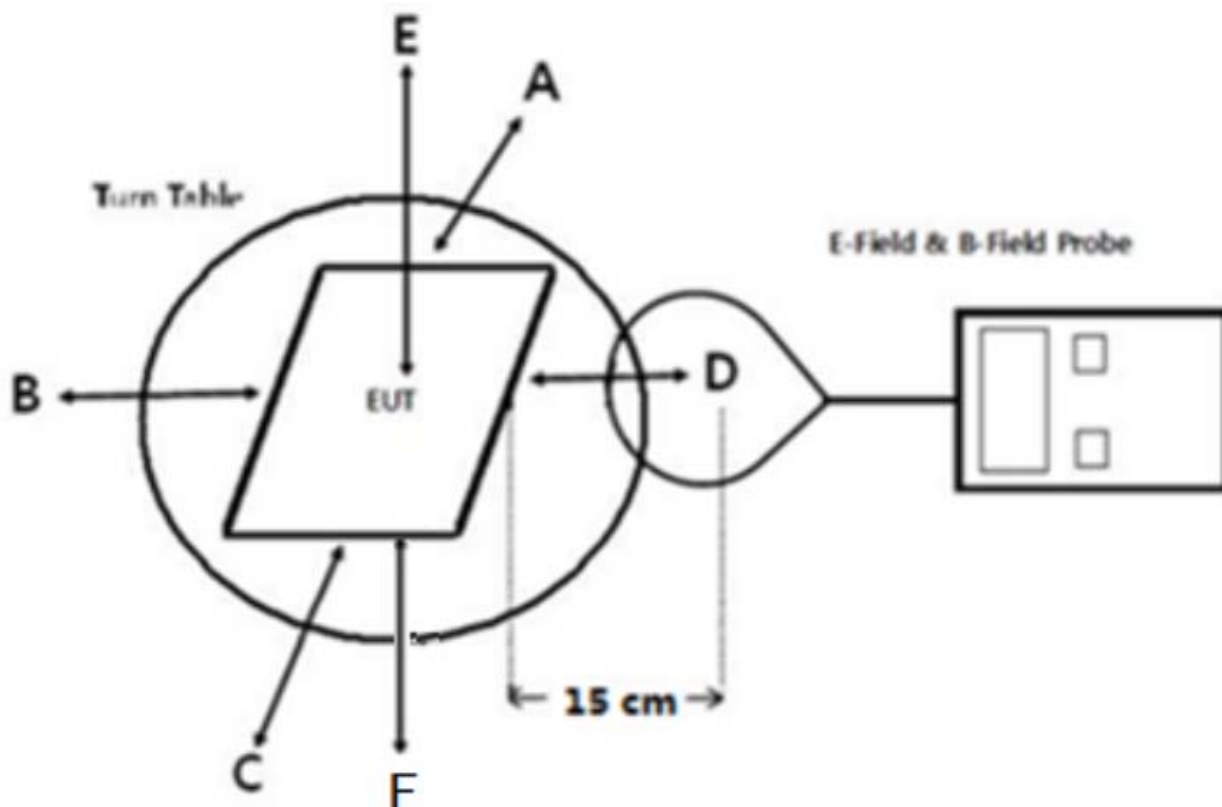
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Measurement	Value
Electric Filed Strength	1.13 dB
Magnetic Filed Strength	1.18 dB

4 TEST SETUP

4.1 Test Setup Photo

Maximum H-field and E-field measurements were made on each of five sides of the EUT that could come in contact with a user. The five sides are defined as follows: Top (A), Left (B), Bottom (C), Right (D), Front (E) and Back (F). Refer to the test position diagram below.



4.2 Measurement procedure

1. The RF exposure test was performed in anechoic chamber.
2. The measurement probe was placed at test distance (15 cm) which is between the edge of the charger and the geometric center of probe. For top edge used test distance 15mm instead of test distance 20cm to measurement more conservation H-Filed and E-Filed values.
3. The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E, F) were completed.
4. The EUT was measured according the dictates of KDB 680106 D01v03.

4.3 Mobile Condition

Probe	Condition	Test Distance (cm) A/B/C/D/E/F
H-field	Mobile	15
E-field	Mobile	15

4.4 Equipment Approval Considerations item 5.2 of KDB 680106 D01 v03.

1. Power transfer frequency is less than 1 MHz.
- The device operates at a frequency 110~205 kHz
2. Output power from each primary coil is less than or equal to 15 watts.
- Output power from primary coil 10 watts.
3. The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.
- The transfer system including a charging system with one primary and secondary coils is to detect and allow only between individual pairs of coils.
4. Client device is placed directly in contact with the transmitter.
- Client device is placed directly in contact with the transmitter.
5. Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
- On the normal use this EUT only support mobile exposure condition.
6. The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.
- Refer to following test results.
The EUT E-Field Strength levels at 10 cm < 50 % of the MPE E-Field Strength limit 83.00 V/m
10.351 V/m (Max. at 10 cm) < 41.50 V/m
The EUT H-Field Strength levels at 10 cm < 50 % of the MPE H-Field Strength limit 90.00 A/m
0.015 A/m (Max. at 10 cm) < 45.00 A/m

4.5 Test Equipment

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
H-field Probe	SCHWARZBECK	FESP 5134-40	5134-40-242	2019.10.10	2020.10.09
E-field Probe	Narda	EP-602	611WX80276	2020.06.08	2021.06.08
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2020.06.08	2021.06.08
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2020.02.18	2021.02.17

4.6 Test Configuration

To check all kinds of possible modes, the EUT was evaluated with appropriate client and under each charging condition as the below table:

Test Mode NO.	Description	
1	Charging Mode	EUT + AC/DC Adapter + Mobile Phone which has Less than 1 % of battery
2	Charging Mode	EUT + AC/DC Adapter + Mobile Phone which has Less than 50 % of battery
3	Charging Mode	EUT + AC/DC Adapter + Mobile Phone which has 100 % of battery

5 TEST RESULT

5.1 H-field

Distance (cm)	Test Mode	EUT Edges						Limit (A/m)
		A (A/m)	B (A/m)	C (A/m)	D (A/m)	E (A/m)	F (A/m)	
10	1	0.011	0.006	0.008	0.006	0.013	0.009	90.00
	2	0.013	0.007	0.007	0.006	0.015	0.008	
	3	0.011	0.007	0.008	0.007	0.014	0.009	

5.2 E-field

Distance (cm)	Test Mode	EUT Edges						Limit (V/m)
		A (V/m)	B (V/m)	C (V/m)	D (V/m)	E (V/m)	F (V/m)	
10	1	8.512	4.362	5.103	4.211	10.135	5.121	83.00
	2	8.432	4.338	5.541	5.036	10.213	5.064	
	3	8.953	4.986	5.461	4.635	10.351	5.762	

6 Test Conclusion

6.1 H-field

Distance (cm)	Worst-case Test Mode	EUT Edge E	Limit (A/m)	50% Limit (A/m)	Verdict
		(A/m)			
10	2	0.015	90.00	45.00	Pass

6.2 E-field

Distance (cm)	Worst-case Test Mode	EUT Edge E	Limit (V/m)	50% Limit (V/m)	Verdict
		(V/m)			
10	3	10.351	83.00	41.50	Pass

According KDB 680106 D01v03, the EUT is compliant with the 50% of the MPE limits.

--END OF REPORT--