

FCC TEST REPORT

FCC ID: 2AMRO-ATSWCG205

On Behalf of

iOttie, Inc

iOttie Auto Sense 2 Dashboard & Air Vent Mount

Model No.: ATSWCG205, ATSWCG206

Prepared for	:	iOttie, Inc
Address	:	470 7th Avenue, 6 FL, New York, NY 10018

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.		
Address	:	Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China		

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Date of Receipt	:	April 6, 2023
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Version Number	:	VO

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Applicant	:	iOttie, Inc		
Address	:	470 7th Avenue, 6 FL, New York, NY 10018		
Manufacturer	:	iOttie, Inc		
Address	:	470 7th Avenue, 6 FL, New York, NY 10018		
EUT Description	:	iOttie Auto Sense 2 Dashboard & Air Vent Mount		
		(A) Model No. : ATSWCG205, ATSWCG206		
		(B) Trademark : iOttie		

TEST REPORT DECLARATION

Measurement Standard Used: FCC CFR Title 47 Part 15 Subpart C Section 15.209

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC CFR Title 47 Part 15 Subpart C Section 15.209 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

 Tested by (name + signature).....:
 Yannis Wen
Project Engineer
 Yannis Wen
Project Engineer

 Approved by (name + signature).....:
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Project Manager
 Project Manager

 Date of issue......:
 April 12, 2023

Revision History

Revision	Issue Date	Revisions	Revised By
V0	April 12, 2023	Initial released Issue	Yannis Wen

1. 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
Occupied Bandwidth	§15.215 (c)	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.

2. General Information

2.1. Description of Device (EUT)		
EUT Name	:	iOttie Auto Sense 2 Dashboard & Air Vent Mount
Model No.	:	ATSWCG205, ATSWCG206
DIFF.	:	There is no difference except the name of the model and the bracket are different. All tests are made with the ATSWCG205 model.
Trademark	:	iOttie
Power supply	:	DC 12-24V for car charger
EUT information	:	DC 9V/12V from adapter INPUT: 9V 2.2A, 12V 1.6A OUTPUT: 7.5W/10W/15W
Operation frequency	:	115~205KHz
Modulation	:	MSK
Antenna Type	:	Coil Antenna, Maximum Gain is 0dBi (This value is supplied by applicant).
Software version	:	V1.0
Hardware version	:	V1.3
Intend use environment	:	Residential, commercial and light industrial environment

2.2. Accessories of Device (EUT)

Accessories1	:	RapidVolt 20W Car Charger
Manufacturer	:	iOttie, Inc.
Model	:	CHCRIO150
Input	:	DC 12-24V, 2A
Output	:	20W Max DC 5V-3A, 9V-2.33A, 12V-1.67A

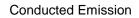
2.3. Tested Supporting System Details

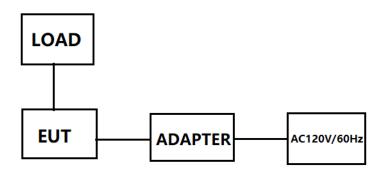
No.	Description	Manufacturer	Model	Serial Number	Certification
1	USB-C Smart Charger	AOHAI	CD127	N/A	N/A
2	Load	N/A	N/A	N/A	N/A

Radiated Spurious Emission

2.4. Block Diagram of Connection between EUT and Simulators

LOAD EUT BATTERY





2.5. Description of Test Modes

Channel	Frequency (KHz)
1	153

2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35°C	24°C
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa

2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission Registration Number: 293961

July 15, 2019 Certificated by IC Registration Number: CN0085

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	1.63dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber	3.74dB(Polarize: V)
(30MHz to 1GHz)	3.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber	3.77dB(Polarize: V)
(1GHz to 25GHz)	3.80dB(Polarize: H)
Uncertainty for radio frequency	5.06×10 ⁻⁸ GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2 °C
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

2.9. Test Equipment List

Equipment	Manufacture	Model No.	Firmwa re version	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	/	N/A	2022.05.17	3Year
Spectrum analyzer	ROHDE&SCHWAR Z	FSV40-N	2.3	102137	2022.08.22	1Year
Spectrum analyzer	Agilent	N9020A	A.14.16	MY499100060	2022.08.22	1Year
Receiver	ROHDE&SCHWAR Z	ESR	2.28 SP1	1316.3003K03- 102082-Wa	2022.08.22	1Year
Receiver	R&S	ESCI	4.42 SP1	101165	2022.08.22	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	/	VULB 9168#627	2021.08.30	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	/	2106	2021.08.30	2Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	/	00059	2021.08.30	2Year
RF Cable	Resenberger	Cable 1	/	RE1	2022.08.22	1Year
RF Cable	Resenberger	Cable 2	/	RE2	2022.08.22	1Year
RF Cable	Resenberger	Cable 3	/	CE1	2022.08.22	1Year
Pre-amplifier	HP	HP8347A	/	2834A00455	2022.08.22	1Year
Pre-amplifier	Agilent	8449B	/	3008A02664	2022.08.22	1Year
L.I.S.N.#1	Schwarzbeck	NSLK812 6	/	8126-466	2022.08.22	1Year
L.I.S.N.#2	ROHDE&SCHWAR Z	ENV216	/	101043	2022.08.23	1 Year
Horn Antenna	SCHWARZBECK	BBHA917 0	/	00946	2021.08.30	2 Year
Preamplifier	SKET	LNPA_18 40-50	/	SK2018101801	2022.08.22	1 Year
Power Meter	Agilent	E9300A	/	MY41496628	2022.08.22	1 Year
Power Sensor	DARE	RPR3006 W	/	15100041SNO9 1	2022.08.22	1 Year
Temp. & Humid. Chamber	Weihuang	WHTH-10 00-40-880	/	100631	2022.08.22	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	/	20140927-6	2022.08.22	1 Year
Adjustable attenuator	MWRFtest	N/A	/	N/A	N/A	N/A
10dB Attenuator	Mini-Circuits	DC-6G	/	N/A	N/A	N/A

Software Information							
Test Item	Software Name	Manufacturer	Version				
RE	EZ-EMC	EZ	Alpha-3A1				
CE	EZ-EMC	EZ	Alpha-3A1				
RF-CE	MTS 8310	MW	V2.0.0.0				

3. Test Results and Measurement Data

3.1. Conducted Emission

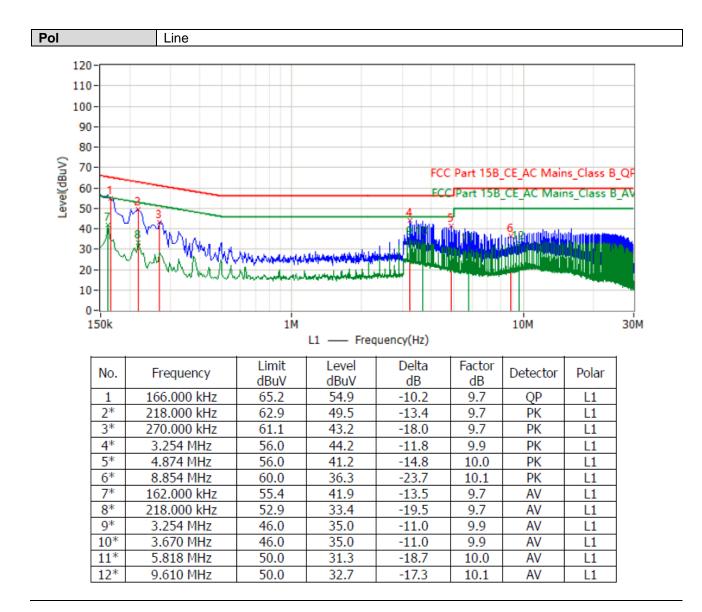
3.1.1. Test Specification

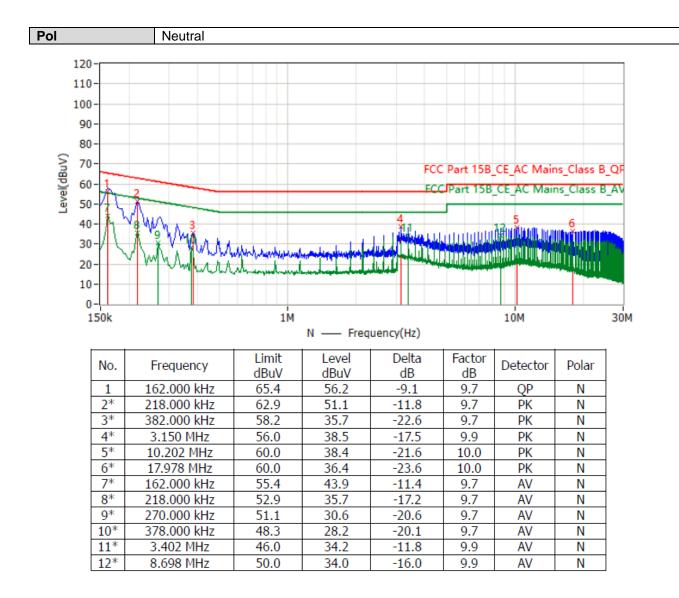
Test Requirement:	FCC Part15 C Section 15.20	07		
Test Method:	ANSI C63.10:2013			
Frequency Range:	150 kHz to 30 MHz			
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto			
	Limit (dBuV)			
	Frequency range (MHz)	Quasi-peak Average		
Limits:	0.15-0.5	66 to 56*	56 to 46*	
	0.5-5	56	46	
	5-30	60	50	
	Refere	nce Plane		
Test Setup:	Image: stable / insulation plane Remark: E.U.T Adapter Filter AC power EMI Remark: E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Network Test table height=0.8m			
Test Mode:	Transmitting Mode			
Test Procedure:	 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. 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). 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			

3.1.2. Test Data

Please refer to following diagram for individual

Test Mode : Output 15W					
Test Re	esult : PASS				
Note:	The test results are listed in next pages.				
All test modes has been tested, this report only reflected the worst mode.(Output 15)					
If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector are detector and the measurement with the average detector need not be carried out.					

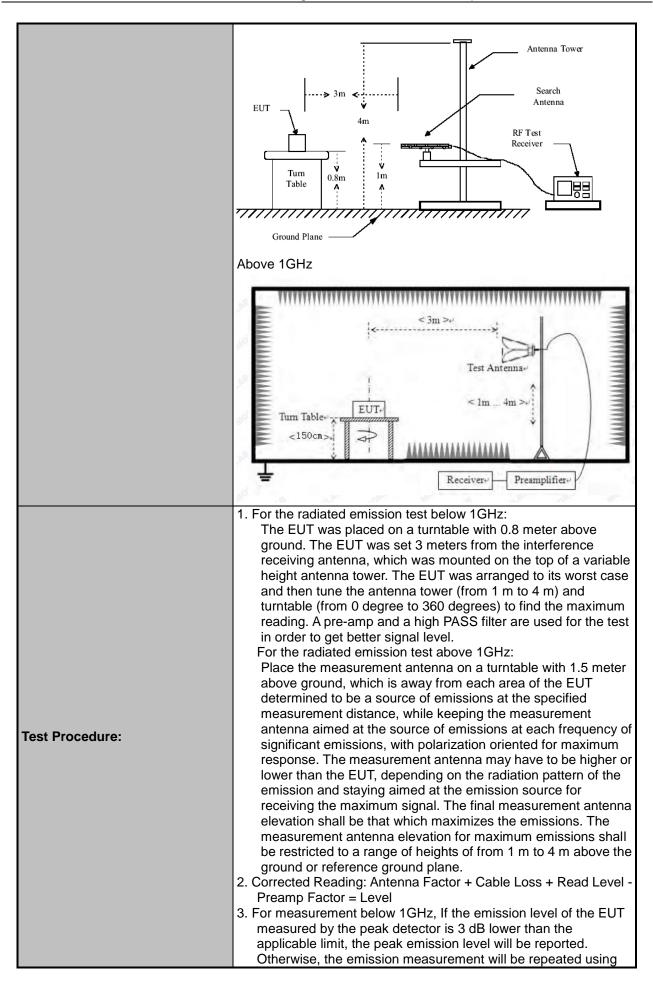




3.2. Radiated Spurious Emission Measurement

3.2.1. 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							
	Frequency		tecto		RBW	VBW		Remark
	9kHz- 150kHz	Qua	isi-pe k	ea	200Hz	1kHz	Q	uasi-peak Value
Dessiver Seture	150kHz-	Qua	si-pe	ea	9kHz	30kHz	Q	uasi-peak
Receiver Setup:	30MHz 30MHz-1GH	Qua	<u>k</u> Isi-pe	a	100KH	300KH	Q	Value uasi-peak
	Z		k		Z	Z		Value
	Above 1GHz		eak		1MHz	3MHz		eak Value
		P	eak		1MHz	10Hz		rage Value
	Frequer	су		Field Stre (microvolts/		ength /meter)		asurement Distance meters)
	0.009-0.490				2400/F(k	(Hz)	300	
	0.490-1.705			24000/F(KHz)		KHz)	30	
	1.705-3			30			30	
	<u>30-88</u> 88-216			<u> </u>			3	
Limit:	216-96			200			3	
	Above 9				500			
	Frequency	Field Strength (microvolts/mete r)		olts/mete	Measure nt Distan	се	Detector	
				500		(meters) 3		Average
	Above 1GHz			5000		3		Peak
	For radiated emissions below 30MHz							
	Distance = 3m							
T	Pre -Amplifier						plifier	
Test setup:	EUT	 Turn ;	table	1m			Reco	iver
			G	roun	d Plane	7		
	30MHz to 1GH	z	<u> </u>			_		

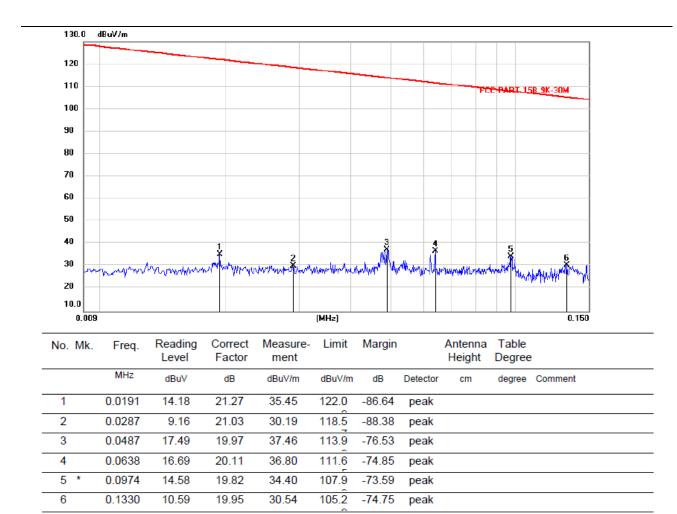


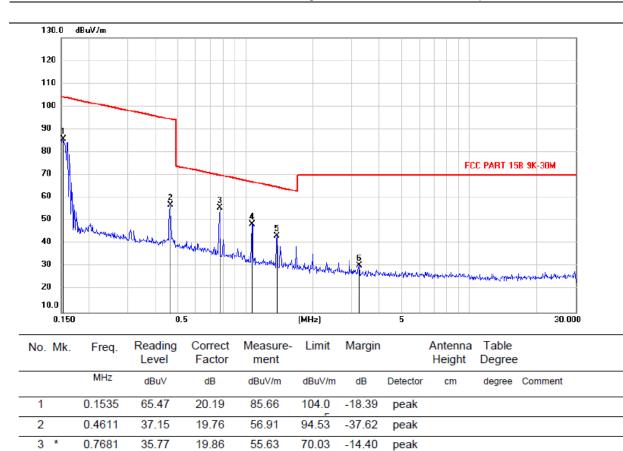
	 the quasi-peak detector and reported. 4. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for f □ 1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 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.
Test mode:	Refer to section 4.1 for details
Test results:	PASS

3.2.2. Test Data

Please refer to following diagram for individual

Fragua	nov Pongo			
Freque	ncy Range	•	9KHz~30MHz	
Test Mode : TX: 153kHz		TX: 153kHz		
Polariza	rization : Coplanar			
Test Re	sults	:	PASS	
Note:	ote: 1. The test results are listed in next pages.			
	2. This mode is worst case mode, so this report only reflected the worst mode.			
	a peak det	ecto	or the measurement with the average detector are met when using a receiver with r, the test unit shall be deemed to meet both limits and the measurement with the ector need not be carried out.	





4

5

6

1.0761

1.3833

3.2267

28.42

23.35

9.95

20.02

20.10

20.62

48.44

43.45

30.57

67.06

64.84

70.00

-18.62

-21.39

-39.43

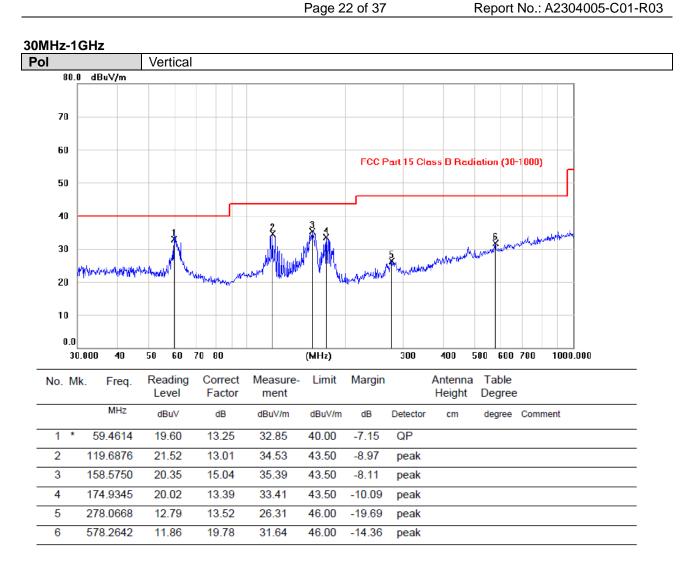
peak

peak

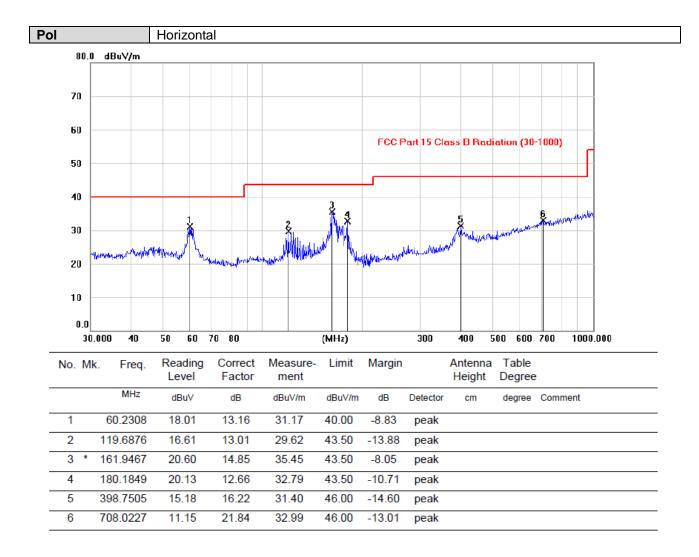
peak

Frequer	ncy Range	:	30MHz~1000MHz	
Test Mo	Test Mode : Output 15W			
Test Re	sults	:	PASS	
Note:	ote: 1. The test results are listed in next pages.			
	2. All test modes has been tested, this report only reflected the worst mode.			
	3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.			

Frequency Range : Above 1GHz	
EUT : /	Test Date : /
M/N : /	Temperature : /
Test Engineer : /	Humidity : /
Test Mode : /	
Test Results : N/A	
	nal sources of the EUT is less than 108 MHz, the GHz. So the frequency rang above 1GHz radiation test



Note:1. *:Maximum data; x:Over limit; I:over margin. 2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.



Note:1. *:Maximum data; x:Over limit; I:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

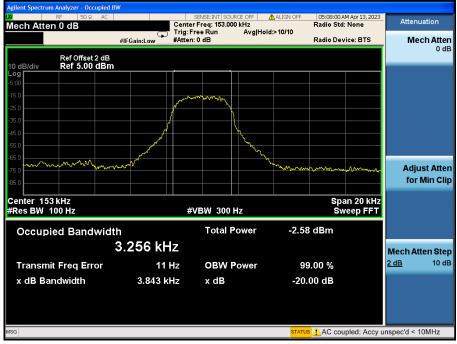
3.3.	Test Specification	
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Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10: 2013
Limit:	N/A
Test Procedure:	 According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. Set to the maximum power setting and enable the EUT transmit continuously. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW≥1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. Measure and record the results in the test report.
Test setup:	Spectrum Analyzer EUT
Test Mode:	Refer to section 4.1 for details
Test results:	PASS

3.3.1. Test Data

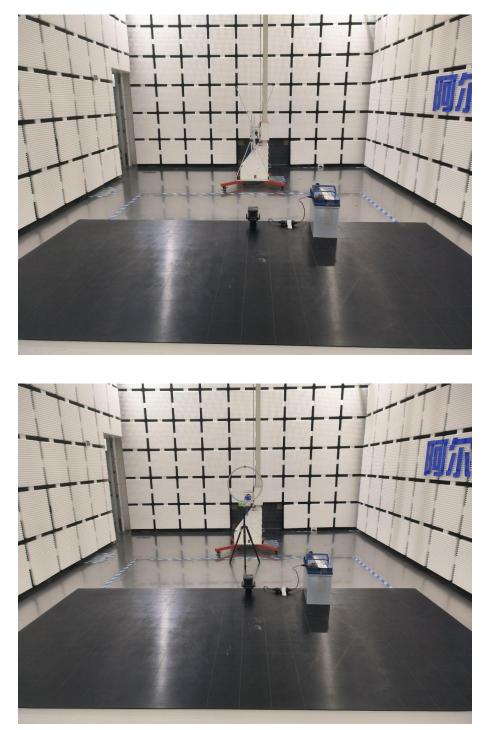
Frequency(kHz)	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion
153	3.843		PASS

Test plots as follows:



4. Photos of Test Setup

Radiated Emission



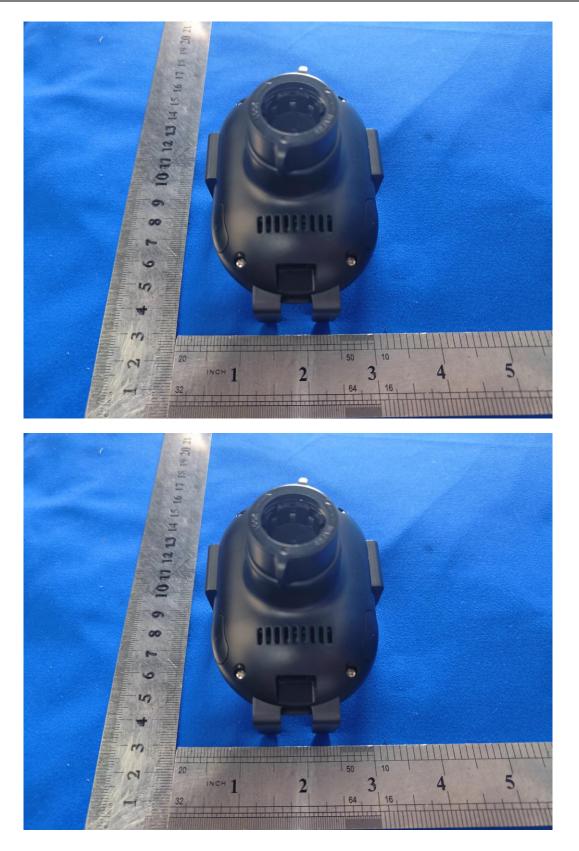
Conducted Emission



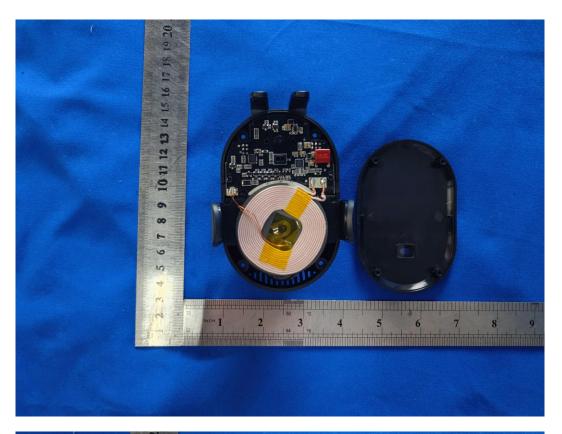
5. Photographs of EUT



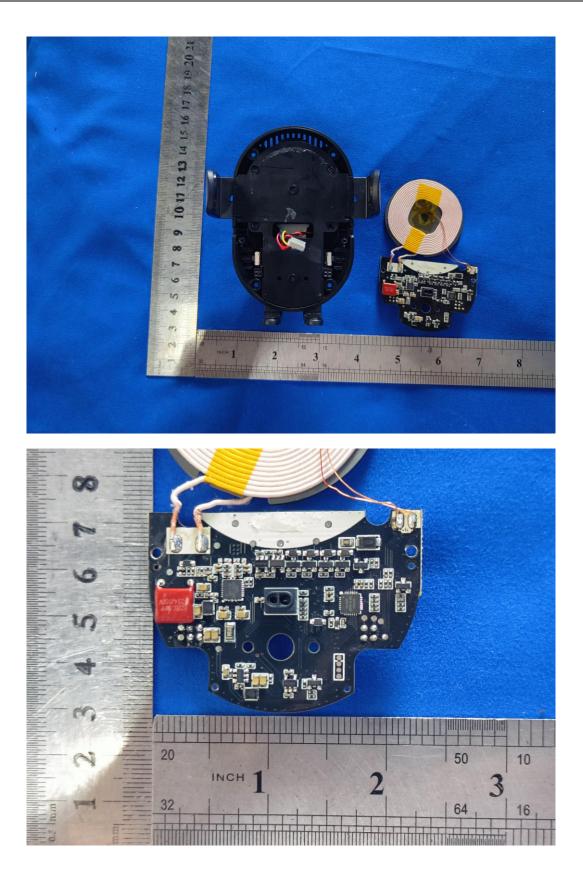


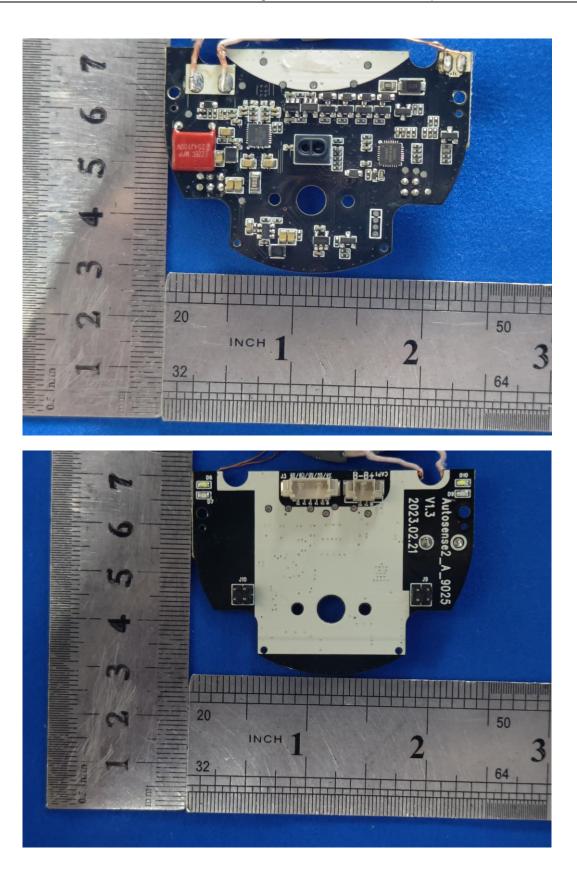






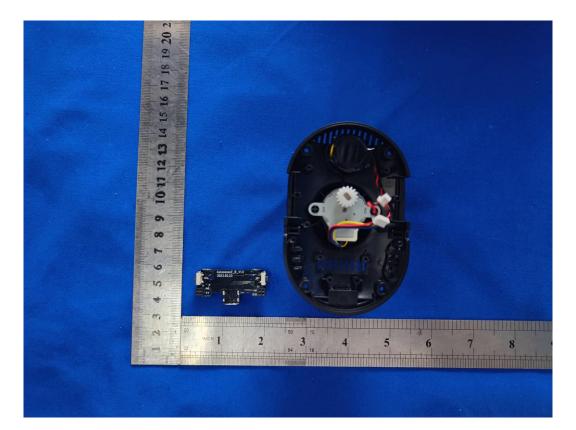


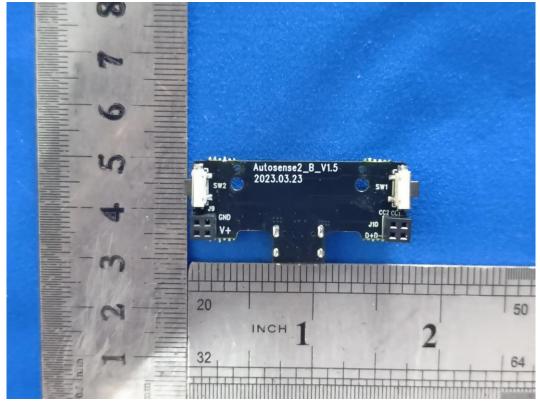


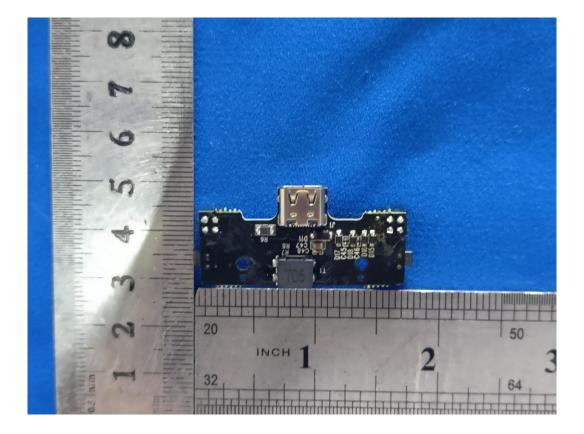














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