

# FCC TEST REPORT FCC ID: 2AMRO-VLXWCG212

On Behalf of

iOttie, Inc.

### Velox Mini Qi2 Wireless Air Vent Mount

Model No.: VLXWCG212, VLXWCG213, VLXWCG214

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

Report Number : A2401019-C01-R06 Date of Receipt : January 8, 2024

Date of Test : January 8, 2024 – February 21, 2024

Date of Report : March 18, 2024

Version Number : V0

Test Result : Pass

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#### TEST REPORT DECLARATION

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 : Velox Mini Qi2 Wireless Air Vent Mount

(A) Model No. : VLXWCG212, VLXWCG213, VLXWCG214

(B) Trademark : **iOttie** 

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

Approved by (name + signature)......

Reak Yang
Project Manager

Date of issue..... March 18, 2024

# **Revision History**

Revision	Issue Date	Revisions	Revised By
V0	March 18, 2024	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 : Velox Mini Qi2 Wireless Air Vent Mount

Model No. : VLXWCG212, VLXWCG213, VLXWCG214

DIFF.

There is no difference except the name of the model and sale territory. All

tests are made with the VLXWCG212 model.

Power supply : DC 5V/9V/12V from adapter

EUT information : Type-C Input: 5V===3A, 9V===2.22A, 12V===2A

Wireless Output: 5W, 7.5W, 15W

Operation frequency : 115~205KHz, 360KHz

Modulation : MSK

Antenna Type : Coil Antenna, Maximum Gain is 0dBi

(This value is supplied by applicant).

Software version : V1.0

Hardware version : V1.1

Connector cable loss : Max. coaxial cable loss:0.5dB

. (Cable lossvalue is provided by applicant.)

Intend use environment : Residential, commercial and light industrial environment

### 2.2. Accessories of Device (EUT)

Accessories1 : Cable

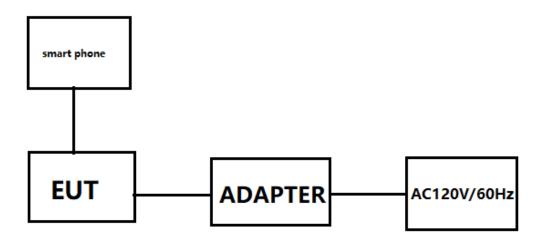
Manufacturer : iOttie, Inc.

Model : /
Ratings : /

### 2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification
1	Smart phone	Apple	iPhone X		
2	Adapter	Apple			

### 2.4. Block Diagram of Connection between EUT and Simulators



### 2.5. Description of Test Modes

Mode	Frequency (KHz)
1	145
2	360

### 2.6. Test Conditions

Items	Required	Actual		
Temperature range:	15-35°C	<b>24</b> °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: 12135A

### 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 <sup>-8</sup> GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2℃
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

# 2.9. Test Equipment List

Equipment	Manufacture	Model No.	Firmware 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&SCHWARZ	FSV40-N	2.3	102137	2023.08.16	1Year
Spectrum analyzer	Agilent	N9020A	A.14.16	MY499100060	2023.08.16	1Year
Receiver	ROHDE&SCHWARZ	ESR	2.28 SP1	1316.3003K03-10 2082-Wa	2023.08.16	1Year
Receiver	R&S	ESCI	4.42 SP1	101165	2023.08.16	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	/	VULB 9168#627	2023.08.28	1Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	/	2106	2023.08.19	1Year
Loop Antenna	SCHWARZBECK	FMZB 1519B	/	00128	2023.08.19	1Year
RF Cable	Resenberger	Cable 1	/	RE1	2023.08.16	1Year
RF Cable	Resenberger	Cable 2	/	RE2	2023.08.16	1Year
RF Cable	Resenberger	Cable 3	/	CE1	2023.08.16	1Year
Pre-amplifier	HP	HP8347A	/	2834A00455	2023.08.16	1Year
Pre-amplifier	ifier Agilent 8449B / 3008A02664		2023.08.16	1Year		
L.I.S.N.#1	Schwarzbeck	NSLK8126	/	8126-466	2023.08.16	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	101043	2023.08.16	1Year
Horn Antenna	SCHWARZBECK	BBHA 9170	/	00946	2023.08.19	1Year
Preamplifier	SKET	LNPA_1840 -50	/	SK2018101801	2023.08.16	1 Year
Power Meter	Power Meter Agilent E9300A / MY4149		MY41496628	2023.08.16	1 Year	
Power Sensor	Sensor DARE RPR3006W / 1510		15100041SNO91	2023.08.16	1 Year	
Temp. & Humid. Chamber	Teelong	TL-HW408S	/	TL-20191205-01	2023.07.25	1 Year
Switching Mode Power Supply JUNKE		JK12010S	/	20140927-6	2023.08.16	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 (d	BuV)		
	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		
	Referei	nce Plane			
Test Setup:	tup:    Adapter				
Test Mode:	Transmitting Mode				
Test Procedure:	<ol> <li>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.</li> <li>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).</li> <li>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.</li> </ol>				
Test Result:	PASS				

#### 3.1.2. Test Data

#### Please refer to following diagram for individual

Test Mode : Mode 2

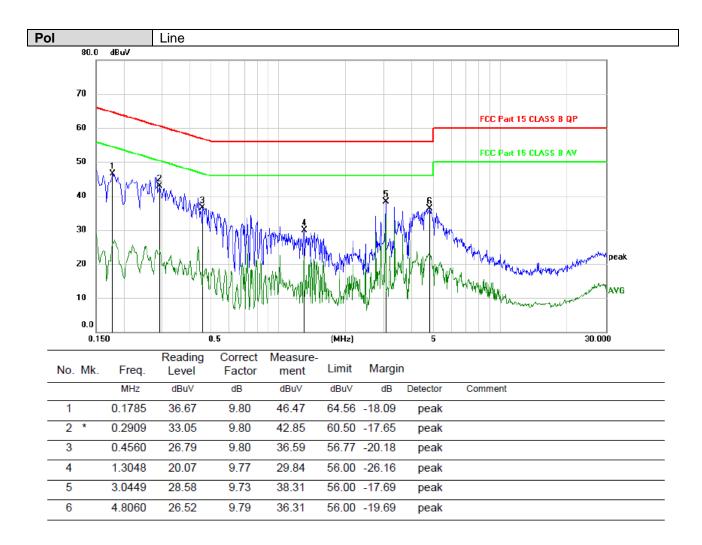
Test Result : PASS

Note: The test results are listed in next pages.

All test modes has been tested, this report only reflected the worst mode.(Mode 2)

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.

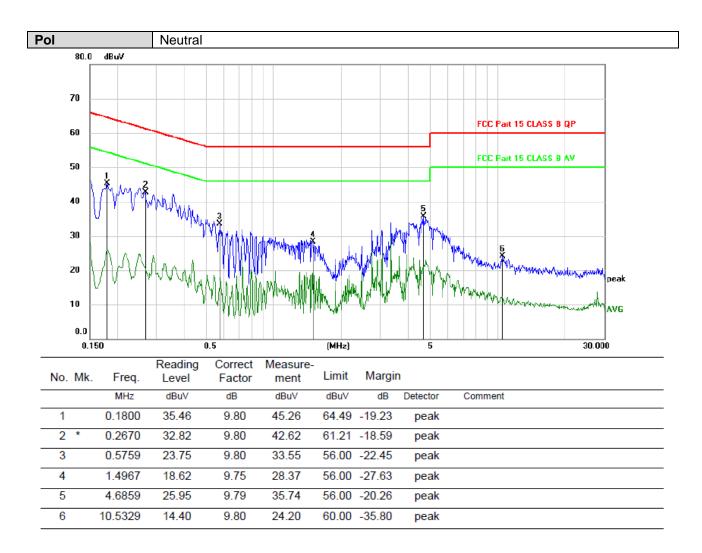
If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.



(Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

<sup>\*:</sup>Maximum data x:Over limit !:over margin

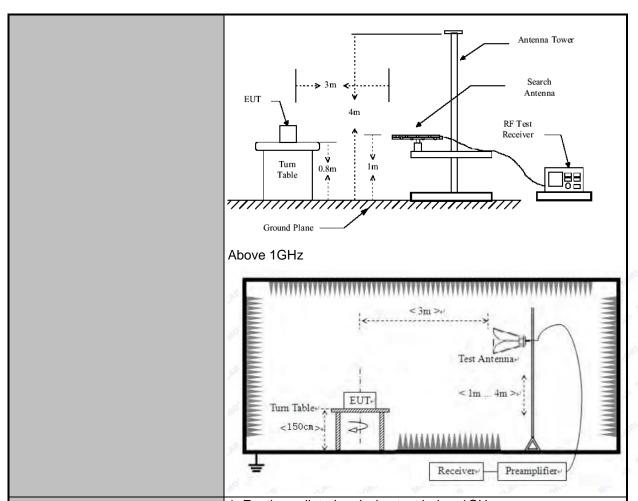


<sup>\*:</sup>Maximum data x:Over limit !:over margin \( \text{Reference Only} \)
Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

# 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 9kHz- 150kHz	Qua	tector asi-pe k	a 200Hz		Q	Remark uasi-peak Value	
Receiver Setup:	150kHz- 30MHz	Qua	asi-pe k	a 9kHz	30kHz	Q	uasi-peak Value	
·	30MHz-1GH z		asi-pe k	Z	Z		uasi-peak Value	
	Above 1GHz		Peak	1MHz			eak Value	
	Frequency		Can	Field S	Field Strength (microvolts/meter)		Average Value  Measurement Distance (meters)	
	0.009-0.490			2400/F			300	
	0.490-1.705			24000/F(KHz)		30		
	1.705-30 30-88			30 100		30		
	88-216			150			3	
Limit:	216-960			200			3	
	Above 960			50	00 3			
			Field Strength (microvolts/mete r)		I nt	nce	Detector	
	Above 1GHz			500	3		Average	
	For radiated emissions below 30MHz					Peak		
	Distance = 3m							
Test setup:	Pre -Amplifier  Turn table					pplifier		
	Ground Plane							
	30MHz to 1GH	Z						



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 restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level
- 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

#### **Test Procedure:**

	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

Frequency Range : 9KHz~30MHz

Polarization : Coaxial

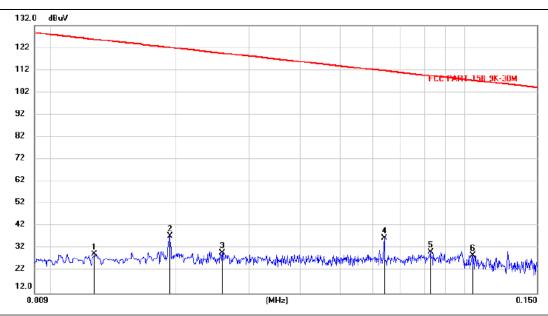
Test Mode : TX: 360kHz

Test Results : PASS

Note: 1. The test results are listed in next pages.

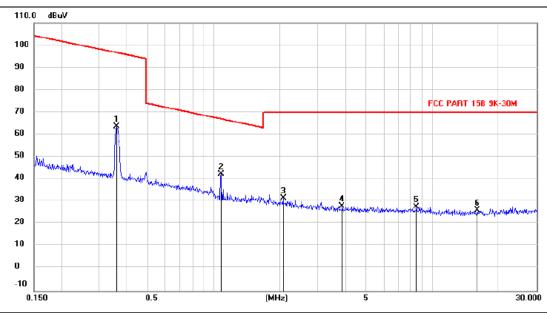
2. This mode is worst case mode, so this report only reflected the worst mode.

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.



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	0.0126	8.21	21.43	29.64	125.6	-96.05	peak			
2	0.0191	16.48	21.27	37.75	122.0	-84.34	peak			
3	0.0258	8.96	21.10	30.06	119.4	-89.43	peak			
4 *	0.0639	16.67	20.11	36.78	111.6	-74.86	peak			
5	0.0827	10.56	20.01	30.57	109.4	-78.83	peak			
6	0.1046	9.29	19.75	29.04	107.3	-78.33	peak			

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



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	0.3594	43.80	19.90	63.70	96.68	-32.98	peak			
2 *	1.0790	22.40	20.02	42.42	67.04	-24.62	peak			
3	2.0776	11.17	20.27	31.44	70.00	-38.56	peak			
4	3.8753	6.95	20.98	27.93	70.00	-42.07	peak			
5	8.4652	5.71	21.97	27.68	70.00	-42.32	peak			
6	16.1200	4.92	21.35	26.27	70.00	-43.73	peak			

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

Frequency Range : 9KHz~30MHz

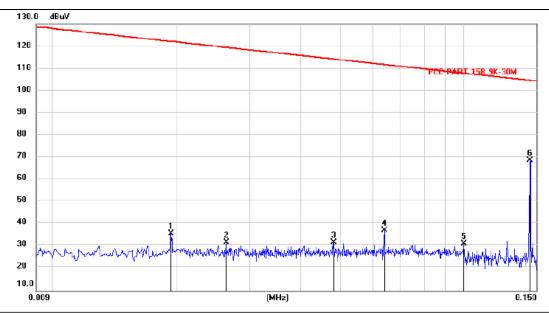
Polarization : Coaxial

Test Mode : TX: 145kHz

Test Results : PASS

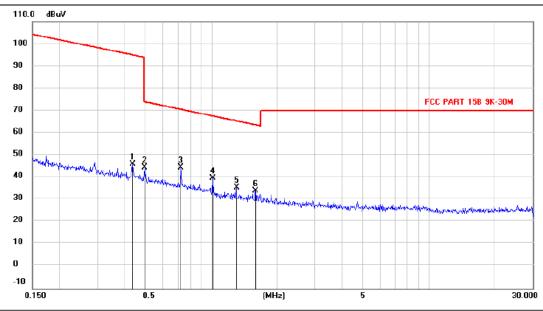
Note: 1. The test results are listed in next pages.

- 2. This mode is worst case mode, so 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.



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	0.0192	14.53	21.27	35.80	122.0	-86.25	peak			
2	0.0263	10.80	21.09	31.89	119.3	-87.43	peak			
3	0.0480	11.65	20.01	31.66	114.1	-82.45	peak			
4	0.0639	17.19	20.11	37.30	111.6	-74.34	peak			
5	0.1000	11.32	19.80	31.12	107.7	-76.64	peak			
6 *	0.1449	48.47	20.12	68.59	104.5	-35.96	peak			

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



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	0.4348	26.09	19.79	45.88	95.03	-49.15	peak			
2	0.4944	24.61	19.71	44.32	73.92	-29.60	peak			
3 *	0.7248	24.77	19.83	44.60	70.55	-25.95	peak			
4	1.0135	19.63	20.00	39.63	67.59	-27.96	peak			
5	1.3052	15.45	20.08	35.53	65.36	-29.83	peak			
6	1.5938	13.74	20.15	33.89	63.59	-29.70	peak			

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

Frequency Range : 30MHz~1000MHz

Test Mode : Full Load

Test Results : PASS

Note: 1. The test results are listed in next pages.

2. All test modes has been tested, this report only reflected the worst mode. (Charging+5W)

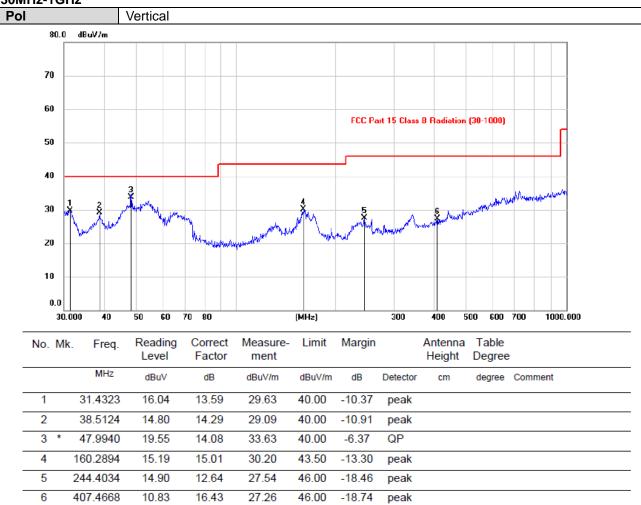
3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

Frequency Range	:	Above 1GHz			
EUT	:	/	Test Date	:	1
M/N	:	/	Temperature	:	/
Test Engineer	:	/	Humidity	:	/
Test Mode	:	/			
Test Results	:	N/A			

Note:

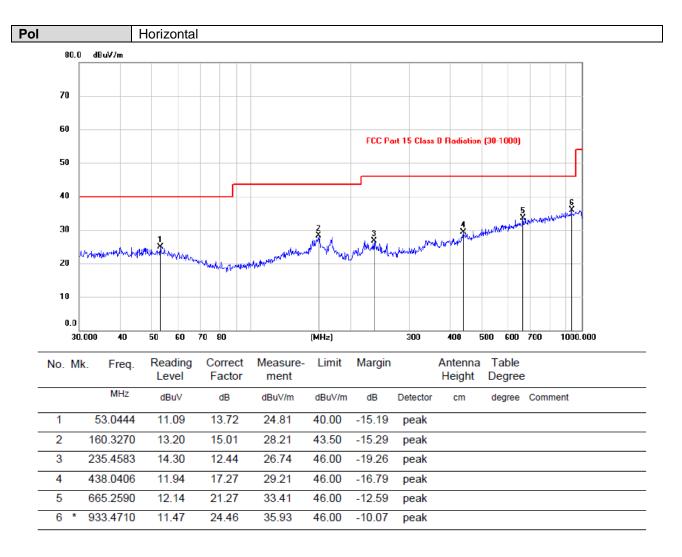
1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the frequency rang above 1GHz radiation test not applicable.

#### 30MHz-1GHz



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

<sup>2.</sup>Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.



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

<sup>2.</sup>Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

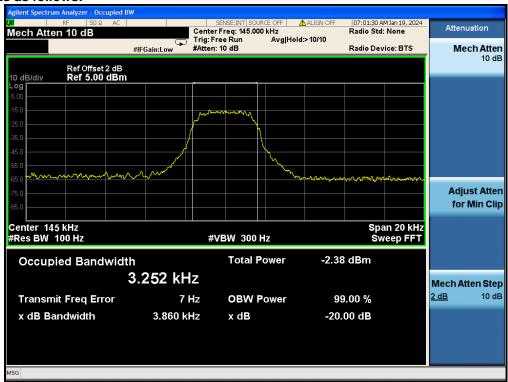
# 3.3. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10: 2013
Limit:	N/A
Test Procedure:	<ol> <li>According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>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.     </li> <li>Measure and record the results in the test report.</li> </ol>
Test setup:	Spectrum Analyzer EUT
Test Mode:	Refer to section 4.1 for details
Test results:	PASS

#### 3.3.1. Test Data

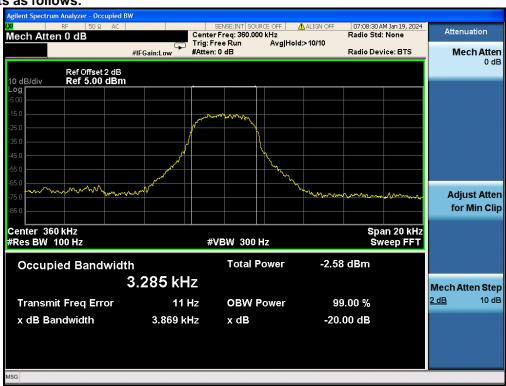
Frequency(KHz)	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion
145	3.860		PASS

Test plots as follows:



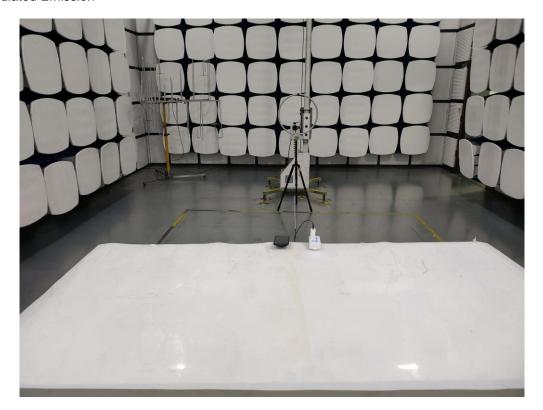
Frequency(KHz)	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion
360	3.869		PASS

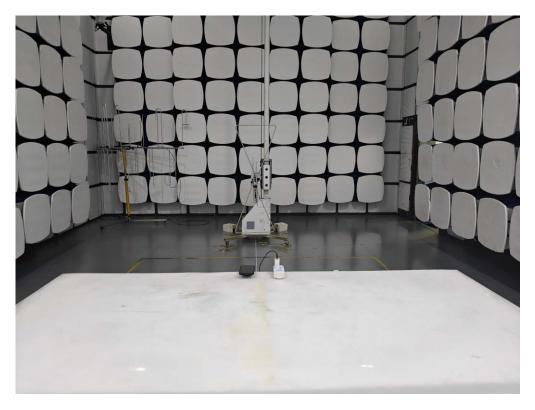
Test plots as follows:



# 4. Photos of Test Setup

Radiated Emission

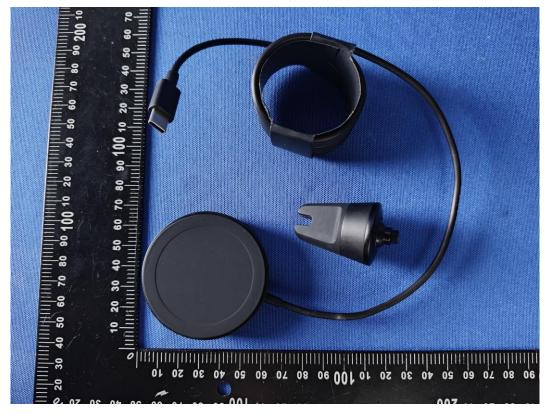


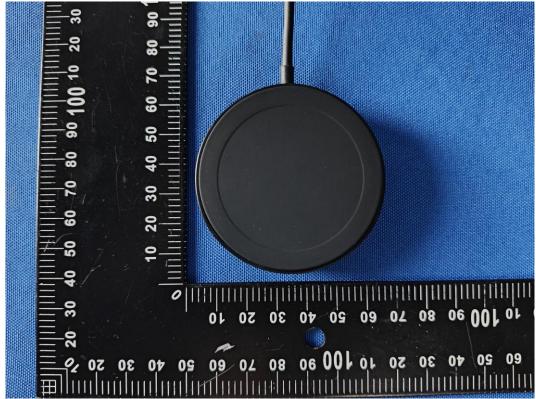


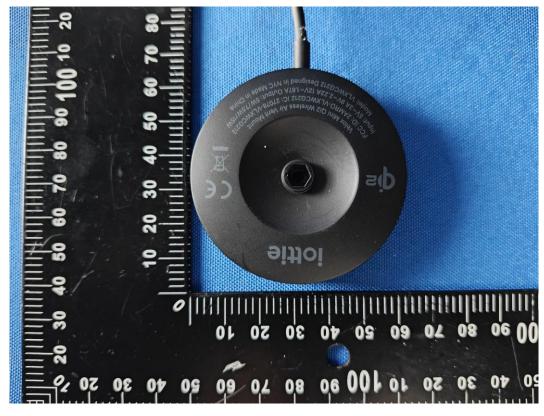
Conducted Emission

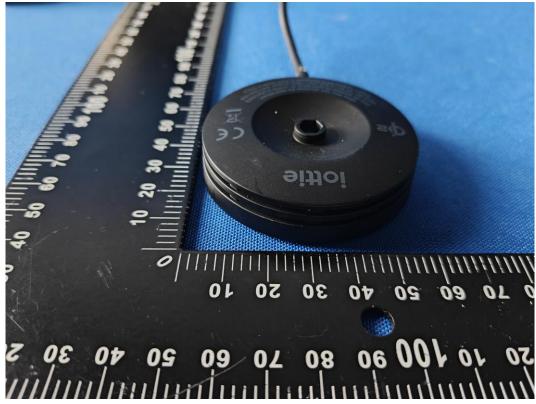


# 5. Photographs of EUT

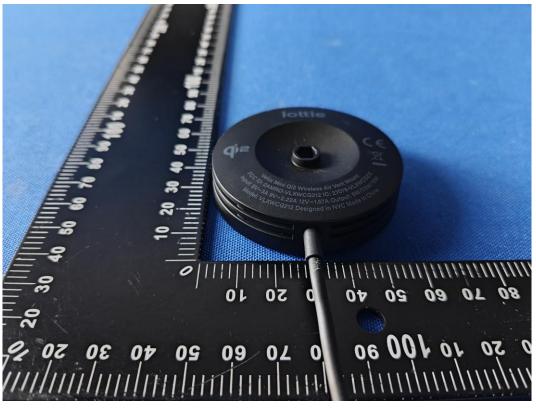


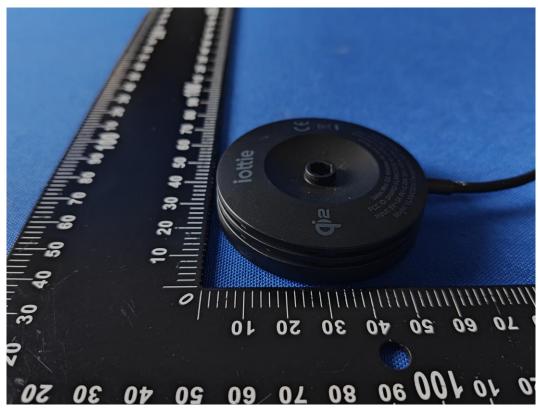


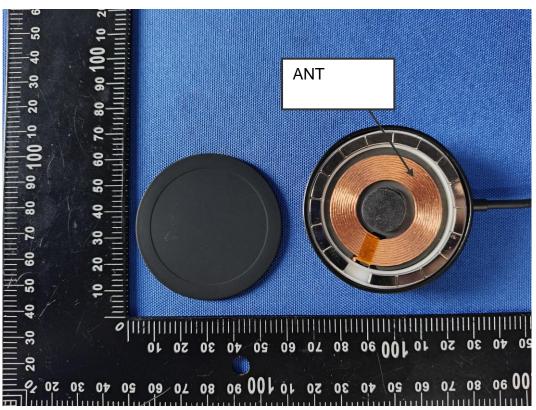


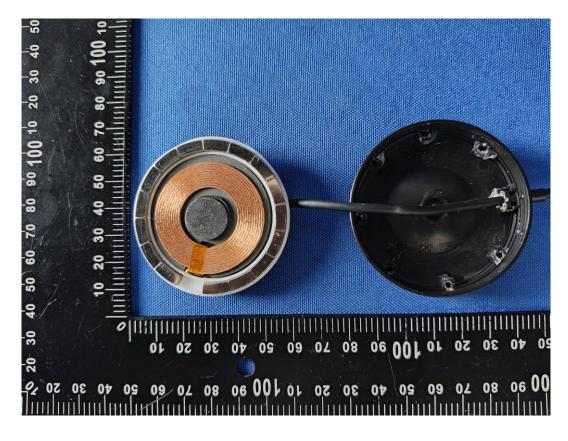


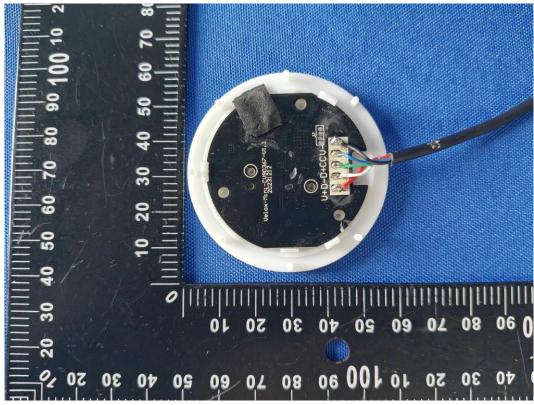


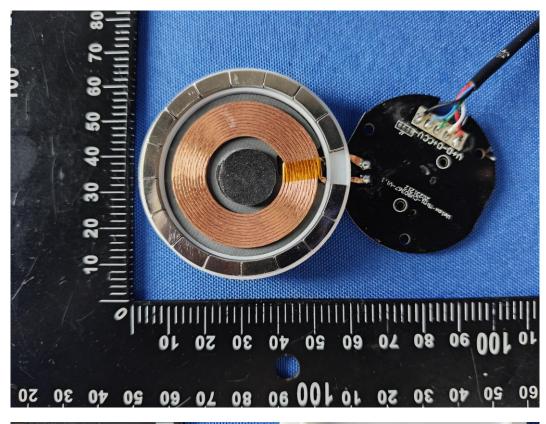


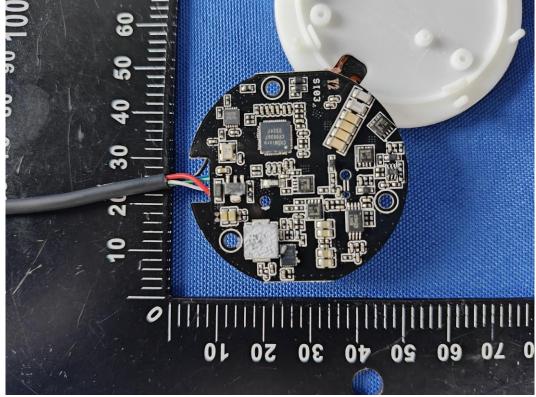


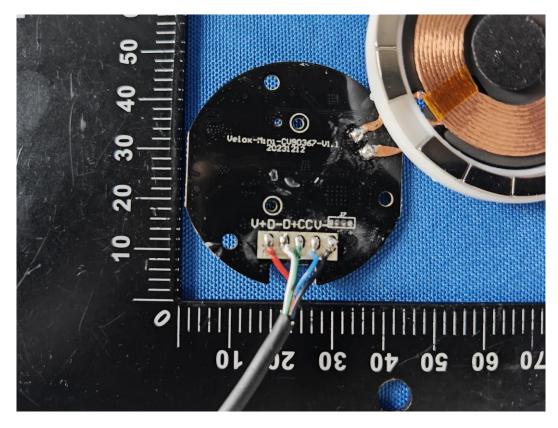












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