FCC TEST REPORT

FCC ID:2AMRO-ATSWCG216

Report No.....	:	ZHT-241119112W02-1
Product.....	:	Auto Sense Lite Wireless Charging Car Mount Dash/Windshield and Air Vent Combo
Trademark.....	:	Iottie
Model(s).....	:	ATSWCG216
Model difference.....	:	/
Applicant.....	:	iOttie, Inc.
Address.....	:	470 7th Avenue, 6 FL, New York, NY 10018
Manufacturer.....	:	DongGuan Visnfa Technology Co., Ltd.
Address.....	:	Suite 1702, Building 11, No. 1 Jingdong Road, Fenggang Town, Dongguan City, Guangdong Province
Prepared by.....	:	Guangdong Zhonghan Testing Technology Co., Ltd.
Address.....	:	Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Date of Receipt.....	:	Nov. 19, 2024
Date of Test(s).....	:	Nov. 19, 2024 to Dec. 9, 2024
Date of Issue.....	:	Dec. 9, 2024
Test Standard(s).....	:	FCC CFR Title 47 Part 15 Subpart C
Test procedure.....	:	ANSI C63.10:2013

In the configuration tested, the EUT complied with the standards specified above.

Tested by:	Reviewed by:	Approved by:
Kimi Lu/ Engineer	Baret Wu/ Director	Levi Lee/ Manager

Note: The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of ZHT. This document may be altered or revised by ZHT, personnel only, and shall be noted in the revision of the document.

TABLE OF CONTENT

1.VERSION

Report No.	Version	Description	Approved
ZHT-241119112W02-1	Rev.01	Initial issue of report	Dec. 9, 2024

2.TEST SUMMARY

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Spurious Emission	15.209(a)(f)	Pass
20dB Bandwidth	15.215	Pass

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

3.GENERAL INFORMATION

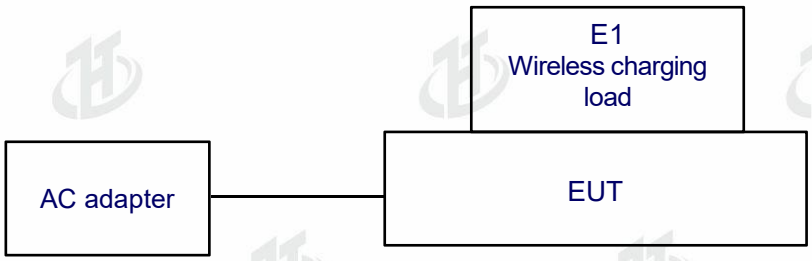
3.1 GENERAL DESCRIPTION OF EUT

Product Name:	Auto Sense Lite Wireless Charging Car Mount Dash/Windshield and Air Vent Combo
Test Model No:	ATSWCG216
Hardware version:	V1.0
Software version:	V1.0
Operation Frequency:	110.1-205KHz
Modulation type:	MSK
Antenna Type:	Coil Antenna
Antenna gain:	0dBi
Power supply:	Input : 9V⎓2.2A, 12V⎓1.6A Output :7.5W/10W/15W
Remark:The antenna gain is provided by the customer, if the data provided by the customer is not accurate, Guangdong Zhonghan Testing Technology Co., Ltd. does not assume any responsibility.	

3.2 Test mode

Test Modes	
Mode 1	AC adapter + wireless charging(7.5W)
Mode 2	AC adapter + wireless charging(10W)
Mode 3	AC adapter + wireless charging(15W)
Mode 4	Standby mode
Note: 1.All full load, half load, and no-load tests have been conducted in each mode, only the worst-case was recorded in the report. Mode 3 full load is the worst mode.	

3.3 Block Diagram of EUT Configuration



3.4 Test Conditions

Temperature: 23~26℃

Relative Humidity: 54~63 %

3.5 Description Of Support Unit (Conducted Mode)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support unit or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Wireless charging load	N/A	EESON	N/A	AE
E-2	AC adapter	N/A	CHG-WALL-PD-45W	N/A	AE

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

4. TEST FACILITY AND TEST INSTRUMENT USED

4.1 Test Facility

Guangdong Zhonghan Testing Technology Co., Ltd.
Add. : Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

FCC Registration Number:255941
Designation Number: CN0325
IC Registered No.: 29832
CAB identifier: CN0143

4.2 Instrument List For All Test Items

Radiation Test Instrument

Item	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Next Cal.
1	Receiver	R&S	ESCI	100874	May 10, 2024	May 09, 2025
2	Loop antenna	EMCI	LAP600	272	May 10, 2024	May 09, 2025
3	Amplifier	Schwarzbeck	BBV 9743 B	00378	May 10, 2024	May 09, 2025
4	Amplifier	Schwarzbeck	BBV 9718 B	00040	May 10, 2024	May 09, 2025
5	Bilog Antenna	Schwarzbeck	VULB9162	00498	May 28, 2024	May 27, 2025
6	Horn Antenna	Schwarzbeck	BBHA9120D	02623	May 16, 2024	May 15, 2025
7	Horn Antenna	A.H.SYSTEMS	SAS574	588	May 10, 2024	May 09, 2025
8	Amplifier	AEROFLEX	100KHz-40GHz	097	May 10, 2024	May 09, 2025
9	Spectrum Analyzer	R&S	FSV40	101413	May 16, 2024	May 15, 2025
10	Spectrum Analyzer	KEYSIGHT	N9020A	MY53420208	May 10, 2024	May 09, 2025
11	WIDBAND RADIO COMMUNICATION TESTER	R&S	CMW500	109863	May 10, 2024	May 09, 2025
12	Single Generator	Agilent	N5182A	MY48180575	May 10, 2024	May 09, 2025
13	Power Sensor	MWRFtest	MW100-RFCB	/	May 10, 2024	May 09, 2025
14	CABLE	EMToni	DA800-NM-NM-11000MM	/	May 10, 2024	May 09, 2025

Conduction Test Instrument

Equipment	Manufacturer	Model	Serial No.	Last Cal.	Next Cal.
Receiver	R&S	ESCI	100874	May 10, 2024	May 09, 2025
LISN	R&S	ENV216	102794	May 10, 2024	May 09, 2025
ISN CAT 6	Schwarzbeck	NTFM 8158	00318	May 10, 2024	May 09, 2025
ISN CAT 5	Schwarzbeck	CAT5 8158	00343	May 10, 2024	May 09, 2025
Capacitive Voltage Probe	Schwarzbeck	CVP 9222 C	00101	May 10, 2024	May 09, 2025
Current Transformer Clamp	Schwarzbeck	SW 9605	SW9605 #209	May 10, 2024	May 09, 2025
CABLE	EMToni	G223-NM-BNC M-2000MM	/	May 10, 2024	May 09, 2025

4.3 Testing Software

Project	Software name	Edition
RF Conducted	MTS 8310	2.0.0.0
Conducted Emission	EZ-EMC	EMC-CON 3A1.1+
Radiated Emission	EZ-EMC	FA-03A2 RE+

4.4 Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended 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	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF conducted power	±0.16dB
3	Conducted spurious emissions	±0.21dB
4	All radiated emissions (9k-30MHz)	±4.68dB
5	All radiated emissions (<1G)	±4.68dB
6	All radiated emissions (>1G)	±4.89dB
7	Temperature	±0.5°C
8	Humidity	±2%
9	Occupied Bandwidth	±4.96dB

Decision Rule

☒ Uncertainty is not included

☐ Uncertainty is included

5. CONDUCTED EMISSION TEST

5.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

5.1.1 POWER LINE CONDUCTED EMISSION Limi/

FREQUENCY (MHz)	Limit (dBuV)		Standard
	QP	AVG	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) *Decreases with the logarithm of the frequency.

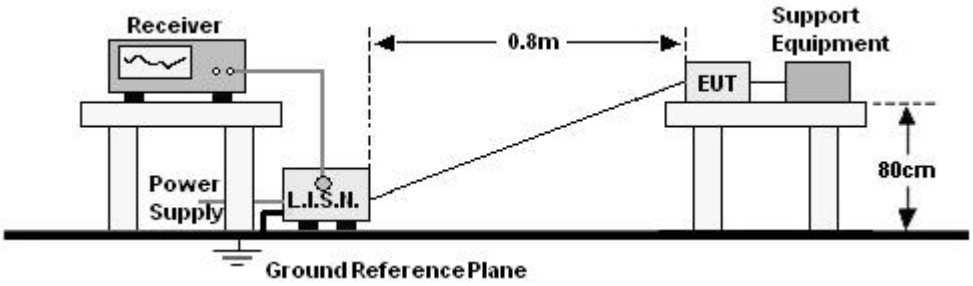
5.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipmen/ powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.1.3 DEVIATION FROM TEST STANDARD

No deviation

5.1.4 TEST SETUP

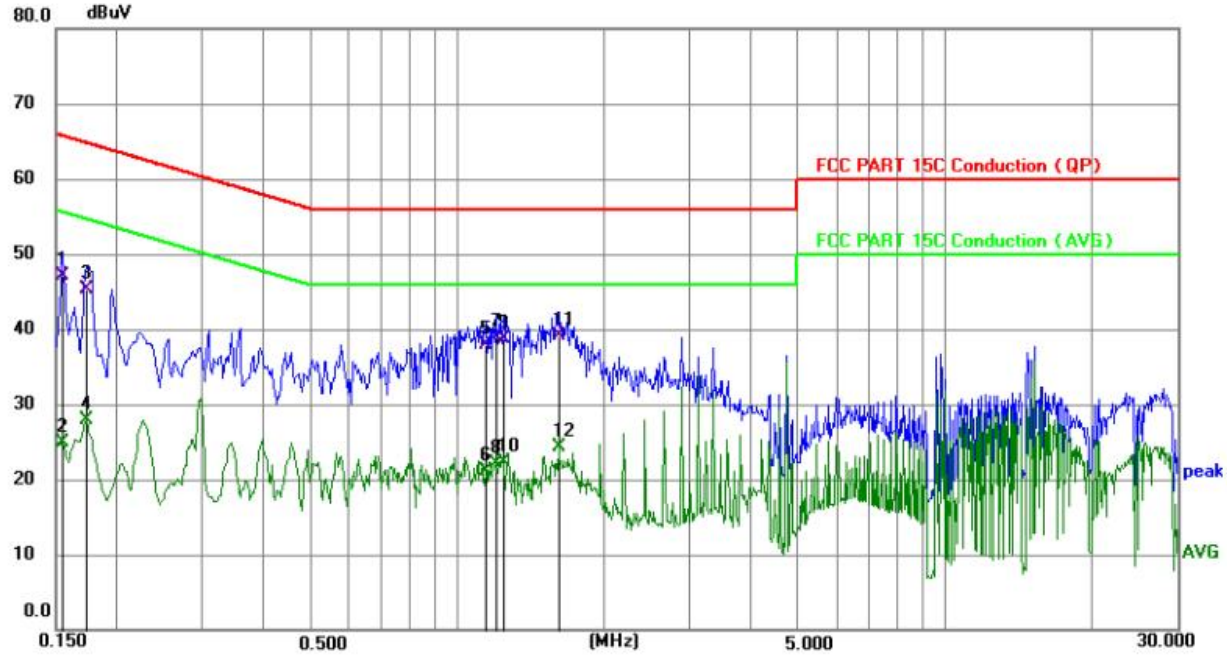


5.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

5.1.6 Test Result

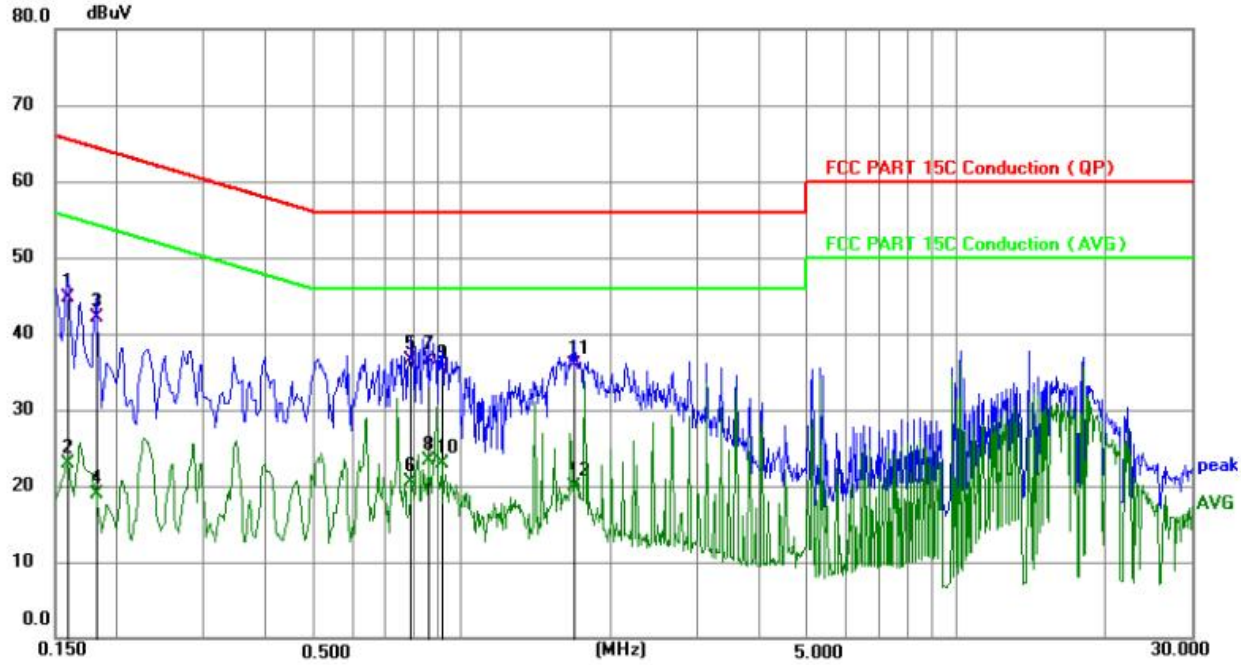
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1548	37.19	9.89	47.08	65.74	-18.66	QP	P	
2	0.1548	15.06	9.89	24.95	55.74	-30.79	AVG	P	
3	0.1730	35.38	9.90	45.28	64.82	-19.54	QP	P	
4	0.1730	18.06	9.90	27.96	54.82	-26.86	AVG	P	
5	1.1412	27.84	10.06	37.90	56.00	-18.10	QP	P	
6	1.1412	11.05	10.06	21.11	46.00	-24.89	AVG	P	
7	1.1970	28.89	10.06	38.95	56.00	-17.05	QP	P	
8	1.1970	12.03	10.06	22.09	46.00	-23.91	AVG	P	
9	1.2422	28.65	10.06	38.71	56.00	-17.29	QP	P	
10	1.2422	12.30	10.06	22.36	46.00	-23.64	AVG	P	
11 *	1.6104	29.02	10.06	39.08	56.00	-16.92	QP	P	
12	1.6104	14.29	10.06	24.35	46.00	-21.65	AVG	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Mesurement Level = Reading level + Correct Factor

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1590	34.80	9.89	44.69	65.52	-20.83	QP	P	
2	0.1590	12.96	9.89	22.85	55.52	-32.67	AVG	P	
3	0.1815	32.28	9.90	42.18	64.42	-22.24	QP	P	
4	0.1815	9.01	9.90	18.91	54.42	-35.51	AVG	P	
5 *	0.7890	26.50	10.04	36.54	56.00	-19.46	QP	P	
6	0.7890	10.44	10.04	20.48	46.00	-25.52	AVG	P	
7	0.8565	26.40	10.05	36.45	56.00	-19.55	QP	P	
8	0.8565	13.21	10.05	23.26	46.00	-22.74	AVG	P	
9	0.9105	25.20	10.05	35.25	56.00	-20.75	QP	P	
10	0.9105	12.76	10.05	22.81	46.00	-23.19	AVG	P	
11	1.6935	25.78	10.06	35.84	56.00	-20.16	QP	P	
12	1.6935	9.89	10.06	19.95	46.00	-26.05	AVG	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Mesurement Level = Reading level + Correct Factor

6.RADIATED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 1GHz
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

6.1 Radiated Emission Limit

Limi/ for frequency below 30MHz

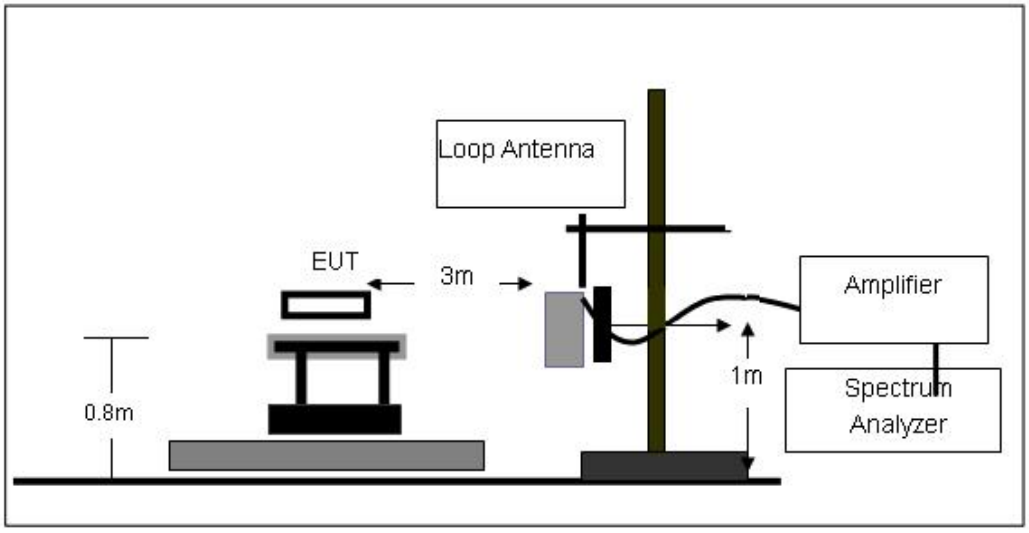
Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009-0.490	2400/F(kHz)	300	Peak Value
0.490-1.705	24000/F(kHz)	30	Quasi-peak Value
1.705-30	30	30	Quasi-peak Value

Limi/ for frequency Above 30MHz

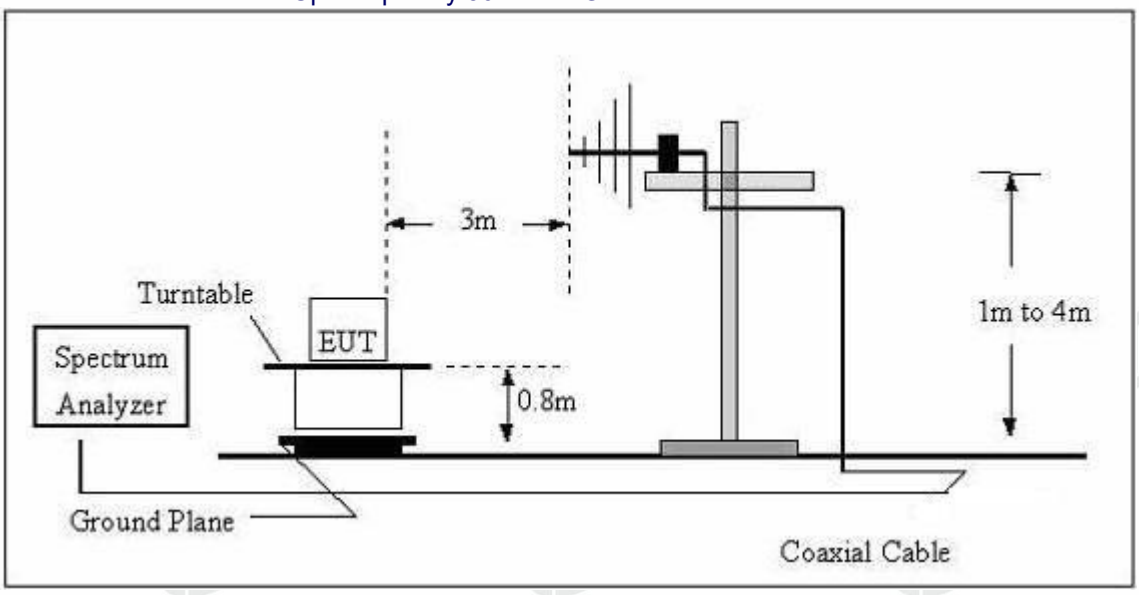
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.00	Quasi-peak Value
88MHz-216MHz	43.50	Quasi-peak Value
216MHz-960MHz	46.00	Quasi-peak Value
960MHz-1GHz	54.00	Quasi-peak Value
Above 1GHz	54.00	Average Value
	74.00	Peak Value

6.2 Anechoic Chamber Test Setup Diagram

（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



The radiated emission test were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limit.

6.3 Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. 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 move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement.

6.4 DEVIATION FROM TEST STANDARD

No deviation

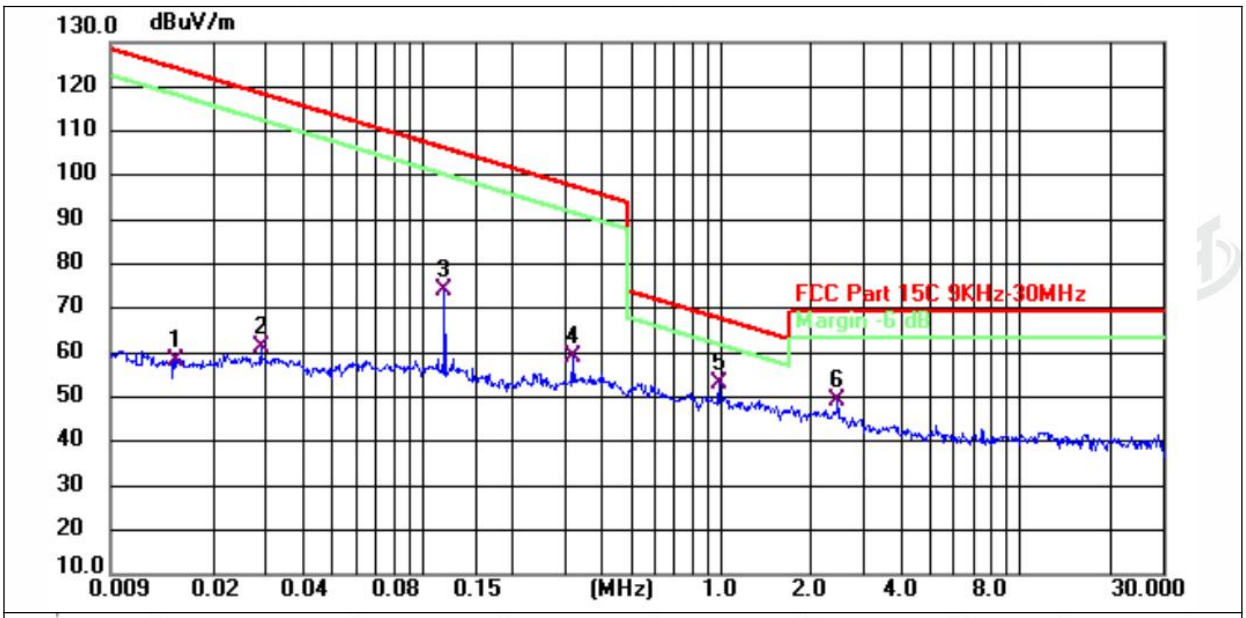
6.5 Test Result

Measurement data:

Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80
Limit dBuV/m @3m = Limit dBuV/m @30m + 40

9 kHz~30 MHz

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	coaxial
Test Voltage:	AC 120V/60Hz	Test Modes:	Mode 3

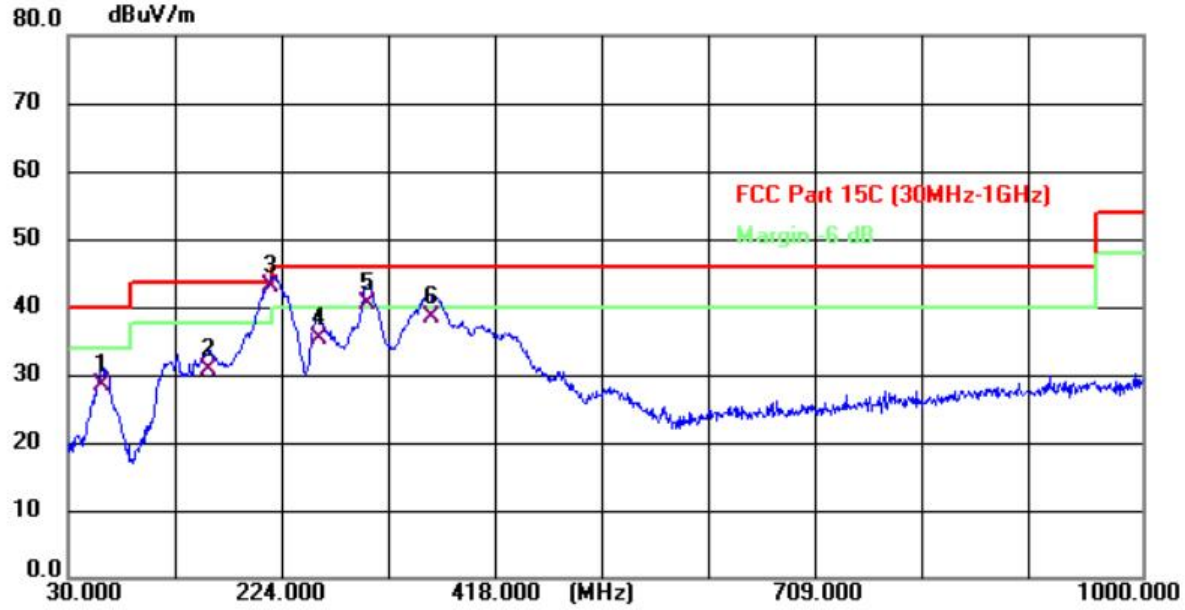


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.015	57.95	0.18	58.13	124.08	-65.95	QP
2	0.029	61.16	0.18	61.34	118.36	-57.02	QP
3	0.118	73.86	0.16	74.02	106.17	-32.15	QP
4	0.317	58.15	0.77	58.92	97.58	-38.66	QP
5 *	0.978	51.20	2.07	53.27	67.80	-14.53	QP
6	2.446	44.24	5.08	49.32	69.54	-20.22	QP

Note:
Pre-scan in the all of mode, the worst case in of was recorded.
Factor = antenna factor + cable loss – pre-amplifier.
Emission Level = Meter Reading - Factor
Margin = Emission Level- Limit.
The amplitude of emissions which are attenuated by more than 20db below the permissible value has no need to be reported.

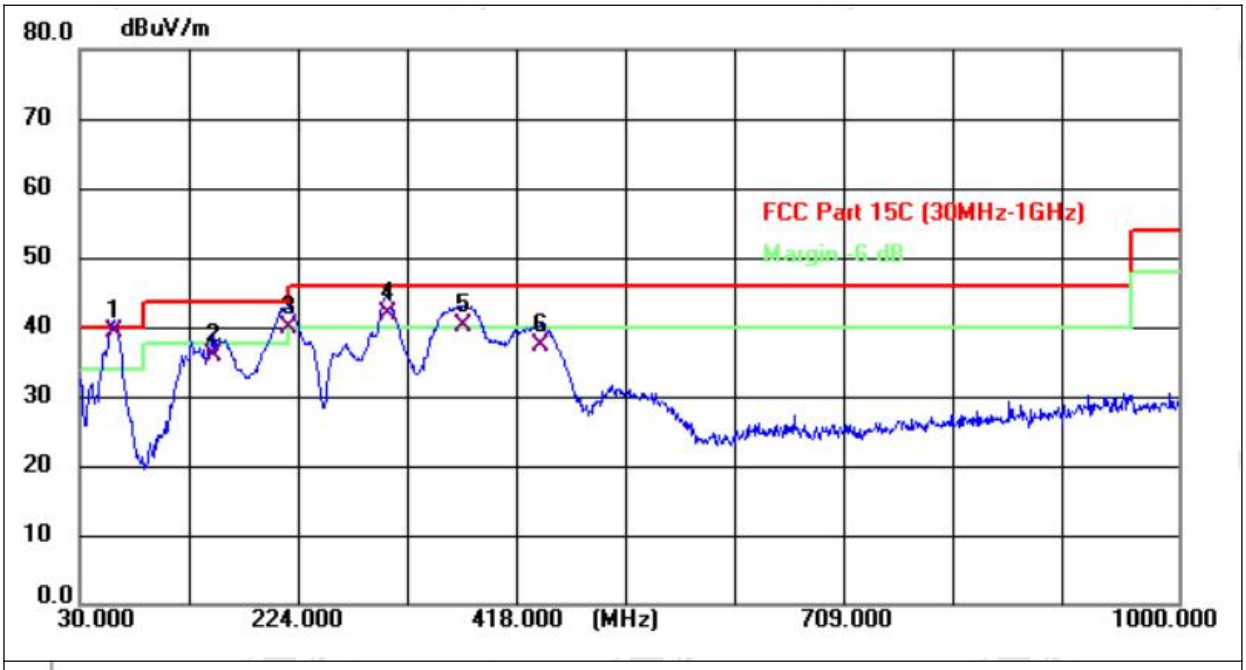
30MHz-1GHz

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Modes:	Mode 3



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	61.040	39.30	-10.96	28.34	40.00	-11.66	QP
2	157.070	44.36	-13.76	30.60	43.50	-12.90	QP
3 *	213.330	53.64	-10.64	43.00	43.50	-0.50	QP
4	256.980	44.35	-9.11	35.24	46.00	-10.76	QP
5 !	300.630	48.54	-8.24	40.30	46.00	-5.70	QP
6	358.830	45.46	-6.89	38.57	46.00	-7.43	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Test Modes:	Mode 3



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	61.040	50.16	-10.96	39.20	40.00	-0.80	QP
2	148.340	49.81	-14.08	35.73	43.50	-7.77	QP
3 !	214.300	50.53	-10.61	39.92	43.50	-3.58	QP
4 !	301.600	50.06	-8.22	41.84	46.00	-4.16	QP
5 !	369.500	46.79	-6.65	40.14	46.00	-5.86	QP
6	436.430	42.63	-5.30	37.33	46.00	-8.67	QP

Remarks:
1. Factor = Antenna Factor + Cable Loss – Preamplifier Factor
2. Level = Reading + Factor
3. Margin = Emission Level- Limit.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

7.BANDWIDTH TEST

1. Set RBW = 10 Hz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude point (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

TEST SETUP

Temperature：	25.0 ℃	Relative Humidity：	54.1%
Pressure：	101kPa		

Frequency (KHz)	20dB bandwidth (KHz)	Result
118.1	0.079	Pass

8.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.	
EUT Antenna:	
The antenna is Coil Antenna, the best case gain of the antennas is 0dBi, reference to the appendix II for details	

9.TEST SETUP PHOTO

Reference to the appendix I for details.

10.EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

※※※※※ END OF REPORT ※※※※※