FCC Test Report

Client Name	:	**Ugreen Group Limited**
Client Address	:	**Ugreen Building,Longcheng Industrial Park, Longguanxi Road,Longhua, ShenZhen, China**
Product Name	:	**Magnetic Wireless Car Charger**
Report Date	:	**Dec. 21, 2022**

Shenzhen Anbotek Compliance Laboratory Limited

Contents

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TEST REPORT

Applicant	:	Ugreen Group Limited
Manufacturer	:	Ugreen Group Limited
Product Name	:	Magnetic Wireless Car Charger
Model No.	:	CD345, 15120, 15120P, 15120X, 15120A, 15120B, 15120U, 15120JP
Trade Mark	:	UGREEN
Rating(s)	:	Input: 5V⎓ 2A, 9V⎓ 2A,12V⎓ 2A Output: 5W; 7.5W; 10W; 15W
Test Standard(s)	:	**FCC Part15 Subpart C, Paragraph 15.209**
Test Method(s)	:	**ANSI C63.10: 2020**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt	Nov. 21, 2022
Date of Test	Nov. 21 ~ 30, 2022
Prepared By	(TuTu Hong)
Approved & Authorized Signer	(Kingkong Jin)

Revision History

Report Version	Description	Issued Date
R00	Original Issue.	Dec. 21, 2022

1. General Information

1.1. Client Information

Applicant	:	Ugreen Group Limited
Address	:	Ugreen Building,Longcheng Industrial Park, Longguanxi Road,Longhua, ShenZhen, China
Manufacturer	:	Ugreen Group Limited
Address	:	Ugreen Building,Longcheng Industrial Park, Longguanxi Road,Longhua, ShenZhen, China
Factory	:	Shenzhen Powerqi Technology Co., Ltd.
Address	:	2th Floor, A4 Building, A4 Block, Fangxin Science & Tech. Park, Longgang District, Shenzhen, China

1.2. Description of Device (EUT)

Product Name	:	Magnetic Wireless Car Charger
Model No.	:	CD345, 15120, 15120P, 15120X, 15120A, 15120B, 15120U, 15120JP (Note: All samples are the same except the model number, so we prepare "CD345" for test only.)
Trade Mark	:	UGREEN
Test Power Supply	:	DC 12V (Note: During the test, pre-scan all test voltages and only show the test data of the worst case (DC 12V) in this Report.
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	N/A
RF Specification		
Operation Frequency	:	111-205kHz
Modulation Type	:	FSK
Antenna Type	:	Inductive loop coil Antenna
Antenna Gain(Peak)	:	0 dBi (Provided by customer)
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

1.3. Auxiliary Equipment Used During Test

Description	Rating(s)
Wireless charging load	Manufacturer: Shenzhen Ouju Technology Co., Ltd. M/N: CD2577 Power: 5W/7.5W/10W/15W

1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	WPT Mode

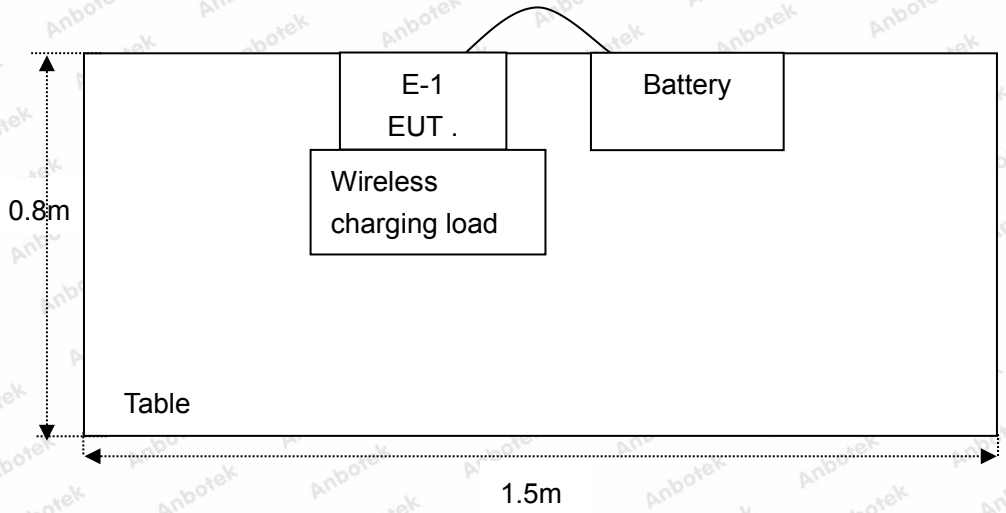
For Radiated Emission	
Final Test Mode	Description
Mode 1	WPT Mode

Note: (1)Test channel is 0.1213MHz.

(2) All the situation(full load, half load and empty load) has been tested,only the worst situation (full load 15W) was recorded in the report.

1.5. Description Of Test Setup

RE



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 23, 2022	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jul. 05, 2022	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 13, 2022	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 23, 2022	1 Year
5.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2022	1 Year
6.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 13, 2022	1 Year
7.	EMI Preamplifier	SKET Electronic	LNPA-0118G-45	SKET-PA-002	Oct. 13, 2022	1 Year
8.	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	Oct. 16, 2022	3 Year
9.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 23, 2022	1 Year
10.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Oct. 23, 2022	1 Year
11.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	Oct. 23, 2022	1 Year
12.	Pre-amplifier	SONOMA	310N	186860	Oct. 23, 2022	1 Year
13.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
14.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 13, 2022	1 Year
15.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 13, 2022	1 Year
16.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 13, 2022	1 Year
17.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 22, 2022	1 Year
18.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Oct. 19, 2022	1 Year

1.7. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 3.9 dB (Horizontal)
		Ur = 3.8 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB

1.8. Description of Test Facility

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

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518128

2. Summary of Test Results

Standard Section	Test Item	Result
15.203	Antenna Requirement	PASS
15.207	Conducted Emission Test	N/A
15.205/15.209	Spurious Emission	PASS

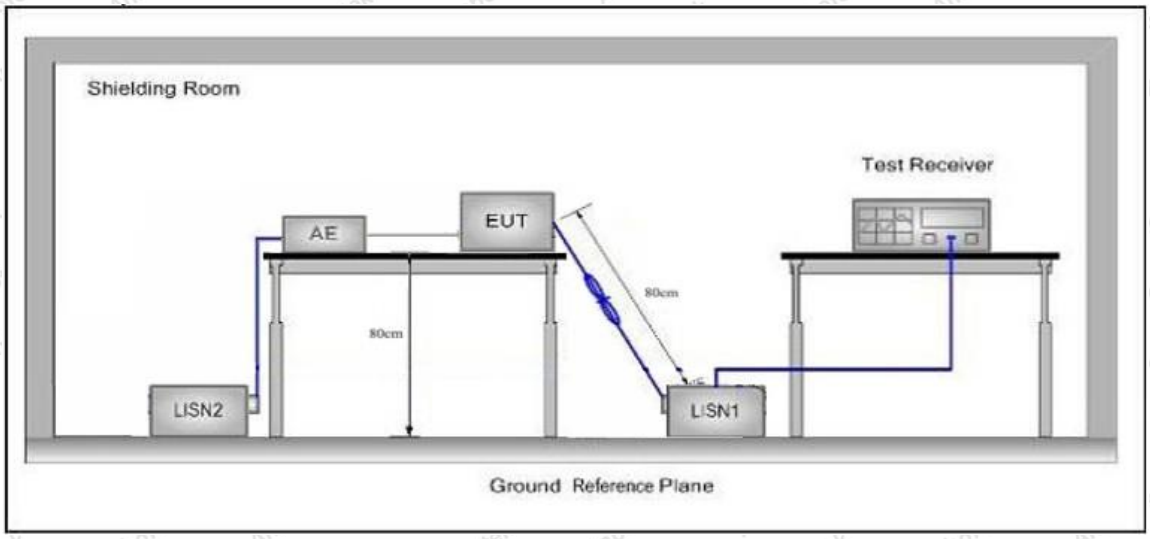
Note: N/A" denotes test is not applicable in this Test Report

3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2020 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Not applicable.

This is a Car device, which is intended to be installed on a vehicle only, not connet to the public utility under normal use.15.207 test is exempted.

4. Radiation Spurious Emission

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:
(1)The lower limit shall apply at the transition frequency.
(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

4.2. Test Setup

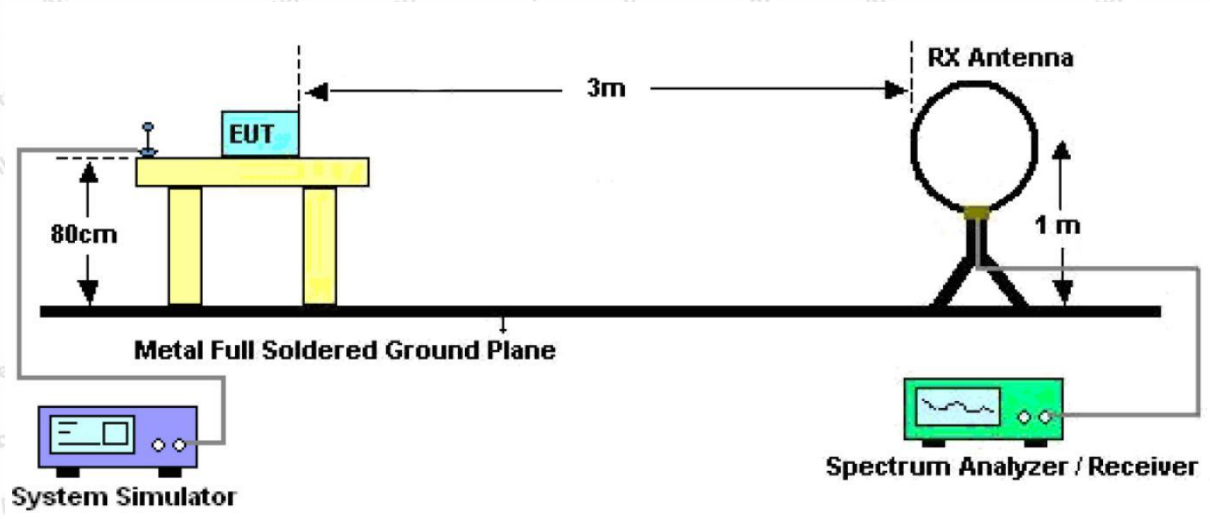


Figure 1. Below 30MHz

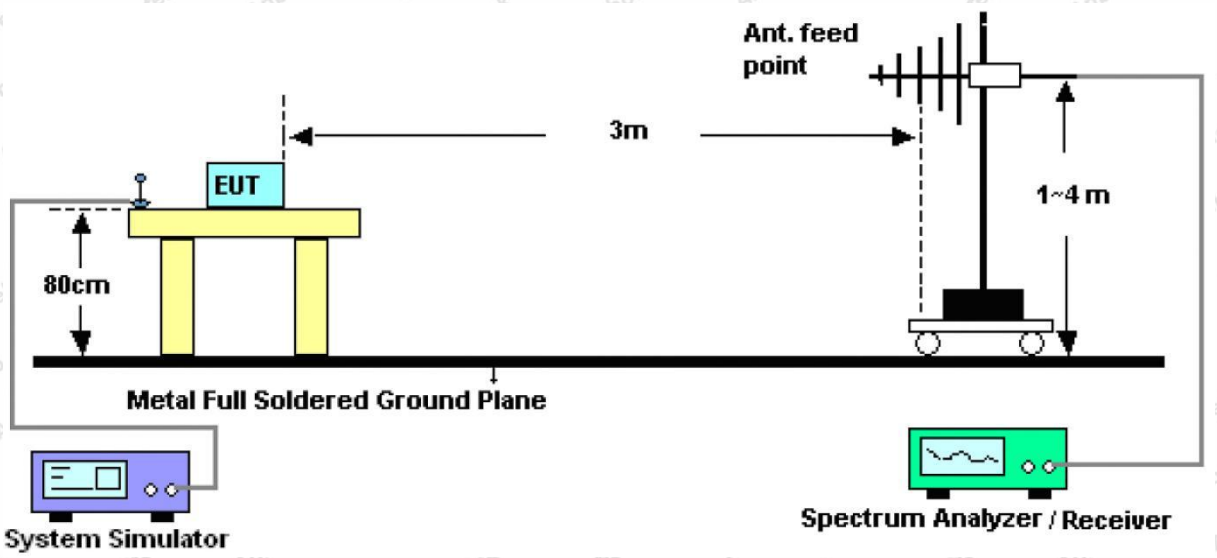


Figure 2. 30MHz to 1GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
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 be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

4.4. Test Data

PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

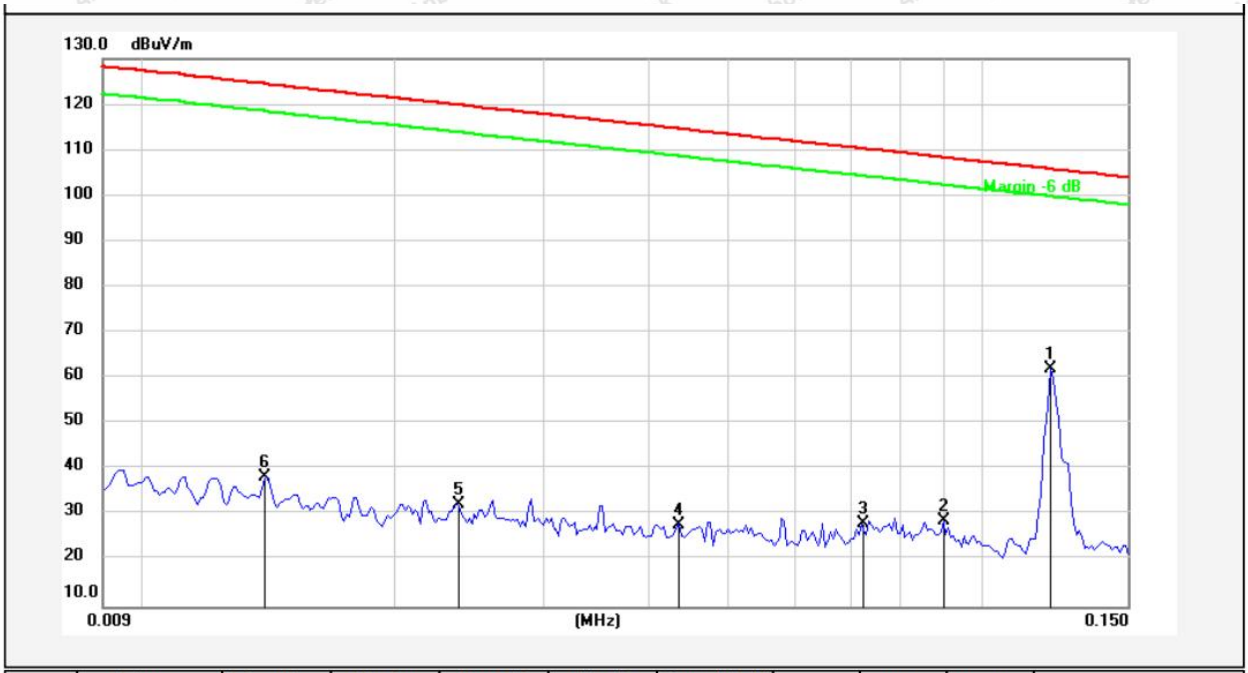
Test Results (Between 9KHz – 150KHz)

Test Mode: Mode 1

Distance: 3m

Power Source: DC 12V

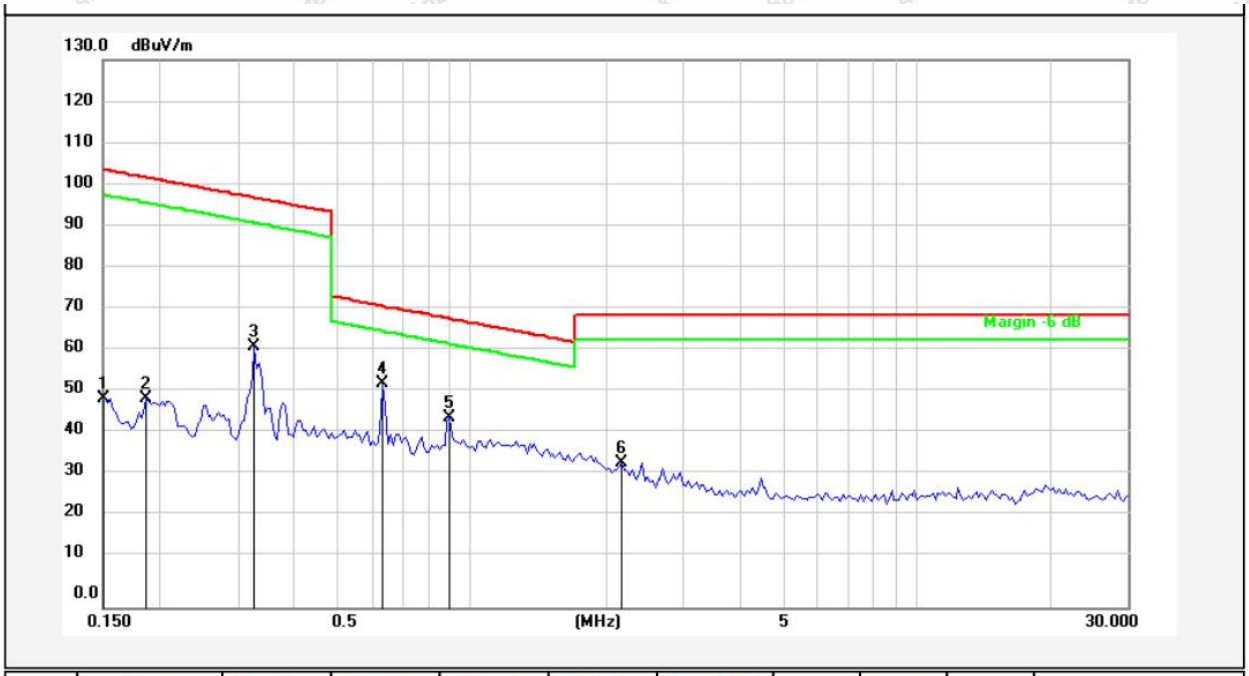
Temp.(℃)/Hum.(%RH): 24.2℃/57%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.1213	41.67	20.34	62.01	105.85	-43.84	AV			
2	0.0903	8.33	20.36	28.69	108.40	-79.71	AV			
3	0.0722	7.67	20.37	28.04	110.33	-82.29	AV			
4	0.0437	7.54	20.46	28.00	114.67	-86.67	AV			
5	0.0238	11.95	20.38	32.33	119.91	-87.58	AV			
6	0.0140	18.08	20.18	38.26	124.49	-86.23	AV			

Test Results (Between 0.15MHz – 30MHz)

Test Mode:	Mode 1
Distance:	3m
Power Source:	DC 12V
Temp.(℃)/Hum.(%RH):	24.2℃/57%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.1520	29.33	20.33	49.66	103.90	-54.24	peak			
2	0.1879	29.32	20.32	49.64	102.07	-52.43	peak			
3	0.3265	41.54	20.29	61.83	97.30	-35.47	peak			
4	0.6355	33.01	20.27	53.28	71.55	-18.27	peak			
5	0.8968	24.78	20.26	45.04	68.56	-23.52	peak			
6	2.1783	14.16	20.28	34.44	69.50	-35.06	peak			

Remark: According to FCC PART 15.209 (d), the emission limits for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Results (Between 30MHz –1000 MHz)

Test Mode:	Mode 1
Distance:	3m
Power Source:	DC 12V
Polarization:	Horizontal
Temp.(℃)/Hum.(%RH):	24.3℃/49%RH

No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	55.0274	46.97	-17.63	29.34	40.00	-10.66	QP			
2	137.4202	49.42	-22.93	26.49	43.50	-17.01	QP			
3	154.8204	52.60	-23.42	29.18	43.50	-14.32	QP			
4	165.4866	49.57	-23.79	25.78	43.50	-17.72	QP			
5	191.7450	54.64	-22.68	31.96	43.50	-11.54	QP			
6	202.8104	50.19	-22.29	27.90	43.50	-15.60	QP			

Test Mode: Mode 1
Distance: 3m
Power Source: DC 12V
Polarization: Vertical
Temp.(℃)/Hum.(%RH): 24.3℃/49%RH

No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	30.1054	50.57	-17.95	32.62	40.00	-7.38	QP			
2	39.0245	50.03	-15.06	34.97	40.00	-5.03	QP			
3	53.5052	50.46	-17.07	33.39	40.00	-6.61	QP			
4	93.4402	45.65	-17.33	28.32	43.50	-15.18	QP			
5	122.8340	46.19	-20.36	25.83	43.50	-17.67	QP			
6	78.3089	56.12	-19.50	36.62	40.00	-3.38	QP			

5. Antenna Requirement

5.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	1) 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.

5.2. Antenna Connected Construction

The antenna is a Inductive loop coil Antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

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