TEST REPORT

Product Name	:	Wireless charger
Model Number	:	WC009-xUQ29-yy
FCC ID	:	2BENG-WC009XUQ29YY

Prepared for	:	JIANGSU MULIN INTELLIGENCE ELECTRIC CO., LTD.
Address	:	No. 6, Xiajia Road, Henglin Town, Economic Development Zone, Changzhou, Jiangsu, China
Prepared by	:	EMTEK (NINGBO) CO., LTD.
Address	:	No. 8, Building 8, Lane 216, Qingyi Road, Ningbo Hi-Tech Zone, Ningbo, Zhejiang, China Tel: +86-574-27907998 Fax: +86-574-27721538

Report Number	:	ENB2401050105W00101R
Date(s) of Tests	:	January 05, 2024 to January 18, 2024
Date of Issue	:	January 19, 2024

TABLE OF CONTENT

TEST REPORT DESCRIPTION

Applicant	:	JIANGSU MULIN INTELLIGENCE ELECTRIC CO., LTD.
Address	:	No. 6, Xiajia Road, Henglin Town, Economic Development Zone, Changzhou, Jiangsu, China.
Manufacturer	:	JIANGSU MULIN INTELLIGENCE ELECTRIC CO., LTD.
Address	:	No. 6, Xiajia Road, Henglin Town, Economic Development Zone, Changzhou, Jiangsu, China.
EUT	:	Wireless charger
Model Name	:	WC009-xUQ29-yy
Trademark	:	N/A

We hereby certify that:

The above equipment was tested by EMTEK (NINGBO) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15C

The test results of this report relate only to the tested sample identified in this report.

Date of Test : January 05, 2024 to January 18, 2024

Prepared by : June Gao /Engineer

Reviewer : Vinay /Supervisor

Approve & Authorized Signer : Tony wei/Manager

Modified Information

Version	Report No.	Revision Data	Summary
/	ENB2401050105W00101R	/	Original Report

1. SUMMARY OF TEST RESULTS

EMISSION		
Description of Test Item	Standard & Limits	Results
Conducted Emission	FCC Part 15, Subpart C- Section 15.207 ANSI C63.10-2013	Pass
Radiated Emission	FCC Part 15, Subpart C- Section 15.209 ANSI C63.10-2013	Pass
Note: N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product:	Wireless charger
Model Number:	WC009-xUQ29-yy Note: WC009-xUQ29-yy "x" represents the total number of USB and TYPE-C interfaces (probably 0.1.2); "yy" stands for serial number“01-99” (only appearance is different). We chose WC009-2UQ29-01 for RF testing.
Sample Number:	ENB2401050105W001-1-1
Power Supply:	AC 120V/60Hz
Wireless specification	5W(MAX)
Modulation:	Ask
Maximum Power Rate:	94.14 dBuV/m
Frequency Range:	110 kHz~205 KHz
Antenna Type:	Integral Antenna(Induction coil)
Antenna Gain:	0 dBi
Operating Temperature	-40°C ~ +85°C
Date of Received:	January 05, 2024

2.2. Input / Output Ports

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
1	DC Power Port	DC	No	N/A	None

* Note: For the purposes of the present document, the following symbols apply:
AC AC Power Port
DC DC Power Port
N/E Non-Electrical
I/O Signal Input or Output Port (Not Involved in Process Control)
TP Telecommunication Ports

2.3. Independent Operation Modes

A 1. Wireless Charging(Full load)

2.4. Test Manner

Test Items	Test Voltage	Operation Modes
Conducted Emission	AC 120V/60Hz	Mode A.1
Radiated Emission	AC 120V/60Hz	Mode A.1

2.5. Description of Test Facility

Site Description

EMC Lab. : **Accredited by CNAS**
The Certificate Registration Number is L6666.
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)

Designation by FCC
Designation Number: CN1354
Test Firm Registration Number: 427606

Accredited by A2LA
The certificate is valid until May 31, 2025

Accredited by Industry Canada
The Conformity Assessment Body Identifier is CN0114
Test Firm Registration Number: 9469A

Name of Firm : EMTEK (NINGBO) CO., LTD.

Site Location : No. 8, Building 8, Lane 216, Qingyi Road, Ningbo Hi-Tech Zone, Ningbo, Zhejiang, China

2.6. Description of Support Device

No.	Equipment	Trade name	Model	S/N	Power Cord
1	Wireless charging load	/	5w	/	/

2.7. Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	±1x10^-5
Conducted Emissions Test	±2.0 dB
Radiated Emission Test	±2.0 dB
Occupied Bandwidth Test	±1.0 dB
Temperature	±0.5 ℃
Humidity	±3 %

Measurement Uncertainty for a level of Confidence of 95%

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. Conducted Emission Test Equipment

Equ.No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-002	EMI Test Receiver	R & S	ESCI	101107	July 06, 2023	1 Year
ENE-003	L.I.S.N	R & S	ENV216	101193	July 06, 2023	1 Year
ENE-162-1	RF Cable	TIMES	2M(N-N)	605236-0001	May 31, 2023	1 Year
ENE-150	Conduction Test Room 2#	SKET	6.5*5*4m	/	Apr 17, 2023	3 Year

3.2. For 3m Radiated Emission Measurement 9K-1GHz

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-185	EMI Test Receiver	R&S	ESR7	102480	Apr 28, 2023	1 Year
ENE-188	Low Frequency Field Antenna	Schwarzbeck	FMZB 1513-60	00026	Aug 24, 2022	2 Year
ENE-279-1	RF Cable	Rosenberger	L17-C001-7000	/	May 31, 2023	1 Year
ENE-279-6	RF Cable	Rosenberger	L08-C446-1500	/	May 31, 2023	1 Year
ENE-280-1	RF Cable	Rosenberger	L17-C001-3500	/	May 31, 2023	1 Year
ENE-280-2	RF Cable	Rosenberger	L17-C001-1500	/	May 31, 2023	1 Year
ENE-204	Low Frequency Notch Filter RF Switching	JS Denki	JSDSW-F	JSDSW2211D02	Apr 28, 2023	1 Year
ENE-144	3-Meter Anechoic Chamber2#	SKET	9*6*6m	/	June 19, 2022	3 Year

3.3. For 3m Radiated Emission Measurement 30M-1GHz

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-185	EMI Test Receiver	R&S	ESR7	102480	Apr 28, 2023	1 Year
ENE-190	Antenna Multiple	Schwarzbeck	VULB 9163	01499	May 21, 2022	2 Year

ENE-195	Pre-Amplifier	JS Denki	PA09K03-40	JSPA21019	Apr 28, 2023	1 Year
ENE-204	Low Frequency Notch Filter RF Switching	JS Denki	JSDSW-F	JSDSW2211D02	Apr 28, 2023	1 Year
ENE-251	6dB Attenuator	Mini-Circuits	UNAT-6+	11542	July 06, 2023	1 Year
ENE-279-1	RF Cable	Rosenberger	L17-C001-7000	/	May 31, 2023	1 Year
ENE-279-2	RF Cable	Rosenberger	L17-C001-3500	/	May 31, 2023	1 Year
ENE-279-3	RF Cable	Rosenberger	L17-C001-1500	/	May 31, 2023	1 Year
ENE-279-4	RF Cable	Rosenberger	/	/	May 31, 2023	1 Year
ENE-279-5	RF Cable	Rosenberger	/	/	May 31, 2023	1 Year
ENE-279-6	RF Cable	Rosenberger	L08-C446-1500	/	May 31, 2023	1 Year
ENE-144	3-Meter Anechoic Chamber2#	SKET	9*6*6m	/	June 19, 2022	3 Year

3.4. For other test items:

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-256	EXA Signal Anaalyzer	Keysight	N9010B	MY62060219	July 05, 2023	1 Year
ENE-172	RF Control Unit	Tonscend	JS0806-2(V.6E)	21L8060521	March 01, 2023	1 Year

4. 20DB BANDWIDTH

4.1. Test Procedure

Set to the maximum power setting and enable the EUT transmit continuously
Set RBW =1%-5%OBW
Set the video bandwidth (VBW) =3*RBW
Set Span= 10 kHz
Set Detector = Peak.
Set Trace mode = max hold.
Set Sweep = auto couple.
Measure and record the results in the test report.

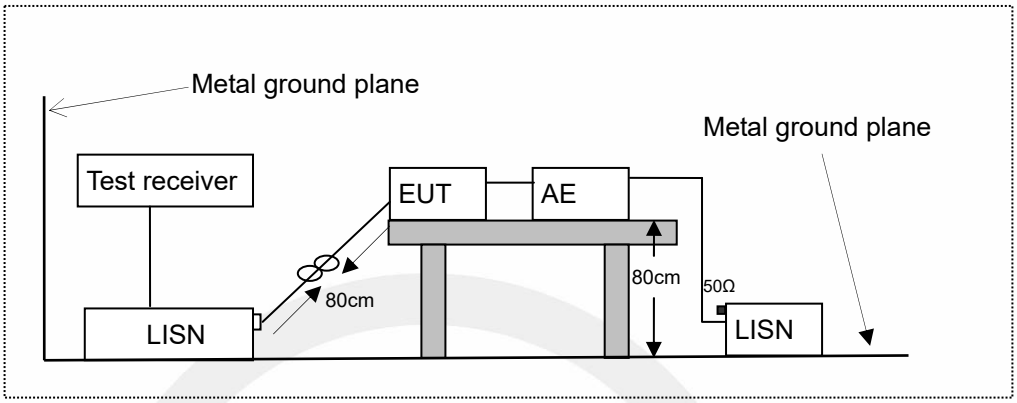
4.2. Test Results

Temperature:	18℃	Test Date:	January 17, 2024
Humidity:	36 %	Test By:	Chloe Cheng

20dB Band=6.074 kHz

5. POWER LINE CONDUCTED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup



LISN: Line Impedance Stabilization Network
AE: Associated equipment
EUT: Equipment under test

5.2. Limits

FCC Part 15.207

Frequency (MHz)			Limit (dBμV)	
			Quasi-peak Level	Average Level
0.15	~	0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50	~	5.00	56.0	46.0
5.00	~	30.00	60.0	50.0
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.				

5.3. Test Procedure

The EUT was placed on a desk 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a line impedance stabilization network (LISN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other LISN.

The LISN provides 50 ohm coupling impedance for the measuring instrument.

Both sides of AC line were checked for maximum conducted interference.

The frequency range from 150 kHz to 30 MHz was sweep.

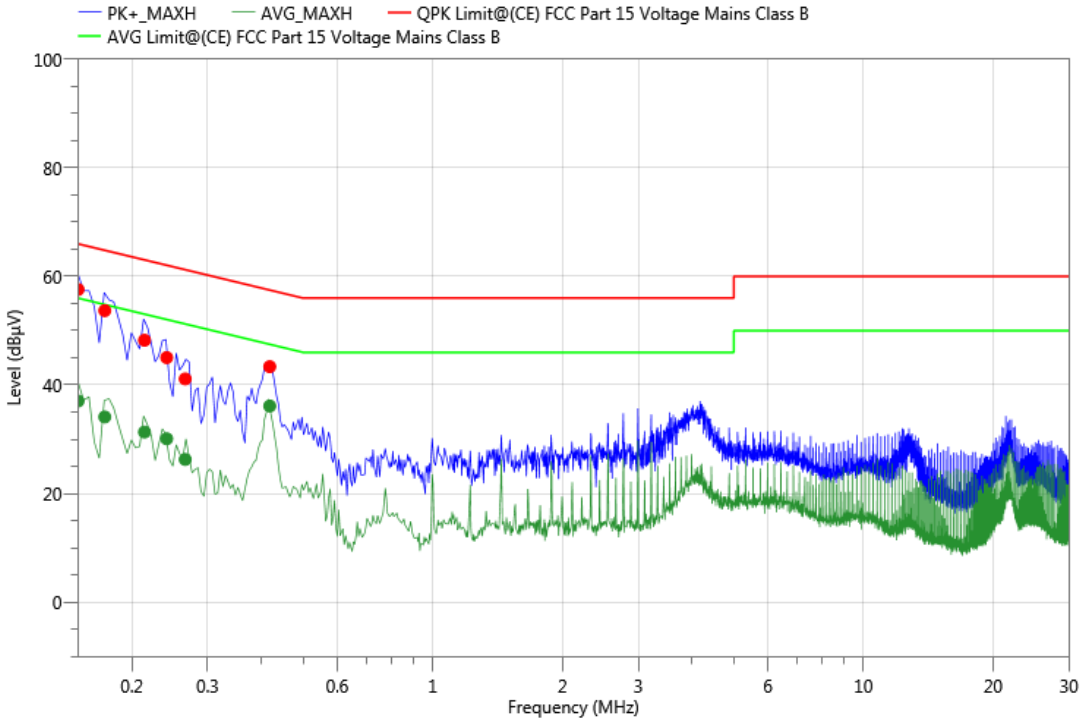
Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

Test results were obtained from the following equation:
Meas (dBμV) =Cable Loss (dB) + Reading (dBμV)
Margin (dB) =Limit-Meas

5.4. Measuring Results

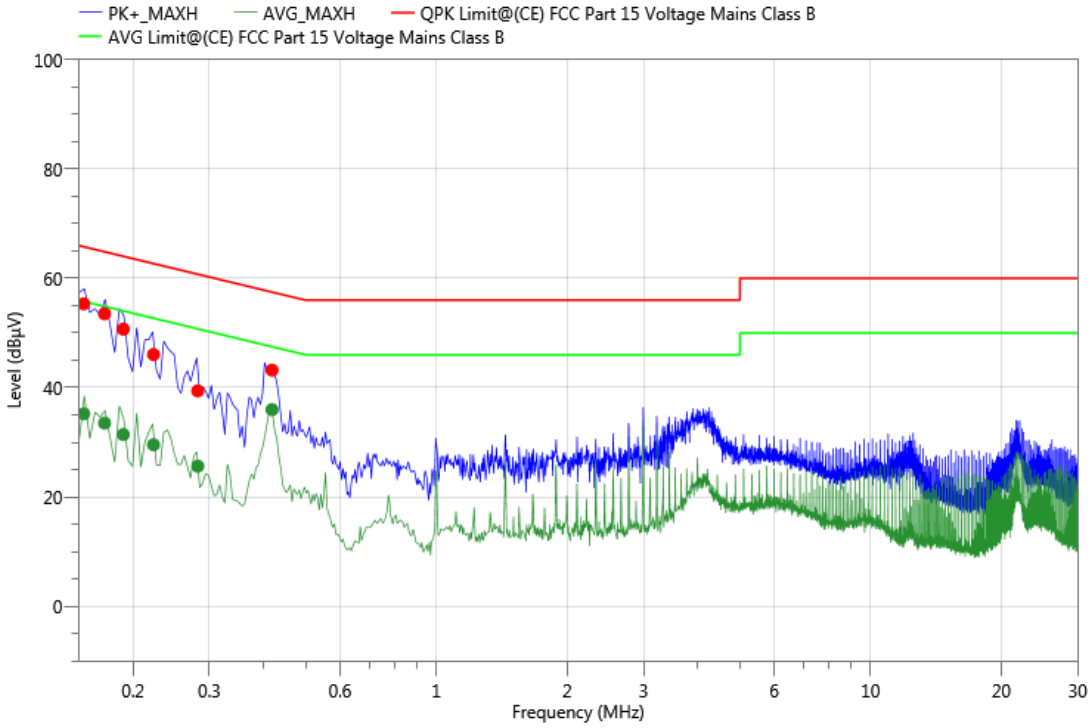
Pass.

Project Information			
Mode:	Wireless Charging	Voltage:	AC 120V/60Hz
Environment:	Temp:24℃; Humi: 33%	Engineer:	Ace Li



Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV)	Limit (dBµV)	Margin (dB)	Det.	Line	PE	Verdict
0.150	47.58	10.01	57.59	66.00	8.41	QPK	N	GND	PASS
0.150	27.03	10.01	37.04	56.00	18.96	AVG	N	GND	PASS
0.173	43.69	10.01	53.70	64.82	11.12	QPK	N	GND	PASS
0.173	24.09	10.01	34.10	54.82	20.72	AVG	N	GND	PASS
0.214	38.23	10.01	48.24	63.05	14.81	QPK	N	GND	PASS
0.214	21.31	10.01	31.32	53.05	21.73	AVG	N	GND	PASS
0.241	35.03	10.01	45.04	62.06	17.02	QPK	N	GND	PASS
0.241	20.07	10.01	30.08	52.06	21.98	AVG	N	GND	PASS
0.266	31.11	10.01	41.12	61.24	20.12	QPK	N	GND	PASS
0.266	16.27	10.01	26.28	51.24	24.96	AVG	N	GND	PASS
0.418	33.36	10.01	43.37	57.49	14.12	QPK	N	GND	PASS
0.418	26.11	10.01	36.12	47.49	11.37	AVG	N	GND	PASS

Project Information			
Mode:	Wireless Charging	Voltage:	AC 120V/60Hz
Environment:	Temp:24℃; Humi: 33%	Engineer:	Ace Li



Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV)	Limit (dBµV)	Margin (dB)	Det.	Line	PE	Verdict
0.154	45.33	10.01	55.34	65.78	10.44	QPK	L1	GND	PASS
0.154	25.20	10.01	35.21	55.78	20.57	AVG	L1	GND	PASS
0.172	43.51	10.01	53.52	64.86	11.34	QPK	L1	GND	PASS
0.172	23.51	10.01	33.52	54.86	21.34	AVG	L1	GND	PASS
0.190	40.70	10.01	50.71	64.04	13.33	QPK	L1	GND	PASS
0.190	21.40	10.01	31.41	54.04	22.63	AVG	L1	GND	PASS
0.223	36.05	10.01	46.06	62.71	16.65	QPK	L1	GND	PASS
0.223	19.54	10.01	29.55	52.71	23.16	AVG	L1	GND	PASS
0.282	29.40	10.01	39.41	60.76	21.35	QPK	L1	GND	PASS
0.282	15.62	10.01	25.63	50.76	25.13	AVG	L1	GND	PASS
0.418	33.19	10.01	43.20	57.49	14.29	QPK	L1	GND	PASS
0.418	25.96	10.01	35.97	47.49	11.52	AVG	L1	GND	PASS

6. RADIATED EMISSION TEST

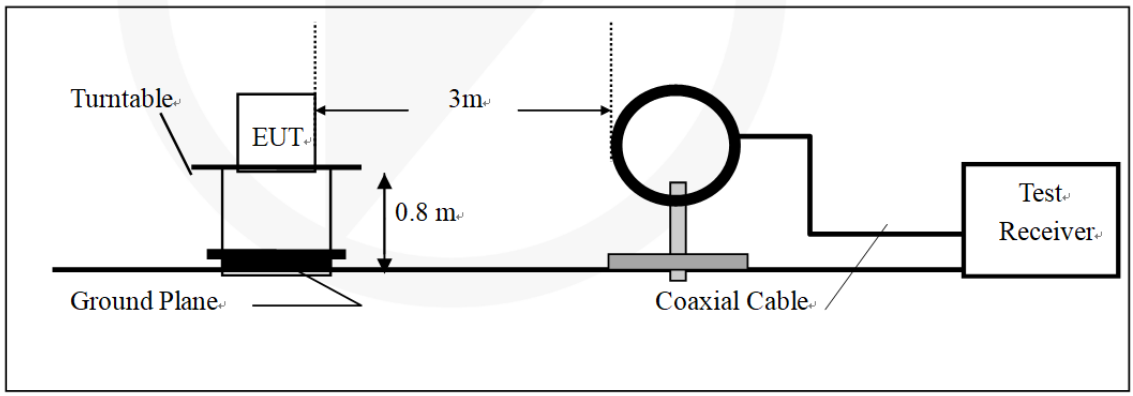
6.1.Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.
5. Use the following receiver/spectrum analyzer settings:

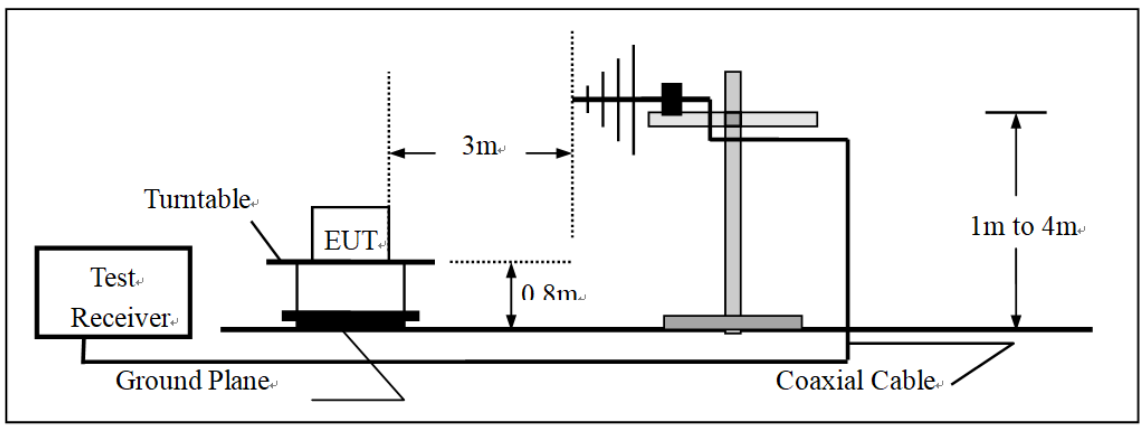
Span = wide enough to fully capture the emission being measured
RBW=200Hz for 9KHz to 150KHz,
RBW=9kHz for 150KHz to 30MHz,
RBW=120KHz for 30MHz to 1GHz
VBW ≥ 3*RBW
Sweep = auto
Detector function = QP
Trace = max hold

6.2.Test SET-UP (Block Diagram of Configuration)

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



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



6.3.Radiated Emission Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

FCC Part 15.209 Limit			
Frequency (MHz)	Field Strength Limitation		Field Strength Limitation Frequency tion at 3m Measurement Dist
	(uV/m)	Dist	(dBuV/m=20 log (uV/m))
0.009 – 0.490	2400 / F(kHz)	300m	20log 2400/F(kHz) + 40 log(300/3)
0.490 – 1.705	24000 / F(kHz)	30m	20log 24000/F(kHz) + 40 log(30/3)
1.705 – 30.00	30	30m	20log 30 + 40 log(30/3)
30.0 – 88.0	100	3m	20log 100
88.0 – 216.0	150	3m	20log 150
216.0 – 960.0	200	3m	20log 200
Above 960.0	500	3m	20log 500
Remark:	dBuV/m=20 log (uV/m) F=Frequency(kHz)		

15.205 Restricted bands of operation

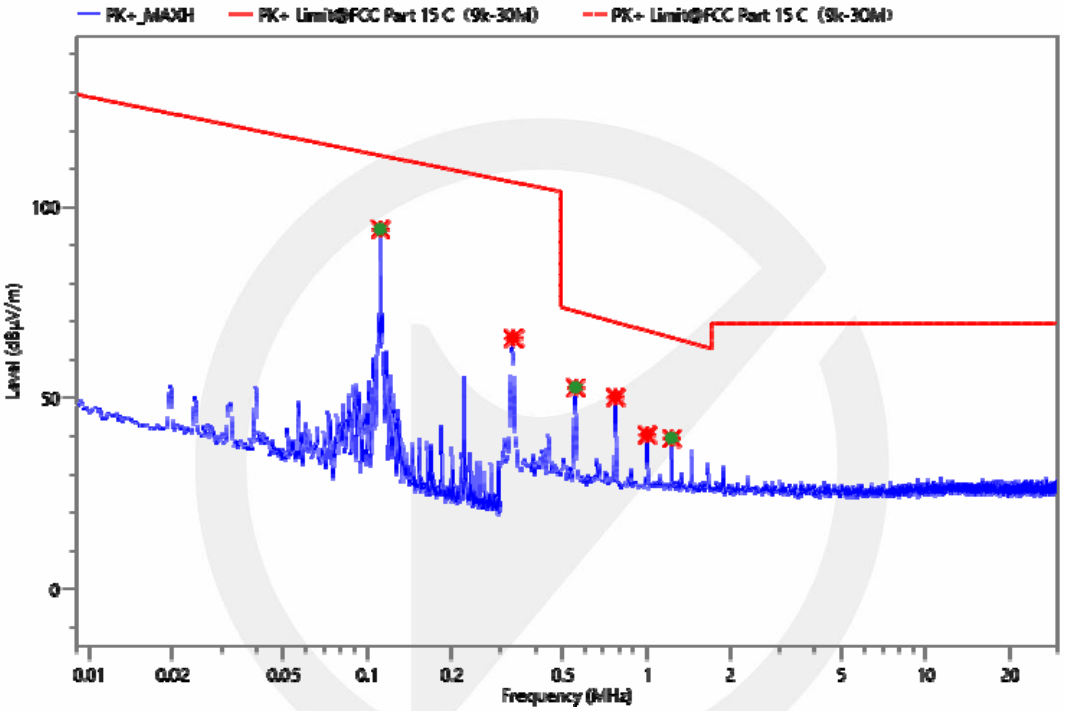
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

6.4.Measurement Result

9KHz-30 MHz:

Project Information			
Mode:	Wireless Charging	Voltage:	AC 120V/60Hz
Environment:	Temp: 18℃; Humi:38%	Engineer:	Chloe Cheng

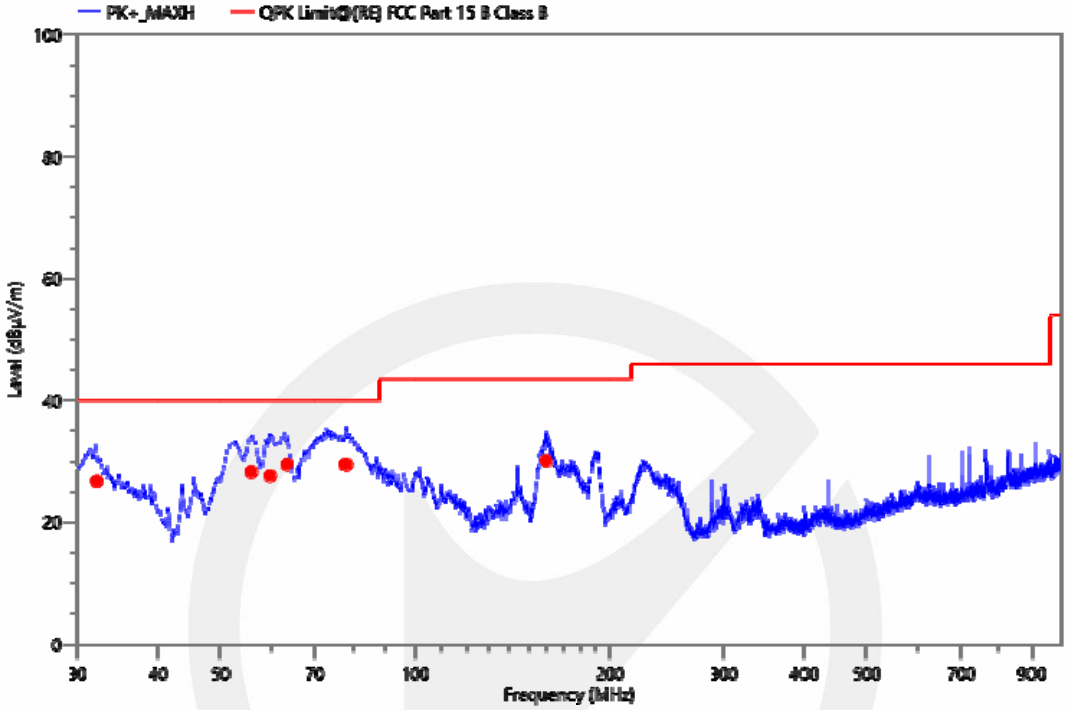


Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Verdict
0.111	73.94	20.2	94.14	113.52	19.38	PK+	PASS
0.333	45.39	20.23	65.62	106.54	40.92	PK+	PASS
0.555	32.56	20.1	52.66	72.71	20.05	PK+	PASS
0.775	29.96	20.2	50.16	69.82	19.66	PK+	PASS
0.998	20.01	20.31	40.32	67.62	27.30	PK+	PASS
1.224	19.14	20.27	39.41	65.85	26.44	PK+	PASS
Note：Final Result (Margin=Limit-Meas.(Reading +Corr.))							

Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Verdict
0.111	67.81	20.2	88.01	113.52	25.51	AVG	PASS
0.333	39.04	20.23	65.62	106.54	47.27	AVG	PASS
Note：Final Result (Margin=Limit-Meas.(Reading +Corr.))							

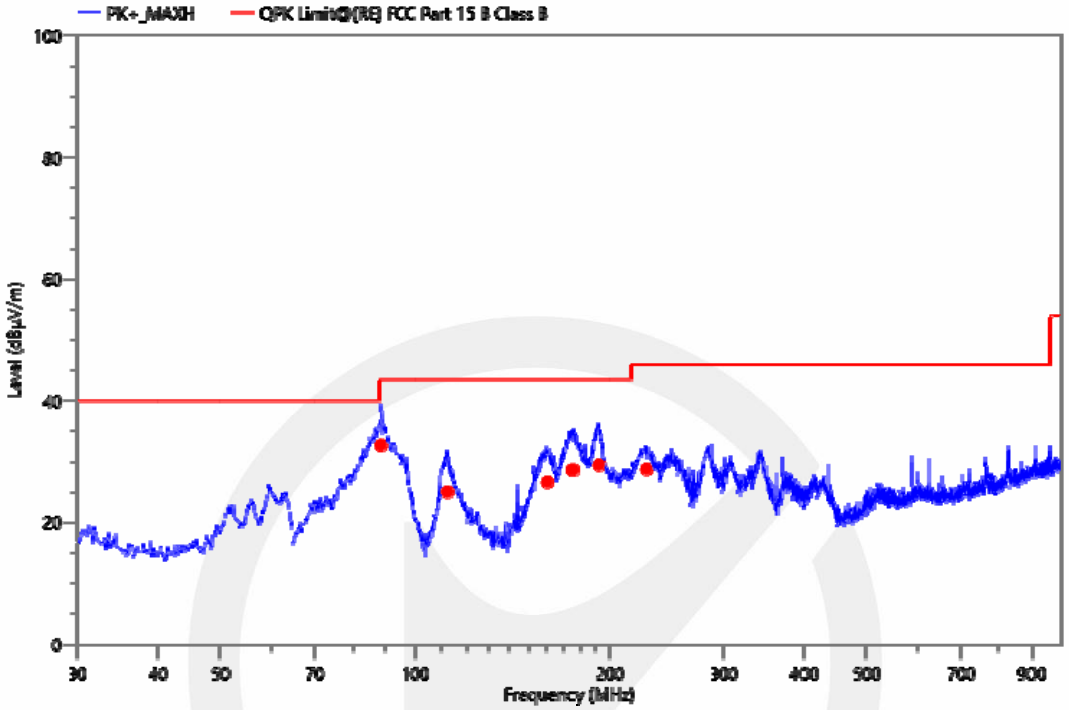
30MHz-1GHz:

Project Information			
Mode:	Wireless Charging	Voltage:	AC 120V/60Hz
Environment:	Temp: 16℃; Humi:48%	Engineer:	Victor Chen



Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
32.134	51.98	-25.2	26.78	40.00	13.22	QPK	100	V	205.5	PASS
55.605	53.41	-25.12	28.29	40.00	11.71	QPK	100	V	254.0	PASS
59.485	53.45	-25.79	27.66	40.00	12.34	QPK	100	V	0.0	PASS
63.268	55.77	-26.26	29.51	40.00	10.49	QPK	100	V	69.5	PASS
77.992	56.44	-26.95	29.49	40.00	10.51	QPK	100	V	50.0	PASS
159.676	57.10	-26.99	30.11	43.50	13.39	QPK	100	V	265.5	PASS
Note：Final Result (Margin=Limit-Meas.(Reading +Corr.))										

Project Information			
Mode:	Wireless Charging	Voltage:	AC 120V/60Hz
Environment:	Temp: 16℃; Humi:48%	Engineer:	Victor Chen



Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
88.363	58.93	-26.22	32.71	43.50	10.79	QPK	200	H	352.4	PASS
112.345	51.31	-26.29	25.02	43.50	18.48	QPK	200	H	122.4	PASS
160.258	53.65	-26.98	26.67	43.50	16.83	QPK	200	H	311.9	PASS
175.194	54.90	-26.24	28.66	43.50	14.84	QPK	200	H	344.4	PASS
192.168	54.81	-25.33	29.48	43.50	14.02	QPK	100	H	12.6	PASS
228.151	52.62	-23.83	28.79	46.00	17.21	QPK	100	H	0	PASS
Note：Final Result (Margin=Limit-Meas.(Reading +Corr.))										

7. ANNTENNA APPLICATION

7.1. Antenna Requirement

Standard	Requirement
FCC CRF Part 15.203	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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, 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.

7.2. Result

Pass

Note: The EUT has 1 antenna: The internal antenna gain is 0.0 dBi;

☒ Antenna use a permanently attached antenna which is not replaceable.
☐ Not using a standard antenna jack or electrical connector for antenna replacement
☐ The antenna has to be professionally installed (please provide method of installation)

which in accordance to section 15.203, please refer to the internal photos.

*** End of Report ***

声 明
Statement

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