

FCC 47 CFR PART 15 SUBPART C
CERTIFICATION TEST REPORT

For

Car Wireless Charger

MODEL NUMBER: CHG-WIRELESS 4.0

REPORT NUMBER: 4791002373-RF-4

ISSUE DATE: March 11, 2024

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Prepared for

Huizhou Desay SV Automotive Co., Ltd.
No.103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development
Zone, Huizhou, Guangdong, P.R. China

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch

Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-
Tech Development Zone Dongguan, 523808, People's Republic of China

Tel: +86 769 22038881

Fax: +86 769 33244054

Website: www.ul.com

The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products.

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	March 11, 2024	Initial Issue	

Summary of Test Results		
Description of Test Item	Standard	Results
Radiated Emission Test	FCC 15.209	PASS
20dB Bandwidth	FCC 15.215	PASS
AC Power Line Conducted Emission	FCC Part 15.207	Not Applicable
Note 1: This test report is only published to and used by the applicant, and it is not for evidence purpose in China.		
Note 2: The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C > when <Accuracy Method> decision rule is applied		

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Huizhou Desay SV Automotive Co., Ltd.
Address: No.103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou, Guangdong, P.R. China

Manufacturer Information

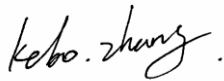
Company Name: Huizhou Desay SV Automotive Co., Ltd.
Address: No.103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou, Guangdong, P.R. China

EUT Information

EUT Name: Car Wireless Charger
Model: CHG-WIRELESS 4.0
Brand: /
Sample Received Date: February 27, 2024
Sample Status: Normal
Sample ID: 6999389
Date of Tested: February 27, 2024 to March 8, 2024

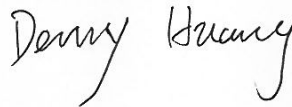
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART C	PASS

Prepared By:



Kebo Zhang
Senior Project Engineer

Checked By:



Denny Huang
Senior Project Engineer

Approved By:



Stephen Guo
Laboratory Manager

2. TEST METHODOLOGY

All tests were performed in accordance with the standard FCC CFR 47 Part 2, KDB 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 15, ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules ISED (Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046. VCCI (Registration No.: G-20192, R-20202, C-20153 and T-20155) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20192 and C-20153 Shielding Room B, the VCCI registration No. is C-20153 and T-20155
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30 MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30 MHz had been correlated to measurements performed on an OFS.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction Emission	3.62 dB
Radiated Emission (Included Fundamental Emission) (9 kHz ~ 30 MHz)	2.2 dB
Radiated Emission (Included Fundamental Emission) (30 MHz ~ 1 GHz)	4.00 dB
DTS and 99% Occupied Bandwidth	±0.0196%
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	Car Wireless Charger	
Model	CHG-WIRELESS 4.0	
Ratings	DC 12 V	

Product Description	Operation Frequency	125.95 kHz and 127.7 kHz
Rated Output Power	15 W	
Antenna type	Coil	

Note 1: The EUT have 3 coils, but only 1 coil can be active at one time, all the coils and circuit before antenna are the same.

Note 2: Because of the limited of the circuit, the 3 coils can't be active at the same time.

Note 3: All the 3 coils were tested, but only the worst data was recorded in the report.

5.2. TEST MODE

Test Mode	Description
Mode 1	Charging with 15 W (1 % battery status of client device)
Mode 2	Charging with 15 W (50 % battery status of client device)
Mode 3	Charging with 15 W (99 % battery status of client device)

Note: All the modes had been tested, but only the worst data was recorded in the report.

5.3. ACCESSORY

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Series No.
1	Wireless charger RX artificial load	/	/	/
2	Mobile Phone	Apple	iPhone 13	/

I/O CABLES

Item	Accessory	Brand Name	Model Name	Description
/	/	/	/	/

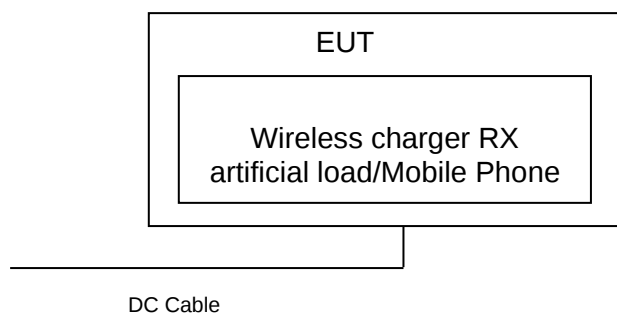
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
/	/	/	/	/

TEST SETUP

The EUT support wireless charging.

SETUP DIAGRAM FOR TEST



5.4. MEASURING INSTRUMENT LIST

Radiated Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Oct.12, 2023	Oct.11, 2024
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	Aug.02, 2021	Aug.01, 2024
Preamplifier	HP	8447D	2944A09099	Oct.12, 2023	Oct.11, 2024
Loop antenna	Schwarzbeck	1519B	00008	Dec.14, 2021	Dec.13, 2024
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Oct.12, 2023	Oct.11, 2024
Software					
Description			Manufacturer	Name	Version
Test Software for Radiated Emissions			Farad	EZ-EMC	Ver. UL-3A1

Other Instruments					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
PXA Signal Analyzer	Keysight	N9030A	MY55410512	Oct.12, 2023	Oct.11, 2024

6. 20dB BANDWIDTH TEST

LIMITS

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.215, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

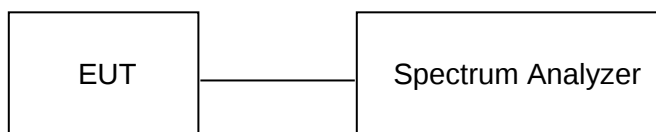
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	1% to 5% of the bandwidth
VBW	approximately 3×RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 99%/20 dB relative to the maximum level measured in the fundamental emission.

TEST SETUP

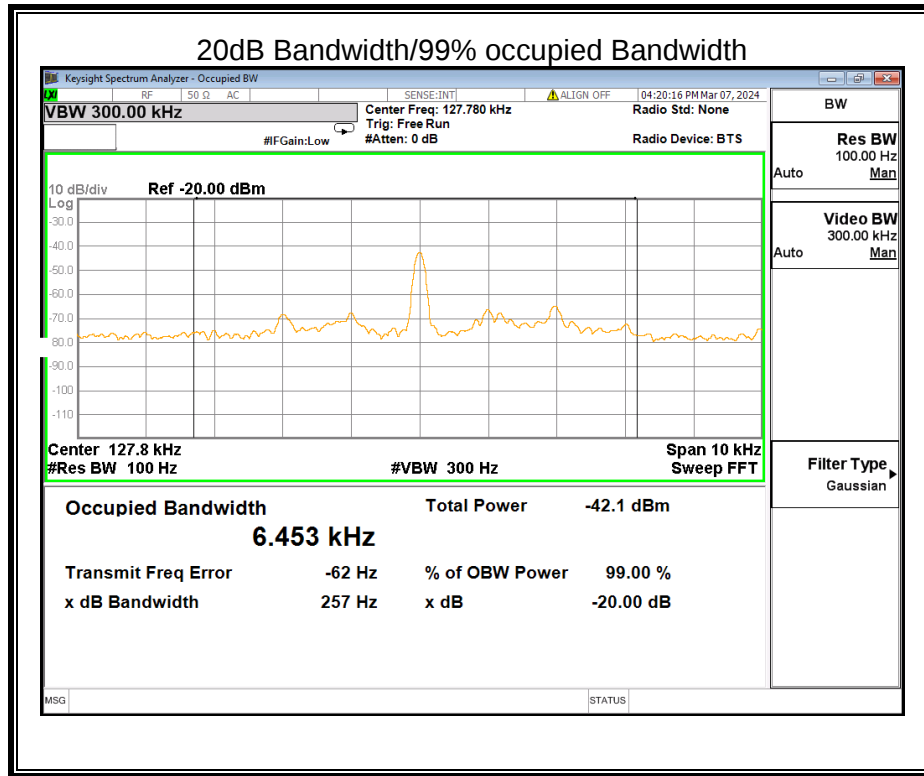


TEST ENVIRONMENT

Temperature	24.1 °C	Relative Humidity	68 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120 V, 60 Hz

RESULTS

Frequency (kHz)	99% occupied Bandwidth (kHz)	20dB Bandwidth (Hz)
127.8	6.453	257



7. RADIATED EMISSION TEST

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209.

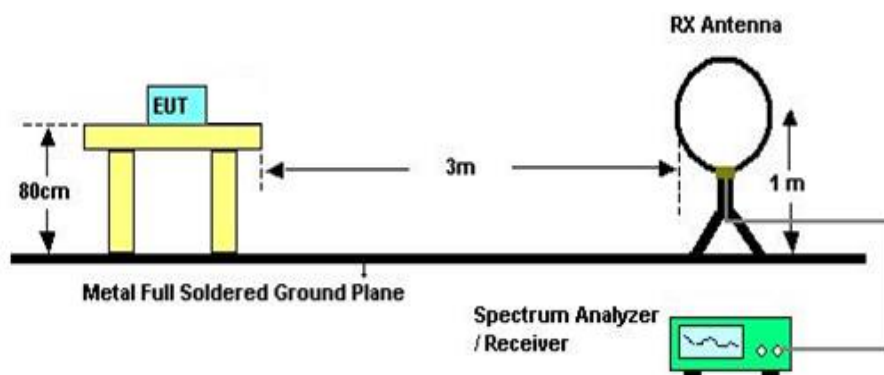
Radiated emissions limits for FCC (Class B) (9 kHz ~ 1 GHz)

Emissions radiated outside of the specified frequency bands above 30 MHz			
Frequency Range (MHz)	Field Strength Limit ($\mu\text{V/m}$) at 3 m	Field Strength Limit (dB $\mu\text{V/m}$) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

Emissions radiated outside of the specified frequency bands below 30 MHz		
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	30
1.705-30.0	30	30

TEST SETUP AND PROCEDURE

Below 30 MHz

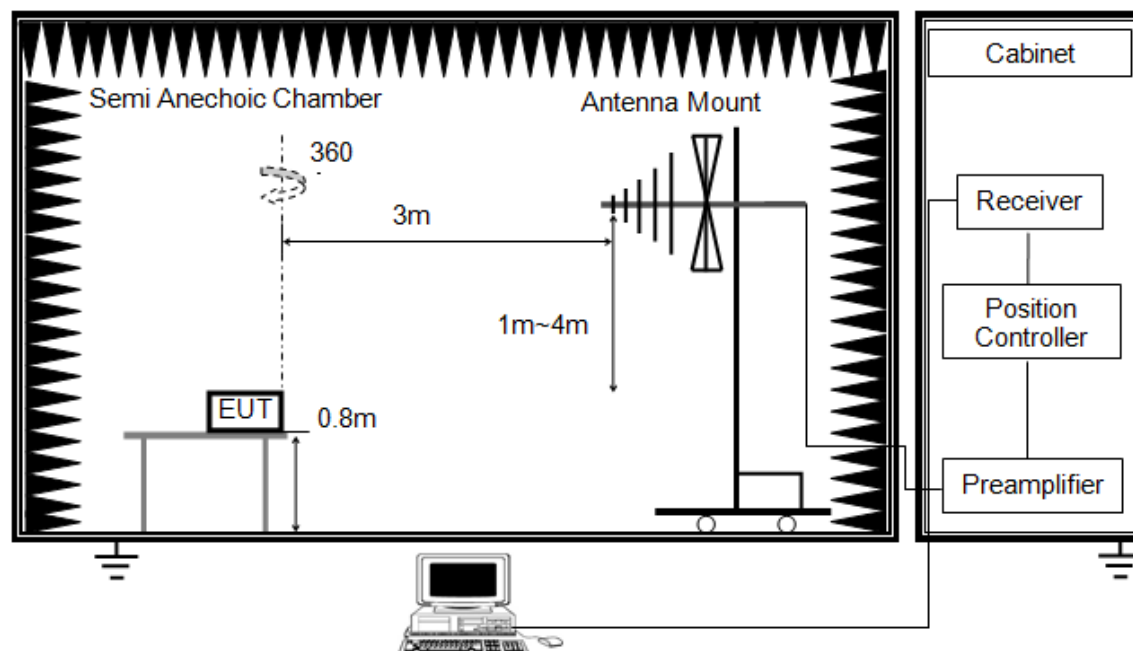


The setting of the spectrum analyser

RBW	200 Hz (From 9 kHz to 0.15 MHz) / 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz) / 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.
2. The EUT was arranged to its worst case and then 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. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1.3 m height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except 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.
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode re-measured. 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 the quasi-peak and average detector and reported.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.

Below 1 GHz and above 30 MHz



The setting of the spectrum analyser

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.
2. 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. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. 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 the quasi-peak detector and reported.

TEST ENVIRONMENT

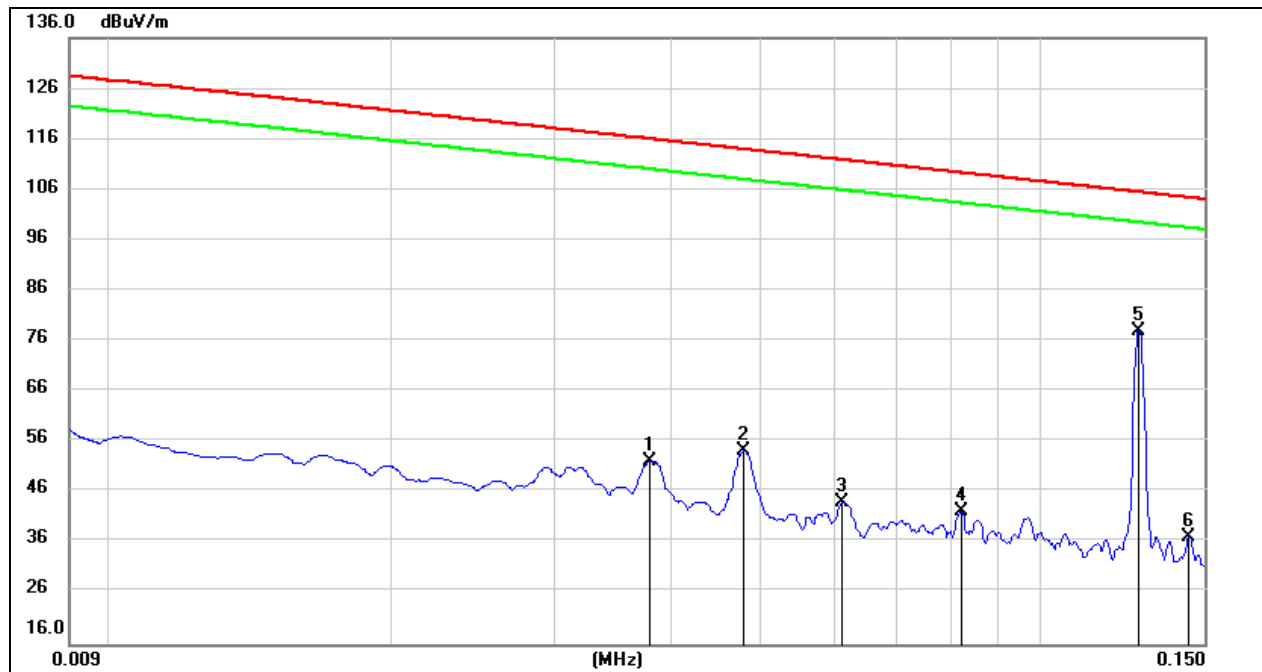
Temperature	22.5 °C	Relative Humidity	59 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120 V, 60 Hz

RESULTS

7.1. SPURIOUS EMISSIONS BELOW 30 MHz

FCC PART 15C BELOW 30MHz SPURIOUS EMISSIONS FOR PLAN A (LOOP ANTENNA FACE ON TO THE EUT)

9 kHz ~ 150 kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0380	60.61	-8.32	52.29	116.01	-63.72	peak
2	0.0479	62.69	-8.53	54.16	113.99	-59.83	peak
3	0.0613	52.52	-8.34	44.18	111.85	-67.67	peak
4	0.0822	50.51	-8.19	42.32	109.31	-66.99	peak
5	0.1276	86.81	-8.79	78.02	/	/	Fundamental
6	0.1446	46.14	-9.01	37.13	104.40	-67.27	peak

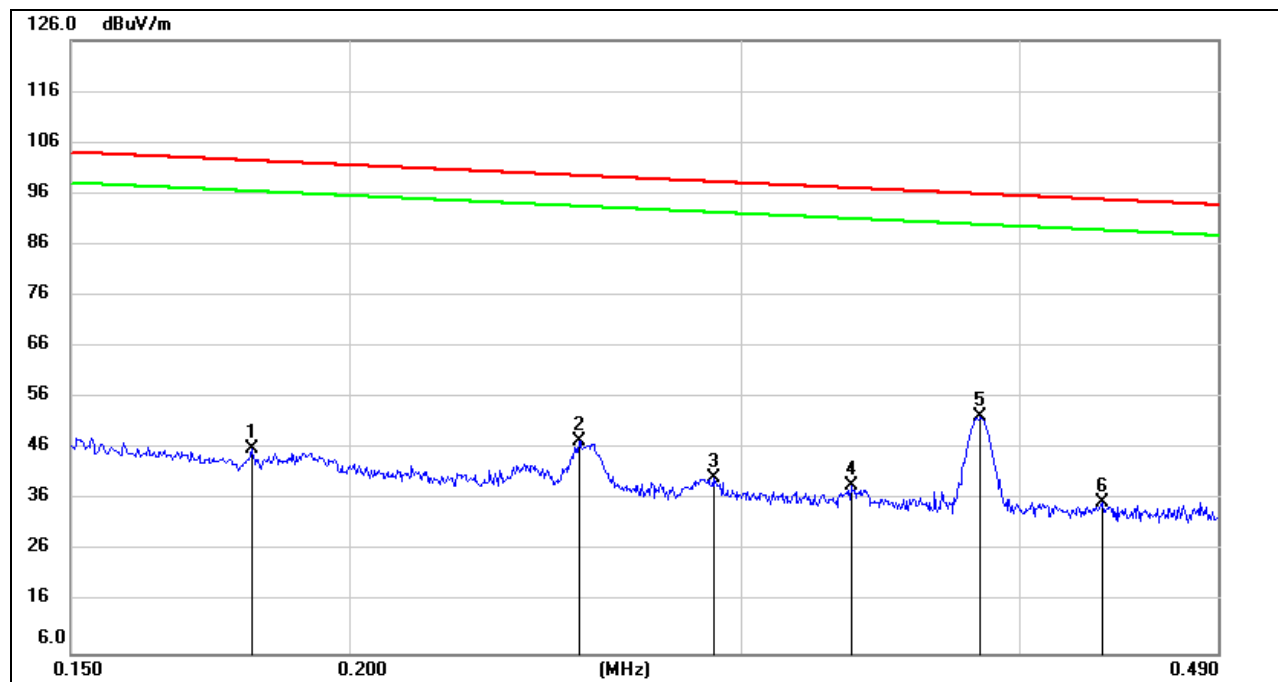
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result are deemed to comply with AV limit.

3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

4. The test was performed at 3 m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

150 kHz ~ 490 kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1809	55.14	-9.06	46.08	102.46	-56.38	peak
2	0.2536	56.48	-9.00	47.48	99.52	-52.04	peak
3	0.2911	49.16	-8.96	40.20	98.32	-58.12	peak
4	0.3359	47.71	-8.94	38.77	97.08	-58.31	peak
5	0.3839	61.36	-8.91	52.45	95.92	-43.47	peak
6	0.4351	44.48	-8.89	35.59	94.83	-59.24	peak

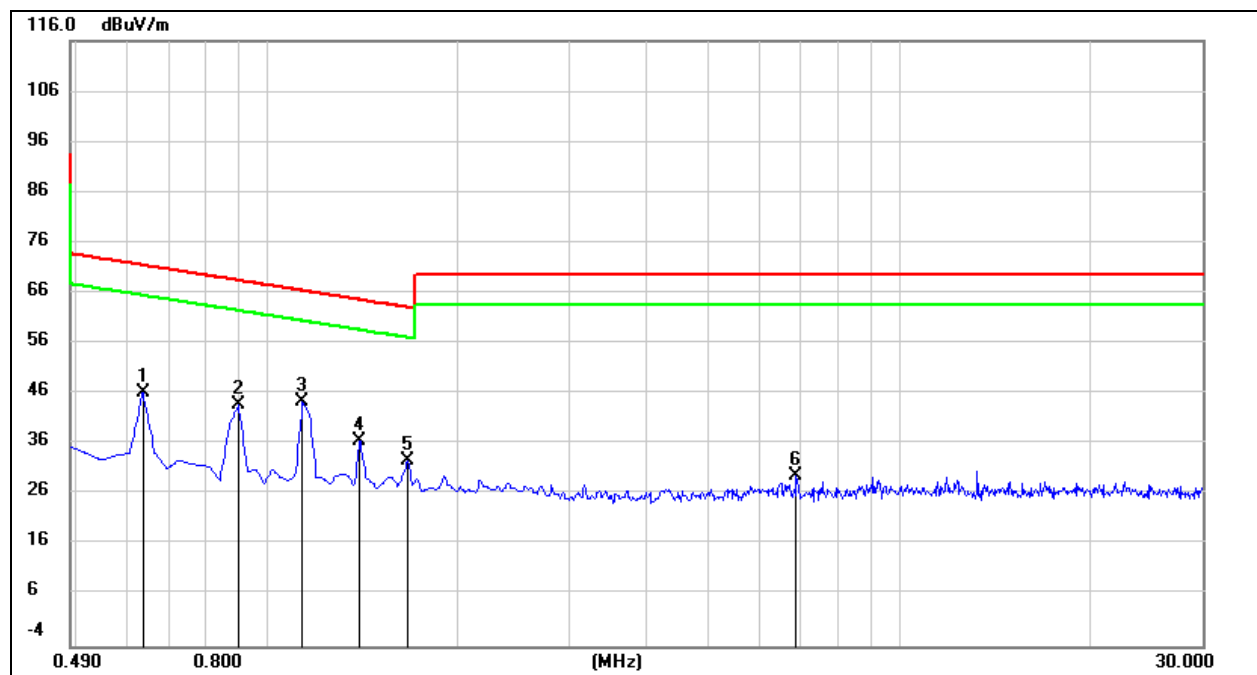
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result are deemed to comply with AV limit.

3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

4. The test was performed at 3 m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

490 kHz ~ 30 MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.6375	55.29	-9.11	46.18	71.51	-25.33	peak
2	0.9031	52.83	-9.03	43.80	68.49	-24.69	peak
3	1.1391	53.23	-8.82	44.41	66.47	-22.06	peak
4	1.4048	45.32	-8.74	36.58	64.65	-28.07	peak
5	1.6704	41.51	-8.65	32.86	63.15	-30.29	peak
6	6.8641	37.82	-8.16	29.66	69.54	-39.88	peak

Note: 1. Measurement = Reading Level + Correct Factor.

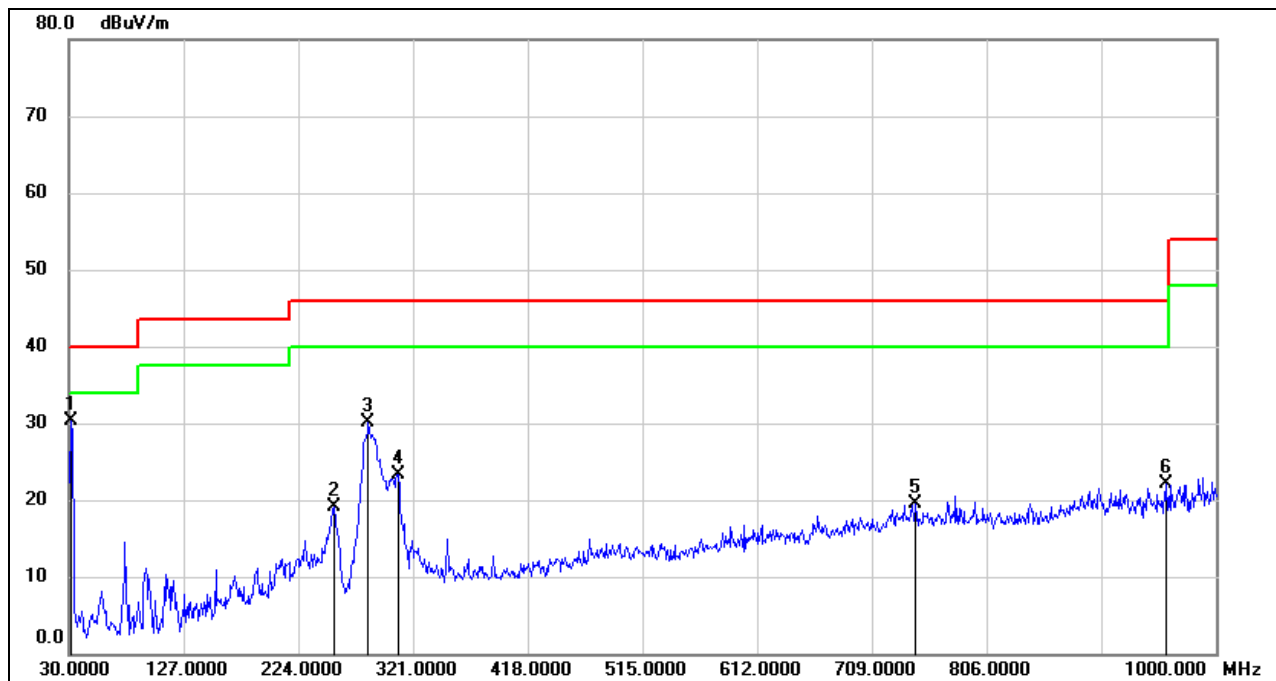
2. If Peak Result complies with AV limit, AV Result are deemed to comply with AV limit.

3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

4. The test was performed at 3 m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

7.2. SPURIOUS EMISSIONS 30 MHz ~ 1 GHz

FCC PART15C SPURIOUS EMISSIONS FOR PLAN A (HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	31.9400	48.20	-17.99	30.21	40.00	-9.79	QP
2	254.0700	37.27	-18.08	19.19	46.00	-26.81	QP
3	283.1700	46.04	-16.00	30.04	46.00	-15.96	QP
4	308.3900	37.80	-14.41	23.39	46.00	-22.61	QP
5	745.8600	26.31	-6.80	19.51	46.00	-26.49	QP
6	958.2900	26.45	-4.41	22.04	46.00	-23.96	QP

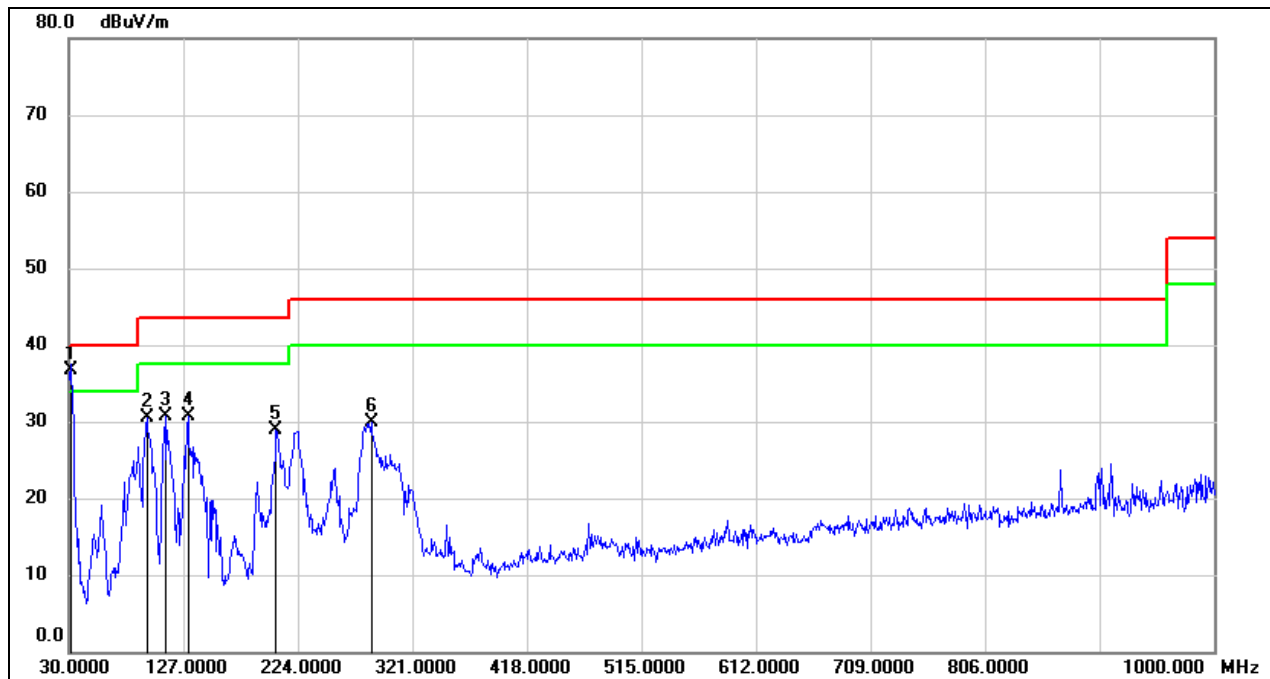
Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

4. All the noise are created from the digital circuit. It is not created by wireless charging circuit.

FCC PART15C SPURIOUS EMISSIONS FOR PLAN B (VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	31.9400	54.78	-17.99	36.79	40.00	-3.21	QP
2	95.9600	51.81	-21.22	30.59	43.50	-12.91	QP
3	111.4800	50.55	-19.88	30.67	43.50	-12.83	QP
4	130.8800	49.60	-18.84	30.76	43.50	-12.74	QP
5	205.5700	44.99	-16.08	28.91	43.50	-14.59	QP
6	286.0799	45.69	-15.80	29.89	46.00	-16.11	QP

Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

4. All the noise are created from the digital circuit. It is not created by wireless charging circuit.

END OF REPORT