FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

Station P

MODEL NUMBER: NSP2-BF(UPC:6973143030415)

FCC ID: 2ADLI-NSP2-BF

REPORT NUMBER: 4791032227-RF-1

ISSUE DATE: December 8, 2023

Prepared for

Koda Electronics HK Co., Ltd
2/F Mandarin Comm Hse, 38 Morrison Hill Road, Wanchai, Hong Kong

Prepared by

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

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	12/08/2023	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	PASS
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:	Koda Electronics HK Co., Ltd
Address:	2/F Mandarin Comm Hse, 38 Morrison Hill Road, Wanchai, Hong Kong

Manufacturer Information

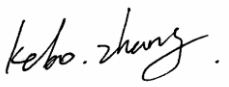
Company Name:	Dongguan Kenuo Electronic Co., Ltd
Address:	Room301, No.6 Jingfu Road, Hengli Town, Dongguan City, Guangdong Province, China

EUT Information

EUT Name:	Station P
Model:	NSP2-BF(UPC:6973143030415)
Model Difference:	/
Brand:	Nonstop
Sample Received Date:	November 1, 2023
Sample Status:	Normal
Sample ID:	6608196
Date of Tested:	November 1, 2023 ~ December 1, 2023

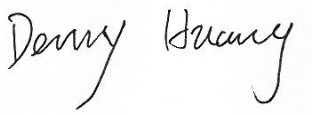
APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 FCC PART 15 SUBPART C	PASS

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 Delcaration 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

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	Station P	
Model	NSP2-BF(UPC:6973143030415)	
Product Description	Operation Frequency	111 ~ 205 kHz
Rated Output Power	10 W	
Antenna type	Coil	
Ratings	AC 120 V, 60 Hz	

Note: The EUT has two different circuit board for power supply (Plan A and Plan B), but all other circuit are the same, pre-scan had been done for both Plan A and Plan B, only the worst data was recorded in the report.

5.2. TEST MODE

Test Mode	Description
Mode 1	Charging with 10 W wireless charging load (Full Load)
Mode 2	Charging with 10 W wireless charging load (Half Load)
Mode 3	Charging with 10 W wireless charging load (No Load)

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	Load	/	/	/
3	Load	/	/	/
4	Incandescent Lamp	/	/	/
5	Incandescent Lamp	/	/	/

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	Type C	Unshielded	0.5	/
2	USB	Type A	Unshielded	0.5	/

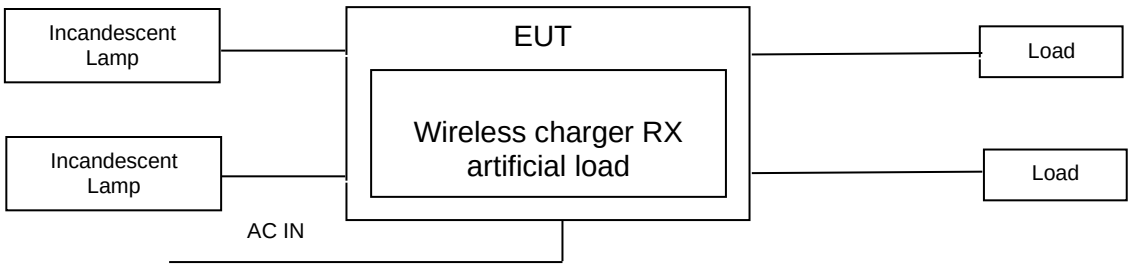
ACCESSORY

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

TEST SETUP

The EUT support wireless charging.

SETUP DIAGRAM FOR TEST



5.4. MEASURING INSTRUMENT LIST

Conducted Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
EMI Test Receiver	R&S	ESR3	101961	Oct.13, 2023	Oct.12, 2024
Two-Line V-Network	R&S	ENV216	101983	Oct.13, 2023	Oct.12, 2024
Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Oct.13, 2023	Oct.12, 2024
Software					
Description			Manufacturer	Name	Version
Test Software for Conducted Emissions			Farad	EZ-EMC	Ver. UL-3A1

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
Software					
Description			Manufacturer	Name	Version
Test Software for Radiated Emissions			Farad	EZ-EMC	Ver. UL-3A1

Other Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	Spectrum Analyzer	Keysight	N9020A	MY49100060	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.

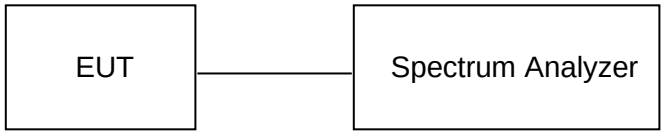
TEST PROCEDURE

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



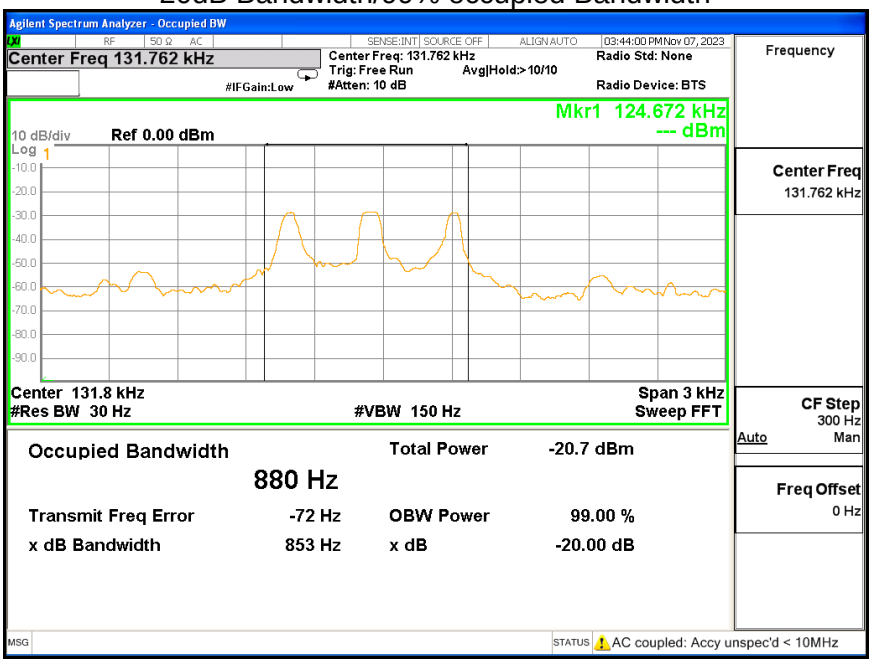
TEST ENVIRONMENT

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

RESULTS

Frequency (kHz)	99% occupied Bandwidth (Hz)	20dB Bandwidth (Hz)
131.8	880	853

20dB Bandwidth/99% occupied Bandwidth



7. RADIATED EMISSION TEST

LIMITS

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

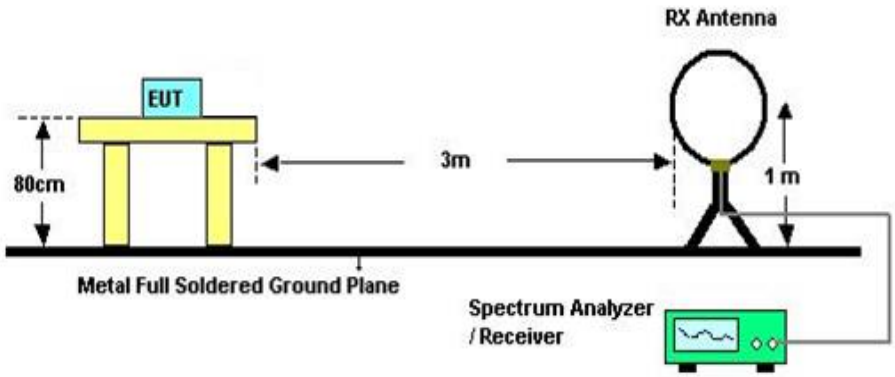
Radiated emissions limits for FCC (Class B) (9 kHz ~ 1 GHz)

Emissions radiated outside of the specified frequency bands above 30 MHz			
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/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(kHz)	300
0.490-1.705	24000/F(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.

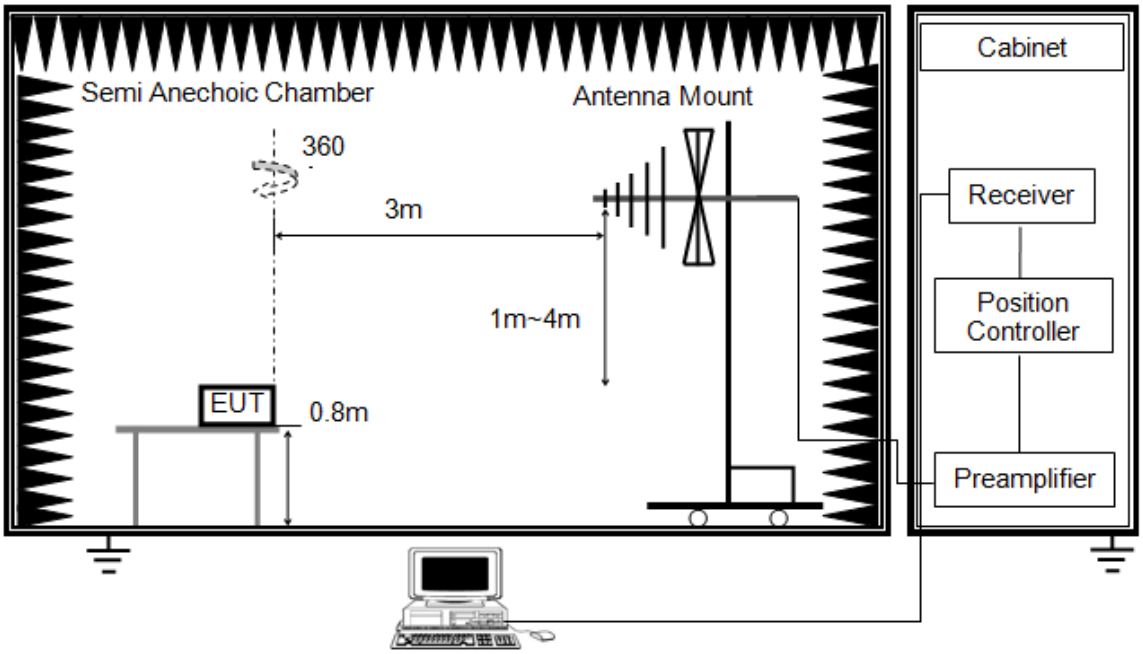
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.

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

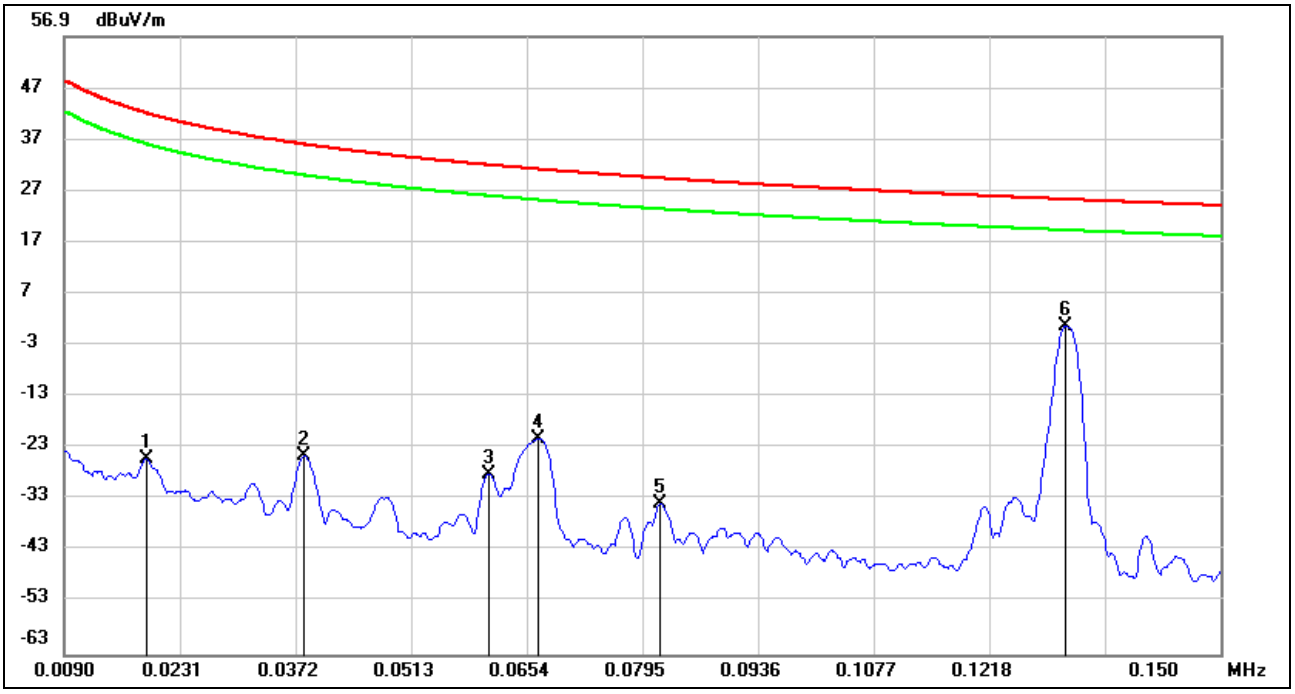
Temperature	22.5 °C	Relative Humidity	59 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120 V, 60 Hz

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)

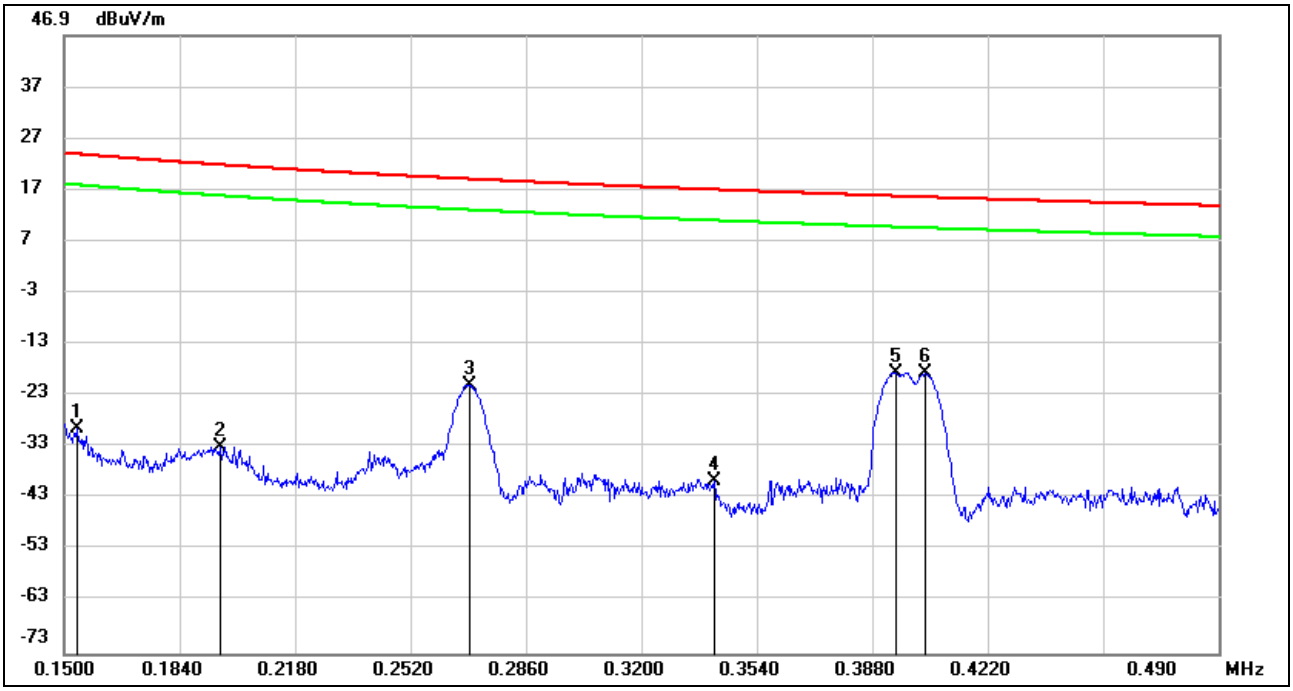
9 kHz ~ 150 kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0190	62.47	-87.72	-25.25	42.03	-67.28	Peak
2	0.0382	63.80	-88.38	-24.58	35.96	-60.54	Peak
3	0.0607	60.30	-88.39	-28.09	31.94	-60.03	Peak
4	0.0668	67.05	-88.26	-21.21	31.11	-52.32	Peak
5	0.0816	54.35	-88.21	-33.86	29.37	-63.23	Peak
6	0.1310	89.54	-88.87	0.67	25.26	-24.59	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).

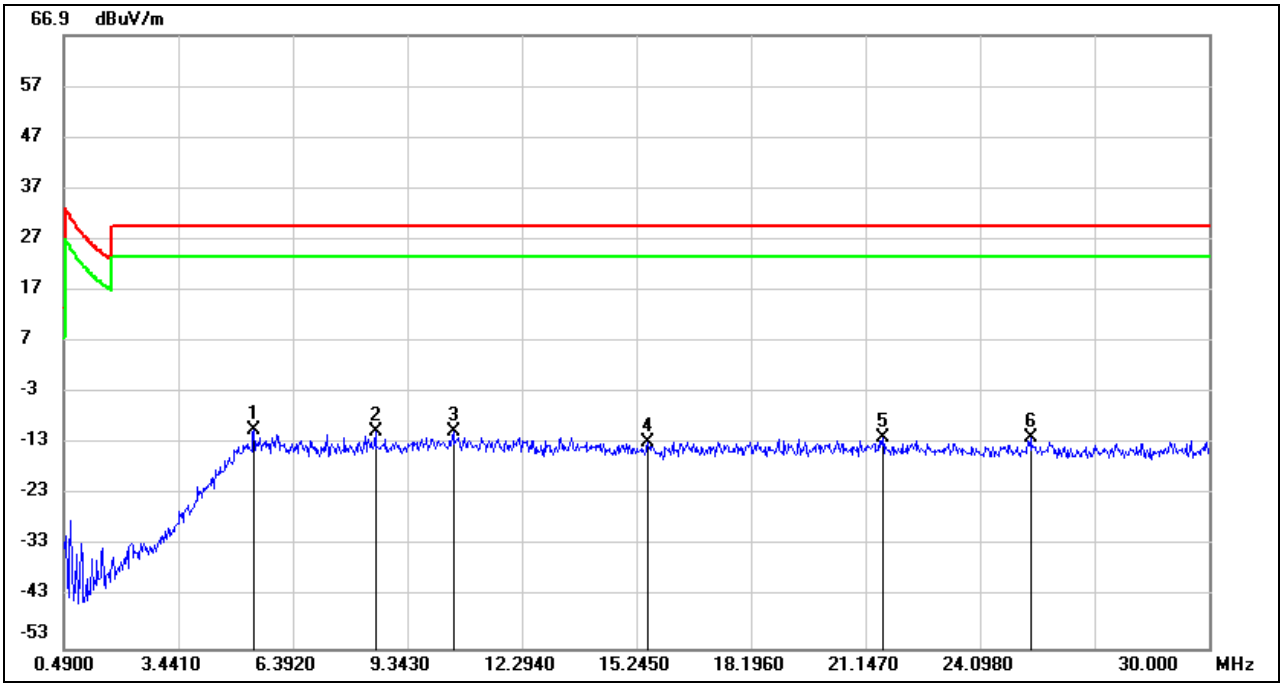
150 kHz ~ 490 kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1537	59.57	-89.10	-29.53	23.87	-53.40	Peak
2	0.1959	56.08	-89.05	-32.97	21.76	-54.73	Peak
3	0.2693	68.01	-88.99	-20.98	19.00	-39.98	Peak
4	0.3414	49.20	-88.96	-39.76	16.94	-56.70	Peak
5	0.3948	70.33	-88.94	-18.61	15.67	-34.28	Peak
6	0.4035	70.16	-88.94	-18.78	15.48	-34.26	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

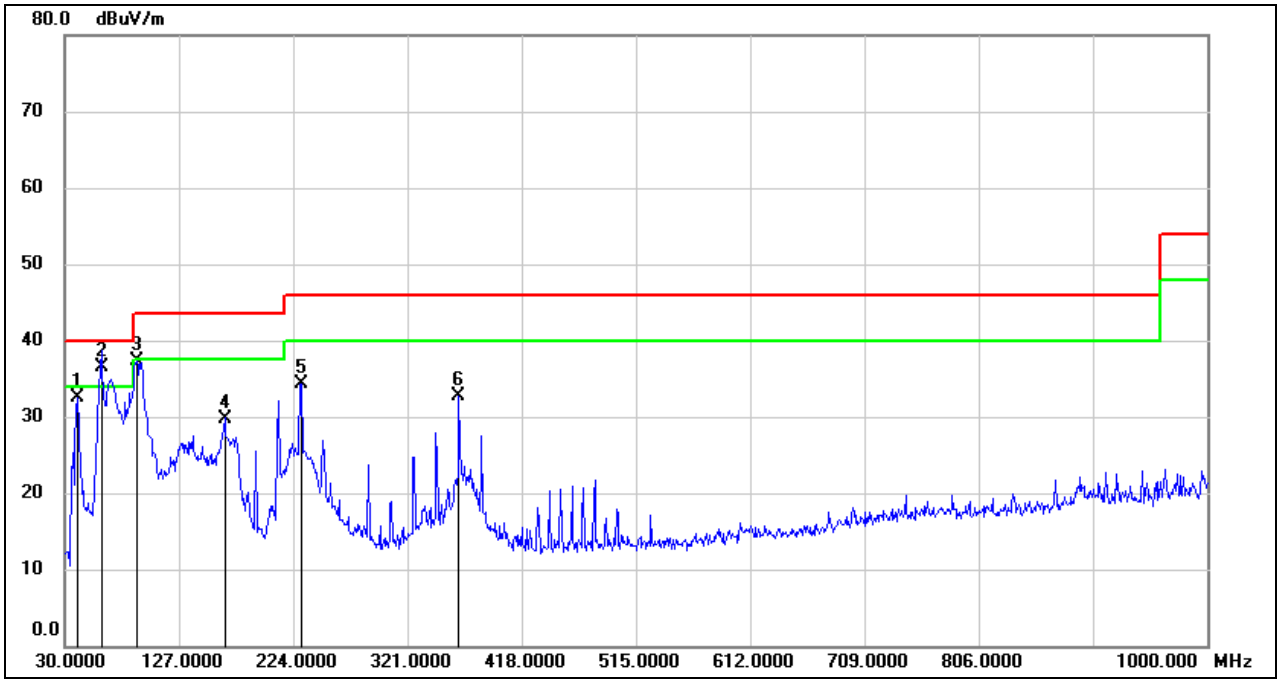


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5.3887	38.15	-48.51	-10.36	29.54	-39.90	Peak
2	8.5166	37.18	-47.78	-10.60	29.54	-40.14	Peak
3	10.5234	36.67	-47.40	-10.73	29.54	-40.27	Peak
4	15.5401	34.65	-47.38	-12.73	29.54	-42.27	Peak
5	21.5896	35.00	-46.75	-11.75	29.54	-41.29	Peak
6	25.3964	34.82	-46.62	-11.80	29.54	-41.34	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

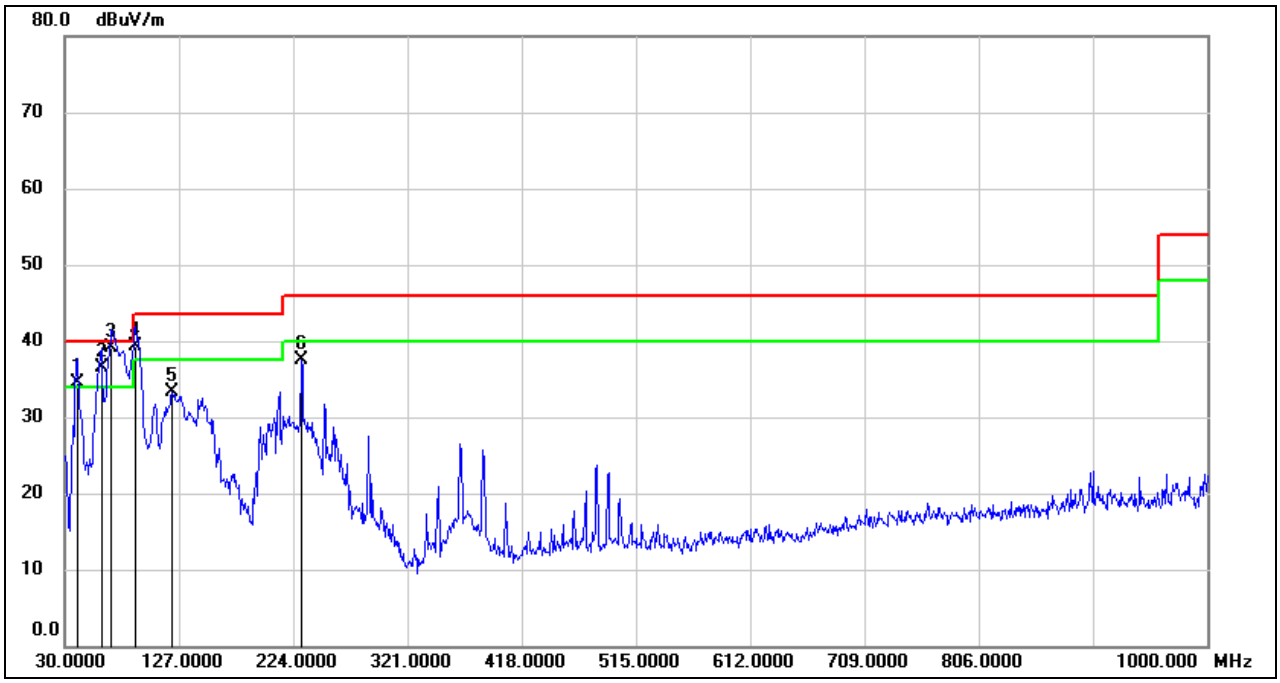
FCC PART15C SPURIOUS EMISSIONS FOR PLAN A (HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	40.6699	51.89	-19.41	32.48	40.00	-7.52	QP
2	61.0400	56.25	-19.84	36.41	40.00	-3.59	QP
3	91.1100	58.85	-21.64	37.21	43.50	-6.29	QP
4	165.8000	46.41	-16.61	29.80	43.50	-13.70	QP
5	230.7900	51.65	-17.33	34.32	46.00	-11.68	QP
6	364.6500	45.12	-12.46	32.66	46.00	-13.34	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 ared 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	40.6699	53.93	-19.41	34.52	40.00	-5.48	QP
2	61.0400	56.44	-19.84	36.60	40.00	-3.40	QP
3	69.7699	59.35	-20.28	39.07	40.00	-0.93	QP
4	90.1400	61.09	-21.72	39.37	43.50	-4.13	QP
5	121.1800	52.58	-19.31	33.27	43.50	-10.23	QP
6	230.7900	54.90	-17.33	37.57	46.00	-8.43	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 ared created from the digital circuit. It is not created by wireless charging circuit.

8. AC POWER LINE CONDUCTED EMISSION

LIMITS

Please refer to CFR 47 FCC §15.207 (a)

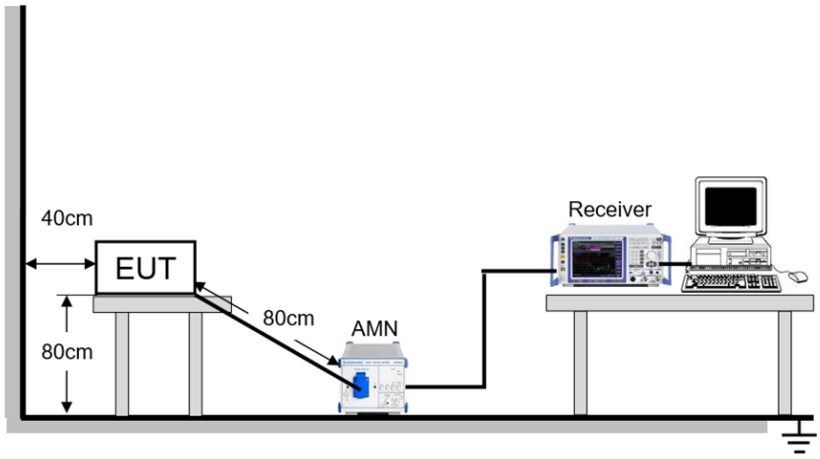
FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST PROCEDURE

The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST SETUP

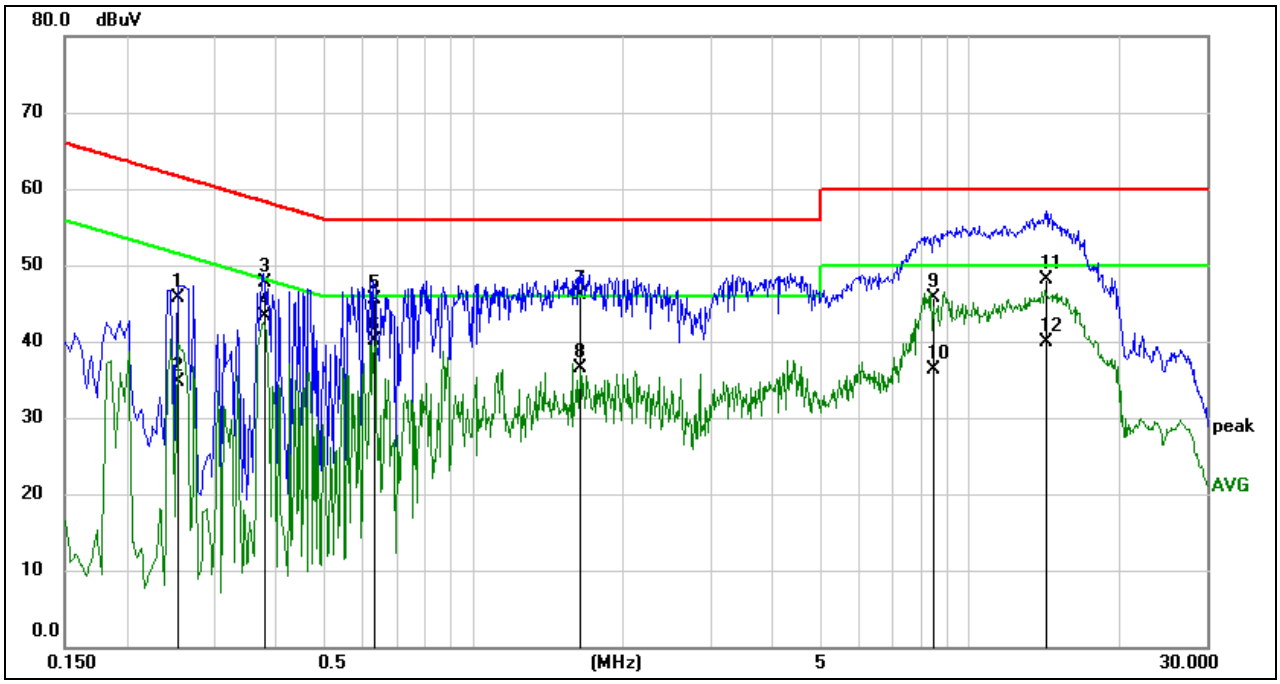


TEST ENVIRONMENT

Temperature	23.1 °C	Relative Humidity	56.4%
Atmosphere Pressure	101 kPa	Test Voltage	AC 120 V/60 Hz

TEST RESULTS

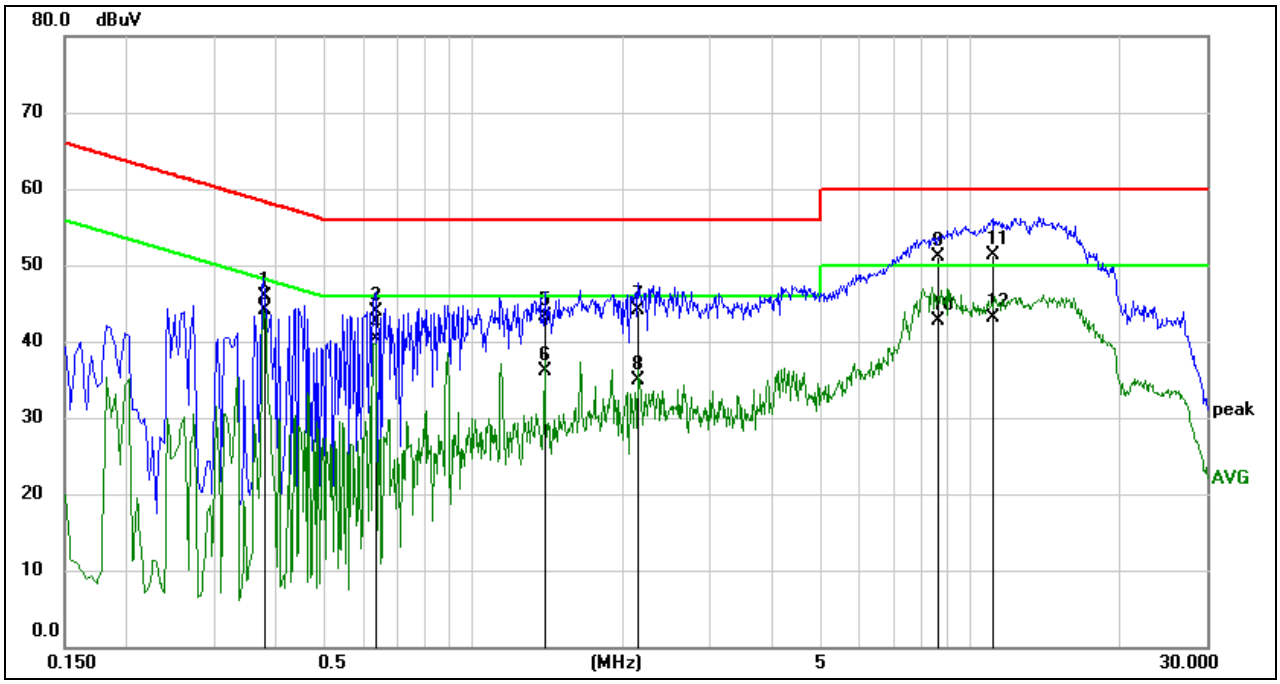
Test Mode:	Mode 1 for Plan B	Test Voltage	AC 120 V/60 Hz
Line	L1		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2528	36.14	9.59	45.73	61.66	-15.93	QP
2	0.2528	25.16	9.59	34.75	51.66	-16.91	AVG
3	0.3802	38.17	9.59	47.76	58.28	-10.52	QP
4	0.3802	33.76	9.59	43.35	48.28	-4.93	AVG
5	0.6328	35.82	9.60	45.42	56.00	-10.58	QP
6	0.6328	30.59	9.60	40.19	46.00	-5.81	AVG
7	1.6446	36.47	9.62	46.09	56.00	-9.91	QP
8	1.6446	26.86	9.62	36.48	46.00	-9.52	AVG
9	8.4707	36.05	9.71	45.76	60.00	-14.24	QP
10	8.4707	26.50	9.71	36.21	50.00	-13.79	AVG
11	14.2096	38.41	9.76	48.17	60.00	-11.83	QP
12	14.2096	30.10	9.76	39.86	50.00	-10.14	AVG

Note:
1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Test Mode:	Mode 1 for Plan B	Test Voltage	AC 120 V/60 Hz
Line	N		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3800	36.24	9.59	45.83	58.28	-12.45	QP
2	0.3800	34.58	9.59	44.17	48.28	-4.11	AVG
3	0.6308	34.23	9.60	43.83	56.00	-12.17	QP
4	0.6308	30.65	9.60	40.25	46.00	-5.75	AVG
5	1.3893	33.60	9.61	43.21	56.00	-12.79	QP
6	1.3893	26.51	9.61	36.12	46.00	-9.88	AVG
7	2.1475	34.52	9.64	44.16	56.00	-11.84	QP
8	2.1475	25.19	9.64	34.83	46.00	-11.17	AVG
9	8.5982	41.30	9.71	51.01	60.00	-8.99	QP
10	8.5982	33.04	9.71	42.75	50.00	-7.25	AVG
11	11.1123	41.56	9.74	51.30	60.00	-8.70	QP
12	11.1123	33.44	9.74	43.18	50.00	-6.82	AVG

Note:
1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

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

END OF REPORT