FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Base Station Watch Hub Edition

MODEL NUMBER: NM3A045A00, NM3W240K00

FCC ID: 2AJYRNM3A045A00

REPORT NUMBER: 4789309605-4

ISSUE DATE: June 10, 2020

Prepared for

Nomad Goods Inc.
1187 Coast Village Rd. #638 Suite 1 Santa Barbara, CA 93108, United State

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

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	06/10/2020	Initial Issue	

Summary of Test Results		
Description of Test Item	**Standard**	**Results**
Power Line Conducted Emission Test	FCC 15.207	PASS
Radiated Emission Test	FCC 15.209	PASS
20dB Bandwidth	FCC 15.215	PASS
This test report is only published to and used by the applicant, and it is not for evidence purpose in China.		

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	Nomad Goods Inc.
Address:	1187 Coast Village Rd. #638 Suite 1 Santa Barbara, CA 93108, United State

Manufacturer Information

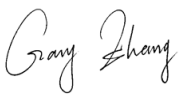
Company Name:	Nomad Goods Inc.
Address:	1187 Coast Village Rd. #638 Suite 1 Santa Barbara, CA 93108, United State

EUT Information

EUT Name:	Base Station Watch Hub Edition
Model:	NM3A045A00
Series Model:	NM3W240K00
Model Difference:	Refer to section 5.1 for details
Brand:	NOMAD
Sample Received Date:	December 26, 2019
Sample Status:	Normal
Sample ID:	2781870
Date of Tested:	December 26, 2019 ~ June 10, 2020

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

Prepared By:



Gary Zhang
Project Engineer

Checked By:

Shawn Wen
Laboratory Leader

Approved By:

Stephen Guo

Laboratory Manager

2. TEST METHODOLOGY

All tests were performed in accordance with the standard FCC CFR 47 Part 2, FCC CFR 47 Part 15C KDB414788 D01 Radiated Test Site v01 and ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

Test Location	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
Address	Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
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 **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** 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-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011

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
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.
3. For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz 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	Measurement Frequency Range	K	U(dB)
Conducted disturbance at mains terminals ports	0.15MHz ~ 30MHz	2	3.62
Radiated disturbance test	9kHz-150kHz	2	3.32
	150kHz-30MHz	2	3.72
Radiated Emission Test	30MHz~1GHz	2	4.00
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	Base Station Watch Hub Edition
EUT Description	The EUT is a wireless charger
Model	NM3A045A00
Series Model	NM3W240K00
Model Difference	Their electrical circuit design, layout and internal wiring are identical, both models have wireless charging function; NM3A045A00 has USB-A and Type-C output port NM3W240K00 didn't have USB-A and Type-C output port We select "NM3A045A00" as the representative model for formal test
Operation Frequency	326.53kHz(for apple watch coil) 120.28kHz (for Left coils) 120.33kHz (for Right coils) 111.63kHz (for Middle coils)
Modulation Type	MSK
Antenna type	Coil
Ratings	DC input: 12V/4A from Adapter Type-C output: 5V/3A or 9V/2A USB A Output: 5V/1A Wireless Output: apple watch coil+10W(left coil)+10W(middle coil)+10W(right coil)

Note 1: The EUT have 4 coils, one for apple watch, other three coils are 10W output for each. The middle coil is not able to work together with two sides coils (left and right), option one is that two sides coils work with apple watch coil at same time, option two is that middle coil works with apple watch coil. In order to ensure all worst case conditions were measured, even though only left and right or center coils can operate simultaneously with the Apple Watch charger, all four coils were loaded for some modes by overriding the device mechanism that allows correct operating conditions.

5.2. TEST MODE

Config	Test Mode	Description
Mode 1	Standby	EUT alone
Mode 2	Operating	apple watch load
Mode 3	Operating	apple watch load 10W load on left coil USB Type-A output 5V1A USB Type-C output 9V2A
Mode 4	Operating	apple watch load 10W load on right coil USB Type-A output 5V1A USB Type-C output 9V2A
Mode 5	Operating	apple watch load 10W load on middle coil USB Type-A output 5V1A USB Type-C output 9V2A
Mode 6	Operating	apple watch load 10W load on left coil 10W load on right coil 10W load on middle coil USB Type-A output 5V1A USB Type-C output 9V2A

Note: all modes have been tested, but only the worst data was recorded in this report, the worst case mode is Mode 6

5.3. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1018Pa	
Temperature	TN	22 ~ 28°C
Voltage :	VL	/
	VN	DC 12V
	VH	/

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage
VH= Upper Extreme Test Voltage
TN= Normal Temperature

5.4. ACCESSORY

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Remark
1	Wireless charger RX artificial load	/	/	3pcs
2	Dummy Load	/	/	5.0 Ω
3	Dummy Load	/	/	4.5 Ω
4	Apple watch	Apple	/	/

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB A	USB	Shielded	1.0 m	/
2	USB type-C	USB type-C	Shielded	1.0 m	/

ACCESSORY

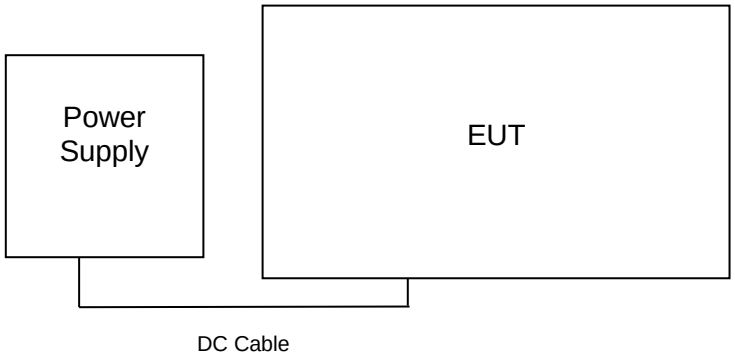
Item	Accessory	Brand Name	Model Name	Description
1	Power Supply	/	A481-1204000I	Input: AC 100-240V~ 50/60Hz 1.5A Output: 12V 4000mA DC cable length: 2.0m

TEST SETUP

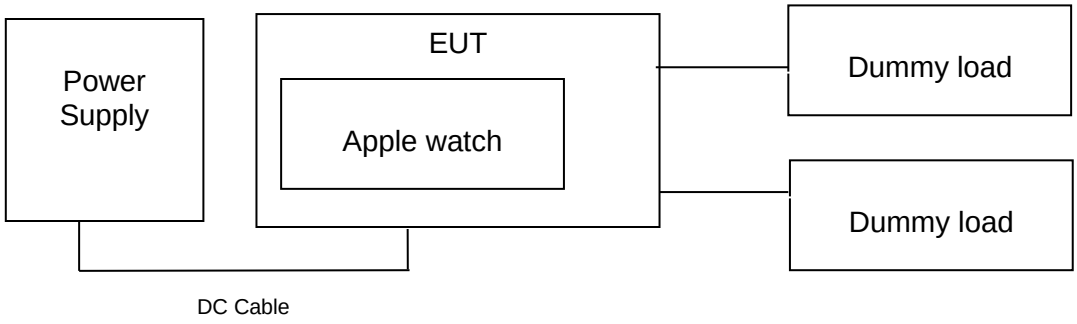
The EUT support wireless charging.

SETUP DIAGRAM FOR TEST

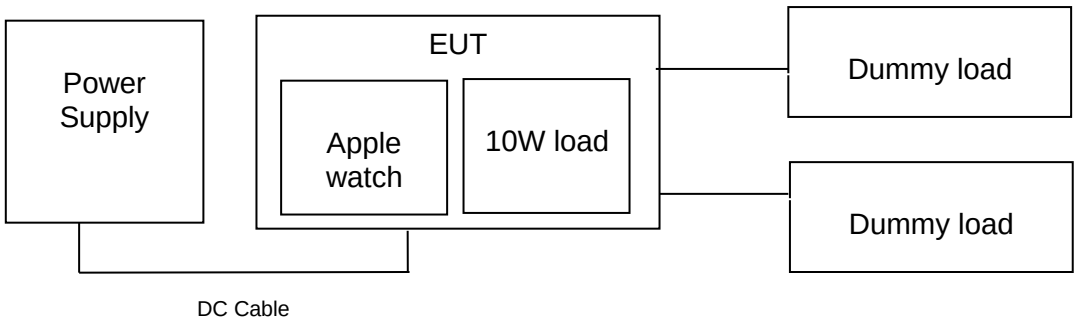
Mode 1



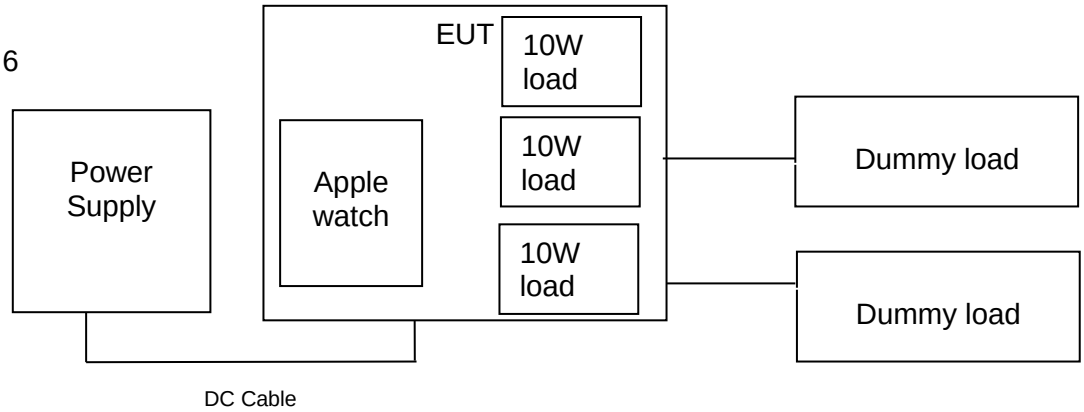
Mode 2



Mode 3 & 4 & 5



Mode 6



5.5. MEASURING INSTRUMENT LIST

Conducted Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
EMI Test Receiver	R&S	ESR3	101961	Dec. 5, 2019	Dec. 5, 2020
Two-Line V-Network	R&S	ENV216	101983	Dec. 5, 2019	Dec. 5, 2020
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	Dec. 6, 2019	Dec. 6, 2020
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	Sept. 17, 2018	Sept. 17, 2021
Preamplifier	HP	8447D	2944A09099	Dec. 5, 2019	Dec. 5, 2020
Loop antenna	Schwarzbeck	1519B	00008	Jan.17, 2019	Jan.17,2022
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Dec. 05, 2019	Dec. 05, 2020
Software					
Description			Manufacturer	Name	Version
Test Software for Radiated Emissions			Farad	EZ-EMC	Ver. UL-3A1

6. 20dB BANDWIDTH TEST

LIMITS

20dB Bandwidth

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.

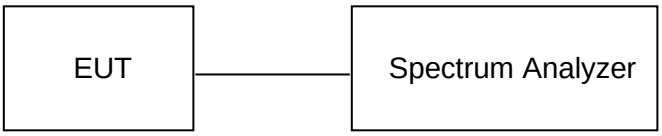
TEST PROCEDURE

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 occupied 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 20 dB relative to the maximum level measured in the fundamental emission.

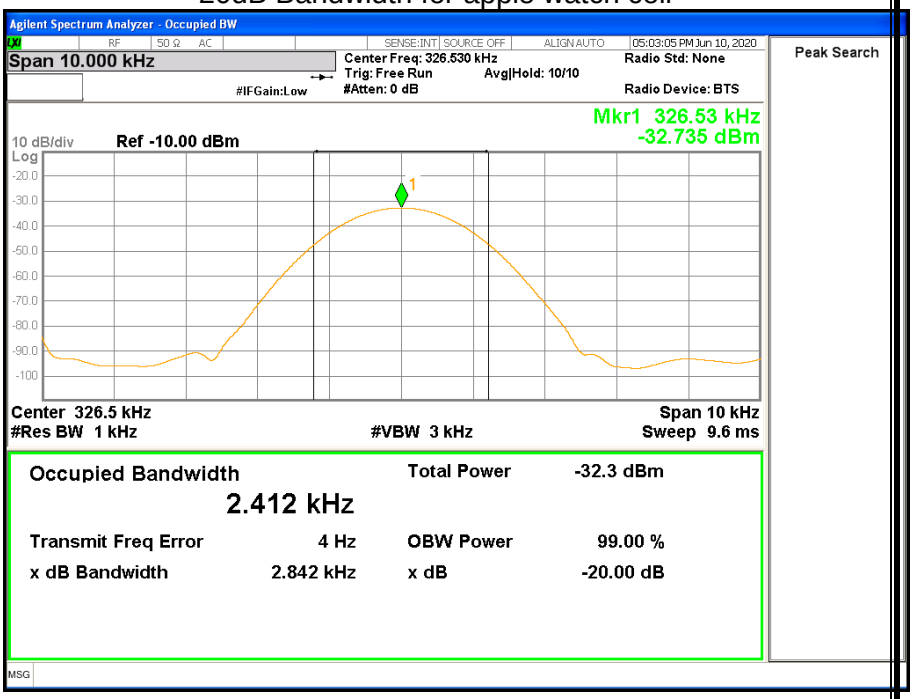
TEST SETUP



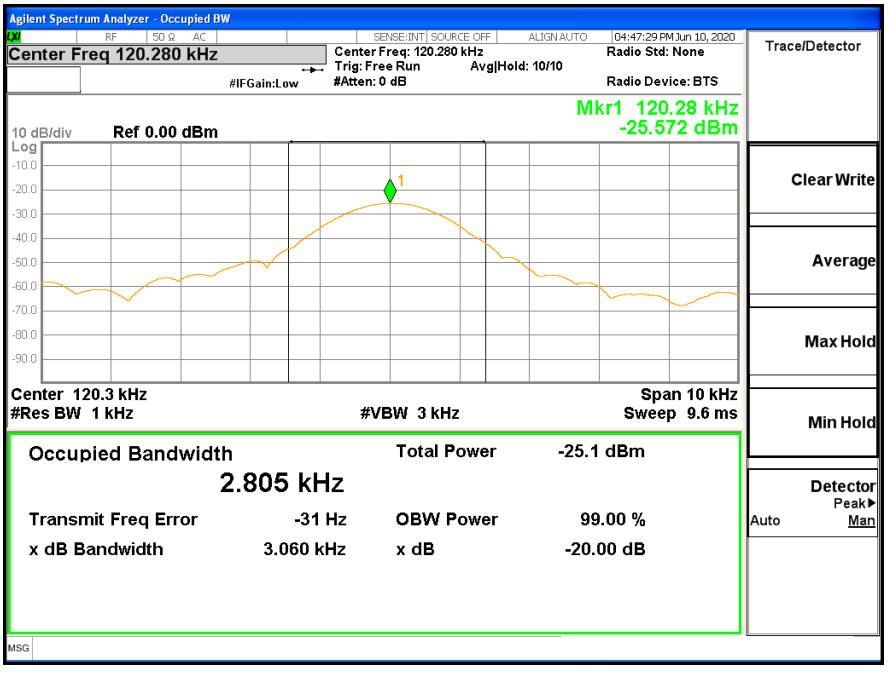
RESULTS

Frequency (kHz)	20dB Bandwidth (kHz)	Coil positon
326.53	2.84	Apple watch
120.28	3.06	Left
120.33	3.12	Right
111.63	3.05	Middle

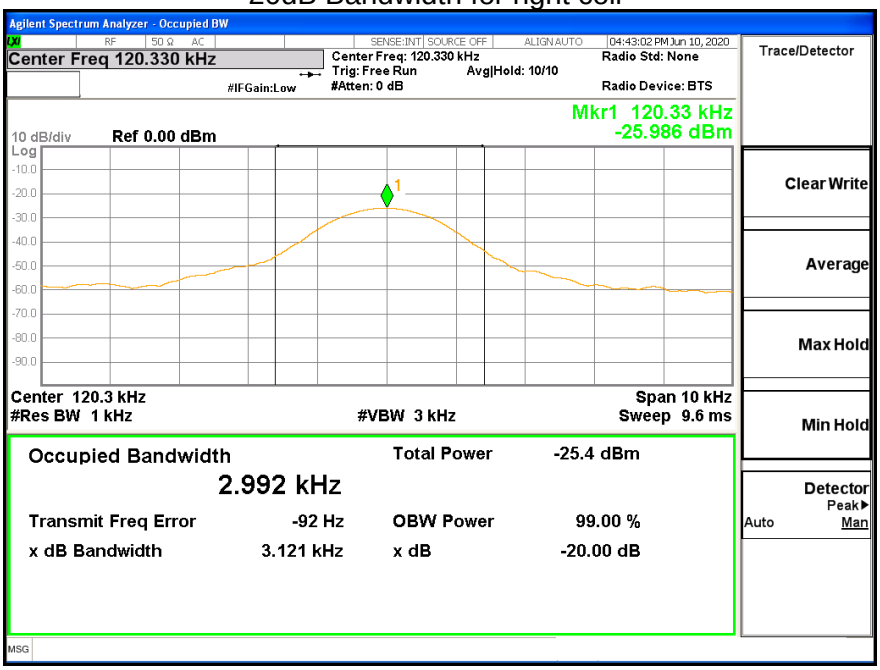
20dB Bandwidth for apple watch coil



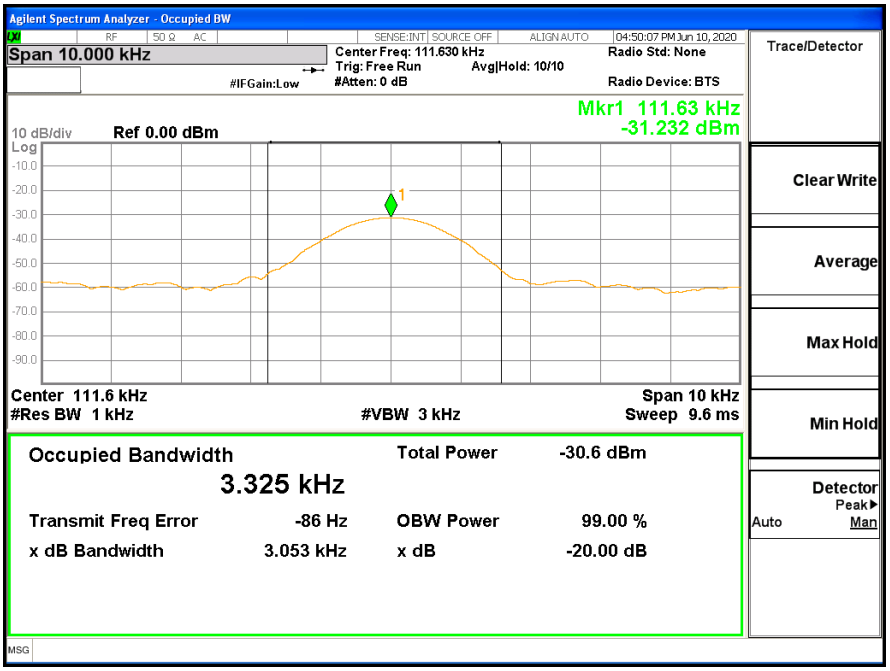
20dB Bandwidth for left coil



20dB Bandwidth for right coil



20dB Bandwidth for middle coil



Note 1: All the modes have been tested, only the worst data record in the report.
Note 2: the signal was narrowband, therefore it was impossible to set RBW within 1% – 5%.

7. EMISSION TEST

LIMITS

Please refer to FCC §15.205 and §15.209

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

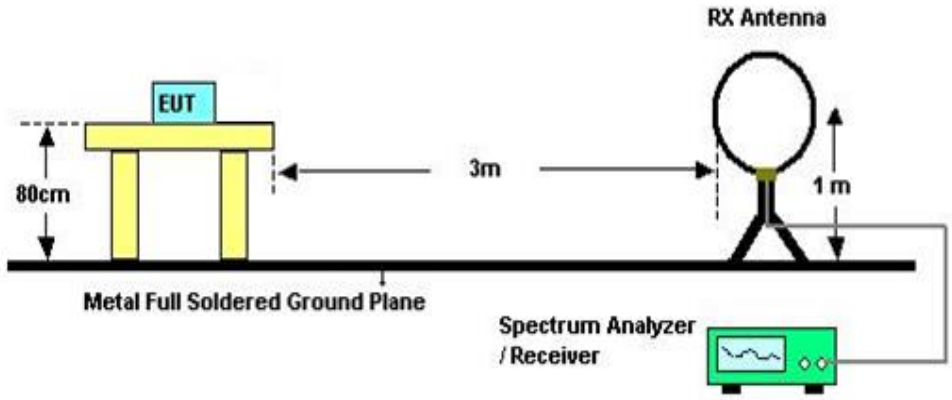
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

TEST SETUP AND PROCEDURE

Below 30MHz (Loop Antenna)



The setting of the spectrum analyzer

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

1. The testing follows the guidelines in ANSI C63.10-2013 and 414788 D01 Radiated Test Site v01.

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 meter above ground.

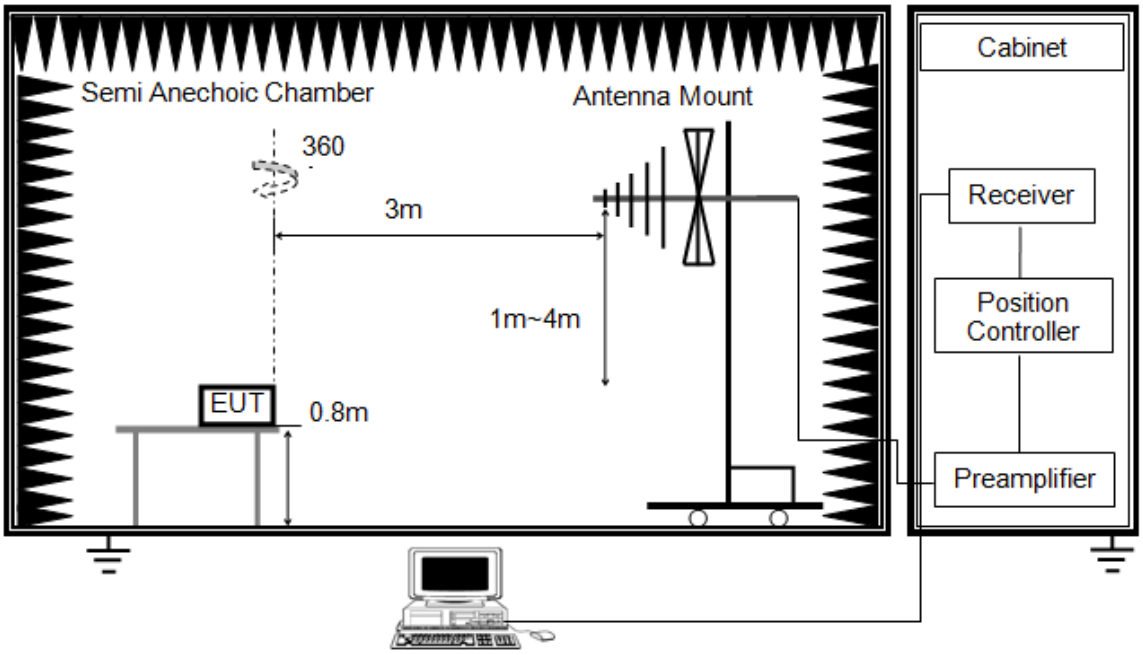
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m height antenna tower.

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 1GHz, 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.

7. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open are test 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 based on KDB 414788.

Below 1G and above 30MHz



The setting of the spectrum analyzer

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

1. The testing follows the guidelines in ANSI C63.10-2013.

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 0.8m 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 1GHz, 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.

RESULTS

7.1. SPURIOUS EMISSIONS BELOW 30MHz

FCC PART 15C BELOW 30MHz SPURIOUS EMISSIONS (MODE 1, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~ 150kHz

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0120	68.43	-101.46	-33.03	46.02	-79.05	peak
2	0.0379	60.51	-101.22	-40.71	36.03	-76.74	peak
3	0.0689	57.44	-101.00	-43.56	30.84	-74.40	peak
4	0.0911	53.26	-101.14	-47.88	28.41	-76.29	peak
5	0.1276	51.51	-101.62	-50.11	25.49	-75.60	peak
6	0.1461	54.91	-101.84	-46.93	24.31	-71.24	peak

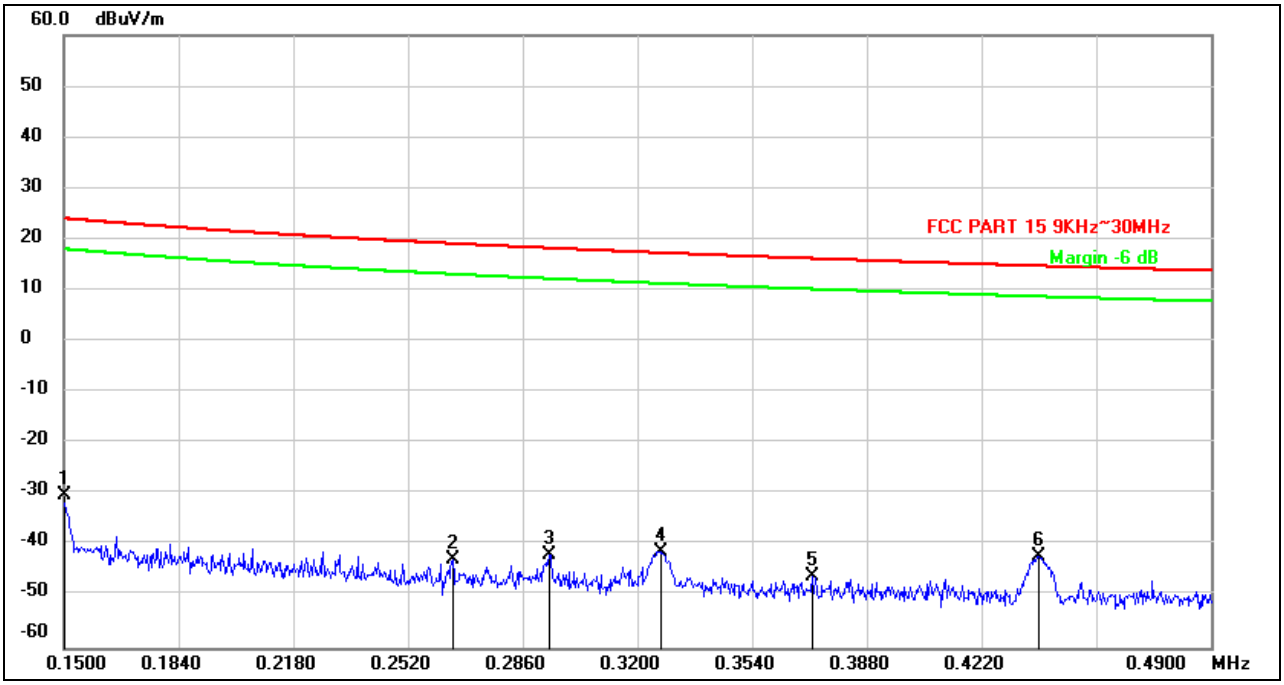
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

150kHz ~ 490kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1500	71.65	-101.89	-30.24	24.08	-54.32	peak
2	0.2652	58.90	-101.78	-42.88	19.13	-62.01	peak
3	0.2938	59.86	-101.77	-41.91	18.24	-60.15	peak
4	0.3268	60.59	-101.77	-41.18	17.32	-58.50	peak
5	0.3720	55.79	-101.75	-45.96	16.19	-62.15	peak
6	0.4390	59.55	-101.72	-42.17	14.75	-56.92	peak

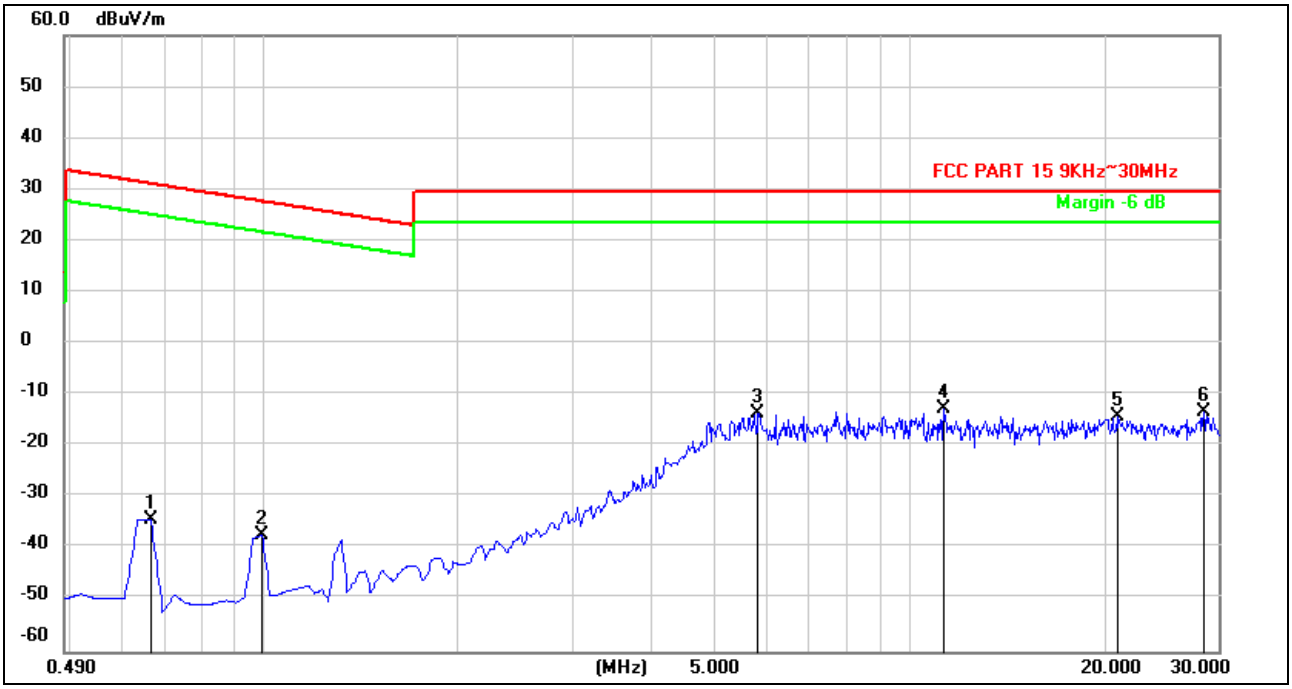
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

490kHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.6671	66.18	-100.46	-34.28	31.12	-65.40	peak
2	0.9917	60.17	-97.46	-37.29	27.67	-64.96	peak
3	5.8313	48.17	-61.81	-13.64	29.54	-43.18	peak
4	11.2907	48.61	-61.28	-12.67	29.54	-42.21	peak
5	20.9109	46.75	-61.07	-14.32	29.54	-43.86	peak
6	28.4950	47.54	-60.75	-13.21	29.54	-42.75	peak

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

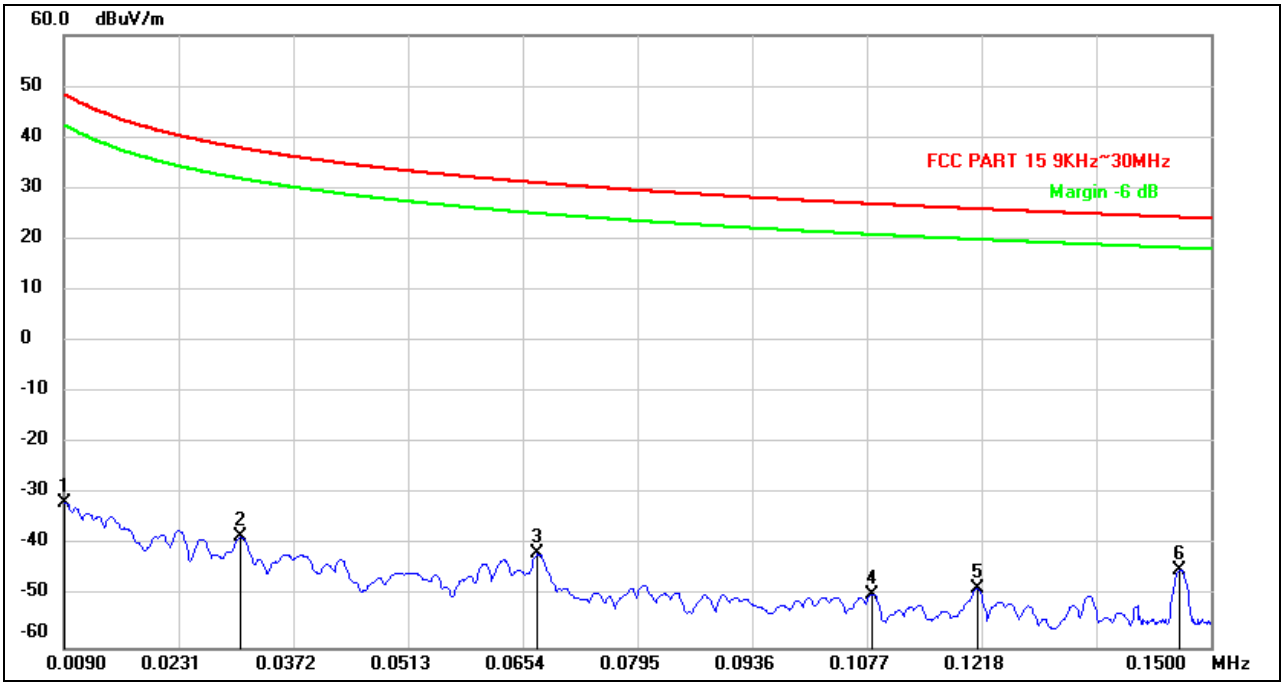
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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

FCC PART 15C BELOW 30MHz SPURIOUS EMISSIONS (MODE 2, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~ 150kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0091	69.52	-101.17	-31.65	48.34	-79.99	peak
2	0.0307	62.72	-101.12	-38.40	37.86	-76.26	peak
3	0.0672	59.34	-101.03	-41.69	31.05	-72.74	peak
4	0.1084	51.86	-101.39	-49.53	26.91	-76.44	peak
5	0.1212	53.11	-101.54	-48.43	25.93	-74.36	peak
6	0.1462	57.03	-101.85	-44.82	24.30	-69.12	peak

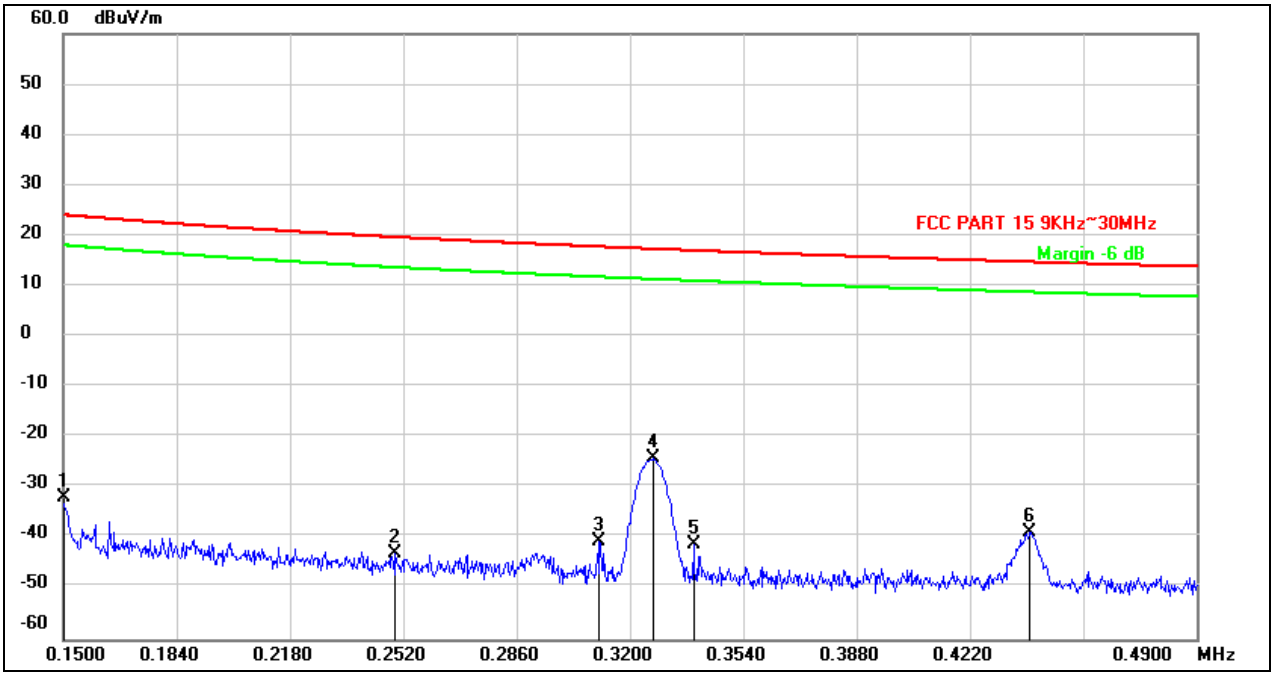
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

150kHz ~ 490kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1500	69.88	-101.89	-32.01	24.08	-56.09	peak
2	0.2496	58.85	-101.79	-42.94	19.66	-62.60	peak
3	0.3108	61.06	-101.78	-40.72	17.75	-58.47	peak
4	0.3268	77.60	-101.77	-24.17	17.32	-41.49	peak
5	0.3390	60.61	-101.76	-41.15	17.00	-58.15	peak
6	0.4400	62.80	-101.72	-38.92	14.73	-53.65	peak

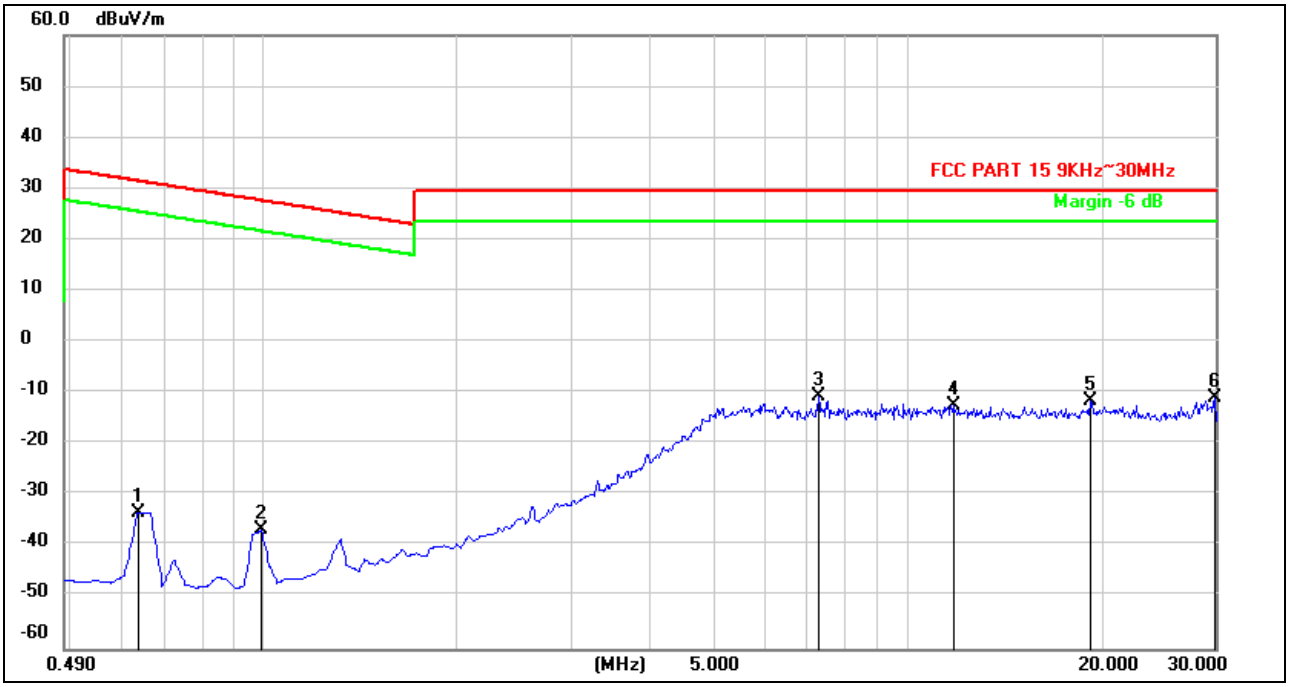
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

490kHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.6375	67.16	-100.66	-33.50	31.51	-65.01	peak
2	0.9917	60.67	-97.46	-36.79	27.67	-64.46	peak
3	7.2773	51.06	-61.60	-10.54	29.54	-40.08	peak
4	11.7628	48.95	-61.31	-12.36	29.54	-41.90	peak
5	19.2289	49.67	-61.15	-11.48	29.54	-41.02	peak
6	29.9115	49.80	-60.65	-10.85	29.54	-40.39	peak

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

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

FCC PART 15C BELOW 30MHz SPURIOUS EMISSIONS (MODE 3, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~ 150kHz

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0505	85.27	-101.37	-16.10	33.53	-49.63	peak
2	0.0640	60.80	-101.10	-40.30	31.48	-71.78	peak
3	0.0991	68.88	-101.27	-32.39	27.68	-60.07	peak
4	0.1098	73.37	-101.41	-28.04	26.80	-54.84	peak
5	0.1179	95.37	-101.51	-6.14	26.17	-32.31	peak
6	0.1462	89.17	-101.85	-12.68	24.30	-36.98	peak

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

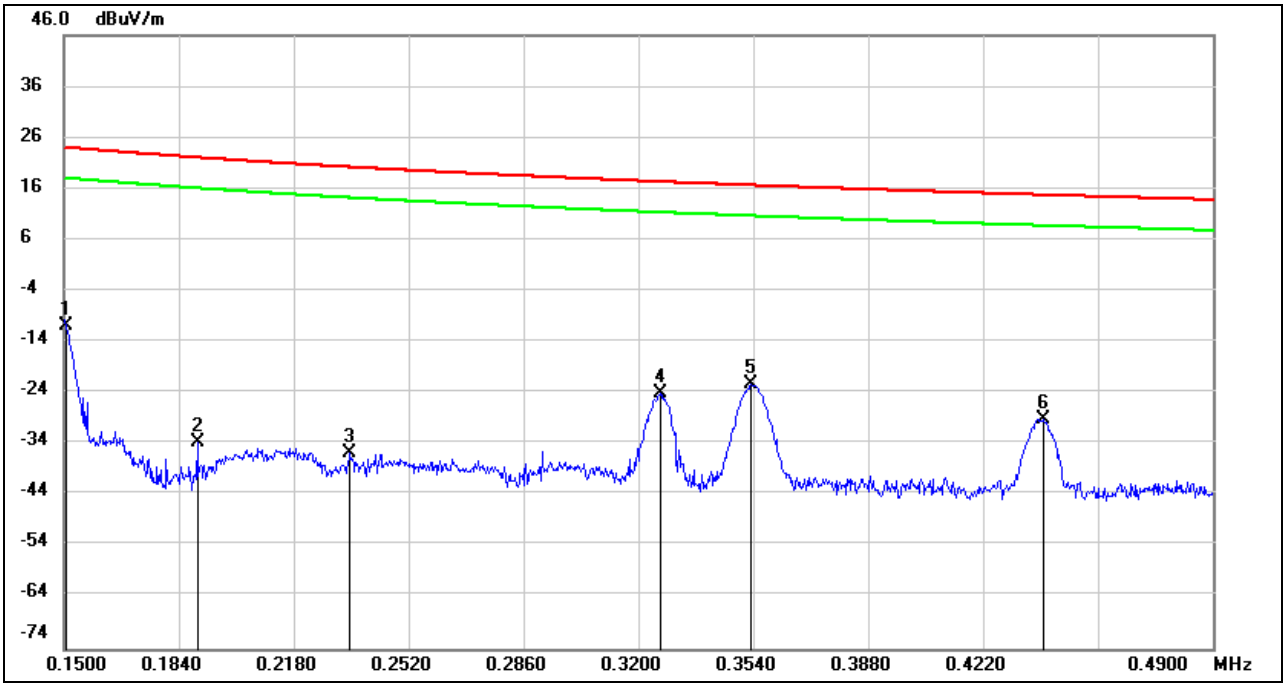
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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

5. the point 5 is the fundamental frequency

150kHz ~ 490kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1507	91.06	-101.89	-10.83	24.04	-34.87	peak
2	0.1894	68.06	-101.85	-33.79	22.06	-55.85	peak
3	0.2347	65.92	-101.81	-35.89	20.19	-56.08	peak
4	0.3265	77.61	-101.77	-24.16	17.32	-41.48	peak
5	0.3533	79.41	-101.76	-22.35	16.64	-38.99	peak
6	0.4397	72.58	-101.72	-29.14	14.74	-43.88	peak

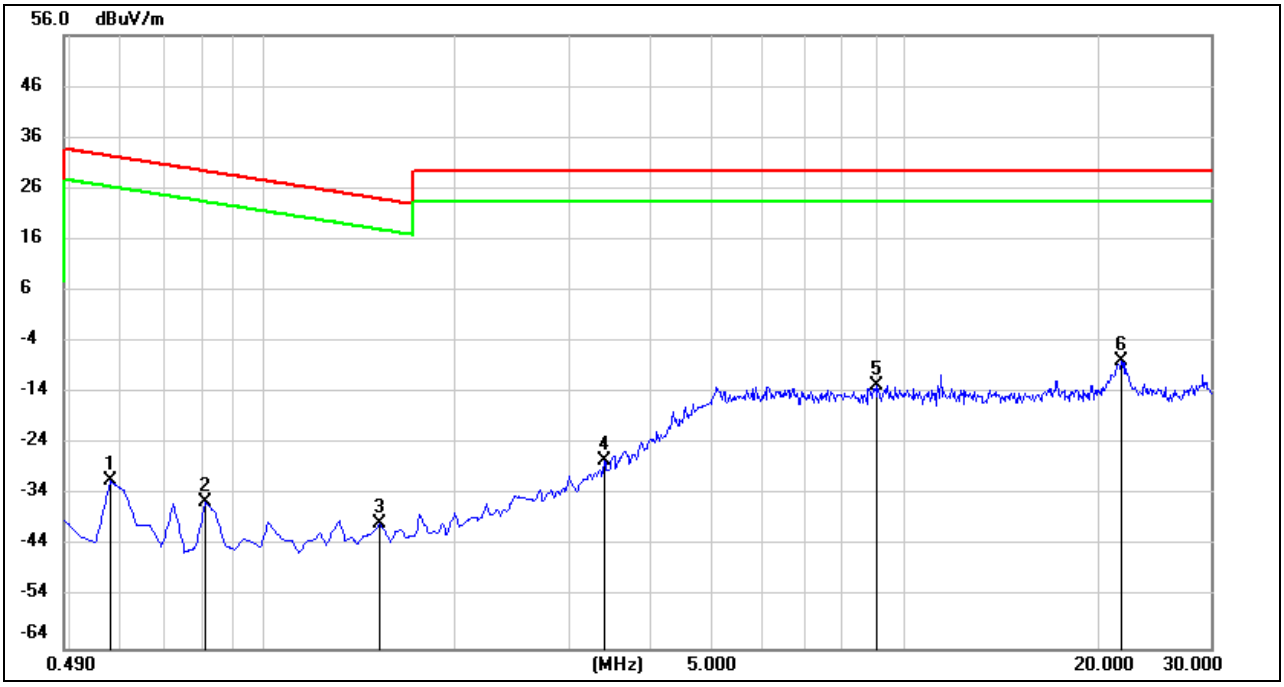
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

490kHz ~ 30MHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.5785	69.81	-101.08	-31.27	32.36	-63.63	peak
2	0.8146	63.79	-99.24	-35.45	29.38	-64.83	peak
3	1.5229	53.04	-92.64	-39.60	23.95	-63.55	peak
4	3.4115	48.84	-76.08	-27.24	29.54	-56.78	peak
5	9.0479	48.87	-61.34	-12.47	29.54	-42.01	peak
6	21.8257	53.16	-61.04	-7.88	29.54	-37.42	peak

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

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

FCC PART 15C BELOW 30MHz SPURIOUS EMISSIONS (MODE 4, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~ 150kHz

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0299	73.80	-101.11	-27.31	38.09	-65.40	peak
2	0.0545	84.86	-101.29	-16.43	32.87	-49.30	peak
3	0.1052	71.82	-101.34	-29.52	27.16	-56.68	peak
4	0.1132	72.26	-101.45	-29.19	26.53	-55.72	peak
5	0.1239	94.30	-101.58	-7.28	25.74	-33.02	peak
6	0.1462	88.35	-101.85	-13.50	24.30	-37.80	peak

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

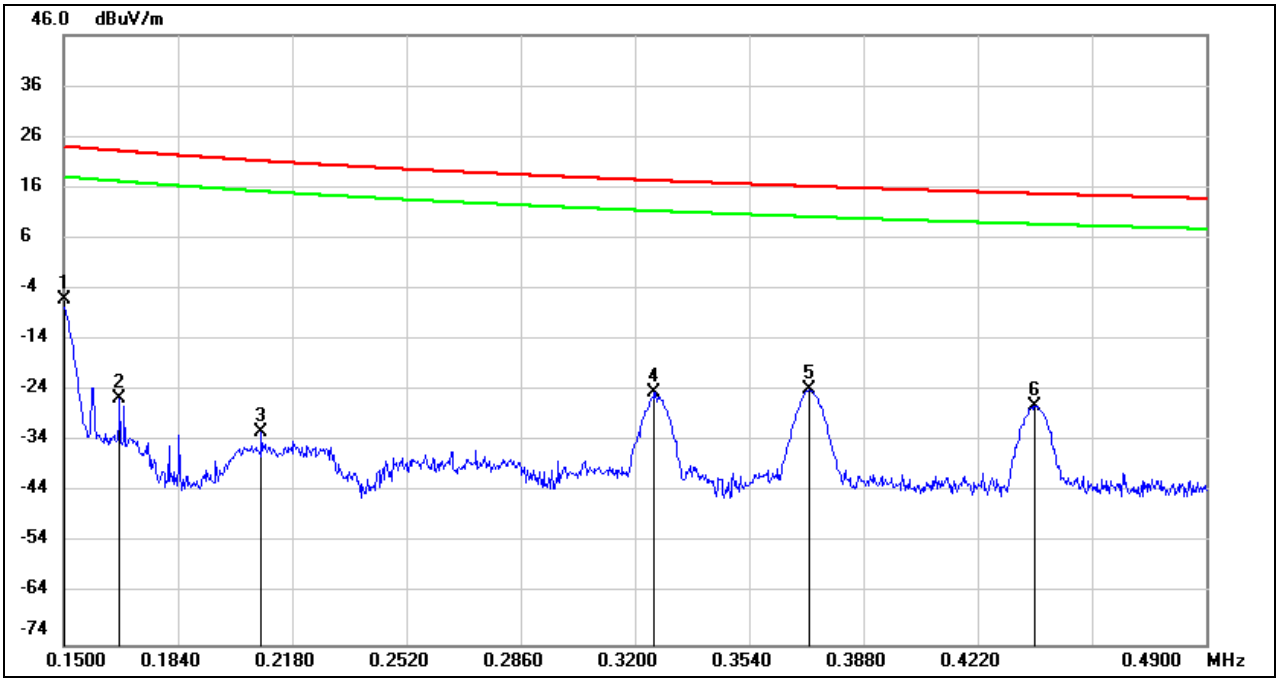
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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

5. The point 5 is the fundamental frequency

150kHz ~ 490kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1500	95.72	-101.89	-6.17	24.08	-30.25	peak
2	0.1667	76.34	-101.87	-25.53	23.17	-48.70	peak
3	0.2088	69.64	-101.83	-32.19	21.21	-53.40	peak
4	0.3258	77.30	-101.77	-24.47	17.34	-41.81	peak
5	0.3717	77.86	-101.75	-23.89	16.20	-40.09	peak
6	0.4390	74.79	-101.72	-26.93	14.75	-41.68	peak

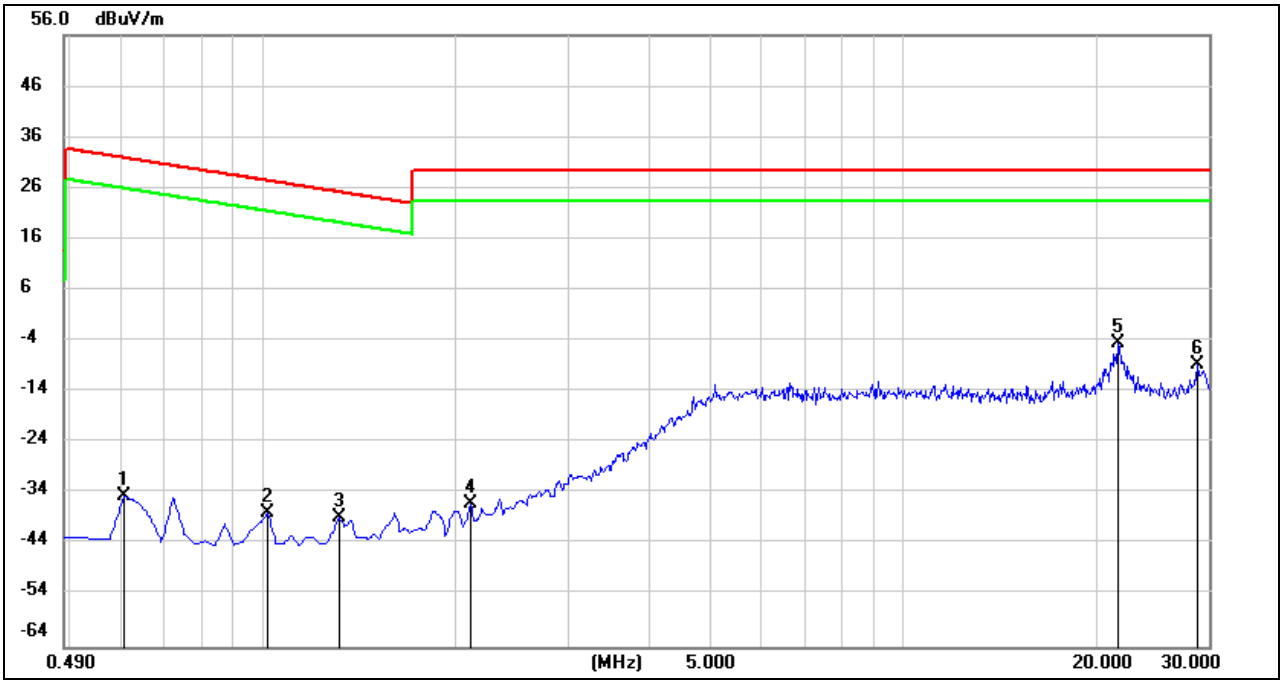
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

490kHz ~ 30MHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.6080	66.49	-100.87	-34.38	31.92	-66.30	peak
2	1.0212	59.31	-97.18	-37.87	27.42	-65.29	peak
3	1.3163	55.99	-94.51	-38.52	25.22	-63.74	peak
4	2.1130	51.33	-87.36	-36.03	29.54	-65.57	peak
5	21.5896	56.63	-61.05	-4.42	29.54	-33.96	peak
6	28.9081	52.05	-60.72	-8.67	29.54	-38.21	peak

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

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

FCC PART 15C BELOW 30MHz SPURIOUS EMISSIONS (MODE 5, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~ 150kHz

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0299	71.01	-101.11	-30.10	38.09	-68.19	peak
2	0.0552	84.49	-101.28	-16.79	32.76	-49.55	peak
3	0.1030	74.34	-101.32	-26.98	27.35	-54.33	peak
4	0.1100	72.75	-101.41	-28.66	26.78	-55.44	peak
5	0.1139	69.95	-101.46	-31.51	26.48	-57.99	peak
6	0.1208	92.27	-101.54	-9.27	25.96	-35.23	peak

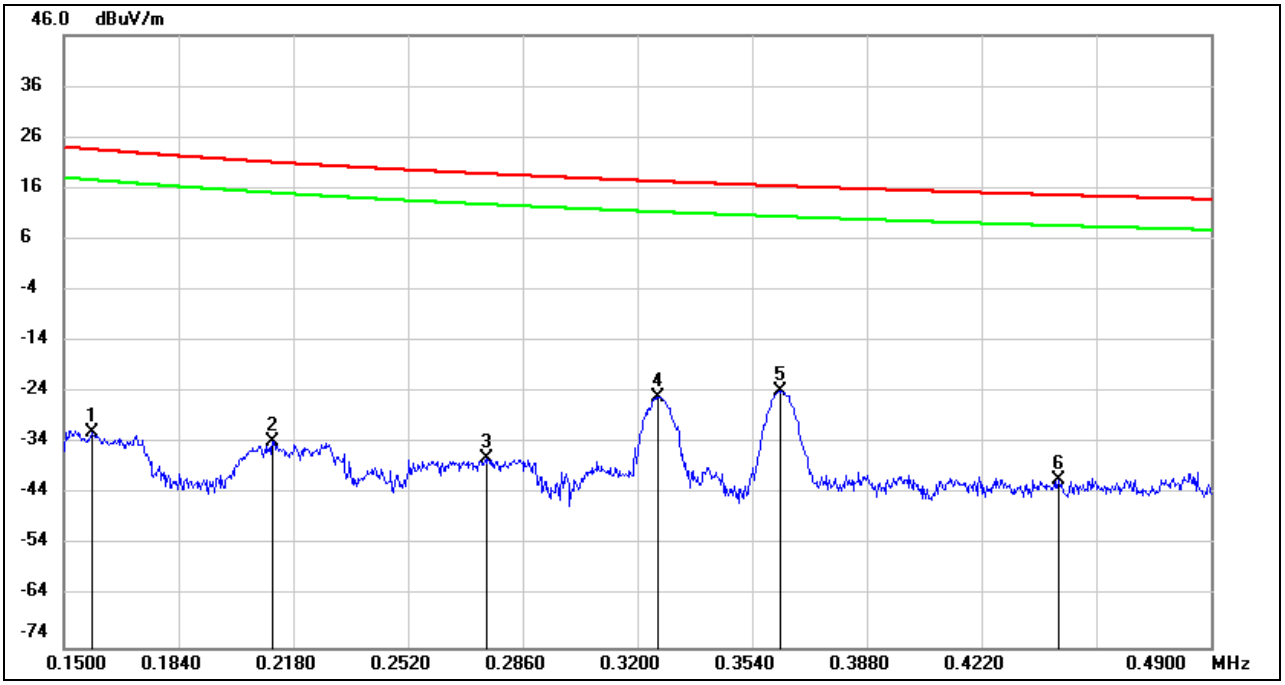
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

150kHz ~ 490kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1582	70.07	-101.88	-31.81	23.62	-55.43	peak
2	0.2119	68.19	-101.83	-33.64	21.08	-54.72	peak
3	0.2751	64.93	-101.78	-36.85	18.81	-55.66	peak
4	0.3261	76.78	-101.77	-24.99	17.33	-42.32	peak
5	0.3622	78.07	-101.76	-23.69	16.42	-40.11	peak
6	0.4448	60.46	-101.72	-41.26	14.64	-55.90	peak

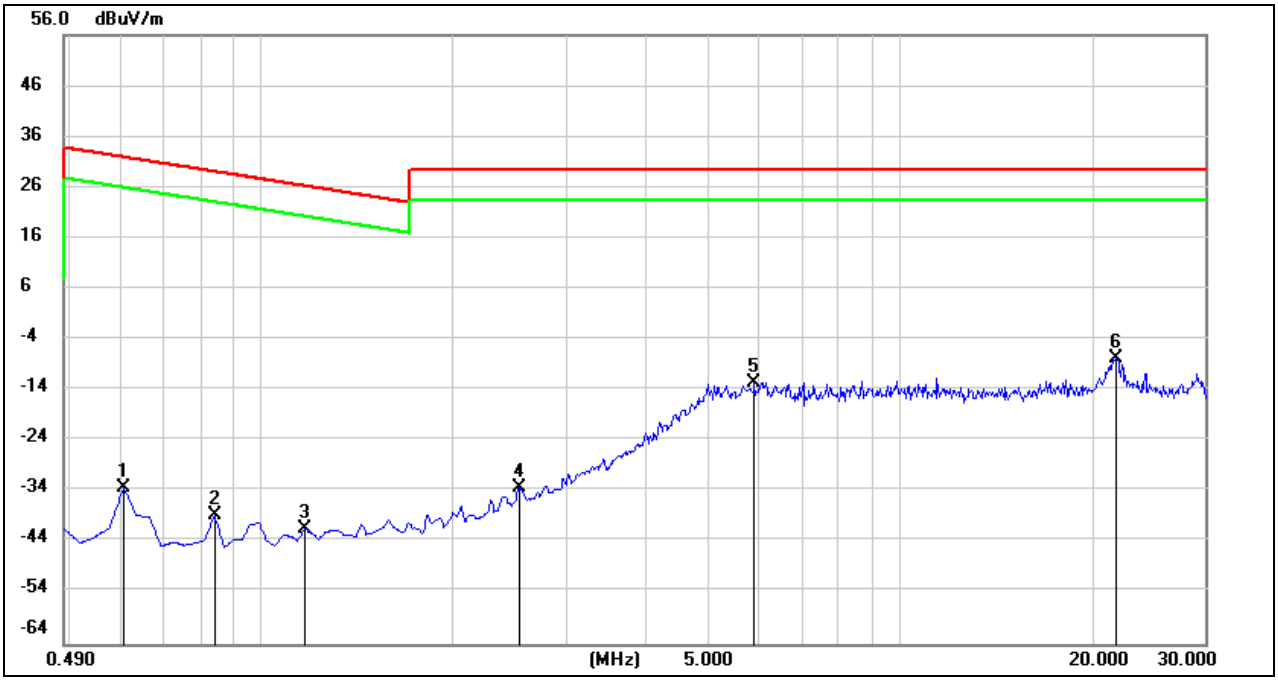
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

490kHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.6080	67.75	-100.87	-33.12	31.92	-65.04	peak
2	0.8441	60.41	-98.95	-38.54	29.08	-67.62	peak
3	1.1687	54.59	-95.84	-41.25	26.25	-67.50	peak
4	2.5262	50.51	-83.85	-33.34	29.54	-62.88	peak
5	5.9198	49.39	-61.79	-12.40	29.54	-41.94	peak
6	21.7667	53.39	-61.04	-7.65	29.54	-37.19	peak

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

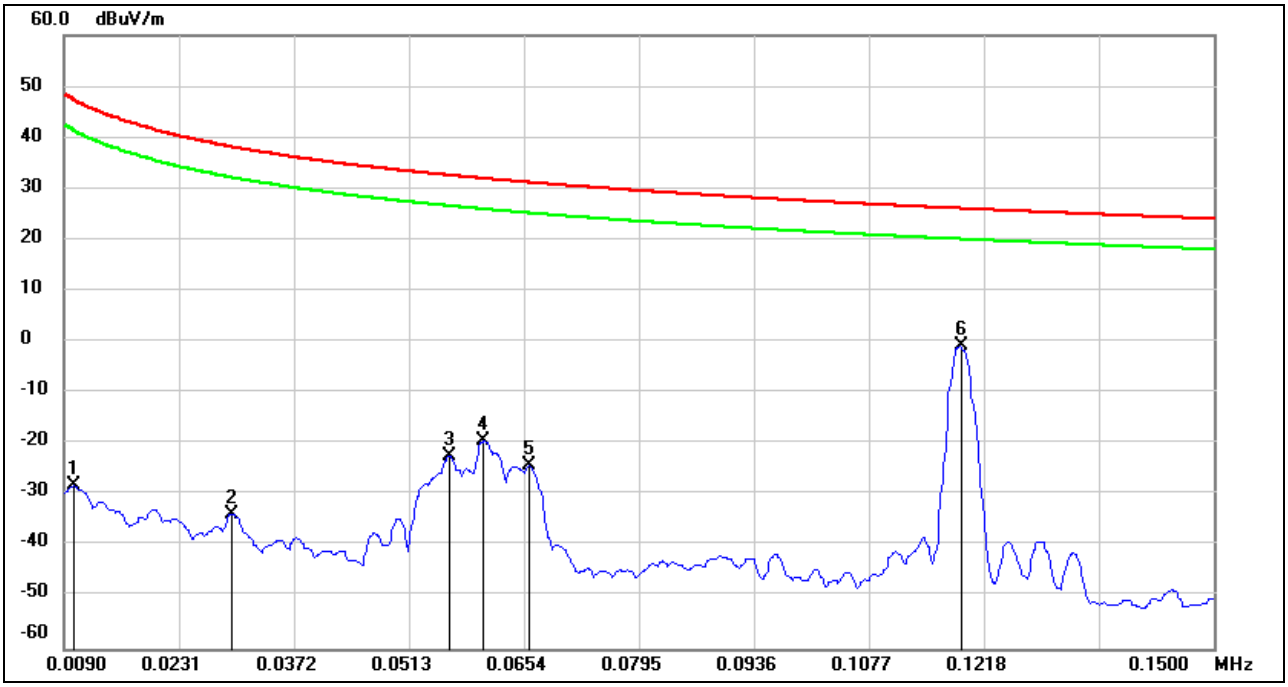
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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

FCC PART 15C BELOW 30MHz SPURIOUS EMISSIONS (MODE 6, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~ 150kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0103	73.40	-101.56	-28.16	47.34	-75.50	peak
2	0.0297	67.43	-101.11	-33.68	38.15	-71.83	peak
3	0.0564	78.80	-101.25	-22.45	32.58	-55.03	peak
4	0.0606	81.83	-101.17	-19.34	31.95	-51.29	peak
5	0.0661	76.84	-101.06	-24.22	31.20	-55.42	peak
6	0.1190	100.72	-101.52	-0.80	26.09	-26.89	peak

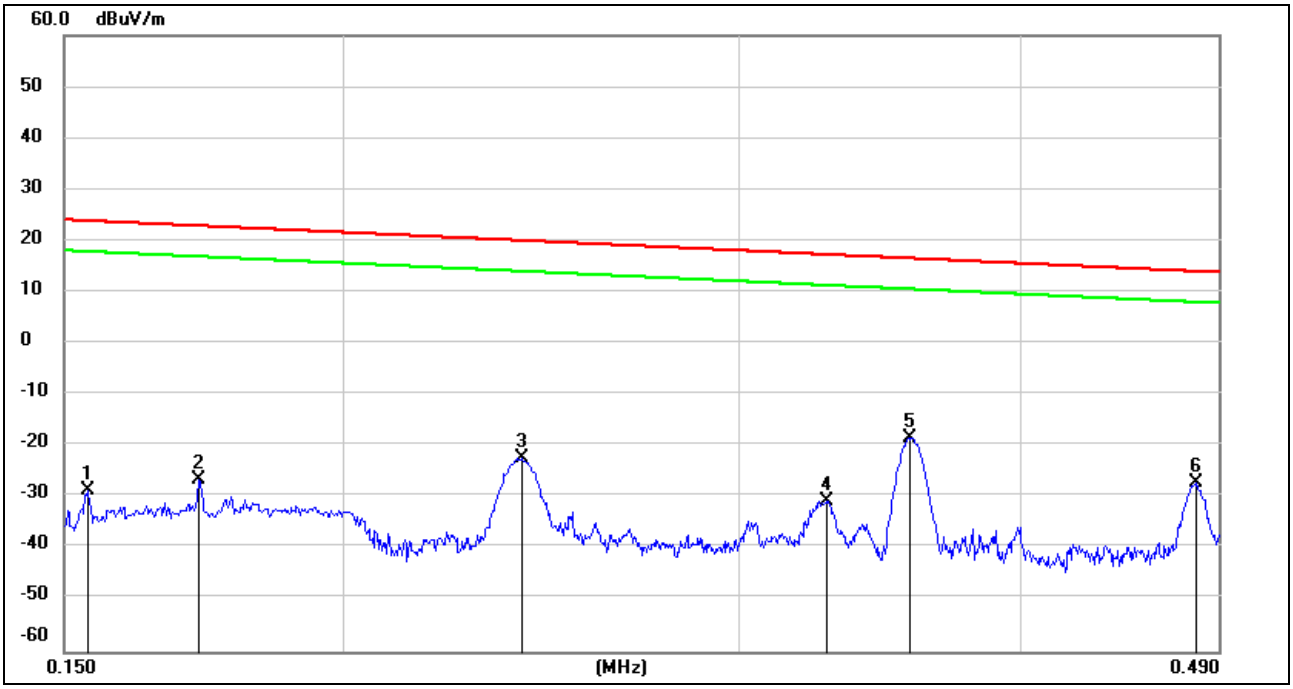
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

150kHz ~ 490kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1537	73.29	-101.89	-28.60	23.87	-52.47	peak
2	0.1720	75.37	-101.87	-26.50	22.90	-49.40	peak
3	0.2398	79.56	-101.80	-22.24	20.00	-42.24	peak
4	0.3282	71.14	-101.77	-30.63	17.28	-47.91	peak
5	0.3574	83.39	-101.76	-18.37	16.54	-34.91	peak
6	0.4795	74.52	-101.71	-27.19	13.99	-41.18	peak

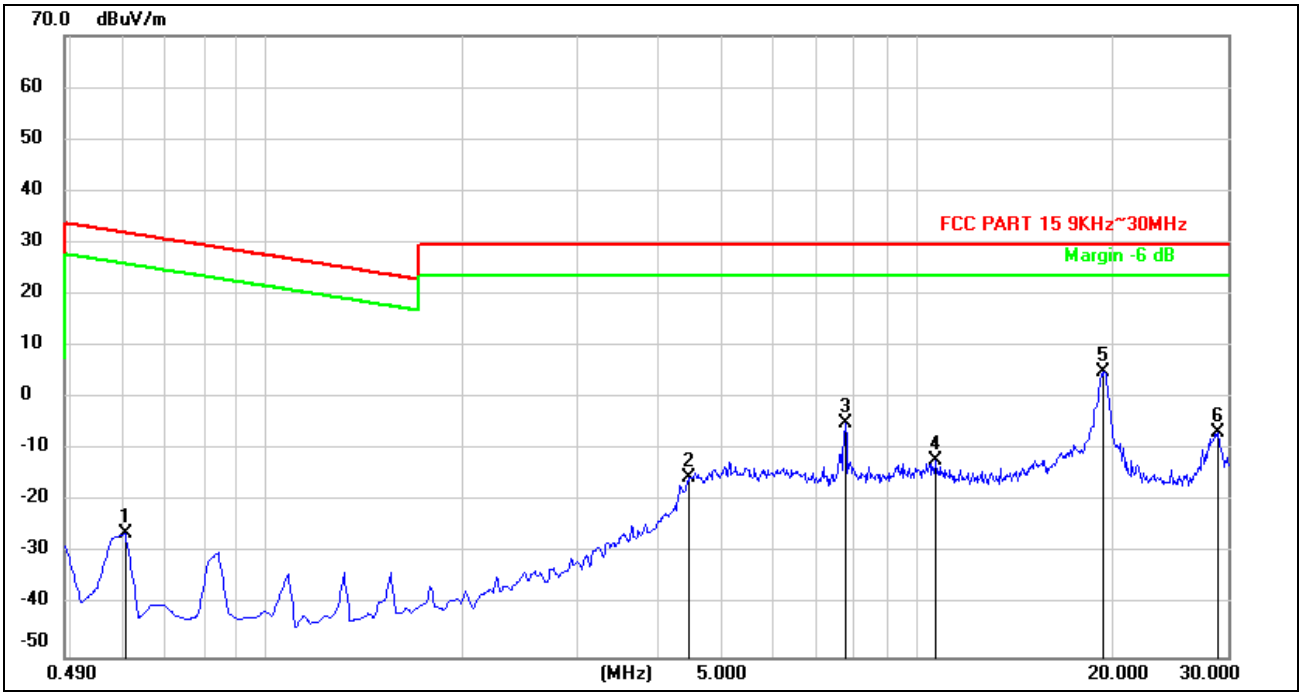
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP 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 3m test site, but we added the corresponding factor to extrapolated the result to the specified distance according to FCC 15.31(f)(2).

490kHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.6080	74.72	-100.87	-26.15	31.92	-58.07	peak
2	4.4739	51.30	-66.54	-15.24	29.54	-44.78	peak
3	7.7495	56.69	-61.53	-4.84	29.54	-34.38	peak
4	10.7005	49.17	-61.24	-12.07	29.54	-41.61	peak
5	19.3469	66.21	-61.14	5.07	29.54	-24.47	peak
6	28.9967	54.01	-60.72	-6.71	29.54	-36.25	peak

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

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

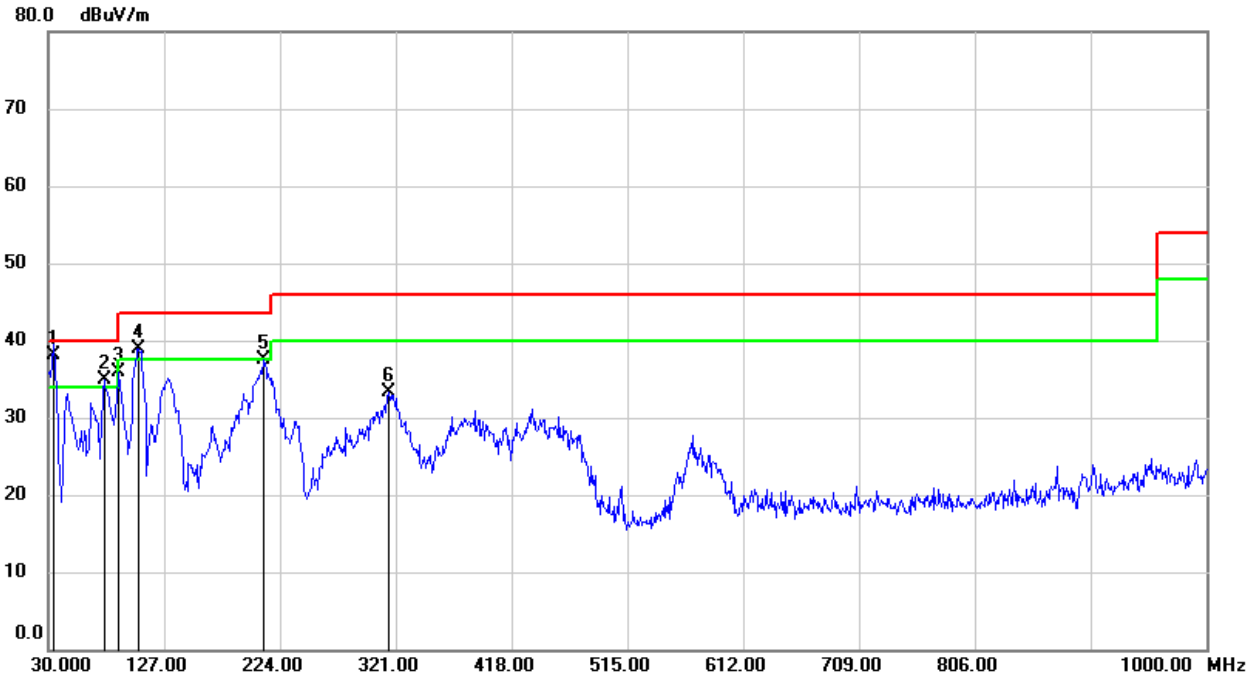
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

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

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

7.2. SPURIOUS EMISSIONS 30MHz - 1GHz

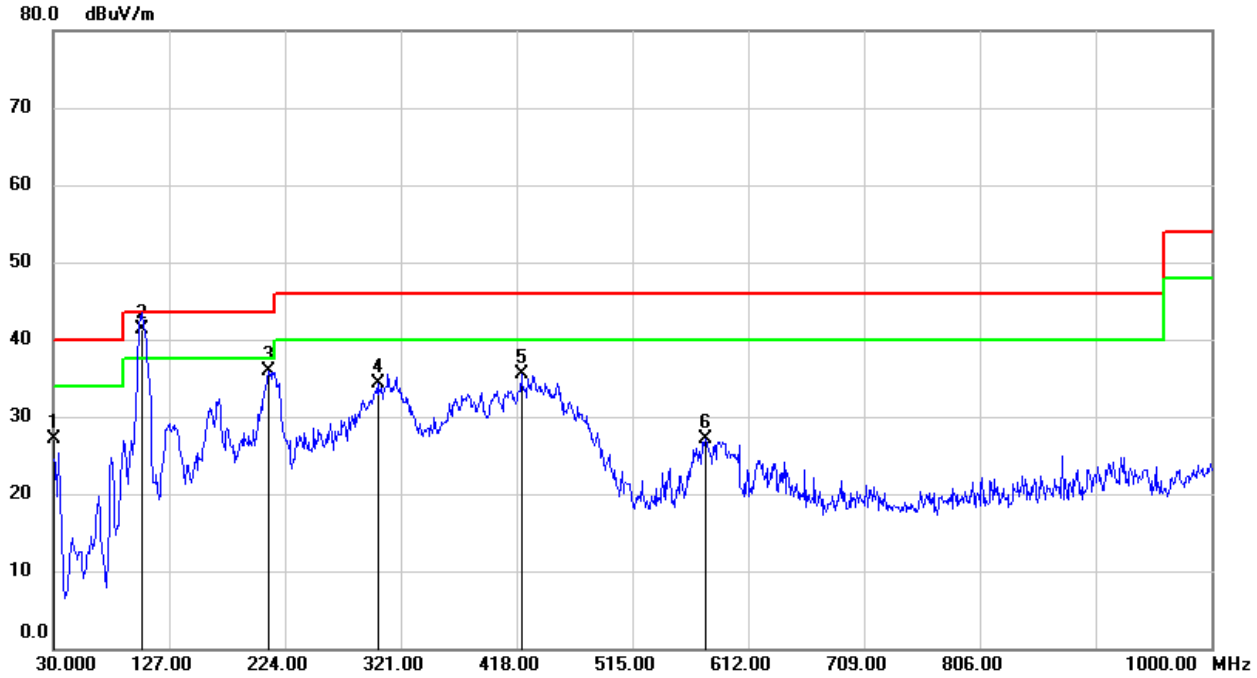
FCC PART15C SPURIOUS EMISSIONS (MODE 6, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	33.8800	55.61	-17.43	38.18	40.00	-1.82	QP
2	76.5600	55.29	-20.35	34.94	40.00	-5.06	QP
3	89.1700	56.98	-20.98	36.00	43.50	-7.50	QP
4	105.6600	60.42	-21.51	38.91	43.50	-4.59	QP
5	210.4200	54.15	-16.56	37.59	43.50	-5.91	QP
6	315.1800	47.34	-14.04	33.30	46.00	-12.70	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 (MODE 6, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	43.97	-16.94	27.03	40.00	-12.97	QP
2	104.6900	62.73	-21.52	41.21	43.50	-2.29	QP
3	210.4200	52.54	-16.56	35.98	43.50	-7.52	QP
4	301.6000	48.56	-14.17	34.39	46.00	-11.61	QP
5	421.8800	47.80	-12.32	35.48	46.00	-10.52	QP
6	576.1100	36.44	-9.29	27.15	46.00	-18.85	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.

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

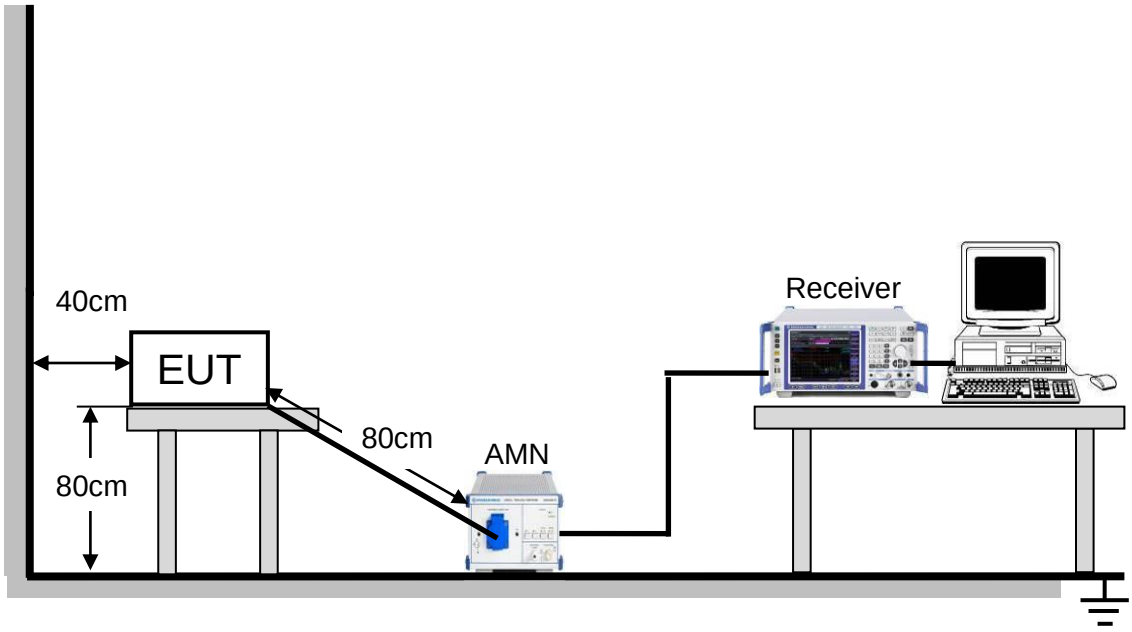
8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

Please refer to FCC §15.207 (a) .

FREQUENCY (MHz)	(dBuV)	
	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

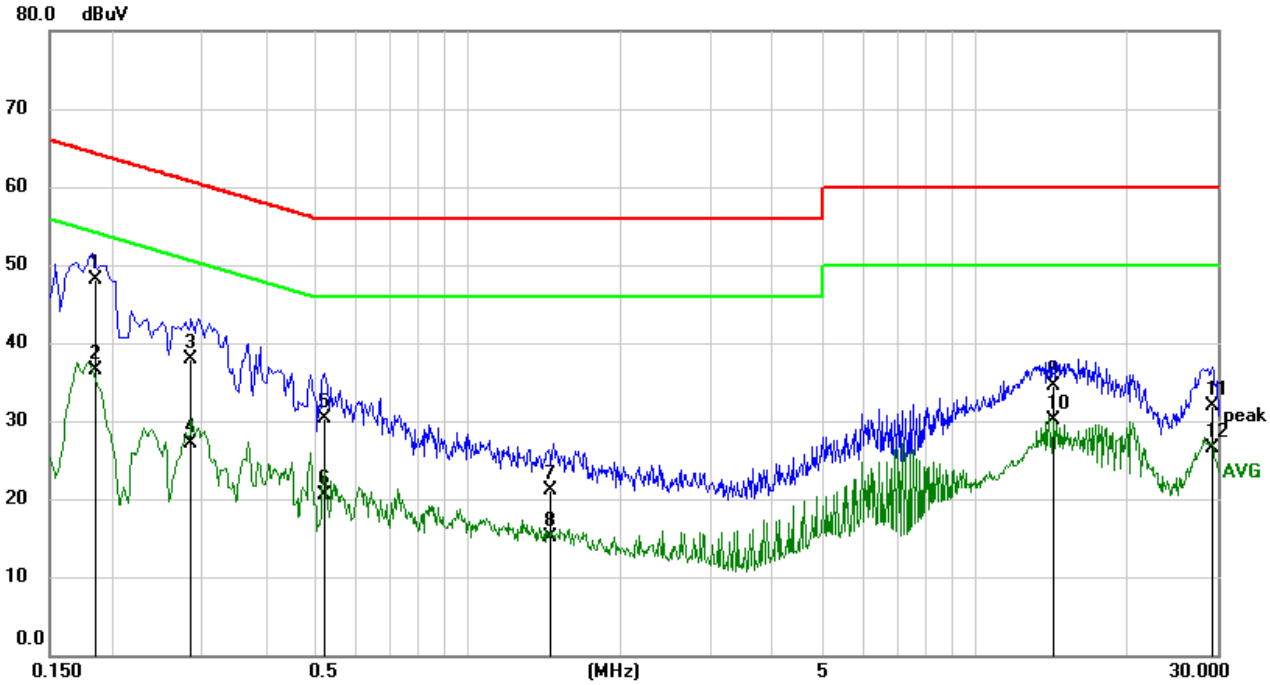
TEST SETUP AND PROCEDURE



The EUT is put on a table of non-conducting material that is 0.8m high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). An 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 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.
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 RESULTS

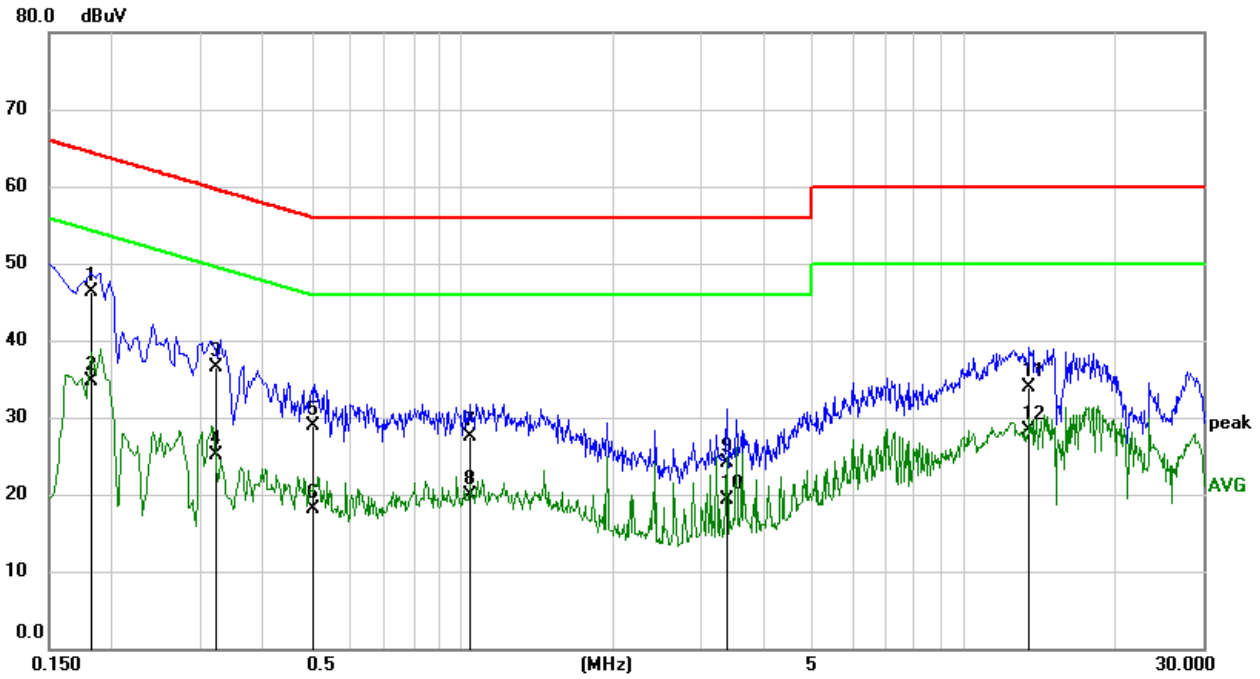
LINE L RESULTS (MODE 6, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1847	38.42	9.60	48.02	64.27	-16.25	QP
2	0.1847	26.96	9.60	36.56	54.27	-17.71	AVG
3	0.2856	28.24	9.60	37.84	60.65	-22.81	QP
4	0.2856	17.44	9.60	27.04	50.65	-23.61	AVG
5	0.5219	20.72	9.60	30.32	56.00	-25.68	QP
6	0.5219	10.96	9.60	20.56	46.00	-25.44	AVG
7	1.4578	11.43	9.61	21.04	56.00	-34.96	QP
8	1.4578	5.41	9.61	15.02	46.00	-30.98	AVG
9	14.2178	24.71	9.83	34.54	60.00	-25.46	QP
10	14.2178	20.20	9.83	30.03	50.00	-19.97	AVG
11	29.2861	22.19	9.80	31.99	60.00	-28.01	QP
12	29.2861	16.66	9.80	26.46	50.00	-23.54	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: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.
5. The extension cord/outlet strip was calibrated with the LISN as required by ANSI C63.10:2013 Clause 6.2.2.

LINE N RESULTS (MODE 6, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1723	33.21	9.60	42.81	64.85	-22.04	QP
2	0.1723	4.60	9.60	14.20	54.85	-40.65	AVG
3	0.2427	27.13	9.60	36.73	62.00	-25.27	QP
4	0.2427	18.16	9.60	27.76	52.00	-24.24	AVG
5	0.5379	32.40	9.60	42.00	56.00	-14.00	QP
6	0.5379	10.86	9.60	20.46	46.00	-25.54	AVG
7	1.4515	24.87	9.61	34.48	56.00	-21.52	QP
8	1.4515	17.84	9.61	27.45	46.00	-18.55	AVG
9	7.9835	29.03	9.72	38.75	60.00	-21.25	QP
10	7.9835	17.39	9.72	27.11	50.00	-22.89	AVG
11	29.9549	33.38	9.87	43.25	60.00	-16.75	QP
12	29.9549	21.07	9.87	30.94	50.00	-19.06	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: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.
5. The extension cord/outlet strip was calibrated with the LISN as required by ANSI C63.10:2013 Clause 6.2.2.

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

END OF REPORT