



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Base Station Hub Edition

MODEL NUMBER: NM30011A30, NM300W4A00, NM30045A00

FCC ID: 2AJYRNM30011A30

REPORT NUMBER: 4789432896.1-3

ISSUE DATE: April 13, 2020

Prepared for

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Prepared by

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V0	04/13/2020	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
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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: Zhongshan Zen Factory Ltd.
Address: 6th.Industrial Area,Nanlang Town,Zhongshan City, Guangdong,China

EUT Information

EUT Name: Base Station Hub Edition
Model: NM300W4A00
Series Model: NM30011A30, NM30045A00
Model Difference: Refer to section 5.1 for details
Brand: NOMAD
Sample Received Date: March 26, 2020
Sample Status: Normal
Sample ID: 2981551
Date of Tested: March 26, 2020 ~ April 13 2020

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

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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	<p>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.</p> <p>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</p> <p>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.</p> <p>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</p>

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 Hub Edition
EUT Description	The EUT is a wireless charger with USB type-A and type-C output.
Model	NM300W4A00
Series Model	NM30011A30, NM30045A00
Model Difference	Their electrical circuit design, layout and internal wiring are identical, all models have wireless charging function, the appearance are different. We select "NM300W4A00" as the representative model for formal test
Operation Frequency	119.74kHz (for Left coils) 121.55kHz (for Right coils) 110.09kHz (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: 10W(left coil)+10W(middle coil)+10W(right coil)

Note 1: The middle coil is not able to work together with two sides coils (left and right), option one is that two sides coils work at same time, option two is that middle coil work alone. In order to ensure all worst case conditions were measured, even though only left and right can operate simultaneously, all three coils were loaded for some modes by overriding the device mechanism that allows correct operating conditions.

Note 2: All three models were evaluated, only the data of the worst Model NM300W4A00 was recorded in this report.



5.2. TEST MODE

Config	Test Mode	Description
Mode 1	Standby	EUT alone
Mode 2	Operating	10W load on left coil USB Type-A output 5V1A USB Type-C output 9V2A
Mode 3	Operating	10W load on right coil USB Type-A output 5V1A USB Type-C output 9V2A
Mode 4	Operating	10W load on middle coil USB Type-A output 5V1A USB Type-C output 9V2A
Mode 5	Operating	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 1: the Type-C output port support 5V/3A and 9V/2A, these two modes have been evaluated, but only the worst case (9V2A output) was recorded in this report;

Note 2: all modes have been tested, but only the worst data was recorded in this report, the worst case mode is Mode 5.

Note 3: For Mode 5, based on the feature of the device, there are only two coils (left and right) are operated.

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	/	/	5.0Ω
3	Dummy Load	/	/	4.5Ω

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

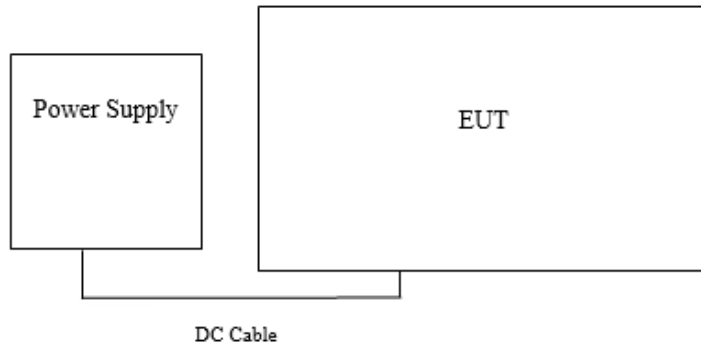
Item	Accessory	Brand Name	Model Name	Description
1	Power Supply	/	A481-1204000I	Input: AC 100-240V~ 50/60Hz 1.5A Output: 12V 4000mA DC cable length: 2.0m

TEST SETUP

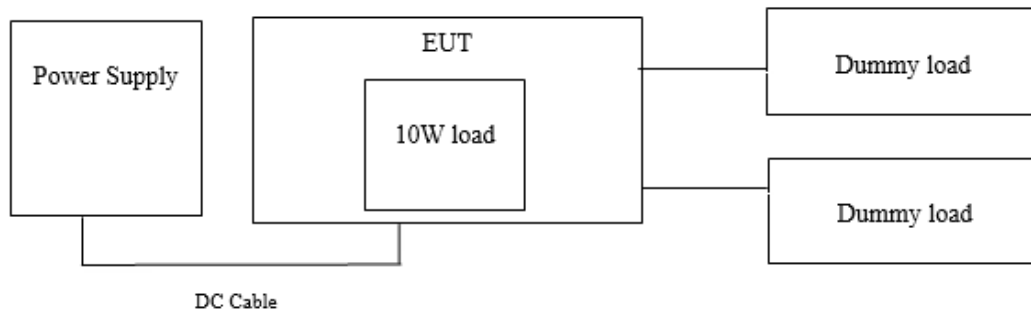
The EUT support wireless charging.

SETUP DIAGRAM FOR TEST

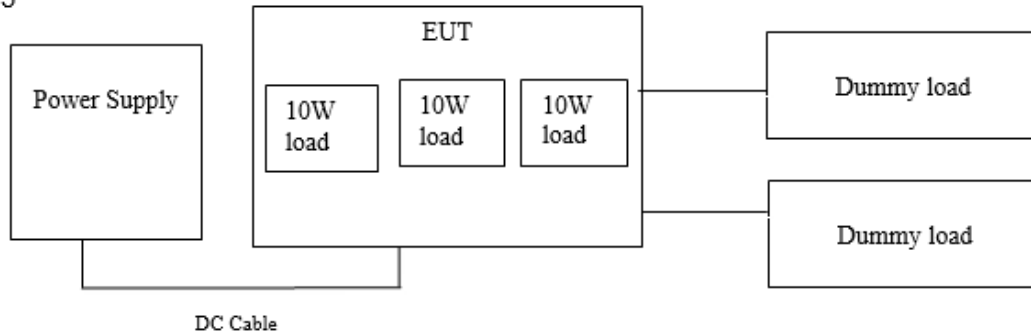
Mode 1



Mode 2 & 3 & 4



Mode 5



**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.

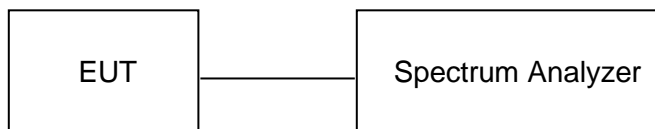
TEST PROCEDURE

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

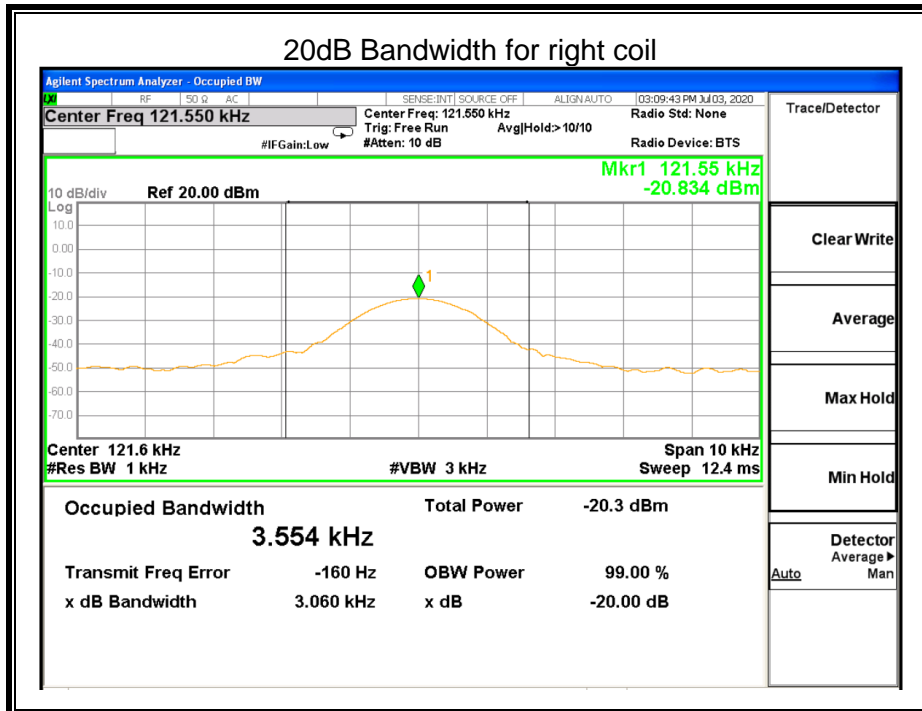
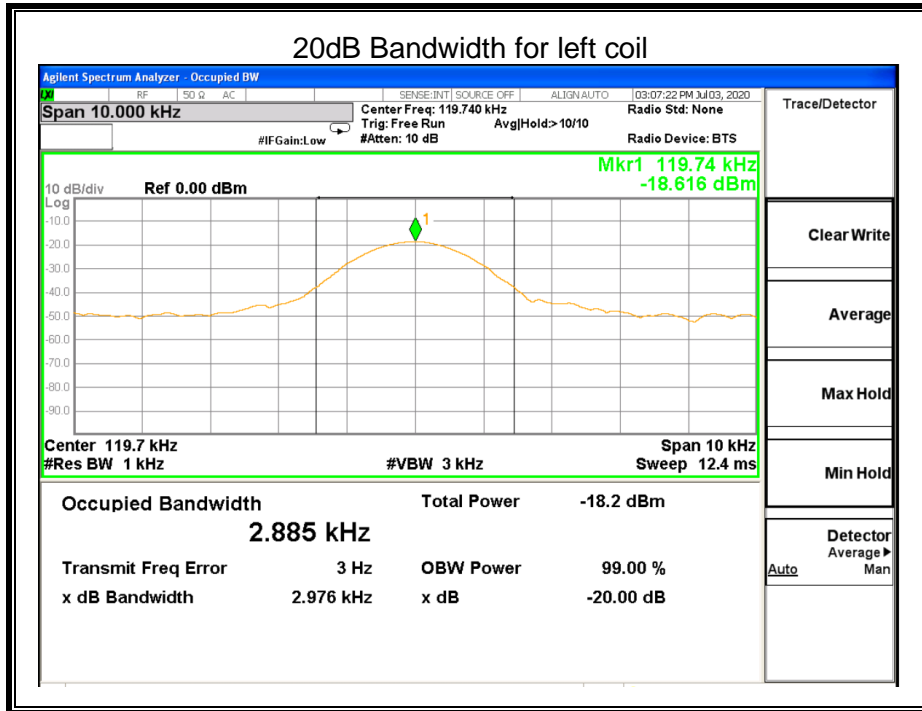
Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

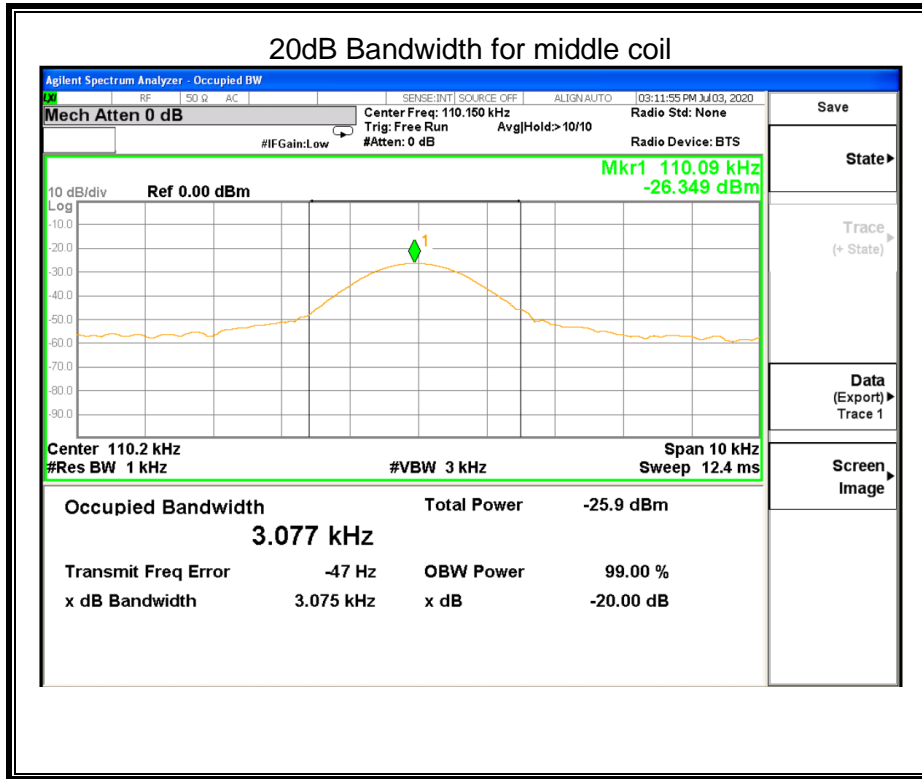
TEST SETUP



RESULTS

Frequency (kHz)	20dB Bandwidth (kHz)	Coil positon
119.74	2.976	Left
121.55	3.060	Right
110.09	3.075	Middle





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)

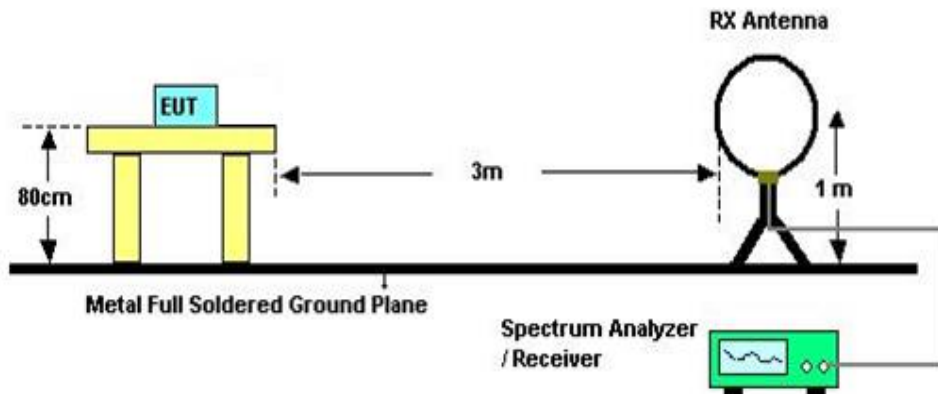
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

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)

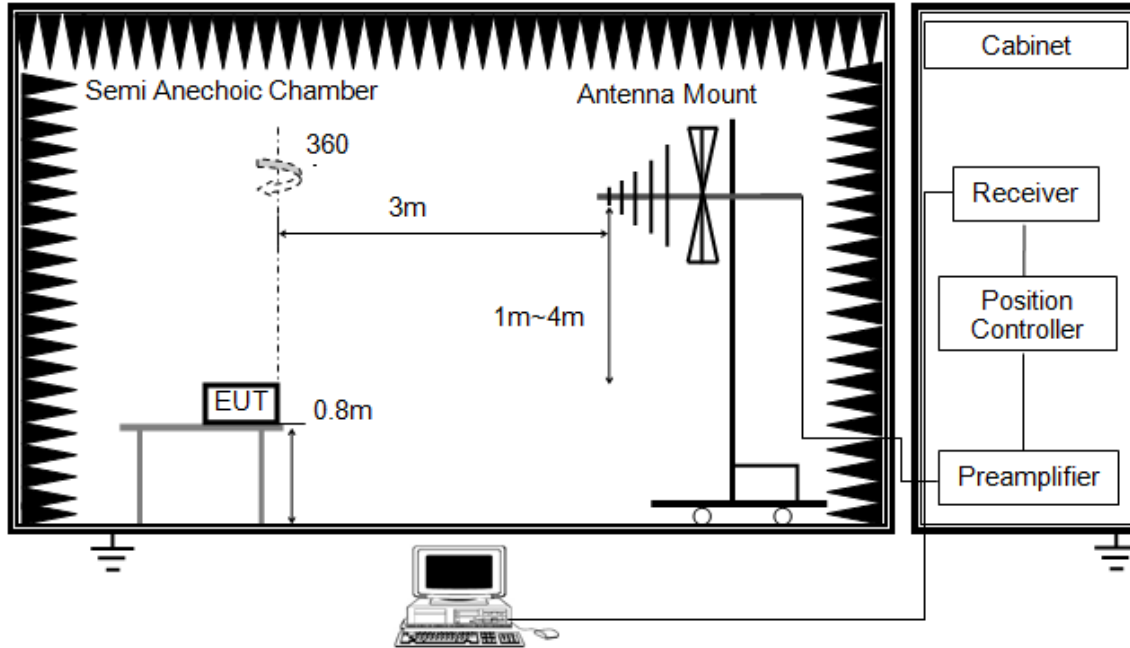


The setting of the spectrum analyzer

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.

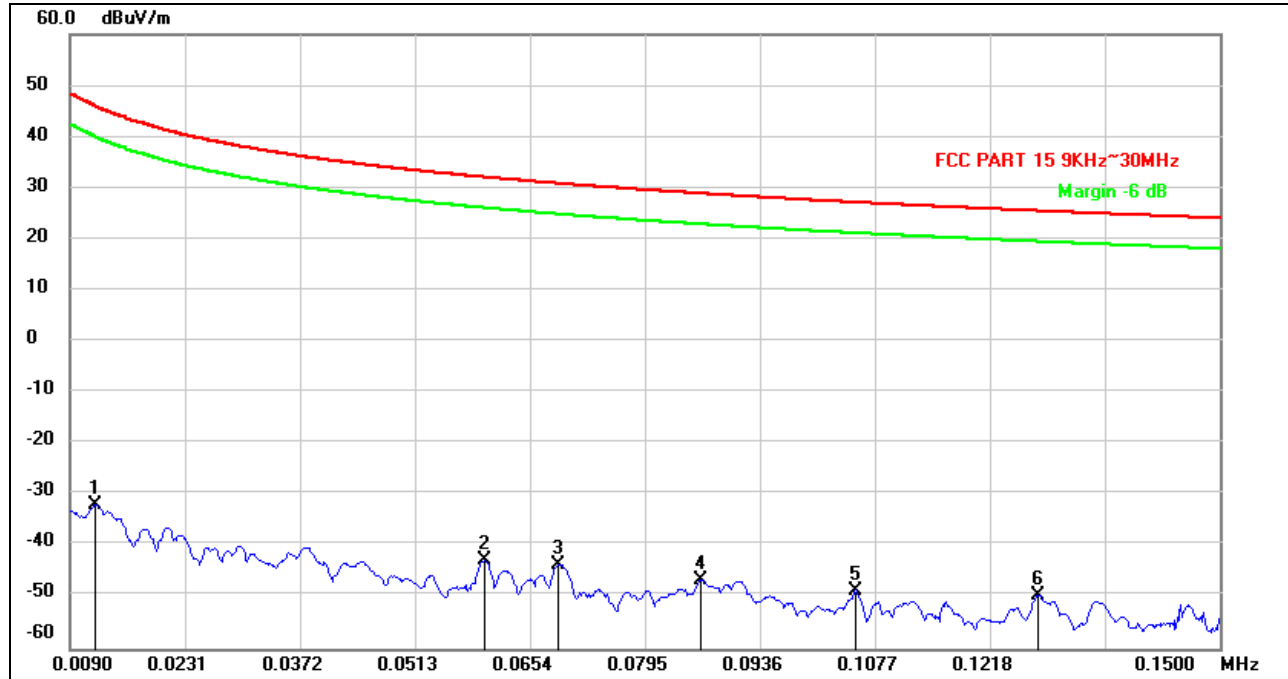
Below 1G and above 30MHz



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**

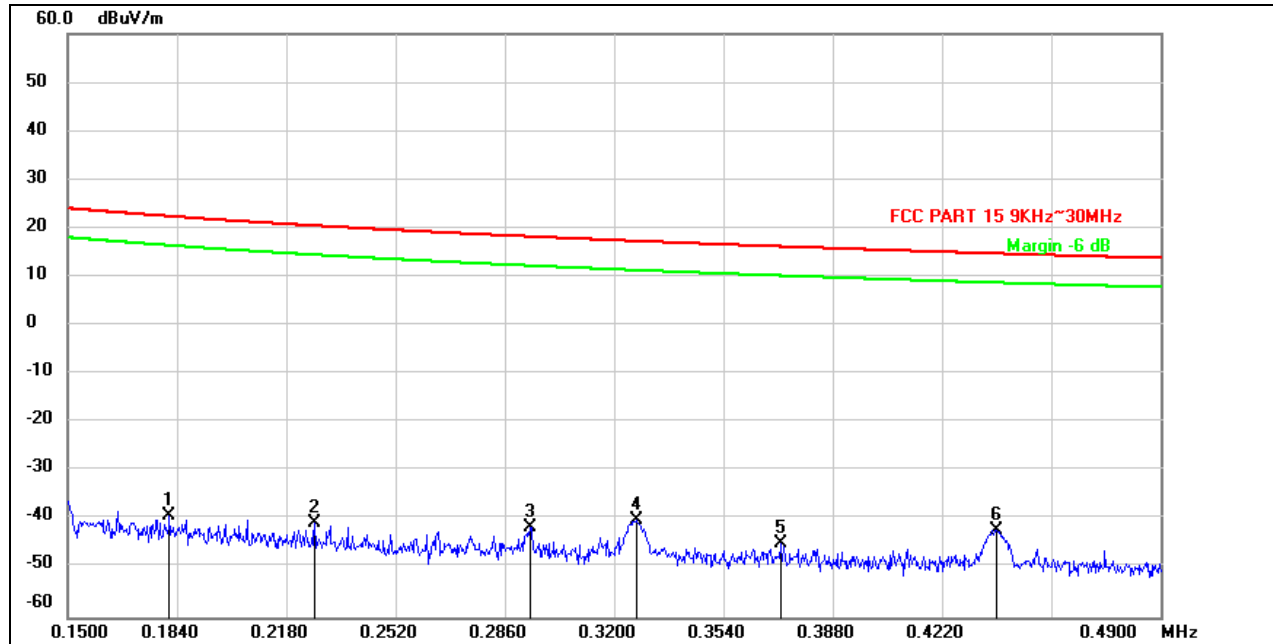
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0120	69.43	-101.46	-32.03	46.02	-78.05	peak
2	0.0597	58.31	-101.18	-42.87	32.08	-74.95	peak
3	0.0689	57.44	-101.00	-43.56	30.84	-74.40	peak
4	0.0864	54.41	-101.06	-46.65	28.87	-75.52	peak
5	0.1053	52.74	-101.34	-48.60	27.16	-75.76	peak
6	0.1276	52.01	-101.62	-49.61	25.49	-75.10	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**

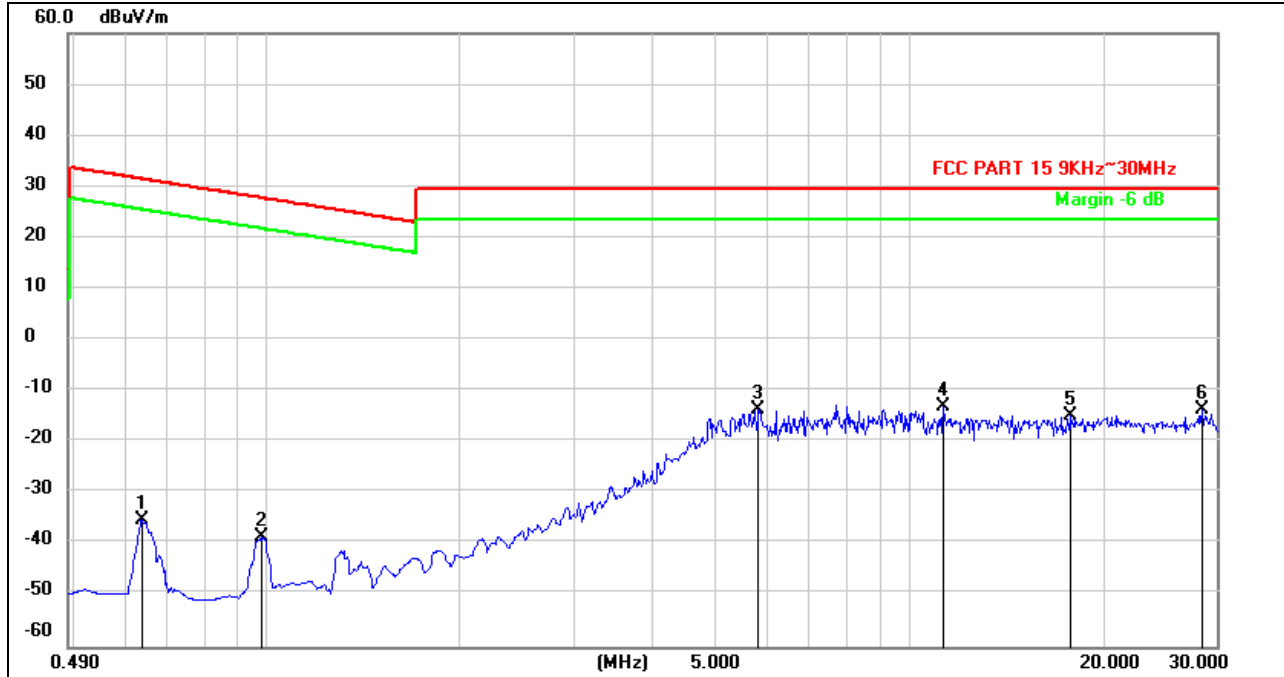
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1816	62.65	-101.86	-39.21	22.42	-61.63	peak
2	0.2268	61.09	-101.81	-40.72	20.49	-61.21	peak
3	0.2938	60.36	-101.77	-41.41	18.24	-59.65	peak
4	0.3266	61.59	-101.77	-40.18	17.32	-57.50	peak
5	0.3719	56.79	-101.75	-44.96	16.19	-61.15	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	0.6401	65.34	-100.65	-35.31	31.48	-66.79	peak
2	0.9779	59.00	-97.60	-38.60	27.80	-66.40	peak
3	5.8311	48.17	-61.81	-13.64	29.54	-43.18	peak
4	11.2904	48.11	-61.28	-13.17	29.54	-42.71	peak
5	17.7238	46.53	-61.27	-14.74	29.54	-44.28	peak
6	28.4949	47.04	-60.75	-13.71	29.54	-43.25	peak

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

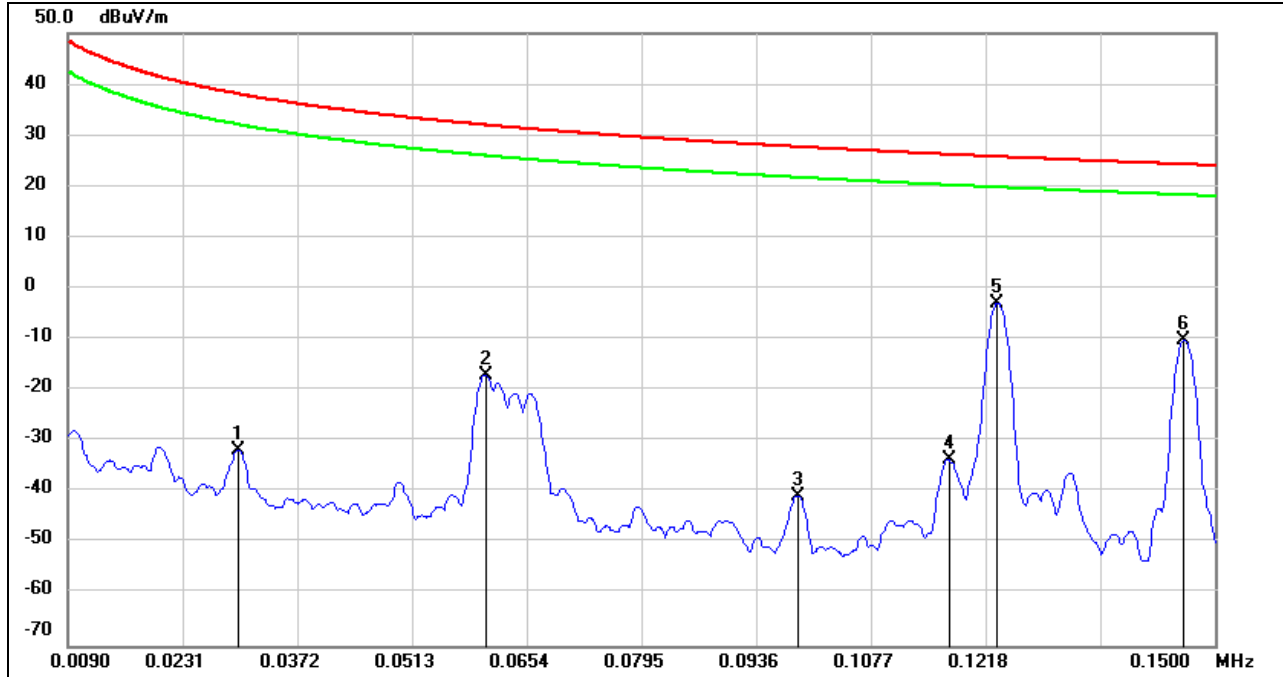
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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).

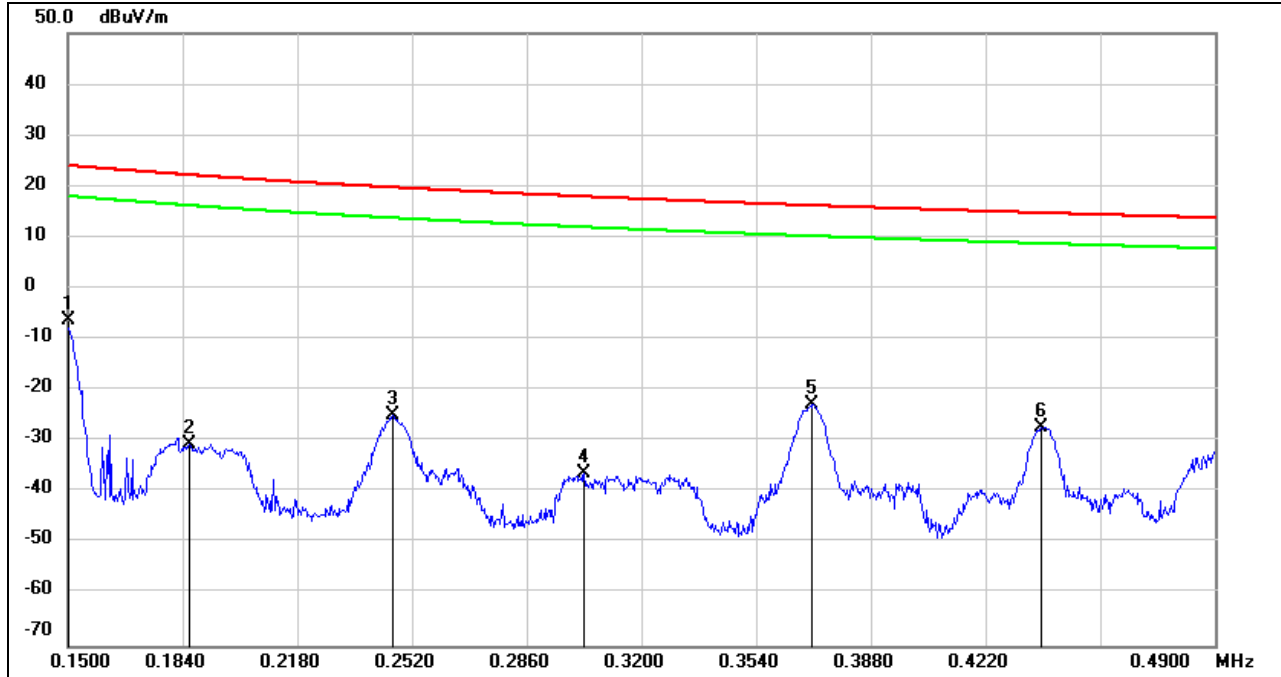
FCC PART 15C BELOW 30MHz SPURIOUS EMISSIONS (MODE 2, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~ 150kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0299	69.44	-101.11	-31.67	38.09	-69.76	peak
2	0.0603	84.17	-101.17	-17.00	32.00	-49.00	peak
3	0.0987	60.62	-101.26	-40.64	27.71	-68.35	peak
4	0.1171	68.03	-101.50	-33.47	26.23	-59.70	peak
5	0.1232	98.65	-101.57	-2.92	25.79	-28.71	peak
6	0.1462	91.67	-101.85	-10.18	24.30	-34.48	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 marker 5 is the operational frequency

150kHz ~ 490kHz


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1500	95.59	-101.89	-6.30	24.08	-30.38	peak
2	0.1860	71.37	-101.85	-30.48	22.21	-52.69	peak
3	0.2462	76.80	-101.79	-24.99	19.78	-44.77	peak
4	0.3030	65.47	-101.77	-36.30	17.97	-54.27	peak
5	0.3707	79.11	-101.75	-22.64	16.22	-38.86	peak
6	0.4387	74.60	-101.72	-27.12	14.76	-41.88	peak

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

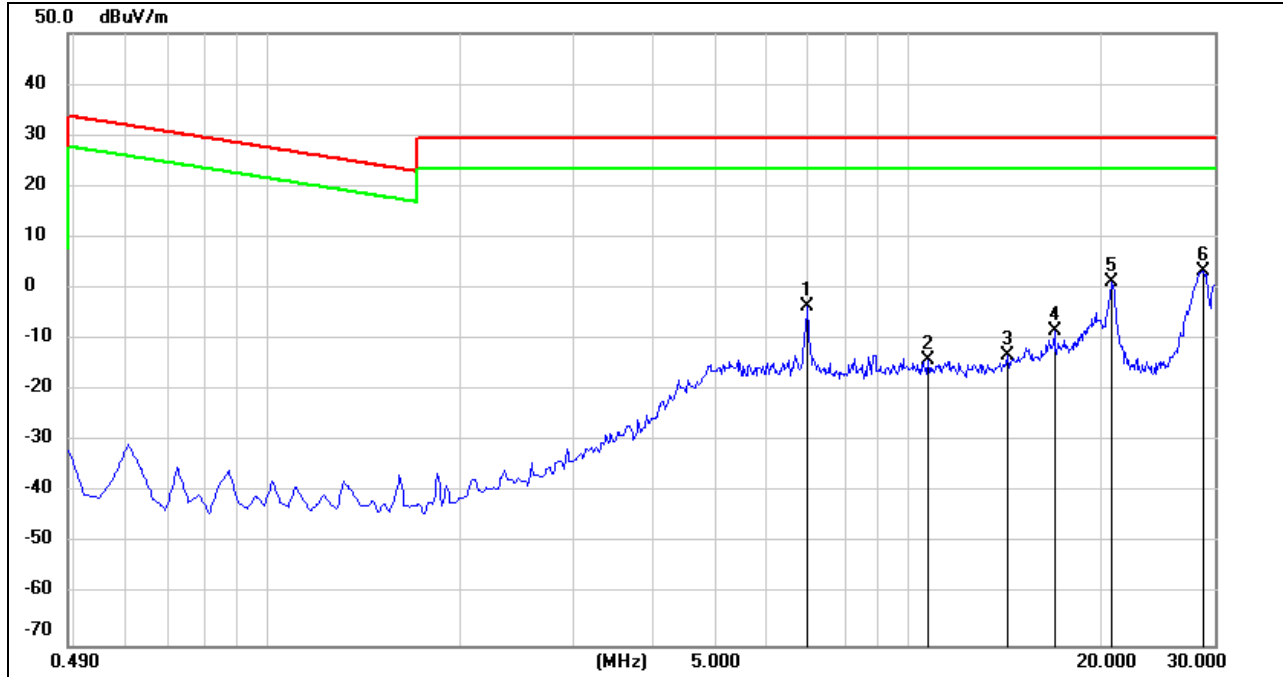
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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).

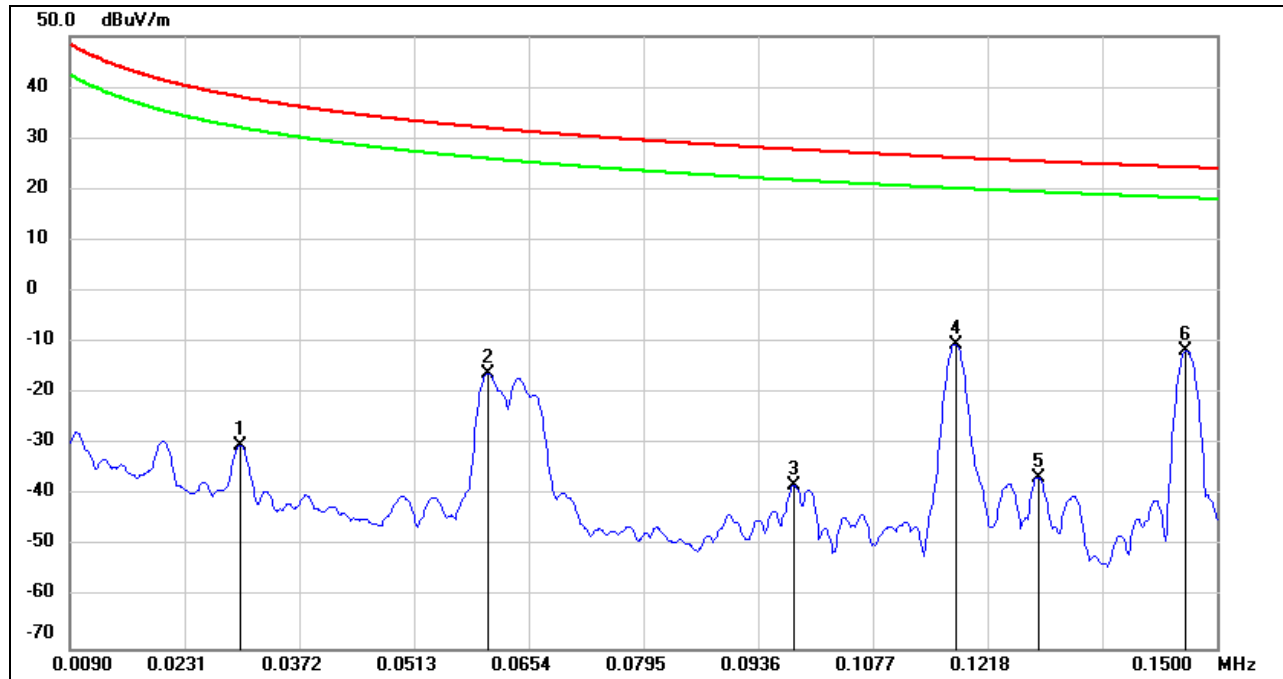


490kHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6.9822	58.12	-61.64	-3.52	29.54	-33.06	peak
2	10.7595	47.12	-61.25	-14.13	29.54	-43.67	peak
3	14.2712	48.22	-61.46	-13.24	29.54	-42.78	peak
4	16.8681	52.86	-61.35	-8.49	29.54	-38.03	peak
5	20.7634	62.25	-61.07	1.18	29.54	-28.36	peak
6	28.8196	64.22	-60.73	3.49	29.54	-26.05	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	0.0299	70.85	-101.11	-30.26	38.09	-68.35	peak
2	0.0603	85.13	-101.17	-16.04	32.00	-48.04	peak
3	0.0980	63.19	-101.25	-38.06	27.78	-65.84	peak
4	0.1179	91.14	-101.51	-10.37	26.17	-36.54	peak
5	0.1280	65.19	-101.63	-36.44	25.46	-61.90	peak
6	0.1462	90.17	-101.85	-11.68	24.30	-35.98	peak

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

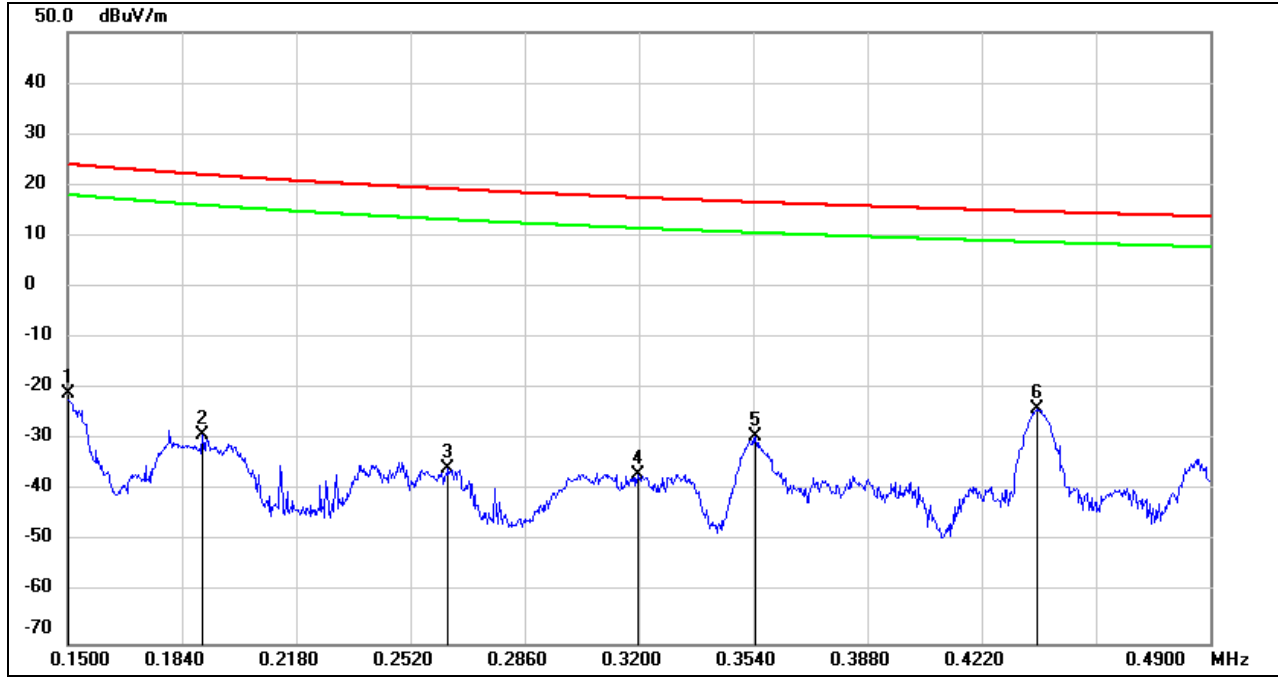
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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).

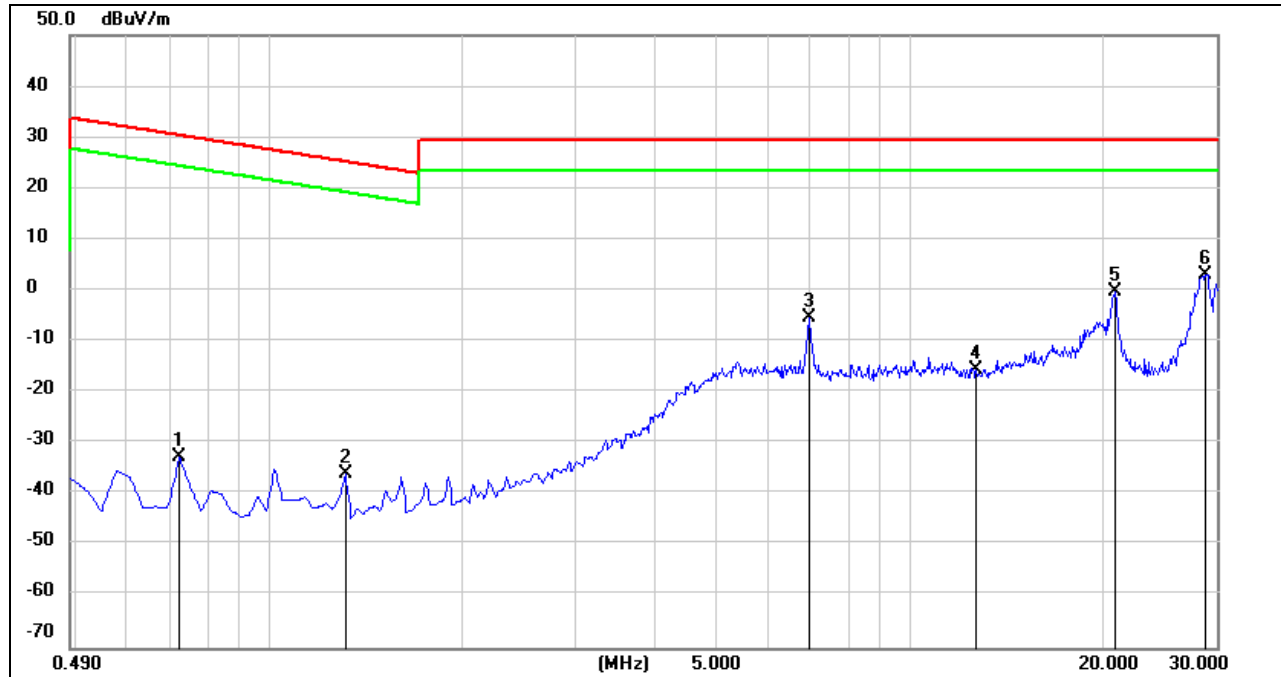
5. The marker 4 is the operational frequency

150kHz ~ 490kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1500	98.34	-101.89	-3.55	24.08	-27.63	peak
2	0.1901	72.79	-101.85	-29.06	22.03	-51.09	peak
3	0.2632	66.02	-101.78	-35.76	19.20	-54.96	peak
4	0.3197	64.80	-101.77	-36.97	17.51	-54.48	peak
5	0.3547	72.27	-101.76	-29.49	16.60	-46.09	peak
6	0.4383	77.78	-101.72	-23.94	14.77	-38.71	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

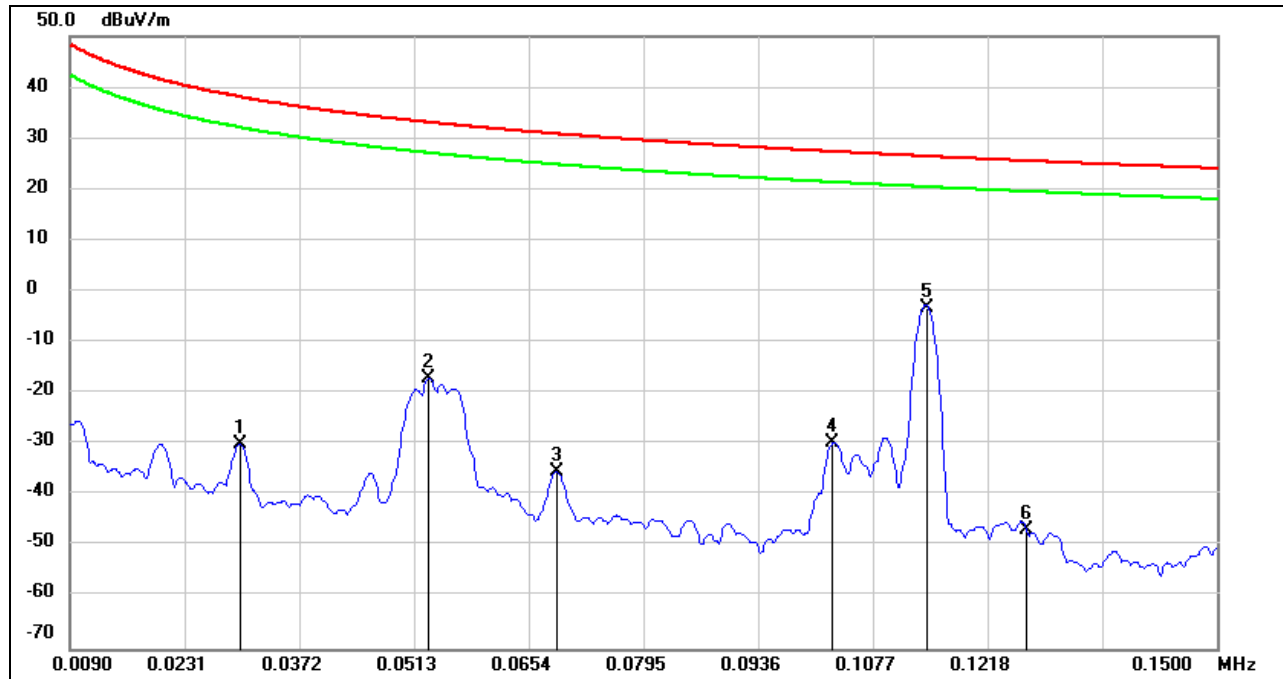
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.7261	67.52	-100.06	-32.54	30.38	-62.92	peak
2	1.3163	58.42	-94.51	-36.09	25.22	-61.31	peak
3	6.9527	56.37	-61.64	-5.27	29.54	-34.81	peak
4	12.6481	45.85	-61.35	-15.50	29.54	-45.04	peak
5	20.8814	60.91	-61.07	-0.16	29.54	-29.70	peak
6	28.8491	63.84	-60.73	3.11	29.54	-26.43	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**

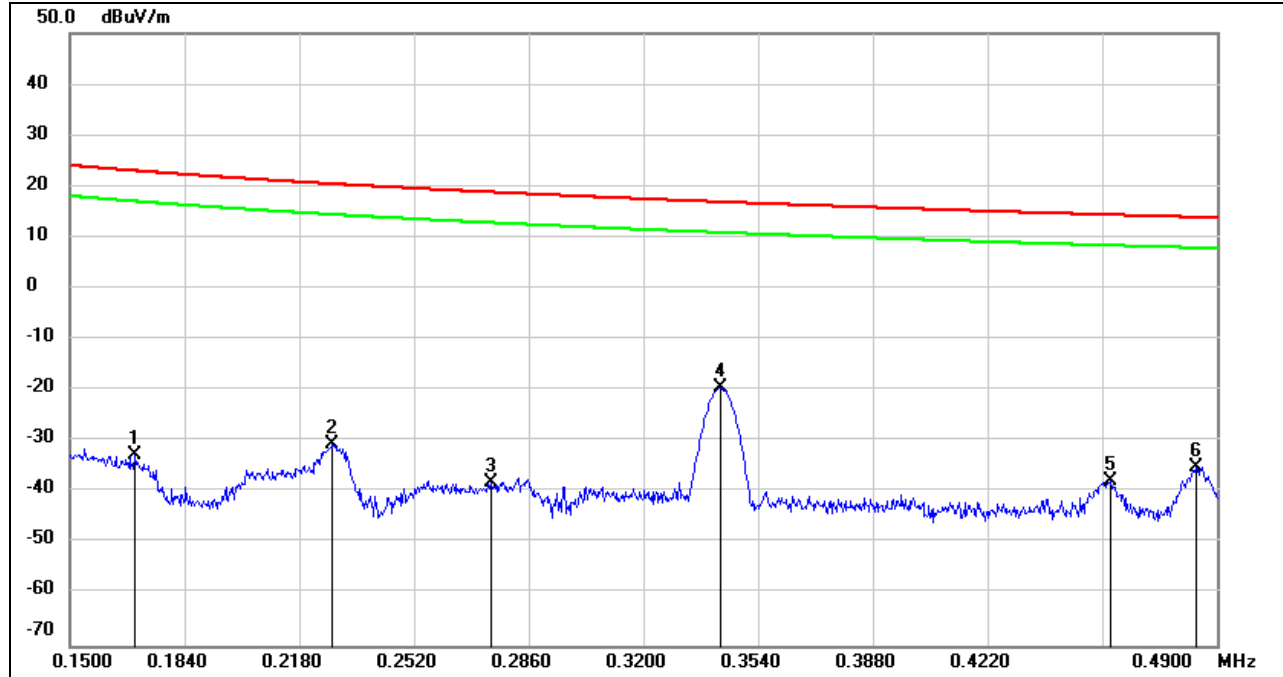
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0299	71.09	-101.11	-30.02	38.09	-68.11	peak
2	0.0531	84.23	-101.32	-17.09	33.10	-50.19	peak
3	0.0687	65.58	-101.00	-35.42	30.86	-66.28	peak
4	0.1028	71.63	-101.31	-29.68	27.36	-57.04	peak
5	0.1142	98.24	-101.46	-3.22	26.45	-29.67	peak
6	0.1266	54.97	-101.61	-46.64	25.56	-72.20	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


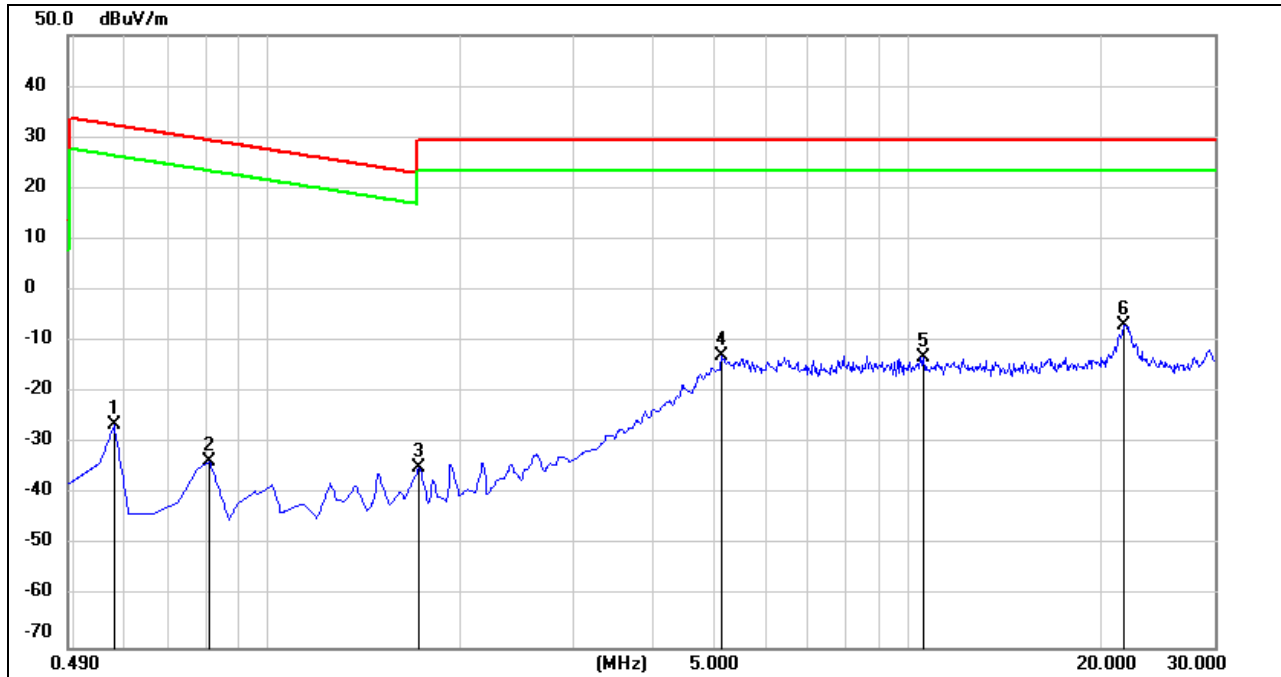
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1689	69.25	-101.87	-32.62	23.06	-55.68	peak
2	0.2279	71.33	-101.81	-30.48	20.45	-50.93	peak
3	0.2748	63.78	-101.78	-38.00	18.82	-56.82	peak
4	0.3428	82.30	-101.76	-19.46	16.90	-36.36	peak
5	0.4584	63.89	-101.72	-37.83	14.38	-52.21	peak
6	0.4839	66.64	-101.71	-35.07	13.91	-48.98	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).

490kHz ~ 30MHz


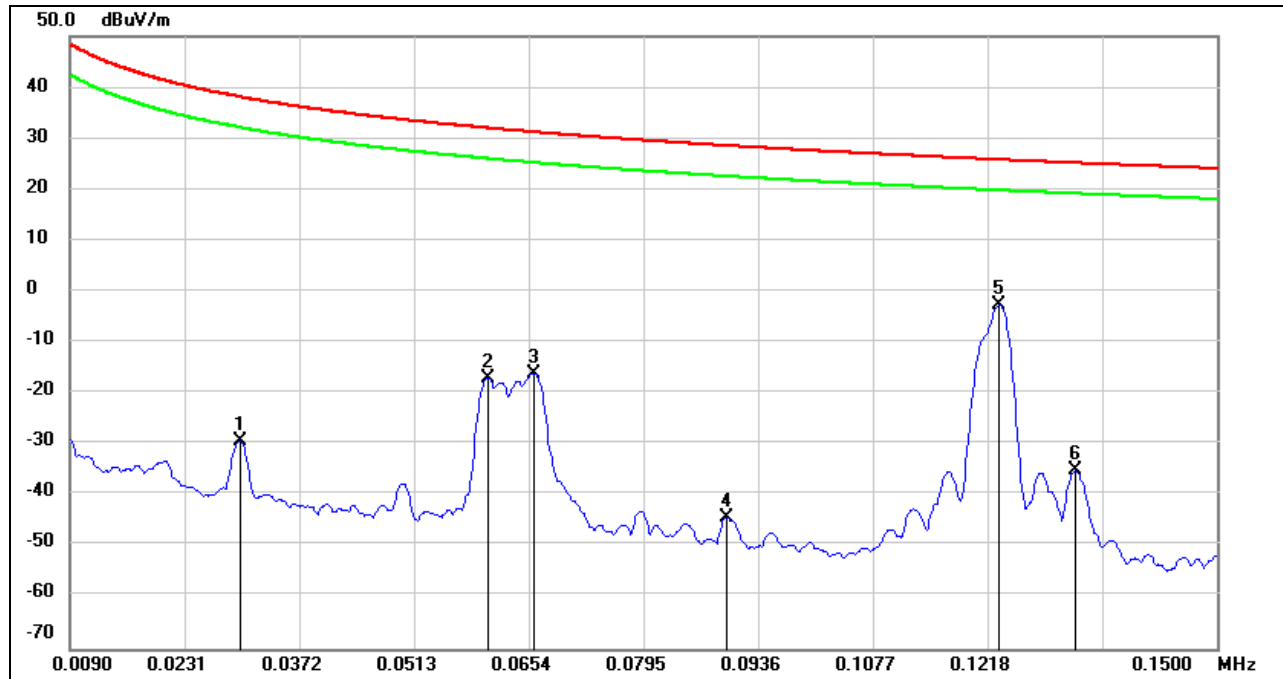
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.5785	74.63	-101.08	-26.45	32.36	-58.81	peak
2	0.8146	65.73	-99.24	-33.51	29.38	-62.89	peak
3	1.7294	56.03	-90.75	-34.72	29.54	-64.26	peak
4	5.1230	49.01	-61.92	-12.91	29.54	-42.45	peak
5	10.5824	48.18	-61.23	-13.05	29.54	-42.59	peak
6	21.7076	54.28	-61.05	-6.77	29.54	-36.31	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**

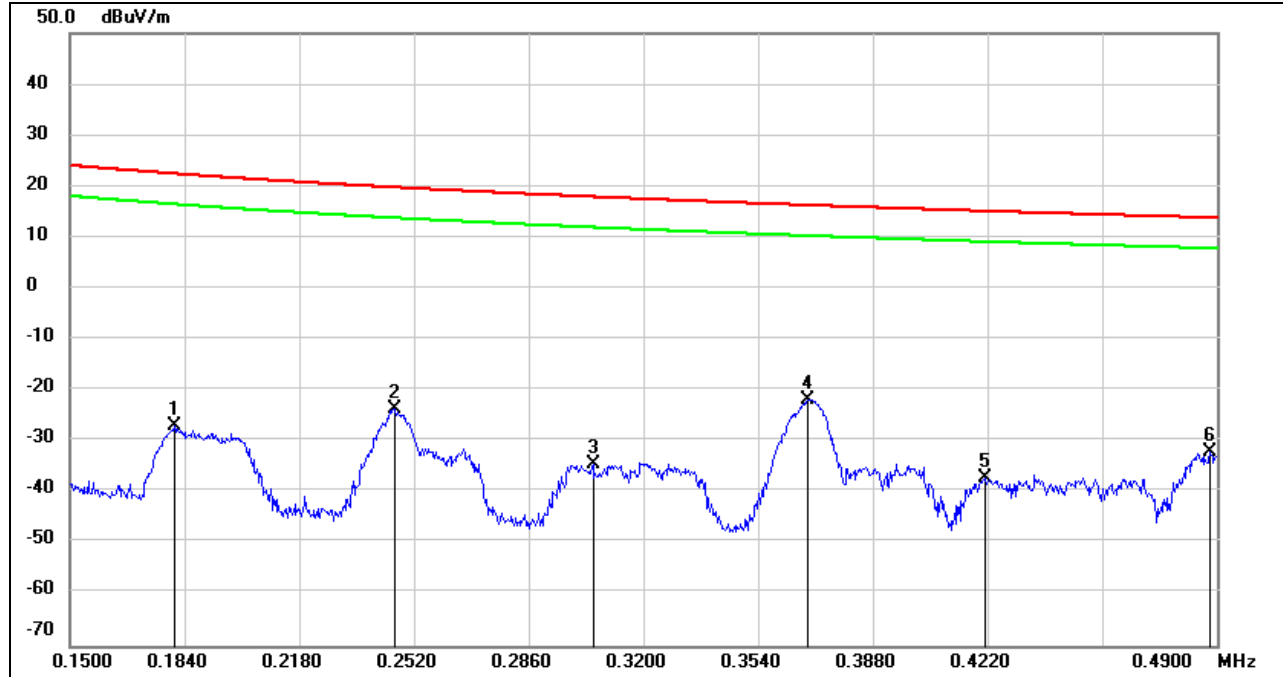
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0299	71.80	-101.11	-29.31	38.09	-67.40	peak
2	0.0603	84.24	-101.17	-16.93	32.00	-48.93	peak
3	0.0660	85.04	-101.06	-16.02	31.21	-47.23	peak
4	0.0897	56.78	-101.12	-44.34	28.55	-72.89	peak
5	0.1232	98.91	-101.57	-2.66	25.79	-28.45	peak
6	0.1324	66.52	-101.68	-35.16	25.17	-60.33	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	0.1809	74.77	-101.86	-27.09	22.46	-49.55	peak
2	0.2462	78.09	-101.79	-23.70	19.78	-43.48	peak
3	0.3050	67.22	-101.77	-34.55	17.92	-52.47	peak
4	0.3686	79.85	-101.75	-21.90	16.27	-38.17	peak
5	0.4213	64.73	-101.73	-37.00	15.11	-52.11	peak
6	0.4880	69.65	-101.70	-32.05	13.84	-45.89	peak

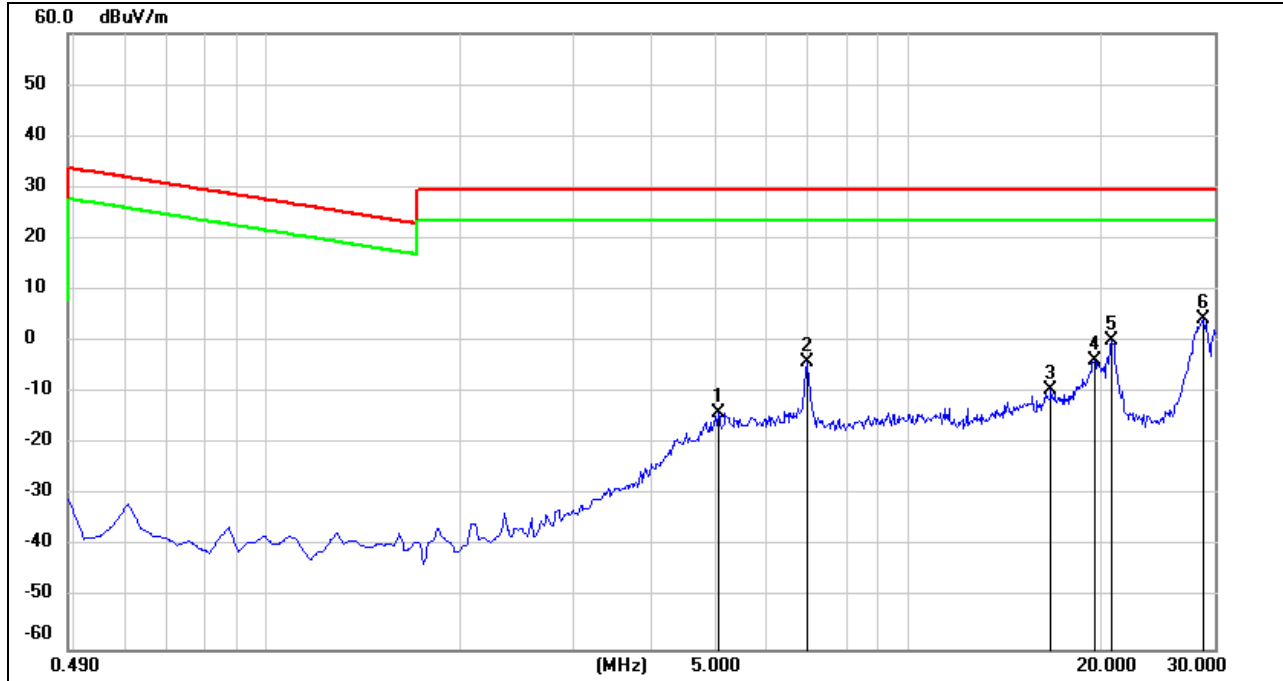
Note: 1. Measurement = Reading Level + Correct Factor.

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).

490kHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5.0640	48.08	-61.92	-13.84	29.54	-43.38	peak
2	6.9527	57.63	-61.64	-4.01	29.54	-33.55	peak
3	16.6910	51.85	-61.35	-9.50	29.54	-39.04	peak
4	19.5535	57.52	-61.13	-3.61	29.54	-33.15	peak
5	20.7339	61.32	-61.08	0.24	29.54	-29.30	peak
6	28.8786	65.00	-60.73	4.27	29.54	-25.27	peak

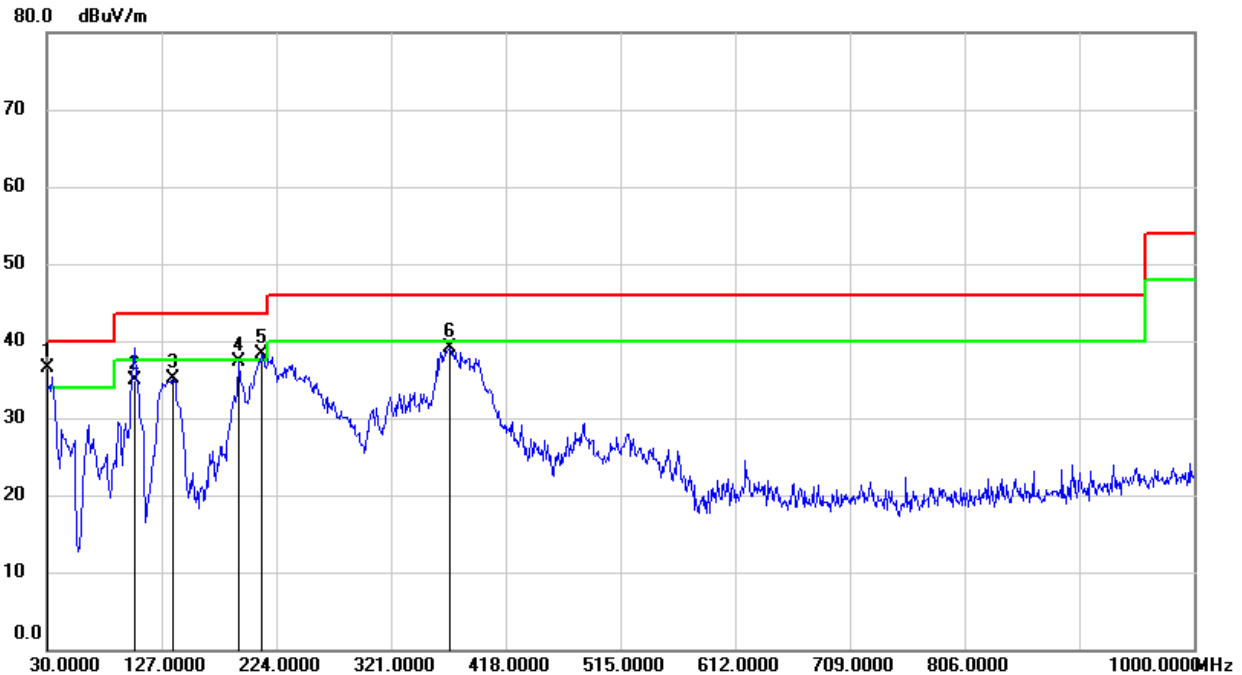
- Note: 1. Measurement = Reading Level + Correct Factor.
 2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
 3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
 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.



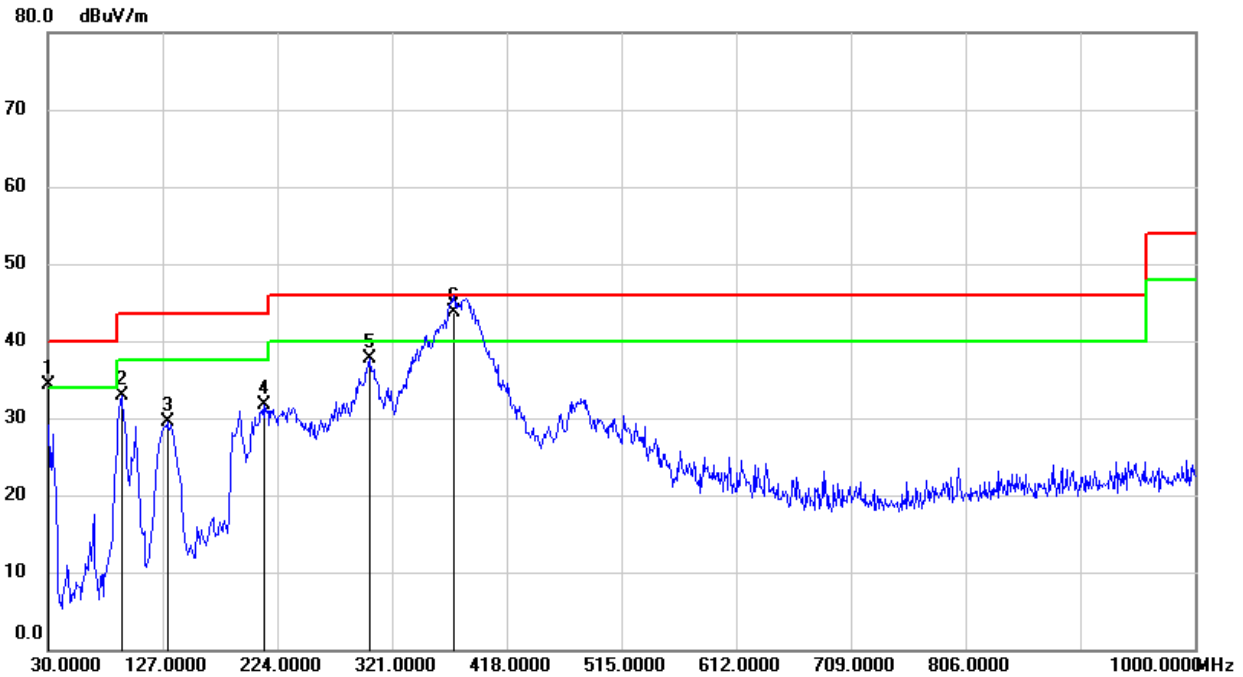
7.2. SPURIOUS EMISSIONS 30MHz - 1GHz

FCC PART15C SPURIOUS EMISSIONS (MODE 5, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	53.46	-16.94	36.52	40.00	-3.48	QP
2	103.7200	56.40	-21.56	34.84	43.50	-8.66	QP
3	136.7000	54.48	-19.38	35.10	43.50	-8.40	QP
4	191.9900	53.80	-16.54	37.26	43.50	-6.24	QP
5	211.3900	54.82	-16.60	38.22	43.50	-5.28	QP
6	370.4700	52.29	-13.15	39.14	46.00	-6.86	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 (MODE 5, WORST-CASE CONFIGURATION, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	51.28	-16.94	34.34	40.00	-5.66	QP
2	92.0800	54.08	-21.14	32.94	43.50	-10.56	QP
3	130.8800	48.96	-19.52	29.44	43.50	-14.06	QP
4	212.3600	48.37	-16.63	31.74	43.50	-11.76	QP
5	302.5700	51.81	-14.16	37.65	46.00	-8.35	QP
6	373.3800	56.81	-13.11	43.70	46.00	-2.30	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 recorded in the report.

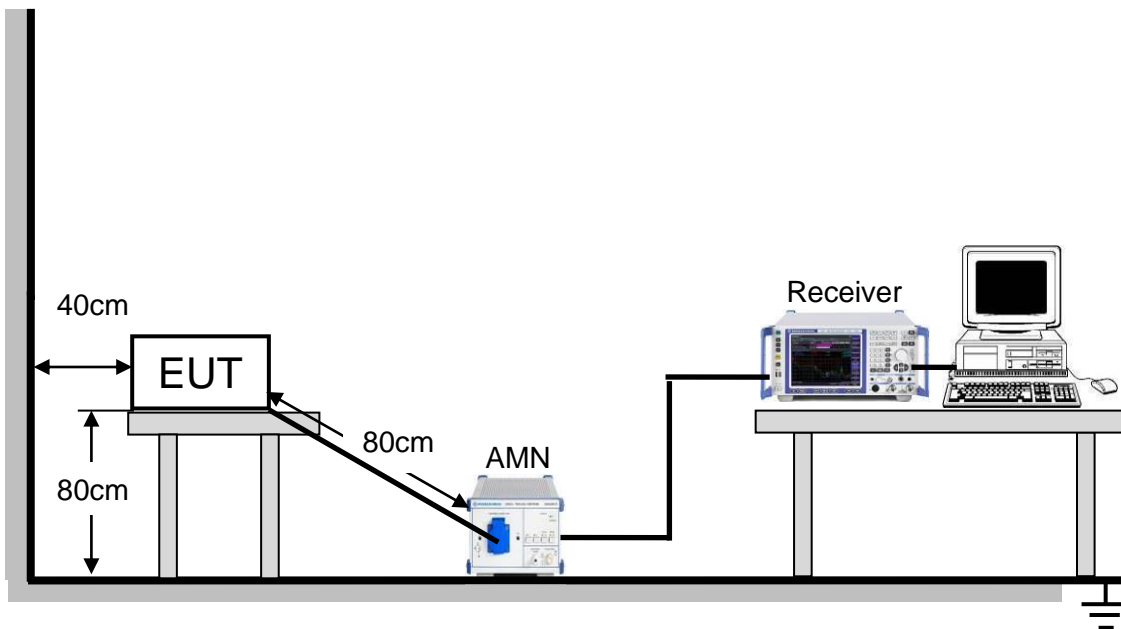
8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

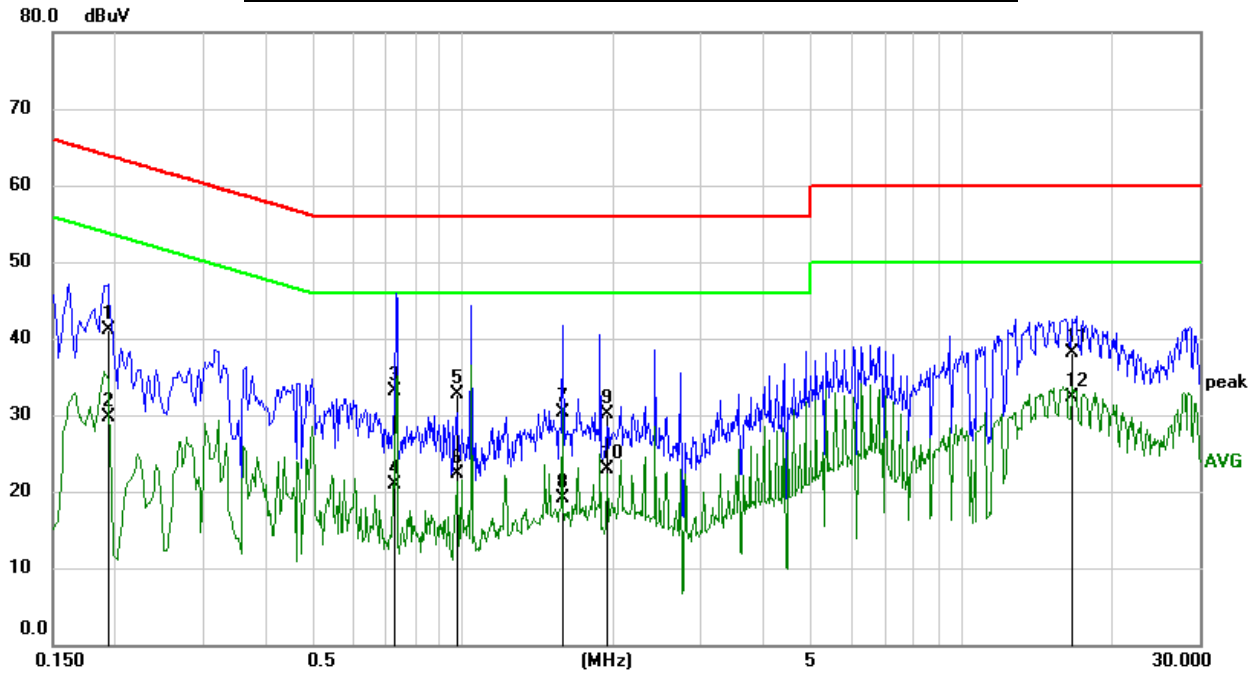
Please refer to FCC §15.207 (a) .

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 5, WORST-CASE CONFIGURATION)


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1928	31.59	9.60	41.19	63.92	-22.73	QP
2	0.1928	20.09	9.60	29.69	53.92	-24.23	AVG
3	0.7293	23.50	9.60	33.10	56.00	-22.90	QP
4	0.7293	11.23	9.60	20.83	46.00	-25.17	AVG
5	0.9720	23.12	9.61	32.73	56.00	-23.27	QP
6	0.9720	12.77	9.61	22.38	46.00	-23.62	AVG
7	1.5796	20.60	9.62	30.22	56.00	-25.78	QP
8	1.5796	9.47	9.62	19.09	46.00	-26.91	AVG
9	1.9431	20.49	9.62	30.11	56.00	-25.89	QP
10	1.9431	13.34	9.62	22.96	46.00	-23.04	AVG
11	16.6246	28.20	9.93	38.13	60.00	-21.87	QP
12	16.6246	22.46	9.93	32.39	50.00	-17.61	AVG

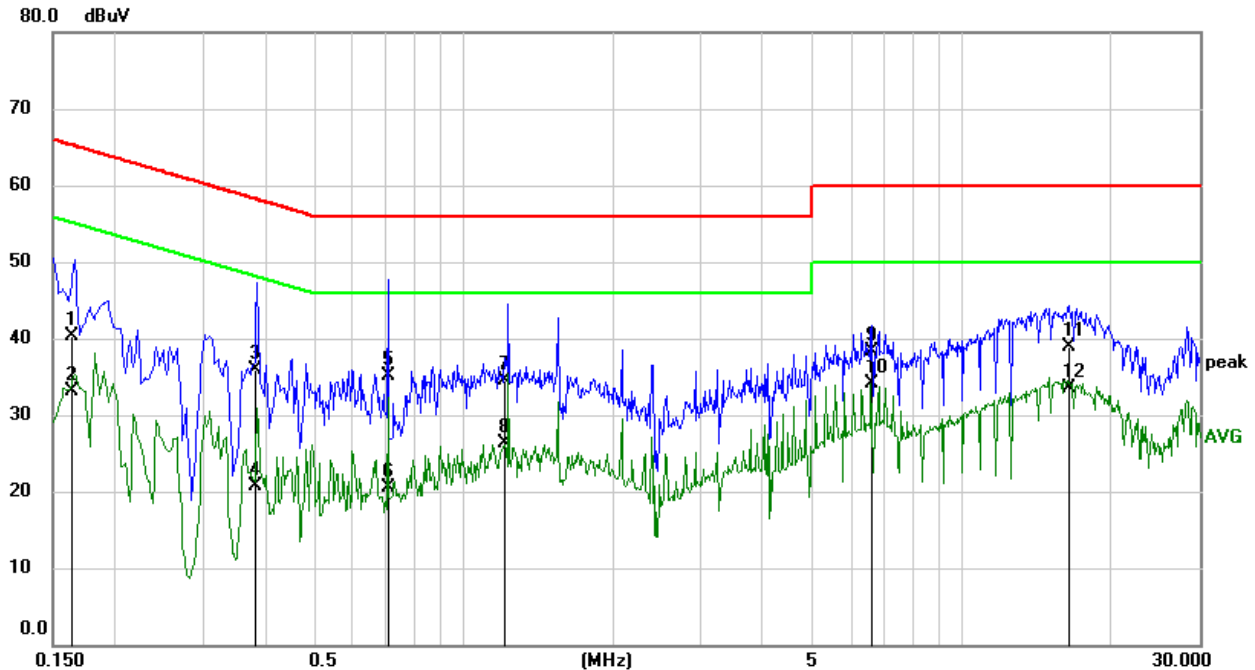
Note: 1. Result = Reading +Correct Factor.

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 5, WORST-CASE CONFIGURATION)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1625	30.68	9.61	40.29	65.34	-25.05	QP
2	0.1625	23.57	9.61	33.18	55.34	-22.16	AVG
3	0.3811	26.32	9.60	35.92	58.26	-22.34	QP
4	0.3811	11.06	9.60	20.66	48.26	-27.60	AVG
5	0.7067	25.55	9.60	35.15	56.00	-20.85	QP
6	0.7067	10.85	9.60	20.45	46.00	-25.55	AVG
7	1.2149	24.85	9.61	34.46	56.00	-21.54	QP
8	1.2149	16.66	9.61	26.27	46.00	-19.73	AVG
9	6.5620	28.59	9.70	38.29	60.00	-21.71	QP
10	6.5620	24.39	9.70	34.09	50.00	-15.91	AVG
11	16.3621	29.04	9.92	38.96	60.00	-21.04	QP
12	16.3621	23.54	9.92	33.46	50.00	-16.54	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.

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

END OF REPORT